MILLING
FREZOWANIE

SOLID CARBIDE END MILLS
FREZY WĘGLIKOWE MONOLITYCZNE

UFG	Hard Twarde	<70HRC
UFX	Hard Twarde	65HRC (Possible, Możliwe) <55HRC (Recommended, Zalecane)
UFJ	Difficult to cut materials Materiały ciężko obrabialne	<45HRC
UFD		Graphite Grafit
UFA		Aluminuim Aluminium
UFC		Copper Miedź
PMT		Powder Metal End Mills Frezy proszkowe
UCX		Multi purpose Obróbka ogólna
RB		Solid Carbide Rotary Burrs Węglikowe pilniki obrotowe
CBN		CBN Milling Cutters Narzędzia frezarskie CBN
HSS		HSSCo8 End Mills Frezy HSSCo8

INDEXIBLE MILLING CUTERS NARZĘDZIA SKADANE DO FREZOWANIA

ICT	Indexable Milling tools Narzędzia skadane do frezowania
TSLOT	T-Slot Milling Cutters Frezy T-owe

SYMBOLS SYMBOLE

TOLERANCE / **TOLERANCJA**



Outside diameter tolerance indicates diameter tolerance of end mill, (µm)



R tolerance indicates the Radius tolerance of a ball nose end mill, (mm)

Tolerancja promienia określa tolerancję promienia freza kulistego, (mm)



Tolerance of Taper angle indicates the tolerance of taper angle on the side of a taper end mill in decimal minutes
Tolerancja stożka określa tolerancję kąta stożka dla boku freza stożkowego w minutach kątowych



Tolerance of Point angle indicates the tolerance of the point angle of the taper end mill, (µm)
Tolerancja wierzchołka określa tolerancję wierzchołka stożka dla freza stożkowego, (µm)

MATERIAL / **MATERIAŁ**

UF Ultra micro grain solid carbide end mills
Frezy walcowo-czołowe z ultra drobnoziarnistego węglika spiekanego

CBN Cubic Boron Nitride CBN
Frezy z azotkiem boru

PM Powder Metal End Mills
Frezy walcowo-czołowe proszkoweFrezy walcowo-czołowe proszkowe

GEOMETRY / **GEOMETRIA**



Helix angle
Kąt pochylenia rowka wiórowego



Center cut
Skrawanie walcowo-czołowe

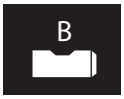


Non center cut
Skrawanie obwodowe

SHANK / **CHWYT**



Plain Shank
Chwyt walcowy (HA)



Flat Shank
Chwyt typu Weldon (HB)

PERFORMANCE / **WYDAJNOŚĆ**

HPM Qmax — High Performance Machining
Obróbka wydajnościowa

XSM Fmax — Ultra High-Feed Machining
Obróbka z dużym posuwem

HSM Vmax — High Speed Machining
Obróbka szybkościowa

CSM Standard — Conventional Speed Machining
Obróbka konwencjonalna

MACHINIG / **TYP OBRÓBKI**



Roughing
Zgrubna



Semi-Finishing
Półwykańczająca



Finishing
Wykańczająca

APPLICATION / ZASTOSOWANIA

Material Materiał	Coating Powłoka	G	X	J	D	A	C	T	S
	Hardness Twardość HRC	**30 ~ 70**	**≤ 65**	**≤ 45**	**-**	**-**	**-**	**≤ 40**	
Carbon steels Stale węglowe		●	●	●				●	
Alloy steels Stale stopowe		●	●	●				●	
Prehardened Steels Stale ulepszane		●	●	●				●	
Hardened Steels Stale hartowane		●	●						
Cooper Miedź			○			●	●	○	
Graphite Grafit					●	○			
Plastics Tworzywa sztuczne					●	●			
Cast Iron Żeliwo		●	●					●	
Aluminium alloy Si>10% Stopy aluminium Si>10%			○		●	●			
Aluminium alloy Si<10% Stopy aluminium Si<10%						●			
Stainless Steel Stale nierdzewne				●				●	
Heat resistant steels Stale żaroodporne		●	●					○	
Titanium Tytan				●				○	

Recommended ● Zalecane
Possible ○ Możliwe

N no coating
brak powłoki

CUTTING SHAPES / RODZAJ OBRÓBKI


Facing
Planowanie


Side Cutting
Frezowanie boku


Slotting
Frezowanie rowka


Die sinking
Frezowanie form


Profiling
Obróbka kształtowa


Radius Cutting
Frezowanie promienia


Chamfering
Fazowanie


Helical Cutting
Obróbka helikalna


Contour line cutting
Obróbka profilowa warstwowa


Spot Facing
Pogłębianie czołowe


Taper Cutting
Frezowanie rowka stożkowego


Radius Taper Cutting cartridge
Frezowanie rowka stożkowego
z promieniem


Side-open Cavity Cutting
Frezowanie zagłębień otwartych


Corner Recessing
Frezowanie naroży


Miniature Cutting
Frezowanie miniaturowe


Boring
Wytaczanie


Ramp down
Zagłębianie skośne


Plunging&Recessing
Zagłębienie narzędzia
i obróbka wybrania

MATERIAL GROUPS / GRUPY MATERIAŁÓW

Revolution per minute (RPM) / Obroty na minutę		
$N=\frac{V \times 1000}{\pi \times d1}\ (min^{-1})$	· V:Cutting speed (m/min)	· V: Prędkość skrawania (m/min)
	· ∏ Constant (≈ 3.14)	· ∏ : Stała (≈ 3.14)
	· d1: Mill diameter (mm)	· d1: Średnica freza (mm)
Feed / Posuw		
$F=N \times f_R\ (mm/min)$	· f_R : Feed rate(mm/rev)	f_R: Posuw (mm/obr)

UFG END MILLS are designed for HSM and dry machining of high hardened materials from 25 up to 70 HRC.

FREZY WALCOWO-CZOŁOWE UFX przeznaczone są do obróbki szybkościowej (OS) stali stopowej, niestopowej, narzędziowej, żaroodpornej, hartowanej <65 HRC (Możliwe) / <55HRC (Zalecane), żeliwa oraz stali do produkcji form i wykrojników.

EDP No.		Z	Angle Kąt	Materials Materiały	D / R
UFG31	**SQUARE TYPE** WALCOWO-CZOŁOWE	**2-Flute, Short flute** 2-ostrzowe, o krótkim ostrzu			
		2	30°	P H	D 0,1 - 20
UFG95	**SQUARE TYPE** WALCOWO-CZOŁOWE	**4-Flute, Short flute** 2-ostrzowe, o krótkim ostrzu			
		4	30°	P H	D 1 - 20
UFG07	**SQUARE TYPE** WALCOWO-CZOŁOWE	**4-Flute, Short** 4-ostrzowe, krótkie			
		4	45°	P H	D 3 - 20
UFG08	**SQUARE TYPE** WALCOWO-CZOŁOWE	**4-Flute, Medium length** 4-ostrzowe, średniej długośc			
		4	45°	P H	D 3 - 20
UFG09	**SQUARE TYPE** WALCOWO-CZOŁOWE	**4-Flute, Long** 4-ostrzowe, długie			
		4	45°	P H	D 3 - 20
UFG40	**SQUARE TYPE** WALCOWO-CZOŁOWE	**2-Flute** 2-ostrzowe			
		6 - 8	30°	P H	D 6 - 25
UFG50	**TOROIDAL** TOROIDALNE	**2-Flute, Miniature** 2-ostrzowe, miniaturowe			
		2	30°	P H	D 0,3 - 2
UFG01	**TOROIDAL** TOROIDALNE	**2-Flute, Miniature** 2-ostrzowe, miniaturowe			
		2	30°	P H	D 0,5 - 12
UFG02	**TOROIDAL** TOROIDALNE	**2-Flute, Medium flute** 2-ostrzowe, średniej długości			
		2	30°	P H	D 6 - 12
UFG36	**TOROIDAL** TOROIDALNE	**2-Flute, Medium flute** 2-ostrzowe, średniej długości			
		2	30°	P H	D 0,3 - 20
UFG47	**TOROIDAL** TOROIDALNE	**4-Flute** 4-ostrzowe			
		4	30°	P H	D 2 - 12
UFG37	**TOROIDAL** TOROIDALNE	**4-Flute,Short length** 4-ostrzowe, krótkie			
		4	30°	P H	D 1 - 20
UFG18	**TOROIDAL** TOROIDALNE	**4-Flute** 4-ostrzowe			
		4	30°	P H	D 6 - 12
UFG20	**TOROIDAL** TOROIDALNE	**4-Flute,Short length** 4-ostrzowe, krótkie			
		4	30°	P H	D 3 - 20
UFG04	**TOROIDAL** TOROIDALNE	**4-Flute, Long length**			
		4		P H	D 2 - 16

EDP No.		Z	Angle Kąt	Materials Materiały	D / R
UFG39	**TOROIDAL** TOROIDALNE	**6-Flute** 6-ostrzowe			
		6	45°	P H	D 6 - 20
UFG19	**TOROIDAL** TOROIDALNE	**3-Flute** 3-ostrzowe			
		3	30°	P H	D 3 - 12
UFG22	**TOROIDAL** TOROIDALNE	**4-Flute** 4-ostrzowe			
		4	45°	P H	D 1 - 16
UFG53	**BALL NOSE** KULISTE	**2-Flute, Miniature Ball Nose** 2-ostrzowe, kuliste, miniaturowe			
		2	30°	P H	R 0,2 - 1
UFG28	**BALL NOSE** KULISTE	**2-Flute Ball Nose** 2-ostrzowe kuliste			
		2	30°	P H	R 0,05 - 6
UFG38	**BALL NOSE** KULISTE	**2-Flute Ball Nose** 2-ostrzowe kuliste			
		2	30°	P H	R 0,5 - 12,5
UFG55	**BALL NOSE** KULISTE	**2-Flute Ball Nose** 2-ostrzowe kuliste			
		2	30°	P H	R 0,5 - 12,5
UFG59	**BALL NOSE** KULISTE	**3-Flute, Long length Ball Nose** 3-ostrzowe, długie, kuliste			
		3	30°	P H	R 1,5 - 10
UFG21	**BALL NOSE** KULISTE	**3-Flute, Miniature** 3-ostrzowe, miniaturowe			
		3	30°	P H	R 0,5 - 6
UFG41	**BALL NOSE** KULISTE	**4-Flute, Short** 4-ostrzowe, krótkie			
		4	45°	P H	R 1,5 - 10
UFG83	**FOR RIB PROCESSING** DO ŻEBER	**2-Flute, Miniature Ball Nose** 2-ostrzowe, kuliste, miniaturowe			
		2	30°	P H	D 0,1 - 4
UFG52	**FOR RIB PROCESSING** DO ŻEBER	**2-Flute, Toroidal** 2-ostrzowe, toroidalne			
		2	30°	P H	D 0,5 - 2
UFG54	**FOR RIB PROCESSING** DO ŻEBER	**2-Flute, Miniature Ball Nose** 2-ostrzowe, kuliste, miniaturowe			
		2	30°	P H	R 0,25 - 1
UFG86	**FOR RIB PROCESSING** DO ŻEBER	**2-Flute, Miniature Ball Nose** 2-ostrzowe, kuliste, miniaturowe			
		2	30°	P H	R 0,05 - 2

UFX END MILLS for HSM are designed to machine alloy steels, non-alloy steels, tool steels, heat resistant steels, hardened steels up to HRC 65 (Possible) / up to 55HRC (Recommended), cast iron, mold steels.

FREZY WALCOWO-CZOŁOWE UFX przeznaczone są do obróbki szybkościowej (OS) stali stopowej, niestopowej, narzędziowej, żaroodpornej, hartowanej <65 HRC (Możliwe) / <55HRC (Zalecane), żeliwa oraz stali do produkcji form i wykrojników.

EDP No.		Z	Angle Kąt	Materials Materiały	D / R
UFX10	**SQUARE TYPE** WALCOWO-CZOŁOWE	**2-Flute, Short Length** 2-ostrzowe, krótkie			
		2	30°	P K N	D 0,4 - 25
UFX16	**SQUARE TYPE** WALCOWO-CZOŁOWE	**2-Flute, Long Length** 2-ostrzowe, długie			
		2	30°	P K N	D 2 - 25
UFX36	**SQUARE TYPE** WALCOWO-CZOŁOWE	**3-Flute, Miniature** 3-ostrzowe, miniaturowe			
		3	30°	P K N	D 1 - 20
UFX95	**SQUARE TYPE** WALCOWO-CZOŁOWE	**3-Flute, Short Length** 3-ostrzowe, krótkie			
		3	30°	P K N	D 1 - 20
UFX11	**SQUARE TYPE** WALCOWO-CZOŁOWE	**4-Flute, Short Length** 4-ostrzowe, krótkie			
		3	30°	P K N	D 2 - 25
UFX17	**SQUARE TYPE** WALCOWO-CZOŁOWE	**4-Flute, Long length**			
		4	30°	P K N	D 2 - 25
UFX14	**SQUARE TYPE** WALCOWO-CZOŁOWE	**Multi Flute, Long Length** Wieloostrzowe, długie			
		3 - 5	20°	P K N	D 6 - 25
UFX12	**SQUARE TYPE** WALCOWO-CZOŁOWE	**Multi Flute, Long Length** Wieloostrzowe, długie			
		6 - 8	20°	P K N	D 6 - 25
UFX34	**SQUARE TYPE** WALCOWO-CZOŁOWE	**6-Flute, Extra Long Length** 6-ostrzowe, bardzo długie			
		6	45°	P K	D 6 - 25
UFX06	**SQUARE TYPE** WALCOWO-CZOŁOWE	**4-Flute, Stub** 4-ostrzowe, bardzo krótkie			
		4	45°	P H M K N S	D 2 - 20
UFX07	**SQUARE TYPE** WALCOWO-CZOŁOWE	**4-Flute, Stub** 4-ostrzowe, bardzo krótkie			
		4	45°	P H M K N S	D 3 - 20
UFX08	**SQUARE TYPE** WALCOWO-CZOŁOWE	**4-Flute, Medium length** 4-ostrzowe, średniej długośc			
		4	45°	P H M K N S	D 3 - 20
UFX09	**SQUARE TYPE** WALCOWO-CZOŁOWE	**4-Flute, Long** 4-ostrzowe, długie			
		4	45°	P H M K N S	D 3 - 20
UFX32	**SQUARE TYPE** WALCOWO-CZOŁOWE	**3-5-Flute, Long** 3-5-ostrzowe, długie			
		3 - 5	20°	P K N	D 6 - 25
UFX39	**SQUARE TYPE** WALCOWO-CZOŁOWE	**4-Flute, Long** 4-ostrzowe, długie			
		4	30°	P K	D 2 - 16
UFX35	**SQUARE TYPE** WALCOWO-CZOŁOWE	**6-Flute, Long** 6-ostrzowe, długie			
		6	45°	P K	D 6 - 20
UFX60	**SQUARE TYPE** WALCOWO-CZOŁOWE	**4-5 Flute, Short,Long** 4-5 ostrzowe, krótkie, długie			
		4 - 5	45°	P K N	D 6 - 20

EDP No.		Z	Angle Kąt	Materials Materiały	D / R
UFX54	**SQUARE TYPE** WALCOWO-CZOŁOWE	**2 Flute** 2 ostrzowe ,			
		2	30°	P K	D 0,2 - 20
UFX58	**SQUARE TYPE** WALCOWO-CZOŁOWE	**2-Flute with extended neck** 2-ostrzowe z szyjką			
		2	30°	P K	D 0,2 - 20
UFX61	**SQUARE TYPE** WALCOWO-CZOŁOWE	**2 Flute** 2 ostrzowe ,			
		4	30°	P K	D 1 - 20
UFX62	**SQUARE TYPE** WALCOWO-CZOŁOWE	**4-Flute with extended neck** 4-ostrzowe z szyjką			
		4		P K	D 1 - 20
UFX67	**SQUARE TYPE** WALCOWO-CZOŁOWE	**2 Flute** 2 ostrzowe ,			
		2	30°	P K N	D 0.03 - 25
UFX71	**SQUARE TYPE** WALCOWO-CZOŁOWE	**2-Flute Long Length** 2-ostrzowe długie			
		2	30°	P K	D 1 - 25
UFX69	**SQUARE TYPE** WALCOWO-CZOŁOWE	**2-Flute with extended neck** 2-ostrzowe z szyjką			
		2	30°	P K N	D 0.1 - 12
UFX70	**SQUARE TYPE** WALCOWO-CZOŁOWE	**4-Flute Multiple Helix** 4-ostrzowe wielokątowe			
		4		P K N	D 0.8 - 25
UFX75	**SQUARE TYPE** WALCOWO-CZOŁOWE	**4-Flute Multiple Helix** 4-ostrzowe wielokątowe			
		4		P K	D 1 - 20
UFX73	**SQUARE TYPE** WALCOWO-CZOŁOWE	**4-Flute Multiple Helix** 4-ostrzowe wielokątowe			
		4	30°	P K	D 1 - 25
UFX74	**SQUARE TYPE** WALCOWO-CZOŁOWE	**4-Flute with External Neck** 4-ostrzowe z szyjką			
		4	30°	P K N	D 1.0 - 12
UFX77	**SQUARE TYPE** WALCOWO-CZOŁOWE	**6-Flute** 6-ostrzowe			
		6	45°	P K S	D 6 - 20
UFX18	**TOROIDAL** TOROIDALNE	**2-Flute, Long Length** 2-ostrzowe, długie			
		2	30°	P	D 3 - 20
UFX19	**TOROIDAL** TOROIDALNE	**4-Flute, Long length**			
		4	30°	P K N	D 3 - 20
UFX05	**TOROIDAL** TOROIDALNE	**4-Flute, Long Reach** 4-ostrzowe, bardzo długie			
		4	45°	P K N	D 10 - 22
UFX97	**TOROIDAL** TOROIDALNE	**6-Flute, Stub** 6-ostrzowe, krótkie			
		6	45°	P K	D 6 - 12
UFX20	**TOROIDAL** TOROIDALNE	**4-Flute, Long Reach** 4-ostrzowe, bardzo długie			
		4	45°	P H M K N S	D 3 - 20
UFX65	**BALL NOSE** KULISTE	**2-Flute, Miniature** 2-ostrzowe, miniaturowe			
		2	30°	P K	R 0,2 - 1,5
UFX76	**BALL NOSE** KULISTE	**2-Flute, Long Length** 2-ostrzowe, długie			
		2	30°	P K	R 0,2 - 12,5

EDP No.		Z	Angle Kąt	Materials Materiały	D / R
UFX13	**BALL NOSE** KULISTE	**2-Flute, Long Length** 2-ostrzowe, długie			
		2	30°	P K	R 0,5 - 12,5
UFX78	**BALL NOSE** KULISTE	**2-Flute, With Neck** 2-ostrzowe, ze zwężoną szyjką й			
		2	30°	P K	R 0,5 - 12,5
UFX53	**BALL NOSE** KULISTE	**2 Flute** 2 ostrzowe ,			
		2	30°	P K	R 0,5 - 12,5
UFX99	**BALL NOSE** KULISTE	**2 Flute** 2 ostrzowe ,			
		2	30°	P K	R 1,5 - 12,5
UFX51	**BALL NOSE** KULISTE	**2 Flute** 2 ostrzowe ,			
		2	30°	P K	R 0,05 - 12,5
UFX56	**BALL NOSE** KULISTE	**2-Flute with extended neck** 2-ostrzowe z szyjką			
		2	30°	P K	R 0,05 - 6
UFX38	**BALL NOSE** KULISTE	**2-Flute, Long Length** 2-ostrzowe, długie			
		2	30°	P K	R 1 - 10
UFX41	**BALL NOSE** KULISTE	**2-Flute, Long Length** 2-ostrzowe, długie			
		2	30°	P K	R 1,5 - 8
UFX42	**BALL NOSE** KULISTE	**2-Flute, Long Length** 2-ostrzowe, długie			
		2	30°	P K	R 2,5 - 8
UFX63	**BALL NOSE** KULISTE	**2-Flute, Long, Sphere Type** 2-ostrzowe, długie, sferyczne			
		2	30°	P K	R 1,5 - 8
UFX33	**BALL NOSE** KULISTE	**3,4-Flute, Long** 3,4-ostrzowe, długie			
		3 - 4	20°	P K N	R 3 - 10
UFX15	**BALL NOSE** KULISTE	**4-Flute, Long length**			
		4	30°	P H K	R 0,5 - 12,5
UFX64	**BALL NOSE** KULISTE	**4-Flute, Long, Sphere Type** 4-ostrzowe, długie, sferyczne			
		4	30°	P H K	R 2,5 - 8
UFX02	**TAPER** STOŻKOWE	**2-Flute, Taper Neck** 2-ostrzowe. ze stożkową szyjką			
		2	30°	P	R 0,5 - 6
UFX37	**TAPER** STOŻKOWE	**2-Flute, Taper, Short Length** 2-ostrzowe, stożkowe, krótkie ,			
		2	30°	P K	D 2 - 8
UFX83	**FOR RIB PROCESSING** DO ŻEBER	**2-Flute, Ball Nose, Micro, For Rib Processing** 2-ostrzowe, kuliste, mikro, do żeber			
		2	30°	P K	D 0,4 - 3
UFX86	**FOR RIB PROCESSING** DO ŻEBER	**2-Flute, Ball Nose, Micro, For Rib Processing** 2-ostrzowe, kuliste, mikro, do żeber			
		2	30°	P K	D 04 - 20
UFX66	**FOR RIB PROCESSING** DO ŻEBER	**2 Flute** 2 ostrzowe ,			
		2	25°	P K	D 0,5 - 6
UFX89	**FOR RIB PROCESSING** DO ŻEBER	**4-Flute, Taper** 4-ostrzowe, stożkowe			
		4	25°	P K	D 1 - 2
UFX90	**FOR RIB PROCESSING** DO ŻEBER	**4-Flute, Taper** 4-ostrzowe, stożkowe			
		4	25°	P K	D 1 - 2

UFJ END MILLS are designed for HSM machining of stainless steels, titanium, Inconel and materials difficult to cut under 45 HRC.

FREZY UFJ przeznaczone są do obróbki szybkościowej (OS) stali nierdzewnej, tytanu, inconelu oraz materiałów ciężko obrabialnych poniżej 45 HRC.

EDP No.		Z	Angle Kąt	Materials Materiały	D / R
UFJ70	**SQUARE TYPE** WALCOWO-CZOŁOWE	**3-Flute, Medium length** 3-ostrzowe, średniej długości			
		3	45°	P H N S	D 2 - 20
UFJ72	**SQUARE TYPE** WALCOWO-CZOŁOWE	**4-Flute, Short** 4-ostrzowe, krótkie			
		4		P H N S	D 3 - 20
UFJ73	**SQUARE TYPE** WALCOWO-CZOŁOWE	**4-Flute, Medium** 4-ostrzowe, średniej długości			
		4		P H N S	D 3 - 25
UFJ74	**SQUARE TYPE** WALCOWO-CZOŁOWE	**5-Flute, Medium** 5-ostrzowe, średniej długości			
		5		P H N S	D 6 - 25
UFJ75	**SQUARE TYPE** WALCOWO-CZOŁOWE	**4-Flute, Medium** 4-ostrzowe, średniej długości			
		4		P K N	D 3 - 20
UFJ76	**SQUARE TYPE** WALCOWO-CZOŁOWE	**4-Flute, Medium** 4-ostrzowe, średniej długości			
		4		P K N	D 3 - 25
UFJ17	**SQUARE TYPE** WALCOWO-CZOŁOWE	**Multiflute** Wieloostrzowe			
		4	45°	P N S	D 6 - 20
UFJ19	**SQUARE TYPE** WALCOWO-CZOŁOWE	**Multiflute** Wieloostrzowe			
		3 - 6	45°	P N S	D 4 - 25
UFJ21	**SQUARE TYPE** WALCOWO-CZOŁOWE	**Multiflute** Wieloostrzowe			
		4 - 6	45°	P N S	D 6 - 20
UFJ15	**SQUARE TYPE** WALCOWO-CZOŁOWE	**Multiflute** Wieloostrzowe			
		6 - 8	45°	P N S	D 6 - 25
	SQUARE TYPE WALCOWO-CZOŁOWE	**4-Flute** 4-ostrzowe			
UFJ01		4	45°	P H	D 6 - 25
UFJ02	**SQUARE TYPE** WALCOWO-CZOŁOWE	**4-Flute** 4-ostrzowe			
		4	45°	P H	D 6 - 25
UFJ03	**SQUARE TYPE** WALCOWO-CZOŁOWE	**4-Flute** 4-ostrzowe			
		4	45°	P H	D 6 - 25
UFJ22	**SQUARE TYPE** WALCOWO-CZOŁOWE	**4-Flute** 4-ostrzowe			
		4	45°	P H	D 6 - 20
UFJ11	**SQUARE TYPE** WALCOWO-CZOŁOWE	**2-Flute, Short Length** 2-ostrzowe, krótkie			
		2	30°	P N S	D 1 - 25

EDP No.		Z	Angle Kąt	Materials Materiały	D / R
UFJ13	**SQUARE TYPE** WALCOWO-CZOŁOWE	**4-Flute, Short Length** 4-ostrzowe, krótkie			
		4	45°	P N S	D 2 - 25
UFJ30	**SQUARE TYPE** WALCOWO-CZOŁOWE	**3-4 Flute, Long length** 3-4 ostrzowe, długie			
		3 - 4	45°	P N S	D 6 - 25
UFJ08	**SQUARE TYPE** WALCOWO-CZOŁOWE	**4-6 Flute, Short Length** 4-6 ostrzowe, krótkie			
		4 - 6	30°	P N S	D 3 - 25
UFJ09	**SQUARE TYPE** WALCOWO-CZOŁOWE	**3-5 Flute, Short Roughing** 3-5 ostrzowe, krótkie, zgrubne			
		3 - 5	30°	P N S	D 6 - 25
UFJ35	**SQUARE TYPE** WALCOWO-CZOŁOWE	**5-Flute, Corner Radius Roughing** 5-ostrzowe, z promieniem,zgrubne			
		5	40°	P N S	D 6 - 25
UFJ36	**SQUARE TYPE** WALCOWO-CZOŁOWE	**4-Flute, with Extended Neck** 4-ostrzowe, ze zwężaną szyjką			
		4		P K N	D 3 - 20
UFJ37	**SQUARE TYPE** WALCOWO-CZOŁOWE	**4-Flute, with Extended Neck, Corner Radius** 4-ostrzowe, z zwężaną szyjką z prom.			
		4		P K N	D 3 - 20
UFJ38	**SQUARE TYPE** WALCOWO-CZOŁOWE	**4-Flute, with Extended Neck** 4-ostrzowe, ze zwężaną szyjką			
		4		P N S	D 3 - 20
UFJ39	**SQUARE TYPE** WALCOWO-CZOŁOWE	**4-Flute, with Extended Neck, Corner Radius** 4-ostrzowe, z zwężaną szyjką z prom.			
		4		P N S	D 3 - 20
UFJ77	**SQUARE TYPE** WALCOWO-CZOŁOWE	**4-Flute, Medium** 4-ostrzowe, średniej długości			
		4		P N S	R 1,5 - 12,5

DIAMOND COATING UFD END MILLS are designed for HSM and dry machining of graphite, high silicon aluminum, magnesium alloys, plastics, glass and carbon fiber reinforced plastics. IMPOSSIBLE FOR STEELS !!!

FREZY Z POWŁOKĄ DIAMENTOWĄ UFD przeznaczone są do obróbki szybkościowej oraz na sucho grafitu, stopów aluminium o wysokiej zawartości krzemu oraz metali nieżelaznych, stopów magnezu, tworzyw sztucznych, tworzyw z włókna szklanego i włókna węglowego. NIE STOSOWAĆ DO STALI !!!

EDP No.		Z	Angle Kąt	Materials Materiały	D / R
UFD27	**SQUARE TYPE** WALCOWO-CZOŁOWE	**2-Flute, Long Length** 2-ostrzowe, długie			
		2	30°	N	D 0,5 - 12
UFD24	**SQUARE TYPE** WALCOWO-CZOŁOWE	**2 Flute, Miniature** 2 ostrzowe, miniaturowe			
		2	30°	N	D 1 - 2
UFD25	**SQUARE TYPE** WALCOWO-CZOŁOWE	**4 Flute, Short Length** 4 ostrzowe, krótkie			
		4	30°	N	D 0,5 - 1
UFD96	**TOROIDAL** TOROIDALNE	**2 Flute, Miniature** 2 ostrzowe, miniaturowe			
		2	30°	N	D 0,2 - 6
UFD13	**TOROIDAL** TOROIDALNE	**3 Flute, Short Length** 3 ostrzowe, krótkie			
		3	30°	N	D 2 - 12
UFD14	**TOROIDAL** TOROIDALNE	**3 Flute, Short Length** 3 ostrzowe, krótkie			
		3	40°	N	D 2 - 12
UFD97	**BALL NOSE** KULISTE	**2 Flute, Miniature** 2 ostrzowe, miniaturowe			
		2	30°	N	D 0,2 - 6
UFD80	**BALL NOSE** KULISTE	**2 Flute, Short Length** 2 ostrzowe, krótkie			
		2	30°	N	R 1 - 6
UFD51	**BALL NOSE** KULISTE	**2-Flute, Long Length** 2-ostrzowe, długie			
		2	30°	N	R 1 - 6
UFD50	**BALL NOSE** KULISTE	**2 Flute, Short Length** 2 ostrzowe, krótkie			
		2	30°	N	R 1 - 6
UFD81	**BALL NOSE** KULISTE	**3 Flute, Short Length** 3 ostrzowe, krótkie			
		2	30°	N	R 1 - 6
UFD16	**BALL NOSE** KULISTE	**2 Flute, Miniature** 2 ostrzowe, miniaturowe			
		2	30°	N	R 0,2 - 2

UFA END MILLS are designed for HSM machining of aluminum and it's alloys, copper, graphite (economic type),non-ferrous materials.

FREZY UFA przeznaczone są do obróbki szybkościowej (OS) aluminium i jego stopów, miedzi, grafitu (wariant ekonomiczny) oraz materiałów nieżelaznych.

EDP No.		Z	Angle Kąt	Materials Materiały	D / R
UFA40	**SQUARE TYPE** WALCOWO-CZOŁOWE	**2-Flute, Long Length** 2-ostrzowe, długie			
		2	30°	N	D 0,5 - 12
UFA26	**SQUARE TYPE** WALCOWO-CZOŁOWE	**2-Flute, Short Length** 2-ostrzowe, krótkie			
		2	45°	N	D 1 - 20
UFA28	**SQUARE TYPE** WALCOWO-CZOŁOWE	**2-Flute, Long Length** 2-ostrzowe, długie			
		2	55°	N	D 3 - 20
UFA37	**SQUARE TYPE** WALCOWO-CZOŁOWE	**3-Flute, Short Length** 3-ostrzowe, krótkie			
		3	55°	N	D 6 - 20
UFA38	**SQUARE TYPE** WALCOWO-CZOŁOWE	**3-Flute, Long length** 3-ostrzowe, długie			
		3	55°	N	D 3 - 20
UFA25	**SQUARE TYPE** WALCOWO-CZOŁOWE	**3-Flute, Short Length** 3-ostrzowe, krótkie			
		3	55°	N	D 4 - 25
	SQUARE TYPE WALCOWO-CZOŁOWE	**2-Flute, Long Length** 2-ostrzowe, długie			
UFA23		2	30°	N	D 1 - 12
UFA33	**SQUARE TYPE** WALCOWO-CZOŁOWE	**3-Flute** 3-ostrzowe			
		3	45°	N	D 1 - 20
UFA41	**TOROIDAL** TOROIDALNE	**2-Flute, With Tapper Neck** 2-ostrzowe, ze stożkową szyjką			
		2	30°	N	D 1 - 2
UFA11	**SQUARE TYPE** WALCOWO-CZOŁOWE	**1-Flute** 1-ostrzowe			
		1	30°	N	D 2 - 12
UFA14	**SQUARE TYPE** WALCOWO-CZOŁOWE	**2-Flute, Corner Radius** 2-ostrzowe z promieniem			
		2	25°	N	D 2 - 20
UFA17	**SQUARE TYPE** WALCOWO-CZOŁOWE	**2-Flute Short Length** 2-ostrzowe krótkie			
		2	45°	N	D 3 - 20
UFA12	**SQUARE TYPE** WALCOWO-CZOŁOWE	**2-Flute Long Length** 2-ostrzowe długie			
		2	45°	N	D 3 - 20
UFA18	**SQUARE TYPE** WALCOWO-CZOŁOWE	**2-Flute Corner Radius with Neck** 2-ostrzowe z promieniem z zwężaną szyjką			
		2	45°	N	D 4 - 20
UFA19	**SQUARE TYPE** WALCOWO-CZOŁOWE	**3-Flute with Neck** 3-ostrzowe z zwężaną szyjką			
		2	45°	N	D 3 - 20

EDP No.		Z	Angle Kąt	Materials Materiały	D / R
UFA20	**SQUARE TYPE** WALCOWO-CZOŁOWE	**3-Flute Long Length** 3-ostrzowe dugie			
		3	45°	N	D 3 - 20
UFA21	**SQUARE TYPE** WALCOWO-CZOŁOWE	**3-Flute Long Length Croner Radius** 3-ostrzowe dugie z promieniem			
		3	45°	N	D 3 - 20
UFA27	**SQUARE TYPE** WALCOWO-CZOŁOWE	**3-Flute Long Length** 3-ostrzowe dugie			
		3	30°	N	D 6 - 25
UFA32	**SQUARE TYPE** WALCOWO-CZOŁOWE	**3-Flute Long Length With Neck** 3-ostrzowe dugie z zwężaną szyjką			
		3	30°	N	D 6 - 20
UFA42	**TOROIDAL** TOROIDALNE	**2-Flute, Miniature** 2-ostrzowe, miniaturowe			
		2	30°	N	D 0,2 - 6
UFA30	**TOROIDAL** TOROIDALNE	**2-Flute** 2-ostrzowe			
		2	25°	N	D 2 - 20
UFA09	**TOROIDAL** TOROIDALNE	**2-Flute** 2-ostrzowe			
		2	30°	N	D 4 - 20
UFA43	**TOROIDAL** TOROIDALNE	**3-Flute, Short Length** 3-ostrzowe, krótkie			
		3	40°	N	D 2- 12
UFA44	**TOROIDAL** TOROIDALNE	**3-Flute** 3-ostrzowe			
		3	40°	N	D 2 - 12
UFA99	**TOROIDAL** TOROIDALNE	**3-Flute Long Length With Neck** 3-ostrzowe dugie z zwężaną szyjką			
		3	40°	N	D 3 - 20
UFA45	**TOROIDAL** TOROIDALNE	**3-Flute Long Length With Neck** 3-ostrzowe dugie z zwężaną szyjką			
		4	30°	N	D 6 - 12
UFA56	**TOROIDAL** TOROIDALNE	**3-Flute** 3-ostrzowe			
		3	40°	N	D 10 - 20
UFA68	**TOROIDAL** TOROIDALNE	**3-Flute** 3-ostrzowe			
		3	30°	N	D 8 - 20
UFA46	**BALL NOSE** KULISTE	**2-Flute** 2-ostrzowe			
		2	30°	N	R 0,5 - 1
UFA47	**BALL NOSE** KULISTE	**2-Flute, Micro** 2-ostrzowe, mikro ,			
		2	30°	N	R 0,1 - 3
UFA48	**BALL NOSE** KULISTE	**2-Flute, Micro** 2-ostrzowe, mikro ,			
		2	30°	N	R 1 - 6
UFA10	**BALL NOSE** KULISTE	**2-Flute, Short Length** 2-ostrzowe, krótkie			
		2	30°	N	R 3 - 10

EDP No.		Z	Angle Kąt	Materials Materiały	D / R
UFA49	**BALL NOSE** KULISTE	**2-Flute, Long Length** 2-ostrzowe, długie			
		2	30°	N	R 1 - 6
UFA50	**BALL NOSE** KULISTE	**2-Flute, Long Reach** 2-ostrzowe, bardzo długie			
		2	30°	N	R 1 - 6
UFA51	**BALL NOSE** KULISTE	**3-Flute, Short Length** 3-ostrzowe, krótkie			
		3	25°	N	R 1 - 6
UFA07	**BALL NOSE** KULISTE	**2-Flute, Micro** 2-ostrzowe, mikro ,			
		2	30°	N	R 0,5 - 6
UFA08	**BALL NOSE** KULISTE	**3-Flute, Micro** 3-ostrzowe, mikro ,			
		3	40°	N	R 1 - 8
UFA15	**BALL NOSE** KULISTE	**2-Flute WIth Neck** 2-ostrzowe z zwężaną szyjką			
		2	50°	N	R 3 - 10
UFA31	**BALL NOSE** KULISTE	**3-Flute WIth Neck** 3-ostrzowe z zwężaną szyjką			
		3	40°	N	R 1 - 8

UFC END MILLS are designed for HSM and dry machining of copper.

FREZY UFC zalecane są przede wszystkim do obróbki szybkościowej (OS) na sucho miedzi.

EDP No.		Z	Angle Kąt	Materials Materiały	D / R
UFC13	**SQUARE TYPE** WALCOWO-CZOŁOWE	**2-Flute** 2-ostrzowe			
		2	30°	N	D 0,5 - 4
UFC14	**SQUARE TYPE** WALCOWO-CZOŁOWE	**2-Flute** 2-ostrzowe			
		2	30°	N	D 1 - 12
UFC64	**TOROIDAL** TOROIDALNE	**2-Flute** 2-ostrzowe			
		2	30°	N	D 2 - 12
UFC10	**BALL NOSE** KULISTE	**2-Flute** 2-ostrzowe			
		2	30°	N	R 0,25 - 6
UFC11	**BALL NOSE** KULISTE	**2-Flute** 2-ostrzowe			
		2	30°	N	R 0,5 - 6
UFC33	**FOR RIB PROCESSING** DO ŻEBER	**2-Flute** 2-ostrzowe			
		2	30°	N	D 0,6 - 4
UFC32	**FOR RIB PROCESSING** DO ŻEBER	**2-Flute** 2-ostrzowe			
		2	30°	N	D 0,5 - 6
UFC12	**FOR RIB PROCESSING** DO ŻEBER	**2-Flute** 2-ostrzowe			
		2	30°	N	D 1,0 - 12

POWDER END MILLS PMT for high productivity on conventional milling machines for materials up to 40 HRC.

FREZY PROSZKOWE PMT przeznaczone są do wysokowydajnej obróbki materiałów >40 HRC na obrabiarkach konwencjonalnych.

EDP No.		Z	Angle Kąt	Materials Materiały	D / R
PMT36	**SQUARE TYPE** WALCOWO-CZOŁOWE	**2-Flute, Short Length** 2-ostrzowe, krótkie			
		2	30°	P K N	D 1 - 25
PMT29	**SQUARE TYPE** WALCOWO-CZOŁOWE	**2-Flute, Long Length** 2-ostrzowe, długie			
		2	30°	P K N	D 1 - 25
PMT42	**SQUARE TYPE** WALCOWO-CZOŁOWE	**3-Flute, Short Length** 3-ostrzowe, krótkie			
		3	30°	P K N	D 1 - 25
PMT30	**SQUARE TYPE** WALCOWO-CZOŁOWE	**3-Flute, Short Length** 3-ostrzowe, krótkie			
		3	30°	P K N	D 1 - 25
PMT38	**SQUARE TYPE** WALCOWO-CZOŁOWE	**4 Flute, Short Length** 4-ostrzowy, krótki			
		4	30°	P K N	D 1 - 25
PMT31	**SQUARE TYPE** WALCOWO-CZOŁOWE	**4 Flute, Short Length** 4-ostrzowy, krótki i			
		4	30°	P K N	D 2 - 25
PMT41	**SQUARE TYPE** WALCOWO-CZOŁOWE	**Multi Flute, Fine Pitch** Wieloostrzowy, łamacz drobny			
		3 - 5	30°	P K N	D 6 - 25
PMT53	**SQUARE TYPE** WALCOWO-CZOŁOWE	**4 Flute, Short** 4-ostrzowy, krótkie			
		4	30°	P K N	D 6 - 25
PMT55	**SQUARE TYPE** WALCOWO-CZOŁOWE	**4 Flute** 4-ostrzowy			
		4	30°	P K N	D 4 - 20
PMT35	**SQUARE TYPE** WALCOWO-CZOŁOWE	**Multi Flute, Fine Pitch** Wieloostrzowy, łamacz drobny			
		3 - 5	30°	P K N	D 6 - 25
PMT26	**SQUARE TYPE** WALCOWO-CZOŁOWE	**Multi Flute, Short** Wieloostrzowy, krótkie			
		3 - 6	30°	P K N	D 4 - 25
PMT57	**SQUARE TYPE** WALCOWO-CZOŁOWE	**Multi Flute, Short** Wieloostrzowy, krótkie			
		3 - 6	45°	P K N	D 4 - 25
PMT33	**SQUARE TYPE** WALCOWO-CZOŁOWE	**Croase Form, Short** Łamacz zgrubny, krótkie			
		3 - 5	30°	P K N	D 6 - 25
PMT59	**SQUARE TYPE** WALCOWO-CZOŁOWE	**Multi Flute, Short** Wieloostrzowy, krótkie			
		4 - 5		P K N	D 6 - 25

EDP No.		Z	Angle Kąt	Materials Materiały	D / R
PMT34	**SQUARE TYPE** WALCOWO-CZOŁOWE	**Multi Flute, Short** Wieloostrzowy, krótkie			
		3 - 5		P K N	D 6 - 25
PMT40	**BALL NOSE** KULISTE	**2 Flute, Short Length** 2 ostrzowe, krótkie			
		2		P K N	R 0,5 - 12,5
PMT32	**BALL NOSE** KULISTE	**2 Flute, Long Length** 2 ostrzowe, długie			
		2		P K N	R 1 - 12,5

Rotary burrs with chip breaker and standard cutting edge are used in fast machining welds, burrs, plane smoothing, chamfering and other similar operations relatet with metal machining.

Frezy rotacyjne o nacięciu standardowym i łamaczem wióra znajdują zastosowanie w szybkim usuwaniu nadmiaru spoin spawalniczych, usuwaniu zadziorów, wyrównywaniu płaszczyzn, fazowaniu i innych podobnych operacji związanych z obróbką metali.

EDP No.		
SA		**CYLINDER SHAPE** WALCOWE BEZ OSTRZY NA CZOLE
SB		**CYLINDER SHAPE WITH END CUT** WALCOWE Z OSTRZAMI NA CZOLE
SC		**CYLINDER SHAPE WITH RADIUS CUT** WALCOWE ZAOKRĄGLONE
SD		**BALL SHAPE** KULISTE
SE		**OVAL SHAPE** OWALNE
SF		**TREE SHAPE WITH RADIUS END** OSTROŁUKOWE ZAOKRĄGLONE
SG		**TREE SHAPE WITH POINTED END** OSTROŁUKOWE
SH		**FLAME SHAPE** O ZARYSIE PŁOMIENIA
SJ		**60° CONE SHAPE** POGŁĘBIACZE 60°
SK		**90° CONE SHAPE** POGŁĘBIACZE 90°
SL		**TAPER WITH RADIUS END** STOŻKOWE ZAOKRĄGLONE
SM		**CONE SHAPE** STOŻKOWE
SN		**INVERTED CONE SHAPE** STOŻKOWE ODWRÓCONE

CUBIC BORON NITRIDE CBN machining high hardened steels up to 70 HRC

FREZY Z AZTOKIEM BORU CBN przeznaczone są do wysokowydajnej obróbki materiałów >70 HRC

EDP No.		Z	Angle Kąt	Materials Materiały	D / R
CBN01	**BALL NOSE** KULISTE	**2-Flute, Bal Nose** 2-ostrzowe, kuliste			
		2		P K N	R 0,2 - 1,5
CBN02	**TOROIDAL** TOROIDALNE	**2-Flute** 2-ostrzowe			
		2		P K N	D 0,5 - 2

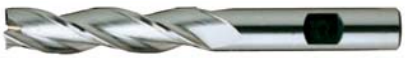
UCX END MILLS

FREZY UCX

EDP No.		Z	Materials Materiały	D / R
UCX10		2		D1-20
UCX11		4	P M K N S	D1-20
UCX13		2		R0.5-10
UCX14		3~5		D6-25
UCX15		4		R1-R10
UCX18		2		D2-12
UCX19		4		D2-20
UCX83		2		D0.4-4
UCX86		2		R0.2-2
UCX95		3		D0.5-20

General purpose HSSCo8 End Mills with TiAlN coating or non-coated

Frezy HSSCo8 do zastosowania ogólnego z pokryciem TiAlN lub bez pokrycia

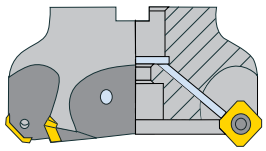
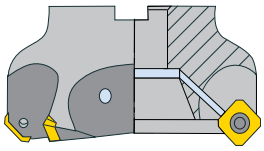
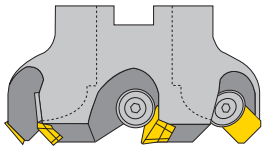
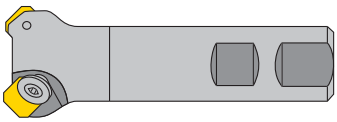
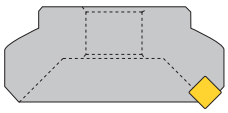
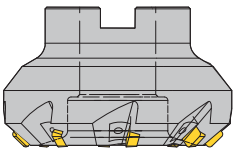
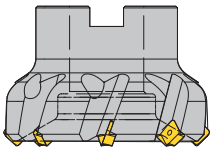
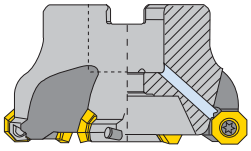
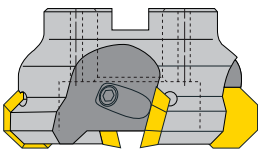
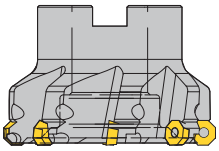
EDP No.		Z	Angle Kąt	Materials Materiały	D / R
HM070 HMF70	**SQUARE TYPE** WALCOWO-CZOŁOWE	**2 Flute, Short Length** 2 ostrzowe, krótkie			
		2	30°	P N	D 1,0 - 40
HM071 HMF71	**SQUARE TYPE** WALCOWO-CZOŁOWE	**2 Flute, Long Length** 2 ostrzowe, długie			
		2	30°	P N	D 1,5 - 40
HM010 HMF10	**SQUARE TYPE** WALCOWO-CZOŁOWE	**2 Flute, Extra Long Length** 2-ostrzowe, bardzo długie			
		2	30°	P N	D 2,5 - 40
HM064	**SQUARE TYPE** WALCOWO-CZOŁOWE	**2 Flute, Short Length** 2 ostrzowe, krótkie			
		2	30°	P N	D 1,0 - 32
HM009	**SQUARE TYPE** WALCOWO-CZOŁOWE	**2 Flute, Long Length** 2 ostrzowe, długie			
		2	30°	P N	D 2,0 - 20
HM612	**SQUARE TYPE** WALCOWO-CZOŁOWE	**1 Flute,** 1-ostrzowe			
		2	30°	P N	D 0,6 - 4
HM623	**SQUARE TYPE** WALCOWO-CZOŁOWE	**1 Flute,** 1-ostrzowe			
		2	30°	P N	D 0,5 - 6
HM072 HMF72	**SQUARE TYPE** WALCOWO-CZOŁOWE	**3 Flute, Long Length** 3-ostrzowe, długie			
		3	30°	P N	D 1,5 - 32
HM073 HMF73	**SQUARE TYPE** WALCOWO-CZOŁOWE	**3 Flute, Short Length** 3-ostrzowe, krótkie			
		3	30°	P N	D 1,0 - 40
HM016 HMF16	**SQUARE TYPE** WALCOWO-CZOŁOWE	**3 Flute, Long Length** 3-ostrzowe, długie			
		3	30°	P N	D 2,0 - 40
HM053 HMF53	**SQUARE TYPE** WALCOWO-CZOŁOWE	**3 Flute, Short Length** 3-ostrzowe, krótkie			
		3	30°	P N	D 1,0 - 20
HM054 HMF54	**SQUARE TYPE** WALCOWO-CZOŁOWE	**3 Flute, Short Length** 3-ostrzowe, krótkie			
		3	30°	P N	D 1,5 - 10
HM051 HMF51	**SQUARE TYPE** WALCOWO-CZOŁOWE	**3 Flute, Short Length** 3-ostrzowe, krótkie			
		3	30°	P N	D 1,0 - 10
HM052 HMF52	**SQUARE TYPE** WALCOWO-CZOŁOWE	**3 Flute, Long Length** 3-ostrzowe, długie			
		3	30°	P N	D 1,5 - 10
HM074 HMF74 HM075 HMF75	**SQUARE TYPE** WALCOWO-CZOŁOWE	**4-6 Flute, Short Length** 4-6 ostrzowe, krótkie			
		4-6	30°	P N	D 2,0 - 40

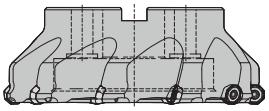
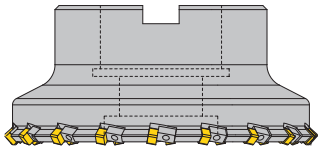
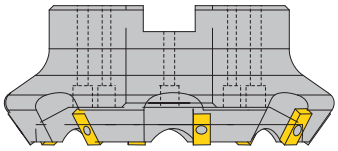
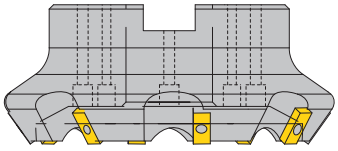
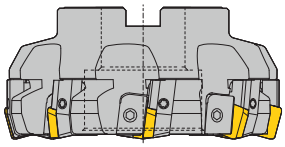
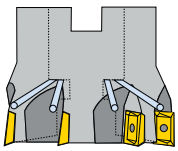
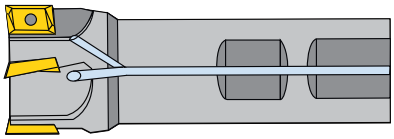
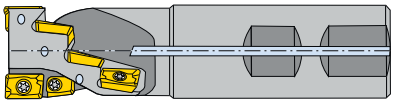
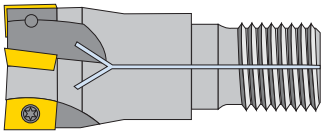
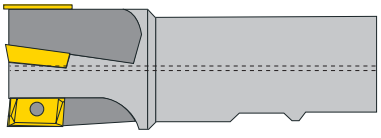
EDP No.		Z	Angle Kąt	Materials Materiały	D / R
HM076 HMF76 HM077 HMF77	**SQUARE TYPE** WALCOWO-CZOŁOWE	**4-6 Flute, Long Length** 4-6-ostrzowe, długie			
		4-6	30°	P N	D 2,0 - 40
HM095 HMF95 HM096 HMF96	**SQUARE TYPE** WALCOWO-CZOŁOWE	**4-6 Flute, Short Length** 4-6 ostrzowe, krótkie			
		4-6	30°	P N	D 2,0 - 40
HM097 HMF97 HM098 HMF98	**SQUARE TYPE** WALCOWO-CZOŁOWE	**4-6 Flute, Long Length** 4-6-ostrzowe, długie			
		4-6	30°	P N	D 2,0 - 40
HM061 HMF61 HM062 HMF62 HMF63 HMF63	**SQUARE TYPE** WALCOWO-CZOŁOWE	**Multi Flute, Long Length** Wieloostrzowe, długie			
		Multi Wiele	50°	P N	D 2,0 - 30
HM035 HMF35	**BALL NOSE** KULISTE	**2 Flute, Short Length** 2 ostrzowe, krótkie			
		2	30°	P N	R 1,0 - 16
HM092 HMF92	**BALL NOSE** KULISTE	**2 Flute, Long Length** 2 ostrzowe, długie			
		2	30°	P N	R 1,0 - 15
HM0A0 HMFA0	**BALL NOSE** KULISTE	**4-6 Flute, Short Length** 4-6 ostrzowe, krótkie			
		4-6	30°	P N	R 3,0 - 12,5
HM029 HMF29	**BALL NOSE** KULISTE	**4-6 Flute, Long Length** 4-6-ostrzowe, długie			
		4-6	30°	P N	R 5,0 - 12,5
HM012 HMF12	**BALL NOSE** KULISTE	**3 Flute, Short Length** 3-ostrzowe, krótkie			
		3	30°	P N	R 1,0 - 3
HM0A1 HMFA1	**SQUARE TYPE** WALCOWO-CZOŁOWE	**Multi Flute, Short Length** Wieloostrzowe, krótkie			
		Multi Wiele	30°	P N	D 6,0 - 50
HM0A2 HMFA2	**SQUARE TYPE** WALCOWO-CZOŁOWE	**Multi Flute, Long Length** Wieloostrzowe, długie			
		Multi Wiele	30°	P N	D 6,0 - 40
HM0B4 HMFB4	**SQUARE TYPE** WALCOWO-CZOŁOWE	**3 Flute, Short Length** 3-ostrzowe, krótkie			
		3	30°	P N	D 10,0 - 40
HM065 HMF65	**SQUARE TYPE** WALCOWO-CZOŁOWE	**3 Flute, Short Length** 3-ostrzowe, krótkie			
		3	30°	P N	D 10,0 - 40
HM0A5	**SQUARE TYPE** WALCOWO-CZOŁOWE	**3 Flute, Short Length** 3-ostrzowe, krótkie			
		3		P N	D 6,0 - 30
HM056	**SQUARE TYPE** WALCOWO-CZOŁOWE	**3 Flute, Long Length** 3-ostrzowe, długie			
		3		P N	D 10,0 - 30
HM057 HMF57	**SQUARE TYPE** WALCOWO-CZOŁOWE	**3-4 Flute, Short Length** 3-4-ostrzowe, krótkie			
		3-4	30°	P N	R 3,0 - 20

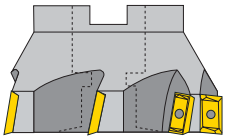
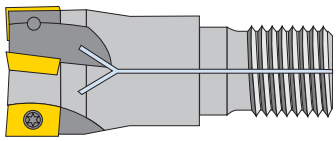
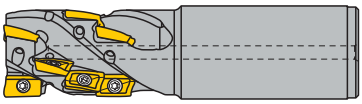
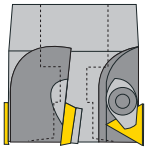
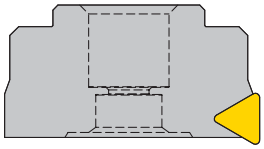
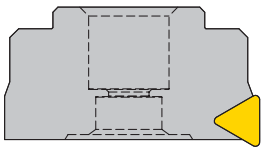
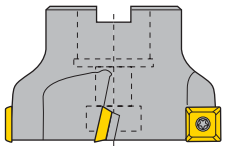
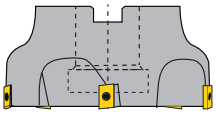
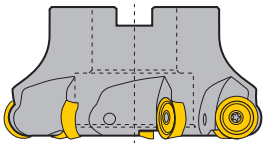
EDP No.		Z	Angle Kąt	Materials Materiały	D / R
HM0P1 HMFP1	**SQUARE TYPE** WALCOWO-CZOŁOWE	**2 Flute, Short Length** 2 ostrzowe, krótkie			
		2		P N	D 2,0 - 25
HM059 HMF59	**SQUARE TYPE** WALCOWO-CZOŁOWE	**Multi Flute, Short Length** Wieloostrzowe, krótkie			
		4-6		P N	D 6,0 - 30

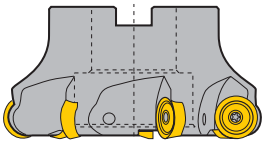
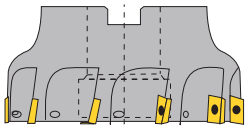
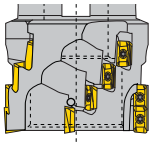
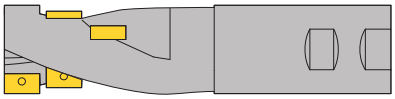
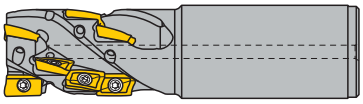
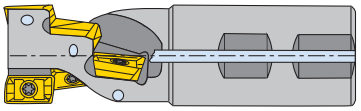
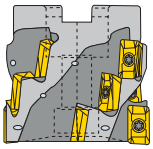
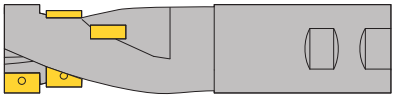
Indexable milling tools gives a wide range of milling cutters and holders. Sets new standards in case of precision and performance for modular milling systems.

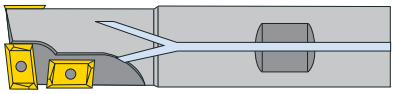
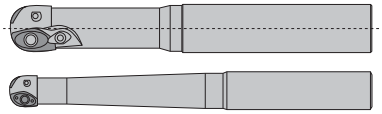
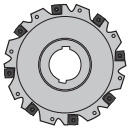
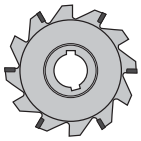
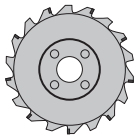
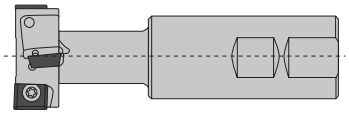
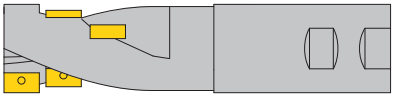
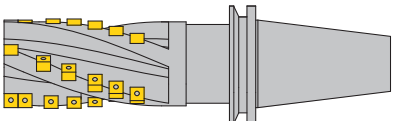
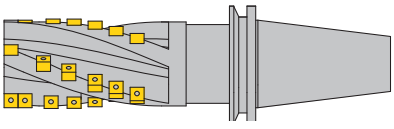
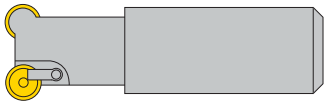
Oferta frezów składanych obejmuje szeroką gamę płytek i oprawek do frezowania. Ustanawiając nowe standardy w zakresie precyzyjnej i wydajnej obróbki, z wykorzystaniem modułowych systemów frezowania.

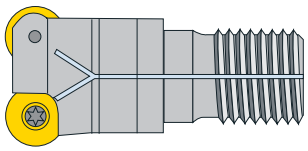
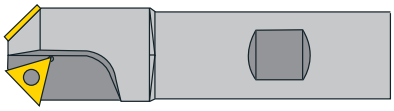
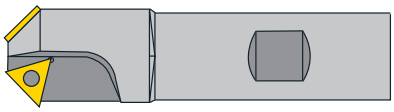
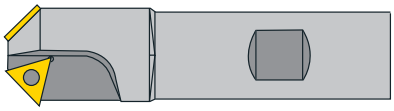
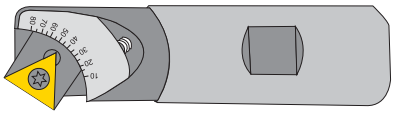
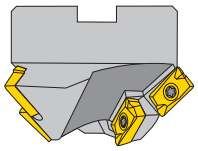
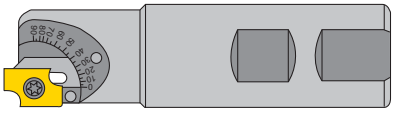
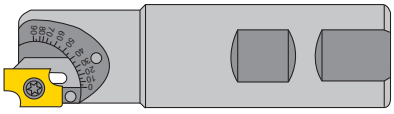
EDP No.		Description Opis	Z	Insert Płytka	
M770		**FACE MILLING CUTTERS** NARZĘDZIA DO OBRÓBKI PŁASZCZYZN	11-12	SDKT 1204	
M700		**FACE MILLING CUTTERS** NARZĘDZIA DO OBRÓBKI PŁASZCZYZN	13-14	SEKT 1204	
M440		**FACE MILLING CUTTERS** NARZĘDZIA DO OBRÓBKI PŁASZCZYZN	4-8	SEKN/ SEKR 1203	
M440		**FACE MILLING CUTTERS** NARZĘDZIA DO OBRÓBKI PŁASZCZYZN	2-4	SEKN/ SEKR 1203	
M441		**FACE MILLING CUTTERS** NARZĘDZIA DO OBRÓBKI PŁASZCZYZN	4-26	SEKN 1203/ 1504	
M164		**FACE MILLING CUTTERS** NARZĘDZIA DO OBRÓBKI PŁASZCZYZN	4-15	SEEN/SEER 1203/1504	
M162 M163		**FACE MILLING CUTTERS** NARZĘDZIA DO OBRÓBKI PŁASZCZYZN	4-18	SEKT 12T3	
M460		**FACE MILLING CUTTERS** NARZĘDZIA DO OBRÓBKI PŁASZCZYZN	3-12	ODMX/ODMW 060508	
M980		**FACE MILLING CUTTERS** NARZĘDZIA DO OBRÓBKI PŁASZCZYZN	4-10	OFER 070405	
M165		**FACE MILLING CUTTERS** NARZĘDZIA DO OBRÓBKI PŁASZCZYZN	4-10	OFMT 05T3	

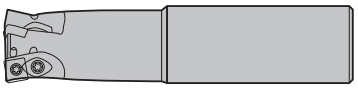
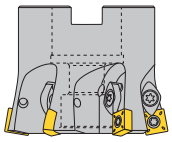
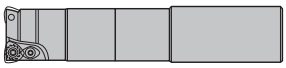
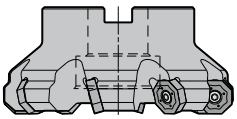
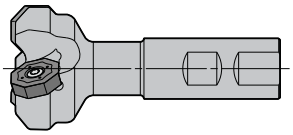
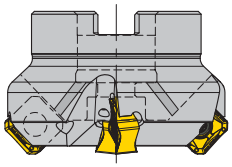
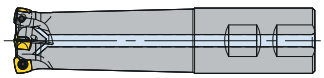
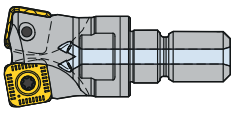
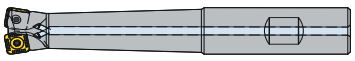
EDP No.		Description Opis	Z	Insert Płytka	
M166		**FACE MILLING CUTTERS** NARZĘDZIA DO OBRÓBKI PŁASZCZYZN	8-20	OFMR 0704	
M168		**FACE MILLING CUTTERS** NARZĘDZIA DO OBRÓBKI PŁASZCZYZN	8-32	HNMN 090512	
M170		**FACE MILLING CUTTERS** NARZĘDZIA DO OBRÓBKI PŁASZCZYZN	5-16	LNMT 2007/2510	
M174		**FACE MILLING CUTTERS** NARZĘDZIA DO OBRÓBKI PŁASZCZYZN	6-16	LNMT 1606	
M850		**FACE MILLING CUTTERS** NARZĘDZIA DO OBRÓBKI PŁASZCZYZN	4-20	SPKN/SPKR 1203/1503	
M305		**FACE MILLING CUTTERS** NARZĘDZIA DO OBRÓBKI PŁASZCZYZN	6-8	JDMX 1003	
M305		**FACE MILLING CUTTERS** NARZĘDZIA DO OBRÓBKI PŁASZCZYZN	1-5	JDMX 1003	
M600		**FACE MILLING CUTTERS** NARZĘDZIA DO OBRÓBKI PŁASZCZYZN	4-14	JDMX 1003	
M930		**FACE MILLING CUTTERS** NARZĘDZIA DO OBRÓBKI PŁASZCZYZN	2-6	JDMX 1003	
M330		**FACE MILLING CUTTERS** NARZĘDZIA DO OBRÓBKI PŁASZCZYZN	2-6	JDMX 1705	

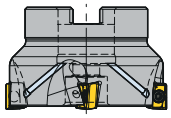
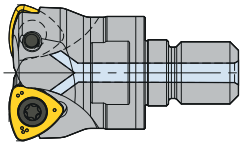
EDP No.		Description Opis	Z	Insert Płytka	
M330		**FACE MILLING CUTTERS** NARZĘDZIA DO OBRÓBKI PŁASZCZYZN	4-10	JDMX 1705	
M330		**FACE MILLING CUTTERS** NARZĘDZIA DO OBRÓBKI PŁASZCZYZN	2-4	JDMX 1705	
M330		**FACE MILLING CUTTERS** NARZĘDZIA DO OBRÓBKI PŁASZCZYZN	2-4	JDMX 1705	
M320		**FACE MILLING CUTTERS** NARZĘDZIA DO OBRÓBKI PŁASZCZYZN	4-5	TPUK/TPKN 1603	
M175		**FACE MILLING CUTTERS** NARZĘDZIA DO OBRÓBKI PŁASZCZYZN	4-20	TPKN 2204	
M321		**FACE MILLING CUTTERS** NARZĘDZIA DO OBRÓBKI PŁASZCZYZN	5-20	TPKX 2204	
M176		**FACE MILLING CUTTERS** NARZĘDZIA DO OBRÓBKI PŁASZCZYZN	5-24	SEMT 098308/120308	
M177		**FACE MILLING CUTTERS** NARZĘDZIA DO OBRÓBKI PŁASZCZYZN	5-16	LNMT 1506/2007/2510	
M178		**FACE MILLING CUTTERS** NARZĘDZIA DO OBRÓBKI PŁASZCZYZN	2-3	RCMT 10T3/1204	
M178		**FACE MILLING CUTTERS** NARZĘDZIA DO OBRÓBKI PŁASZCZYZN	4-10	RCMT 10T3/1204	

EDP No.		Description Opis	Z	Insert Płytka	
M179		**FACE MILLING CUTTERS** NARZĘDZIA DO OBRÓBKI PŁASZCZYZN	2-4	RDMW 0702/0803/1003	
M179		**FACE MILLING CUTTERS** NARZĘDZIA DO OBRÓBKI PŁASZCZYZN	3-9	RDMW 0702/0803/1003	
M180		**SHOULDER MILLING CUTTERS** NARZĘDZIA WALCOWO-CZOŁOWE	1-6	APLT 11T3- 1604	
M180		**SHOULDER MILLING CUTTERS** NARZĘDZIA WALCOWO-CZOŁOWE	5-12	APLT 11T3- 1604	
M182		**SHOULDER MILLING CUTTERS** NARZĘDZIA WALCOWO-CZOŁOWE	16-24	APLT 11T3/1604	
M182		**SHOULDER MILLING CUTTERS** NARZĘDZIA WALCOWO-CZOŁOWE	3-14	APLT 11T3/ 1604	
M330		**SHOULDER MILLING CUTTERS** NARZĘDZIA WALCOWO-CZOŁOWE	2-4	JDMX 1705	
M650		**SHOULDER MILLING CUTTERS** NARZĘDZIA WALCOWO-CZOŁOWE	2-8	APKT/ APGT 1604	
M650		**SHOULDER MILLING CUTTERS** NARZĘDZIA WALCOWO-CZOŁOWE	6-12	APKT/ APGT 1604	
M344		**SHOULDER MILLING CUTTERS** NARZĘDZIA WALCOWO-CZOŁOWE	3	JDMX/ APGT 1003/1604	

EDP No.		Description Opis	Z	Insert Płytka	
M183		**SHOULDER MILLING CUTTERS** NARZĘDZIA WALCOWO-CZOŁOWE	1-4	APMT 1135/ 1604	
M500		**PROFIL MILLING TOOLS** FREZY DO OBRÓBKI PROFILU	2	BPMT	
M541		**SIDE AND FACE MILLING** FREZY DO OBRÓBKI BRZEGU ORAZ PROFILU	10-24	SNEQ 12T3/ 1202 / 1203/ 1204	
M542		**SIDE AND FACE MILLING** FREZY DO OBRÓBKI BRZEGU ORAZ PROFILU	10-18	MPMT 0603/0803/1204	
M543		**SIDE AND FACE MILLING** FREZY DO OBRÓBKI BRZEGU ORAZ PROFILU	10-18	MPMT 0603/0803/1204	
M110		**T-SLOT MILLING TOOLS** FREZY DO ROWKÓW TYPU T	2-6	MPMT 0603/0803/1204	
M111		**HELLICAL END MILL** FREZY JEŻOWE	2-4	APLT/ SPMT 150412/120408	
M112		**HELLICAL END MILL** FREZY JEŻOWE	4	APLT/ SPMT 150412/120408	
M113		**HELLICAL END MILL** FREZY JEŻOWE	4	APLT/ SPMT 150412/120408	
M120		**MOULD MILLING CUTTERS** NARZĘDZIA DO DO OBRÓBKI FORM	2-3	RDMX 0803/10T3/1204	

EDP No.		Description Opis	Z	Insert Płytka	
M910		**MOULD MILLING CUTTERS** NARZĘDZIA DO DO OBRÓBKI FORM	2-5	RDMX 10T3	
M390 **M391** **M392**		**CHAMFERING MILLING CUTTERS** FREZY DO FAZOWANIA	2-3	SPMT 1204	
M400		**CHAMFERING MILLING CUTTERS** FREZY DO FAZOWANIA	2	TCMT 1102/16T3	
M401		**CHAMFERING MILLING CUTTERS** FREZY DO FAZOWANIA	1-3	TCMT 1102/16T3	
M402		**CHAMFERING MILLING CUTTERS** FREZY DO FAZOWANIA	1-3	TCMT 1102/16T3	
M710		**CHAMFERING MILLING CUTTERS** FREZY DO FAZOWANIA		TCMT 1102/16T3	
M135		**CHAMFERING MILLING CUTTERS** FREZY DO FAZOWANIA	6	APKT 1604	
M741		**CHAMFERING MILLING CUTTERS** FREZY DO FAZOWANIA	6-12	XDCW 1503	
M810		**CHAMFERING MILLING CUTTERS** FREZY DO FAZOWANIA	2	XDCW/ XPCW/ 1503/ 2004	
M742		**CHAMFERING MILLING CUTTERS** FREZY DO FAZOWANIA	2	XDCW 1503	

EDP No.		Description Opis	Z	Insert Płytka	
M820		**CHAMFERING MILLING CUTTERS** FREZY DO FAZOWANIA	2	XDCW/ XPCW 1503/2004	
M550		**HIGH FEED MILLING CUTERS** FREZY DO OBRÓBKI SZYBKOŚCIOWEJ	2-3	SDMT 09T3	
M550		**HIGH FEED MILLING CUTERS** FREZY DO OBRÓBKI SZYBKOŚCIOWEJ	4-6	SDMT 09T3/1204	
M551		**HIGH FEED MILLING CUTERS** FREZY DO OBRÓBKI SZYBKOŚCIOWEJ	2-3	WPGT 0503/ 0604/ 0806/ 0907	
M173		**FACE MILLING CUTERS** FREZY DO OBRÓBKI PŁASZCZYZN	5-17	OSWX 0804/08T5	
M173		**FACE MILLING CUTERS** FREZY DO OBRÓBKI PŁASZCZYZN	2-4	OSWX 0804/08T5	
M184		**FACE MILLING CUTERS** FREZY DO OBRÓBKI PŁASZCZYZN	4-16	SWGX 1206	
M191		**FACE MILLING CUTERS** FREZY DO OBRÓBKI PŁASZCZYZN	2-5	SEKW/SEKT 08T3	
M192		**FACE MILLING CUTERS** FREZY DO OBRÓBKI PŁASZCZYZN	2-5	SPEW 0803	
M192		**HIGH FEED MILLING CUTERS** FREZY DO OBRÓBKI SZYBKOŚCIOWEJ	2-4	SPEW 0803	

EDP No.		Description Opis	Z	Insert Płytka	
M186		**HIGH FEED MILLING CUTERS** FREZY DO OBRÓBKI SZYBKOŚCIOWEJ	2-5	APKX 0803	
M252		**FACE MILLING CUTERS** FREZY DO OBRÓBKI PŁASZCZYZN	2-5	WN..1207	

T-Slot milling cutters can easily cut accurate keyways, T-slots and similar applications in the material.

Frezy T-owe w łatwy sposób mogą wykonywać dokładne rowki prowadzące, rowki T-owe oraz inne podobne operacje w materiale.

EDP No.		Description Opis	Insert Płytka
M712		**T-SLOT MILLING CUTERS** FREZY T-OWE	LNKX
M725		**T-SLOT MILLING CUTERS** FREZY T-OWE	LNKX
M725		**T-SLOT MILLING CUTERS** FREZY T-OWE	LNKX
M725		**T-SLOT MILLING CUTERS** FREZY T-OWE	LNKX
M725		**T-SLOT MILLING CUTERS** FREZY T-OWE	LNKX
M725		**T-SLOT MILLING CUTERS** FREZY T-OWE	LNKX
M748		**T-SLOT MILLING CUTERS** FREZY T-OWE	LNKX
M749		**T-SLOT MILLING CUTERS** FREZY T-OWE	SNEX
M747		**T-SLOT MILLING CUTERS** FREZY T-OWE	SNHT

EDP No.		Description Opis	Insert Płytka
M750		**T-SLOT MILLING CUTERS** FREZY T-OWE	RDNW
M715		**T-SLOT MILLING CUTERS** FREZY T-OWE	LNKX
M718		**T-SLOT MILLING CUTERS** FREZY T-OWE	SNEX
M745		**T-SLOT MILLING CUTERS** FREZY T-OWE	SNEX
M743		**DISC MILLING CUTTERS** FREZY TARCZOWE	LNGX
M744		**T-SLOT TRANSFORMER SERIES** FREZY T-OWE SERIA Z CONVERTEREM	LNGX
M730		**T-SLOT MILLING CUTERS** FREZY T-OWE	SNEX
M732		**T-SLOT MILLING CUTERS** FREZY T-OWE	SNEX
M734		**T-SLOT MILLING CUTERS** FREZY T-OWE	SNEX
M739		**DISC MILLING CUTTERS** FREZY TARCZOWE	LNGX

EDP No.		Description Opis	Insert Płytka
M740		**T-SLOT MILLING CUTERS** FREZY T-OWE	LNGX
M746		**T-SLOT MILLING CUTERS** FREZY T-OWE	LNGX
M753		**T-SLOT MILLING CUTERS** FREZY T-OWE	LNGX
M754		**T-SLOT MILLING CUTERS** FREZY T-OWE	LNGX
TLC		**T-SLOT MILLING CUTERS** FREZY T-OWE	TRTF

UFG

UFG END MILLS
FREZY UFG



UFG END MILLS are designed for HSM and dry machining of high hardened materials from 25 up to 70 HRC.

FREZY WALCOWO-CZOŁOWE UFX przeznaczone są do obróbki szybkościowej (OS) stali stopowej, niestopowej, narzędziowej, żaroodpornej, hartowanej <65 HRC (Możliwe) / <55HRC (Zalecane), żeliwa oraz stali do produkcji form i wykrojników.

TIZ IMPLEMENTS

P H

UFG END MILLS are designed for HSM and dry machining of high hardened materials from 25 up to 70 HRC.

FREZY WALCOWO-CZOŁOWE UFG przede wszystkim zalecane są do obróbki szybkościowej (OS) na sucho materiałów utwardzonych o twardości 25 - 70HRC.

NOTE:

- If the rigidity of the machine or the work material installation is very low, or chattering and noise is generated, please reduce RPM and FEED rate proportionally
- Cutting conditions may be considerably different due to the tool overhang, depth of cut, and machining tool condition, please use the catalogue cutting parameters as a reference starting point
- If the depth of cut is shallow, the RPM and FEED rate can be increased
- For hardened materials air blow/air oil mist is recommended
- A high-speed spindle is recommended, when using a reduced RPM, the FEED rate must be reduced proportionally
- Use a rigid machine and work clamping method
- Down (climb) cutting is recommended
- We recommend that you set the width of cut as small as possible (about 5% of dia.) and divide the machining into several passes and work on high cutting parameters. There will be much higher tool life and surface roughness
- When drilling, please set the FEED rate 30% below the normal rate

- UWAGA:
- Jeżeli sztywność obrabiarki lub mocowanie obrabianego przedmiotu nie są wystarczające lubwystępują wibracje i nadmierny hałas, należy proporcjonalnie zmniejszyć obroty i posuw
- Parametry skrawania mogą być różne w zależności od długości narzędzia wystającegoz oprawki, głębokości skrawania oraz stanu obrabiarki. Proszę stosować parametry skra-wania podane w katalogu jako wyjściowy punkt odniesienia
- Jeżeli głębokość skrawania jest mała, obroty i posuw mogą być zwiększone
- Przy obróbce twardych materiałów zaleca się stosowanie nadmuchu powietrza lub mgły olejowej
- Zalecane jest stosowanie wysokoobrotowych obrabiarek; w przypadku mniejszych prędkościobrotowych, posuw powinien być zmniejszony proporcjonalnie
- Zalecane jest stosowanie sztywnych obrabiarek oraz systemów mocowania
- Zalecane jest frezowanie współbieżne
- Zalecamy stosowanie możliwie najmniejszej szerokości skrawania - około 5% średnicy roboczej narzędzia i podzielenie operacji obróbki na kilka przejść przy większych parametrach skrawania, co znacznie wydłuży żywotność narzędzia oraz polepszy jakość obrabianej powierzchni
- Przy zagłębianiu zalecane jest ustawienie posuwu wgłębnego na poziomie o 30% mniejszym od posuwu roboczego

EDP No.		Z	Angle Kąt	Materials Materiały	D / R	Pag. / Str.
UFG31		2	30°	P H	D 0,1 - 20	5 - 6
UFG95		4	30°	P H	D 1 - 20	7
UFG07		4	45°	P H	D 3 - 20	8 - 9
UFG08		4	45°	P H	D 3 - 20	10 - 11
UFG09		4	45°	P H	D 3 - 20	12 - 13
UFG40		6 - 8	30°	P H	D 6 - 25	14
UFG50		2	30°	P H	D 0,3 - 2	15
UFG01		2	30°	P H	D 0,5 - 12	15 - 18
UFG02		2	30°	P H	D 6 - 12	19 - 20
UFG36		2	30°	P H	D 0,3 - 20	21 - 22
UFG47		4	30°	P H	D 2 - 12	23
UFG37		4	30°	P H	D 1 - 20	24
UFG18		4	30°	P H	D 6 - 12	25
UFG20		4	30°	P H	D 3 - 20	26 - 27
UFG04		4		P H	D 2 - 16	28 - 29
UFG39		6	45°	P H	D 6 - 20	30
UFG19		3	30°	P H	D 3 - 12	31 - 32
UFG22		4	45°	P H	D 1 - 16	33 - 36
UFG53		2	30°	P H	R 0,2 - 1	37
UFG28		2	30°	P H	R 0,05 - 6	38 - 39
UFG38		2	30°	P H	R 0,5 - 12,5	40
UFG55		2	30°	P H	R 0,5 - 12,5	41
UFG59		3	30°	P H	R 1,5 - 10	42
UFG21		3	30°	P H	R 0,5 - 6	43 - 46

UFG41		4		P H	R 1,5 - 10	47
UFG83		2		P H	D 0,1 - 4	48 - 50
UFG52		2		P H	D 0,5 - 2	51 - 52
UFG54		2		P H	R 0,25 - 1	53 - 54
UFG86		2		P H	R 0,05 - 2	55 - 57

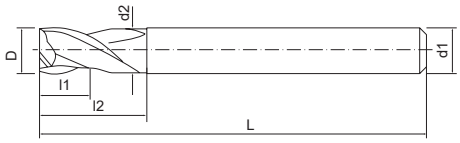
UFG31

SQUARE TYPE WALCOWO-CZOŁOWE

2-Flute, Short flute 2-ostrzowe, o krótkim ostrzu

			HSM Vmax	F	M	R	30°	A					max	min		AIR
													○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, SI <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
	○	○	●	●										





D code new Nowy kod	D code kod	D	d1	d2	L	l1	l2	Z	Shank Uchwyt
UFG31001000A04000040	UFG31001	0,1	4	-	40	0,2	-	2	A
UFG31002000A04000040	UFG31002	0,2	4	-	40	0,4	-	2	A
UFG31003000A04000040	UFG31003	0,3	4	-	40	0,6	-	2	A
UFG31004000A04000040	UFG31004	0,4	4	-	40	0,8	-	2	A
UFG31005000A04000040	UFG31005	0,5	4	-	40	1	-	2	A
UFG31006000A04000040	UFG31006	0,6	4	-	40	1,2	-	2	A
UFG31007000A04000040	UFG31007	0,7	4	-	40	1,4	-	2	A
UFG31008000A04000040	UFG31008	0,8	4	-	40	1,6	-	2	A
UFG31009000A04000040	UFG31009	0,9	4	-	40	2	-	2	A
UFG31010000A06003050	UFG31010	1	6	0,95	50	1,5	3	2	A
UFG31015000A06004050	UFG31015	1,5	6	1,45	50	1,7	4	2	A
UFG31020000A06005050	UFG31020	2	6	1,95	50	2	5	2	A
UFG31025000A06006055	UFG31025	2,5	6	2,4	55	2,5	6	2	A
UFG31030000A06008055	UFG31030	3	6	2,85	55	3	8	2	A
UFG31035000A06009055	UFG31035	3,5	6	3,35	55	3,5	9	2	A
UFG31040000A06010055	UFG31040	4	6	3,85	55	4	10	2	A
UFG31050000A06013055	UFG31050	5	6	4,85	55	5	13	2	A
UFG31060000A06015055	UFG31060	6	6	5,85	55	6	15	2	A
UFG31080000A08020065	UFG31080	8	8	7,7	65	8	20	2	A
UFG31100000A10025075	UFG31100	10	10	9,7	75	10	25	2	A
UFG31120000A12028085	UFG31120	12	12	11,7	85	12	28	2	A
UFG31160000A16032090	UFG31160	16	16	15,7	90	16	32	2	A
UFG31200000A20040105	UFG31200	20	20	19,7	105	20	40	2	A

UFG31

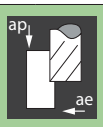
Cutting Conditions Parametry skrawania

SLOTTING / FREZOWANIE ROWKÓW



			Hardened Steels, Heat Resistant Steels Stale hartowane i żaroodporne									
			30 - 42HRC		42 - 55HRC		55 - 65HRC		ae	ap	65 - 70HRC	
d1 (mm)	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min			RPM	mm/min
0,2	0,20	0,01	50000	135	40000	95	33000	45	0,20	0,004	26400	30
0,3	0,30	0,02	50000	195	40000	120	25000	50	0,30	0,006	20000	35
0,4	0,40	0,02	50000	245	40000	145	25000	55	0,40	0,008	20000	40
0,5	0,50	0,03	50000	385	40000	230	25000	85	0,50	0,010	20000	60
0,6	0,60	0,03	50000	490	40000	295	25000	110	0,60	0,012	20000	75
0,8	0,80	0,04	50000	630	30000	305	19000	115	0,80	0,016	15200	80
0,9	0,90	0,05	49000	685	27800	345	17500	130	0,90	0,018	14000	90
1,0	1,00	0,05	48000	785	25500	375	16000	140	1,00	0,020	12500	85
2,0	2,00	0,10	33300	890	17500	440	11000	165	2,00	0,040	9500	120
3,0	3,00	0,15	21800	890	11500	440	7500	165	3,00	0,060	6400	120
4,0	4,00	0,20	16700	920	8800	460	5600	175	4,00	0,080	4750	120
5,0	5,00	0,25	15700	1050	8300	525	5100	185	5,00	0,100	4450	135
6,0	6,00	0,30	13100	995	6900	500	4200	185	6,00	0,120	3700	135
8,0	8,00	0,40	9880	975	5200	465	3200	170	8,00	0,160	2800	125
10,0	10,00	0,50	7800	890	4100	435	2550	160	10,00	0,200	2200	115
12,0	12,00	0,60	6650	890	3500	435	2100	160	12,00	0,240	1860	115
16,0	16,00	0,80	4900	765	2600	380	1600	140	16,00	0,320	1400	95
20,0	20,00	1,00	3900	690	2050	350	1300	130	20,00	0,400	1100	85

SIDE CUTTING / FREZOWANIE OBWODOWE



			Hardened Steels Heat Resistant Steels Stale hartowne i żaroodporne						Hardened Steel Stal hartowna	
			30 - 42HRC		42 - 55HRC		55 - 65HRC		65 - 70HRC	
d1 (mm)	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
1	0,03	1,00	48000	1100	25500	535	16000	195	12500	130
2	0,06	2,00	33300	1260	17500	630	11000	240	9500	170
3	0,09	3,00	21800	1260	11500	630	7500	240	6400	170
4	0,12	4,00	16700	1310	8800	655	5600	250	4750	175
5	0,15	5,00	15700	1520	8300	745	5100	270	4450	195
6	0,18	6,00	13100	1415	6900	720	4200	265	3700	190
8	0,24	8,00	9880	1385	5200	665	3200	245	2800	175
10	0,30	10,00	7800	1260	4100	615	2550	230	2200	165
12	0,36	12,00	6650	1260	3500	615	2100	230	1860	165
16	0,48	16,00	4900	1100	2600	545	1600	195	1400	145
20	0,60	20,00	3900	995	2050	495	1300	180	1100	130

µm	<D<6	0 — -12
	6<D<20	0 — -15

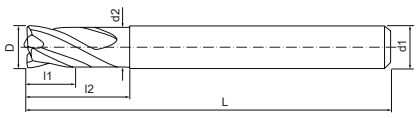
UFG95

SQUARE TYPE WALCOWO-CZOŁOWE

4-Flute, Short flute 4-ostrzowe, o krótkim ostrzu

			HSM Vmax	F	M	R	30°	A					max	min		AIR
													○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
	○	○	●	●										





D code new Nowy kod	D code kod	D	d1	d2	L	l1	l2	Z	Shank Uchwyt
UFG95010000A06003050	UFG95010	1	6	0,95	50	1,5	3	4	A
UFG95020000A06005050	UFG95020	2	6	1,95	50	2	5	4	A
UFG95030000A06008055	UFG95030	3	6	2,85	55	3	8	4	A
UFG95040000A06010055	UFG95040	4	6	3,85	55	4	10	4	A
UFG95050000A06013055	UFG95050	5	6	4,85	55	5	13	4	A
UFG95060000A06015055	UFG95060	6	6	5,85	55	6	15	4	A
UFG95080000A08020065	UFG95080	8	8	7,7	65	8	20	4	A
UFG95100000A10025075	UFG95100	10	10	9,7	75	10	25	4	A
UFG95120000A12028085	UFG95120	12	12	11,7	85	12	28	4	A
UFG95160000A16032090	UFG95160	16	16	15,7	90	16	32	4	A
UFG95200000A20040105	UFG95200	20	20	19,7	105	20	40	4	A

Cutting Conditions Parametry skrawania



			Hardened Steels, Heat Resistant Steels Stale hartowane i żaroodporne							
			30 - 42HRC		42 - 55HRC		55 - 65HRC		65 - 70HRC	
d1 (mm)	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
1	0,03	0,10	48000	1550	25500	745	16000	280	12500	180
2	0,06	0,20	33300	1835	17500	880	11000	335	9500	240
3	0,09	0,30	21800	1835	11500	880	7500	335	6400	240
4	0,12	0,40	16700	1890	8800	920	5600	350	4750	250
5	0,15	0,50	15700	2100	8300	1050	5100	385	4450	280
6	0,18	0,60	13100	2045	6900	995	4200	365	3700	270
8	0,24	0,80	9880	1970	5200	945	3200	345	2800	250
10	0,30	1,00	7800	1835	4100	880	2550	325	2200	230
12	0,36	1,20	6650	1835	3500	880	2100	315	1860	230
16	0,48	1,60	4900	1575	2600	765	1600	280	1400	210
20	0,60	2,00	3900	1365	2050	680	1300	260	1100	185

µm	<D<6	0 — -12
	6<D<20	0 — -15

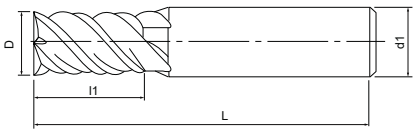
UFG07

SQUARE TYPE WALCOWO-CZOŁOWE

4-Flute, Short 4-ostrzowe, krótkie

HSM Vmax	F	M	R	45°	A	max	min	AIR
						○	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
	○	○	●	●										





D code new Nowy kod	D code kod	D	d1	L	l1	Z	Shank Uchwyt
UFG07030000A06008060	UFG07030	3	6	60	8	4	A
UFG07040000A06011060	UFG07040	4	6	60	11	4	A
UFG07050000A06013060	UFG07050	5	6	60	13	4	A
UFG07060000A06013060	UFG07060	6	6	60	13	4	A
UFG07080000A08019060	UFG07080	8	8	60	19	4	A
UFG07100000A10022075	UFG07100	10	10	75	22	4	A
UFG07120000A12026100	UFG07120	12	12	100	26	4	A
UFG07160000A16035100	UFG07160	16	16	100	35	4	A
UFG07200000A20040100	UFG07200	20	20	100	40	4	A

UFG07

Cutting Conditions Parametry skrawania

Material Materiał	Mild steel, Carbon steel. Cast iron Stal miękka, Stal węglowa, Żeliwo				Alloy steel, Tool steel Stal stopowa, Stal narzędziowa				Hardened steel, Prehardened steel (Free-cutting) Stal hartowana, Stal ulepszona (automatowa)				Hardened steel, Stainless steel Stal hartowana, Stal nierdzewna				Hardened steel, Titanium alloys, Heat resistant alloy steel Stal hartowana, Stopy tytanu, Stal stopowa żaroodporna				Hardened steel Stal hartowana			
	<750N/mm²				<30HRC				30 - 38HRC				38 - 45HRC				45 - 55HRC				55 - 60HRC			
d1 (mm)	FO		HFO		FO		HFO		FO		HFO		FO		HFO		FO		HFO		FO		HFO	
	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
3	11130	1024	22260	2258	8715	798	22260	2520	7350	588	22260	1365	6930	583	16695	1208	6337	509	11130	714	3360	200	8925	462
4	8348	1050	16695	2153	6510	861	16695	2415	5513	593	16695	1365	5198	620	12495	1313	4988	541	8348	835	2520	200	6668	483
5	6668	1103	13335	1995	5198	887	13335	2258	4410	620	13335	1313	4148	662	10028	1418	3990	562	6668	882	1995	200	5355	536
6	5565	1313	11130	3203	4358	992	11130	2783	3675	735	11130	2100	3465	693	8348	1523	3360	572	5565	956	1680	200	4463	641
8	4200	1313	8348	2940	3255	940	8348	2520	2783	693	8348	1995	2573	672	6248	1470	2520	583	4200	903	1260	184	3360	604
10	3360	1155	6668	2678	2625	898	6668	2310	2205	635	6668	1943	2048	620	4988	1418	1995	551	3360	872	1003	168	2678	536
12	2783	1155	5565	2678	2153	893	5565	2310	1838	593	5565	1890	1733	562	4200	1418	1680	499	2783	872	835	168	2205	536
16	2100	1003	4200	1995	1628	782	4200	1995	1365	525	4200	1785	1313	467	3150	1418	1260	420	2100	872	625	168	1680	536
20	1680	803	3360	1628	1313	625	3360	1628	1103	478	3360	1628	1034	415	2520	1208	1003	373	1680	767	499	168	1313	536

Depth of cut
Głębokość skrawania

FO	ap	ae
	1.5xd1	0.2xd1

HFO	ap	ae
d1<6	1.5xd1	0.02xd1
6≤d1	1.5xd1	0.05xd1

aeMax=0.5mm

FO	ap	ae
	1.5xd1	0.1xd1

HFO	ap	ae
d1<6	1.5xd1	0.01xd1
6≤d1	1.5xd1	0.02xd1

aeMax=0.5mm

FO	ap	ae
	1xd1	0.05xd1

HFO	ap	ae
d1<6	1xd1	0.01xd1
6≤d1	1xd1	0.02xd1

aeMax=0.5mm

Material Materiał Materiał	Mild steel, Carbon steel. Cast iron Stal miękka, Stal węglowa, Żeliwo				Alloy steel, Tool steel Stal stopowa, Stal narzędziowa				Hardened steel, Prehardened steel (Free-cutting) Stal hartowana, Stal ulepszona (automatowa)				Hardened steel, Stainless steel Stal hartowana, Stal nierdzewna				Hardened steel, Titanium alloys, Heat resistant alloy steel Stal hartowana, Stopy tytanu, Stal stopowa żaroodpornaStal hartowana, Stopy tytanu, Stal stopowa żaroodporna		Hardened steel Stal hartowana	
	<750N/mm²				<30HRC				30 - 38HRC				38 - 45HRC				45 - 55HRC		55 - 60HRC	
d1 (mm)	FR		HFR		FR		HFR		FR		HFR		FR		HFR		FR		FR	
	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
3	8925	740	13335	1103	6668	1007	11130	982	6143	478	10028	782	5775	420	6668	483	4673	336	2205	116
4	6668	740	10028	1208	4988	709	8348	1050	4620	478	7508	782	4358	473	5408	588	3518	378	1680	126
5	5355	751	8033	1260	3990	693	7350	1155	3675	499	6668	908	3465	499	4358	625	2783	404	1313	131
6	4463	751	3833	1628	3360	588	6143	1208	3045	525	5565	956	2888	520	3885	704	2363	420	1103	131
8	3360	693	4988	1523	2520	578	4620	1365	2310	572	4200	1034	2153	541	2940	725	1733	436	835	131
10	2678	641	3990	1470	1995	562	3675	1260	1838	499	3360	908	1733	494	2363	667	1418	399	667	121
12	2205	641	3360	1313	1680	499	3045	1208	1523	473	2783	856	1470	462	1943	625	1155	373	557	121
16	1680	641	2520	1103	1260	452	2310	1013	1155	389	2100	709	1103	389	1470	525	877	315	420	92
20	1313	536	1995	882	1003	399	1838	809	919	368	1680	667	872	347	1155	467	704	278	336	93

Depth of cut
Głębokość skrawania

FR a_p=0.5xd1

HFR ap=0.2xd1, apMax=3mm

ap=0.05xd1

(H)FO (mm/min) — (HIGH SPEED) SIDE CUTTING — FREZOWANIE OBWODOWE (SZYBKOŚCIOWE)

(H)FR (mm/min) — (HIGH SPEED) SLOTTING — FREZOWANIE ROWKÓW (SZYBKOŚCIOWE)

µm	D	0 — -12

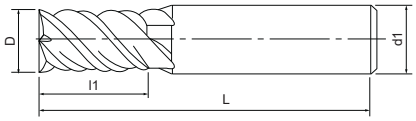
UFG08

SQUARE TYPE WALCOWO-CZOŁOWE

4-Flute, Medium length 4-ostrzowe, średniej długości

			HSM Vmax	F	M	R	45°	A					max	min		AIR
													○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
	○	○	●	●										





D code new Nowy kod	D code kod	D	d1	L	l1	Z	Shank Uchwyt
UFG08030000A06012060	UFG08030	3	6	60	12	4	A
UFG08040000A06016060	UFG08040	4	6	60	16	4	A
UFG08050000A06018060	UFG08050	5	6	60	18	4	A
UFG08060000A06020060	UFG08060	6	6	60	20	4	A
UFG08080000A08025075	UFG08080	8	8	75	25	4	A
UFG08100000A10030080	UFG08100	10	10	80	30	4	A
UFG08120000A12035100	UFG08120	12	12	100	35	4	A
UFG08160000A16045115	UFG08160	16	16	115	45	4	A
UFG08200000A20050125	UFG08200	20	20	125	50	4	A

UFG08

Cutting Conditions Parametry skrawania

Material Materiał Materiał	Mild steel, Carbon steel. Cast iron Stal miękka, Stal węglowa, Żeliwo				Alloy steel, Tool steel Stal stopowa, Stal narzędziowa				Hardened steel, Prehardened steel (Free-cutting) Stal hartowana, Stal ulepszona (automatowa)				Hardened steel, Stainless steel Stal hartowana, Stal nierdzewna Stal hartowana, Stal nierdzewna				Hardened steel, Titanium alloys, Heat resistant alloy steel Stal hartowana, Stopy tytanu, Stal stopowa żaroodporna				Hardened steel Stal hartowana			
	<750N/mm²				<30HRC				30 - 38HRC				38 - 45HRC				45 - 55HRC				55 - 60HRC			
d1 (mm)	FO		HFO		FO		HFO		FO		HFO		FO		HFO		FO		HFO		FO		HFO	
	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
3	11130	1024	22260	2258	8715	798	22260	2520	7350	588	22260	1365	6930	583	16695	1208	6337	509	11130	714	3360	200	8925	462
4	8348	1050	16695	2153	6510	861	16695	2415	5513	593	16695	1365	5198	620	12495	1313	4988	541	8348	835	2520	200	6668	483
5	6668	1103	13335	1995	5198	887	13335	2258	4410	620	13335	1313	4148	662	10028	1418	3990	562	6668	882	1995	200	5355	536
6	5565	1313	11130	3203	4358	992	11130	2783	3675	735	11130	2100	3465	693	8348	1523	3360	572	5565	956	1680	200	4463	641
8	4200	1313	8348	2940	3255	940	8348	2520	2783	693	8348	1995	2573	672	6248	1470	2520	583	4200	903	1260	184	3360	604
10	3360	1155	6668	2678	2625	898	6668	2310	2205	635	6668	1943	2048	620	4988	1418	1995	551	3360	872	1003	168	2678	536
12	2783	1155	5565	2678	2153	893	5565	2310	1838	593	5565	1890	1733	562	4200	1418	1680	499	2783	872	835	168	2205	536
16	2100	1003	4200	1995	1628	782	4200	1995	1365	525	4200	1785	1313	467	3150	1418	1260	420	2100	872	625	168	1680	536
20	1680	803	3360	1628	1313	625	3360	1628	1103	478	3360	1628	1034	415	2520	1208	1003	373	1680	767	499	168	1313	536

Depth of cut
Głębokość skrawania

FO	ap	ae
	1.5xd1	0.2xd1

HFO	ap	ae
d1<6	1.5xd1	0.02xd1
6≤d1	1.5xd1	0.05xd1

aeMax=0.5mm

FO	ap	ae
	1.5xd1	0.1xd1

HFO	ap	ae
d1<6	1.5xd1	0.01xd1
6≤d1	1.5xd1	0.02xd1

aeMax=0.5mm

FO	ap	ae
	1xd1	0.05xd1

HFO	ap	ae
d1<6	1xd1	0.01xd1
6≤d1	1xd1	0.02xd1

aeMax=0.5mm

Material Materiał Materiał	Mild steel, Carbon steel. Cast iron Stal miękka, Stal węglowa, Żeliwo				Alloy steel, Tool steel Stal stopowa, Stal narzędziowa				Hardened steel, Prehardened steel (Free-cutting) Stal hartowana, Stal ulepszona (automatowa)				Hardened steel, Stainless steel Stal hartowana, Stal nierdzewna Stal hartowana, Stal nierdzewna				Hardened steel, Titanium alloys, Heat resistant alloy steel Stal hartowana, Stopy tytanu, Stal stopowa żaroodporna				Hardened steel Stal hartowana			
	<750N/mm²				<30HRC				30 - 38HRC				38 - 45HRC				45 - 55HRC				55 - 60HRC			
d1 (mm)	FR		HFR		FR		HFR		FR		HFR		FR		HFR		FR				FR			
	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min			RPM	mm/min		
3	8925	740	13335	1103	6668	1007	11130	982	6143	478	10028	782	5775	420	6668	483	4673	336			2205	116		
4	6668	740	10028	1208	4988	709	8348	1050	4620	478	7508	782	4358	473	5408	588	3518	378			1680	126		
5	5355	751	8033	1260	3990	693	7350	1155	3675	499	6668	908	3465	499	4358	625	2783	404			1313	131		
6	4463	751	3833	1628	3360	588	6143	1208	3045	525	5565	956	2888	520	3885	704	2363	420			1103	131		
8	3360	693	4988	1523	2520	578	4620	1365	2310	572	4200	1034	2153	541	2940	725	1733	436			835	131		
10	2678	641	3990	1470	1995	562	3675	1260	1838	499	3360	908	1733	494	2363	667	1418	399			667	121		
12	2205	641	3360	1313	1680	499	3045	1208	1523	473	2783	856	1470	462	1943	625	1155	373			557	121		
16	1680	641	2520	1103	1260	452	2310	1013	1155	389	2100	709	1103	389	1470	525	877	315			420	92		
20	1313	536	1995	882	1003	399	1838	809	919	368	1680	667	872	347	1155	467	704	278			336	93		

Depth of cut
Głębokość skrawania

FR a_p=0.5xd1

HFR ap=0.2xd1
apMax=3mm

ap=0.05xd1

(H)FO (mm/min) — (HIGH SPEED) SIDE CUTTING — FREZOWANIE OBWODOWE (SZYBKOŚCIOWE)

(H)FR (mm/min) — (HIGH SPEED) SLOTTING — FREZOWANIE ROWKÓW (SZYBKOŚCIOWE)

µm	D	0 — -12

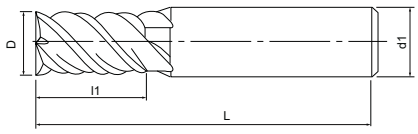
UFG09

SQUARE TYPE WALCOWO-CZOŁOWE

4-Flute, Long 4-ostrzowe, długie

			HSM Vmax	F	M	R	45°	A					max	min		AIR
													○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
	○	○	●	●										





D code new Nowy kod	D code kod	D	d1	L	l1	Z	Shank Uchwyt
UFG09030000A06015060	UFG09030	3	6	60	15	4	A
UFG09040000A06020060	UFG09040	4	6	60	20	4	A
UFG09050000A06022060	UFG09050	5	6	60	22	4	A
UFG09060000A06025075	UFG09060	6	6	75	25	4	A
UFG09080000A08030075	UFG09080	8	8	75	30	4	A
UFG09100000A10035080	UFG09100	10	10	80	35	4	A
UFG09120000A12040100	UFG09120	12	12	100	40	4	A
UFG09160000A16055115	UFG09160	16	16	115	55	4	A
UFG09200000A20060125	UFG09200	20	20	125	60	4	A

UFG09

Cutting Conditions Parametry skrawania

Material Materiał Materiał	Mild steel, Carbon steel. Cast iron Stal miękka, Stal węglowa, Żeliwo				Alloy steel, Tool steel Stal stopowa, Stal narzędziowa				Hardened steel, Prehardened steel (Free-cutting) Stal hartowana, Stal ulepszona (automatowa)				Hardened steel, Stainless steel Stal hartowana, Stal nierdzewna Stal hartowana, Stal nierdzewna				Hardened steel, Titanium alloys, Heat resistant alloy steel Stal hartowana, Stopy tytanu, Stal stopowa żaroodporna				Hardened steel Stal hartowana			
	<750N/mm²				<30HRC				30 - 38HRC				38 - 45HRC				45 - 55HRC				55 - 60HRC			
d1 (mm)	FO		HFO		FO		HFO		FO		HFO		FO		HFO		FO		HFO		FO		HFO	
	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
3	11130	1024	22260	2258	8715	798	22260	2520	7350	588	22260	1365	6930	583	16695	1208	6337	509	11130	714	3360	200	8925	462
4	8348	1050	16695	2153	6510	861	16695	2415	5513	593	16695	1365	5198	620	12495	1313	4988	541	8348	835	2520	200	6668	483
5	6668	1103	13335	1995	5198	887	13335	2258	4410	620	13335	1313	4148	662	10028	1418	3990	562	6668	882	1995	200	5355	536
6	5565	1313	11130	3203	4358	992	11130	2783	3675	735	11130	2100	3465	693	8348	1523	3360	572	5565	956	1680	200	4463	641
8	4200	1313	8348	2940	3255	940	8348	2520	2783	693	8348	1995	2573	672	6248	1470	2520	583	4200	903	1260	184	3360	604
10	3360	1155	6668	2678	2625	898	6668	2310	2205	635	6668	1943	2048	620	4988	1418	1995	551	3360	872	1003	168	2678	536
12	2783	1155	5565	2678	2153	893	5565	2310	1838	593	5565	1890	1733	562	4200	1418	1680	499	2783	872	835	168	2205	536
16	2100	1003	4200	1995	1628	782	4200	1995	1365	525	4200	1785	1313	467	3150	1418	1260	420	2100	872	625	168	1680	536
20	1680	803	3360	1628	1313	625	3360	1628	1103	478	3360	1628	1034	415	2520	1208	1003	373	1680	767	499	168	1313	536

Depth of cut
Głębokość skrawania

FO	ap	ae
	1.5xd1	0.2xd1

HFO	ap	ae
d1<6	1.5xd1	0.02xd1
6≤d1	1.5xd1	0.05xd1

aeMax=0.5mm

FO	ap	ae
	1.5xd1	0.1xd1

HFO	ap	ae
d1<6	1.5xd1	0.01xd1
6≤d1	1.5xd1	0.02xd1

aeMax=0.5mm

FO	ap	ae
	1xd1	0.05xd1

HFO	ap	ae
d1<6	1xd1	0.01xd1
6≤d1	1xd1	0.02xd1

aeMax=0.5mm

Material Materiał Materiał	Mild steel, Carbon steel. Cast iron Stal miękka, Stal węglowa, Żeliwo				Alloy steel, Tool steel Stal stopowa, Stal narzędziowa				Hardened steel, Prehardened steel (Free-cutting) Stal hartowana, Stal ulepszona (automatowa)				Hardened steel, Stainless steel Stal hartowana, Stal nierdzewna Stal hartowana, Stal nierdzewna				HHardened steel, Titanium alloys, Heat resistant alloy steel Stal hartowana, Stopy tytanu, Stal stopowa żaroodporna		Hardened steel Stal hartowana	
	<750N/mm²				<30HRC				30 - 38HRC				38 - 45HRC				45 - 55HRC		55 - 60HRC	
d1 (mm)	FR		HFR		FR		HFR		FR		HFR		FR		HFR		FR		FR	
	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
3	8925	740	13335	1103	6668	1007	11130	982	6143	478	10028	782	5775	420	6668	483	4673	336	2205	116
4	6668	740	10028	1208	4988	709	8348	1050	4620	478	7508	782	4358	473	5408	588	3518	378	1680	126
5	5355	751	8033	1260	3990	693	7350	1155	3675	499	6668	908	3465	499	4358	625	2783	404	1313	131
6	4463	751	3833	1628	3360	588	6143	1208	3045	525	5565	956	2888	520	3885	704	2363	420	1103	131
8	3360	693	4988	1523	2520	578	4620	1365	2310	572	4200	1034	2153	541	2940	725	1733	436	835	131
10	2678	641	3990	1470	1995	562	3675	1260	1838	499	3360	908	1733	494	2363	667	1418	399	667	121
12	2205	641	3360	1313	1680	499	3045	1208	1523	473	2783	856	1470	462	1943	625	1155	373	557	121
16	1680	641	2520	1103	1260	452	2310	1013	1155	389	2100	709	1103	389	1470	525	877	315	420	92
20	1313	536	1995	882	1003	399	1838	809	919	368	1680	667	872	347	1155	467	704	278	336	93

Depth of cut
Głębokość skrawania

FR a_p=0.5xd1

HFR ap=0.2xd1, apMax=3mm

ap=0.05xd1

(H)FO (mm/min) — (HIGH SPEED) SIDE CUTTING — FREZOWANIE OBWODOWE (SZYBKOŚCIOWE)

(H)FR (mm/min) — (HIGH SPEED) SLOTTING — FREZOWANIE ROWKÓW (SZYBKOŚCIOWE)

µm	D	0 — -12

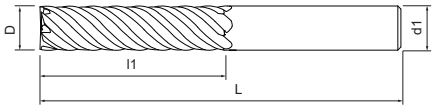
UFG40

SQUARE TYPE WALCOWO-CZOŁOWE

2-Flute, Short and Long Flute 2-ostrzowe, o krótkim i długim ostrzu

HSM Vmax	F	M	R	30°	A	max	min	AIR
						○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
	○	○	●	●										

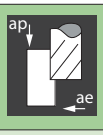




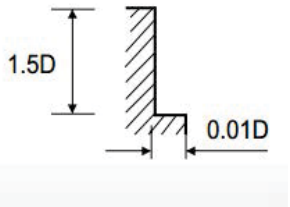
D code Kod	D	d1	L	l1	Z	Shank Uchwyt
UFG40060000A06013057	6	6	57	13	6	A
UFG40060000A06026070	6	6	70	26	6	A
UFG40080000A08019063	8	8	63	19	6	A
UFG40080000A08036090	8	8	90	36	6	A
UFG40100000A10022072	10	10	72	22	6	A
UFG40100000A10046100	10	10	100	46	6	A
UFG40120000A12026083	12	12	83	26	6	A
UFG40120000A12056110	12	12	110	56	6	A
UFG40140000A14026083	14	14	83	26	6	A
UFG40160000A16032092	16	16	92	32	6	A
UFG40160000A16066130	16	16	130	66	6	A
UFG40180000A18032092	18	18	92	32	8	A
UFG40200000A20038104	20	20	104	38	8	A
UFG40200000A20076140	20	20	140	76	8	A
UFG40250000A02044010	25	2	10	44	8	A
UFG40250000A25092180	25	25	180	92	8	A

Cutting Conditions Parametry skrawania

SIDE CUTTING / FREZOWANIE OBWODOWE



	Alloy steels, Heat Resistant Steels Stale stopowe i żaroodporne				Hardened steel Stal hartowana	
	30 - 40HRC		40 - 55HRC		55-65HRC	
d1 (mm)	RPM	mm/min	RPM	mm/min	RPM	mm/min
6.0	3180	770	3180	575	2540	455
8.0	2390	720	2390	575	1910	455
10.0	1910	685	1910	575	1520	455
12.0	1580	660	1580	575	1270	455
14.0	1370	620	1370	540	1090	430
16.0	1190	575	1190	505	960	410
18.0	1070	730	1070	685	850	550
20.0	960	660	960	695	770	560
25.0	770	550	770	490	610	395



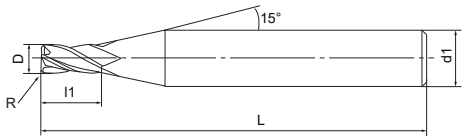
µm		
	<D<6	0 — -12
	6<D<20	0 — -15

UFG50

TOROIDAL TOROIDALNE
2-Flute, Miniature 2-ostrzowe, miniaturowe

HSM Vmax	F	M	30°	A				max	min		AIR
								○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
	○	○	●	●										





D code new Nowy kod	D code kod	R	D	d1	L	l1	Z	Shank Uchwyt
UFG50003000A06000050			0,3	6	50	0,45	2	A
UFG50004000A06000050			0,4	6	50	0,6	2	A
UFG50005X50A06000050	UFG50005	0,05	0,5	6	50	0,7	2	A
UFG50006X50A06000050	UFG50006	0,05	0,6	6	50	0,9	2	A
UFG50008X50A06001050	UFG50008	0,05	0,8	6	50	1,2	2	A
UFG50010001A06001050	UFG50010	0,1	1	6	50	1,5	2	A
UFG50012001A06001050	UFG50012	0,1	1,2	6	50	1,8	2	A
UFG50015002A06002050	UFG50015	0,15	1,5	6	50	2,2	2	A
UFG50020002A06002050	UFG50020	0,15	2	6	50	2,2	2	A

Cutting Conditions Parametry skrawania

ap	Hardened Steels, Heat Resistant Steels Stale hartowane i żaroodporne				Hardened Steel Stal hartowana		
	30 - 42HRC		42 - 55HRC		55 - 65HRC		
d1(mm)	ap	RPM	mm/min	RPM	mm/min	ap	RPM	mm/min
0,5	0,03	50000	385	40000	230	0,01	25000	85
0,6	0,03	50000	490	40000	295	0,01	25000	110
0,8	0,04	50000	630	30000	305	0,02	19000	115
1,0	0,05	48000	785	25500	375	0,02	16000	140
1,2	0,06	42000	825	22500	395	0,02	14500	150
1,5	0,08	37000	840	21000	430	0,03	13000	160
2,0	0,10	33300	890	17500	440	0,04	11000	165

µm	D 0 — -20	R	±0,01
	d1 h6		

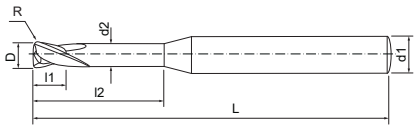
UFG01

TOROIDAL TOROIDALNE

2-Flute, Miniature 2-ostrzowe, miniaturowe

				HSM Vmax	F	M	30°	A					max	min		AIR
													○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
	○	○	●	●										





D code new Nowy kod	D code kod	R	D	d1	d2	L	l1	l2	Z	Shank Uchwyt
UFG01005X50A04001045	UFG01936	0,05	0,5	4	0,45	45	0,7	1,5	2	A
UFG01005X50A04002045	UFG01932	0,05	0,5	4	0,45	45	0,7	2,5	2	A
UFG01005X50A04004045	UFG01935	0,05	0,5	4	0,45	45	0,7	4	2	A
UFG01006X50A04002045	UFG01931	0,05	0,6	4	0,55	45	0,9	2	2	A
UFG01006X50A04003045	UFG01933	0,05	0,6	4	0,55	45	0,9	3	2	A
UFG01006X50A04004045	UFG01934	0,05	0,6	4	0,55	45	0,9	4	2	A
UFG01006001A04002045	UFG01006	0,1	0,6	4	0,55	45	0,9	2	2	A
UFG01007001A04004045	UFG01007	0,1	0,7	4	0,65	45	1	4	2	A
UFG01008001A04002045	UFG01812	0,1	0,8	4	0,75	45	1,2	2	2	A
UFG01008001A04004045	UFG01008	0,1	0,8	4	0,75	45	1,2	4	2	A
UFG01008001A04006045	UFG01924	0,1	0,8	4	0,75	45	1,2	6	2	A
UFG01010001A06004050	UFG01925	0,1	1	6	0,95	50	1,5	4	2	A
UFG01010001A06006050	UFG01926	0,1	1	6	0,95	50	1,5	6	2	A
UFG01010002A06004050	UFG01010	0,2	1	6	0,95	50	1,5	4	2	A
UFG01010002A06006050	UFG01910	0,2	1	6	0,95	50	1,5	6	2	A
UFG01010002A06008050	UFG01911	0,2	1	6	0,95	50	1,5	8	2	A
UFG01010003A06004050	UFG01912	0,3	1	6	0,95	50	1,5	4	2	A
UFG01010003A06006050	UFG01930	0,3	1	6	0,95	50	1,5	6	2	A
UFG01010003A06008050	UFG01138	0,3	1	6	0,95	50	1,5	8	2	A
UFG01015002A06004050	UFG01015	0,2	1,5	6	1,45	50	2,5	4	2	A
UFG01015002A06006050	UFG01526	0,2	1,5	6	1,45	50	2,5	6	2	A
UFG01015002A06008050	UFG01528	0,2	1,5	6	1,45	50	2,5	8	2	A
UFG01015002A06010050	UFG01913	0,2	1,5	6	1,45	50	2,5	10	2	A
UFG01015002A06012050	UFG01914	0,2	1,5	6	1,45	50	2,5	12	2	A
UFG01015003A06004050	UFG01915	0,3	1,5	6	1,45	50	2,5	4	2	A
UFG01015003A06006050	UFG01536	0,3	1,5	6	1,45	50	2,5	6	2	A
UFG01015003A06008050	UFG01538	0,3	1,5	6	1,45	50	2,5	8	2	A
UFG01020002A06006050	UFG01927	0,2	2	6	1,95	50	3	6	2	A
UFG01020002A06008050	UFG01228	0,2	2	6	1,95	50	3	8	2	A
UFG01020002A06010055	UFG01221	0,2	2	6	1,95	55	3	10	2	A
UFG01020002A06012055	UFG01222	0,2	2	6	1,95	55	3	12	2	A
UFG01020003A06006050	UFG01916	0,3	2	6	1,95	50	3	6	2	A
UFG01020003A06008050	UFG01238	0,3	2	6	1,95	50	3	8	2	A
UFG01020003A06010055	UFG01231	0,3	2	6	1,95	55	3	10	2	A
UFG01020003A06012055	UFG01232	0,3	2	6	1,95	55	3	12	2	A
UFG01020003A06016050	UFG01236	0,3	2	6	1,95	50	3	16	2	A
UFG01020005A06006050	UFG01917	0,5	2	6	1,95	50	3	6	2	A
UFG01020005A06010055	UFG01020	0,5	2	6	1,95	55	3	10	2	A
UFG01020005A06012055	UFG01918	0,5	2	6	1,95	55	3	12	2	A
UFG01030002A06008055	UFG01328	0,2	3	6	2,85	55	4	8	2	A
UFG01030002A06010055	UFG01321	0,2	3	6	2,85	55	4	10	2	A
UFG01030002A06012055	UFG01322	0,2	3	6	2,85	55	4	12	2	A
UFG01030002A06016055	UFG01326	0,2	3	6	2,85	55	4	16	2	A
UFG01030003A06008055	UFG01338	0,3	3	6	2,85	55	4	8	2	A
UFG01030003A06010055	UFG01919	0,3	3	6	2,85	55	4	10	2	A
UFG01030003A06012055	UFG01332	0,3	3	6	2,85	55	4	12	2	A
UFG01030003A06016055	UFG01336	0,3	3	6	2,85	55	4	16	2	A
UFG01030005A06010055	UFG01030	0,5	3	6	2,85	55	4	10	2	A
UFG01030005A06012055	UFG01352	0,5	3	6	2,85	55	4	12	2	A

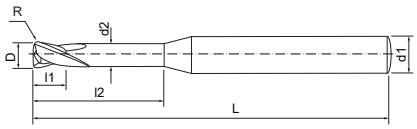
UFG01

TOROIDAL TOROIDALNE

2-Flute, Miniature 2-ostrzowe, miniaturowe

				HSM Vmax	F	M	30°	A				max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
	○	○	●	●										





D code new Nowy kod	D code kod	R	D	d1	d2	L	l1	l2	Z	Shank Uchwyt
UFG01030005A06016055	UFG01901	0,5	3	6	2,85	55	4	16	2	A
UFG01030005A06020055	UFG01902	0,5	3	6	2,85	55	4	20	2	A
UFG01040002A06012055	UFG01421	0,2	4	6	3,85	55	5	12	2	A
UFG01040002A06016055	UFG01426	0,2	4	6	3,85	55	5	16	2	A
UFG01040002A06020055	UFG01422	0,2	4	6	3,85	55	5	20	2	A
UFG01040003A06010055	UFG01431	0,3	4	6	3,85	55	5	10	2	A
UFG01040003A06012055	UFG01920	0,3	4	6	3,85	55	5	12	2	A
UFG01040003A06016055	UFG01436	0,3	4	6	3,85	55	5	16	2	A
UFG01040003A06020055	UFG01432	0,3	4	6	3,85	55	5	20	2	A
UFG01040005A06012055	UFG01040	0,5	4	6	3,85	55	5	12	2	A
UFG01040005A06016055	UFG01903	0,5	4	6	3,85	55	5	16	2	A
UFG01040005A06020055	UFG01904	0,5	4	6	3,85	55	5	20	2	A
UFG01040010A06012055	UFG01412	1	4	6	3,85	55	5	12	2	A
UFG01040010A06016055	UFG01416	1	4	6	3,85	55	5	16	2	A
UFG01060003A06020060	UFG01921	0,3	6	6	5,85	60	7	20	2	A
UFG01060005A06020060	UFG01060	0,5	6	6	5,85	60	7	20	2	A
UFG01060010A06020060	UFG01905	1	6	6	5,85	60	7	20	2	A
UFG01060015A06020060	UFG01906	1,5	6	6	5,85	60	7	20	2	A
UFG01060020A06020060	UFG01622	2	6	6	5,85	60	7	20	2	A
UFG01080003A08025060	UFG01922	0,3	8	8	7,7	60	9	25	2	A
UFG01080005A08025060	UFG01929	0,5	8	8	7,7	60	9	25	2	A
UFG01080010A08025060	UFG01080	1	8	8	7,7	60	9	25	2	A
UFG01080015A08025060	UFG01907	1,5	8	8	7,7	60	9	25	2	A
UFG01080020A08025060	UFG01825	2	8	8	7,7	60	9	25	2	A
UFG01100003A10032070	UFG01923	0,3	10	10	9,7	70	11	32	2	A
UFG01100005A10032070	UFG01153	0,5	10	10	9,7	70	11	32	2	A
UFG01100010A10032070	UFG01100	1	10	10	9,7	70	11	32	2	A
UFG01100015A10032070	UFG01908	1,5	10	10	9,7	70	11	32	2	A
UFG01100020A10032070	UFG01123	2	10	10	9,7	70	11	32	2	A
UFG01120005A12038080	UFG01125	0,5	12	12	11,7	80	12	38	2	A
UFG01120010A12038080	UFG01120	1	12	12	11,7	80	12	38	2	A
UFG01120015A12038080	UFG01909	1,5	12	12	11,7	80	12	38	2	A
UFG01120020A12038080	UFG01122	2	12	12	11,7	80	12	38	2	A

UFG01

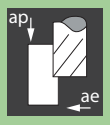
Cutting Conditions Parametry skrawania

SLOTTING / FREZOWANIE ROWKÓW



		Hardened Steel, Heat Resistant Steels Stal hartowana i żaroodporna		Hardened Steels Stale hartowane						
		30 - 42HRC		42 - 55HRC		55 - 65HRC		ap	65 - 70HRC	
d1 (mm)	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min		RPM	mm/min
0,5	0,03	50000	280	40000	180	25000	70	0,01	20000	40
0,6	0,03	50000	350	40000	235	25000	90	0,01	20000	55
0,8	0,04	50000	450	40000	245	19000	95	0,02	16000	60
1,0	0,05	48000	570	25500	300	16000	115	0,02	12500	75
2,0	0,10	33300	640	17500	350	11000	140	0,04	9500	100
3,0	0,15	21800	640	11500	350	7500	140	0,06	6400	100
4,0	0,20	16700	660	8800	365	5600	145	0,08	4750	100
5,0	0,25	15700	760	8300	420	5100	155	0,10	4450	115
6,0	0,30	13100	720	6900	400	4200	155	0,12	3700	110
8,0	0,40	9880	700	5200	370	3200	145	0,16	2800	105
10,0	0,50	7800	640	4100	345	2550	135	0,20	2200	95
12,0	0,60	6650	640	3500	345	2100	135	0,24	1860	95

SIDE CUTTING / FREZOWANIE OBWODOWE



			Hardened Steel, Heat Resistant Steels Stal hartowana i żaroodporna		Hardened Steels Stale hartowane					
			30 - 42HRC		42 - 55HRC		55 - 65HRC		65 - 70HRC	
d1 (mm)	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
0,5	0,02	0,50	50000	215	40000	130	25000	45	20000	30
0,6	0,02	0,60	50000	275	40000	165	25000	60	20000	35
0,8	0,02	0,80	50000	350	30000	170	19000	65	16000	40
1,0	0,03	1,00	48000	880	25500	425	16000	155	12500	105
2,0	0,06	2,00	33300	1005	17500	500	11000	190	9500	135
3,0	0,09	3,00	21800	1005	11500	500	7500	190	6400	135
4,0	0,12	4,00	16700	1050	8800	525	5600	200	4750	140
5,0	0,15	5,00	15700	1215	8300	595	5100	215	4450	155
6,0	0,18	6,00	13100	1130	6900	575	4200	210	3700	155
8,0	0,24	8,00	9880	1105	5200	530	3200	195	2800	140
10,0	0,30	10,00	7800	1005	4100	495	2550	180	2200	130
12,0	0,36	12,00	6650	1005	3500	495	2100	180	1860	130

µm	D≤ 6	0 — -12	R	R ≤ 6	± 0,020
	D> 6	0 — -15		R > 6	± 0,015

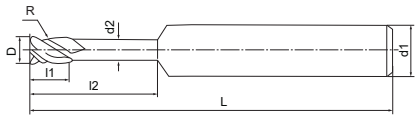
UFG02

TOROIDAL TOROIDALNE

2-Flute, Medium 2-ostrzowe, średniej długości

HSM Vmax	F	R	30°	A	max	min	AIR
					○	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
	○	○	●	●										





D code new Nowy kod	D code kod	R	D	d1	d2	L	l1	l2	Z	Shank Uchwyt
UFG02060002A06018075	UFG0206002	0,2	6	6	5,9	75	18	9	2	A
UFG02060003A06018075	UFG0206003	0,3	6	6	5,9	75	18	9	2	A
UFG02060005A06018075	UFG0206005	0,5	6	6	5,9	75	18	9	2	A
UFG02060010A06018075	UFG0206010	1	6	6	5,9	75	18	9	2	A
UFG02060020A06018075	UFG0206020	2	6	6	5,9	75	18	9	2	A
UFG02080003A08020100	UFG0208003	0,3	8	8	7,9	100	20	12	2	A
UFG02080005A08020100	UFG0208005	0,5	8	8	7,9	100	20	12	2	A
UFG02080010A08020100	UFG0208010	1	8	8	7,9	100	20	12	2	A
UFG02080020A08020100	UFG0208020	2	8	8	7,9	100	20	12	2	A
UFG02100005A10025100	UFG0210005	0,5	10	10	9,9	100	25	15	2	A
UFG02100010A10025100	UFG0210010	1	10	10	9,9	100	25	15	2	A
UFG02100015A10025100	UFG0210015	1,5	10	10	9,9	100	25	15	2	A
UFG02100020A10025100	UFG0210020	2	10	10	9,9	100	25	15	2	A
UFG02100030A10025100	UFG0210030	3	10	10	9,9	100	25	15	2	A
UFG02120005A12030100	UFG0212005	0,5	12	12	11,9	100	30	18	2	A
UFG02120010A12030100	UFG0212010	1	12	12	11,9	100	30	18	2	A
UFG02120015A12030100	UFG0212015	1,5	12	12	11,9	100	30	18	2	A
UFG02120020A12030100	UFG0212020	2	12	12	11,9	100	30	18	2	A
UFG02120030A12030100	UFG0212030	3	12	12	11,9	100	30	18	2	A

UFG02

Cutting Conditions Parametry skrawania



			Steels Stale											
			<22HRC		22 - 32HRC		30 - 40HRC		38 - 45HRC		45 - 50HRC		50 - 55HRC	
d1 (mm)	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
6	3,00	0,06	9878	1120	8430	860	6721	685	5125	523	4456	454	3676	337
	0,06	3,00	13220	1666	11995	1360	10770	1222	8319	944	7093	804	6350	648
8	4,00	0,08	7409	1156	6322	888	5041	708	3844	540	3343	469	2757	349
	0,08	4,00	9916	1719	8996	1404	8077	1260	6239	973	5320	830	4763	669
10	5,00	0,10	5927	972	5058	747	4033	595	3075	454	2674	395	2206	293
	0,10	5,00	7932	1447	7197	1182	6462	1061	4991	820	4256	699	3810	563
12	6,00	0,12	4939	891	4215	685	3361	546	2563	416	2228	362	1838	269
	0,12	6,00	6610	1324	5998	1082	5384	972	4159	750	3546	640	3175	516



			Steels Stale				Cast Irons Żeliwa					
			55 - 60HRC		60 - 65HRC		<180HB		180 - 250HB		>250HB	
d1 (mm)	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
6	3,00	0,06	2377	218	2080	172	11066	1255	9433	962	7576	773
	0,06	3,00	4419	451	3825	351	14818	1867	13406	1520	12107	1373
8	4,00	0,08	1782	225	1560	178	8300	1295	7074	993	5682	798
	0,08	4,00	3315	466	2869	363	11113	1927	10055	1569	9080	1416
10	5,00	0,10	1426	190	1248	149	6640	1089	5660	835	4546	671
	0,10	5,00	2652	392	2295	305	8891	1622	8044	1321	7264	1193
12	6,00	0,12	1189	174	1040	137	5534	998	4717	766	3788	615
	0,12	6,00	2210	359	1912	279	7409	1485	6703	1209	6053	1092

µm	D ≤ 5	0 — -12	d1 h6
	d1 ≥ 6	0 — -30	

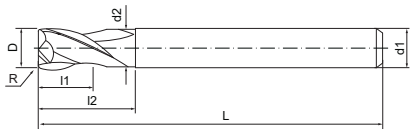
UFG36

TOROIDAL TOROIDALNE

2-Flute, Medium Flute 2-ostrzowe, średniej długości

		HSM Vmax	F	M	30°	A							max	min		AIR
													○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
	○	○	●	●										





D code new Nowy kod	D code kod	R	D	d1	d2	L	l1	l2	Z	Shank Uchwyt
UFG36003000A03000040		-	0,3	3	-	40	0.45	-	2	A
UFG36004000A03000040		-	0,4	3	-	40	0.6	-	2	A
UFG36005X50A03000040		0,05	0,5	3	-	40	0.7	-	2	A
UFG36005X50A04000040	UFG36907	0,05	0,5	4	-	40	1	-	2	A
UFG36006X50A03000040		0,05	0,6	3	-	40	0.9	-	2	A
UFG36006X50A04000040	UFG36908	0,05	0,6	4	-	40	1.2	-	2	A
UFG36007X50A04000040	UFG36909	0,05	0,7	4	-	40	1.4	-	2	A
UFG36008X50A03000040		0,05	0,8	3	-	40	1.2	-	2	A
UFG36008X50A04000040	UFG36910	0,05	0,8	4	-	40	1.6	-	2	A
UFG36009X50A04000040	UFG36911	0,05	0,9	4	-	40	2	-	2	A
UFG36010001A03000040		0,1	1	3	-	40	1.5	-	2	A
UFG36010001A04000040	UFG36901	0,1	1	4	-	40	1.5	-	2	A
UFG36010001A06000040	UFG36903	0,1	1	6	-	40	1.5	-	2	A
UFG36015001A03000040		0,1	1,5	3	-	40	2.2	-	2	A
UFG36015001A06000040	UFG36904	0,1	1,5	6	-	40	2.2	-	2	A
UFG36020001A03006040		0,1	2	3	1.95	40	3	6	2	A
UFG36020001A04006040	UFG36902	0,1	2	4	1.95	40	3	6	2	A
UFG36020001A06006040	UFG36905	0,1	2	6	1.95	40	3	6	2	A
UFG36025001A03006040		0,1	2,5	3	2.4	40	4	6	2	A
UFG36025001A06006040	UFG36906	0,1	2,5	6	2.4	40	4	6	2	A
UFG36030001A06007045	UFG36030	0,1	3	6	2.85	45	4	7	2	A
UFG36035001A06009045	UFG36035	0,1	3,5	6	3.35	45	5	9	2	A
UFG36040001A06009045	UFG36040	0,1	4	6	3.85	45	5	9	2	A
UFG36045001A06010045	UFG36045	0,1	4,5	6	4.35	45	6	10	2	A
UFG36050002A06011050	UFG36050	0,2	5	6	4.85	50	6	11	2	A
UFG36060002A06014050	UFG36060	0,2	6	6	5.85	50	7	14	2	A
UFG36080002A08018060	UFG36080	0,2	8	8	7.7	60	9	18	2	A
UFG36100002A10025075	UFG36100	0,2	10	10	9.7	75	12	25	2	A
UFG36120003A12030075	UFG36120	0,3	12	12	11.7	75	15	30	2	A
UFG36160003A16038090	UFG36160	0,3	16	16	15.7	90	18	38	2	A
UFG36200003A20045100	UFG36200	0,3	20	20	19.7	100	24	45	2	A

UFG36

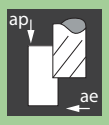
Cutting Conditions Parametry skrawania

SLOTTING / FREZOWANIE ROWKÓW



		Hardened Steels, Heat Resistant Steels Stale hartowane i żaroodporne								
		30 - 42HRC		42 - 55HRC		55 - 65HRC		ap	65 - 70HRC	
d1 (mm)	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min		RPM	mm/min
0,2	0,01	50000	135	40000	95	33000	45	0,004	26400	30
0,3	0,02	50000	195	40000	120	25000	50	0,006	20000	35
0,4	0,02	50000	245	40000	145	25000	55	0,008	20000	40
0,5	0,03	50000	385	40000	230	25000	85	0,010	20000	60
0,6	0,03	50000	490	40000	295	25000	110	0,012	20000	75
0,8	0,04	50000	630	30000	305	19000	115	0,016	15200	80
0,9	0,05	49000	685	27800	345	17500	130	0,018	14000	90
1,0	0,05	48000	785	25500	375	16000	140	0,020	12500	85
2,0	0,10	33300	890	17500	440	11000	165	0,040	9500	120
3,0	0,15	21800	890	11500	440	7500	165	0,060	6400	120
4,0	0,20	16700	920	8800	460	5600	175	0,080	4750	120
5,0	0,25	15700	1050	8300	525	5100	185	0,100	4450	135
6,0	0,30	13100	995	6900	500	4200	185	0,120	3700	135
8,0	0,40	9880	975	5200	465	3200	170	0,160	2800	125
10,0	0,50	7800	890	4100	435	2550	160	0,200	2200	115
12,0	0,60	6650	890	3500	435	2100	160	0,240	1860	115
16,0	0,80	4900	765	2600	380	1600	140	0,320	1400	95
20,0	1,00	3900	690	2050	350	1300	130	0,400	1100	85

SIDE CUTTING / FREZOWANIE OBWODOWE



			Hardened Steels Heat Resistant Steels Stal hartowana i żaroodporna						Hardened Steels Stal hartowana	
			30 - 42HRC		42 - 55HRC		55 - 65HRC		65 - 70HRC	
d1 (mm)	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
1	0,03	1,00	48000	1100	25500	535	16000	195	12500	130
2	0,06	2,00	33300	1260	17500	630	11000	240	9500	170
3	0,09	3,00	21800	1260	11500	630	7500	240	6400	170
4	0,12	4,00	16700	1310	8800	655	5600	250	4750	175
5	0,15	5,00	15700	1520	8300	745	5100	270	4450	195
6	0,18	6,00	13100	1415	6900	720	4200	265	3700	190
8	0,24	8,00	9880	1385	5200	665	3200	245	2800	175
10	0,30	10,00	7800	1260	4100	615	2550	230	2200	165
12	0,36	12,00	6650	1260	3500	615	2100	230	1860	165
16	0,48	16,00	4900	1100	2600	545	1600	195	1400	145
20	0,60	20,00	3900	995	2050	495	1300	180	1100	130

µm	D<6 ± 12	d1 h6	R	R<6	± 0.010
	D<20 ± 15			R<20	± 0.015

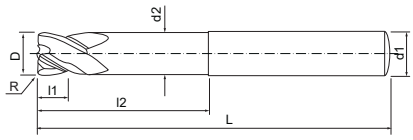
UFG47

TOROIDAL TOROIDALNE

4-Flute 4-ostrzowe

HSM Vmax	F	M	30°	A	max	min	AIR
					○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
	○	○	●	●										





D code new Nowy kod	D code kod	R	D	d1	d2	L	l1	l2	Z	Shank Uchwyt
UFG47030003A06012055	UFG47916	0,3	3	6	2,85	55	4	12	4	A
UFG47030003A06016055	UFG47917	0,3	3	6	2,85	55	4	16	4	A
UFG47030003A06020055	UFG47918	0,3	3	6	2,85	55	4	20	4	A
UFG47030005A06010055	UFG47030	0,5	3	6	2,85	55	4	10	4	A
UFG47030005A06016055	UFG47901	0,5	3	6	2,85	55	4	16	4	A
UFG47030005A06020055	UFG47902	0,5	3	6	2,85	55	4	20	4	A
UFG47040003A06012055	UFG47919	0,3	4	6	3,85	55	5	12	4	A
UFG47040003A06016055	UFG47920	0,3	4	6	3,85	55	5	16	4	A
UFG47040003A06020055	UFG47921	0,3	4	6	3,85	55	5	20	4	A
UFG47040005A06012055	UFG47040	0,5	4	6	3,85	55	5	12	4	A
UFG47040005A06016055	UFG47903	0,5	4	6	3,85	55	5	16	4	A
UFG47040005A06020055	UFG47904	0,5	4	6	3,85	55	5	20	4	A
UFG47040010A06012055	UFG47922	1	4	6	3,85	55	5	12	4	A
UFG47060005A06020060	UFG47060	0,5	6	6	5,85	60	7	20	4	A
UFG47060010A06020060	UFG47905	1	6	6	5,85	60	7	20	4	A
UFG47060015A06020060	UFG47906	1,5	6	6	5,85	60	7	20	4	A
UFG47080005A08025060	UFG47910	0,5	8	8	7,7	60	9	25	4	A
UFG47080010A08025060	UFG47080	1	8	8	7,7	60	9	25	4	A
UFG47080015A08025060	UFG47907	1,5	8	8	7,7	60	9	25	4	A
UFG47080020A08025060	UFG47913	2	8	8	7,7	60	9	25	4	A
UFG47100005A10032070	UFG47911	0,5	10	10	9,7	70	11	32	4	A
UFG47100010A10032070	UFG47100	1	10	10	9,7	70	11	32	4	A
UFG47100015A10032070	UFG47908	1,5	10	10	9,7	70	11	32	4	A
UFG47100020A10032070	UFG47914	2	10	10	9,7	70	11	32	4	A
UFG47120005A12038080	UFG47912	0,5	12	12	11,7	80	12	38	4	A
UFG47120010A12038080	UFG47120	1	12	12	11,7	80	12	38	4	A
UFG47120015A12038080	UFG47909	1,5	12	12	11,7	80	12	38	4	A
UFG47120020A12038080	UFG47915	2	12	12	11,7	80	12	38	4	A

Cutting Conditions Parametry skrawania



			Hardened Steel, Heat Resistant Steel Stale hartowane i żaroodporne		Hardened Steels Stale hartowane					
			30 - 42HRC		42 - 55HRC		55 - 65HRC		65 - 70HRC	
d1 (mm)	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
3	0,09	3	21800	1470	11500	705	7500	265	6400	190
4	0,12	4	16700	1510	8800	735	5600	280	4750	200
5	0,15	5	15700	1680	8300	840	5100	310	4450	225
6	0,18	6	13100	1635	6900	795	4200	290	3700	215
8	0,24	8	9880	1575	5200	755	3200	275	2800	200
10	0,30	10	7800	1470	4100	705	2550	260	2200	180
12	0,36	12	6650	1470	3500	705	2100	250	1860	180

µm	D<6 ± 12	d1 h6	R	R<6	± 0.010
	D<20 ± 15			R<20	± 0.015

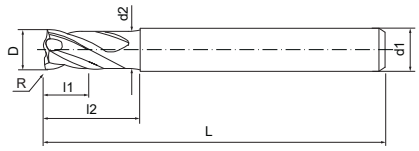
UFG37

TOROIDAL TOROIDALNE

4-Flute,Short Length 4-ostrzowe, krótkie

			HSM Vmax	F	M	30°	A					max	min		AIR
												○	●	●	●

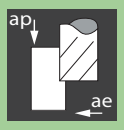
P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
	○	○	●	●										





D code new Nowy kod	D code kod	R	D	d1	d2	L	l1	l2	Z	Shank Uchwyt
UFG37010001A03000040		0,1	1	3	-	40	1.5		4	A
UFG37010001A06000040	UFG37901	0,1	1	6	-	40	1.5		4	A
UFG37015001A03000040		0,1	1,5	3	-	40	2.2		4	A
UFG37015001A06000040	UFG37902	0,1	1,5	6	-	40	2.2		4	A
UFG37020001A03006040		0,1	2	3	1,95	40	3	6	4	A
UFG37020001A06006040	UFG37903	0,1	2	6	1,95	40	3	6	4	A
UFG37025001A03006040		0,1	2,5	3	2,4	40	4	6	4	A
UFG37025001A06006040	UFG37904	0,1	2,5	6	2,4	40	4	6	4	A
UFG37030001A06007045	UFG37030	0,1	3	6	2,85	45	4	7	4	A
UFG37035001A06009045	UFG37035	0,1	3,5	6	3,35	45	5	9	4	A
UFG37040001A06009045	UFG37040	0,1	4	6	3,85	45	5	9	4	A
UFG37045001A06010045	UFG37045	0,1	4,5	6	4,35	45	6	10	4	A
UFG37050002A06011050	UFG37050	0,2	5	6	4,85	50	6	11	4	A
UFG37060002A06014050	UFG37060	0,2	6	6	5,85	50	7	14	4	A
UFG37080002A08018060	UFG37080	0,2	8	8	7,7	60	9	18	4	A
UFG37100002A10025075	UFG37100	0,2	10	10	9,7	75	12	25	4	A
UFG37120003A12030075	UFG37120	0,3	12	12	11,7	75	15	30	4	A
UFG37160003A16038090	UFG37160	0,3	16	16	15,7	90	18	38	4	A
UFG37200003A20045100		0,3	20	20	19,7	100	24	45	4	A

Cutting Conditions Parametry skrawania



			Hardened Steel, Heat Resistant Steel Stale hartowane i żaroodporne		Hardened Steels Stale hartowane					
			30 - 42HRC		42 - 55HRC		55 - 65HRC		65 - 70HRC	
d1 (mm)	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
1	0,03	0,10	48000	1550	25500	745	16000	280	12500	180
2	0,06	0,20	33300	1835	17500	880	11000	335	9500	240
3	0,09	0,30	21800	1835	11500	880	7500	335	6400	240
4	0,12	0,40	16700	1890	8800	920	5600	350	4750	250
5	0,15	0,50	15700	2100	8300	1050	5100	385	4450	280
6	0,18	0,60	13100	2045	6900	995	4200	365	3700	270
8	0,24	0,80	9880	1970	5200	945	3200	345	2800	250
10	0,30	1,00	7800	1835	4100	880	2550	325	2200	230
12	0,36	1,20	6650	1835	3500	880	2100	315	1860	230
16	0,48	1,60	4900	1575	2600	765	1600	280	1400	210
20	0,60	2,00	3900	1365	2050	680	1300	260	1100	185

µm	D<6 ± 12	d1 h6	R	R<6	± 0.010
	D<20 ± 15			R<20	± 0.015

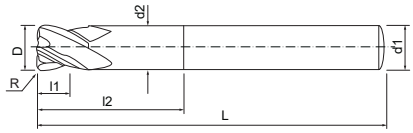
UFG18

TOROIDAL TOROIDALNE

4-Flute 4-ostrzowe

			HSM Vmax	F	M	30°	A					max	min		AIR
												○	●	●	●

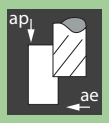
P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
	○	○	●	●										





D code new Nowy kod	D code kod	R	D	d1	d2	L	l1	l2	Z	Shank Uchwyt
UFG18060005A06020090	UFG18060	0,5	6	6	5,85	90	9	20	4	A
UFG18060010A06020090	UFG18061	1	6	6	5,85	90	9	20	4	A
UFG18080005A08025100	UFG18080	0,5	8	8	7,7	100	12	25	4	A
UFG18080010A08025100	UFG18081	1	8	8	7,7	100	12	25	4	A
UFG18100005A10032100	UFG18100	0,5	10	10	9,7	100	15	32	4	A
UFG18100010A10032100	UFG18101	1	10	10	9,7	100	15	32	4	A
UFG18100020A10032100	UFG18102	2	10	10	9,7	100	15	32	4	A
UFG18120005A12038110	UFG18120	0,5	12	12	11,7	110	18	38	4	A
UFG18120010A12038110	UFG18121	1	12	12	11,7	110	18	38	4	A
UFG18120020A12038110	UFG18122	2	12	12	11,7	110	18	38	4	A

Cutting Conditions Parametry skrawania



			Hardened Steel, Heat Resistant Steel Stale hartowane i żaroodporne		Hardened Steels Stale hartowane					
			30 - 42HRC		42 - 55HRC		55 - 65HRC		65 - 70HRC	
d1 (mm)	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
6	0,18	6	13100	1635	6900	795	4200	290	3700	215
8	0,24	8	9880	1575	5200	755	3200	275	2800	200
10	0,30	10	7800	1470	4100	705	2550	260	2200	180
12	0,36	12	6650	1470	3500	705	2100	250	1860	180

µm	D<6	± 12	0 — -15	d1 h6	R<6	± 0.010
					R<20	± 0.015

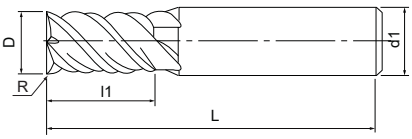
UFG20

TOROIDAL TOROIDALNE

4-Flute,Short Length 4-ostrzowe, krótkie

					HSM Vmax	F	M	R	30°	A			max	min		AIR
													○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
	○	○	●	●										





D code new Nowy kod	D code kod	R	D	d1	L	l1	Z	Shank Uchwyt
UFG20030002A06008060	UFG200302	0,2	3	6	60	8	4	A
UFG20030005A06008060	UFG200305	0,5	3	6	60	8	4	A
UFG20040002A06011060	UFG200402	0,2	4	6	60	11	4	A
UFG20040005A06011060	UFG200405	0,5	4	6	60	11	4	A
UFG20040010A06011060	UFG200410	1	4	6	60	11	4	A
UFG20050002A06013060	UFG200502	0,2	5	6	60	13	4	A
UFG20050005A06013060	UFG200505	0,5	5	6	60	13	4	A
UFG20050010A06013060	UFG200510	1	5	6	60	13	4	A
UFG20060003A06013060	UFG200603	0,3	6	6	60	13	4	A
UFG20060005A06013060	UFG200605	0,5	6	6	60	13	4	A
UFG20060010A06013060	UFG200610	1	6	6	60	13	4	A
UFG20080003A08019060	UFG200803	0,3	8	8	60	19	4	A
UFG20080005A08019060	UFG200805	0,5	8	8	60	19	4	A
UFG20080010A08019060	UFG200810	1	8	8	60	19	4	A
UFG20080015A08019060	UFG200815	1,5	8	8	60	19	4	A
UFG20080020A08019060	UFG200820	2	8	8	60	19	4	A
UFG20100003A10022075	UFG201003	0,3	10	10	75	22	4	A
UFG20100005A10022075	UFG201005	0,5	10	10	75	22	4	A
UFG20100010A10022075	UFG201010	1	10	10	75	22	4	A
UFG20100015A10022075	UFG201015	1,5	10	10	75	22	4	A
UFG20100020A10022075	UFG201020	2	10	10	75	22	4	A
UFG20100030A10022075	UFG201030	3	10	10	75	22	4	A
UFG20120005A12026100	UFG201205	0,5	12	12	100	26	4	A
UFG20120010A12026100	UFG201210	1	12	12	100	26	4	A
UFG20120015A12026100	UFG201215	1,5	12	12	100	26	4	A
UFG20120020A12026100	UFG201220	2	12	12	100	26	4	A
UFG20120030A12026100	UFG201230	3	12	12	100	26	4	A
UFG20160010A16032100	UFG201610	1	16	16	100	32	4	A
UFG20160015A16035100	UFG201615	1,5	16	16	100	35	4	A
UFG20160020A16035100	UFG201620	2	16	16	100	35	4	A
UFG20160030A16035100	UFG201630	3	16	16	100	35	4	A
UFG20200010A20040100	UFG202010	1	20	20	100	40	4	A
UFG20200015A20040100	UFG202015	1,5	20	20	100	40	4	A
UFG20200020A20040100	UFG202020	2	20	20	100	40	4	A
UFG20200030A20040100	UFG202030	3	20	20	100	40	4	A

µm	D 0 — -15	

UFG20

Cutting Conditions Parametry skrawania

Material Materiał	Mild steel, Carbon steel. Cast iron Stal miękka, Stal węglowa, Żeliwo				Alloy steel, Tool steel Stal stopowa, Stal narzędziowa				Hardened steel, Prehardened steel (Free-cutting) Stal hartowana, Stal ulepszona (automatowa)				Hardened steel, Stainless steel Stal hartowana, Stal nierdzewna				Hardened steel, Titanium alloys, Heat resistant alloy steel Stal hartowana, Stopy tytanu, Stal stopowa żaroodporna				Hardened steel Stal hartowana			
	<750N/mm²				<30HRC				30 - 38HRC				38 - 45HRC				45 - 55HRC				55 - 60HRC			
d1 (mm)	FO		HFO		FO		HFO		FO		HFO		FO		HFO		FO		HFO		FO		HFO	
	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
3	11130	1024	22260	2258	8715	798	22260	2520	7350	588	22260	1365	6930	583	16695	1208	6337	509	11130	714	3360	200	8925	462
4	8348	1050	16695	2153	6510	861	16695	2415	5513	593	16695	1365	5198	620	12495	1313	4988	541	8348	835	2520	200	6668	483
5	6668	1103	13335	1995	5198	887	13335	2258	4410	620	13335	1313	4148	662	10028	1418	3990	562	6668	882	1995	200	5355	536
6	5565	1313	11130	3203	4358	992	11130	2783	3675	735	11130	2100	3465	693	8348	1523	3360	572	5565	956	1680	200	4463	641
8	4200	1313	8348	2940	3255	940	8348	2520	2783	693	8348	1995	2573	672	6248	1470	2520	583	4200	903	1260	184	3360	604
10	3360	1155	6668	2678	2625	898	6668	2310	2205	635	6668	1943	2048	620	4988	1418	1995	551	3360	872	1003	168	2678	536
12	2783	1155	5565	2678	2153	893	5565	2310	1838	593	5565	1890	1733	562	4200	1418	1680	499	2783	872	835	168	2205	536
16	2100	1003	4200	1995	1628	782	4200	1995	1365	525	4200	1785	1313	467	3150	1418	1260	420	2100	872	625	168	1680	536
20	1680	803	3360	1628	1313	625	3360	1628	1103	478	3360	1628	1034	415	2520	1208	1003	373	1680	767	499	168	1313	536

Depth of cut
Głębokość skrawania

FO	ap	ae
	1.5xd1	0.2xd1

HFO	ap	ae
d1<6	1.5xd1	0.02xd1
6≤d1	1.5xd1	0.05xd1

aeMax=0.5mm

FO	ap	ae
	1.5xd1	0.1xd1

HFO	ap	ae
d1<6	1.5xd1	0.01xd1
6≤d1	1.5xd1	0.02xd1

aeMax=0.5mm

FO	ap	ae
	1xd1	0.05xd1

HFO	ap	ae
d1<6	1xd1	0.01xd1
6≤d1	1xd1	0.02xd1

aeMax=0.5mm

Material Materiał	Mild steel, Carbon steel. Cast iron Stal miękka, Stal węglowa, Żeliwo				Alloy steel, Tool steel Stal stopowa, Stal narzędziowa				Hardened steel, Prehardened steel (Free-cutting) Stal hartowana, Stal ulepszona (automatowa)				Hardened steel, Stainless steel Stal hartowana, Stal nierdzewna				Hardened steel, Titanium alloys, Heat resistant alloy steel Stal hartowana, Stopy tytanu, Stal stopowa żaroodporna		Hardened steel Stal hartowana	
	<750N/mm²				<30HRC				30 - 38HRC				38 - 45HRC				45 - 55HRC		55 - 60HRC	
d1 (mm)	FR		HFR		FR		HFR		FR		HFR		FR		HFR		FR		FR	
	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
3	8925	740	13335	1103	6668	1007	11130	982	6143	478	10028	782	5775	420	6668	483	4673	336	2205	116
4	6668	740	10028	1208	4988	709	8348	1050	4620	478	7508	782	4358	473	5408	588	3518	378	1680	126
5	5355	751	8033	1260	3990	693	7350	1155	3675	499	6668	908	3465	499	4358	625	2783	404	1313	131
6	4463	751	3833	1628	3360	588	6143	1208	3045	525	5565	956	2888	520	3885	704	2363	420	1103	131
8	3360	693	4988	1523	2520	578	4620	1365	2310	572	4200	1034	2153	541	2940	725	1733	436	835	131
10	2678	641	3990	1470	1995	562	3675	1260	1838	499	3360	908	1733	494	2363	667	1418	399	667	121
12	2205	641	3360	1313	1680	499	3045	1208	1523	473	2783	856	1470	462	1943	625	1155	373	557	121
16	1680	641	2520	1103	1260	452	2310	1013	1155	389	2100	709	1103	389	1470	525	877	315	420	92
20	1313	536	1995	882	1003	399	1838	809	919	368	1680	667	872	347	1155	467	704	278	336	93

Depth of cut
Głębokość skrawania

FR ap=0.5xd1

HFR ap=0.2xd1
apMax=3mm

ap=0.05xd1

(H)FO (mm/min) — (HIGH SPEED) SIDE CUTTING FREZOWANIE OBWODOWE (SZYBKOŚCIOWE)

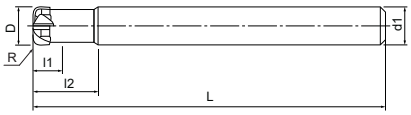
UFG04

TOROIDAL TOROIDALNE

4-Flute, Long length 4-ostrzowe, długie

					HSM Vmax	F	M	R	A				max	min		AIR
													○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
	○	○	●	●										





D code Kod	R	D	d1	L	l1	l2	Z	Shank Uchwyt
UFG04020005A06006050	0,5	2.0	6	50	1	6	4	A
UFG04030005A06008050	0,5	3.0	6	50	1.2	8	4	A
UFG04040005A06010050	0,5	4.0	6	50	1.5	10	4	A
UFG04060005A06012060	0,5	6.0	6	60	2.5	12	4	A
UFG04060010A06012060	1	6.0	6	60	2.5	12	4	A
UFG04080010A08016060	1	8.0	8	60	3.5	16	4	A
UFG04080020A08016060	2	8.0	8	60	3.5	16	4	A
UFG04100010A10020070	1	10.0	10	70	4	20	4	A
UFG04100020A10020070	2	10.0	10	70	4	20	4	A
UFG04120020A12025080	2	12.0	12	80	5	25	4	A
UFG04120030A12025080	3	12.0	12	80	5	25	4	A
UFG04020005A06006070	0,5	2.0	6	70	1	6	4	A
UFG04030005A06008070	0,5	3.0	6	70	1.2	8	4	A
UFG04040005A06010070	0,5	4.0	6	70	1.5	10	4	A
UFG04050005A06010070	0,5	5.0	6	70	2	10	4	A
UFG04060005A06012090	0,5	6.0	6	90	2.5	12	4	A
UFG04060010A06012090	1	6.0	6	90	2.5	12	4	A
UFG04080010A08016010	1	8.0	8	10	3.5	16	4	A
UFG04080020A08016100	2	8.0	8	100	3.5	16	4	A
UFG04100010A10020100	1	10.0	10	100	4	20	4	A
UFG04100020A10020100	2	10.0	10	100	4	20	4	A
UFG04120020A12025110	2	12.0	12	110	5	25	4	A
UFG04120030A12025110	3	12.0	12	110	5	25	4	A
UFG04160030A16030130	3	16	16	130	6,5	30	4	A

µm	D 0 — -30		R	±0,01

UFG04

Cutting Conditions Parametry skrawania

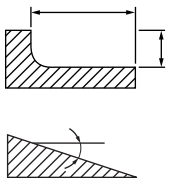
Material Materiał	Mild steel, Carbon steel. Cast iron Stal miękka, Stal węglowa, Żeliwo				Alloy steel, Tool steel Stal stopowa, Stal narzędziowa				Hardened steel, Prehardened steel (Free-cutting) Stal hartowana, Stal ulepszona (automatowa)				Hardened steel, Stainless steel Stal hartowana, Stal nierdzewna				Hardened steel, Titanium alloys, Heat resistant alloy steel				Hardened steel Stal hartowana			
	<750N/mm²				<30HRC				30 - 38HRC				38 - 45HRC				45 - 55HRC				55 - 60HRC			
d1 (mm)	FO		HFO		FO		HFO		FO		HFO		FO		HFO		FO		HFO		FO		HFO	
	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
2xR0.5	15200	4990	30250	9970	15200	4510	30400	9070	11870	3610	30400	9070	10450	3180	22800	6800	7550	2040	22800	6130	4510	820	15200	2710
3xR0.75	9970	5940	19950	11870	9970	5320	19950	11400	8070	4270	19950	11400	7080	3705	15200	7980	5030	2470	15200	7450	3040	940	9980	3130
4xR1	7550	6270	15200	12350	7550	5700	15200	11400	6030	4560	15200	11400	5270	3990	11400	8550	3800	2610	11400	7790	2280	1000	7550	3370
5xR1 2	6030	6650	11870	13300	6030	6030	11870	11870	4840	4840	11870	11870	4230	4230	9070	9070	3040	2710	9070	8170	1800	1090	6030	3610
6xR1.5	5030	6650	10070	13300	5030	6030	10070	12060	4040	4840	10070	12060	3510	4230	7550	9070	2520	2710	7550	8170	1520	1090	5030	3610
7xR1.5	4320	5700	8650	11400	4320	5180	8640	10350	3470	4130	8640	10350	3040	3610	6460	7790	2140	2330	6460	6980	1280	930	4320	3090
8xR2	3800	6650	7550	13300	3800	6030	7550	12060	3040	4840	7550	12060	2660	4230	5650	9070	1900	2710	5650	8170	1140	1090	3800	3610
9xR2	3370	5890	6700	11780	3370	5370	6700	10730	2710	4320	6700	10730	2370	3750	5030	8075	1660	2420	5030	7270	1000	950	3370	3230
10xR2	3040	6650	6030	13300	3040	6030	6030	12060	2420	4840	6030	12060	2140	4230	4510	9070	1520	2710	4510	8170	910	1090	3040	3610
11xR2	2750	6030	5510	12060	2750	5510	5510	11020	2180	4420	5510	11020	1950	3840	4130	8260	1380	2470	4130	7410	830	1000	2750	3320
12xR3	2520	6650	5030	13300	2520	6030	5030	12060	2000	4840	5030	12060	1760	4230	3800	9070	1280	2710	3800	8170	750	1090	2520	3610
13xR3	2330	6130	4650	12250	2330	5600	4650	11210	1850	4460	4650	11210	1610	3900	3460	8360	1140	2520	3460	7550	700	1000	2330	3370

DOC*

FO

ap 0,1xR

ae 0,3xd1



HFO

	ap	ae
R≤2	0,2xR	0,5xd1
2<R	0,5mm	0,5xd1

FO	ap	ae
R≤2	0,2xR	0,5xd1
2<R	0,4mm	0,5xd1
HFO	ap	ae
R≤2	0,1xR	0,3xd1
2<R	0,2mm	0,3xd1

FO	ap	ae
R≤2	0,1xR	0,5xd1
2<R	0,2mm	0,5xd1
HFO	ap	ae
R≤2	0,05xR	0,3xd1
2<R	0,1mm	0,3xd1

* Depth of cut
Głębokość skrawania

1. Use a rigid and precise machine and holder.
Stosować sztywną i precyzyjną obrabiarkę i oprawkę narzędziową.

2. These milling conditions are based on milling with circular interpolation at corners.
For milling without circular interpolation (such as right angle corners), reduce the speed to 50-70% and the cutting depth to 50-80% of the above conditions.
Warunki frezowania bazują na frezowaniu naroży z interpolacją kołową. Dla frezowania bez interpolacji kołowej (tak jak dla naroży o kącie prostym), należy zredukować prędkość do 50-70% a głębokość skrawania do 50-80% podanych powyżej wartości.

3. We suggest using an air blow or MQL (mist).
Zalecamy użycie nadmuchu powietrza lub smarowanie mgłą olejową

4. Please adjust the speed, feed and cutting depth according to actual cutting conditions.
Proszę ustawić prędkość, posuw i głębokość skrawania zgodnie z bieżącymi warunkami skrawania.

5. When UFG-04 enters in Z axis, reduce the feed speed to 30-60% of the above conditions with machining incline angle (β) ≤ 2°.
Gdy UFG-04 rozpoczyna obróbkę w osi Z należy zmniejszyć prędkość posuwu do 30-60% podanych powyżej warunków dla obróbki pod kątem nachylenia (β) ≤ 2°.
6. These milling conditions are for a tool extension length: less than 4 x D. For a longer tool extension, reduce the speed, feed rate, and the cutting depth in accordance with the respective coefficients, to prevent chattering.
Podane warunki frezowania dotyczą długości wysunięcia narzędzia mniejszej od 4xD. Dla większych długości wysunięcia należy zmniejszyć prędkość, posuw oraz głębokość skrawania zgodnie z odpowiednimi współczynnikami, aby zapobiec karbowaniu (powierzchni obrabianej).

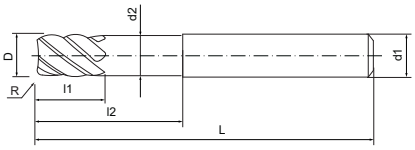
UFG39

TOROIDAL TOROIDALNE

6-Flute 6-ostrzowe

HSM Vmax	F	M	45°	A	max	min	AIR
					○	●	●	●

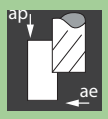
P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
	○	○	●	●										





D code new Nowy kod	D code kod	R	D	d1	d2	L	l1	l2	Z	Shank Uchwyt
UFG39060003A06014050	UFG39916	0,25	6	6	5,85	50	6	14	6	A
UFG39060005A06014050	UFG39060	0,5	6	6	5,85	50	6	14	6	A
UFG39060005A06013070	UFG39901	0,5	6	6	-	70	13	-	6	A
UFG39060005A06026070	UFG39910	0,5	6	6	-	70	26	-	6	A
UFG39080005A08024060	UFG39080	0,5	8	8	7,7	60	8	24	6	A
UFG39080005A08019090	UFG39902	0,5	8	8	-	90	19	-	6	A
UFG39080005A08036090	UFG39911	0,5	8	8	-	90	36	-	6	A
UFG39100005A10022100	UFG39903	0,5	10	10	-	100	22	-	6	A
UFG39100010A10030070	UFG39100	1	10	10	9,7	70	10	30	6	A
UFG39100010A10022100	UFG39904	1	10	10	-	100	22	-	6	A
UFG39100010A10046100	UFG39912	1	10	10	-	100	46	-	6	A
UFG39120005A12026110	UFG39905	0,5	12	12	-	110	26	-	6	A
UFG39120010A12030075	UFG39120	1	12	12	11,7	75	12	30	6	A
UFG39120010A12026110	UFG39906	1	12	12	-	110	26	-	6	A
UFG39120010A12056110	UFG39913	1	12	12	-	110	56	-	6	A
UFG39160010A16032130	UFG39160	1	16	16	-	130	32	-	6	A
UFG39160015A16032130	UFG39907	1,5	16	16	-	130	32	-	6	A
UFG39160015A16066130	UFG39914	1,5	16	16	-	130	66	-	6	A
UFG39200010A20038140	UFG39200	1	20	20	-	140	38	-	6	A
UFG39200015A20038140	UFG39908	1,5	20	20	-	140	38	-	6	A
UFG39200020A20038140	UFG39909	2	20	20	-	140	38	-	6	A
UFG39200020A20076140	UFG39915	2	20	20	-	140	76	-	6	A

Cutting Conditions Parametry skrawania



			Hardened Steel, Heat Resistant Steel Stale hartowane i żaroodporne		Hardened Steels Stale hartowane							
			30 - 42HRC		42 - 55HRC				55 - 65HRC		65 - 70HRC	
d1 (mm)	ae	ap	RPM	mm/min	RPM	mm/min	ae	ap	RPM	mm/min	RPM	mm/min
6	0,30	6,00	24800	5615	16000	5145	0,18	6,00	10500	2205	8000	1520
8	0,40	8,00	20000	5775	12000	4830	0,24	8,00	8000	2100	6000	1470
10	0,50	10,00	16000	5145	9500	4305	0,30	10,00	6400	1890	4800	1365
12	0,60	12,00	13000	4725	8000	3990	0,36	12,00	5300	1680	4000	1205
16	0,80	16,00	10000	4200	6000	3570	0,48	16,00	4000	1310	3000	910
20	1,00	20,00	8000	3515	4800	3360	0,60	20,00	3200	1070	2400	720

µm	d1 0 — -3		R<6	± 0.010
			R<20	± 0.015

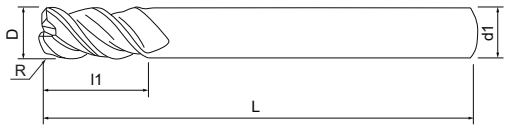
UFG19

TOROIDAL TOROIDALNE

3-Flute 3-ostrzowe

						HSM Vmax	F	M	30°	A			max	min		AIR
													○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
	○	○	●	●										





D code new Nowy kod	D code kod	R	D	d1	L	l1	Z	Shank Uchwyt
UFG19030008A06006070	UFG190300	0,8	3	6	70	6	3	A
UFG19040010A06008070	UFG190400	1	4	6	70	8	3	A
UFG19060015A06012080	UFG190600	1.5	6	6	80	12	3	A
UFG19080020A08016090	UFG190800	2	8	8	90	16	3	A
UFG19100020A10020100	UFG191000	2	10	10	100	20	3	A
UFG19120020A12024120	UFG191200	2	12	12	120	24	3	A

UFG19

Cutting Conditions Parametry skrawania

Work material materiał obrabiany			**Cutting angle** Kąt zagłębiania	**Mild steels Carbon steels** / Stal stopowa Stal węglowa				**Hardened steels, Pre-hardened steels** / Stal ulepszana i hartowana				**Hardened steels, Stainless steels** / Stal hatrowana, Stal nierdzewna				**Hardened steels, Titanium alloys, Heat resistant alloys steels** / Stal hartowana, Stopy tytanu, Stal żaroodporna			
				(<30HRC)				**(30-42HRC)**				**(42-50HRC)**				**(50-65HRC)**			
D	**R**	**L / D**		**S**	**F**	**ap [mm]**	**ae [mm]**	**S**	**F**	**ap [mm]**	**ae [mm]**	**S**	**F**	**ap [mm]**	**ae [mm]**	**S**	**F**	**ap [mm]**	**ae [mm]**
3	R0,8	3	0,3°	23430	5500	0,15	0,70	21120	4400	0,14	0,70	17600	3080	0,12	0,70	14080	2200	0,12	0,60
		5	0,3°	21670	5280	0,15	0,70	19470	4180	0,13	0,70	16280	2970	0,12	0,60	12980	2090	0,12	0,60
		7	0,3°	19140	4620	0,14	0,70	17160	3630	0,13	0,60	14300	2640	0,11	0,60	11440	1870	0,11	0,50
		8	0,3°	17380	4180	0,14	0,70	15620	3300	0,12	0,60	13090	2310	0,11	0,50	10450	1650	0,11	0,50
		10	0,3°	13640	3190	0,13	0,70	12320	2530	0,12	0,60	10230	1760	0,11	0,50	8250	1320	0,11	0,50
4	R1	3	0,5°	17490	5830	0,19	1,00	15730	4620	0,17	1,00	13090	3300	0,15	1,00	10450	2310	0,15	0,90
		4	0,5°	16500	5390	0,18	1,00	14850	4290	0,16	1,00	12320	3080	0,14	0,90	9900	2200	0,14	0,80
		5	0,5°	15070	4620	0,17	1,00	13530	3740	0,15	0,90	11220	2640	0,13	0,80	9020	1870	0,13	0,70
		6	0,5°	10010	3850	0,13	1,00	9020	3080	0,12	0,90	7480	2200	0,10	0,80	6050	1540	0,10	7,00
		8	0,5°	6930	3080	0,11	1,00	6270	2420	0,10	0,90	5170	1760	0,08	0,80	4180	1210	0,08	0,70
6	R1,5	4	0,5°	11880	5720	0,28	1,50	10670	4510	0,25	1,50	8910	3190	0,22	1,40	7150	2310	0,22	1,30
		5	0,5°	9350	5390	0,27	1,50	8360	4290	0,24	1,50	7040	3080	0,21	1,30	5610	2200	0,21	1,20
		6	0,5°	7810	4840	0,23	1,50	7040	3850	0,20	1,30	5830	2750	0,18	1,20	4620	1980	0,18	1,00
		7	0,5°	6710	3740	0,16	1,40	6050	2970	0,15	1,20	5060	2090	0,13	1,10	4070	1540	0,13	1,00
		8	0,5°	4730	2420	0,16	1,30	4180	1980	0,15	1,10	3520	1430	0,13	1,00	2860	990	0,13	0,90
8	R2	4	0,5°	8800	5610	0,38	2,00	7920	4400	0,34	2,00	6600	3190	0,30	1,90	5280	2200	0,30	1,70
		5	0,5°	7040	5280	0,36	2,00	6380	4180	0,33	2,00	5280	2970	0,29	1,80	4180	2090	0,29	1,60
		6	0,5°	5830	4730	0,30	2,00	5280	3740	0,27	1,70	4400	2750	0,24	1,60	3520	1870	0,24	1,40
10	R2	4	1°	7040	5720	0,46	3,00	6270	4510	0,41	3,00	5280	3245	0,36	2,80	4180	2310	0,36	2,60
		5	1°	5610	5390	0,44	3,00	5060	4290	0,39	3,00	4180	3080	0,35	2,70	3410	2145	0,35	2,40
		6	1°	4730	4840	0,38	3,00	4180	3850	0,34	2,60	3520	2750	0,30	2,30	2750	1925	0,30	2,00
12	R2	4	1°	5830	6160	0,38	4,00	5280	4840	0,34	4,00	4400	3520	0,30	3,80	3520	2420	0,30	3,40
		5	1°	4620	5830	0,36	4,00	4180	4620	0,33	4,00	3520	3300	0,29	3,60	2750	2310	0,29	3,20
		6	1°	3850	5280	0,32	4,00	3520	4180	0,29	3,50	2970	2970	0,26	3,10	2310	2090	0,26	2,80
		7	1°	3300	4070	0,26	3,90	2970	3190	0,23	3,40	2530	2310	0,20	3,00	1980	1650	0,20	2,70

1. Podane parametry skrawania odpowiadają obróbce pół zgrubnej i zgrubnej. Do obróbki wykańczającej zalecane jest stosować podobną prędkość skrawania jak do zgrubnej ale posuw na ząb i grubość skrawania dostosować do chropowatości powierzchni którą trzeba uzyskać. Trzeba pamiętać że Fz (posuw na ostrze mm/z) = F(posuw mm/min) / S(Obr/min)/ N (ilość ostrzy) oraz teoretyczna chropowatość powierzchni oblicza się h(maksymalna wysokość wiercholkow) = Ae (szerokość frezowania, mm) 2 / 8 x R (radius frez).

2. Powyższe parametry przedstawione są w zależności na ile frezjest wystawiony z oprawki, gdzie L/D - stosunek długości frezu wystawionej z oprawki do nominalnej średnicy roboczej -są to referencyjne parametry skrawania. Aktualne parametry skrawania są zależne od bieżących warunków i trzeba ustawiać je w każdym osobnym przypadku na obrabiarce.

3. Zaleca się stosować sztywne obrabiarki i precyzyjne oprawki.

4. Dla maksymalnej dokładności trzeba kontrolować poziom wibracji na minimalnym poziomie.

5. W ostrych narożach należy zmniejszyć posuw oraz głębokość skrawania do 70% wartości zalecanej. Do bardziej stabilnej obróbki zaleca się wstawiać promienń R w narożach i zmniejszać posuw przy pisaniu programów w CAM systemach.

6. Kiedy kąt zagłębiania jest większy od zalecanego należy zmniejszyć posuw.

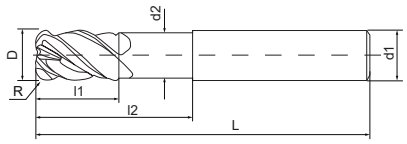
7.

UFG22

TOROIDAL TOROIDALNE
4-Flute 4-ostrzowe

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
	○	○	●	●										

HSM Vmax | M | 45° | A | max ○ | min ● | ● | AIR ●





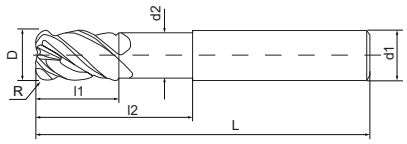
D code Kod	R	D	d1	d2	L	l1	l2	Z	Shank Uchwyt
UFG22010002A06004060	0,2	1	6	0,94	60	1	4	4	A
UFG22010002A06006060	0,2	1	6	0,94	60	1	6	4	A
UFG22010002A06008060	0,2	1	6	0,94	60	1	8	4	A
UFG22010002A06010060	0,2	1	6	0,94	60	1	10	4	A
UFG22010002A06015060	0,2	1	6	0,94	60	1	15	4	A
UFG22010002A06020080	0,2	1	6	0,94	80	1	20	4	A
UFG22015003A06004060	0,3	1,5	6	1,44	60	1,5	4	4	A
UFG22015003A06006060	0,3	1,5	6	1,44	60	1,5	6	4	A
UFG22015003A06010060	0,3	1,5	6	1,44	60	1,5	10	4	A
UFG22015003A06015060	0,3	1,5	6	1,44	60	1,5	15	4	A
UFG22015003A06020080	0,3	1,5	6	1,44	80	1,5	20	4	A
UFG22015003A06025080	0,3	1,5	6	1,44	80	1,5	25	4	A
UFG22015003A06030080	0,3	1,5	6	1,44	80	1,5	30	4	A
UFG22020005A06006060	0,5	2	6	1,9	60	2	6	4	A
UFG22020005A06010060	0,5	2	6	1,9	60	2	10	4	A
UFG22020005A06015060	0,5	2	6	1,9	60	2	15	4	A
UFG22020005A06020080	0,5	2	6	1,9	80	2	20	4	A
UFG22020005A06025080	0,5	2	6	1,9	80	2	25	4	A
UFG22020005A06030080	0,5	2	6	1,9	80	2	30	4	A
UFG22020005A06035090	0,5	2	6	1,9	90	2	35	4	A
UFG22020005A06040090	0,5	2	6	1,9	90	2	40	4	A
UFG22030005A06010060	0,5	3	6	2,9	60	3	10	4	A
UFG22030005A06015060	0,5	3	6	2,9	60	3	15	4	A
UFG22030005A06020080	0,5	3	6	2,9	80	3	20	4	A
UFG22030005A06030080	0,5	3	6	2,9	80	3	30	4	A
UFG22030008A06010060	0,8	3	6	2,9	60	3	10	4	A
UFG22030008A06015060	0,8	3	6	2,9	60	3	15	4	A
UFG22030008A06020080	0,8	3	6	2,9	80	3	20	4	A
UFG22030008A06030080	0,8	3	6	2,9	80	3	30	4	A
UFG22030008A06040090	0,8	3	6	2,9	90	3	40	4	A
UFG22030008A06050090	0,8	3	6	2,9	90	3	50	4	A
UFG22040005A06012060	0,5	4	6	3,9	60	4	12	4	A
UFG22040005A06020080	0,5	4	6	3,9	80	4	20	4	A
UFG22040005A06030080	0,5	4	6	3,9	80	4	30	4	A
UFG22040005A06048090	0,5	4	6	3,9	90	4	48	4	A
UFG22040010A06012060	1	4	6	3,9	60	4	12	4	A
UFG22040010A06020080	1	4	6	3,9	80	4	20	4	A
UFG22040010A06030080	1	4	6	3,9	80	4	30	4	A
UFG22060005A06018060	0,5	6	6	5,85	60	9	18	4	A
UFG22060005A06030080	0,5	6	6	5,85	80	9	30	4	A
UFG22060010A06018060	1	6	6	5,85	60	9	18	4	A
UFG22060010A06030080	1	6	6	5,85	80	9	30	4	A
UFG22060010A06054090	1	6	6	5,85	90	9	54	4	A
UFG22060015A06018060	1,5	6	6	5,85	60	9	18	4	A
UFG22060015A06030080	1,5	6	6	5,85	80	9	30	4	A

UFG22

TOROIDAL TOROIDALNE
4-Flute 4-ostrzowe

					HSM Vmax	M	45°	A					max	min		AIR
													○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
	○	○	●	●										





D code Kod	R	D	d1	d2	L	l1	l2	Z	Shank Uchwyt
UFG22060015A06042090	1,5	6	6	5,85	90	9	42	4	A
UFG22060015A06054090	1,5	6	6	5,85	90	9	54	4	A
UFG22060020A06018060	2	6	6	5,85	60	9	18	4	A
UFG22060020A06030080	2	6	6	5,85	80	9	30	4	A
UFG22070015A06000080	1,5	7	6		80	11		4	A
UFG22080005A08024060	0,5	8	8	7,85	60	12	24	4	A
UFG22080005A08040060	0,5	8	8	7,85	100	12	40	4	A
UFG22080010A08024060	1	8	8	7,85	60	12	24	4	A
UFG22080010A08040060	1	8	8	7,85	100	12	40	4	A
UFG22080020A08024060	2	8	8	7,85	60	12	24	4	A
UFG22080020A08040060	2	8	8	7,85	100	12	40	4	A
UFG22080020A08056060	2	8	8	7,85	120	12	56	4	A
UFG22080020A08072060	2	8	8	7,85	120	12	72	4	A
UFG22090020A08000100	2	9	8		100	13,5		4	A
UFG22100005A10030070	0,5	10	10	9,7	70	15	30	4	A
UFG22100005A10050110	0,5	10	10	9,7	110	15	50	4	A
UFG22100010A10030070	1	10	10	9,7	70	15	30	4	A
UFG22100010A10050110	1	10	10	9,7	110	15	50	4	A
UFG22100020A10030070	2	10	10	9,7	70	15	30	4	A
UFG22100020A10050110	2	10	10	9,7	110	15	50	4	A
UFG22100020A10070150	2	10	10	9,7	150	15	70	4	A
UFG22100020A10090150	2	10	10	9,7	150	15	90	4	A
UFG22110020A10000110	2	11	10		110	16,5		4	A
UFG22120005A12036080	0,5	12	12	11,7	80	18	36	4	A
UFG22120005A12060120	0,5	12	12	11,7	120	18	60	4	A
UFG22120010A12036080	1	12	12	11,7	80	18	36	4	A
UFG22120010A12060120	1	12	12	11,7	120	18	60	4	A
UFG22120020A12036080	2	12	12	11,7	80	18	36	4	A
UFG22120020A12060120	2	12	12	11,7	120	18	60	4	A
UFG22120020A12084160	2	12	12	11,7	160	18	84	4	A
UFG22120020A120X0160	2	12	12	11,7	160	18	108	4	A
UFG22120030A12036080	3	12	12	11,7	80	18	36	4	A
UFG22120030A12060120	3	12	12	11,7	120	18	60	4	A
UFG22130030A12000120	3	13	12		120	19,5		4	A
UFG22160005A16042100	0,5	16	16	15,5	100	24	42	4	A
UFG22160020A16042100	2	16	16	15,5	100	24	42	4	A
UFG22160030A16042100	3	16	16	15,5	100	24	42	4	A
UFG22160030A16080140	3	16	16	15,5	140	24	80	4	A
UFG22160030A160X0175	3	16	16	15,5	175	24	120	4	A

µm	d1=6	0 – -0.008	R	D≤10 ±0.007	D≤10 ±0.007
	8≤d1≤10	0 – -0.009		D>10 ±0.01	D>10 ±0.01
	12≤d1≤16	0 – -0.011			

UFG22

Cutting Conditions Parametry skrawania

High speed of cutting Duża prędkość skrawania

Material Materiał obrabiany			**Mild steels, Carbon steels /** Stal stopowa, Stal węglowa				**Hardened steels, Prehardened steels /** Stal ulepszana i hartowana				**Hardened steels, Stainless steels /** Stal hatrowana, Stal nierdzewna				**Hardened steels, Titanium alloys, Heat resistant alloys steels /** Stal hartowana, Stopy tytanu, Stal żarood-porna			
			<30HRC				**30-42HRC**				**42-50HRC**				**50-65HRC**			
D	**R**	**L2**	**S**	**F**	**ap [mm]**	**ae [mm]**	**S**	**F**	**ap [mm]**	**ae [mm]**	**S**	**F**	**ap [mm]**	**ae [mm]**	**S**	**F**	**ap [mm]**	**ae [mm]**
1	0,2	4	42000	7560	0,04	0,43	34650	5355	0,03	0,43	28350	4305	0,02	0,43	21000	1890	0,01	0,43
	0,2	6	42000	6825	0,03	0,43	34650	4830	0,02	0,43	28350	3885	0,02	0,43	21000	1680	0,01	0,43
	0,2	8	33600	4725	0,02	0,43	28350	3360	0,02	0,43	22050	2730	0,01	0,43	16800	1155	0,01	0,43
	0,2	10	25200	2835	0,01	0,43	21000	1995	0,01	0,43	16800	1575	0,01	0,43	12600	735	0,01	0,43
	0,2	15	16800	1260	0,01	0,43	14700	735	0,01	0,43	12600	525	0,01	0,43	10500	420	0,01	0,43
	0,2	20	14700	1050	0,01	0,43	12600	630	0,01	0,43	10500	420	0,01	0,43	9450	315	0,01	0,43
1,5	0,3	4	33600	10500	0,10	0,62	28350	7455	0,08	0,62	22050	5985	0,06	0,62	16800	2625	0,03	0,62
	0,3	6	33600	8190	0,08	0,62	28350	5775	0,06	0,62	22050	4410	0,05	0,62	16800	2100	0,02	0,62
	0,3	10	28350	5985	0,05	0,62	23100	4200	0,03	0,62	18900	3150	0,03	0,62	14700	1470	0,01	0,62
	0,3	15	23100	3360	0,03	0,62	18900	2415	0,02	0,62	15750	1785	0,02	0,62	11550	1050	0,01	0,62
	0,3	20	16800	1470	0,02	0,62	14700	1260	0,02	0,62	13650	1050	0,01	0,62	9450	735	0,01	0,62
	0,3	25	13650	1050	0,01	0,62	11550	840	0,01	0,62	10500	735	0,01	0,62	7875	525	0,01	0,62
	0,3	30	13650	945	0,01	0,62	11550	735	0,01	0,62	10500	630	0,01	0,62	7875	420	0,01	0,62
2	0,5	6	25200	10500	0,10	0,71	21000	7455	0,08	0,71	16800	5985	0,06	0,71	12600	2625	0,03	0,71
	0,5	10	25200	10500	0,08	0,71	21000	7455	0,06	0,71	16800	5985	0,05	0,71	12600	2625	0,02	0,71
	0,5	15	21000	7350	0,05	0,71	17850	5250	0,04	0,71	13650	3360	0,03	0,71	10500	1890	0,02	0,71
	0,5	20	21000	3780	0,04	0,71	17850	2730	0,03	0,71	13650	1890	0,02	0,71	10500	945	0,01	0,71
	0,5	25	16800	1890	0,03	0,71	14700	1470	0,02	0,71	12600	1155	0,02	0,71	9450	756	0,01	0,71
	0,5	30	16800	1470	0,02	0,71	14700	1260	0,02	0,71	12600	945	0,02	0,71	9450	683	0,01	0,71
	0,5	35	13650	1155	0,02	0,71	11550	840	0,02	0,71	10500	735	0,01	0,71	7350	525	0,01	0,71
	0,5	40	13650	1050	0,02	0,71	11550	735	0,01	0,71	10500	630	0,01	0,71	7350	420	0,01	0,71
3	0,5	10	16800	11550	0,11	1,43	13650	8190	0,09	1,43	11550	6615	0,07	1,43	8400	2940	0,04	1,43
	0,5	15	16800	9450	0,10	1,43	13650	6720	0,08	1,43	11550	5355	0,06	1,43	8400	2415	0,04	1,43
	0,5	20	13650	7560	0,09	1,43	11550	5355	0,07	1,43	9135	4200	0,05	1,43	6825	1890	0,03	1,43
	0,5	30	13650	5985	0,06	1,43	11550	4200	0,05	1,43	9135	3150	0,04	1,43	6825	1470	0,02	1,43
	0,8	10	16800	11550	0,23	0,95	13650	8190	0,18	0,95	11550	6615	0,13	0,95	8400	2940	0,07	0,95
	0,8	15	16800	9450	0,21	0,95	13650	6720	0,16	0,95	11550	5355	0,12	0,95	8400	2415	0,07	0,95
	0,8	20	13650	7560	0,18	0,95	11550	5355	0,14	0,95	9135	4200	0,10	0,95	6825	1890	0,06	0,95
	0,8	30	13650	5985	0,11	0,95	11550	4200	0,09	0,95	9135	3150	0,07	0,95	6825	1470	0,04	0,95
	0,8	40	11550	3780	0,08	0,95	9555	2730	0,06	0,95	7770	2100	0,05	0,95	5775	1050	0,02	0,95
	0,8	50	8400	2730	0,07	0,95	6930	1890	0,05	0,95	6090	1575	0,04	0,95	4830	840	0,02	0,95
4	0,5	12	8820	6300	0,14	1,90	7350	4515	0,11	1,90	5880	3570	0,09	1,90	4410	1575	0,05	1,90
	0,5	20	8820	6300	0,13	1,90	7350	4515	0,10	1,90	5880	3570	0,08	1,90	4410	1575	0,04	1,90
	0,5	30	7245	5145	0,11	1,90	5985	3675	0,09	1,90	4830	2940	0,07	1,90	3675	1260	0,03	1,90
	0,5	48	5880	2100	0,07	1,90	4830	1470	0,05	1,90	3990	1155	0,04	1,90	2940	525	0,02	1,90
	1	12	12600	12600	0,29	1,43	10500	8925	0,22	1,43	8400	7140	0,17	1,43	6300	3150	0,10	1,43
	1	20	12600	12600	0,26	1,43	10500	8925	0,20	1,43	8400	7140	0,15	1,43	6300	3150	0,08	1,43
	1	30	10500	10395	0,23	1,43	8715	7350	0,18	1,43	7035	5880	0,13	1,43	5250	2625	0,07	1,43
6	0,5	18	4200	4095	0,14	3,33	3465	2940	0,11	3,33	2835	2310	0,09	3,33	2100	1050	0,05	3,33
	0,5	30	4200	4095	0,13	3,33	3465	2940	0,10	3,33	2835	2310	0,08	3,33	2100	1050	0,04	3,33
	1	18	8400	13650	0,48	2,86	6930	9660	0,38	2,86	5670	7770	0,29	2,86	4200	3465	0,14	2,86
	1	30	8400	13650	0,43	2,86	6930	9660	0,33	2,86	5670	7770	0,26	2,86	4200	3465	0,13	2,86
	1	54	6930	11550	0,24	2,86	5775	8190	0,19	2,86	4620	6615	0,14	2,86	3465	2940	0,08	2,86
	1,5	18	8400	13650	0,48	1,90	6930	9660	0,38	1,90	5670	7770	0,29	1,90	4200	3465	0,14	1,90
	1,5	30	8400	13650	0,43	1,90	6930	9660	0,33	1,90	5670	7770	0,26	1,90	4200	3465	0,13	1,90
	1,5	42	6930	11550	0,38	1,90	5775	8190	0,29	1,90	4620	6615	0,23	1,90	3465	2940	0,11	1,90
	1,5	54	6930	11550	0,24	1,90	5775	8190	0,19	1,90	4620	6615	0,14	1,90	3465	2940	0,08	1,90
	2	18	8400	13650	0,48	1,43	6930	9660	0,38	1,43	5670	7770	0,29	1,43	4200	3465	0,14	1,43
	2	30	8400	13650	0,43	1,43	6930	9660	0,33	1,43	5670	7770	0,26	1,43	4200	3465	0,13	1,43
7	1,5		7140	13650	0,48	2,86	5880	9660	0,38	2,86	4830	7770	0,29	2,86	3570	3465	0,14	2,86

UFG22

Cutting Conditions Parametry skrawania

High speed of cutting Duża prędkość skrawania

Material Materiał obrabiany			**Mild steels, Carbon steels /** Stal stopowa, Stal węglowa				**Hardened steels, Prehardened steels /** Stal ulepszana i hartowana				**Hardened steels, Stainless steels /** Stal hatrowana, Stal nierdzewna				**Hardened steels, Titanium alloys, Heat resistant alloys steels /** Stal hartowana, Stopy tytanu, Stal żarood-porna			
			<30HRC				**30-42HRC**				**42-50HRC**				**50-65HRC**			
D	**R**	**L2**	**S**	**F**	**ap [mm]**	**ae [mm]**	**S**	**F**	**ap [mm]**	**ae [mm]**	**S**	**F**	**ap [mm]**	**ae [mm]**	**S**	**F**	**ap [mm]**	**ae [mm]**
8	0,5	24	3150	4095	0,17	4,76	2625	2940	0,13	4,76	2100	2310	0,1	4,76	1575	1050	0,05	4,76
	0,5	40	3150	4095	0,15	4,76	2625	2940	0,11	4,76	2100	2310	0,1	4,76	1575	1050	0,05	4,76
	1	24	4410	6825	0,29	4,29	3675	4830	0,22	4,29	2940	3885	0,17	4,29	2205	1680	0,09	4,29
	1	40	4410	6825	0,26	4,29	3675	4830	0,2	4,29	2940	3885	0,15	4,29	2205	1680	0,08	4,29
	2	24	6300	13650	0,57	2,86	5250	9660	0,44	2,86	4200	7770	0,34	2,86	3150	3465	0,17	2,86
	2	40	6300	13650	0,51	2,86	5250	9660	0,4	2,86	4200	7770	0,3	2,86	3150	3465	0,15	2,86
	2	56	5250	11550	0,46	2,86	4410	8190	0,35	2,86	3570	6615	0,29	2,86	2625	2940	0,13	2,86
	2	72	5250	11550	0,29	2,86	4410	8190	0,22	2,86	3570	6615	0,19	2,86	2625	2940	0,09	2,86
9	2		5565	13650	0,57	3,33	4620	9660	0,44	3,33	3780	7770	0,34	3,33	2835	3465	0,17	3,33
10	0,5	30	2520	4095	0,17	6,19	2100	2940	0,13	6,19	1680	2310	0,1	6,19	1260	1050	0,05	6,19
	0,5	50	2520	4095	0,15	6,19	2100	2940	0,11	6,19	1680	2310	0,1	6,19	1260	1050	0,05	6,19
	1	30	3465	6825	0,29	5,71	2835	4830	0,22	5,71	2310	3885	0,17	5,71	1785	1680	0,09	5,71
	1	50	3465	6825	0,26	5,71	2835	4830	0,2	5,71	2310	3885	0,15	5,71	1785	1680	0,08	5,71
	2	30	5040	13650	0,57	4,29	4200	9660	0,44	4,29	3360	7770	0,34	4,29	2520	3465	0,17	4,29
	2	50	5040	13650	0,51	4,29	4200	9660	0,4	4,29	3360	7770	0,3	4,29	2520	3465	0,15	4,29
	2	70	4200	11550	0,46	4,29	3465	8190	0,35	4,29	2835	6615	0,29	4,29	2100	2940	0,13	4,29
	2	90	4200	11550	0,46	4,29	3465	8190	0,35	4,29	2835	6615	0,29	4,29	2100	2940	0,13	4,29
11	2		4515	12600	0,57	4,76	3780	8925	0,44	4,76	3045	7140	0,34	4,76	2310	3150	0,17	4,76
12	0,5	36	2100	3780	0,26	7,62	1785	2730	0,2	7,62	1365	2205	0,13	7,62	1050	945	0,07	7,62
	0,5	60	2100	3780	0,23	7,62	1785	2730	0,17	7,62	1365	2205	0,11	7,62	1050	945	0,06	7,62
	1	36	2520	5040	0,34	7,14	2100	3570	0,27	7,14	1680	2835	0,17	7,14	1260	1260	0,09	7,14
	1	60	2520	5040	0,3	7,14	2100	3570	0,24	7,14	1680	2835	0,15	7,14	1260	1260	0,08	7,14
	2	36	4200	12600	0,86	5,71	3465	8925	0,67	5,71	2835	7140	0,43	5,71	2100	3150	0,22	5,71
	2	60	4200	12600	0,76	5,71	3465	8925	0,57	5,71	2835	7140	0,38	5,71	2100	3150	0,19	5,71
	2	84	3465	10395	0,67	5,71	2835	7350	0,52	5,71	2310	5880	0,34	5,71	1785	2625	0,17	5,71
	2	108	3465	10395	0,43	5,71	2835	7350	0,33	5,71	2310	5880	0,22	5,71	1785	2625	0,1	5,71
	3	36	4200	12600	0,86	4,29	3465	8925	0,67	4,29	2835	7140	0,43	4,29	2100	3150	0,22	4,29
	3	60	4200	12600	0,76	4,29	3465	8925	0,57	4,29	2835	7140	0,38	4,29	2100	3150	0,19	4,29
13	3		3885	12600	0,86	4,76	3255	8925	0,67	4,76	2625	7140	0,43	4,76	1995	3150	0,22	4,76
16	0,5	42	1575	3150	0,26	10,48	1260	2205	0,2	10,48	1050	1785	0,11	10,48	788	788	0,05	10,48
	2	42	2205	5250	0,43	8,57	1785	3780	0,33	8,57	1470	3045	0,19	8,57	1155	1365	0,08	8,57
	3	42	3150	10500	0,86	7,14	2625	7455	0,67	7,14	2100	5985	0,38	7,14	1575	2625	0,14	7,14
	3	80	3150	10500	0,76	7,14	2625	7455	0,57	7,14	2100	5985	0,35	7,14	1575	2625	0,13	7,14
	3	120	2625	8715	0,67	7,14	2205	6195	0,52	7,14	1785	4935	0,3	7,14	1365	2205	0,11	7,14

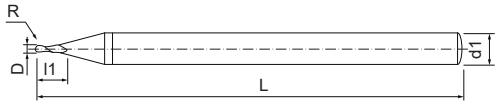
UFG53

BALL NOSE KULISTE

2-Flute, Miniature Ball Nose 2-ostrzowe, kuliste, miniaturowe

		HSM Vmax	F	M	30°	A						max	min		AIR
												○	●	●	●

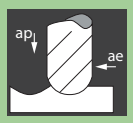
P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
	○	○	●	●										





D code new Nowy kod	D code kod	R	D	d1	L	l1	Z	Shank Uchwyt
UFG53004002A06000050	UFG53004	0,2	0,4	6	50	0,4	2	A
UFG53005003A06000050	UFG53005	0,25	0,5	6	50	0,5	2	A
UFG53006003A06000050	UFG53006	0,3	0,6	6	50	0,6	2	A
UFG53008004A06000050	UFG53008	0,4	0,8	6	50	0,8	2	A
UFG53010005A06001050	UFG53010	0,5	1	6	50	1	2	A
UFG53012006A06001050	UFG53012	0,6	1,2	6	50	1,2	2	A
UFG53015008A06001050	UFG53015	0,75	1,5	6	50	1,5	2	A
UFG53020010A06002050	UFG53020	1	2	6	50	2	2	A

Cutting Conditions Parametry skrawania



			Hardened Steel, Heat Resistant Steel Stal hartowana i żaroodporna		Hardened Steels Stale hartowane					
			30 - 42HRC		42 - 55HRC		55 - 65HRC		65 - 70HRC	
Rxd (mm)	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
R0,2x0,4	0,02	0,008	50000	1995	45000	1575	35000	1100	31500	930
R0,25x0,5	0,03	0,010	50000	2520	45000	1995	35000	1365	31500	1155
R0,3x0,6	0,03	0,012	50000	3045	45000	2310	35000	1680	31500	1470
R0,4x0,8	0,04	0,016	50000	4095	45000	3150	35000	2205	31500	1890
R0,5x1,0	0,05	0,020	50000	5040	45000	3990	35000	2730	35000	2415
R0,6x1,2	0,06	0,024	50000	5355	43000	4040	34000	2835	30600	2415
R0,75x1,5	0,08	0,030	50000	5670	43000	4200	33000	2835	29700	2415
R1,0x2,0	0,10	0,040	49700	5985	40000	4200	32000	2940	28500	2415

µm	d1 h6		R	±0,005

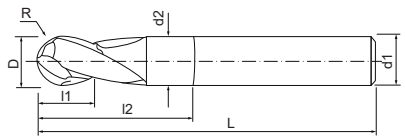
UFG28

BALL NOSE KULISTE

2-Flute Ball Nose 2-ostrzowe kuliste

HSM Vmax	F	M	30°	A						max	min		AIR
										○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
	○	○	●	●										





D code Kod	R	D	d1	d2	L	l1	l2	Z	Shank Uchwyt
UFG28001X50A04000040	0,05	0,1	4	-	40	0,2	-	2	A
UFG28002001A04000040	0,1	0,2	4	-	40	0,3	-	2	A
UFG28003002A04000040	0,15	0,3	4	-	40	0,5	-	2	A
UFG28004002A04000040	0,2	0,4	4	-	40	0,6	-	2	A
UFG28005003A04000040	0,25	0,5	4	-	40	0,7	-	2	A
UFG28006003A04000040	0,3	0,6	4	-	40	0,9	-	2	A
UFG28007004A04000040	0,35	0,7	4	-	40	1,1	-	2	A
UFG28008004A04000040	0,4	0,8	4	-	40	1,2	-	2	A
UFG28009005A04000040	0,45	0,9	4	-	40	1,4	-	2	A
UFG28010005A06003050	0,5	1	6	0,95	50	1,5	3	2	A
UFG28015008A06004050	0,75	1,5	6	1,45	50	2	4	2	A
UFG28020010A06005050	1	2	6	1,95	50	2,5	5	2	A
UFG28025013A06007050	1,25	2,5	6	2,4	50	3	7	2	A
UFG28030015A06010060	1,5	3	6	2,85	60	4	10	2	A
UFG28035018A06010060	1,75	3,5	6	3,35	60	4,5	10	2	A
UFG28040020A06010060	2	4	6	3,85	60	5	10	2	A
UFG28045023A06010060	2,25	4,5	6	4,35	60	5,5	10	2	A
UFG28050025A06012060	2,5	5	6	4,85	60	6	12	2	A
UFG28055028A06012060	2,75	5,5	6	5,35	60	6,5	12	2	A
UFG28060030A06015060	3	6	6	5,85	60	7	15	2	A
UFG28060030A06030090	3	6	6	5,85	90	9	30	2	A
UFG28080040A08015060	4	8	8	7,7	60	9	15	2	A
UFG28080040A08015080	4	8	8	7,7	80	9	15	2	A
UFG28080040A08030100	4	8	8	7,7	100	12	30	2	A
UFG28100050A10025060	5	10	10	9,7	60	11	25	2	A
UFG28100050A10025080	5	10	10	9,7	80	11	25	2	A
UFG28100050A10030100	5	10	10	9,7	100	15	30	2	A
UFG28120060A12025080	6	12	12	11,7	80	14	25	2	A

µm	d1 h6		R	R0,05-R3 ±0,005
				R4-R6 ±0,010

UFG28

Cutting Conditions Parametry skrawania

			Hardened Steel, Heat Resistant Steel Stal hartowana i żaroodporna		Hardened Steels Stale hartowane					
			30 - 42HRC		42 - 55HRC		55 - 65HRC		65 - 70HRC	
Rxd (mm)	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
R0,1x0,2	0,01	0,004	50000	1260	45000	1005	35000	705	31500	595
R0,15x0,3	0,02	0,006	50000	1575	45000	1260	35000	880	31500	735
R0,2x0,4	0,02	0,008	50000	1995	45000	1575	35000	1100	31500	930
R0,25x0,5	0,03	0,010	50000	2520	45000	1995	35000	1365	31500	1155
R0,3x0,6	0,03	0,012	50000	3045	45000	2310	35000	1680	31500	1470
R0,4x0,8	0,04	0,016	50000	4095	45000	3150	35000	2205	31500	1890
R0,5x1,0	0,05	0,020	50000	5040	45000	3990	35000	2730	35000	2415
R0,6x1,2	0,06	0,024	50000	5355	43000	4040	34000	2835	30600	2415
R0,75x1,5	0,08	0,030	50000	5670	43000	4200	33000	2835	29700	2415
R1,0x2,0	0,10	0,040	49700	5985	40000	4200	32000	2940	28500	2415
R1,5x3,0	0,15	0,060	33100	6300	26500	4200	21000	2940	19000	2415
R2,0x4,0	0,20	0,080	24900	6300	20000	4200	16000	2940	14500	2415
R2,5x5,0	0,25	0,100	18600	6090	15000	3935	11500	2675	10500	2205
R3,0x6,0	0,30	0,120	13900	5090	11000	3255	8800	2255	8000	1835
R4,0x8,0	0,40	0,160	11100	4410	9000	2835	7000	1940	6500	1625
R5,0x10,0	0,50	0,200	9300	3885	7500	2520	5800	1730	5300	1445
R6,0x12,0	0,60	0,240	6950	3095	5600	1995	4400	1310	4000	1100

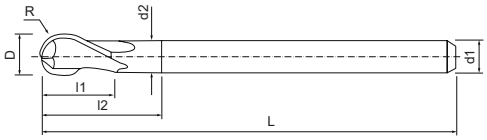
UFG38

BALL NOSE KULISTE

2-Flute Ball Nose 2-ostrzowe kuliste

HSM Vmax	F	M	30°	A						max	min		AIR
										○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
	○	○	●	●										





D code new Nowy kod	D code kod	R	D	d1	d2	L	l1	l2	Z	Shank Uchwyt
UFG38010005A04002050	UFG38010	0,5	1	4	0,95	50	1	2,2	2	A
UFG38012006A04003050	UFG38012	0,6	1,2	4	1,15	50	1,2	2,6	2	A
UFG38015008A04003050	UFG38015	0,8	1,5	4	1,45	50	1,5	3	2	A
UFG38020010A06004050	UFG38020	1	2	6	1,95	50	2	4	2	A
UFG38030015A06006060	UFG38030	1,5	3	6	2,85	60	3	6	2	A
UFG38040020A06008070	UFG38040	2	4	6	3,85	70	4	8	2	A
UFG38050025A06010080	UFG38050	2,5	5	6	4,85	80	5	10	2	A
UFG38060030A06012090	UFG38060	3	6	6	5,85	90	6	12	2	A
UFG38070035A08014090	UFG38070	3,5	7	8	6,7	90	7	14	2	A
UFG38080040A08016100	UFG38080	4	8	8	7,7	100	8	16	2	A
UFG38090045A10018100	UFG38090	4,5	9	10	8,7	100	9	18	2	A
UFG38100050A10020100	UFG38100	5	10	10	9,7	100	10	20	2	A
UFG38120060A12024110	UFG38120	6	12	12	11,7	110	12	24	2	A
UFG38140070A14028110	UFG38140	7	14	14	13,7	110	14	28	2	A
UFG38160080A16032140	UFG38160	8	16	16	15,7	140	16	32	2	A
UFG38180090A18036140	UFG38180	9	18	18	17,7	140	18	36	2	A
UFG38200100A20040160	UFG38200	10	20	20	19,7	160	20	40	2	A
UFG38250125A25050180	UFG38250	12,5	25	25	24,7	180	25	50	2	A

Cutting Conditions Parametry skrawania



Rxd (mm)	ae	ap	Hardened Steel, Heat Resistant Steel Stal hartowana i żaroodporna 30 - 42HRC RPM	mm/min	Hardened Steels Stale hartowane 42 - 55HRC RPM	mm/min	55 - 65HRC RPM	mm/min	65 - 70HRC RPM	mm/min
R0,5x1,0	0,05	0,020	50000	5040	45000	3990	35000	2730	35000	2415
R0,6x1,2	0,06	0,024	50000	5355	43000	4040	34000	2835	30600	2415
R0,75x1,5	0,08	0,030	50000	5670	43000	4200	33000	2835	29700	2415
R1,0x2,0	0,10	0,040	49700	5985	40000	4200	32000	2940	28500	2415
R1,5x3,0	0,15	0,060	33100	6300	26500	4200	21000	2940	19000	2415
R2,0x4,0	0,20	0,080	24900	6300	20000	4200	16000	2940	14500	2415
R2,5x5,0	0,25	0,100	18600	6090	15000	3935	11500	2675	10500	2205
R3,0x6,0	0,30	0,120	13900	5090	11000	3255	8800	2255	8000	1835
R4,0x8,0	0,40	0,160	11100	4410	9000	2835	7000	1940	6500	1625
R5,0x10,0	0,50	0,200	9300	3885	7500	2520	5800	1730	5300	1445
R6,0x12,0	0,60	0,240	6950	3095	5600	1995	4400	1310	4000	1100
R8,0x16,0	0,80	0,320	5570	2780	4500	1785	3500	1050	3200	890
R10,0x20,0	1,00	0,400	4450	2465	3600	1575	2800	840	2550	690

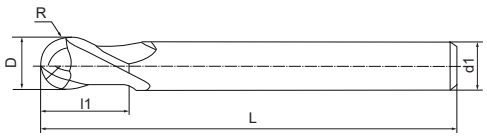
µm	d1 h6		R	R0,05-R3 ±0,005
				R4-R6 ±0,010

UFG55

BALL NOSE KULISTE
2-Flute Ball Nose 2-ostrzowe kuliste

HSM Vmax	F	30°	A			max	min		AIR
						○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
	○	○	●	●										





D code new Nowy kod	D code kod	R	D	d1	L	l1	Z	Shank Uchwyt
UFG55010005A06003075	UFG55010	0,5	1	6	75	3	2	A
UFG55020010A06004075	UFG55020	1	2	6	75	4	2	A
UFG55030015A06005075	UFG55030	1,5	3	6	75	5	2	A
UFG55040020A06006075	UFG55040	2	4	6	75	6	2	A
UFG55050025A06008075	UFG55050	2,5	5	6	75	8	2	A
UFG55060030A06009075	UFG55060	3	6	6	75	9	2	A
UFG55060030A06009100	UFG55061	3	6	6	100	9	2	A
UFG55070035A08014075	UFG55070	3,5	7	8	75	14	2	A
UFG55080040A08016075	UFG55080	4	8	8	75	16	2	A
UFG55080040A08016100	UFG55081	4	8	8	100	16	2	A
UFG55090045A10018100	UFG55090	4,5	9	10	100	18	2	A
UFG55100050A10020100	UFG55100	5	10	10	100	20	2	A
UFG55100050A10020150	UFG55101	5	10	10	150	20	2	A
UFG55120060A12024100	UFG55120	6	12	12	100	24	2	A
UFG55120060A12024150	UFG55121	6	12	12	150	24	2	A
UFG55140070A16028100	UFG55140	7	14	16	100	28	2	A
UFG55160080A16032150	UFG55160	8	16	16	150	32	2	A
UFG55160080A16032200	UFG55161	8	16	16	200	32	2	A
UFG55200100A20040200	UFG55200	10	20	20	200	40	2	A
UFG55250125A25050200	UFG55250	12,5	25	25	200	50	2	A

Cutting Conditions Parametry skrawania

			Hardened Steel, Heat Resistant Steel Stal hartowana, stal żaroodporna		Hardened Steels Stal hartowana					
			30 - 42HRC		42 - 55HRC		55 - 65HRC		65 - 70HRC	
Rxd (mm)	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
R0,5x1	0,05	0,02	47500	4530	42700	3590	33200	2450	33200	2170
R0,6x1,2	0,06	0,024	47500	4810	40800	3630	32300	2550	29000	2170
R0,75x1,5	0,075	0,03	47500	5100	40800	3780	31300	2550	28200	2170
R1,0x2	0,1	0,04	47200	5380	38000	3780	30400	2640	27000	2170
R1,5x3	0,15	0,06	31400	5670	25100	3780	19900	2640	18000	2170
R2,0x4	0,2	0,08	23600	5670	19000	3780	15200	2640	13700	2170
R2,5x5	0,25	0,1	17600	5480	14200	3540	10900	2400	9900	1980
R3,0x6	0,3	0,12	13200	4580	10400	2920	8300	2020	7600	1650
R4,0x8	0,4	0,16	10500	3960	8500	2550	6600	1740	6100	1460
R5,0x10	0,5	0,2	8800	3490	7100	2260	5500	1550	5000	1300
R6,0x12	0,6	0,24	6600	2780	5300	1790	4100	1170	3800	990
R8,0x16	0,8	0,32	5200	2500	4200	1600	3300	940	3000	800
R10,0x20	1	0,4	4200	2210	3400	1410	2600	750	2400	620

µm	D 0 — -20	R	±0,01
	d1 h6		

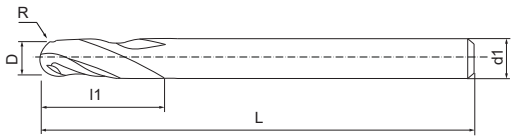
UFG59

BALL NOSE KULISTE

3-Flute, Long Length Ball Nose 3-ostrzowe, długie, kuliste

			HSM Vmax	F	M	30°	A					max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
	○	○	●	●										





D code new Nowy kod	D code kod	R	D	d1	L	l1	Z	Shank Uchwyt
UFG59030015A06008060	UFG59030	1,5	3	6	60	8	3	A
UFG59040020A06008070	UFG59040	2	4	6	70	8	3	A
UFG59050025A06010080	UFG59050	2,5	5	6	80	10	3	A
UFG59060030A06012090	UFG59060	3	6	6	90	12	3	A
UFG59080040A08014100	UFG59080	4	8	8	100	14	3	A
UFG59100050A10018100	UFG59100	5	10	10	100	18	3	A
UFG59120060A12022110	UFG59120	6	12	12	110	22	3	A
UFG59160080A16030140	UFG59160	8	16	16	140	30	3	A
UFG59200100A20038160	UFG59200	10	20	20	160	38	3	A

Cutting Conditions Parametry skrawania



			Hardened Steel, Heat Resistant Steel Stal hartowana i żaroodporna		Hardened Steels Stale hartowane							
			30 - 42HRC		42 - 55HRC		55 - 60HRC		60 - 65HRC		60 - 70HRC	
Rxd (mm)	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
R1,5x3,0	0,2	0,1	33600	9030	28180	6090	20830	4490	19610	4240	13415	2895
R2,0x4,0	0,2	0,1	25280	8085	21135	5700	15620	4070	14930	3830	10055	2625
R2,5x5,0	0,3	0,1	21000	7610	17615	5700	13020	3870	12250	3640	8400	2485
R3,0x6,0	0,3	0,1	18900	8995	15960	6530	12810	4725	11655	4020	7965	2580
R4,0x8,0	0,4	0,2	14175	7715	11865	5510	9660	4175	8735	3515	5970	2235
R5,0x10,0	0,5	0,2	11340	6855	9555	4815	7715	3620	6990	3010	4775	2055
R6,0x12,0	0,6	0,2	9500	6405	7965	4470	6435	3345	5805	2520	3990	1720
R8,0x16,0	0,8	0,3	7035	4830	5970	3410	4830	2600	4365	1890	2990	1290
R10,0x20,0	1,0	0,4	5670	3780	4775	2750	3850	2075	3465	1510	2390	1025

µm	d1 h6		R	±0,005
				±0,010

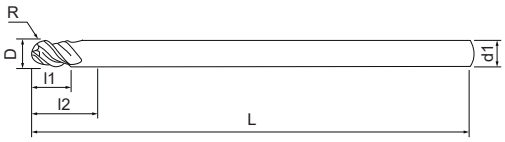
UFG21

BALL NOSE KULISTE

3-Flute, Miniature 3-ostrzowe, miniaturowe

HSM Vmax	F	M	45°	A	max	min	AIR
					○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
	○	○	●	●										





D code Kod	R	D	d1	L	l1	l2	Z	Shank Uchwyt
UFG21030015A06005070	1.5	3	6	70	4.5	-	3	A
UFG21040020A06006070	2	4	6	70	6	-	3	A
UFG21060030A06009080	3	6	6	80	9	-	3	A
UFG21060030A06009110	3	6	6	110	9	-	3	A
UFG21080040A08012090	4	8	8	90	12	-	3	A
UFG21080040A08012120	4	8	8	120	12	-	3	A
UFG21100050A10015100	5	10	10	100	15		3	A
UFG21100050A10015130	5	10	10	130	15	-	3	A
UFG21120060A12018100	6	12	12	100	18	-	3	A
UFG21120060A12018140	6	12	12	140	18	-	3	A
UFG21010005A06016060	0,5	1	6	60	1,5	16	3	A
UFG21010005A06006060	0,5	1	6	60	1,5	6	3	A
UFG21010005A06008060	0,5	1	6	60	1,5	8	3	A
UFG21010005A06010060	0,5	1	6	60	1,5	10	3	A
UFG21010005A06012060	0,5	1	6	60	1,5	12	3	A
UFG21010005A06016060	0,5	1	6	60	1,5	16	3	A
UFG21010005A06020060	0,5	1	6	60	1,5	20	3	A
UFG21010005A06025070	0,5	1	6	70	1,5	25	3	A
UFG21010005A06015060	0,5	1	6	60	1,5	15	3	A
UFG21010005A06025070	0,5	1	6	70	1,5	25	3	A
UFG21010005A06030070	0,5	1	6	70	1,5	30	3	A
UFG21010008A06006060	0,75	1	6	60	2,25	6	3	A
UFG21010008A06009060	0,75	1	6	60	2,25	9	3	A
UFG21010008A06012060	0,75	1	6	60	2,25	12	3	A
UFG21010008A06015060	0,75	1	6	60	2,25	15	3	A
UFG21010008A06021060	0,75	1	6	60	2,25	21	3	A
UFG21010008A06030070	0,75	1	6	70	2,25	30	3	A
UFG21020010A06020060	1	2	6	60	3	20	3	A
UFG21020010A06010060	1	2	6	60	3	10	3	A
UFG21020010A06015060	1	2	6	60	3	15	3	A
UFG21020010A06020060	1	2	6	60	3	20	3	A
UFG21020010A06025070	1	2	6	70	3	25	3	A
UFG21020010A06030080	1	2	6	80	3	30	3	A
UFG21020010A06040080	1	2	6	80	3	40	3	A
UFG21020010A06050100	1	2	6	100	3	50	3	A
UFG21020010A06040080	1	2	6	80	3	40	3	A
UFG21020010A06060100	1	2	6	100	3	60	3	A
UFG21020010A06041080	1	2	6	80	3	41	3	A
UFG21020010A06030080	1	2	6	80	3	30	3	A
UFG21030015A06020080	1,5	3	6	80	4,5	20	3	A
UFG21030015A06020080	1,5	3	6	80	4,5	20	3	A
UFG21030015A06025080	1,5	3	6	80	4,5	25	3	A
UFG21030015A06030080	1,5	3	6	80	4,5	30	3	A
UFG21030015A06040080	1,5	3	6	80	4,5	40	3	A
UFG21030015A06050100	1,5	3	6	100	4,5	50	3	A

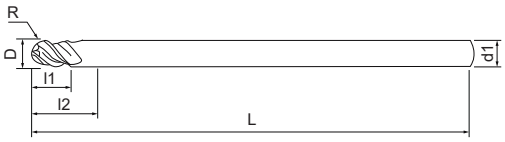
UFG21

BALL NOSE KULISTE

3-Flute, Miniature Ball Nose 3-ostrzowe, kuliste, miniaturowe

HSM Vmax	F	M	45°	A	max	min	AIR
					○	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
	○	○	●	●										





D code Kod	R	D	d1	L	l1	l2	Z	Shank Uchwyt
UFG21030015A06060100	1,5	3	6	100	4,5	60	3	A
UFG21030015A06061100	1,5	3	6	100	4,5	61	3	A
UFG21030015A06047100	1,5	3	6	100	4,5	47	3	A
UFG21030015A06032080	1,5	3	6	80	4,5	32	3	A
UFG21040020A06025080	2	4	6	80	6	25	3	A
UFG21040020A06030080	2	4	6	80	6	30	3	A
UFG21040020A06040080	2	4	6	80	6	40	3	A
UFG21040020A06050100	2	4	6	100	6	50	3	A
UFG21040020A06061100	2	4	6	100	6	61	3	A
UFG21040020A08080120	2	4	8	120	6	80	3	A
UFG21040020A06042080	2	4	6	80	6	42	3	A
UFG21040020A08080120	2	4	8	120	6	80	3	A
UFG21040020A08061120	2	4	8	120	6	61	3	A
UFG21040020A08042100	2	4	8	100	6	42	3	A
UFG21050025A08035100	2,5	5	8	100	7,5	35	3	A
UFG21050025A08050100	2,5	5	8	100	7,5	50	3	A
UFG21050025A08070130	2,5	5	8	130	7,5	70	3	A
UFG21050025A08090130	2,5	5	8	130	7,5	90	3	A
UFG21050025A08062130	2,5	5	8	130	7,5	62	3	A
UFG21050025A08048130	2,5	5	8	130	7,5	48	3	A
UFG21060030A08040100	3	6	8	100	9	40	3	A
UFG21060030A08050100	3	6	8	100	9	50	3	A
UFG21060030A08062130	3	6	8	130	9	62	3	A
UFG21060030A10090130	3	6	10	130	9	90	3	A
UFG21060030A08043100	3	6	8	100	9	43	3	A
UFG21060030A10081130	3	6	10	130	9	81	3	A
UFG21060030A08034100	3	6	8	100	9	34	3	A
UFG21060030A10062130	3	6	10	130	9	62	3	A
UFG21080040A10050120	4	8	10	120	12	50	3	A
UFG21080040A10063120	4	8	10	120	12	63	3	A
UFG21080040A12090150	4	8	12	150	12	90	3	A
UFG21080040A120X2180	4	8	12	180	12	121	3	A
UFG21080040A10044120	4	8	10	120	12	44	3	A
UFG21080040A12082150	4	8	12	150	12	82	3	A
UFG21080040A12063120	4	8	12	120	12	63	3	A
UFG21100050A12064120	5	10	12	120	15	64	3	A
UFG21100050A16080160	5	10	16	160	15	80	3	A
UFG21100050A160X0160	5	10	16	160	15	100	3	A
UFG21100050A160X2180	5	10	16	180	15	120	3	A
UFG21100050A160X4200	5	10	16	200	15	140	3	A
UFG21100050A160X6220	5	10	16	220	15	160	3	A
UFG21100050A12045120	5	10	12	120	15	45	3	A
UFG21100050A160X2180	5	10	16	180	15	122	3	A
UFG21100050A12036120	5	10	12	120	15	36	3	A
UFG21100050A16093160	5	10	16	160	15	93	3	A

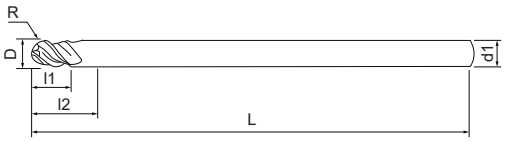
UFG21

BALL NOSE KULISTE

3-Flute, Miniature Ball Nose 3-ostrzowe, kuliste, miniaturowe

HSM Vmax	F	M	45°	A	max	min	AIR
					○	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
	○	○	●	●										





D code Kod	R	D	d1	L	l1	l2	Z	Shank Uchwyt
UFG21120060A16060120	6	12	16	120	18	60	3	A
UFG21120060A160X0180	6	12	16	180	18	100	3	A
UFG21120060A160X2180	6	12	16	180	18	123	3	A
UFG21120060A200X6220	6	12	20	220	18	160	3	A
UFG21120060A200X7220	6	12	20	220	18	161	3	A

1. Podane parametry skrawania odpowiadają obróbce pół zgrubnej i zgrubnej. Do obróbki wykańczającej zalecane jest stosować podobną prędkość skrawania jak do zgrubnej ale posuw na ząb i grubość skrawania dostosować do chropowatości powierzchni którą trzeba uzyskać. Trzeba pamiętać że Fz (posuw na ostrze mm/z) = F(posuw mm/min) / S(Obr/min)/ N (ilość ostrzy) oraz teoretyczna chropowatość powierzchni oblicza się h(maksymalna wysokość wiercholkow) = Ae (szerokość frezowania, mm) 2 / 8 x R (radius frez).
2. Powyższe parametry przedstawione są w zależności na ile frezjest wystawiony z oprawki, gdzie L/D - stosunek długości frezu wystawionej z oprawki do nominalnej średnicy roboczej -są to referencyjne parametry skrawania. Aktualne parametry skrawania są zależne od bieżących warunków i trzeba ustawiać je w każdym osobnym przypadku na obrabiarce.
3. Zaleca się stosować sztywne obrabiarki i precyzyjne oprawki.
4. Dla maksymalnej dokładności trzeba kontrolować poziom wibracji na minimalnym poziomie.
5. W ostrych narożach należy zmniejszyć posuw oraz głębokość skrawania do 70% wartości zalecanej. Do bardziej stabilnej obróbki zaleca się wstawiać promienń R w narożach i zmniejszać posuw przy pisaniu programów w CAM systemach.
6. Kiedy kąt zagłębiania jest większy od zalecanego należy zmniejszyć posuw.

UFG21

Cutting Conditions Parametry skrawania

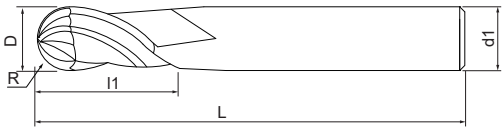
Work material materiał obrabiany			Cutting angle Kąt zagłębiania	Mild steels Carbon steels / Stal stopowa Stal węglowa				Hardened steels, Prehardened steels / Stal ulepszana i hartowana				Hardened steels, Stainless steels / Stal hatrowana, Stal nierdzewna				Hardened steels, Titanium alloys, Heat resistant alloys steels / Stal hartowana, Stopy tytanu, Stal żaroodporna			
				<30HRC				30-42HRC				42-50HRC				50-65HRC			
D	R	L/D		S	F	ap [mm]	ae [mm]	S	F	ap [mm]	ae [mm]	S	F	ap [mm]	ae [mm]	S	F	ap [mm]	ae [mm]
1	R0,5	11	0,3°	70180	5610	0,08	0,20	63140	4400	0,07	0,20	52580	3190	0,06	0,20	42020	2200	0,06	0,20
		15		68530	5280	0,08	0,20	61710	4180	0,07	0,20	51370	2970	0,06	0,20	41140	2090	0,06	0,20
		20		64680	4950	0,08	0,20	58190	3850	0,07	0,20	48510	2750	0,06	0,20	38720	1980	0,06	0,20
		25		60280	4290	0,07	0,20	54230	3410	0,06	0,20	45210	2420	0,05	0,20	36190	1760	0,05	0,20
		30		53350	3630	0,07	0,20	47960	2860	0,06	0,20	39930	2090	0,05	0,20	32010	1430	0,05	0,20
2	R1	6	0,3°	34980	5500	0,16	0,50	31460	4400	0,15	0,40	26290	3080	0,13	0,40	21010	2200	0,13	0,30
		8		33770	5170	0,16	0,50	30360	4180	0,14	0,40	25300	2970	0,13	0,40	20240	2090	0,13	0,30
		10		31790	4840	0,16	0,50	28600	3850	0,14	0,40	23870	2750	0,12	0,40	19030	1980	0,12	0,30
		13		27940	4180	0,15	0,50	25080	3300	0,13	0,40	20900	2420	0,12	0,40	16720	1650	0,12	0,30
		15		24750	3630	0,15	0,50	22220	2860	0,13	0,40	18480	2090	0,12	0,40	14850	1430	0,12	0,30
3	R1,5	3	0,3°	23320	5390	0,24	0,70	21010	4290	0,22	0,60	17490	3080	0,19	0,50	13970	2200	0,19	0,50
		5		22330	5170	0,24	0,70	20130	4070	0,21	0,60	16720	2970	0,19	0,50	13420	2090	0,19	0,50
		7		20020	4620	0,22	0,70	18040	3630	0,20	0,60	15070	2640	0,18	0,50	11990	1870	0,18	0,50
		8		18920	3520	0,21	0,70	17050	2860	0,19	0,60	14190	1980	0,17	0,50	11330	1430	0,17	0,50
		10		16170	2310	0,19	0,70	14630	1870	0,17	0,60	12100	1320	0,15	0,50	9680	990	0,15	0,50
4	R2	3	0,5°	17600	5390	0,32	0,90	15840	4290	0,29	0,80	13200	3080	0,26	0,70	10560	2200	0,26	0,60
		4		17050	5060	0,31	0,90	15400	4070	0,28	0,80	12870	2860	0,25	0,70	10230	2090	0,25	0,60
		5		13860	4620	0,28	0,90	12430	3630	0,25	0,80	10450	2640	0,22	0,70	8360	1870	0,22	0,60
		6		11110	3520	0,26	0,90	10010	2750	0,24	0,80	8360	1980	0,21	0,70	6710	1430	0,21	0,60
		8		9240	2310	0,26	0,90	8250	1870	0,23	0,80	6930	1320	0,20	0,70	5500	880	0,20	0,60
5	R2,5	2	0,5°	13970	5280	0,40	1,20	12650	4180	0,36	1,00	10450	2970	0,32	0,90	8360	2090	0,32	0,80
		4		11220	4950	0,37	1,20	10120	3960	0,33	1,00	8360	2860	0,29	0,90	6710	1980	0,29	0,80
		6		9350	4510	0,31	1,20	8360	3630	0,28	1,00	7040	2530	0,25	0,90	5610	1760	0,25	0,80
		7		8030	3520	0,16	1,20	7150	2750	0,14	1,00	6050	1980	0,13	0,90	4840	1430	0,13	0,80
		8		5610	2310	0,13	1,00	5060	1870	0,12	0,90	4180	1320	0,10	0,80	3410	924	0,10	0,70
6	R3	4	0,5°	11660	5280	0,49	1,40	10450	4180	0,44	1,20	8800	2970	0,39	1,10	7040	2090	0,39	1,00
		5		9350	4950	0,39	1,40	8360	3960	0,35	1,20	7040	2860	0,31	1,10	5610	1980	0,31	1,00
		6		7810	4510	0,33	1,40	7040	3520	0,29	1,20	5830	2530	0,26	1,10	4620	1760	0,26	1,00
		7		6710	3410	0,24	1,30	6050	2750	0,21	1,10	4950	1980	0,19	1,02	3960	1430	0,19	0,90
		8		4620	2310	0,17	1,20	4180	1760	0,15	1,00	3520	1320	0,13	0,90	2750	913	0,13	0,80
8	R4	4	0,5°	8800	5170	0,65	1,80	7920	4070	0,59	1,60	6600	2860	0,52	1,40	5280	2090	0,52	1,30
		5		7040	4840	0,53	1,80	6270	3850	0,47	1,60	5280	2750	0,42	1,40	4180	1980	0,42	1,30
		6		5830	4400	0,44	1,80	5280	3410	0,39	1,60	4400	2530	0,34	1,40	3520	1760	0,34	1,30
		7		4950	3410	0,32	1,70	4510	2640	0,29	1,50	3740	1870	0,25	1,30	2970	1320	0,25	1,20
		8		3520	2200	0,17	1,60	3190	1760	0,16	1,40	2640	1210	0,14	1,30	2090	891	0,14	1,10
10	R5	4	1°	7040	4950	0,81	2,30	6270	5170	0,67	2,00	5280	3740	0,64	1,80	4180	2640	0,59	1,60
		5		5610	4400	0,63	2,30	5060	4730	0,58	2,00	4180	3410	0,51	1,80	3410	2420	0,51	1,60
		6		4730	3960	0,54	2,30	4180	4180	0,48	2,00	3520	3080	0,43	1,70	2750	2090	0,42	1,50
		7		3960	3080	0,40	2,10	3630	3300	0,35	1,90	2970	2310	0,31	1,70	2420	1650	0,31	1,50
		8		2750	1980	0,18	2,10	2530	2090	0,16	1,80	2090	1540	0,14	1,70	1650	1100	0,14	1,50
12	R6	4	1°	5830	4620	0,93	2,80	5280	3630	0,83	2,40	4400	2640	0,73	2,20	3520	1870	0,73	1,90
		5		4620	4290	0,76	2,80	4180	3410	0,68	2,40	3520	2420	0,60	2,20	2750	1760	0,60	1,90
		6		3850	3850	0,66	2,80	3520	3080	0,59	2,40	2970	2200	0,52	2,20	2310	1540	0,52	1,90
		7		3300	2970	0,48	2,50	2970	2420	0,43	2,20	2530	1760	0,38	2,00	1980	1210	0,38	1,80
		8		2310	1980	0,19	2,50	2090	1540	0,17	2,20	1760	1100	0,15	2,00	1430	792	0,15	1,80
16	R8	3	2°	4400	4290	1,26	2,80	3960	3410	1,13	2,40	3300	2420	0,99	2,20	2640	1760	0,99	1,90
		5		3520	4070	1,05	2,80	3190	3300	0,94	2,40	2640	2310	0,83	2,20	2090	1650	0,83	1,90
		6		2970	3740	0,87	2,80	2640	2970	0,78	2,40	2200	2090	0,69	2,20	1760	1430	0,69	1,90
		7		2530	2860	0,64	2,50	2200	2310	0,57	2,20	1870	1650	0,50	2,00	1540	1100	0,50	1,80
		8		1760	1870	0,20	2,50	1540	1540	0,18	2,20	1320	1100	0,16	2,00	1100	759	0,16	1,80
20	R10	4	2°	3520	4070	1,42	4,60	3190	3300	1,28	4,00	2640	2310	1,12	3,60	2090	1650	1,12	3,20
		5		2750	3850	1,31	4,60	2530	3080	1,18	4,00	2090	2200	1,03	3,60	1650	1540	1,03	3,20
		6		2310	3520	1,09	4,50	2090	2750	0,98	3,90	1760	1980	0,86	3,50	1430	1430	0,86	3,10
		7		1980	2640	0,79	4,40	1760	2090	0,71	3,80	1540	1540	0,63	3,40	1210	1100	0,63	3,00
		8		1430	1760	0,22	4,30	1210	1430	0,19	3,70	1045	1001	0,17	3,40	836	704	0,17	3,00

UFG41

BALL NOSE KULISTE
4-Flute, Short Flute 4-ostrzowe, krótkie

HSM Vmax	F	M	R	45°	A			max	min		AIR
								○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
	○	○	●	●										



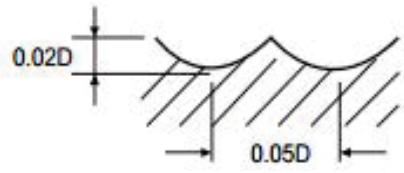


D code Kod	R	D	d1	L	l1	Z	Shank Uchwyt
UFG41030015A06008060	1,5	3	6	60	8	4	A
UFG41040020A06008070	2	4	6	70	8	4	A
UFG41050025A06010080	2,5	5	6	80	10	4	A
UFG41060030A06012090	3	6	6	90	12	4	A
UFG41080040A08014100	4	8	8	100	14	4	A
UFG41100050A10018100	5	10	10	100	18	4	A
UFG41120060A12022110	6	12	12	110	22	4	A
UFG41160080A16030140	8	16	16	140	30	4	A
UFG41200100A20038160	10	20	20	160	38	4	A

Cutting Conditions Parametry skrawania



	Hardened Steel, Heat Resistant Steel Stal stopowa, stal żaroodporna		Hardened Steels Stale hartowane							
	30 - 45HRC		45- 55HRC		55 - 60HRC		60 - 65HRC		65 - 70HRC	
Rxd (mm)	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
R1.5 × 3.0	36100	10200	30250	7300	24440	4880	22280	4010	15170	2430
R2.0 × 4.0	27050	8700	22650	6350	18300	4400	16710	3680	11380	2280
R2.5 × 5.0	21600	7800	17820	5750	14650	4150	13370	3590	9100	2260
R3.0 × 6.0	18040	7320	15180	5560	12210	4020	11110	3410	7590	2200
R4.0 × 8.0	13530	6270	11330	4680	9190	3520	8310	2970	5670	1870
R5.0 × 10.0	10840	5560	9130	4070	7370	3080	6660	2530	4570	1760
R6.0 × 12.0	9020	5230	7590	3800	6110	2810	5560	2150	3800	1430
R8.0 × 16.0	6770	3910	5670	2920	4620	2200	4180	1600	2860	1100
R10.0×20.0	5450	3140	4570	2310	3690	1760	3300	1270	2260	880



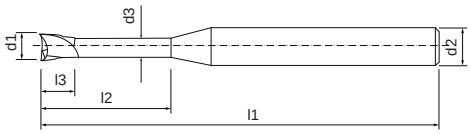
UFG83

FOR RIB PROCESSING DO ŻEBER

2-Flute, Miniature Ball Nose 2-ostrzowe, kuliste, miniaturowe

		HSM Vmax	F	M	30°	A						max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
	○	○	●	●										





D code new Nowy kod	D code kod	D	d1	d2	L	l1	l2	Z	Shank Uchwyt
UFG83001000A0403X045	UFG83863	0,1	4	0,085	45	0,15	0,3	2	A
UFG83001000A0405X045	UFG83864	0,1	4	0,085	45	0,15	0,5	2	A
UFG83002000A04000045	UFG83002	0,2	4	0,18	45	0,3	0,5	2	A
UFG83002000A04001045	UFG83815	0,2	4	0,18	45	0,3	1	2	A
UFG83002000A04002045	UFG83816	0,2	4	0,18	45	0,3	1,5	2	A
UFG83003000A04000045	UFG83003	0,3	4	0,27	45	0,45	1	2	A
UFG83003000A04001045	UFG83844	0,3	4	0,27	45	0,45	1,5	2	A
UFG83003000A04002045	UFG83817	0,3	4	0,27	45	0,45	2	2	A
UFG83003000A04003045	UFG83818	0,3	4	0,27	45	0,45	3	2	A
UFG83003000A04004045	UFG83842	0,3	4	0,27	45	0,45	4	2	A
UFG83004000A04001045	UFG83843	0,4	4	0,37	45	0,6	1	2	A
UFG83004000A04002045	UFG83004	0,4	4	0,37	45	0,6	2	2	A
UFG83004000A04003045	UFG83984	0,4	4	0,37	45	0,6	3	2	A
UFG83004000A04004045	UFG83985	0,4	4	0,37	45	0,6	4	2	A
UFG83004000A04005045	UFG83986	0,4	4	0,37	45	0,6	5	2	A
UFG83005000A04002045	UFG83005	0,5	4	0,45	45	0,7	2	2	A
UFG83005000A04003045	UFG83861	0,5	4	0,45	45	0,7	2,5	2	A
UFG83005000A04004045	UFG83988	0,5	4	0,45	45	0,7	4	2	A
UFG83005000A04006045	UFG83989	0,5	4	0,45	45	0,7	6	2	A
UFG83005000A04008045	UFG83990	0,5	4	0,45	45	0,7	8	2	A
UFG83006000A04002045	UFG83006	0,6	4	0,55	45	0,9	2	2	A
UFG83006000A04003045	UFG83860	0,6	4	0,55	45	0,9	3	2	A
UFG83006000A04004045	UFG83991	0,6	4	0,55	45	0,9	4	2	A
UFG83006000A04006045	UFG83992	0,6	4	0,55	45	0,9	6	2	A
UFG83006000A04008045	UFG83993	0,6	4	0,55	45	0,9	8	2	A
UFG83006000A04010045	UFG83819	0,6	4	0,55	45	0,9	10	2	A
UFG83008000A04002045	UFG83862	0,8	4	0,75	45	1,2	2	2	A
UFG83008000A04004045	UFG83008	0,8	4	0,75	45	1,2	4	2	A
UFG83008000A04006045	UFG83908	0,8	4	0,75	45	1,2	6	2	A
UFG83008000A04008045	UFG83909	0,8	4	0,75	45	1,2	8	2	A
UFG83008000A04010045	UFG83994	0,8	4	0,75	45	1,2	10	2	A
UFG83008000A04012045	UFG83995	0,8	4	0,75	45	1,2	12	2	A
UFG83010000A04004045	UFG83996	1	4	0,95	45	1,5	4	2	A
UFG83010000A04006045	UFG83010	1	4	0,95	45	1,5	6	2	A
UFG83010000A04008045	UFG83912	1	4	0,95	45	1,5	8	2	A
UFG83010000A04010045	UFG83913	1	4	0,95	45	1,5	10	2	A
UFG83010000A04012045	UFG83914	1	4	0,95	45	1,5	12	2	A
UFG83010000A04016050	UFG83997	1	4	0,95	50	1,5	16	2	A
UFG83010000A04020055	UFG83998	1	4	0,95	55	1,5	20	2	A
UFG83012000A04006045	UFG83012	1,2	4	1,15	45	1,8	6	2	A
UFG83012000A04008045	UFG83915	1,2	4	1,15	45	1,8	8	2	A
UFG83012000A04010045	UFG83916	1,2	4	1,15	45	1,8	10	2	A
UFG83012000A04012045	UFG83917	1,2	4	1,15	45	1,8	12	2	A
UFG83012000A04016050	UFG83999	1,2	4	1,15	50	1,8	16	2	A

µm	d1 h6	
	D 0 — -12	

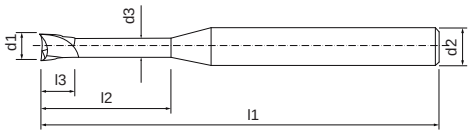
UFG83

FOR RIB PROCESSING DO ŻEBER

2-Flute, Miniature Ball Nose 2-ostrzowe, kuliste, miniaturowe

		HSM Vmax	F	M	30°	A							max	min		AIR
													○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
	○	○	●	●										





D code new Nowy kod	D code kod	D	d1	d2	L	l1	l2	Z	Shank Uchwyt
UFG83015000A04006045	UFG83015	1,5	4	1,45	45	2,3	6	2	A
UFG83015000A04008045	UFG83923	1,5	4	1,45	45	2,3	8	2	A
UFG83015000A04010045	UFG83924	1,5	4	1,45	45	2,3	10	2	A
UFG83015000A04012045	UFG83925	1,5	4	1,45	45	2,3	12	2	A
UFG83015000A04014050	UFG83926	1,5	4	1,45	50	2,3	14	2	A
UFG83015000A04016050	UFG83927	1,5	4	1,45	50	2,3	16	2	A
UFG83015000A04018055	UFG83928	1,5	4	1,45	55	2,3	18	2	A
UFG83015000A04020055	UFG83810	1,5	4	1,45	55	2,3	20	2	A
UFG83020000A04006045	UFG83958	2	4	1,95	45	3	6	2	A
UFG83020000A04008045	UFG83020	2	4	1,95	45	3	8	2	A
UFG83020000A04010045	UFG83959	2	4	1,95	45	3	10	2	A
UFG83020000A04012045	UFG83960	2	4	1,95	45	3	12	2	A
UFG83020000A04014050	UFG83961	2	4	1,95	50	3	14	2	A
UFG83020000A04016050	UFG83962	2	4	1,95	50	3	16	2	A
UFG83020000A04018055	UFG83963	2	4	1,95	55	3	18	2	A
UFG83020000A04020055	UFG83964	2	4	1,95	55	3	20	2	A
UFG83020000A04025060	UFG83966	2	4	1,95	60	3	25	2	A
UFG83020000A04030070	UFG83814	2	4	1,95	70	3	30	2	A
UFG83030000A06010045	UFG83975	3	6	2,85	45	4,5	10	2	A
UFG83030000A06012045	UFG83976	3	6	2,85	45	4,5	12	2	A
UFG83030000A06014050	UFG83977	3	6	2,85	50	4,5	14	2	A
UFG83030000A06016055	UFG83978	3	6	2,85	55	4,5	16	2	A
UFG83030000A06018055	UFG83979	3	6	2,85	55	4,5	18	2	A
UFG83030000A06020060	UFG83980	3	6	2,85	60	4,5	20	2	A
UFG83030000A06025065	UFG83981	3	6	2,85	65	4,5	25	2	A
UFG83030000A06030070	UFG83832	3	6	2,85	70	4,5	30	2	A
UFG83030000A06035080	UFG83833	3	6	2,85	80	4,5	35	2	A
UFG83030000A06040090	UFG83983	3	6	2,85	90	4,5	40	2	A
UFG83040000A06012050	UFG83040	4	6	3,85	50	6	12	2	A
UFG83040000A06016060	UFG83801	4	6	3,85	60	6	16	2	A
UFG83040000A06020060	UFG83802	4	6	3,85	60	6	20	2	A
UFG83040000A06025070	UFG83803	4	6	3,85	70	6	25	2	A
UFG83040000A06030070	UFG83834	4	6	3,85	70	6	30	2	A
UFG83040000A06035080	UFG83835	4	6	3,85	80	6	35	2	A
UFG83040000A06040090	UFG83836	4	6	3,85	90	6	40	2	A
UFG83040000A06045090	UFG83837	4	6	3,85	90	6	45	2	A
UFG83040000A06050100	UFG83838	4	6	3,85	100	6	50	2	A

d1 h6	
D 0 — -12	

UFG83

Cutting Conditions Parametry skrawania

SEMI-FINISHING / OBRÓBKA PÓŁWYKAŃCZAJĄCA



	Alloy Steel, Heat Resistant Steel Stal stopowa, stal żaroodporna			**Hardened Steels** Stale hartowane				
	30 - 42HRC			**42 - 55HRC**			**55 - 65HRC**	
d1 (mm)	**ap (mm)**	**RPM**	**mm/min**	**ap (mm)**	**RPM**	**mm/min**	**RPM**	**mm/min**
0,2	0,016	50000	280	0,012	50000	275	50000	240
0,3	0,015	43000	310	0,007	39900	275	23900	110
0,4	0,028	31400	330	0,012	30500	305	18300	130
0,5	0,035	25650	350	0,015	23750	295	14200	120
0,6	0,030	20900	310	0,013	19900	270	11900	110
0,8	0,040	16150	340	0,017	15200	290	9000	120
1,0	0,028	12300	330	0,012	10500	260	6300	110
1,2	0,070	10450	330	0,026	9100	260	5400	110
1,5	0,077	9100	400	0,033	7000	260	4300	110
2,0	0,140	6350	320	0,060	6100	280	3600	110
3,0	0,210	4300	520	0,090	3990	465	2400	110
4,0	0,280	3200	380	0,120	3000	350	1800	80

FINISHING / OBRÓBKA WYKAŃCZAJĄCA



	Alloy Steel, Heat Resistant Steel Stal stopowa, stal żaroodporna			**Hardened Steels** Stale hartowane				
	30 - 42HRC			**42 - 55HRC**			**55 - 65HRC**	
d1 (mm)	**ap (mm)**	**RPM**	**mm/min**	**ap (mm)**	**RPM**	**mm/min**	**RPM**	**mm/min**
0,2	0,006	50000	330	0,005	50000	325	50000	290
0,3	0,006	50000	390	0,003	46200	325	32300	200
0,4	0,005	50000	560	0,002	35200	355	24600	220
0,5	0,006	33000	440	0,003	26000	330	18000	140
0,6	0,007	35200	530	0,003	22000	300	15500	130
0,8	0,009	26400	560	0,004	16700	325	11700	130
1,0	0,011	18700	510	0,005	11500	290	8050	120
1,2	0,025	17600	560	0,009	10000	290	7000	120
1,5	0,017	17600	780	0,007	8000	290	5500	120
2,0	0,021	10550	540	0,009	6700	315	4700	130
3,0	0,056	7050	850	0,024	4600	540	3200	340
4,0	0,074	5300	640	0,032	3400	395	2400	250

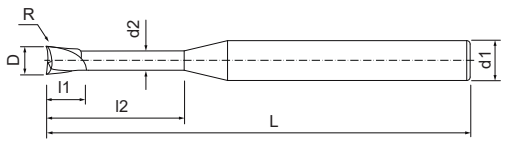
UFG52

FOR RIB PROCESSING DO ŻEBER

2-Flute, Toroidal 2-ostrzowe, toroidalne

HSM Vmax	F	M	30°	A							max	min		AIR
											○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
	○	○	●	●										





D code new Nowy kod	D code kod	R	D	d1	d2	L	l1	l2	Z	Shank Uchwyt
UFG52005001A06002050	UFG52005	0,05	0,5	6	0,45	50	0,7	1,5	2	A
UFG52005001A06003050	UFG52901	0,05	0,5	6	0,45	50	0,7	3,3	2	A
UFG52006001A06002050	UFG52006	0,05	0,6	6	0,55	50	0,9	2	2	A
UFG52006001A06004050	UFG52902	0,05	0,6	6	0,55	50	0,9	4	2	A
UFG52008001A06003050	UFG52008	0,05	0,8	6	0,75	50	1,2	2,5	2	A
UFG52008001A06006050	UFG52903	0,05	0,8	6	0,75	50	1,2	5,5	2	A
UFG52010001A06003050	UFG52010	0,1	1	6	0,95	50	1,5	3,3	2	A
UFG52010001A06007050	UFG52904	0,1	1	6	0,95	50	1,5	6,7	2	A
UFG52012001A06004050	UFG52012	0,1	1,2	6	1,15	50	1,8	4,4	2	A
UFG52012001A06008050	UFG52905	0,1	1,2	6	1,15	50	1,8	8	2	A
UFG52015002A06005050	UFG52015	0,15	1,5	6	1,45	50	2,2	5	2	A
UFG52015002A06010050	UFG52906	0,15	1,5	6	1,45	50	2,2	9,7	2	A
UFG52020002A06006050	UFG52020	0,15	2	6	1,95	50	2,2	6	2	A
UFG52020002A06013050	UFG52907	0,15	2	6	1,95	50	2,2	13	2	A

µm	d1 h6	R	± 0.005
	D 0 — -12		

UFG52

Cutting Conditions Parametry skrawania

SEMI-FINISHING / OBRÓBKA PÓŁWYKAŃCZAJĄCA



	Alloy Steel, Heat Resistant Steel Stal stopowa, stal żaroodporna			**Hardened Steels** Stale hartowane					
	30 - 42HRC			**42 - 55HRC**			**55 - 65HRC**		
d1 (mm)	**ap (mm)**	**RPM**	**mm/min**	**ap (mm)**	**RPM**	**mm/min**	**ap (mm)**	**RPM**	**mm/min**
0,50	0,035	25650	350	0,025	23750	290	0,015	14200	100
0,60	0,029	20900	310	0,021	19900	270	0,013	11900	90
0,80	0,039	16150	340	0,028	15200	290	0,017	9000	100
1,00	0,028	12300	330	0,020	10500	260	0,012	6300	90
1,20	0,070	10450	330	0,042	9100	260	0,025	5400	90
1,50	0,077	9100	400	0,055	7000	260	0,033	4300	90
2,00	0,140	6350	320	0,100	6100	280	0,060	3600	90
2,00	0,021	10550	540	0,015	6700	310	0,009	4700	110

FINISHING / OBRÓBKA WYKAŃCZAJĄCA



	Alloy Steel, Heat Resistant Steel Stal stopowa, stal żaroodporna			**Hardened Steels** Stale hartowane					
	30 - 42HRC			**42 - 55HRC**			**55 - 65HRC**		
d1 (mm)	**ap (mm)**	**RPM**	**mm/min**	**ap (mm)**	**RPM**	**mm/min**	**ap (mm)**	**RPM**	**mm/min**
0,50	0,006	33000	440	0,004	26000	330	0,002	18000	120
0,60	0,006	35200	530	0,045	22000	300	0,003	15500	110
0,80	0,008	26400	560	0,006	16700	320	0,004	11700	110
1,00	0,011	18700	510	0,008	11500	290	0,005	8050	100
1,20	0,025	17600	560	0,015	10000	290	0,009	7000	100
1,50	0,016	17600	780	0,012	8000	290	0,007	5500	100
2,00	0,021	10550	540	0,015	6700	310	0,009	4700	110

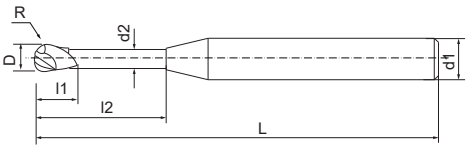
UFG54

FOR RIB PROCESSING DO ŻEBER

2-Flute, Miniature Ball Nose 2-ostrzowe, kuliste, miniaturowe

HSM Vmax	F	M	30°	A							max	min		AIR
											○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
	○	○	●	●										





D code Kod	R	D	d1	d2	L	l1	l2	Z	Shank Uchwyt
UFG54005003A06002050	0,25	0,5	6	0,45	50	0,5	1,5	2	A
UFG54005003A06003050	0,25	0,5	6	0,45	50	0,5	3,3	2	A
UFG54006003A06002050	0,3	0,6	6	0,55	50	0,6	2	2	A
UFG54006003A06004050	0,3	0,6	6	0,55	50	0,6	4	2	A
UFG54008004A06003050	0,4	0,8	6	0,75	50	0,8	2,5	2	A
UFG54008004A06006050	0,4	0,8	6	0,75	50	0,8	5,5	2	A
UFG54010005A06003050	0,5	1	6	0,95	50	1	3,3	2	A
UFG54010005A06007050	0,5	1	6	0,95	50	1	6,7	2	A
UFG54010005A06012050	0,5	1	6	0,95	50	1	12	2	A
UFG54012006A06004050	0,6	1,2	6	1,15	50	1,2	4,4	2	A
UFG54012006A06008050	0,6	1,2	6	1,15	50	1,2	8	2	A
UFG54015008A06005050	0,75	1,5	6	1,45	50	1,5	5	2	A
UFG54015008A06010050	0,75	1,5	6	1,45	50	1,5	9,7	2	A
UFG54015008A06015050	0,75	1,5	6	1,45	50	1,5	15	2	A
UFG54020010A06006050	1	2	6	1,95	50	2	6	2	A
UFG54020010A06013050	1	2	6	1,95	50	2	13	2	A
UFG54020010A06020060	1	2	6	1,95	60	2	20	2	A

µm	d1 h6	R	± 0.005
	D 0 — -12		

UFG54

Cutting Conditions Parametry skrawania

SEMI-FINISHING / OBRÓBKA PÓŁWYKAŃCZAJĄCA

	**Alloy Steel** Stal stopowa			**Hardened Steels** Stale hartowane				
	ap (mm)	**30 - 42HRC**		**ap (mm)**	**42 - 55HRC**		**55 - 65HRC**	
d1 (mm)		**RPM**	**mm/min**		**RPM**	**mm/min**	**RPM**	**mm/min**
0,50	0,028	34100	630	0,022	31900	510	31900	460
0,60	0,034	28600	615	0,027	26400	500	26400	420
0,80	0,064	22000	670	0,050	19800	510	19800	460
1,00	0,080	17600	630	0,063	15400	490	15400	460
1,20	0,032	14300	615	0,025	12000	500	12000	440
1,50	0,048	11000	605	0,038	10000	500	10000	440
2,00	0,160	8500	615	0,130	7900	490	7900	460

FINISHING / OBRÓBKA WYKAŃCZAJĄCA

	**Alloy Steel** Stal stopowa			**Hardened Steels** Stale hartowane				
	ap (mm)	**30 - 42HRC**		**ap (mm)**	**42 - 55HRC**		**55 - 65HRC**	
d1 (mm)		**RPM**	**mm/min**		**RPM**	**mm/min**	**RPM**	**mm/min**
0,50	0,007	49500	910	0,005	35200	565	35200	500
0,60	0,007	40700	890	0,006	29700	565	29700	500
0,80	0,016	30800	930	0,013	22000	575	22000	525
1,00	0,008	24200	890	0,007	17600	565	17600	525
1,20	0,024	18700	815	0,019	14000	565	14000	500
1,50	0,031	14300	795	0,024	11500:	565	11500	500
2,00	0,024	11000	840	0,019	8800	555	8800	500

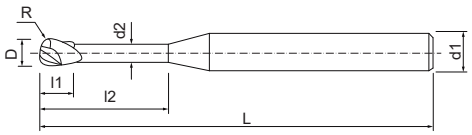
UFG86

FOR RIB PROCESSING DO ŻEBER

2-Flute, Miniature Ball Nose 2-ostrzowe, kuliste, miniaturowe

	HSM Vmax	F	M	30°	A							max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
	○	○	●	●										





D code Kod	R	D	d1	d2	L	l1	l2	Z	Shank Uchwyt
UFG86001X50A04000045	0,05	0,1	4	0,085	45	0,1	0,3	2	A
UFG86001X50A04001045	0,05	0,1	4	0,085	45	0,1	0,5	2	A
UFG86002001A04000045	0,1	0,2	4	0,18	45	0,2	0,5	2	A
UFG86002001A04001045	0,1	0,2	4	0,18	45	0,2	1	2	A
UFG86002001A04002045	0,1	0,2	4	0,18	45	0,2	1,5	2	A
UFG86003002A04001045	0,15	0,3	4	0,27	45	0,3	1	2	A
UFG86003002A04002045	0,15	0,3	4	0,27	45	0,3	2	2	A
UFG86003002A04003045	0,15	0,3	4	0,27	45	0,3	3	2	A
UFG86004002A04001045	0,2	0,4	4	0,37	45	0,4	1	2	A
UFG86004002A04002045	0,2	0,4	4	0,37	45	0,4	2	2	A
UFG86004002A04003045	0,2	0,4	4	0,37	45	0,4	3	2	A
UFG86004002A04004045	0,2	0,4	4	0,37	45	0,4	4	2	A
UFG86004002A04005045	0,2	0,4	4	0,37	45	0,4	5	2	A
UFG86005003A04002045	0,25	0,5	4	0,45	45	0,4	2	2	A
UFG86005003A04003045	0,25	0,5	4	0,45	45	0,4	2,5	2	A
UFG86005003A04004045	0,25	0,5	4	0,45	45	0,4	4	2	A
UFG86005003A04006045	0,25	0,5	4	0,45	45	0,4	6	2	A
UFG86005003A04008045	0,25	0,5	4	0,45	45	0,4	8	2	A
UFG86006003A04002045	0,3	0,6	4	0,55	45	0,5	2	2	A
UFG86006003A04003045	0,3	0,6	4	0,55	45	0,5	3	2	A
UFG86006003A04004045	0,3	0,6	4	0,55	45	0,5	4	2	A
UFG86006003A04005045	0,3	0,6	4	0,55	45	0,5	5	2	A
UFG86006003A04006045	0,3	0,6	4	0,55	45	0,5	6	2	A
UFG86006003A04008045	0,3	0,6	4	0,55	45	0,5	8	2	A
UFG86006003A04010045	0,3	0,6	4	0,55	45	0,5	10	2	A
UFG86008004A04002045	0,4	0,8	4	0,75	45	0,6	2	2	A
UFG86008004A04004045	0,4	0,8	4	0,75	45	0,6	4	2	A
UFG86008004A04006045	0,4	0,8	4	0,75	45	0,6	6	2	A
UFG86008004A04008045	0,4	0,8	4	0,75	45	0,6	8	2	A
UFG86008004A04010045	0,4	0,8	4	0,75	45	0,6	10	2	A
UFG86010005A04003045	0,5	1	4	0,95	45	0,8	3	2	A
UFG86010005A04004045	0,5	1	4	0,95	45	0,8	4	2	A
UFG86010005A04005045	0,5	1	4	0,95	45	0,8	5	2	A
UFG86010005A04006045	0,5	1	4	0,95	45	0,8	6	2	A
UFG86010005A04007045	0,5	1	4	0,95	45	0,8	7	2	A
UFG86010005A04008045	0,5	1	4	0,95	45	0,8	8	2	A
UFG86010005A04009045	0,5	1	4	0,95	45	0,8	9	2	A
UFG86010005A04010045	0,5	1	4	0,95	45	0,8	10	2	A
UFG86010005A04012045	0,5	1	4	0,95	45	0,8	12	2	A
UFG86010005A04014050	0,5	1	4	0,95	50	0,8	14	2	A
UFG86010005A04016050	0,5	1	4	0,95	50	0,8	16	2	A
UFG86010005A04020055	0,5	1	4	0,95	55	0,8	20	2	A
UFG86012006A04006045	0,6	1,2	4	1,15	45	1	6	2	A
UFG86012006A04008045	0,6	1,2	4	1,15	45	1	8	2	A

µm	d1 h6	R	± 0.005

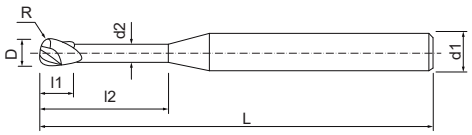
UFG86

FOR RIB PROCESSING DO ŻEBER

2-Flute, Miniature Ball Nose 2-ostrzowe, kuliste, miniaturowe

	HSM Vmax	F	M	30°	A							max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
	○	○	●	●										





D code Kod	R	D	d1	d2	L	l1	l2	Z	Shank Uchwyt
UFG86012006A04010045	0,6	1,2	4	1,15	45	1	10	2	A
UFG86012006A04012045	0,6	1,2	4	1,15	45	1	12	2	A
UFG86015008A04006045	0,75	1,5	4	1,45	45	1,2	6	2	A
UFG86015008A04008045	0,75	1,5	4	1,45	45	1,2	8	2	A
UFG86015008A04010045	0,75	1,5	4	1,45	45	1,2	10	2	A
UFG86015008A04012045	0,75	1,5	4	1,45	45	1,2	12	2	A
UFG86015008A04014050	0,75	1,5	4	1,45	50	1,2	14	2	A
UFG86015008A04016050	0,75	1,5	4	1,45	50	1,2	16	2	A
UFG86015008A04020055	0,75	1,5	4	1,45	55	1,2	20	2	A
UFG86020010A04004045	1	2	4	1,95	45	1,6	4	2	A
UFG86020010A04006045	1	2	4	1,95	45	1,6	6	2	A
UFG86020010A04008045	1	2	4	1,95	45	1,6	8	2	A
UFG86020010A04010045	1	2	4	1,95	45	1,6	10	2	A
UFG86020010A04012045	1	2	4	1,95	45	1,6	12	2	A
UFG86020010A04014050	1	2	4	1,95	50	1,6	14	2	A
UFG86020010A04016050	1	2	4	1,95	50	1,6	16	2	A
UFG86020010A04018055	1	2	4	1,95	55	1,6	18	2	A
UFG86020010A04020055	1	2	4	1,95	55	1,6	20	2	A
UFG86020010A04022060	1	2	4	1,95	60	1,6	22	2	A
UFG86020010A04025060	1	2	4	1,95	60	1,6	25	2	A
UFG86020010A04030070	1	2	4	1,95	70	1,6	30	2	A
UFG86030015A06012050	1,5	3	6	2,85	50	2,4	12	2	A
UFG86030015A06014055	1,5	3	6	2,85	55	2,4	14	2	A
UFG86030015A06016055	1,5	3	6	2,85	55	2,4	16	2	A
UFG86030015A06018060	1,5	3	6	2,85	60	2,4	18	2	A
UFG86030015A06020060	1,5	3	6	2,85	60	2,4	20	2	A
UFG86030015A06025065	1,5	3	6	2,85	65	2,4	25	2	A
UFG86030015A06030070	1,5	3	6	2,85	70	2,4	30	2	A
UFG86030015A06035080	1,5	3	6	2,85	80	2,4	35	2	A
UFG86040020A06012060	2	4	6	3,85	60	3,2	12	2	A
UFG86040020A06016060	2	4	6	3,85	60	3,2	16	2	A
UFG86040020A06020065	2	4	6	3,85	65	3,2	20	2	A
UFG86040020A06025070	2	4	6	3,85	70	3,2	25	2	A
UFG86040020A06030070	2	4	6	3,85	70	3,2	30	2	A
UFG86040020A06035080	2	4	6	3,85	80	3,2	35	2	A
UFG86040020A06040090	2	4	6	3,85	90	3,2	40	2	A
UFG86040020A06045090	2	4	6	3,85	90	3,2	45	2	A
UFG86040020A06050100	2	4	6	3,85	100	3,2	50	2	A

µm	d1 h6	R	± 0.005

UFG86

Cutting Conditions Parametry skrawania

SEMI-FINISHING / OBRÓBKA PÓŁWYKAŃCZAJĄCA

	**Alloy Steel** Stal stopowa			**Hardened Steels** Stale hartowane				
	30 - 42HRC			**42 - 55HRC**			**55 - 65HRC**	
d1 (mm)	**ap (mm)**	**RPM**	**mm/min**	**ap (mm)**	**RPM**	**mm/min**	**RPM**	**mm/min**
0,20	0,016	50000	315	0,013	50000	275	50000	235
0,30	0,017	48000	500	0,014	48000	460	46000	405
0,40	0,032	48000	755	0,025	48000	470	46000	420
0,50	0,028	34100	630	0,022	31900	510	31900	460
0,60	0,034	28600	615	0,027	26400	500	26400	420
0,80	0,064	22000	670	0,050	19800	510	19800	460
1,00	0,080	17600	630	0,063	15400	490	15400	460
1,20	0,032	14300	615	0,025	12000	500	12000	440
1,50	0,048	11000	605	0,038	10000	500	10000	440
2,00	0,064	8500	615	0,050	7900	490	7900	460
3,00	0,096	5700	765	0,076	5300	615	5300	575
4,00	0,128	4300	710	0,100	3950	575	3850	555

FINISHING / OBRÓBKA WYKAŃCZAJĄCA

	**Alloy Steel** Stal stopowa			**Hardened Steels** Stale hartowane				
	30 - 42HRC			**42 - 55HRC**			**55 - 65HRC**	
d1 (mm)	**ap (mm)**	**RPM**	**mm/min**	**ap (mm)**	**RPM**	**mm/min**	**RPM**	**mm/min**
0,20	0,006	50000	365	0,005	50000	325	50000	275
0,30	0,010	50000	545	0,008	50000	480	50000	440
0,40	0,013	50000	825	0,011	50000	575	50000	480
0,50	0,007	49500	910	0,005	35200	565	35200	500
0,60	0,007	40700	890	0,006	29700	565	29700	500
0,80	0,016	30800	930	0,013	22000	575	22000	525
1,00	0,008	24200	890	0,007	17600	565	17600	525
1,20	0,024	18700	815	0,019	14000	565	14000	500
1,50	0,031	14300	795	0,024	11500:	565	11500	500
2,00	0,024	11000	840	0,019	8800	555	8800	500
3,00	0,064	8200	1050	0,050	5800	680	5800	650
4,00	0,080	6200	1035	0,063	4400	650	4400	595

UFX

UFX END MILLS
FREZY UFX



UFX END MILLS for HSM are designed to machine alloy steels, non-alloy steels, tool steels, heat resistant steels, hardened steels up to HRC 65 (Possible) / up to 55HRC (Recommended), cast iron, mold steels.

FREZY WALCOWO-CZOŁOWE UFX przeznaczone są do obróbki szybkościowej (OS) stali stopowej, niestopowej, narzędziowej, żaroodpornej, hartowanej <65 HRC (Możliwe) / <55HRC (Zalecane), żeliwa oraz stali do produkcji form i wykrojników.

TIZ IMPLEMENTS

P	H	M	K	N	S

UFX END MILLS for HSM are designed to machine alloy steels, non-alloy steels, tool steels, heat resistant steels, hardened steels up to HRC 65 (Possible) / up to 55HRC (Recommended), cast iron, mold steels.

FREZY WALCOWO-CZOŁOWE UFX przede wszystkim zalecane są do obróbki szybkościowej (OS) stali stopowej, niestopowej, narzędziowej, żaroodpornej, hartowanej do 65 HRC (Możliwe) / do 55HRC (Zalecane), żeliwa, stali do produkcji form i wykrojników.

NOTE:

- If the rigidity of the machine or the work material installation is very low, or chattering and noise is generated, please reduce RPM and FEED rate proportionally.
- Cutting conditions may be considerably different due to the tool overhang, depth of cut, and machining tool condition, please use the catalogue cutting parameters as a reference starting point.
- If the depth of cut is shallow, the RPM and FEED rate can be increased.
- For hardened materials air blow/air oil mist is recommended.
- A high-speed spindle is recommended, when using a reduced RPM, the FEED rate must be reduced proportionally.
- High pressure coolant and air blow are recommended to dispose of chips efficiency.
- Use a rigid machine and work clamping method.
- Down (climb) cutting is recommended.
- We recommend that you set the width of cut as small as possible (about 5% of dia.) and divide the machining into several passes and work on high cutting parameters. There will be much higher tool life and surface roughness.
- When drilling, please set the FEED rate 30% below the normal rate.
- When cutting austenitic stainless steel and heat resistant steel, the use of non-water soluble fluid is strongly recommended.

UWAGA:

- Jeżeli sztywność obrabiarki lub mocowanie obrabianego przedmiotu nie są wystarczające lub występują wibracje i nadmierny hałas, należy proporcjonalnie zmniejszyć obroty i posuw.
- Parametry skrawania mogą być różne w zależności od długości narzędzia wystającej z oprawki, głębokości skrawania oraz stanu obrabiarki. Proszę stosować parametry skra-wania podane w katalogu jako wyjściowy punkt odniesienia.
- Jeżeli głębokość skrawania jest mała, obroty i posuw mogą być zwiększone.
- Przy obróbce twardych materiałów zaleca się stosowanie mgły olejowej/nadmuchu powietrza.
- Zalecane jest stosowanie wysokoobrotowych obrabiarek, w przypadku mniejszych pręd-kości obrotowych, posuw powinien być zmniejszony proporcjonalnie.
- Dla efektywnego odprowadzania wiórów zalecane jest stosowanie nadmuchu powietrza lub chłodziwa pod dużym ciśnieniem.
- Zalecane jest stosowanie sztywnych obrabiarek oraz systemów mocowania.
- Zalecane jest frezowanie współbieżne.
- Zalecamy stosowanie możliwie najmniejszej szerokości skrawania - około 5% średnicy roboczej narzędzia i podzielenie operacji obróbki na kilka przejść przy większych parametrach skrawania, co znacznie wydłuży żywotność narzędzia oraz polepszy jakość obrabianej powierzchni.
- Przy zagłębianiu zalecane jest ustawienie posuwu wgłębnego na poziomie 30% mniejszym od posuwu roboczego.
- Przy obróbce stali austenitycznej, nierdzewnej i stali żaroodpornej zaleca się bez-względne stosowanie oleju nie emulgującego.

EDP No.		Z	Angle Kąt	Materials Materiały	D / R	Pag. / Str.
UFX10		2	30°	P K N	D 0,4 - 25	5 - 6
UFX16		2	30°	P K N	D 2 - 25	7
UFX36		3	30°	P K N	D 1 - 20	8
UFX95		3	30°	P K N	D 1 - 20	9
UFX11		3	30°	P K N	D 2 - 25	10 - 11
UFX17		4	30°	P K N	D 2 - 25	12 - 13
UFX14		3 - 5	20°	P K N	D 6 - 25	14
UFX12		6 - 8	20°	P K N	D 6 - 25	15 - 16
UFX34		6	45°	P K	D 6 - 25	17
UFX06		4	45°	P H M K N S	D 2 - 20	18 - 20
UFX07		4	45°	P H M K N S	D 3 - 20	21 - 22
UFX08		4	45°	P H M K N S	D 3 - 20	23 - 24
UFX09		4	45°	P H M K N S	D 3 - 20	25 - 26
UFX32		3 - 5	20°	P K N	D 6 - 25	27
UFX39		4	30°	P K	D 2 - 16	28 - 29
UFX35		6	45°	P K	D 6 - 20	30
UFX60		4 - 5	45°	P K N	D 6 - 20	31 - 32
UFX54		2	30°	P K	D 0,2 - 20	33 - 37
UFX58		2	30°	P K	D 0,2 - 20	38 - 51
UFX61		4	30°	P K	D 1 - 20	52 - 56
UFX62		4		P K	D 1 - 20	57 - 67
UFX67		2	30°	P K N	D 0.03 - 25	68 - 71
UFX71		2	30°	P K	D 1 - 25	72 - 77
UFX69		2	30°	P K N	D 0.1 - 12	78 - 86
UFX70		4		P K N	D 0.8 - 25	87
UFX75		4		P K	D 1 - 20	88 - 90
UFX73		4	30°	P K	D 1 - 25	91 - 95
UFX74		4	30°	P K N	D 1.0 - 12	96 - 101

EDP No.		Z	Angle Kąt	Materials Materiały	D / R	Pag. / Str.
UFX77		6	45°	P K S	D 6 - 20	102 - 103
UFX18		2	30°	P	D 3 - 20	104 - 105
UFX19		4	30°	P K N	D 3 - 20	106 - 107
UFX05		4	45°	P K N	D 10 - 22	108 - 109
UFX97		6	45°	P K	D 6 - 12	110
UFX20		4	45°	P H M K N S	D 3 - 20	111 - 112
UFX65		2	30°	P K	R 0,2 - 1,5	113
UFX76		2	30°	P K	R 0,2 - 12,5	114 - 115
UFX13		2	30°	P K	R 0,5 - 12,5	116 - 117
UFX78		2	30°	P K	R 0,5 - 12,5	118 - 119
UFX53		2	30°	P K	R 0,5 - 12,5	120 - 121
UFX99		2	30°	P K	R 1,5 - 12,5	122 - 123
UFX51		2	30°	P K	R 0,05 - 12,5	124 - 127
UFX56		2	30°	P K	R 0,05 - 6	128 - 138
UFX38		2	30°	P K	R 1 - 10	139
UFX41		2	30°	P K	R 1,5 - 8	140 - 141
UFX42		2	30°	P K	R 2,5 - 8	142 - 143
UFX63		2	30°	P K	R 1,5 - 8	144 - 145
UFX33		3 - 4	20°	P K N	R 3 - 10	146
UFX15		4	30°	P H K	R 0,5 - 12,5	147 - 148
UFX64		4	30°	P H K	R 2,5 - 8	149 - 150
UFX02		2	30°	P	R 0,5 - 6	151 - 152
UFX37		2	30°	P K	D 2 - 8	153
UFX83		2	30°	P K	D 0,4 - 3	154 - 156
UFX86		2	30°	P K	D 04 - 20	157 - 160
UFX66		2	25°	P K	D 0,5 - 6	161 - 164
UFX89		4	25°	P K	D 1 - 2	165 - 166
UFX90		4	25°	P K	D 1 - 2	167 - 168

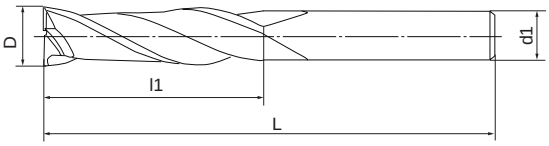
UFX10

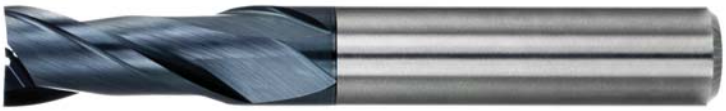
SQUARE TYPE WALCOWO-CZOŁOWE

2-Flute, Short Length 2-ostrzowe, krótkie

		HSM Vmax	F	M	30°	A	B					max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○	●	●	○					○	○	○				

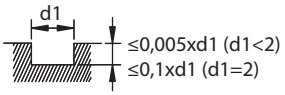


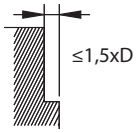
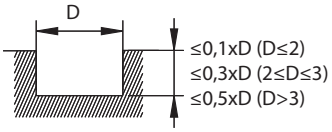
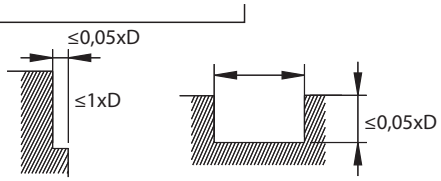


D code new Nowy kod	D code kod код	D	d1	L	l1	Shank Uchwyt	Z
UFX10004000A03001040	UFX10004	0,4	3	40	0,8	A	2
UFX10005000A03001040	UFX10005	0,5	3	40	1	A	2
UFX10006000A03001040	UFX10006	0,6	3	40	1,2	A	2
UFX10007000A03001040	UFX10007	0,7	3	40	1,4	A	2
UFX10008000A03002040	UFX10008	0,8	3	40	1,6	A	2
UFX10009000A03002040	UFX10009	0,9	3	40	2	A	2
UFX10010000A04003040	UFX10010	1	4	40	2,5	A	2
UFX10011000A04003040	UFX10011	1,1	4	40	2,5	A	2
UFX10012000A04004040	UFX10012	1,2	4	40	4	A	2
UFX10013000A04004040	UFX10013	1,3	4	40	4	A	2
UFX10014000A04004040	UFX10014	1,4	4	40	4	A	2
UFX10015000A04004040	UFX10015	1,5	4	40	4	A	2
UFX10010000A06003040	UFX10901	1	6	40	2,5	A	2
UFX10015001A06004040	UFX10902	1,5	6	40	4	A	2
UFX10020002A04006040	UFX10020	2	4	40	6	A	2
UFX10020003A06006040	UFX10903	2	6	40	6	A	2
UFX10025004A04008040	UFX10025	2,5	4	40	8	A	2
UFX10025005A06008040	UFX10904	2,5	6	40	8	A	2
UFX10030006A06008045	UFX10030	3	6	45	8	A	2
UFX10035007A06010045	UFX10035	3,5	6	45	10	A	2
UFX10040008A06011045	UFX10040	4	6	45	11	A	2
UFX10045009A06011045	UFX10045	4,5	6	45	11	A	2
UFX10050010A06013050	UFX10050	5	6	50	13	A	2
UFX10055011A06013050	UFX10055	5,5	6	50	13	A	2
UFX10060012A06013050	UFX10060	6	6	50	13	A	2
UFX10065013A08016060	UFX10065	6,5	8	60	16	A	2
UFX10070014A08016060	UFX10070	7	8	60	16	A	2
UFX10075015A08016060	UFX10075	7,5	8	60	16	A	2
UFX10080016A08019060	UFX10080	8	8	60	19	A	2
UFX10085017A10019070	UFX10085	8,5	10	70	19	A	2
UFX10090018A10019070	UFX10090	9	10	70	19	A	2
UFX10095019A10019070	UFX10095	9,5	10	70	19	A	2
UFX10100020A10022070	UFX10100	10	10	70	22	A	2
UFX10105021A12022075	UFX10105	10,5	12	75	22	A	2
UFX10110022A12022075	UFX10110	11	12	75	22	A	2
UFX10115023A12022075	UFX10115	11,5	12	75	22	A	2
UFX10120024A12026075	UFX10120	12	12	75	26	A	2
UFX10130025A12026085	UFX10906	13	12	85	26	A	2
UFX10140026A14026085	UFX10140	14	14	85	26	A	2
UFX10140027A16026085	UFX10905	14	16	85	26	A	2
UFX10150028A16026090	UFX10908	15	16	90	26	A	2
UFX10160029A16032100	UFX10160	16	16	100	32	A	2
UFX10170030A16032100	UFX10909	17	16	100	32	A	2
UFX10180031A18032100	UFX10180	18	18	100	32	A	2
UFX10190032A20032100	UFX10911	19	20	100	32	A	2
UFX10200033A20038105	UFX10200	20	20	105	38	A	2
UFX10220034A20038105	UFX10220	22	20	105	38	A	2
UFX10240035A25045120	UFX10240	24	25	120	45	A	2
UFX10250036A25045120	UFX10250	25	25	120	45	A	2

UFX10

Cutting Conditions Parametry skrawania

Material Materiał	Carbon Steel, Cast Iron Stal węglowa, żeliwo		Alloy steel, Tool steel Stal stopowa, Stal narzędziowa		Austenitic Heat Resistant Steel Stal żaroodporna austenityczna		Hardened steel Stal hartowana	
	<30HRC		30 - 45HRC				45 - 65HRC	
D (mm)	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
0,4	42000	170	42000	170	42000	170	42000	80
0,5	42000	340	42000	340	31500	250	31500	130
1,0	31500	630	21000	420	15750	320	15750	160
1,5	21000	840	14180	590	10500	420	10500	170
DOC*								

Material Materiał	Aluminium Alloy Except Soft Aluminium Alloys Stopy aluminium (oprócz miękkich stopów aluminium)		Carbon Steel, Cast Iron Stal węglowa, żeliwo		Alloy steel, Tool steel Stal stopowa, Stal narzędziowa		Austenitic Heat Resistant Steel Stal żaroodporna austenityczna		Hardened steel Stal hartowana	
			<30HRC		30 - 45HRC				45 - 65HRC	
D (mm)	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
2	23100	460 (460)	11550	190 (190)	7560	120 (120)	6300 (6300)	90 (90)	5040	50 (50)
3	17850	500 (500)	8930	210 (210)	5570	140 (140)	4620 (4620)	120 (120)	3360	60 (60)
4	14700	770 (610)	7560	380 (300)	4620	230 (190)	3890 (3150)	190 (120)	2840	80 (60)
5	12600	900 (720)	6300	400 (320)	3780	240 (190)	3150 (2520)	200 (120)	2310	80 (70)
6	11550	1040 (830)	5570	440 (360)	3360	250 (200)	2840 (2310)	220 (140)	2100	110 (80)
8	8400	1050 (840)	4200	470 (380)	2520	250 (200)	2100 (1680)	230 (140)	1680	130 (100)
10	6720	950 (760)	3360	410 (330)	2000	200 (160)	1680 (1370)	200 (120)	1370	110 (80)
12	5570	780 (620)	2840	350 (270)	1680	170 (140)	1370 (1050)	160 (90)	1160	90 (70)
16	4200	590 (470)	2100	250 (200)	1260	130 (110)	1050 (840)	130 (70)	840	70 (50)
20	3360	470 (380)	1680	210 (170)	1050	110 (80)	840 (670)	100 (60)	670	50 (40)
25	2630	370 (290)	1370	170 (140)	840	80 (70)	670 (540)	80 (50)	540	40 (30)
DOC*	≤0,01xD (D≤3) ≤0,2xD (D>3)  									

*Depth of cut
Głębokość skrawania W ( ) Indicates standard feed rate for slotting
W ( ) pokazane są wartości standardowe posuwu dla frezowania rowków When drilling, please set the feed rate 30% below the normal rate.
Przy zagłębianiu zalecamy stosowanie posuwu na poziomie o 30% niższym od podanych wartości.

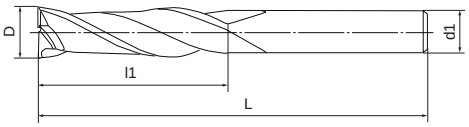
µm	D 0~-0.03	d1 h6

UFX16

SQUARE TYPE WALCOWO-CZOŁOWE
2-Flute, Long Length 2-ostrzowe, długie

HSM Vmax	F	M	30°	A	B					max	min		AIR
										○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○	●	●	○					○	○	○				





D code new Nowy kod	D code kod код	D	d1	L	l1	Shank Uchwyt	Z
UFX16020000A04008040	UFX16020	2	4	40	8	A	2
UFX16030000A06012050	UFX16030	3	6	50	12	A	2
UFX16040000A06015050	UFX16040	4	6	50	15	A	2
UFX16050000A06020060	UFX16050	5	6	60	20	A	2
UFX16060000A06020060	UFX16060	6	6	60	20	A	2
UFX16080000A08025070	UFX16080	8	8	70	25	A	2
UFX16100000A10030090	UFX16100	10	10	90	30	A	2
UFX16120000A12030090	UFX16120	12	12	90	30	A	2
UFX16140000A16040110	UFX16140	14	16	110	40	A	2
UFX16160000A16050110	UFX16160	16	16	110	50	A	2
UFX16180000A20050110	UFX16180	18	20	110	50	A	2
UFX16200000A20055110	UFX16200	20	20	110	55	A	2
UFX16250000A25075140	UFX16250	25	25	140	75	A	2

Cutting Conditions

Material Materiał	Carbon Steel, Cast Iron Stal węglowa, żeliwo		Alloy steel, Tool steel Stal stopowa, Stal narzędziowa		Austenitic Heat Resistant Steel Stal żaroodporna austenityczna		Hardened steel Stal hartowana	
	<30HRC		30 - 45HRC				45 - 65HRC	
D (mm)	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
2	6300	60 (60)	5040	50 (50)	3680 (3680)	30 (32)	3150	30 (16)
3	4410	70 (70)	3570	60 (60)	2730 (2730)	40 (42)	2210	30 (21)
4	3570	80 (40)	2840	70 (30)	2210 (1680)	50 (21)	1790	40 (21)
5	3050	110 (50)	2420	80 (40)	1890 (1420)	60 (26)	1580	40 (21)
6	2630	130 (60)	2100	110 (50)	1580 (1160)	80 (32)	1370	50 (26)
8	2000	140 (70)	1580	110 (50)	1260 (950)	90 (37)	1050	50 (26)
10	1680	140 (70)	1370	110 (50)	1000 (750)	80 (32)	840	50 (26)
12	1370	110 (50)	1160	90 (50)	840 (630)	60 (26)	700	40 (21)
16	1050	80 (40)	860	70 (30)	630 (470)	50 (21)	530	30 (16)
20	840	70 (30)	680	50 (30)	500 (380)	40 (16)	420	30 (14)
25	680	50 (30)	550	40 (20)	400 (290)	30 (13)	340	20 (11)
DOC*	≤0,05xD (MAX 0,5mm) ≤2,5xD		D ≤0,05xD (D=1) ≤0,1xD (1<D≤2) ≤0,1xD (2<D≤3) ≤0,3xD (D>3) (MAX 3mm)				(MAX 0,3mm) D (MAX 5mm)	

* Depth of cut

Głębokość skrawania W( ) Indicates standard feed rate for slotting

When drilling, please set the feed rate 30% below the normal rate.

µm	D 0~-0.03	d1 h6

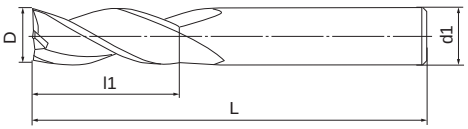
UFX36

SQUARE TYPE WALCOWO-CZOŁOWE

3-Flute, Miniature 3-ostrzowe, miniaturowe

HSM Vmax	F	M	30°	A	B					max	min		AIR
										○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○	●	●	○					○	○	○				





D code new Nowy kod	D code kod код	D	d1	L	l1	Shank Uchwyt	Z
UFX36010000A04002035	UFX36010	1	4	35	2	A	3
UFX36020000A04004035	UFX36020	2	4	35	4	A	3
UFX36030000A06005036	UFX36030	3	6	36	5	A	3
UFX36040000A06007038	UFX36040	4	6	38	7	A	3
UFX36050000A06008039	UFX36050	5	6	39	8	A	3
UFX36060000A06008039	UFX36060	6	6	39	8	A	3
UFX36080000A08011043	UFX36080	8	8	43	11	A	3
UFX36100000A10013050	UFX36100	10	10	50	13	A	3
UFX36120000A12015055	UFX36120	12	12	55	15	A	3
UFX36140000A14015058	UFX36140	14	14	58	15	A	3
UFX36160000A16018062	UFX36160	16	16	62	18	A	3
UFX36180000A18020070	UFX36180	18	18	70	20	A	3
UFX36200000A20022075	UFX36200	20	20	75	22	A	3

Cutting Conditions Parametry skrawania

Material Materiał	Non-alloyed, alloy steel, cast iron Stal stopowa, niestopowa, żeliwo			Alloy steel, heat resistant steel Stal stopowa, żaroodporna			Stainless steel Stal nierdzewna			Hardened steel Stal hartowana Stale hartowane					
	30HRC			30 - 45HRC						45 - 55HRC			55 - 65HRC		
d1 (mm)	RPM	FO	FR	RPM	FO	FR	RPM	FO	FR	RPM	FO	FR	RPM	FO	FR
2	11560	210	170	7560	140	110	6300	115	80	5040	30	30			
3	8920	240	190	5560	150	130	4620	125	110	3360	40	35	1900	45	40
4	7560	430	270	4620	260	160	3880	210	130	2940	45	35	1480	45	35
5	6300	450	280	3780	270	170	3160	230	140	2320	55	45	1260	45	35
6	5560	500	310	3360	310	200	2840	250	160	2000	60	50	1100	45	35
8	4200	530	340	2520	290	180	2100	265	160	1680	80	65	840	45	35
10	3260	460	300	2000	230	140	1680	230	145	1360	70	55	680	35	30
12	2740	390	250	1680	190	120	1360	180	120	1160	60	50	560	35	30
16	2200	310	200	1360	150	100	1060	150	100	900	45	35	440	20	20
18	1940	280	175	1210	135	85	950	130	85	790	35	30	380	20	20
20	1680	240	150	1060	120	70	840	115	70	680	30	25	320	20	20
DOC*	0,05xD, 1,0xD			D, 0,5xD, 0,2xD (D>3)						0,05xD, 1,0xD			D, 0,05xD		

* Depth of cut
Głębokość skrawania

µm	D 0~-0.03	d1 h6

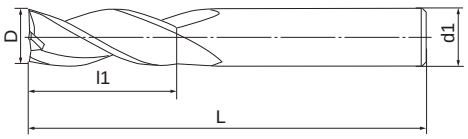
UFX95

SQUARE TYPE WALCOWO-CZOŁOWE

3-Flute, Short 3-ostrzowe, krótkie

HSM Vmax	F	M	30°	A	B					max	min		AIR
										○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○	●	●	○					○	○	○				





D code new Nowy kod	D code kod	D	d1	L	l1	Shank Uchwyt	Z
UFX95010000A03003038	UFX95010	1	3	38	2,5	A	3
UFX95015000A04005050	UFX95015	1,5	4	50	5	A	3
UFX95025000A03007038	UFX95025	2,5	3	38	7	A	3
UFX95030000A03010038	UFX95030	3	3	38	10	A	3
UFX95030000A06010050	UFX95901	3	6	50	10	A	3
UFX95035000A04012050	UFX95035	3,5	4	50	12	A	3
UFX95035000A06012050	UFX95902	3,5	6	50	12	A	3
UFX95040000A04012050	UFX95040	4	4	50	12	A	3
UFX95040000A06012050	UFX95903	4	6	50	12	A	3
UFX95045000A06014057	UFX95045	4,5	6	57	14	A	3
UFX95050000A05014050	UFX95050	5	5	50	14	A	3
UFX95050000A06014057	UFX95904	5	6	57	14	A	3
UFX95060000A06016057	UFX95060	6	6	57	16	A	3
UFX95080000A08020063	UFX95080	8	8	63	20	A	3
UFX95100000A10022072	UFX95100	10	10	72	22	A	3
UFX95120000A12025073	UFX95120	12	12	73	25	A	3
UFX95140000A14025075	UFX95140	14	14	75	25	A	3
UFX95160000A16032082	UFX95160	16	16	82	32	A	3
UFX95180000A18032092	UFX95180	18	18	92	32	A	3
UFX95200000A20038092	UFX95200	20	20	92	38	A	3

Cutting Conditions Parametry skrawania

Material Materiał	Non-alloyed, alloy steel, cast iron Stal stopowa, niestopowa, żeliwo Stal stopowa, niestopowa, żeliwo			Alloy steel, heat resistant steel Stal stopowa, żaroodporna			Stainless steel Stal nierdzewna Stal nierdzewna			Hardened steels Stale hartowane					
	30HRC			30 - 45HRC						45 - 55HRC			55 - 65HRC		
D (mm)	RPM	FO	FR	RPM	FO	FR	RPM	FO	FR	RPM	FO	FR	RPM	FO	FR
2	11560	210	170	7560	140	110	6300	115	80	5040	30	30			
3	8920	240	190	5560	150	130	4620	125	110	3360	40	35	1900	45	40
4	7560	430	270	4620	260	160	3880	210	130	2940	45	35	1480	45	35
5	6300	450	280	3780	270	170	3160	230	140	2320	55	45	1260	45	35
6	5560	500	310	3360	310	200	2840	250	160	2000	60	50	1100	45	35
8	4200	530	340	2520	290	180	2100	265	160	1680	80	65	840	45	35
10	3260	460	300	2000	230	140	1680	230	145	1360	70	55	680	35	30
12	2740	390	250	1680	190	120	1360	180	120	1160	60	50	560	35	30
16	2200	310	200	1360	150	100	1060	150	100	900	45	35	440	20	20
18	1940	280	175	1210	135	85	950	130	85	790	35	30	380	20	20
20	1680	240	150	1060	120	70	840	115	70	680	30	25	320	20	20
DOC*	0,05xD 1,0xD D 0,5xD 0,2xD (D>3)									0,05xD 1,0xD D 0,05xD					

µm	D 0~-0.03	d1 h6

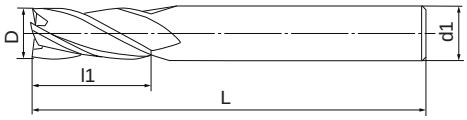
* Depth of cut
Głębokość skrawania

UFX11

SQUARE TYPE WALCOWO-CZOŁOWE
4-Flute, Short Length 4-ostrzowe, krótkie

HSM Vmax	F	M	30°	A	B					max	min		AIR
										○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○	●	●	○					○	○	○				



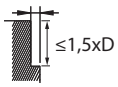
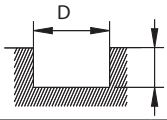


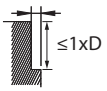
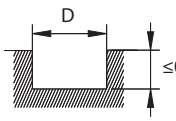
D code new Nowy kod	D code kod	D	d1	L	l1	Shank Uchwyt	Z
UFX11020000A04006040	UFX11020	2	4	40	6	A	4
UFX11020000A06006040	UFX11901	2	6	40	6	A	4
UFX11025000A04008040	UFX11025	2,5	4	40	8	A	4
UFX11025000A06008040	UFX11902	2,5	6	40	8	A	4
UFX11030000A06008045	UFX11030	3	6	45	8	A	4
UFX11035000A06010045	UFX11035	3,5	6	45	10	A	4
UFX11040000A06011045	UFX11040	4	6	45	11	A	4
UFX11045000A06011045	UFX11045	4,5	6	45	11	A	4
UFX11050000A06013050	UFX11050	5	6	50	13	A	4
UFX11055000A06013050	UFX11055	5,5	6	50	13	A	4
UFX11060000A06013050	UFX11060	6	6	50	13	A	4
UFX11065000A08016060	UFX11065	6,5	8	60	16	A	4
UFX11070000A08016060	UFX11070	7	8	60	16	A	4
UFX11075000A08016060	UFX11075	7,5	8	60	16	A	4
UFX11080000A08019060	UFX11080	8	8	60	19	A	4
UFX11085000A10019070	UFX11085	8,5	10	70	19	A	4
UFX11090000A10019070	UFX11090	9	10	70	19	A	4
UFX11095000A10019070	UFX11095	9,5	10	70	19	A	4
UFX11100000A10022070	UFX11100	10	10	70	22	A	4
UFX11105000A12022075	UFX11105	10,5	12	75	22	A	4
UFX11110000A12022075	UFX11110	11	12	75	22	A	4
UFX11115000A12022075	UFX11115	11,5	12	75	22	A	4
UFX11120000A12026075	UFX11120	12	12	75	26	A	4
UFX11130000A12026085	UFX11904	13	12	85	26	A	4
UFX11140000A14026085	UFX11140	14	14	85	26	A	4
UFX11140000A12026085	UFX11905	14	12	85	26	A	4
UFX11140000A16026085	UFX11903	14	16	85	26	A	4
UFX11150000A16026090	UFX11906	15	16	90	26	A	4
UFX11160000A16032100	UFX11160	16	16	100	32	A	4
UFX11170000A16032100	UFX11907	17	16	100	32	A	4
UFX11180000A18032100	UFX11180	18	18	100	32	A	4
UFX11180000A16032100	UFX11908	18	16	100	32	A	4
UFX11190000A20032100	UFX11909	19	20	100	32	A	4
UFX11200000A20038105	UFX11200	20	20	105	38	A	4
UFX11220000A20038105	UFX11220	22	20	105	38	A	4
UFX11240000A25045120	UFX11240	24	25	120	45	A	4
UFX11250000A25045120	UFX11250	25	25	120	45	A	4

µm	D 0~-0.03	d1 h6

UFX11

Cutting Conditions Parametry skrawania

Material Materiał	**Aluminium Alloy Except Soft Aluminium Alloys** Stopy aluminium (oprócz miękkich stopów aluminium)		**Carbon Steel, Alloy Steel , Cast Iron** Stal węglowa, stal stopowa, żeliwo		**Alloy steel, Tool steel** Stal stopowa, Stal narzędziowa		**Austenitic Heat Resistant Steel** Stal żaroodporna austenityczna	
			<30HRC		**30 - 45HRC**			
D (mm)	**RPM**	**mm/min**	**RPM**	**mm/min**	**RPM**	**mm/min**	**RPM**	**mm/min**
2	22000	800	11000	270	7200	170	6000	140
3	17000	870	8500	300	5300	200	4400	170
4	14000	1100	7200	540	4400	330	3700	270
5	12000	1300	6000	570	3600	350	3000	290
6	11000	1500	5300	630	3200	360	2700	320
8	8000	1500	4000	680	2400	360	2000	330
10	6400	1350	3200	590	1900	290	1600	290
12	5300	1100	2700	500	1600	240	1300	230
16	4000	840	2000	360	1200	180	1000	180
20	3200	680	1600	300	1000	150	800	140
25	2500	530	1300	240	800	120	640	110
DOC*	≤0,1xD (D≤3) ≤0,2xD (D>3)  ≤1,5xD				D  ≤0,3xD (D≤3) ≤0,5xD (D>3)			

Material Materiał	**Hardened Steel** Stal hartowana		**Hardened Steel** Stal hartowana	
	45 - 55HRC		**55 - 65HRC**	
D (mm)	**RPM**	**mm/min**	**RPM**	**mm/min**
2	4800	70	2400	30
3	3200	85	1800	55
4	2700	110	1400	75
5	2200	120	1200	75
6	2000	150	1000	75
8	1600	180	800	70
10	1300	150	650	65
12	1100	140	530	55
16	800	100	400	40
20	640	75	320	30
25	510	60	250	25
	≤0,05xD  ≤1xD		D  ≤0,05xD	

The above table shows cutting condition for side milling. For slotting, please reduce only the feed rate by 20%. Please reduce the revolution by 40% and the feed rate by 60% in the case of slotting of Austenitic Heat Resistant Steel.

Podane powyżej warunki skrawania dotyczą frezowania boku. Dla frezowania rowków zalecamy zmniejszyć tylko wartości posuwu o 20%. W wypadku frezowania rowków w stali żaroodpornej austenitycznej zalecamy zmniejszyć o 40% prędkość obrotową oraz o 60% - posuw.

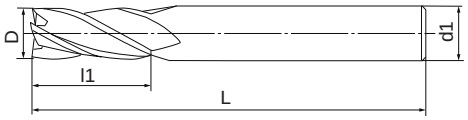
* Depth of cut
Głębokość skrawania

UFX17

SQUARE TYPE WALCOWO-CZOŁOWE
4-Flute, Long Length 4-ostrzowe, długie

		HSM Vmax	F	M	30°	A	B					max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○	●	●	○					○	○	○				



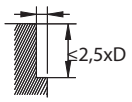
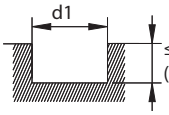


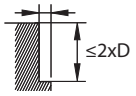
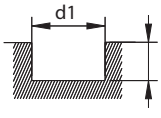
D code new Nowy kod	D code kod	D	d1	L	l1	Shank Uchwyt	Z
UFX17020000A04008040	UFX17020	2	4	40	8	A	4
UFX17030000A06012050	UFX17030	3	6	50	12	A	4
UFX17040000A06015050	UFX17040	4	6	50	15	A	4
UFX17050000A06020060	UFX17050	5	6	60	20	A	4
UFX17060000A06020060	UFX17060	6	6	60	20	A	4
UFX17080000A08025070	UFX17080	8	8	70	25	A	4
UFX17100000A10030090	UFX17100	10	10	90	30	A	4
UFX17120000A12030090	UFX17120	12	12	90	30	A	4
UFX17140000A16040110	UFX17140	14	16	110	40	A	4
UFX17160000A16050110	UFX17160	16	16	110	50	A	4
UFX17180000A20050110	UFX17180	18	20	110	50	A	4
UFX17200000A20055110	UFX17200	20	20	110	55	A	4
UFX17250000A25075140	UFX17250	25	25	140	75	A	4

µm	D 0~-0.03	d1 h6

UFX17

Cutting Conditions Parametry skrawania

Material Materiał	Carbon Steel, Alloy Steel Cast Iron Stal węglowa, stal stopowa, żeliwo		Alloy steel, Tool steel Stal stopowa, Stal narzędziowa		Austenitic Heat Resistant Steel Stal żaroodporna austenityczna	
	<30HRC		30 - 45HRC			
D (mm)	RPM	mm/min	RPM	mm/min	RPM	mm/min
2	6620	110	5290	80	3100	60
3	4630	120	3750	110	2600	70
4	3750	150	2980	120	2100	85
5	3200	190	2540	150	1800	100
6	2760	230	2210	190	1500	130
8	2100	240	1660	190	1200	150
10	1760	240	1440	190	950	130
12	1440	190	1220	170	800	100
16	1220	170	930	130	600	80
20	880	120	710	90	480	70
25	650	85	520	70	380	50
DOC*	≤0,05xD (MAX 0,5mm)  ≤2,5xD		d1  ≤0,3xD (MAX 0,5mm)			

Material Materiał	Hardened Steel Stal hartowana		Hardened Steel Stal hartowana	
	45 - 55HRC		55 - 65HRC	
D (mm)	RPM	mm/min	RPM	mm/min
2	3310	50	2200	25
3	2310	60	1980	30
4	1880	60	1540	40
5	1660	70	1320	40
6	1440	90	1220	50
8	1100	90	880	50
10	880	90	700	50
12	740	70	590	40
16	590	60	460	40
20	440	50	360	30
25	320	35	250	20
DOC*	≤0,02xD (MAX 0,3mm)  ≤2xD		d1  ≤0,05xD (MAX 0,5mm)	

The above table shows cutting condition for side milling. For slotting, please reduce the feed rate by 50% for the table figure. Please reduce the revolution by 40% and the feed rate by 60% in the case of slotting of Austenitic Heat Resistant Steel. When drilling, please reduce the feed rate by 30% or more.

Podane powyżej warunki skrawania dotyczą frezowania boku. Dla frezowania rowków zalecamy zmniejszyć wartości posuwu o połowę. W wypadku frezowania rowków stali żaroodpornej austenitycznej zalecamy zmniejszyć o 40% prędkość obrotową oraz o 60% - posuw. Przy zagłębianiu zalecamy stosowanie posuwu na poziomie o co najmniej 30% mniejszym od podanych wartości.

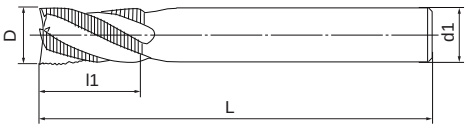
*Depth of cut
Głębokość skrawania

UFX14

SQUARE TYPE WALCOWO-CZOŁOWE
Multi Flute, Long Length Wieloostrzowe, długie

HSM Vmax	F	M	20°	A	B					max	min		AIR
										○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○	●	●	○					○	○	○				





D code new Nowy kod	D code kod	D	d1	L	l1	Shank Uchwyt	Z
UFX14060000A06016057	UFX14060	6	6	57	16	A	3
UFX14070000A08016063	UFX14070	7	8	63	16	A	3
UFX14080000A08016063	UFX14080	8	8	63	16	A	3
UFX14090000A10019072	UFX14090	9	10	72	19	A	4
UFX14100000A10022072	UFX14100	10	10	72	22	A	4
UFX14120000A12026083	UFX14120	12	12	83	26	A	4
UFX14140000A14026083	UFX14140	14	14	83	26	A	4
UFX14140000A16026083	UFX14901	14	16	83	26	A	4
UFX14160000A16032092	UFX14160	16	16	92	32	A	4
UFX14180000A18032092	UFX14180	18	18	92	32	A	4
UFX14200000A20038104	UFX14200	20	20	104	38	A	4
UFX14250000A25045121	UFX14250	25	25	121	45	A	5

Cutting Conditions Parametry skrawania

			Non-alloyed, alloy steels, cast iron Stale stopowe, niestopowe, żeliwo		Austenitic Heat Resistant Steel Stal żaroodporna austenityczna					Hardened Steel Stal hartowana			
			30HRC		30 - 38HRC		38 - 45HRC			45 - 55HRC		55 - 65HRC	
D (mm)	ae	ap	RPM	mm/ min	RPM	mm/ min	RPM	mm/ min	ap	RPM	mm/ min	RPM	mm/ min
6	1,8	9	15600	2320	12400	840	8400	570	0,3	3400	260	2400	190
8	2,4	12	11600	2320	9200	840	6300	570	0,4	2400	240	1800	180
10	3	15	9200	2320	7600	840	5100	570	0,5	2000	290	1300	190
12	3,6	18	8000	2400	6000	800	4200	570	0,6	1680	260	1200	190
14	4,2	21	6800	2400	5200	840	3600	570	0,7	1400	200	900	130
16	4,8	24	6000	2400	4800	760	3300	510	0,8	1200	160	800	110
18	5,4	27	5200	2320	4400	720	2700	420	0,9	1100	150	700	100
20	6	30	4800	2160	3600	560	2400	360	1	1000	150	660	100
25	75	37,5	4300	2150	3200	620	2160	410	1,25	900	160	600	100

The above table shows cutting condition for side milling. For slotting, please reduce only the feed rate by 20%. Please reduce the revolution by 40% and the feed rate by 60% in the case of slotting of Austenitic Heat Resistant Steel.

Podane powyżej warunki skrawania dotyczą frezowania boku. Dla frezowania rowków zalecamy zmniejszyć tylko wartości posuwu o 20%.
W wypadku frezowania rowków stali żaroodpornej austenitycznej zalecamy zmniejszyć o 40% prędkość obrotową oraz o 60% - posuw.

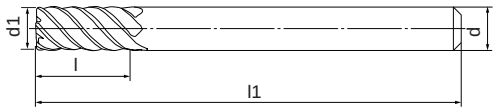
µm	D 0~-0.03	d1 h6

UFX12

SQUARE TYPE WALCOWO-CZOŁOWE
Multi Flute, Long Length Wieloostrzowe, długie

HSM Vmax	F	M	20°	A	B	max	min	AIR
						○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○	●	●	○					○	○	○				





D code new Nowy kod	D code kod	D	d1	L	l1	Shank Uchwyt	Z
UFX12060000A06013057	UFX12060	6	6	57	13	A	6
UFX12070000A08016063	UFX12070	7	8	63	16	A	6
UFX12080000A08019063	UFX12080	8	8	63	19	A	6
UFX12090000A10019072	UFX12090	9	10	72	19	A	6
UFX12100000A10022072	UFX12100	10	10	72	22	A	6
UFX12120000A12026083	UFX12120	12	12	83	26	A	6
UFX12140000A14026083	UFX12140	14	14	83	26	A	6
UFX12140000A16026083	UFX12901	14	16	83	26	A	6
UFX12160000A16032092	UFX12160	16	16	92	32	A	6
UFX12180000A18032092	UFX12180	18	18	92	32	A	8
UFX12200000A20038104	UFX12200	20	20	104	38	A	8
UFX12250000A25044104	UFX12250	25	25	104	44	A	8

µm	D 0~-0.03	d1 h6

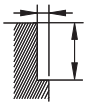
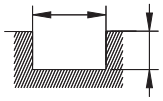
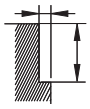
UFX12

Cutting Conditions Parametry skrawania

CONVENTIONAL MILLING / FREZOWANIE KONWENCJONALNE

Material Materiał	**Alloy steel, Tool steel** Stal stopowa, Stal narzędziowa				**Hardened Steel** Stal hartowana			
	Side milling Frezowanie boku		**Grooving or Slotting** Frezowanie rowka					
	30 - 45HRC				45 - 55HRC		55 - 60HRC	
D (mm)	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
6	4070	1440	3360	370	1660	220	1420	160
8	3090	1440	2520	370	1220	220	1050	160
10	2440	1440	2000	360	1050	220	840	160
12	2100	1220	1680	300	880	190	680	130
16	1550	920	1260	230	670	140	530	90
20	1220	720	1000	180	530	120	420	70
25	1160	630	800	150	450	90	340	60
DOC*								

CONVENTIONAL MILLING KONWENCJONALNE **HSM** / SZYBKOŚCIOWE

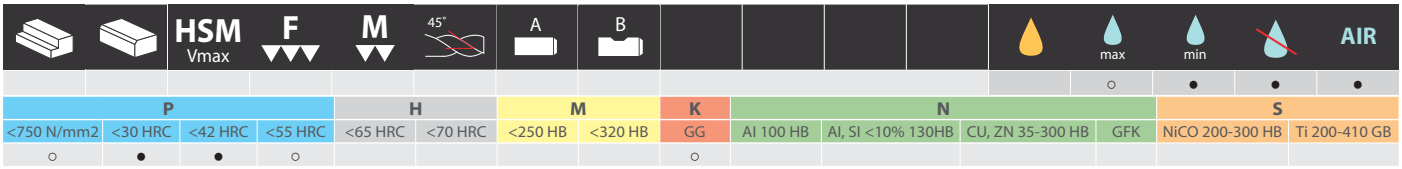
Material Materiał	**Hardened Steel** Stal hartowana		**Hardened Steel** Stal hartowana		**Alloy Steel, Hardened steel** Stal stopowa, stal hartowana		**Hardened Steel** Stal hartowana			
	60 - 65HRC		65 - 70HRC		<55 HRC		55 - 60HRC		>60HRC	
D (mm)	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
6	1160	140	840	90	17640	6390	8820	3200	4410	1540
8	880	140	630	90	13230	6390	6620	3200	3320	1540
10	710	140	500	90	10480	6290	5290	3200	2650	1540
12	590	120	420	80	8820	5290	4410	2650	2210	1320
16	440	70	320	50	6620	3970	3320	1980	1660	1000
20	340	60	250	50	5290	3200	2650	1540	1320	800
25	270	50	200	40	4730	2840	2310	1370	1180	700
DOC*										

* Depth of cut
Głębokość skrawania

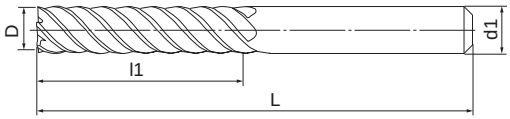
UFX34

SQUARE TYPE WALCOWO-CZOŁOWE

6-Flute, Extra Long Length 6-ostrzowe, bardzo długie



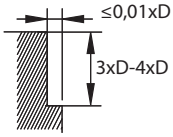
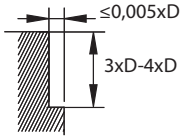
P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○	●	●	○					○						





D code new Nowy kod	D code kod	D	d1	L	l1	Shank Uchwyt	Z
UFX34060000A06026070	UFX34060	6	6	70	26	A	6
UFX34080000A08036090	UFX34080	8	8	90	36	A	6
UFX34100000A10046100	UFX34100	10	10	100	46	A	6
UFX34120000A12056110	UFX34120	12	12	110	56	A	6
UFX34160000A16066130	UFX34160	16	16	130	66	A	6
UFX34200000A20076140	UFX34200	20	20	140	76	A	6
UFX34250000A25092180	UFX34250	25	25	180	92	A	6

Cutting Conditions Parametry skrawania

Material Materiał	Alloy Steel, Hardened Steel Stal stopowa, Stal hartowana		Hardened Steel Stal hartowana					
	<45HRC		45 - 55HRC		55 - 60HRC		60 - 65HRC	
D (mm)	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
6	2340	490	1750	370	1460	260	1170	210
8	1750	470	1310	350	1100	250	880	190
10	1400	460	1050	320	880	240	710	170
12	1170	420	880	280	720	220	590	160
16	880	350	660	240	560	180	440	140
20	700	290	530	210	440	160	340	130
25	570	250	420	180	360	140	280	100
DOC*								

* Depth of cut
Głębokość skrawania

µm	D 0~-0.03	d1 h6

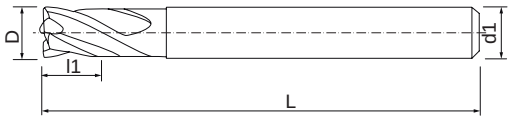
UFX06

SQUARE TYPE WALCOWO-CZOŁOWE

4-Flute, Stub 4-ostrzowe, bardzo krótkie

HSM Vmax	F	M	45°	A	B	max	min	AIR
						○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●	●	●		○	●	●		○			○	○





D code new Nowy kod	D code kod	D	d1	L	l1	Shank Uchwyt	Z
UFX06020000A06003050	UFX06020	2	6	50	3	A	4
UFX06021000A06003050	UFX06021	2,1	6	50	3,2	A	4
UFX06022000A06003050	UFX06022	2,2	6	50	3,3	A	4
UFX06023000A06004050	UFX06023	2,3	6	50	3,5	A	4
UFX06024000A06004050	UFX06024	2,4	6	50	3,6	A	4
UFX06025000A06004050	UFX06025	2,5	6	50	3,8	A	4
UFX06026000A06004050	UFX06026	2,6	6	50	3,9	A	4
UFX06027000A06004050	UFX06027	2,7	6	50	4,1	A	4
UFX06028000A06004050	UFX06028	2,8	6	50	4,2	A	4
UFX06029000A06004050	UFX06029	2,9	6	50	4,4	A	4
UFX06030000A06005050	UFX06030	3	6	50	4,5	A	4
UFX06031000A06005050	UFX06031	3,1	6	50	4,7	A	4
UFX06032000A06005050	UFX06032	3,2	6	50	4,8	A	4
UFX06033000A06005050	UFX06033	3,3	6	50	5	A	4
UFX06034000A06005050	UFX06034	3,4	6	50	5,1	A	4
UFX06035000A06005050	UFX06035	3,5	6	50	5,3	A	4
UFX06036000A06005050	UFX06036	3,6	6	50	5,4	A	4
UFX06037000A06006050	UFX06037	3,7	6	50	5,6	A	4
UFX06038000A06006050	UFX06038	3,8	6	50	5,7	A	4
UFX06039000A06006050	UFX06039	3,9	6	50	5,9	A	4
UFX06040000A06006050	UFX06040	4	6	50	6	A	4
UFX06041000A06006050	UFX06041	4,1	6	50	6,2	A	4
UFX06042000A06006050	UFX06042	4,2	6	50	6,3	A	4
UFX06043000A06007050	UFX06043	4,3	6	50	6,5	A	4
UFX06044000A06007050	UFX06044	4,4	6	50	6,6	A	4
UFX06045000A06007050	UFX06045	4,5	6	50	6,8	A	4
UFX06046000A06007050	UFX06046	4,6	6	50	6,9	A	4
UFX06047000A06007050	UFX06047	4,7	6	50	7,1	A	4
UFX06048000A06007050	UFX06048	4,8	6	50	7,2	A	4
UFX06049000A06007050	UFX06049	4,9	6	50	7,4	A	4
UFX06050000A06008050	UFX06050	5	6	50	7,5	A	4
UFX06051000A06008050	UFX06051	5,1	6	50	7,7	A	4
UFX06069000A08010060	UFX06069	6,9	8	60	10,4	A	4
UFX06070000A08011060	UFX06070	7	8	60	10,5	A	4
UFX06071000A08011060	UFX06071	7,1	8	60	10,7	A	4
UFX06072000A08011060	UFX06072	7,2	8	60	10,8	A	4
UFX06073000A08011060	UFX06073	7,3	8	60	11	A	4
UFX06074000A08011060	UFX06074	7,4	8	60	11,1	A	4
UFX06075000A08011060	UFX06075	7,5	8	60	11,3	A	4
UFX06076000A08011060	UFX06076	7,6	8	60	11,4	A	4
UFX06077000A08012060	UFX06077	7,7	8	60	11,6	A	4
UFX06078000A08012060	UFX06078	7,8	8	60	11,7	A	4
UFX06079000A08012060	UFX06079	7,9	8	60	11,9	A	4
UFX06080000A08012060	UFX06080	8	8	60	12	A	4
UFX06081000A10012075	UFX06081	8,1	10	75	12,2	A	4
UFX06082000A10012075	UFX06082	8,2	10	75	12,3	A	4
UFX06083000A10013075	UFX06083	8,3	10	75	12,5	A	4
UFX06084000A10013075	UFX06084	8,4	10	75	12,6	A	4
UFX06085000A10013075	UFX06085	8,5	10	75	12,8	A	4

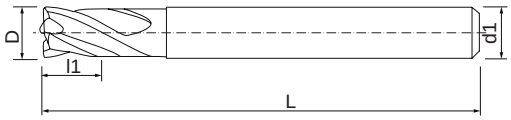
UFX06

SQUARE TYPE WALCOWO-CZOŁOWE

4-Flute, Stub 4-ostrzowe, bardzo krótkie

		HSM Vmax	F	M	45°	A	B					max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●	●	●		○	●	●		○			○	○





D code new Nowy kod	D code kod	D	d1	L	l1	Shank Uchwyt	Z
UFX06086000A10013075	UFX06086	8,6	10	75	12,9	A	4
UFX06087000A10013075	UFX06087	8,7	10	75	13,1	A	4
UFX06088000A10013075	UFX06088	8,8	10	75	13,2	A	4
UFX06089000A10013075	UFX06089	8,9	10	75	13,4	A	4
UFX06090000A10014075	UFX06090	9	10	75	13,5	A	4
UFX06091000A10014075	UFX06091	9,1	10	75	13,7	A	4
UFX06092000A10014075	UFX06092	9,2	10	75	13,8	A	4
UFX06093000A10014075	UFX06093	9,3	10	75	14	A	4
UFX06094000A10014075	UFX06094	9,4	10	75	14,1	A	4
UFX06095000A10014075	UFX06095	9,5	10	75	14,3	A	4
UFX06096000A10014075	UFX06096	9,6	10	75	14,4	A	4
UFX06097000A10015075	UFX06097	9,7	10	75	14,6	A	4
UFX06098000A10015075	UFX06098	9,8	10	75	14,7	A	4
UFX06099000A10015075	UFX06099	9,9	10	75	14,9	A	4
UFX06100000A10015075	UFX06100	10	10	75	15	A	4
UFX06052000A06008050	UFX06052	5,2	6	50	7,8	A	4
UFX06053000A06008050	UFX06053	5,3	6	50	8	A	4
UFX06064000A06008050	UFX06054	6,4	6	50	8,1	A	4
UFX06055000A06008050	UFX06055	5,5	6	50	8,3	A	4
UFX06066000A06008060	UFX06056	6,6	6	60	8,4	A	4
UFX06057000A06009050	UFX06057	5,7	6	50	8,6	A	4
UFX06058000A06009050	UFX06058	5,8	6	50	8,7	A	4
UFX06590000A06009050	UFX06059	59	6	50	8,9	A	4
UFX06060000A06009050	UFX06060	6	6	50	9	A	4
UFX06061000A08009060	UFX06061	6,1	8	60	9,2	A	4
UFX06062000A08009060	UFX06062	6,2	8	60	9,3	A	4
UFX06063000A08010060	UFX06063	6,3	8	60	9,5	A	4
UFX06064000A08010060	UFX06064	6,4	8	60	9,6	A	4
UFX06065000A08010060	UFX06065	6,5	8	60	9,8	A	4
UFX06066000A08010060	UFX06066	6,6	8	60	9,9	A	4
UFX06067000A08010060	UFX06067	6,7	8	60	10,1	A	4
UFX06068000A08010060	UFX06068	6,8	8	60	10,2	A	4
UFX06105000A12016100	UFX06105	10,5	12	100	15,8	A	4
UFX06110000A12017100	UFX06110	11	12	100	16,5	A	4
UFX06115000A12017100	UFX06115	11,5	12	100	17,3	A	4
UFX06120000A12018100	UFX06120	12	12	100	18	A	4
UFX06125000A16019100	UFX06125	12,5	16	100	18,8	A	4
UFX06130000A16020100	UFX06130	13	16	100	19,5	A	4
UFX06135000A16020100	UFX06135	13,5	16	100	20,3	A	4
UFX06140000A16021100	UFX06140	14	16	100	21	A	4
UFX06145000A16022100	UFX06145	14,5	16	100	21,8	A	4
UFX06150000A16023100	UFX06150	15	16	100	22,5	A	4
UFX06155000A16023100	UFX06155	15,5	16	100	23,3	A	4
UFX06160000A16024100	UFX06160	16	16	100	24	A	4
UFX06170000A20026100	UFX06170	17	20	100	25,5	A	4
UFX06180000A20027100	UFX06180	18	20	100	27	A	4
UFX06190000A20029100	UFX06190	19	20	100	28,5	A	4
UFX06200000A20030100	UFX06200	20	20	100	30	A	4

UFX06

Cutting Conditions Parametry skrawania

Material Materiał	Mild steels, Carbon steel. Cast iron Stal miękka, Stal węglowa, Żeliwo				Alloy steel, Tool steel Stal stopowa, Stal narzędziowa				Hardened steel, Prehardened steel (Free-cutting) Stal hartowana, Stal ulepszona (automatowa)				Hardened steel, Stainless steel Stal hartowana, Stal nierdzewna				Hardened steel, Titanium alloys, Heat resistant alloy steel Stal hartowana, Stopy tytanu, Stal stopowa żaroodporna				Hardened Steel Stal hartowana			
	<750N/mm²				<30HRC				30 - 38HRC				38 - 45HRC				45 - 55HRC				55 - 60HRC			
D (mm)	FO		HFO		FO		HFO		FO		HFO		FO		HFO		FO		HFO		FO		HFO	
	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
3	10070	926	20140	2043	7885	722	20140	2280	6650	532	20140	1235	6270	527	15105	1093	5733	461	10070	646	3040	181	8075	418
4	7553	950	15105	1948	5890	779	15105	2185	4988	537	15105	1235	4703	561	11305	1188	4513	489	7553	755	2280	181	6033	437
5	6033	998	12065	1805	4703	803	12065	2043	3990	561	12065	1188	3753	599	9073	1283	3610	508	6033	798	1805	181	4845	485
6	5035	1188	10070	2898	3943	898	10070	2518	3325	665	10070	1900	3135	627	7553	1378	3040	518	5035	865	1520	181	4038	580
8	3800	1188	7553	2660	2945	850	7553	2280	2518	627	7553	1805	2328	608	5653	1330	2280	527	3800	817	1140	166	3040	546
10	3040	1045	6033	2423	2375	812	6033	2090	1995	575	6033	1758	1853	561	4513	1283	1805	499	3040	789	907	152	2423	485
12	2518	1045	5035	2423	1948	808	5035	2090	1663	537	5035	1710	1568	508	3800	1283	1520	451	2518	789	755	152	1995	485
16	1900	907	3800	1805	1473	708	3800	1805	1235	475	3800	1615	1188	423	2850	1283	1140	380	1900	789	565	152	1520	485
20	1520	727	3040	1473	1188	565	3040	1473	998	432	3040	1473	936	375	2280	1093	907	337	1520	694	451	152	1188	485

Depth of cut
Głębokość skrawania

FO	ap	ae
	1.5xD	0.2xD

HFO	ap	ae
D<6	1.5xD	0.02xD
6≤D	1.5xD	0.05xD

aeMax=0.5mm

FO	ap	ae
	1.5xD	0.1xD

HFO	ap	ae
D<6	1.5xD	0.01xD
6≤D	1.5xD	0.02xD

aeMax=0.5mm

FO	ap	ae
	1xD	0.05xD

HFO	ap	ae
D<6	1xD	0.01xD
6≤D	1xD	0.02xD

aeMax=0.5mm

Material Materiał	Mild steels, Carbon steel, Cast iron Stal miękka, Stal węglowa, Żeliwo				Alloy steel, Tool steel Stal stopowa, Stal narzędziowa				Hardened steel, Prehardened steel (Free-cutting) Stal hartowana, Stal ulepszona (automatowa)				Hardened steel, Stainless steel Stal hartowana, Stal nierdzewna				Hardened steel, Titanium alloys, Heat resistant alloy steel Stal hartowana, Stopy tytanu, Stal stopowa żaroodporna				Hardened Steel Stal hartowana			
	<750N/mm²				<30HRC				30 - 38HRC				38 - 45HRC				45 - 55HRC				55 - 60HRC			
D (mm)	FR		HFR		FR		HFR		FR		HFR		FR		HFR		FR				FR			
	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min			RPM	mm/min		
3	8075	670	12065	998	6033	911	10070	888	5558	432	9073	708	5225	380	6033	437	4228	304			1995	105		
4	6033	670	9073	1093	4513	641	7553	950	4180	432	6793	708	3943	428	4893	532	3183	342			1520	114		
5	4845	679	7268	1140	3610	627	6650	1045	3325	451	6033	822	3135	451	3943	565	2518	366			1188	119		
6	4038	679	3468	1473	3040	532	5558	1093	2755	475	5035	865	2613	470	3515	637	2138	380			998	119		
8	3040	627	4513	1378	2280	523	4180	1235	2090	518	3800	936	1948	489	2660	656	1568	394			755	119		
10	2423	580	3610	1330	1805	508	3325	1140	1663	451	3040	822	1568	447	2138	603	1283	361			603	109		
12	1995	580	3040	1188	1520	451	2755	1093	1378	428	2518	774	1330	418	1758	565	1045	337			504	109		
16	1520	580	2280	998	1140	409	2090	917	1045	352	1900	641	998	352	1330	475	793	285			380	84		
20	1188	485	1805	798	907	361	1663	732	831	333	1520	603	789	314	1045	423	637	252			304	85		

Depth of cut
Głębokość skrawania

FR a_p=0.5xD

HFR ap=0.2xD, apMax=3mm

ap=0.05xD

(H)FO (mm/min) — (HIGH SPEED) SIDE CUTTING

(H)FR (mm/min) — (HIGH SPEED) SLOTTING

FREZOWANIE OBWODOWE (SZYBKOŚCIOWE)

µm D 0 — -20

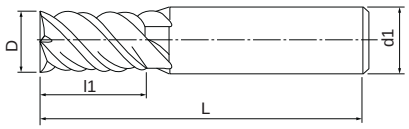
UFX07

SQUARE TYPE WALCOWO-CZOŁOWE

4-Flute, Stub 4-ostrzowe, bardzo krótkie

			HSM Vmax	F	M	R	45°	A	B			max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●	●	●		○	●	●		○			○	○





D code new Nowy kod	D code kod	D	d1	L	l1	Shank Uchwyt	Z
UFX07030000A06008060	UFX07030	3	6	60	8	A	4
UFX07040000A06011060	UFX07040	4	6	60	11	A	4
UFX07050000A06013060	UFX07050	5	6	60	13	A	4
UFX07060000A06013060	UFX07060	6	6	60	13	A	4
UFX07080000A08019060	UFX07080	8	8	60	19	A	4
UFX07100000A10022075	UFX07100	10	10	75	22	A	4
UFX07120000A12026100	UFX07120	12	12	100	26	A	4
UFX07160000A16035100	UFX07160	16	16	100	35	A	4
UFX07200000A20040100	UFX07200	20	20	100	40	A	4

µm D1 0 — -20

UFX07

Cutting Conditions Parametry skrawania

Material Materiał	Mild steels, Carbon steel. Cast iron Stal miękka, Stal węglowa, Żeliwo				Alloy steel, Tool steel Stal stopowa, Stal narzędziowa				Hardened steel, Prehardened steel (Free-cutting) Stal hartowana, Stal ulepszona (automatowa)				Hardened steel, Stainless steel Stal hartowana, Stal nierdzewna				Hardened steel, Titanium alloys, Heat resistant alloy steel Stal hartowana, Stopy tytanu, Stal stopowa żaroodporna				Hardened steel Stal hartowana			
	<750N/mm²				<30HRC				30 - 38HRC				38 - 45HRC				45 - 55HRC				55 - 60HRC			
D (mm)	FO		HFO		FO		HFO		FO		HFO		FO		HFO		FO		HFO		FO		HFO	
	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
3	10070	926	20140	2043	7885	722	20140	2280	6650	532	20140	1235	6270	527	15105	1093	5733	461	10070	646	3040	181	8075	418
4	7553	950	15105	1948	5890	779	15105	2185	4988	537	15105	1235	4703	561	11305	1188	4513	489	7553	755	2280	181	6033	437
5	6033	998	12065	1805	4703	803	12065	2043	3990	561	12065	1188	3753	599	9073	1283	3610	508	6033	798	1805	181	4845	485
6	5035	1188	10070	2898	3943	898	10070	2518	3325	665	10070	1900	3135	627	7553	1378	3040	518	5035	865	1520	181	4038	580
8	3800	1188	7553	2660	2945	850	7553	2280	2518	627	7553	1805	2328	608	5653	1330	2280	527	3800	817	1140	166	3040	546
10	3040	1045	6033	2423	2375	812	6033	2090	1995	575	6033	1758	1853	561	4513	1283	1805	499	3040	789	907	152	2423	485
12	2518	1045	5035	2423	1948	808	5035	2090	1663	537	5035	1710	1568	508	3800	1283	1520	451	2518	789	755	152	1995	485
16	1900	907	3800	1805	1473	708	3800	1805	1235	475	3800	1615	1188	423	2850	1283	1140	380	1900	789	565	152	1520	485
20	1520	727	3040	1473	1188	565	3040	1473	998	432	3040	1473	936	375	2280	1093	907	337	1520	694	451	152	1188	485

Depth of cut
Głębokość skrawania

FO	ap	ae
	1.5xD	0.2xD

HFO	ap	ae
D<6	1.5xD	0.02xD
6≤D	1.5xD	0.05xD

aeMax=0.5mm

FO	ap	ae
	1.5xD	0.1xD

HFO	ap	ae
D<6	1.5xD	0.01xD
6≤D	1.5xD	0.02xD

aeMax=0.5mm

FO	ap	ae
	1xD	0.05xD

HFO	ap	ae
D<6	1xD	0.01xD
6≤D	1xD	0.02xD

aeMax=0.5mm

Material Materiał	Mild steels, Carbon steel. Cast iron Stal miękka, Stal węglowa, Żeliwo				Alloy steel, Tool steel Stal stopowa, Stal narzędziowa				Hardened steel, Prehardened steel (Free-cutting) Stal hartowana, Stal ulepszona (automatowa)				Hardened steel, Stainless steel Stal hartowana, Stal nierdzewna				Hardened steel, Titanium alloys, Heat resistant alloy steel Stal hartowana, Stopy tytanu, Stal stopowa żaroodporna		Hardened steel Stal hartowana	
	<750N/mm²				<30HRC				30 - 38HRC				38 - 45HRC				45 - 55HRC		55 - 60HRC	
D (mm)	FR		HFR		FR		HFR		FR		HFR		FR		HFR		FR		FR	
	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
3	8075	670	12065	998	6033	911	10070	888	5558	432	9073	708	5225	380	6033	437	4228	304	1995	105
4	6033	670	9073	1093	4513	641	7553	950	4180	432	6793	708	3943	428	4893	532	3183	342	1520	114
5	4845	679	7268	1140	3610	627	6650	1045	3325	451	6033	822	3135	451	3943	565	2518	366	1188	119
6	4038	679	3468	1473	3040	532	5558	1093	2755	475	5035	865	2613	470	3515	637	2138	380	998	119
8	3040	627	4513	1378	2280	523	4180	1235	2090	518	3800	936	1948	489	2660	656	1568	394	755	119
10	2423	580	3610	1330	1805	508	3325	1140	1663	451	3040	822	1568	447	2138	603	1283	361	603	109
12	1995	580	3040	1188	1520	451	2755	1093	1378	428	2518	774	1330	418	1758	565	1045	337	504	109
16	1520	580	2280	998	1140	409	2090	917	1045	352	1900	641	998	352	1330	475	793	285	380	84
20	1188	485	1805	798	907	361	1663	732	831	333	1520	603	789	314	1045	423	637	252	304	85

Depth of cut
Głębokość skrawania

FR a_p=0.5xD

HFR ap=0.2xD, apMax=3mm

ap=0.05xD

(H)FO (mm/min) — (HIGH SPEED) SIDE CUTTING

(H)FR (mm/min) — (HIGH SPEED) SLOTTING

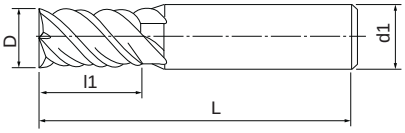
UFX08

SQUARE TYPE WALCOWO-CZOŁOWE

4-Flute, Medium Length 4-ostrzowe, średniej długości

HSM Vmax	F	M	R	45°	A	B	max	min	AIR
							○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●	●	●		○	●	●		○			○	○





D code new Nowy kod	D code kod	D	d1	L	l1	Shank Uchwyt	Z
UFX08030000A06012060	UFX08030	3	6	60	12	A	4
UFX08040000A06016060	UFX08040	4	6	60	16	A	4
UFX08050000A06018060	UFX08050	5	6	60	18	A	4
UFX08060000A06020060	UFX08060	6	6	60	20	A	4
UFX08080000A08025075	UFX08080	8	8	75	25	A	4
UFX08100000A10030080	UFX08100	10	10	80	30	A	4
UFX08120000A12035100	UFX08120	12	12	100	35	A	4
UFX08160000A16045115	UFX08160	16	16	115	45	A	4
UFX08200000A20050125	UFX08200	20	20	125	50	A	4

µm D 0 — -20

UFX08

Cutting Conditions Parametry skrawania

Material Materiał	Mild steels, Carbon steel. Cast iron Stal miękka, Stal węglowa, Żeliwo				Alloy steel, Tool steel Stal stopowa, Stal narzędziowa				Hardened steel, Prehardened steel (Free-cutting) Stal hartowana, Stal ulepszona (automatowa)				Hardened steel, Stainless steel Stal hartowana, Stal nierdzewna				Hardened steel, Titanium alloys, Heat resistant alloy steel Stal hartowana, Stopy tytanu, Stal stopowa żaroodporna				Hardened steel Stal hartowana			
	<750N/mm²				<30HRC				30 - 38HRC				38 - 45HRC				45 - 55HRC				55 - 60HRC			
D (mm)	FO		HFO		FO		HFO		FO		HFO		FO		HFO		FO		HFO		FO		HFO	
	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
3	10070	926	20140	2043	7885	722	20140	2280	6650	532	20140	1235	6270	527	15105	1093	5733	461	10070	646	3040	181	8075	418
4	7553	950	15105	1948	5890	779	15105	2185	4988	537	15105	1235	4703	561	11305	1188	4513	489	7553	755	2280	181	6033	437
5	6033	998	12065	1805	4703	803	12065	2043	3990	561	12065	1188	3753	599	9073	1283	3610	508	6033	798	1805	181	4845	485
6	5035	1188	10070	2898	3943	898	10070	2518	3325	665	10070	1900	3135	627	7553	1378	3040	518	5035	865	1520	181	4038	580
8	3800	1188	7553	2660	2945	850	7553	2280	2518	627	7553	1805	2328	608	5653	1330	2280	527	3800	817	1140	166	3040	546
10	3040	1045	6033	2423	2375	812	6033	2090	1995	575	6033	1758	1853	561	4513	1283	1805	499	3040	789	907	152	2423	485
12	2518	1045	5035	2423	1948	808	5035	2090	1663	537	5035	1710	1568	508	3800	1283	1520	451	2518	789	755	152	1995	485
16	1900	907	3800	1805	1473	708	3800	1805	1235	475	3800	1615	1188	423	2850	1283	1140	380	1900	789	565	152	1520	485
20	1520	727	3040	1473	1188	565	3040	1473	998	432	3040	1473	936	375	2280	1093	907	337	1520	694	451	152	1188	485

Depth of cut
Głębokość skrawania

FO	ap	ae
	1.5xD	0.2xD

HFO	ap	ae
D<6	1.5xD	0.02xD
6≤D	1.5xD	0.05xD

aeMax=0.5mm

FO	ap	ae
	1.5xD	0.1xD

HFO	ap	ae
D<6	1.5xD	0.01xD
6≤D	1.5xD	0.02xD

aeMax=0.5mm

FO	ap	ae
	1xD	0.05xD

HFO	ap	ae
D<6	1xD	0.01xD
6≤D	1xD	0.02xD

aeMax=0.5mm

Material Materiał	Mild steels, Carbon steel. Cast iron Stal miękka, Stal węglowa, Żeliwo				Alloy steel, Tool steel Stal stopowa, Stal narzędziowa				Hardened steel, Prehardened steel (Free-cutting) Stal hartowana, Stal ulepszona (automatowa)				Hardened steel, Stainless steel Stal hartowana, Stal nierdzewna				Hardened steel, Titanium alloys, Heat resistant alloy steel Stal hartowana, Stopy tytanu, Stal stopowa żaroodporna		Hardened steel Stal hartowana	
	<750N/mm²				<30HRC				30 - 38HRC				38 - 45HRC				45 - 55HRC		55 - 60HRC	
D (mm)	FR		HFR		FR		HFR		FR		HFR		FR		HFR		FR		FR	
	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
3	8075	670	12065	998	6033	911	10070	888	5558	432	9073	708	5225	380	6033	437	4228	304	1995	105
4	6033	670	9073	1093	4513	641	7553	950	4180	432	6793	708	3943	428	4893	532	3183	342	1520	114
5	4845	679	7268	1140	3610	627	6650	1045	3325	451	6033	822	3135	451	3943	565	2518	366	1188	119
6	4038	679	3468	1473	3040	532	5558	1093	2755	475	5035	865	2613	470	3515	637	2138	380	998	119
8	3040	627	4513	1378	2280	523	4180	1235	2090	518	3800	936	1948	489	2660	656	1568	394	755	119
10	2423	580	3610	1330	1805	508	3325	1140	1663	451	3040	822	1568	447	2138	603	1283	361	603	109
12	1995	580	3040	1188	1520	451	2755	1093	1378	428	2518	774	1330	418	1758	565	1045	337	504	109
16	1520	580	2280	998	1140	409	2090	917	1045	352	1900	641	998	352	1330	475	793	285	380	84
20	1188	485	1805	798	907	361	1663	732	831	333	1520	603	789	314	1045	423	637	252	304	85

Depth of cut
Głębokość skrawania

FR a_p=0.5xD

HFR ap=0.2xD, apMax=3mm

ap=0.05xD

(H)FO (mm/min) — (HIGH SPEED) SIDE CUTTING

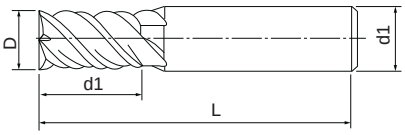
(H)FR (mm/min) — (HIGH SPEED) SLOTTING

UFX09

SQUARE TYPE WALCOWO-CZOŁOWE
4-Flute, Long 4-ostrzowe, długie

HSM Vmax	F	M	R	45°	A	B	max	min	AIR
							○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●	●	●		○	●	●		○			○	○





D code new Nowy kod	D code kod	D	d1	L	l1	Shank Uchwyt	Z
UFX09030000A06015060	UFX09030	3	6	60	15	A	4
UFX09040000A06020060	UFX09040	4	6	60	20	A	4
UFX09050000A06022060	UFX09050	5	6	60	22	A	4
UFX09060000A06025075	UFX09060	6	6	75	25	A	4
UFX09080000A08030075	UFX09080	8	8	75	30	A	4
UFX09100000A10035080	UFX09100	10	10	80	35	A	4
UFX09120000A12040100	UFX09120	12	12	100	40	A	4
UFX09160000A16055115	UFX09160	16	16	115	55	A	4
UFX09200000A20060125	UFX09200	20	20	125	60	A	4

µm D 0 — -20

UFX09

Cutting Conditions Parametry skrawania

Material Materiał	Mild steels, Carbon steel. Cast iron Stal miękka, Stal węglowa, Żeliwo				Alloy steel, Tool steel Stal stopowa, Stal narzędziowa				Hardened steel, Prehardened steel (Free-cutting) Stal hartowana, Stal ulepszona (automatowa)				Hardened steel, Stainless steel Stal hartowana, Stal nierdzewna				Hardened steel, Titanium alloys, Heat resistant alloy steel Stal hartowana, Stopy tytanu, Stal stopowa żaroodporna				Hardened steel Stal hartowana			
	<750N/mm²				<30HRC				30 - 38HRC				38 - 45HRC				45 - 55HRC				55 - 60HRC			
D (mm)	FO		HFO		FO		HFO		FO		HFO		FO		HFO		FO		HFO		FO		HFO	
	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
3	10070	926	20140	2043	7885	722	20140	2280	6650	532	20140	1235	6270	527	15105	1093	5733	461	10070	646	3040	181	8075	418
4	7553	950	15105	1948	5890	779	15105	2185	4988	537	15105	1235	4703	561	11305	1188	4513	489	7553	755	2280	181	6033	437
5	6033	998	12065	1805	4703	803	12065	2043	3990	561	12065	1188	3753	599	9073	1283	3610	508	6033	798	1805	181	4845	485
6	5035	1188	10070	2898	3943	898	10070	2518	3325	665	10070	1900	3135	627	7553	1378	3040	518	5035	865	1520	181	4038	580
8	3800	1188	7553	2660	2945	850	7553	2280	2518	627	7553	1805	2328	608	5653	1330	2280	527	3800	817	1140	166	3040	546
10	3040	1045	6033	2423	2375	812	6033	2090	1995	575	6033	1758	1853	561	4513	1283	1805	499	3040	789	907	152	2423	485
12	2518	1045	5035	2423	1948	808	5035	2090	1663	537	5035	1710	1568	508	3800	1283	1520	451	2518	789	755	152	1995	485
16	1900	907	3800	1805	1473	708	3800	1805	1235	475	3800	1615	1188	423	2850	1283	1140	380	1900	789	565	152	1520	485
20	1520	727	3040	1473	1188	565	3040	1473	998	432	3040	1473	936	375	2280	1093	907	337	1520	694	451	152	1188	485

Depth of cut
Głębokość skrawania

FO	ap	ae
	1.5xD	0.2xD

HFO	ap	ae
D<6	1.5xD	0.02xD
6≤D	1.5xD	0.05xD

aeMax=0.5mm

FO	ap	ae
	1.5xD	0.1xD

HFO	ap	ae
D<6	1.5xD	0.01xD
6≤D	1.5xD	0.02xD

aeMax=0.5mm

FO	ap	ae
	1xD	0.05xD

HFO	ap	ae
D<6	1xD	0.01xD
6≤D	1xD	0.02xD

aeMax=0.5mm

Material Materiał	Mild steels, Carbon steel. Cast iron Stal miękka, Stal węglowa, Żeliwo				Alloy steel, Tool steel Stal stopowa, Stal narzędziowa				Hardened steel, Prehardened steel (Free-cutting) Stal hartowana, Stal ulepszona (automatowa)				Hardened steel, Stainless steel Stal hartowana, Stal nierdzewna				Hardened steel, Titanium alloys, Heat resistant alloy steel Stal hartowana, Stopy tytanu, Stal stopowa żaroodporna		Hardened steel Stal hartowana	
	<750N/mm²				<30HRC				30 - 38HRC				38 - 45HRC				45 - 55HRC		55 - 60HRC	
D (mm)	FR		HFR		FR		HFR		FR		HFR		FR		HFR		FR		FR	
	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
3	8075	670	12065	998	6033	911	10070	888	5558	432	9073	708	5225	380	6033	437	4228	304	1995	105
4	6033	670	9073	1093	4513	641	7553	950	4180	432	6793	708	3943	428	4893	532	3183	342	1520	114
5	4845	679	7268	1140	3610	627	6650	1045	3325	451	6033	822	3135	451	3943	565	2518	366	1188	119
6	4038	679	3468	1473	3040	532	5558	1093	2755	475	5035	865	2613	470	3515	637	2138	380	998	119
8	3040	627	4513	1378	2280	523	4180	1235	2090	518	3800	936	1948	489	2660	656	1568	394	755	119
10	2423	580	3610	1330	1805	508	3325	1140	1663	451	3040	822	1568	447	2138	603	1283	361	603	109
12	1995	580	3040	1188	1520	451	2755	1093	1378	428	2518	774	1330	418	1758	565	1045	337	504	109
16	1520	580	2280	998	1140	409	2090	917	1045	352	1900	641	998	352	1330	475	793	285	380	84
20	1188	485	1805	798	907	361	1663	732	831	333	1520	603	789	314	1045	423	637	252	304	85

Depth of cut
Głębokość skrawania

FR a_p=0.5xD

HFR ap=0.2xD, apMax=3mm

ap=0.05xD

(H)FO (mm/min) — (HIGH SPEED) SIDE CUTTING

(H)FR (mm/min) — (HIGH SPEED) SLOTTING

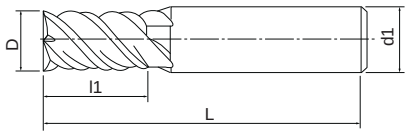
FREZOWANIE ROWKÓW (SZYBKOŚCIOWE)

UFX32

SQUARE TYPE WALCOWO-CZOŁOWE
3-5-Flute, Long 3-5-ostrzowe, długie

HSM Vmax	R	20°	A	B						max	min		AIR
										○	●	●	●

P				H		M		K	N			S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○	●	●	○					○	○	○				





D code Kod	D	d1	L	l1	Shank Uchwyt	Z
UFX32060000A06007054	6	6	54	7	A	3
UFX32070000A08008058	7	8	58	8	A	3
UFX32080000A08009058	8	8	58	9	A	3
UFX32090000A10013066	9	10	66	13	A	4
UFX32100000A10014066	10	10	66	14	A	4
UFX32120000A12016073	12	12	73	16	A	4
UFX32140000A14018075	14	14	75	18	A	4
UFX32160000A16022082	16	16	82	22	A	4
UFX32180000A18024084	18	18	84	24	A	4
UFX32200000A20026092	20	20	92	26	A	4
UFX32250000A25025110	25	25	110	25	A	5

Cutting Conditions Parametry skrawania

			Non-alloyed, alloy steels, cast iron Stale stopowe, niestopowe, żeliwo		Austenitic Heat Resistant Steel Stal żaroodporna austenityczna					Hardened steel, Stainless steel Stal hartowana, Stal nierdzewna			
			30HRC		30 - 38HRC		38 - 45HRC			45 - 55HRC		55 - 65HRC	
D (mm)	ae	ap	RPM	mm/ min	RPM	mm/ min	RPM	mm/ min	ap	RPM	mm/ min	RPM	mm/ min
6	1,8	9	15600	2320	12400	840	8400	570	0,3	3400	260	2400	190
8	2,4	12	11600	2320	9200	840	6300	570	0,4	2400	240	1800	180
10	3	15	9200	2320	7600	840	5100	570	0,5	2000	290	1300	190
12	3,6	18	8000	2400	6000	800	4200	570	0,6	1680	260	1200	190
14	4,2	21	6800	2400	5200	840	3600	570	0,7	1400	200	900	130
16	4,8	24	6000	2400	4800	760	3300	510	0,8	1200	160	800	110
18	5,4	27	5200	2320	4400	720	2700	420	0,9	1100	150	700	100
20	6	30	4800	2160	3600	560	2400	360	1	1000	150	660	100
25	75	37,5	4300	2150	3200	620	2160	410	1,25	900	160	600	100

µm	D ≤ 3,0	-14 — -28	d1 ≤ 3,0	0 — -6
	D ≤ 6,0	20 — -38	d1 ≤ 6,0	0 — -8
	D ≤ 10	-25 — -47	d1 ≤ 10	0 — -9
	D ≤18	-32 — -59	d1 ≤18	0 — -11
	D ≤ 30	-40 — -73	d1 ≤ 30	0 — -13

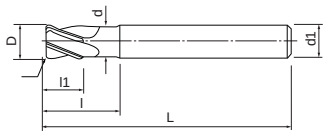
UFX39

SQUARE TYPE WALCOWO-CZOŁOWE

4-Flute, Long 4-ostrzowe, długie

HSM Vmax	F	M	30°	A	B	max	min	AIR
						○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○	●	●	○					○						





D code Kod	R	D	d1	d2	L	l1	l2	Shank Uchwyt	Z
UFX39020002A06003050	0,2	2.0	6	1.9	50	2.5	5	4	4
UFX39025003A06003050	0,25	2.5	6	2.4	50	3	6	4	4
UFX39030003A06004050	0,3	3.0	6	2.8	50	4	7	4	4
UFX39035004A06005050	0,35	3.5	6	3.2	50	4.5	8	4	4
UFX39040004A06005050	0,4	4.0	6	3.7	50	5	9	4	4
UFX39050005A06006050	0,5	5.0	6	4.6	50	6	12	4	4
UFX39060006A06007055	0,6	6.0	6	5.6	55	7	14	4	4
UFX39080008A08010060	0,8	8.0	8	7.4	60	10	18	4	4
UFX39100010A10012070	1	10.0	10	9.4	70	12	25	4	4
UFX39120012A12015080	1,2	12.0	12	11.4	80	15	30	4	4
UFX39160016A16018090	1,6	16.0	16	15.4	90	18	35	4	4

µm				
	D 0~-0.03			
	d1 h6			

UFX39

Cutting Conditions Parametry skrawania

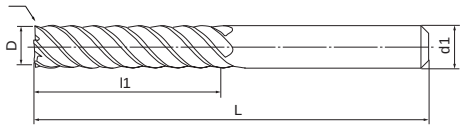
			**Non-alloyed Steels Alloy Steels Cast Iron** Stale niestopowe, żeliwo stopowe		**Alloy Steels Heat Resistant Steels** Stale stopowe, Stale żaroodporne		**Hardened Steels** Stale hartowane		**Hardened Steels** Stale hartowane	
			~ 35 HRC		**35 HRC ~ 45 HRC**		**45 HRC ~ 55 HRC**		**55 HRC ~ 65 HRC**	
D (mm)	**ae**	**ap**	**RPM**	**mm/min**	**RPM**	**mm/min**	**RPM**	**mm/min**	**RPM**	**mm/min**
2.0	0,1	2	13870	340	9070	205	6050	60		
2.5	0,125	2,5	12290	360	7870	220	5040	65		
3.0	0,15	3	10700	385	6670	240	4030	70	2280	70
3.5	0,175	3,5	9890	535	6100	330	3780	70	2030	70
4.0	0,2	4	9070	685	5540	420	3530	70	1780	70
5.0	0,25	5	7560	720	4540	430	2780	85	1510	70
6.0	0,3	6	6670	790	4030	490	2400	95	1320	70
8.0	0,4	8	5040	850	3020	455	2020	130	1010	70
10.0	0,5	10	3910	730	2400	360	1630	110	820	60
12.0	0,6	12	3290	625	2020	300	1390	95	670	60
16.0	0,8	16	2640	490	1630	240	1080	70	530	35

UFX35

SQUARE TYPE WALCOWO-CZOŁOWE
6-Flute, Long 6-ostrzowe, długie

HSM Vmax	F	M	45°	A	B	max	min	AIR
						○	●	●	●

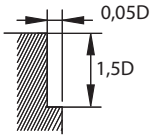
P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○	●	●	○					○						





D code Kod	R	D	d1	L	l1	Shank Uchwyt	Z
UFX35060005A06013070	0,5	6	6	70	13	A	6
UFX35080005A08019090	0,5	8	8	90	19	A	6
UFX35100005A10022100	0,5	10	10	100	22	A	6
UFX35100010A10022100	1	10	10	100	22	A	6
UFX35120005A12026110	0,5	12	12	110	26	A	6
UFX35120010A12026110	1	12	12	110	26	A	6
UFX35160010A16032130	1	16	16	130	32	A	6
UFX35160015A16032130	1,5	16	16	130	32	A	6
UFX35200010A20038140	1	20	20	140	38	A	6
UFX35200015A20038140	1,5	20	20	140	38	A	6
UFX35200020A20038140	2	20	20	140	38	A	6

Cutting Conditions Parametry skrawania

Material Materiał	Alloy Steel, Hardened Steel Stal stopowa, Stal hartowana		Hardened steel Stal hartowana			
	<50HRC		50 - 60HRC		60 - 65HRC	
D (mm)	RPM	mm/min	RPM	mm/min	RPM	mm/min
6	16800	6090	8400	3050	4200	1470
8	12600	6090	6300	3050	3150	1470
10	9980	5990	5040	3050	2520	1470
12	8400	5040	4200	2520	2100	1260
16	6300	3780	3150	1890	1580	950
20	5040	3050	2520	1470	1260	760
25	570	250	360	140	280	100
DOC*						

*Depth of cut
Głębokość skrawania

µm D 0 — -20

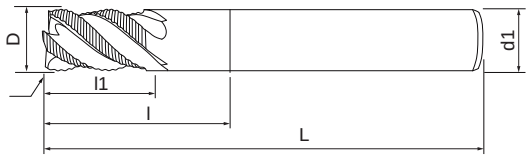
UFX60

SQUARE TYPE WALCOWO-CZOŁOWE

4-5 Flute, Short,Long 4-5 ostrzowe, krótkie, długie

HSM Vmax	F	M	45°	A	B				max	min		AIR
									○	●	●	●

P				H		M		K	N			S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●	○					●	○	○	○			





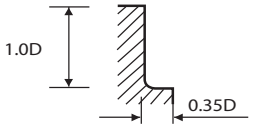
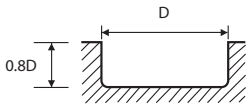
D code Kod	R	D	d1	L	l1	l2	Shank Uchwyt	Z
UFX60060005A06009057	0,5	6	6	57	-	9	A	4
UFX60060005B06009057	0,5	6	6	57	-	9	B	4
UFX60060005A06018057	0,5	6	6	57	18	9	A	4
UFX60060005B06018057	0,5	6	6	57	18	9	B	4
UFX60060005A06012057	0,5	6	6	57	-	12	A	4
UFX60060005B06012057	0,5	6	6	57	-	12	B	4
UFX60080005A08012063	0,5	8	8	63	-	12	A	4
UFX60080005B08012063	0,5	8	8	63	-	12	B	4
UFX60080005A08024063	0,5	8	8	63	24	12	A	4
UFX60080005B08024063	0,5	8	8	63	24	12	B	4
UFX60080005A08016063	0,5	8	8	63	-	16	A	4
UFX60080005B08016063	0,5	8	8	63	-	16	B	4
UFX60100005A10015072	0,5	10	10	72	-	15	A	4
UFX60100005B10015072	0,5	10	10	72	-	15	B	4
UFX60100005A10030072	0,5	10	10	72	30	15	A	4
UFX60100005B10030072	0,5	10	10	72	30	15	B	4
UFX60100005A10020072	0,5	10	10	72	-	20	A	4
UFX60100005B10020072	0,5	10	10	72	-	20	B	4
UFX60120005A12018083	0,5	12	12	83	-	18	A	4
UFX60120005B12018083	0,5	12	12	83	-	18	B	4
UFX60120005A12036083	0,5	12	12	83	36	18	A	4
UFX60120005B12036083	0,5	12	12	83	36	18	B	4
UFX60120005A12024083	0,5	12	12	83	-	24	A	4
UFX60120005B12024083	0,5	12	12	83	-	24	B	4
UFX60160010A16024092	1	16	16	92	-	24	A	5
UFX60160010B16024092	1	16	16	92	-	24	B	5
UFX60160010A16048100	1	16	16	100	48	24	A	5
UFX60160010B16048100	1	16	16	100	48	24	B	5
UFX60160010A16032092	1	16	16	92	-	32	A	5
UFX60160010B16032092	1	16	16	92	-	32	B	5
UFX60200010A20030104	1	20	20	104	-	30	A	5
UFX60200010B20030104	1	20	20	104	-	30	B	5
UFX60200010A20060110	1	20	20	110	60	30	A	5
UFX60200010B20060110	1	20	20	110	60	30	B	5
UFX60200010A20040104	1	20	20	104	-	40	A	5
UFX60200010B20040104	1	20	20	104	-	40	B	5

µm d1 0 — -20

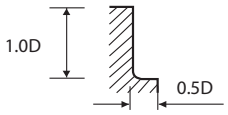
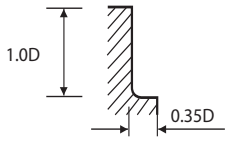
UFX60

Cutting Conditions Parametry skrawania

SLOTTING ROWKOWANIE

Material Materiał	Alloy steels, carbon steels Tool steels, cast iron		Alloy steels, carbon steels Tool steels, cast iron Prehardened steels	
Hardness Twardość	~ HRc 25		HRc 25 ~ HRc 40	
Diameter Średnica	RPM	Feed	RPM	Feed
6.0	12000	1550	10600	1100
8.0	9000	1650	8100	1180
10.0	7200	1650	6400	1180
12.0	6000	1540	5400	1140
16.0	4500	1500	4100	1050
20.0	3600	1330	3200	900
				

SIDE CUTTING FREZOWANIE BOCZNE

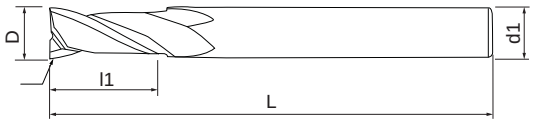
Material Materiał	Alloy steels, carbon steels Tool steels, cast iron		Alloy steels, carbon steels Tool steels, cast iron Prehardened steels	
Hardness Twardość	~ HRc 25		HRc 25 ~ HRc 40	
Diameter Średnica	RPM	Feed	RPM	Feed
6.0	15800	2570	14300	1850
8.0	11900	2700	10700	1950
10.0	9500	2700	8500	1950
12.0	8000	2570	7100	1850
16.0	6000	2450	5400	1750
20.0	4800	2140	4300	1500
				

UFX54 NEW

SQUARE TYPE WALCOWO-CZOŁOWE
2 Flute 2 ostrzowe

HSM Vmax	F	M	30°	A					max	min		AIR
									○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●	○					○						





D code Kod	R	D	d1	L	l1	Shank Uchwyt	Z
UFX5400204Y20A004040	0,02	0,2	4	40	0,4	A	2
UFX5400204Y50A004040	0,05	0,2	4	40	0,4	A	2
UFX5400304Y20A006040	0,02	0,3	4	40	0,6	A	2
UFX5400304Y50A006040	0,05	0,3	4	40	0,6	A	2
UFX5400404Y50A008040	0,05	0,4	4	40	0,8	A	2
UFX5400404001A008040	0,1	0,4	4	40	0,8	A	2
UFX5400504Y50A010040	0,05	0,5	4	40	1	A	2
UFX5400504001A010040	0,1	0,5	4	40	1	A	2
UFX5400604Y50A012040	0,05	0,6	4	40	1,2	A	2
UFX5400604001A012040	0,1	0,6	4	40	1,2	A	2
UFX5400604002A012040	0,2	0,6	4	40	1,2	A	2
UFX5400704Y50A014040	0,05	0,7	4	40	1,4	A	2
UFX5400704001A014040	0,1	0,7	4	40	1,4	A	2
UFX5400704002A014040	0,2	0,7	4	40	1,4	A	2
UFX5400804Y50A016040	0,05	0,8	4	40	1,6	A	2
UFX5400804001A016040	0,1	0,8	4	40	1,6	A	2
UFX5400804002A016040	0,2	0,8	4	40	1,6	A	2
UFX5400904Y50A018040	0,05	0,9	4	40	1,8	A	2
UFX5400904001A018040	0,1	0,9	4	40	1,8	A	2
UFX5401006Y50A025050	0,05	1	6	50	2,5	A	2
UFX5401006001A025050	0,1	1	6	50	2,5	A	2
UFX5401006002A025050	0,2	1	6	50	2,5	A	2
UFX5401006003A025050	0,3	1	6	50	2,5	A	2
UFX5401206Y50A030050	0,05	1,2	6	50	3	A	2
UFX5401206001A030050	0,1	1,2	6	50	3	A	2
UFX5401206002A030050	0,2	1,2	6	50	3	A	2
UFX5401206003A030050	0,3	1,2	6	50	3	A	2
UFX5401506Y50A040050	0,05	1,5	6	50	4	A	2
UFX5401506001A040050	0,1	1,5	6	50	4	A	2
UFX5401506002A040050	0,2	1,5	6	50	4	A	2
UFX5401506003A040050	0,3	1.5	6	50	4	A	2
UFX5401506005A040050	0,5	1.5	6	50	4	A	2
UFX5402006001A060050	0,1	2.0	6	50	6	A	2
UFX5402006002A060050	0,2	2.0	6	50	6	A	2
UFX5402006003A060050	0,3	2.0	6	50	6	A	2
UFX5402006005A060050	0,5	2.0	6	50	6	A	2
UFX5402506001A070060	0,1	2.5	6	60	7	A	2
UFX5402506002A070060	0,2	2.5	6	60	7	A	2
UFX5402506003A070060	0,3	2.5	6	60	7	A	2
UFX5402506005A070060	0,5	2.5	6	60	7	A	2
UFX5403006001A080060	0,1	3.0	6	60	8	A	2
UFX5403006002A080060	0,2	3.0	6	60	8	A	2
UFX5403006003A080060	0,3	3.0	6	60	8	A	2
UFX5403006005A080060	0,5	3.0	6	60	8	A	2

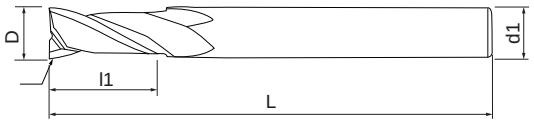
µm	D ≤ 6	0~-0.012	d1 h6		R	R ≤ 6 ±0.010
	D > 6	0~-0.015				R > 6 ±0.015

UFX54 NEW

SQUARE TYPE WALCOWO-CZOŁOWE
2 Flute 2 ostrzowe

HSM Vmax	F	M	30°	A	max	min	AIR
					○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, SI <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●	○					○						





D code Kod	R	D	d1	L	l1	Shank Uchwyt	Z
UFX5403006010A080060	1	3.0	6	60	8	A	2
UFX5403506001A100070	0,1	3.5	6	70	10	A	2
UFX5403506002A100070	0,2	3.5	6	70	10	A	2
UFX5403506003A100070	0,3	3.5	6	70	10	A	2
UFX5403506005A100070	0,5	3.5	6	70	10	A	2
UFX5404004001A100070	0,1	4.0	4	70	10	A	2
UFX5404004002A100070	0,2	4.0	4	70	10	A	2
UFX5404004003A100070	0,3	4.0	4	70	10	A	2
UFX5404004005A100070	0,5	4.0	4	70	10	A	2
UFX5404004010A100070	1	4.0	4	70	10	A	2
UFX5404004001A100100	0,1	4.0	4	100	10	A	2
UFX5404004002A100100	0,2	4.0	4	100	10	A	2
UFX5404004003A100100	0,3	4.0	4	100	10	A	2
UFX5404004005A100100	0,5	4.0	4	100	10	A	2
UFX5404004010A100100	1	4.0	4	100	10	A	2
UFX5404006001A100070	0,1	4.0	6	70	10	A	2
UFX5404006002A100070	0,2	4.0	6	70	10	A	2
UFX5404006003A100070	0,3	4.0	6	70	10	A	2
UFX5404006005A100070	0,5	4.0	6	70	10	A	2
UFX5404006010A100070	1	4.0	6	70	10	A	2
UFX5404506001A110080	0,1	4.5	6	80	11	A	2
UFX5404506002A110080	0,2	4.5	6	80	11	A	2
UFX5404506003A110080	0,3	4.5	6	80	11	A	2
UFX5404506005A110080	0,5	4.5	6	80	11	A	2
UFX5405006001A130090	0,1	5.0	6	90	13	A	2
UFX5405006002A130090	0,2	5.0	6	90	13	A	2
UFX5405006003A130090	0,3	5.0	6	90	13	A	2
UFX5405006005A130090	0,5	5.0	6	90	13	A	2
UFX5405006010A130090	1	5.0	6	90	13	A	2
UFX5405506001A130090	0,1	5.5	6	90	13	A	2
UFX5405506002A130090	0,2	5.5	6	90	13	A	2
UFX5405506003A130090	0,3	5.5	6	90	13	A	2
UFX5405506005A130090	0,5	5.5	6	90	13	A	2
UFX5405506010A130090	1	5.5	6	90	13	A	2
UFX5406006002A150060	0,2	6.0	6	60	15	A	2
UFX5406006003A150060	0,3	6.0	6	60	15	A	2
UFX5406006005A150060	0,5	6.0	6	60	15	A	2
UFX5406006010A150060	1	6.0	6	60	15	A	2
UFX5406006001A150090	0,1	6.0	6	90	15	A	2
UFX5406006002A150090	0,2	6.0	6	90	15	A	2
UFX5406006003A150090	0,3	6.0	6	90	15	A	2
UFX5406006005A150090	0,5	6.0	6	90	15	A	2
UFX5406006010A150090	1	6.0	6	90	15	A	2
UFX5406006015A150090	1,5	6.0	6	90	15	A	2

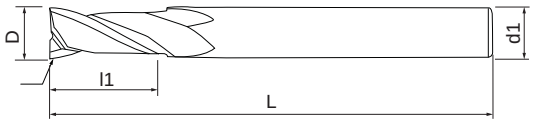
µm	D ≤ 6	0~-0.012	d1 h6		R	R ≤ 6 ±0.010
	D > 6	0~-0.015				R > 6 ±0.015

UFX54 NEW

SQUARE TYPE WALCOWO-CZOŁOWE
2 Flute 2 ostrzowe

HSM Vmax	F	M	30°	A	max	min	AIR
					○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●	○					○						





D code Kod	R	D	d1	L	l1	Shank Uchwyt	Z
UFX5406006020A150090	2	6.0	6	90	15	A	2
UFX5406006005A150110	0,5	6.0	6	110	15	A	2
UFX5406006010A150110	1	6.0	6	110	15	A	2
UFX5406006005A150130	0,5	6.0	6	130	15	A	2
UFX5406006010A150130	1	6.0	6	130	15	A	2
UFX5407008001A160090	0,1	7.0	8	90	16	A	2
UFX5407008002A160090	0,2	7.0	8	90	16	A	2
UFX5407008003A160090	0,3	7.0	8	90	16	A	2
UFX5407008005A160090	0,5	7.0	8	90	16	A	2
UFX5407008010A160090	1	7.0	8	90	16	A	2
UFX5407008020A160090	2	7.0	8	90	16	A	2
UFX5408008003A200070	0,3	8.0	8	70	20	A	2
UFX5408008005A200070	0,5	8.0	8	70	20	A	2
UFX5408008010A200070	1	8.0	8	70	20	A	2
UFX5408008001A200100	0,1	8.0	8	100	20	A	2
UFX5408008002A200100	0,2	8.0	8	100	20	A	2
UFX5408008003A200100	0,3	8.0	8	100	20	A	2
UFX5408008005A200100	0,5	8.0	8	100	20	A	2
UFX5408008010A200100	1	8.0	8	100	20	A	2
UFX5408008015A200100	1,5	8.0	8	100	20	A	2
UFX5408008020A200100	2	8.0	8	100	20	A	2
UFX5408008025A200100	2,5	8.0	8	100	20	A	2
UFX5408008030A200100	3	8.0	8	100	20	A	2
UFX5408008005A200120	0,5	8.0	8	120	20	A	2
UFX5408008010A200120	1	8.0	8	120	20	A	2
UFX5408008005A200150	0,5	8.0	8	150	20	A	2
UFX5408008010A200150	1	8.0	8	150	20	A	2
UFX5410010003A250075	0,3	10.0	10	75	25	A	2
UFX5410010005A250075	0,5	10.0	10	75	25	A	2
UFX5410010010A250075	1	10.0	10	75	25	A	2
UFX5410010001A250100	0,1	10.0	10	100	25	A	2
UFX5410010002A250100	0,2	10.0	10	100	25	A	2
UFX5410010003A250100	0,3	10.0	10	100	25	A	2
UFX5410010005A250100	0,5	10.0	10	100	25	A	2
UFX5410010010A250100	1	10.0	10	100	25	A	2
UFX5410010015A250100	1,5	10.0	10	100	25	A	2
UFX5410010020A250100	2	10.0	10	100	25	A	2
UFX5410010025A250100	2,5	10.0	10	100	25	A	2
UFX5410010030A250100	3	10.0	10	100	25	A	2
UFX5410010040A250100	4	10.0	10	100	25	A	2
UFX5410010005A250130	0,5	10.0	10	130	25	A	2
UFX5410010010A250130	1	10.0	10	130	25	A	2
UFX5410010005A250150	0,5	10.0	10	150	25	A	2
UFX5410010010A250150	1	10.0	10	150	25	A	2

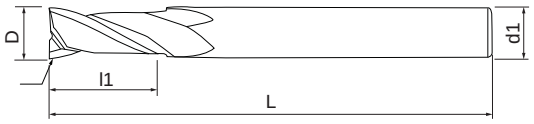
µm	D ≤ 6	0~-0.012	d1 h6		R	R ≤ 6 ±0.010
	D > 6	0~-0.015				R > 6 ±0.015

UFX54 NEW

SQUARE TYPE WALCOWO-CZOŁOWE
2 Flute 2 ostrzowe

HSM Vmax	F	M	30°	A	max	min	AIR
					○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●	○					○						





D code Kod	R	D	d1	L	l1	Shank Uchwyt	Z
UFX5411012002A250110	0,2	11.0	12	110	25	A	2
UFX5411012003A250110	0,3	11.0	12	110	25	A	2
UFX5411012005A250110	0,5	11.0	12	110	25	A	2
UFX5411012010A250110	1	11.0	12	110	25	A	2
UFX5411012020A250110	2	11.0	12	110	25	A	2
UFX5412012003A300080	0,3	12.0	12	80	30	A	2
UFX5412012005A300080	0,5	12.0	12	80	30	A	2
UFX5412012010A300080	1	12.0	12	80	30	A	2
UFX5412012001A300110	0,1	12.0	12	110	30	A	2
UFX5412012002A300110	0,2	12.0	12	110	30	A	2
UFX5412012003A300110	0,3	12.0	12	110	30	A	2
UFX5412012005A300110	0,5	12.0	12	110	30	A	2
UFX5412012010A300110	1	12.0	12	110	30	A	2
UFX5412012015A300110	1,5	12.0	12	110	30	A	2
UFX5412012020A300110	2	12.0	12	110	30	A	2
UFX5412012025A300110	2,5	12.0	12	110	30	A	2
UFX5412012030A300110	3	12.0	12	110	30	A	2
UFX5412012040A300110	4	12.0	12	110	30	A	2
UFX5412012050A300110	5	12.0	12	110	30	A	2
UFX5412012005A300130	0,5	12.0	12	130	30	A	2
UFX5412012010A300130	1	12.0	12	130	30	A	2
UFX5412012005A300150	0,5	12.0	12	150	30	A	2
UFX5412012010A300150	1	12.0	12	150	30	A	2
UFX5414016005A350150	0,5	14.0	16	150	35	A	2
UFX5414016010A350150	1	14.0	16	150	35	A	2
UFX5414016020A350150	2	14.0	16	150	35	A	2
UFX5416016005A320150	0,5	16.0	16	150	32	A	2
UFX5416016010A320150	1	16.0	16	150	32	A	2
UFX5416016015A320150	1,5	16.0	16	150	32	A	2
UFX5416016020A320150	2	16.0	16	150	32	A	2
UFX5420020005A380150	0,5	20.0	20	150	38	A	2
UFX5420020010A380150	1	20.0	20	150	38	A	2
UFX5420020015A380150	1,5	20.0	20	150	38	A	2
UFX5420020020A380150	2	20.0	20	150	38	A	2

µm	D ≤ 6	0~-0.012	d1 h6		R	R ≤ 6 ±0.010
	D > 6	0~-0.015				R > 6 ±0.015

UFX54

Cutting Conditions Parametry skrawania

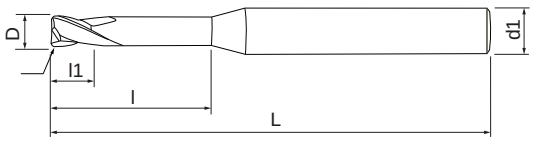
			Non-alloyed Steels Alloy Steels Cast Iron Stale niestopowe, żeliwo stopowe		Alloy Steels Heat Resistant Steels Stale stopowe, Stale żaroodporne		Hardened Steels Stale hartowane	
			~ 35 HRC		35 HRC ~ 45 HRC		45 HRC ~ 55 HRC	
D (mm)	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min
0.2	0,2	0,04	44000	145	28800	60	17600	40
0.3	0,3	0,06	41000	170	27000	70	16500	45
0.4	0,4	0,08	41000	170	27000	70	16500	45
0.5	0,5	0,1	36000	190	23400	80	14300	50
0.6	0,6	0,12	30000	210	19800	90	12100	55
0.7	0,7	0,14	30000	210	19800	90	12100	55
0.8	0,8	0,16	30000	210	19800	90	12100	55
0.9	0,9	0,18	30000	225	18900	90	11550	55
1.0	1	0,2	27600	240	18000	100	11000	60
1.2	1,2	0,24	24800	245	15750	105	9750	60
1.5	1,5	0,3	22000	250	13500	110	8500	60
2.0	2	0,4	18000	260	11560	120	7200	70
2.5	2,5	0,5	15000	270	9500	130	6100	70
3.0	3	0,6	13240	280	8560	140	5280	70
3.5	3,5	0,7	11980	310	7690	155	4790	75
4.0	4	0,8	10720	340	6820	170	4300	80
4.5	4,5	0,9	9940	380	6310	185	4300	90
5.0	5	1	9160	420	5800	200	3800	100
5.5	5,5	1,1	8530	460	5420	225	3540	110
6.0	6	1,2	7900	500	5040	250	3280	120
7.0	7	1,4	6950	520	4420	250	2900	120
8.0	8	1,6	6000	540	3800	250	2520	120
10.0	10	2	5040	540	3280	250	2020	120
11.0	11	2,2	4580	480	3030	240	1850	110
12.0	12	2,4	4120	420	2780	230	1680	100
14.0	14	2,8	3610	390	2440	200	1480	90
16.0	16	3,2	3100	360	2100	170	1280	80
20.0	20	4	2520	280	1640	120	1000	60

UFX58 NEW

SQUARE TYPE WALCOWO-CZOŁOWE
2-Flute with extended neck 2-ostrzowe z szyjką

HSM Vmax	F	M	30°	A	max	min	AIR
					○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●	○					○						





D code Kod	R	D	d1	L	l1	l2	Shank Uchwyt	Z
UFX5800204Y20A003005	0,02	0.2	4	40	0.3	0.5	A	2
UFX5800204Y20A003010	0,02	0.2	4	40	0.3	1	A	2
UFX5800204Y20A003015	0,02	0.2	4	40	0.3	1.5	A	2
UFX5800204Y20A003020	0,02	0.2	4	40	0.3	2	A	2
UFX5800204Y50A003005	0,05	0.2	4	40	0.3	0.5	A	2
UFX5800204Y50A003010	0,05	0.2	4	40	0.3	1	A	2
UFX5800204Y50A003015	0,05	0.2	4	40	0.3	1.5	A	2
UFX5800204Y50A003020	0,05	0.2	4	40	0.3	2	A	2
UFX5800304Y20A005010	0,02	0.3	4	40	0.5	1	A	2
UFX5800304Y20A005020	0,02	0.3	4	40	0.5	2	A	2
UFX5800304Y20A005030	0,02	0.3	4	40	0.5	3	A	2
UFX5800304Y50A005010	0,05	0.3	4	40	0.5	1	A	2
UFX5800304Y50A005020	0,05	0.3	4	40	0.5	2	A	2
UFX5800304Y50A005030	0,05	0.3	4	40	0.5	3	A	2
UFX5800404Y50A006010	0,05	0.4	4	40	0.6	1	A	2
UFX5800404Y50A006015	0,05	0.4	4	40	0.6	1.5	A	2
UFX5800404Y50A006020	0,05	0.4	4	40	0.6	2	A	2
UFX5800404Y50A006025	0,05	0.4	4	40	0.6	2.5	A	2
UFX5800404Y50A006030	0,05	0.4	4	40	0.6	3	A	2
UFX5800404Y50A006040	0,05	0.4	4	40	0.6	4	A	2
UFX5800404001A006010	0,1	0.4	4	40	0.6	1	A	2
UFX5800404001A006015	0,1	0.4	4	40	0.6	1.5	A	2
UFX5800404001A006020	0,1	0.4	4	40	0.6	2	A	2
UFX5800404001A006025	0,1	0.4	4	40	0.6	2.5	A	2
UFX5800404001A006030	0,1	0.4	4	40	0.6	3	A	2
UFX5800404001A006040	0,1	0.4	4	40	0.6	4	A	2
UFX5800504Y50A007010	0,05	0.5	4	45	0.7	1	A	2
UFX5800504Y50A007015	0,05	0.5	4	45	0.7	1.5	A	2
UFX5800504Y50A007020	0,05	0.5	4	45	0.7	2	A	2
UFX5800504Y50A007025	0,05	0.5	4	45	0.7	2.5	A	2
UFX5800504Y50A007030	0,05	0.5	4	45	0.7	3	A	2
UFX5800504Y50A007040	0,05	0.5	4	45	0.7	4	A	2
UFX5800504Y50A007050	0,05	0.5	4	45	0.7	5	A	2
UFX5800504Y50A007060	0,05	0.5	4	45	0.7	6	A	2
UFX5800504001A007010	0,1	0.5	4	45	0.7	1	A	2
UFX5800504001A007015	0,1	0.5	4	45	0.7	1.5	A	2
UFX5800504001A007020	0,1	0.5	4	45	0.7	2	A	2
UFX5800504001A007025	0,1	0.5	4	45	0.7	2.5	A	2
UFX5800504001A007030	0,1	0.5	4	45	0.7	3	A	2
UFX5800504001A007040	0,1	0.5	4	45	0.7	4	A	2
UFX5800504001A007050	0,1	0.5	4	45	0.7	5	A	2
UFX5800504001A007060	0,1	0.5	4	45	0.7	6	A	2
UFX5800604Y50A009020	0,05	0.6	4	45	0.9	2	A	2
UFX5800604Y50A009030	0,05	0.6	4	45	0.9	3	A	2

µm	D ≤ 6	0~-0.012	d1 h6		R	R ≤ 6 ±0.010
	D > 6	0~-0.015				R > 6 ±0.015

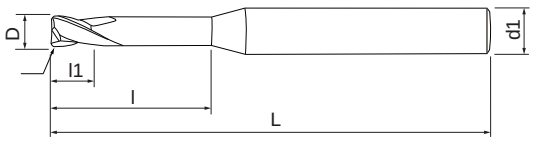
UFX58 NEW

SQUARE TYPE WALCOWO-CZOŁOWE

2-Flute with extended neck 2-ostrzowe z szyjką

HSM Vmax	F	M	30°	A	max	min	AIR
					○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●	○					○						





D code Kod	R	D	d1	L	l1	l2	Shank Uchwyt	Z
UFX5800604Y50A009040	0,05	0.6	4	45	0.9	4	A	2
UFX5800604Y50A009060	0,05	0.6	4	45	0.9	6	A	2
UFX5800604Y50A009080	0,05	0.6	4	45	0.9	8	A	2
UFX5800604Y50A009100	0,05	0.6	4	45	0.9	10	A	2
UFX5800604001A009020	0,1	0.6	4	45	0.9	2	A	2
UFX5800604001A009030	0,1	0.6	4	45	0.9	3	A	2
UFX5800604001A009040	0,1	0.6	4	45	0.9	4	A	2
UFX5800604001A009060	0,1	0.6	4	45	0.9	6	A	2
UFX5800604001A009080	0,1	0.6	4	45	0.9	8	A	2
UFX5800604001A009100	0,1	0.6	4	45	0.9	10	A	2
UFX5800604002A009020	0,2	0.6	4	45	0.9	2	A	2
UFX5800604002A009030	0,2	0.6	4	45	0.9	3	A	2
UFX5800604002A009040	0,2	0.6	4	45	0.9	4	A	2
UFX5800604002A009060	0,2	0.6	4	45	0.9	6	A	2
UFX5800604002A009080	0,2	0.6	4	45	0.9	8	A	2
UFX5800604002A009100	0,2	0.6	4	45	0.9	10	A	2
UFX5800704Y50A012020	0,05	0.7	4	45	1.2	2	A	2
UFX5800704Y50A012040	0,05	0.7	4	45	1.2	4	A	2
UFX5800704Y50A012060	0,05	0.7	4	45	1.2	6	A	2
UFX5800704Y50A012080	0,05	0.7	4	45	1.2	8	A	2
UFX5800704Y50A012100	0,05	0.7	4	45	1.2	10	A	2
UFX5800704001A012020	0,1	0.7	4	45	1.2	2	A	2
UFX5800704001A012040	0,1	0.7	4	45	1.2	4	A	2
UFX5800704001A012060	0,1	0.7	4	45	1.2	6	A	2
UFX5800704001A012080	0,1	0.7	4	45	1.2	8	A	2
UFX5800704001A012100	0,1	0.7	4	45	1.2	10	A	2
UFX5800704002A012020	0,2	0.7	4	45	1.2	2	A	2
UFX5800704002A012040	0,2	0.7	4	45	1.2	4	A	2
UFX5800704002A012060	0,2	0.7	4	45	1.2	6	A	2
UFX5800704002A012080	0,2	0.7	4	45	1.2	8	A	2
UFX5800704002A012100	0,2	0.7	4	45	1.2	10	A	2
UFX5800804Y50A012020	0,05	0.8	4	45	1.2	2	A	2
UFX5800804Y50A012030	0,05	0.8	4	45	1.2	3	A	2
UFX5800804Y50A012040	0,05	0.8	4	45	1.2	4	A	2
UFX5800804Y50A012060	0,05	0.8	4	45	1.2	6	A	2
UFX5800804Y50A012080	0,05	0.8	4	45	1.2	8	A	2
UFX5800804Y50A012100	0,05	0.8	4	45	1.2	10	A	2
UFX5800804001A012020	0,1	0.8	4	45	1.2	2	A	2
UFX5800804001A012030	0,1	0.8	4	45	1.2	3	A	2
UFX5800804001A012040	0,1	0.8	4	45	1.2	4	A	2
UFX5800804001A012060	0,1	0.8	4	45	1.2	6	A	2
UFX5800804001A012080	0,1	0.8	4	45	1.2	8	A	2
UFX5800804001A012100	0,1	0.8	4	45	1.2	10	A	2
UFX5800804002A012020	0,2	0.8	4	45	1.2	2	A	2

µm	D ≤ 6	0~-0.012	d1 h6		R	R ≤ 6 ±0.010
	D > 6	0~-0.015				R > 6 ±0.015

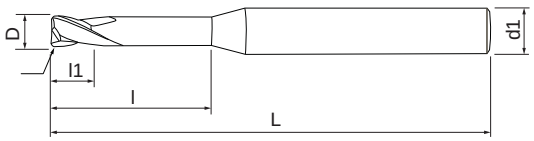
UFX58 NEW

SQUARE TYPE WALCOWO-CZOŁOWE

2-Flute with extended neck 2-ostrzowe z szyjką

HSM Vmax	F	M	30°	A	max	min	AIR
					○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●	○					○						





D code Kod	R	D	d1	L	l1	l2	Shank Uchwyt	Z
UFX5800804002A012030	0,2	0.8	4	45	1.2	3	A	2
UFX5800804002A012040	0,2	0.8	4	45	1.2	4	A	2
UFX5800804002A012060	0,2	0.8	4	45	1.2	6	A	2
UFX5800804002A012080	0,2	0.8	4	45	1.2	8	A	2
UFX5800804002A012100	0,2	0.8	4	45	1.2	10	A	2
UFX5801004Y50A015030	0,05	1.0	4	50	1.5	3	A	2
UFX5801004Y50A015040	0,05	1.0	4	50	1.5	4	A	2
UFX5801004Y50A015060	0,05	1.0	4	50	1.5	6	A	2
UFX5801004Y50A015080	0,05	1.0	4	50	1.5	8	A	2
UFX5801004Y50A015100	0,05	1.0	4	50	1.5	10	A	2
UFX5801004Y50A015120	0,05	1.0	4	50	1.5	12	A	2
UFX5801004Y50A015140	0,05	1.0	4	50	1.5	14	A	2
UFX5801004Y50A015160	0,05	1.0	4	50	1.5	16	A	2
UFX5801004Y50A015200	0,05	1.0	4	50	1.5	20	A	2
UFX5801004001A015030	0,1	1.0	4	50	1.5	3	A	2
UFX5801004001A015040	0,1	1.0	4	50	1.5	4	A	2
UFX5801004001A015060	0,1	1.0	4	50	1.5	6	A	2
UFX5801004001A015080	0,1	1.0	4	50	1.5	8	A	2
UFX5801004001A015100	0,1	1.0	4	50	1.5	10	A	2
UFX5801004001A015120	0,1	1.0	4	50	1.5	12	A	2
UFX5801004001A015140	0,1	1.0	4	50	1.5	14	A	2
UFX5801004001A015160	0,1	1.0	4	50	1.5	16	A	2
UFX5801004001A015200	0,1	1.0	4	50	1.5	20	A	2
UFX5801004002A015030	0,2	1.0	4	50	1.5	3	A	2
UFX5801004002A015040	0,2	1.0	4	50	1.5	4	A	2
UFX5801004002A015060	0,2	1.0	4	50	1.5	6	A	2
UFX5801004002A015080	0,2	1.0	4	50	1.5	8	A	2
UFX5801004002A015100	0,2	1.0	4	50	1.5	10	A	2
UFX5801004002A015120	0,2	1.0	4	50	1.5	12	A	2
UFX5801004002A015140	0,2	1.0	4	50	1.5	14	A	2
UFX5801004002A015160	0,2	1.0	4	50	1.5	16	A	2
UFX5801004002A015200	0,2	1.0	4	50	1.5	20	A	2
UFX5801004003A015030	0,3	1.0	4	50	1.5	3	A	2
UFX5801004003A015040	0,3	1.0	4	50	1.5	4	A	2
UFX5801004003A015060	0,3	1.0	4	50	1.5	6	A	2
UFX5801004003A015080	0,3	1.0	4	50	1.5	8	A	2
UFX5801004003A015100	0,3	1.0	4	50	1.5	10	A	2
UFX5801004003A015120	0,3	1.0	4	50	1.5	12	A	2
UFX5801004003A015140	0,3	1.0	4	50	1.5	14	A	2
UFX5801004003A015160	0,3	1.0	4	50	1.5	16	A	2
UFX5801004003A015200	0,3	1.0	4	50	1.5	20	A	2
UFX5801204Y50A018030	0,05	1.2	4	50	1.8	3	A	2
UFX5801204Y50A018040	0,05	1.2	4	50	1.8	4	A	2

µm	D ≤ 6	0~-0.012	d1 h6		R	R ≤ 6 ±0.010
	D > 6	0~-0.015				R > 6 ±0.015

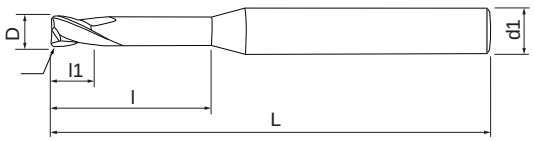
UFX58 NEW

SQUARE TYPE WALCOWO-CZOŁOWE

2-Flute with extended neck 2-ostrzowe z szyjką

HSM Vmax	F	M	30°	A					max	min		AIR
									○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●	○					○						





D code Kod	R	D	d1	L	l1	l2	Shank Uchwyt	Z
UFX5801204Y50A018060	0,05	1.2	4	50	1.8	6	A	2
UFX5801204Y50A018080	0,05	1.2	4	50	1.8	8	A	2
UFX5801204Y50A018100	0,05	1.2	4	50	1.8	10	A	2
UFX5801204Y50A018120	0,05	1.2	4	50	1.8	12	A	2
UFX5801204Y50A018160	0,05	1.2	4	50	1.8	16	A	2
UFX5801204Y50A018200	0,05	1.2	4	50	1.8	20	A	2
UFX5801204001A018030	0,1	1.2	4	50	1.8	3	A	2
UFX5801204001A018040	0,1	1.2	4	50	1.8	4	A	2
UFX5801204001A018060	0,1	1.2	4	50	1.8	6	A	2
UFX5801204001A018080	0,1	1.2	4	50	1.8	8	A	2
UFX5801204001A018100	0,1	1.2	4	50	1.8	10	A	2
UFX5801204001A018120	0,1	1.2	4	50	1.8	12	A	2
UFX5801204001A018160	0,1	1.2	4	50	1.8	16	A	2
UFX5801204001A018200	0,1	1.2	4	50	1.8	20	A	2
UFX5801204002A018030	0,2	1.2	4	50	1.8	3	A	2
UFX5801204002A018040	0,2	1.2	4	50	1.8	4	A	2
UFX5801204002A018060	0,2	1.2	4	50	1.8	6	A	2
UFX5801204002A018080	0,2	1.2	4	50	1.8	8	A	2
UFX5801204002A018100	0,2	1.2	4	50	1.8	10	A	2
UFX5801204002A018120	0,2	1.2	4	50	1.8	12	A	2
UFX5801204002A018160	0,2	1.2	4	50	1.8	16	A	2
UFX5801204002A018200	0,2	1.2	4	50	1.8	20	A	2
UFX5801204003A018030	0,3	1.2	4	50	1.8	3	A	2
UFX5801204003A018040	0,3	1.2	4	50	1.8	4	A	2
UFX5801204003A018060	0,3	1.2	4	50	1.8	6	A	2
UFX5801204003A018080	0,3	1.2	4	50	1.8	8	A	2
UFX5801204003A018100	0,3	1.2	4	50	1.8	10	A	2
UFX5801204003A018120	0,3	1.2	4	50	1.8	12	A	2
UFX5801204003A018160	0,3	1.2	4	50	1.8	16	A	2
UFX5801204003A018200	0,3	1.2	4	50	1.8	20	A	2
UFX5801504Y50A023040	0,05	1.5	4	50	2.3	4	A	2
UFX5801504Y50A023060	0,05	1.5	4	50	2.3	6	A	2
UFX5801504Y50A023080	0,05	1.5	4	50	2.3	8	A	2
UFX5801504Y50A023100	0,05	1.5	4	50	2.3	10	A	2
UFX5801504Y50A023120	0,05	1.5	4	50	2.3	12	A	2
UFX5801504Y50A023140	0,05	1.5	4	50	2.3	14	A	2
UFX5801504Y50A023160	0,05	1.5	4	50	2.3	16	A	2
UFX5801504Y50A023200	0,05	1.5	4	50	2.3	20	A	2
UFX5801504Y50A023220	0,05	1.5	4	60	2.3	22	A	2
UFX5801504Y50A023260	0,05	1.5	4	60	2.3	26	A	2
UFX5801504001A023040	0,1	1.5	4	50	2.3	4	A	2
UFX5801504001A023060	0,1	1.5	4	50	2.3	6	A	2
UFX5801504001A023080	0,1	1.5	4	50	2.3	8	A	2

µm	D ≤ 6	0~-0.012	d1 h6		R	R ≤ 6 ±0.010
	D > 6	0~-0.015				R > 6 ±0.015

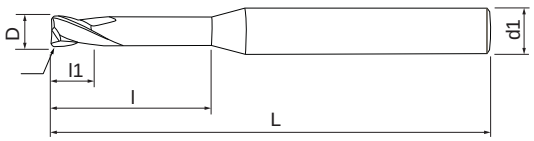
UFX58 NEW

SQUARE TYPE WALCOWO-CZOŁOWE

2-Flute with extended neck 2-ostrzowe z szyjką

HSM Vmax	F	M	30°	A	max	min	AIR
					○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●	○					○						





D code Kod	R	D	d1	L	l1	l2	Shank Uchwyt	Z
UFX5801504001A023100	0,1	1.5	4	50	2.3	10	A	2
UFX5801504001A023120	0,1	1.5	4	50	2.3	12	A	2
UFX5801504001A023140	0,1	1.5	4	50	2.3	14	A	2
UFX5801504001A023160	0,1	1.5	4	50	2.3	16	A	2
UFX5801504001A023200	0,1	1.5	4	50	2.3	20	A	2
UFX5801504001A023220	0,1	1.5	4	60	2.3	22	A	2
UFX5801504001A023260	0,1	1.5	4	60	2.3	26	A	2
UFX5801504002A023040	0,2	1.5	4	50	2.3	4	A	2
UFX5801504002A023060	0,2	1.5	4	50	2.3	6	A	2
UFX5801504002A023080	0,2	1.5	4	50	2.3	8	A	2
UFX5801504002A023100	0,2	1.5	4	50	2.3	10	A	2
UFX5801504002A023120	0,2	1.5	4	50	2.3	12	A	2
UFX5801504002A023140	0,2	1.5	4	50	2.3	14	A	2
UFX5801504002A023160	0,2	1.5	4	50	2.3	16	A	2
UFX5801504002A023200	0,2	1.5	4	50	2.3	20	A	2
UFX5801504002A023220	0,2	1.5	4	60	2.3	22	A	2
UFX5801504002A023260	0,2	1.5	4	60	2.3	26	A	2
UFX5801504003A023040	0,3	1.5	4	50	2.3	4	A	2
UFX5801504003A023060	0,3	1.5	4	50	2.3	6	A	2
UFX5801504003A023080	0,3	1.5	4	50	2.3	8	A	2
UFX5801504003A023100	0,3	1.5	4	50	2.3	10	A	2
UFX5801504003A023120	0,3	1.5	4	50	2.3	12	A	2
UFX5801504003A023140	0,3	1.5	4	50	2.3	14	A	2
UFX5801504003A023160	0,3	1.5	4	50	2.3	16	A	2
UFX5801504003A023200	0,3	1.5	4	50	2.3	20	A	2
UFX5801504003A023220	0,3	1.5	4	60	2.3	22	A	2
UFX5801504003A023260	0,3	1.5	4	60	2.3	26	A	2
UFX5801504005A023040	0,5	1.5	4	50	2.3	4	A	2
UFX5801504005A023060	0,5	1.5	4	50	2.3	6	A	2
UFX5801504005A023080	0,5	1.5	4	50	2.3	8	A	2
UFX5801504005A023100	0,5	1.5	4	50	2.3	10	A	2
UFX5801504005A023120	0,5	1.5	4	50	2.3	12	A	2
UFX5801504005A023140	0,5	1.5	4	50	2.3	14	A	2
UFX5801504005A023160	0,5	1.5	4	50	2.3	16	A	2
UFX5801504005A023200	0,5	1.5	4	50	2.3	20	A	2
UFX5801504005A023220	0,5	1.5	4	60	2.3	22	A	2
UFX5801504005A023260	0,5	1.5	4	60	2.3	26	A	2
UFX5802004001A030060	0,1	2.0	4	50	3	6	A	2
UFX5802004001A030080	0,1	2.0	4	50	3	8	A	2
UFX5802004001A030100	0,1	2.0	4	50	3	10	A	2
UFX5802004001A030120	0,1	2.0	4	50	3	12	A	2
UFX5802004001A030140	0,1	2.0	4	50	3	14	A	2
UFX5802004001A030160	0,1	2.0	4	50	3	16	A	2

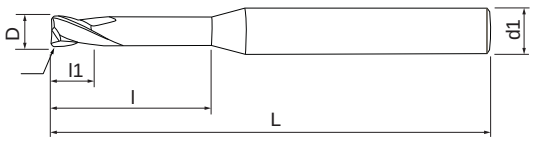
µm	D ≤ 6	0~-0.012	d1 h6		R	R ≤ 6 ±0.010
	D > 6	0~-0.015				R > 6 ±0.015

UFX58 NEW

SQUARE TYPE WALCOWO-CZOŁOWE
2-Flute with extended neck 2-ostrzowe z szyjką

HSM Vmax	F	M	30°	A	max	min	AIR
					○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●	○					○						





D code Kod	R	D	d1	L	l1	l2	Shank Uchwyt	Z
UFX5802004001A030200	0,1	2.0	4	50	3	20	A	2
UFX5802004001A030220	0,1	2.0	4	60	3	22	A	2
UFX5802004001A030260	0,1	2.0	4	60	3	26	A	2
UFX5802004001A030300	0,1	2.0	4	70	3	30	A	2
UFX5802004002A030060	0,2	2.0	4	50	3	6	A	2
UFX5802004002A030080	0,2	2.0	4	50	3	8	A	2
UFX5802004002A030100	0,2	2.0	4	50	3	10	A	2
UFX5802004002A030120	0,2	2.0	4	50	3	12	A	2
UFX5802004002A030140	0,2	2.0	4	50	3	14	A	2
UFX5802004002A030160	0,2	2.0	4	50	3	16	A	2
UFX5802004002A030200	0,2	2.0	4	50	3	20	A	2
UFX5802004002A030220	0,2	2.0	4	60	3	22	A	2
UFX5802004002A030260	0,2	2.0	4	60	3	26	A	2
UFX5802004002A030300	0,2	2.0	4	70	3	30	A	2
UFX5802004003A030060	0,3	2.0	4	50	3	6	A	2
UFX5802004003A030080	0,3	2.0	4	50	3	8	A	2
UFX5802004003A030100	0,3	2.0	4	50	3	10	A	2
UFX5802004003A030120	0,3	2.0	4	50	3	12	A	2
UFX5802004003A030140	0,3	2.0	4	50	3	14	A	2
UFX5802004003A030160	0,3	2.0	4	50	3	16	A	2
UFX5802004003A030200	0,3	2.0	4	50	3	20	A	2
UFX5802004003A030220	0,3	2.0	4	60	3	22	A	2
UFX5802004003A030260	0,3	2.0	4	60	3	26	A	2
UFX5802004003A030300	0,3	2.0	4	70	3	30	A	2
UFX5802004005A030060	0,5	2.0	4	50	3	6	A	2
UFX5802004005A030080	0,5	2.0	4	50	3	8	A	2
UFX5802004005A030100	0,5	2.0	4	50	3	10	A	2
UFX5802004005A030120	0,5	2.0	4	50	3	12	A	2
UFX5802004005A030140	0,5	2.0	4	50	3	14	A	2
UFX5802004005A030160	0,5	2.0	4	50	3	16	A	2
UFX5802004005A030200	0,5	2.0	4	50	3	20	A	2
UFX5802004005A030220	0,5	2.0	4	60	3	22	A	2
UFX5802004005A030260	0,5	2.0	4	60	3	26	A	2
UFX5802004005A030300	0,5	2.0	4	70	3	30	A	2
UFX5802504001A040080	0,1	2.5	4	50	4	8	A	2
UFX5802504001A040100	0,1	2.5	4	50	4	10	A	2
UFX5802504001A040120	0,1	2.5	4	50	4	12	A	2
UFX5802504001A040140	0,1	2.5	4	50	4	14	A	2
UFX5802504001A040160	0,1	2.5	4	50	4	16	A	2
UFX5802504001A040200	0,1	2.5	4	50	4	20	A	2
UFX5802504001A040260	0,1	2.5	4	60	4	26	A	2
UFX5802504001A040300	0,1	2.5	4	70	4	30	A	2
UFX5802504002A040080	0,2	2.5	4	50	4	8	A	2

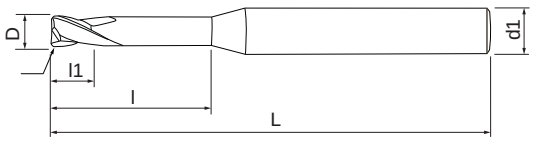
µm	D ≤ 6	0~-0.012	d1 h6		R	R ≤ 6 ±0.010
	D > 6	0~-0.015				R > 6 ±0.015

UFX58 NEW

SQUARE TYPE WALCOWO-CZOŁOWE
2-Flute with extended neck 2-ostrzowe z szyjką

HSM Vmax	F	M	30°	A	max	min	AIR
					○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●	○					○						





D code Kod	R	D	d1	L	l1	l2	Shank Uchwyt	Z
UFX5802504002A040100	0,2	2.5	4	50	4	10	A	2
UFX5802504002A040120	0,2	2.5	4	50	4	12	A	2
UFX5802504002A040140	0,2	2.5	4	50	4	14	A	2
UFX5802504002A040160	0,2	2.5	4	50	4	16	A	2
UFX5802504002A040200	0,2	2.5	4	50	4	20	A	2
UFX5802504002A040260	0,2	2.5	4	60	4	26	A	2
UFX5802504002A040300	0,2	2.5	4	70	4	30	A	2
UFX5802504003A040080	0,3	2.5	4	50	4	8	A	2
UFX5802504003A040100	0,3	2.5	4	50	4	10	A	2
UFX5802504003A040120	0,3	2.5	4	50	4	12	A	2
UFX5802504003A040140	0,3	2.5	4	50	4	14	A	2
UFX5802504003A040160	0,3	2.5	4	50	4	16	A	2
UFX5802504003A040200	0,3	2.5	4	50	4	20	A	2
UFX5802504003A040260	0,3	2.5	4	60	4	26	A	2
UFX5802504003A040300	0,3	2.5	4	70	4	30	A	2
UFX5802506005A040080	0,5	2.5	6	50	4	8	A	2
UFX5802506005A040100	0,5	2.5	6	50	4	10	A	2
UFX5802506005A040120	0,5	2.5	6	50	4	12	A	2
UFX5802506005A040140	0,5	2.5	6	50	4	14	A	2
UFX5802506005A040160	0,5	2.5	6	50	4	16	A	2
UFX5802506005A040200	0,5	2.5	6	50	4	20	A	2
UFX5802506005A040260	0,5	2.5	6	60	4	26	A	2
UFX5802506005A040300	0,5	2.5	6	70	4	30	A	2
UFX5803006001A045080	0,1	3.0	6	50	4.5	8	A	2
UFX5803006001A045100	0,1	3.0	6	50	4.5	10	A	2
UFX5803006001A045120	0,1	3.0	6	50	4.5	12	A	2
UFX5803006001A045140	0,1	3.0	6	60	4.5	14	A	2
UFX5803006001A045160	0,1	3.0	6	60	4.5	16	A	2
UFX5803006001A045200	0,1	3.0	6	60	4.5	20	A	2
UFX5803006001A045260	0,1	3.0	6	65	4.5	26	A	2
UFX5803006001A045300	0,1	3.0	6	70	4.5	30	A	2
UFX5803006001A045350	0,1	3.0	6	70	4.5	35	A	2
UFX5803006001A045400	0,1	3.0	6	80	4.5	40	A	2
UFX5803006002A045080	0,2	3.0	6	50	4.5	8	A	2
UFX5803006002A045100	0,2	3.0	6	50	4.5	10	A	2
UFX5803006002A045120	0,2	3.0	6	50	4.5	12	A	2
UFX5803006002A045140	0,2	3.0	6	60	4.5	14	A	2
UFX5803006002A045160	0,2	3.0	6	60	4.5	16	A	2
UFX5803006002A045200	0,2	3.0	6	60	4.5	20	A	2
UFX5803006002A045260	0,2	3.0	6	65	4.5	26	A	2
UFX5803006002A045300	0,2	3.0	6	70	4.5	30	A	2

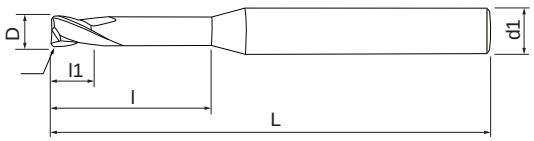
µm	D ≤ 6	0~-0.012	d1 h6		R	R ≤ 6 ±0.010
	D > 6	0~-0.015				R > 6 ±0.015

UFX58 NEW

SQUARE TYPE WALCOWO-CZOŁOWE
2-Flute with extended neck 2-ostrzowe z szyjką

HSM Vmax	F	M	30°	A	max	min	AIR
					○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●	○					○						





D code Kod	R	D	d1	L	l1	l2	Shank Uchwyt	Z
UFX5803006002A045350	0,2	3.0	6	70	4.5	35	A	2
UFX5803006002A045400	0,2	3.0	6	80	4.5	40	A	2
UFX5803006003A045080	0,3	3.0	6	50	4.5	8	A	2
UFX5803006003A045100	0,3	3.0	6	50	4.5	10	A	2
UFX5803006003A045120	0,3	3.0	6	50	4.5	12	A	2
UFX5803006003A045140	0,3	3.0	6	60	4.5	14	A	2
UFX5803006003A045160	0,3	3.0	6	60	4.5	16	A	2
UFX5803006003A045200	0,3	3.0	6	60	4.5	20	A	2
UFX5803006003A045260	0,3	3.0	6	65	4.5	26	A	2
UFX5803006003A045300	0,3	3.0	6	70	4.5	30	A	2
UFX5803006003A045350	0,3	3.0	6	70	4.5	35	A	2
UFX5803006003A045400	0,3	3.0	6	80	4.5	40	A	2
UFX5803006005A045080	0,5	3.0	6	50	4.5	8	A	2
UFX5803006005A045100	0,5	3.0	6	50	4.5	10	A	2
UFX5803006005A045120	0,5	3.0	6	50	4.5	12	A	2
UFX5803006005A045140	0,5	3.0	6	60	4.5	14	A	2
UFX5803006005A045160	0,5	3.0	6	60	4.5	16	A	2
UFX5803006005A045200	0,5	3.0	6	60	4.5	20	A	2
UFX5803006005A045260	0,5	3.0	6	65	4.5	26	A	2
UFX5803006005A045300	0,5	3.0	6	70	4.5	30	A	2
UFX5803006005A045350	0,5	3.0	6	70	4.5	35	A	2
UFX5803006005A045400	0,5	3.0	6	80	4.5	40	A	2
UFX5803006010A045080	1	3.0	6	50	4.5	8	A	2
UFX5803006010A045100	1	3.0	6	50	4.5	10	A	2
UFX5803006010A045120	1	3.0	6	50	4.5	12	A	2
UFX5803006010A045140	1	3.0	6	60	4.5	14	A	2
UFX5803006010A045160	1	3.0	6	60	4.5	16	A	2
UFX5803006010A045200	1	3.0	6	60	4.5	20	A	2
UFX5803006010A045260	1	3.0	6	65	4.5	26	A	2
UFX5803006010A045300	1	3.0	6	70	4.5	30	A	2
UFX5803006010A045350	1	3.0	6	70	4.5	35	A	2
UFX5803006010A045400	1	3.0	6	80	4.5	40	A	2
UFX5804006001A060100	0,1	4.0	6	50	6	10	A	2
UFX5804006001A060120	0,1	4.0	6	50	6	12	A	2
UFX5804006001A060140	0,1	4.0	6	60	6	14	A	2
UFX5804006001A060160	0,1	4.0	6	60	6	16	A	2
UFX5804006001A060200	0,1	4.0	6	60	6	20	A	2
UFX5804006001A060260	0,1	4.0	6	65	6	26	A	2
UFX5804006001A060300	0,1	4.0	6	70	6	30	A	2
UFX5804006001A060350	0,1	4.0	6	70	6	35	A	2
UFX5804006001A060400	0,1	4.0	6	80	6	40	A	2

µm	D ≤ 6	0~-0.012	d1 h6		R	R ≤ 6 ±0.010
	D > 6	0~-0.015				R > 6 ±0.015

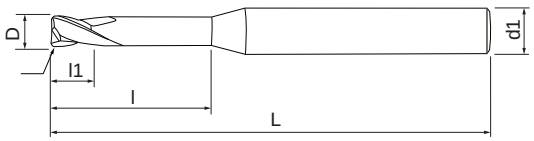
UFX58 NEW

SQUARE TYPE WALCOWO-CZOŁOWE

2-Flute with extended neck 2-ostrzowe z szyjką

HSM Vmax	F	M	30°	A	max	min	AIR
					○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●	○					○						





D code Kod	R	D	d1	L	l1	l2	Shank Uchwyt	Z
UFX5804006001A060450	0,1	4.0	6	90	6	45	A	2
UFX5804006001A060500	0,1	4.0	6	100	6	50	A	2
UFX5804006002A060100	0,2	4.0	6	50	6	10	A	2
UFX5804006002A060120	0,2	4.0	6	50	6	12	A	2
UFX5804006002A060140	0,2	4.0	6	60	6	14	A	2
UFX5804006002A060160	0,2	4.0	6	60	6	16	A	2
UFX5804006002A060200	0,2	4.0	6	60	6	20	A	2
UFX5804006002A060260	0,2	4.0	6	65	6	26	A	2
UFX5804006002A060300	0,2	4.0	6	70	6	30	A	2
UFX5804006002A060350	0,2	4.0	6	70	6	35	A	2
UFX5804006002A060400	0,2	4.0	6	80	6	40	A	2
UFX5804006002A060450	0,2	4.0	6	90	6	45	A	2
UFX5804006002A060500	0,2	4.0	6	100	6	50	A	2
UFX5804006003A060100	0,3	4.0	6	50	6	10	A	2
UFX5804006003A060120	0,3	4.0	6	50	6	12	A	2
UFX5804006003A060140	0,3	4.0	6	50	6	14	A	2
UFX5804006003A060160	0,3	4.0	6	50	6	16	A	2
UFX5804006003A060200	0,3	4.0	6	50	6	20	A	2
UFX5804006003A060260	0,3	4.0	6	65	6	26	A	2
UFX5804006003A060300	0,3	4.0	6	70	6	30	A	2
UFX5804006003A060350	0,3	4.0	6	70	6	35	A	2
UFX5804006003A060400	0,3	4.0	6	80	6	40	A	2
UFX5804006003A060450	0,3	4.0	6	90	6	45	A	2
UFX5804006003A060500	0,3	4.0	6	100	6	50	A	2
UFX5804006005A060100	0,5	4.0	6	50	6	10	A	2
UFX5804006005A060120	0,5	4.0	6	50	6	12	A	2
UFX5804006005A060140	0,5	4.0	6	60	6	14	A	2
UFX5804006005A060160	0,5	4.0	6	60	6	16	A	2
UFX5804006005A060200	0,5	4.0	6	60	6	20	A	2
UFX5804006005A060260	0,5	4.0	6	65	6	26	A	2
UFX5804006005A060300	0,5	4.0	6	70	6	30	A	2
UFX5804006005A060350	0,5	4.0	6	70	6	35	A	2
UFX5804006005A060400	0,5	4.0	6	80	6	40	A	2
UFX5804006005A060450	0,5	4.0	6	90	6	45	A	2
UFX5804006005A060500	0,5	4.0	6	100	6	50	A	2
UFX5804006010A060100	1	4.0	6	50	6	10	A	2
UFX5804006010A060120	1	4.0	6	50	6	12	A	2
UFX5804006010A060140	1	4.0	6	60	6	14	A	2
UFX5804006010A060160	1	4.0	6	60	6	16	A	2
UFX5804006010A060200	1	4.0	6	60	6	20	A	2
UFX5804006010A060260	1	4.0	6	65	6	26	A	2
UFX5804006010A060300	1	4.0	6	70	6	30	A	2
UFX5804006010A060350	1	4.0	6	70	6	35	A	2

µm	D ≤ 6	0~-0.012	d1 h6		R	R ≤ 6 ±0.010
	D > 6	0~-0.015				R > 6 ±0.015

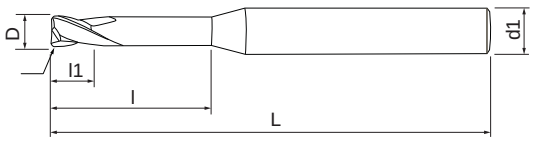
UFX58 NEW

SQUARE TYPE WALCOWO-CZOŁOWE

2-Flute with extended neck 2-ostrzowe z szyjką

HSM Vmax	F	M	30°	A					max	min		AIR
									○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●	○					○						





D code Kod	R	D	d1	L	l1	l2	Shank Uchwyt	Z
UFX5804006010A060400	1	4.0	6	80	6	40	A	2
UFX5804006010A060450	1	4.0	6	90	6	45	A	2
UFX5804006010A060500	1	4.0	6	100	6	50	A	2
UFX5805006001A080150	0,1	5.0	6	60	8	15	A	2
UFX5805006002A080150	0,2	5.0	6	60	8	15	A	2
UFX5805006003A080150	0,3	5.0	6	60	8	15	A	2
UFX5805006005A080150	0,5	5.0	6	60	8	15	A	2
UFX5805006010A080150	1	5.0	6	60	8	15	A	2
UFX5805006015A080150	1,5	5.0	6	60	8	15	A	2
UFX5805006020A080150	2	5.0	6	60	8	15	A	2
UFX5806006001A090200	0,1	6.0	6	60	9	20	A	2
UFX5806006002A090200	0,2	6.0	6	60	9	20	A	2
UFX5806006003A090200	0,3	6.0	6	60	9	20	A	2
UFX5806006005A090200	0,5	6.0	6	60	9	20	A	2
UFX5806006010A090200	1	6.0	6	60	9	20	A	2
UFX5806006015A090200	1,5	6.0	6	60	9	20	A	2
UFX5806006020A090200	2	6.0	6	60	9	20	A	2
UFX5806006003A150300	0,3	6.0	6	90	15	30	A	2
UFX5806006005A150300	0,5	6.0	6	90	15	30	A	2
UFX5806006010A150300	1	6.0	6	90	15	30	A	2
UFX5808008001A120250	0,1	8.0	8	70	12	25	A	2
UFX5808008002A120250	0,2	8.0	8	70	12	25	A	2
UFX5808008003A120250	0,3	8.0	8	70	12	25	A	2
UFX5808008005A120250	0,5	8.0	8	70	12	25	A	2
UFX5808008010A120250	1	8.0	8	70	12	25	A	2
UFX5808008015A120250	1,5	8.0	8	70	12	25	A	2
UFX5808008020A120250	2	8.0	8	70	12	25	A	2
UFX5808008003A200350	0,3	8.0	8	100	20	35	A	2
UFX5808008005A200350	0,5	8.0	8	100	20	35	A	2
UFX5808008010A200350	1	8.0	8	100	20	35	A	2
UFX5810010001A150300	0,1	10.0	10	75	15	30	A	2
UFX5810010002A150300	0,2	10.0	10	75	15	30	A	2
UFX5810010003A150300	0,3	10.0	10	75	15	30	A	2
UFX5810010005A150300	0,5	10.0	10	75	15	30	A	2
UFX5810010010A150300	1	10.0	10	75	15	30	A	2
UFX5810010015A150300	1,5	10.0	10	75	15	30	A	2
UFX5810010020A150300	2	10.0	10	75	15	30	A	2
UFX5810010003A250400	0,3	10.0	10	100	25	40	A	2
UFX5810010005A250400	0,5	10.0	10	100	25	40	A	2
UFX5810010010A250400	1	10.0	10	100	25	40	A	2
UFX5812012002A180320	0,2	12.0	12	80	18	32	A	2
UFX5812012003A180320	0,3	12.0	12	80	18	32	A	2
UFX5812012005A180320	0,5	12.0	12	80	18	32	A	2

µm	D ≤ 6	0~-0.012	d1 h6		R	R ≤ 6 ±0.010
	D > 6	0~-0.015				R > 6 ±0.015

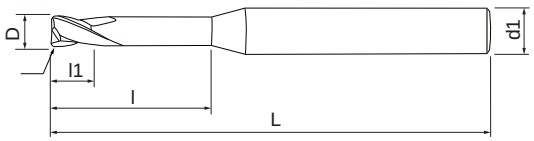
UFX58 NEW

SQUARE TYPE WALCOWO-CZOŁOWE

2-Flute with extended neck 2-ostrzowe z szyjką

			HSM Vmax	F	M	30°	A					max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●	○					○						





D code Kod	R	D	d1	L	l1	l2	Shank Uchwyt	Z
UFX5812012010A180320	1	12.0	12	80	18	32	A	2
UFX5812012015A180320	1,5	12.0	12	80	18	32	A	2
UFX5812012020A180320	2	12.0	12	80	18	32	A	2
UFX5812012003A300450	0,3	12.0	12	110	30	45	A	2
UFX5812012005A300450	0,5	12.0	12	110	30	45	A	2
UFX5812012010A300450	1	12.0	12	110	30	45	A	2
UFX5816016005A200350	0,5	16.0	16	100	20	35	A	2
UFX5816016010A200350	1	16.0	16	100	20	35	A	2
UFX5816016005A350500	0,5	16.0	16	150	35	50	A	2
UFX5816016010A350500	1	16.0	16	150	35	50	A	2
UFX5820020005A250400	0,5	20.0	20	100	25	40	A	2
UFX5820020010A250400	1	20.0	20	100	25	40	A	2
UFX5820020005A400550	0,5	20.0	20	150	40	55	A	2
UFX5820020010A400550	1	20.0	20	150	40	55	A	2

µm	D ≤ 6	0~-0.012	d1 h6		R	R ≤ 6 ±0.010
	D > 6	0~-0.015				R > 6 ±0.015

UFX58

Cutting Conditions Parametry skrawania



	Non-alloyed Steels Alloy Steels Cast Iron Stale niestopowe, żeliwo stopowe				Alloy Steels Heat Resistant Steels Stale stopowe, Stale żaroodporne				Hardened Steels Stale hartowane			
	~ 35 HRC				35 HRC ~ 45 HRC				45 HRC ~ 55 HRC			
D (mm)	ae	ap	RPM	mm/min	ae	ap	RPM	mm/min	ae	ap	RPM	mm/min
0.2	0.2	0.040	50000	170	0.2	0.030	34500	75	0.2	0.024	21150	45
0.2	0.2	0.028	50000	170	0.2	0.021	34500	75	0.2	0.017	21150	45
0.2	0.2	0.016	45000	140	0.2	0.012	31050	60	0.2	0.010	19040	35
0.2	0.2	0.010	45000	140	0.2	0.008	31050	60	0.2	0.006	19040	35
0.3	0.3	0.042	50000	200	0.3	0.032	32000	85	0.3	0.025	20000	50
0.3	0.3	0.024	45000	160	0.3	0.018	28800	70	0.3	0.014	18000	40
0.3	0.3	0.015	45000	160	0.3	0.011	28800	70	0.3	0.009	18000	40
0.4	0.4	0.080	50000	200	0.4	0.060	32000	85	0.4	0.048	20000	50
0.4	0.4	0.056	50000	200	0.4	0.042	32000	85	0.4	0.034	20000	50
0.4	0.4	0.056	50000	200	0.4	0.042	32000	85	0.4	0.034	20000	50
0.4	0.4	0.032	45000	160	0.4	0.024	28800	70	0.4	0.019	18000	40
0.4	0.4	0.032	45000	160	0.4	0.024	28800	70	0.4	0.019	18000	40
0.4	0.4	0.020	45000	160	0.4	0.015	28800	70	0.4	0.012	18000	40
0.5	0.5	0.100	43000	220	0.5	0.075	28000	95	0.5	0.060	17100	60
0.5	0.5	0.100	43000	220	0.5	0.075	28000	95	0.5	0.060	17100	60
0.5	0.5	0.070	43000	220	0.5	0.053	28000	95	0.5	0.042	17100	60
0.5	0.5	0.070	43000	220	0.5	0.053	28000	95	0.5	0.042	17100	60
0.5	0.5	0.040	38700	180	0.5	0.030	25200	75	0.5	0.024	15390	50
0.5	0.5	0.040	38700	180	0.5	0.030	25200	75	0.5	0.024	15390	50
0.5	0.5	0.025	38700	180	0.5	0.019	25200	75	0.5	0.015	15390	50
0.5	0.5	0.025	34400	140	0.5	0.019	22400	60	0.5	0.015	13680	40
0.6	0.6	0.084	36400	250	0.6	0.063	24000	110	0.6	0.050	14500	65
0.6	0.6	0.084	36400	250	0.6	0.063	24000	110	0.6	0.050	14500	65
0.6	0.6	0.048	32760	205	0.6	0.036	21600	90	0.6	0.029	13050	55
0.6	0.6	0.030	32760	205	0.6	0.023	21600	90	0.6	0.018	13050	55
0.6	0.6	0.018	29120	160	0.6	0.014	19200	70	0.6	0.011	11600	40
0.6	0.6	0.012	21840	105	0.6	0.009	14400	45	0.6	0.007	8700	25
0.7	0.7	0.140	36400	250	0.7	0.105	24000	110	0.7	0.084	14500	65
0.7	0.7	0.056	32760	205	0.7	0.042	21600	90	0.7	0.034	13050	55
0.7	0.7	0.035	32760	205	0.7	0.026	21600	90	0.7	0.021	13050	55
0.7	0.7	0.035	29120	160	0.7	0.026	19200	70	0.7	0.021	11600	40
0.7	0.7	0.021	29120	160	0.7	0.016	19200	70	0.7	0.013	11600	40
0.8	0.8	0.160	36400	250	0.8	0.120	24000	110	0.8	0.096	14500	65
0.8	0.8	0.112	36400	250	0.8	0.084	24000	110	0.8	0.067	14500	65
0.8	0.8	0.112	36400	250	0.8	0.084	24000	110	0.8	0.067	14500	65
0.8	0.8	0.064	32760	205	0.8	0.048	21600	90	0.8	0.038	13050	55
0.8	0.8	0.040	32760	205	0.8	0.030	21600	90	0.8	0.024	13050	55
0.8	0.8	0.040	29120	160	0.8	0.030	19200	70	0.8	0.024	11600	40
1.0	1.0	0.200	33100	280	1.0	0.150	21600	120	1.0	0.120	13200	70
1.0	1.0	0.140	33100	280	1.0	0.105	21600	120	1.0	0.084	13200	70
1.0	1.0	0.080	29790	225	1.0	0.060	19440	95	1.0	0.048	11880	55
1.0	1.0	0.080	29790	225	1.0	0.060	19440	95	1.0	0.048	11880	55
1.0	1.0	0.050	29790	225	1.0	0.038	19440	95	1.0	0.030	11880	55
1.0	1.0	0.050	26480	180	1.0	0.038	17280	75	1.0	0.030	10560	45
1.0	1.0	0.030	26480	180	1.0	0.023	17280	75	1.0	0.018	10560	45
1.0	1.0	0.030	19860	120	1.0	0.023	12960	50	1.0	0.018	7920	30
1.0	1.0	0.020	19860	120	1.0	0.015	12960	50	1.0	0.012	7920	30
1.2	1.2	0.240	29750	290	1.2	0.180	18900	125	1.2	0.144	11700	70
1.2	1.2	0.168	29750	290	1.2	0.126	18900	125	1.2	0.101	11700	70
1.2	1.2	0.168	29750	290	1.2	0.126	18900	125	1.2	0.101	11700	70
1.2	1.2	0.096	26780	235	1.2	0.072	17010	100	1.2	0.058	10530	55
1.2	1.2	0.060	26780	235	1.2	0.045	17010	100	1.2	0.036	10530	55
1.2	1.2	0.060	26780	235	1.2	0.045	17010	100	1.2	0.036	10530	55

UFX58

Cutting Conditions Parametry skrawania



	Non-alloyed Steels Alloy Steels Cast Iron Stale niestopowe, żeliwo stopowe				Alloy Steels Heat Resistant Steels Stale stopowe, Stale żaroodporne				Hardened Steels Stale hartowane			
	~ 35 HRC				35 HRC ~ 45 HRC				45 HRC ~ 55 HRC			
D (mm)	ae	ap	RPM	mm/min	ae	ap	RPM	mm/min	ae	ap	RPM	mm/min
1.2	1.2	0.036	23800	185	1.2	0.027	15120	80	1.2	0.022	9360	45
1.2	1.2	0.024	17850	120	1.2	0.018	11340	55	1.2	0.014	7020	30
1.5	1.5	0.300	26400	300	1.5	0.225	16200	130	1.5	0.180	10200	70
1.5	1.5	0.210	26400	300	1.5	0.158	16200	130	1.5	0.126	10200	70
1.5	1.5	0.120	23760	245	1.5	0.090	14580	105	1.5	0.072	9180	55
1.5	1.5	0.120	23760	245	1.5	0.090	14580	105	1.5	0.072	9180	55
1.5	1.5	0.120	23760	245	1.5	0.090	14580	105	1.5	0.072	9180	55
1.5	1.5	0.075	23760	245	1.5	0.056	14580	105	1.5	0.045	9180	55
1.5	1.5	0.075	21120	190	1.5	0.056	12960	85	1.5	0.045	8160	45
1.5	1.5	0.045	21120	190	1.5	0.034	12960	85	1.5	0.027	8160	45
1.5	1.5	0.045	21120	190	1.5	0.034	12960	85	1.5	0.027	8160	45
1.5	1.5	0.030	15840	125	1.5	0.023	9720	55	1.5	0.018	6120	30
2.0	2.0	0.400	21600	310	2.0	0.300	13800	140	2.0	0.240	8640	80
2.0	2.0	0.280	21600	310	2.0	0.210	13800	140	2.0	0.168	8640	80
2.0	2.0	0.280	21600	310	2.0	0.210	13800	140	2.0	0.168	8640	80
2.0	2.0	0.160	19440	250	2.0	0.120	12420	115	2.0	0.096	7780	65
2.0	2.0	0.160	19440	250	2.0	0.120	12420	115	2.0	0.096	7780	65
2.0	2.0	0.160	19440	250	2.0	0.120	12420	115	2.0	0.096	7780	65
2.0	2.0	0.100	19440	250	2.0	0.075	12420	115	2.0	0.060	7780	65
2.0	2.0	0.100	17280	200	2.0	0.075	11040	90	2.0	0.060	6910	50
2.0	2.0	0.100	17280	200	2.0	0.075	11040	90	2.0	0.060	6910	50
2.0	2.0	0.060	17280	200	2.0	0.045	11040	90	2.0	0.036	6910	50
2.5	2.5	0.350	18000	320	2.5	0.263	11400	150	2.5	0.210	7320	80
2.5	2.5	0.350	18000	320	2.5	0.263	11400	150	2.5	0.210	7320	80
2.5	2.5	0.350	18000	320	2.5	0.263	11400	150	2.5	0.210	7320	80
2.5	2.5	0.200	16200	260	2.5	0.150	10260	120	2.5	0.120	6590	65
2.5	2.5	0.200	16200	260	2.5	0.150	10260	120	2.5	0.120	6590	65
2.5	2.5	0.200	16200	260	2.5	0.150	10260	120	2.5	0.120	6590	65
2.5	2.5	0.125	14400	205	2.5	0.094	9120	95	2.5	0.075	5860	50
2.5	2.5	0.125	14400	205	2.5	0.094	9120	95	2.5	0.075	5860	50
3.0	3.0	0.600	15900	330	3.0	0.450	10300	160	3.0	0.360	6300	80
3.0	3.0	0.420	15900	330	3.0	0.315	10300	160	3.0	0.252	6300	80
3.0	3.0	0.420	15900	330	3.0	0.315	10300	160	3.0	0.252	6300	80
3.0	3.0	0.420	15900	330	3.0	0.315	10300	160	3.0	0.252	6300	80
3.0	3.0	0.240	14310	265	3.0	0.180	9270	130	3.0	0.144	5670	65
3.0	3.0	0.240	14310	265	3.0	0.180	9270	130	3.0	0.144	5670	65
3.0	3.0	0.150	14310	265	3.0	0.113	9270	130	3.0	0.090	5670	65
3.0	3.0	0.150	14310	265	3.0	0.113	9270	130	3.0	0.090	5670	65
3.0	3.0	0.150	12720	210	3.0	0.113	8240	100	3.0	0.090	5040	50
3.0	3.0	0.090	12720	210	3.0	0.068	8240	100	3.0	0.054	5040	50
4.0	4.0	0.800	12800	400	4.0	0.600	8200	200	4.0	0.480	5150	95
4.0	4.0	0.800	12800	400	4.0	0.600	8200	200	4.0	0.480	5150	95
4.0	4.0	0.560	12800	400	4.0	0.420	8200	200	4.0	0.336	5150	95
4.0	4.0	0.560	12800	400	4.0	0.420	8200	200	4.0	0.336	5150	95
4.0	4.0	0.560	12800	400	4.0	0.420	8200	200	4.0	0.336	5150	95
4.0	4.0	0.320	11520	325	4.0	0.240	7380	160	4.0	0.192	4640	75
4.0	4.0	0.320	11520	325	4.0	0.240	7380	160	4.0	0.192	4640	75
4.0	4.0	0.200	11520	325	4.0	0.150	7380	160	4.0	0.120	4640	75
4.0	4.0	0.200	11520	325	4.0	0.150	7380	160	4.0	0.120	4640	75
4.0	4.0	0.200	10240	255	4.0	0.150	6560	130	4.0	0.120	4120	60
4.0	4.0	0.200	10240	255	4.0	0.150	6560	130	4.0	0.120	4120	60
5.0	5.0	1.000	11000	500	5.0	0.750	7000	240	5.0	0.600	4560	120
6.0	6.0	0.840	9500	600	6.0	0.630	6000	300	6.0	0.504	3930	140

UFX58

Cutting Conditions Parametry skrawania



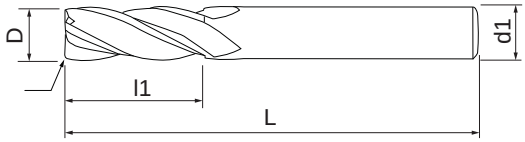
	Non-alloyed Steels Alloy Steels Cast Iron Stale niestopowe, żeliwo stopowe				Alloy Steels Heat Resistant Steels Stale stopowe, Stale żaroodporne				Hardened Steels Stale hartowane			
	~ 35 HRC				35 HRC ~ 45 HRC				45 HRC ~ 55 HRC			
D (mm)	ae	ap	RPM	mm/min	ae	ap	RPM	mm/min	ae	ap	RPM	mm/min
6.0	6.0	0.840	9500	600	6.0	0.630	6000	300	6.0	0.504	3930	140
8.0	8.0	1.120	7200	640	8.0	0.840	4550	300	8.0	0.672	3020	140
8.0	8.0	1.120	7200	640	8.0	0.840	4550	300	8.0	0.672	3020	140
10.0	10.0	2.000	6000	640	10.0	1.500	4000	300	10.0	1.200	2420	140
10.0	10.0	1.400	6000	640	10.0	1.050	4000	300	10.0	0.840	2420	140
12.0	12.0	2.400	5000	500	12.0	1.800	3340	270	12.0	1.440	2000	120
12.0	12.0	1.680	5000	500	12.0	1.260	3340	270	12.0	1.008	2000	120
16.0	16.0	3.200	3720	450	16.0	2.400	2520	210	16.0	1.920	1540	95
16.0	16.0	2.240	3720	450	16.0	1.680	2520	210	16.0	1.344	1540	95
20.0	20.0	4.000	3000	330	20.0	3.000	1950	140	20.0	2.400	1200	70
20.0	20.0	4.000	3000	330	20.0	3.000	1950	140	20.0	2.400	1200	70

UFX61 NEW

SQUARE TYPE WALCOWO-CZOŁOWE
2 Flute 2 ostrzowe

HSM Vmax	F	M	30°	A	max	min	AIR
					○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●	○					○						





D code Kod	R	D	d1	L	l1	Shank Uchwyt	Z
UFX6101006Y50A025050	0,05	1.0	6	50	2.5	A	4
UFX6101006001A025050	0,1	1.0	6	50	2.5	A	4
UFX6101006002A025050	0,2	1.0	6	50	2.5	A	4
UFX6101006003A025050	0,3	1.0	6	50	2.5	A	4
UFX6101206Y50A030050	0,05	1.2	6	50	3	A	4
UFX6101206001A030050	0,1	1.2	6	50	3	A	4
UFX6101206002A030050	0,2	1.2	6	50	3	A	4
UFX6101206003A030050	0,3	1.2	6	50	3	A	4
UFX6101506Y50A040050	0,05	1.5	6	50	4	A	4
UFX6101506001A040050	0,1	1.5	6	50	4	A	4
UFX6101506002A040050	0,2	1.5	6	50	4	A	4
UFX6101506003A040050	0,3	1.5	6	50	4	A	4
UFX6101506005A040050	0,5	1.5	6	50	4	A	4
UFX6102006001A060050	0,1	2.0	6	50	6	A	4
UFX6102006002A060050	0,2	2.0	6	50	6	A	4
UFX6102006003A060050	0,3	2.0	6	50	6	A	4
UFX6102006005A060050	0,5	2.0	6	50	6	A	4
UFX6102506001A070060	0,1	2.5	6	60	7	A	4
UFX6102506002A070060	0,2	2.5	6	60	7	A	4
UFX6102506003A070060	0,3	2.5	6	60	7	A	4
UFX6102506005A070060	0,5	2.5	6	60	7	A	4
UFX6103006001A080060	0,1	3.0	6	60	8	A	4
UFX6103006002A080060	0,2	3.0	6	60	8	A	4
UFX6103006003A080060	0,3	3.0	6	60	8	A	4
UFX6103006005A080060	0,5	3.0	6	60	8	A	4
UFX6103006010A080060	1	3.0	6	60	8	A	4
UFX6103506001A100070	0,1	3.5	6	70	10	A	4
UFX6103506002A100070	0,2	3.5	6	70	10	A	4
UFX6103506003A100070	0,3	3.5	6	70	10	A	4
UFX6103506005A100070	0,5	3.5	6	70	10	A	4
UFX6104004001A100070	0,1	4.0	4	70	10	A	4
UFX6104004002A100070	0,2	4.0	4	70	10	A	4
UFX6104004003A100070	0,3	4.0	4	70	10	A	4
UFX6104004005A100070	0,5	4.0	4	70	10	A	4
UFX6104004010A100070	1	4.0	4	70	10	A	4
UFX6104004001A100100	0,1	4.0	4	100	10	A	4
UFX6104004002A100100	0,2	4.0	4	100	10	A	4
UFX6104004003A100100	0,3	4.0	4	100	10	A	4
UFX6104004005A100100	0,5	4.0	4	100	10	A	4
UFX6104004010A100100	1	4.0	4	100	10	A	4
UFX6104006001A100070	0,1	4.0	6	70	10	A	4
UFX6104006002A100070	0,2	4.0	6	70	10	A	4

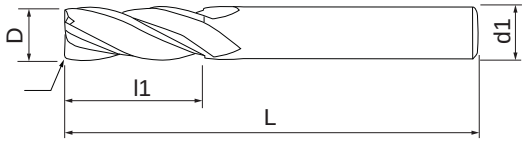
µm	D 0~-0.03				R	±0.02	
	d1 h6						

UFX61 NEW

SQUARE TYPE WALCOWO-CZOŁOWE
2 Flute 2 ostrzowe

HSM Vmax	F	M	30°	A	max	min	AIR
					○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●	○					○						





D code Kod	R	D	d1	L	l1	Shank Uchwyt	Z
UFX6104006003A100070	0,3	4.0	6	70	10	A	4
UFX6104006005A100070	0,5	4.0	6	70	10	A	4
UFX6104006010A100070	1	4.0	6	70	10	A	4
UFX6104506001A110080	0,1	4.5	6	80	11	A	4
UFX6104506002A110080	0,2	4.5	6	80	11	A	4
UFX6104506003A110080	0,3	4.5	6	80	11	A	4
UFX6104506005A110080	0,5	4.5	6	80	11	A	4
UFX6105006001A130090	0,1	5.0	6	90	13	A	4
UFX6105006002A130090	0,2	5.0	6	90	13	A	4
UFX6105006003A130090	0,3	5.0	6	90	13	A	4
UFX6105006005A130090	0,5	5.0	6	90	13	A	4
UFX6105006010A130090	1	5.0	6	90	13	A	4
UFX6105506001A130090	0,1	5.5	6	90	13	A	4
UFX6105506002A130090	0,2	5.5	6	90	13	A	4
UFX6105506003A130090	0,3	5.5	6	90	13	A	4
UFX6105506005A130090	0,5	5.5	6	90	13	A	4
UFX6105506010A130090	1	5.5	6	90	13	A	4
UFX6106006001A150060	0,1	6.0	6	60	15	A	4
UFX6106006002A150060	0,2	6.0	6	60	15	A	4
UFX6106006001A150090	0,1	6.0	6	90	15	A	4
UFX6106006002A150090	0,2	6.0	6	90	15	A	4
UFX6106006003A150090	0,3	6.0	6	90	15	A	4
UFX6106006005A150090	0,5	6.0	6	90	15	A	4
UFX6106006010A150090	1	6.0	6	90	15	A	4
UFX6106006015A150090	1,5	6.0	6	90	15	A	4
UFX6106006020A150090	2	6.0	6	90	15	A	4
UFX6106006005A150110	0,5	6.0	6	110	15	A	4
UFX6106006010A150110	1	6.0	6	110	15	A	4
UFX6106006005A150130	0,5	6.0	6	130	15	A	4
UFX6106006010A150130	1	6.0	6	130	15	A	4
UFX6107008001A160090	0,1	7.0	8	90	16	A	4
UFX6107008002A160090	0,2	7.0	8	90	16	A	4
UFX6107008003A160090	0,3	7.0	8	90	16	A	4
UFX6107008005A160090	0,5	7.0	8	90	16	A	4
UFX6107008010A160090	1	7.0	8	90	16	A	4
UFX6107008020A160090	2	7.0	8	90	16	A	4
UFX6108008003A200070	0,3	8.0	8	70	20	A	4
UFX6108008005A200070	0,5	8.0	8	70	20	A	4
UFX6108008010A200070	1	8.0	8	70	20	A	4
UFX6108008001A200100	0,1	8.0	8	100	20	A	4
UFX6108008002A200100	0,2	8.0	8	100	20	A	4
UFX6108008003A200100	0,3	8.0	8	100	20	A	4
UFX6108008005A200100	0,5	8.0	8	100	20	A	4

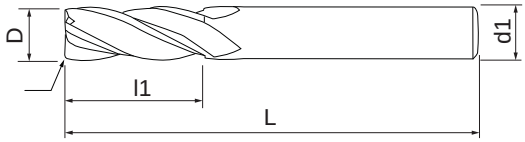
µm	D 0~-0.03				R	±0.02	
	d1 h6						

UFX61 NEW

SQUARE TYPE WALCOWO-CZOŁOWE
2 Flute 2 ostrzowe

HSM Vmax	F	M	30°	A	max	min	AIR
					○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●	○					○						





D code Kod	R	D	d1	L	l1	Shank Uchwyt	Z
UFX6108008010A200100	1	8.0	8	100	20	A	4
UFX6108008015A200100	1,5	8.0	8	100	20	A	4
UFX6108008020A200100	2	8.0	8	100	20	A	4
UFX6108008025A200100	2,5	8.0	8	100	20	A	4
UFX6108008030A200100	3	8.0	8	100	20	A	4
UFX6108008005A200120	0,5	8.0	8	120	20	A	4
UFX6108008010A200120	1	8.0	8	120	20	A	4
UFX6108008005A200150	0,5	8.0	8	150	20	A	4
UFX6108008010A200150	1	8.0	8	150	20	A	4
UFX6110010003A250075	0,3	10.0	10	75	25	A	4
UFX6110010005A250075	0,5	10.0	10	75	25	A	4
UFX6110010010A250075	1	10.0	10	75	25	A	4
UFX6110010001A250100	0,1	10.0	10	100	25	A	4
UFX6110010002A250100	0,2	10.0	10	100	25	A	4
UFX6110010003A250100	0,3	10.0	10	100	25	A	4
UFX6110010005A250100	0,5	10.0	10	100	25	A	4
UFX6110010010A250100	1	10.0	10	100	25	A	4
UFX6110010015A250100	1,5	10.0	10	100	25	A	4
UFX6110010020A250100	2	10.0	10	100	25	A	4
UFX6110010025A250100	2,5	10.0	10	100	25	A	4
UFX6110010030A250100	3	10.0	10	100	25	A	4
UFX6110010040A250100	4	10.0	10	100	25	A	4
UFX6110010005A220130	0,5	10.0	10	130	22	A	4
UFX6110010010A220130	1	10.0	10	130	22	A	4
UFX6110010005A220150	0,5	10.0	10	150	22	A	4
UFX6110010010A220150	1	10.0	10	150	22	A	4
UFX6111012002A250110	0,2	11.0	12	110	25	A	4
UFX6111012003A250110	0,3	11.0	12	110	25	A	4
UFX6111012005A250110	0,5	11.0	12	110	25	A	4
UFX6111012010A250110	1	11.0	12	110	25	A	4
UFX6111012020A250110	2	11.0	12	110	25	A	4
UFX6112012003A300080	0,3	12.0	12	80	30	A	4
UFX6112012005A300080	0,5	12.0	12	80	30	A	4
UFX6112012010A300080	1	12.0	12	80	30	A	4
UFX6112012001A300110	0,1	12.0	12	110	30	A	4
UFX6112012002A300110	0,2	12.0	12	110	30	A	4
UFX6112012003A300110	0,3	12.0	12	110	30	A	4
UFX6112012005A300110	0,5	12.0	12	110	30	A	4
UFX6112012010A300110	1	12.0	12	110	30	A	4
UFX6112012015A300110	1,5	12.0	12	110	30	A	4
UFX6112012020A300110	2	12.0	12	110	30	A	4
UFX6112012025A300110	2,5	12.0	12	110	30	A	4
UFX6112012030A300110	3	12.0	12	110	30	A	4

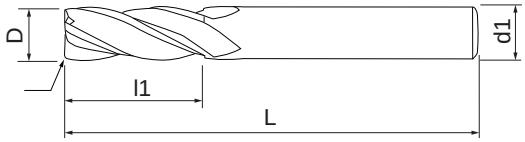
µm	D 0~-0.03				R	±0.02	
	d1 h6						

UFX61 NEW

SQUARE TYPE WALCOWO-CZOŁOWE
2 Flute 2 ostrzowe

HSM Vmax	F	M	30°	A	max	min	AIR
					○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●	○					○						





D code Kod	R	D	d1	L	l1	Shank Uchwyt	Z
UFX6112012040A300110	4	12.0	12	110	30	A	4
UFX6112012050A300110	5	12.0	12	110	30	A	4
UFX6112012005A300130	0,5	12.0	12	130	30	A	4
UFX6112012010A300130	1	12.0	12	130	30	A	4
UFX6112012005A300150	0,5	12.0	12	150	30	A	4
UFX6112012010A300150	1	12.0	12	150	30	A	4
UFX6114016005A350150	0,5	14.0	16	150	35	A	4
UFX6114016010A350150	1	14.0	16	150	35	A	4
UFX6114016020A350150	2	14.0	16	150	35	A	4
UFX6116016005A320150	0,5	16.0	16	150	32	A	4
UFX6116016010A320150	1	16.0	16	150	32	A	4
UFX6116016015A320150	1,5	16.0	16	150	32	A	4
UFX6116016020A320150	2	16.0	16	150	32	A	4
UFX6120020005A380150	0,5	20.0	20	150	38	A	4
UFX6120020010A380150	1	20.0	20	150	38	A	4
UFX6120020015A380150	1,5	20.0	20	150	38	A	4
UFX6120020020A380150	2	20.0	20	150	38	A	4

µm	D 0~-0.03				R	±0.02	
	d1 h6						

UFX61

Cutting Conditions Parametry skrawania



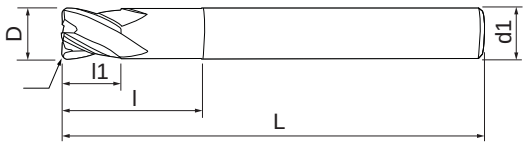
	Non-alloyed Steels Alloy Steels Cast Iron Stale niestopowe, żeliwo stopowe				**Alloy Steels Heat Resistant Steels** Stale stopowe, Stale żaroodporne				**Hardened Steels** Stale hartowane			
	~ 35 HRC				**35 HRC ~ 45 HRC**				**45 HRC ~ 55 HRC**			
D (mm)	**ae**	**ap**	**RPM**	**mm/min**	**ae**	**ap**	**RPM**	**mm/min**	**ae**	**ap**	**RPM**	**mm/min**
1.0	2	0,5	27600	300	2	0,5	18000	220	2	0,2	11000	120
1.2	2,4	0,6	24800	305	2,4	0,6	15750	225	2,4	0,24	9750	120
1.5	3	0,75	22000	310	3	0,75	13500	230	3	0,3	8500	120
2.0	4	1	18000	320	4	1	11560	240	4	0,4	7200	130
2.5	5	1,25	15000	330	5	1,25	9500	250	5	0,5	6100	130
3.0	6	1,5	13240	340	6	1,5	8560	260	6	0,6	5280	130
3.5	7	1,75	11980	380	7	1,75	7690	280	7	0,7	4790	135
4.0	8	2	10720	420	8	2	6820	300	8	0,8	4300	140
4.5	9	2,25	9940	425	9	2,25	6310	330	9	0,9	4050	155
5.0	10	2,5	9160	430	10	2,5	5800	360	10	1	3800	170
5.5	11	2,75	8530	430	11	2,75	5420	360	11	1,1	3540	170
6.0	12	3	7900	430	12	3	5040	360	12	1,2	3280	170
7.0	14	3,5	6950	445	14	3,5	4420	360	14	1,4	2900	170
8.0	16	4	6000	460	16	4	3800	360	16	1,6	2520	170
10.0	20	5	5040	460	20	5	3280	360	20	2	2020	170
11.0	22	5,5	4580	410	22	5,5	3030	340	22	2,2	1850	155
12.0	24	6	4120	360	24	6	2780	320	24	2,4	1680	140
14.0	28	7	3610	320	28	7	2440	275	28	2,8	1480	125
16.0	32	8	3100	280	32	8	2100	230	32	3,2	1280	115
20.0	40	10	2520	230	40	10	1640	180	40	4	1000	90

UFX62 NEW

SQUARE TYPE WALCOWO-CZOŁOWE
4-Flute with extended neck 4-ostrzowe z szyjką

HSM Vmax	F	M	A	max	min	AIR
				○	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●	○					○						





D code Kod	R	D	d1	L	l1	l2	Shank Uchwyt	Z
UFX6201004Y50A015030	0,05	1.0	4	50	1.5	3	A	4
UFX6201004Y50A015040	0,05	1.0	4	50	1.5	4	A	4
UFX6201004Y50A015060	0,05	1.0	4	50	1.5	6	A	4
UFX6201004Y50A015080	0,05	1.0	4	50	1.5	8	A	4
UFX6201004Y50A015100	0,05	1.0	4	50	1.5	10	A	4
UFX6201004Y50A015120	0,05	1.0	4	50	1.5	12	A	4
UFX6201004Y50A015140	0,05	1.0	4	50	1.5	14	A	4
UFX6201004Y50A015160	0,05	1.0	4	50	1.5	16	A	4
UFX6201004Y50A015200	0,05	1.0	4	50	1.5	20	A	4
UFX6201004001A015030	0,1	1.0	4	50	1.5	3	A	4
UFX6201004001A015040	0,1	1.0	4	50	1.5	4	A	4
UFX6201004001A015060	0,1	1.0	4	50	1.5	6	A	4
UFX6201004001A015080	0,1	1.0	4	50	1.5	8	A	4
UFX6201004001A015100	0,1	1.0	4	50	1.5	10	A	4
UFX6201004001A015120	0,1	1.0	4	50	1.5	12	A	4
UFX6201004001A015140	0,1	1.0	4	50	1.5	14	A	4
UFX6201004001A015160	0,1	1.0	4	50	1.5	16	A	4
UFX6201004001A015200	0,1	1.0	4	50	1.5	20	A	4
UFX6201004002A015030	0,2	1.0	4	50	1.5	3	A	4
UFX6201004002A015040	0,2	1.0	4	50	1.5	4	A	4
UFX6201004002A015060	0,2	1.0	4	50	1.5	6	A	4
UFX6201004002A015080	0,2	1.0	4	50	1.5	8	A	4
UFX6201004002A015100	0,2	1.0	4	50	1.5	10	A	4
UFX6201004002A015120	0,2	1.0	4	50	1.5	12	A	4
UFX6201004002A015140	0,2	1.0	4	50	1.5	14	A	4
UFX6201004002A015160	0,2	1.0	4	50	1.5	16	A	4
UFX6201004002A015200	0,2	1.0	4	50	1.5	20	A	4
UFX6201004003A015030	0,3	1.0	4	50	1.5	3	A	4
UFX6201004003A015040	0,3	1.0	4	50	1.5	4	A	4
UFX6201004003A015060	0,3	1.0	4	50	1.5	6	A	4
UFX6201004003A015080	0,3	1.0	4	50	1.5	8	A	4
UFX6201004003A015100	0,3	1.0	4	50	1.5	10	A	4
UFX6201004003A015120	0,3	1.0	4	50	1.5	12	A	4
UFX6201004003A015140	0,3	1.0	4	50	1.5	14	A	4
UFX6201004003A015160	0,3	1.0	4	50	1.5	16	A	4
UFX6201004003A015200	0,3	1.0	4	50	1.5	20	A	4
UFX6201204Y50A018030	0,05	1.2	4	50	1.8	3	A	4
UFX6201204Y50A018040	0,05	1.2	4	50	1.8	4	A	4
UFX6201204Y50A018060	0,05	1.2	4	50	1.8	6	A	4
UFX6201204Y50A018080	0,05	1.2	4	50	1.8	8	A	4
UFX6201204Y50A018100	0,05	1.2	4	50	1.8	10	A	4
UFX6201204Y50A018120	0,05	1.2	4	50	1.8	12	A	4
UFX6201204Y50A018160	0,05	1.2	4	50	1.8	16	A	4

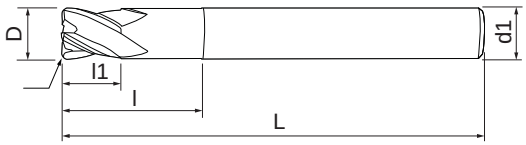
µm	D 0~-0.03				R	±0.02
	d1 h6					

UFX62 NEW

SQUARE TYPE WALCOWO-CZOŁOWE
4-Flute with extended neck 4-ostrzowe z szyjką

HSM Vmax	F	M		A					max	min		AIR
									○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●	○					○						





D code Kod	R	D	d1	L	l1	l2	Shank Uchwyt	Z
UFX6201204Y50A018200	0,05	1.2	4	50	1.8	20	A	4
UFX6201204001A018030	0,1	1.2	4	50	1.8	3	A	4
UFX6201204001A018040	0,1	1.2	4	50	1.8	4	A	4
UFX6201204001A018060	0,1	1.2	4	50	1.8	6	A	4
UFX6201204001A018080	0,1	1.2	4	50	1.8	8	A	4
UFX6201204001A018100	0,1	1.2	4	50	1.8	10	A	4
UFX6201204001A018120	0,1	1.2	4	50	1.8	12	A	4
UFX6201204001A018160	0,1	1.2	4	50	1.8	16	A	4
UFX6201204001A018200	0,1	1.2	4	50	1.8	20	A	4
UFX6201204002A018030	0,2	1.2	4	50	1.8	3	A	4
UFX6201204002A018040	0,2	1.2	4	50	1.8	4	A	4
UFX6201204002A018060	0,2	1.2	4	50	1.8	6	A	4
UFX6201204002A018080	0,2	1.2	4	50	1.8	8	A	4
UFX6201204002A018100	0,2	1.2	4	50	1.8	10	A	4
UFX6201204002A018120	0,2	1.2	4	50	1.8	12	A	4
UFX6201204002A018160	0,2	1.2	4	50	1.8	16	A	4
UFX6201204002A018200	0,2	1.2	4	50	1.8	20	A	4
UFX6201204003A018030	0,3	1.2	4	50	1.8	3	A	4
UFX6201204003A018040	0,3	1.2	4	50	1.8	4	A	4
UFX6201204003A018060	0,3	1.2	4	50	1.8	6	A	4
UFX6201204003A018080	0,3	1.2	4	50	1.8	8	A	4
UFX6201204003A018100	0,3	1.2	4	50	1.8	10	A	4
UFX6201204003A018120	0,3	1.2	4	50	1.8	12	A	4
UFX6201204003A018160	0,3	1.2	4	50	1.8	16	A	4
UFX6201204003A018200	0,3	1.2	4	50	1.8	20	A	4
UFX6201504Y50A023040	0,05	1.5	4	50	2.3	4	A	4
UFX6201504Y50A023060	0,05	1.5	4	50	2.3	6	A	4
UFX6201504Y50A023080	0,05	1.5	4	50	2.3	8	A	4
UFX6201504Y50A023100	0,05	1.5	4	50	2.3	10	A	4
UFX6201504Y50A023120	0,05	1.5	4	50	2.3	12	A	4
UFX6201504Y50A023140	0,05	1.5	4	50	2.3	14	A	4
UFX6201504Y50A023160	0,05	1.5	4	50	2.3	16	A	4
UFX6201504Y50A023200	0,05	1.5	4	50	2.3	20	A	4
UFX6201504Y50A023220	0,05	1.5	4	60	2.3	22	A	4
UFX6201504Y50A023260	0,05	1.5	4	60	2.3	26	A	4
UFX6201504001A023040	0,1	1.5	4	50	2.3	4	A	4
UFX6201504001A023060	0,1	1.5	4	50	2.3	6	A	4
UFX6201504001A023080	0,1	1.5	4	50	2.3	8	A	4
UFX6201504001A023100	0,1	1.5	4	50	2.3	10	A	4
UFX6201504001A023120	0,1	1.5	4	50	2.3	12	A	4
UFX6201504001A023140	0,1	1.5	4	50	2.3	14	A	4
UFX6201504001A023160	0,1	1.5	4	50	2.3	16	A	4
UFX6201504001A023200	0,1	1.5	4	50	2.3	20	A	4

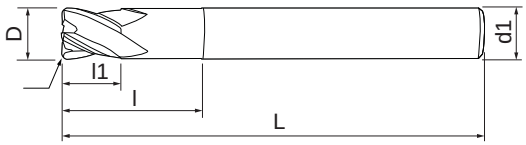
µm	D 0~-0.03				R	±0.02	
	d1 h6						

UFX62 NEW

SQUARE TYPE WALCOWO-CZOŁOWE
4-Flute with extended neck 4-ostrzowe z szyjką

HSM Vmax	F	M	A	max	min	AIR
				○	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●	○					○						





D code Kod	R	D	d1	L	l1	l2	Shank Uchwyt	Z
UFX6201504001A023220	0,1	1.5	4	60	2.3	22	A	4
UFX6201504001A023260	0,1	1.5	4	60	2.3	26	A	4
UFX6201504002A023040	0,2	1.5	4	50	2.3	4	A	4
UFX6201504002A023060	0,2	1.5	4	50	2.3	6	A	4
UFX6201504002A023080	0,2	1.5	4	50	2.3	8	A	4
UFX6201504002A023100	0,2	1.5	4	50	2.3	10	A	4
UFX6201504002A023120	0,2	1.5	4	50	2.3	12	A	4
UFX6201504002A023140	0,2	1.5	4	50	2.3	14	A	4
UFX6201504002A023160	0,2	1.5	4	50	2.3	16	A	4
UFX6201504002A023200	0,2	1.5	4	50	2.3	20	A	4
UFX6201504002A023220	0,2	1.5	4	60	2.3	22	A	4
UFX6201504002A023260	0,2	1.5	4	60	2.3	26	A	4
UFX6201504003A023040	0,3	1.5	4	50	2.3	4	A	4
UFX6201504003A023060	0,3	1.5	4	50	2.3	6	A	4
UFX6201504003A023080	0,3	1.5	4	50	2.3	8	A	4
UFX6201504003A023100	0,3	1.5	4	50	2.3	10	A	4
UFX6201504003A023120	0,3	1.5	4	50	2.3	12	A	4
UFX6201504003A023140	0,3	1.5	4	50	2.3	14	A	4
UFX6201504003A023160	0,3	1.5	4	50	2.3	16	A	4
UFX6201504003A023200	0,3	1.5	4	50	2.3	20	A	4
UFX6201504003A023220	0,3	1.5	4	60	2.3	22	A	4
UFX6201504003A023260	0,3	1.5	4	60	2.3	26	A	4
UFX6201504005A023040	0,5	1.5	4	50	2.3	4	A	4
UFX6201504005A023060	0,5	1.5	4	50	2.3	6	A	4
UFX6201504005A023080	0,5	1.5	4	50	2.3	8	A	4
UFX6201504005A023100	0,5	1.5	4	50	2.3	10	A	4
UFX6201504005A023120	0,5	1.5	4	50	2.3	12	A	4
UFX6201504005A023140	0,5	1.5	4	50	2.3	14	A	4
UFX6201504005A023160	0,5	1.5	4	50	2.3	16	A	4
UFX6201504005A023200	0,5	1.5	4	50	2.3	20	A	4
UFX6201504005A023220	0,5	1.5	4	60	2.3	22	A	4
UFX6201504005A023260	0,5	1.5	4	60	2.3	26	A	4
UFX6202004001A030060	0,1	2.0	4	50	3	6	A	4
UFX6202004001A030080	0,1	2.0	4	50	3	8	A	4
UFX6202004001A030100	0,1	2.0	4	50	3	10	A	4
UFX6202004001A030120	0,1	2.0	4	50	3	12	A	4
UFX6202004001A030140	0,1	2.0	4	50	3	14	A	4
UFX6202004001A030160	0,1	2.0	4	50	3	16	A	4
UFX6202004001A030200	0,1	2.0	4	50	3	20	A	4
UFX6202004001A030220	0,1	2.0	4	60	3	22	A	4
UFX6202004001A030260	0,1	2.0	4	60	3	26	A	4
UFX6202004001A030300	0,1	2.0	4	70	3	30	A	4

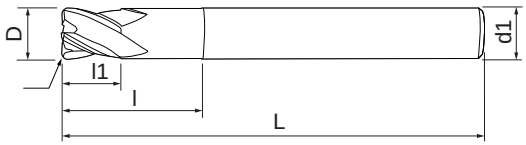
µm	D 0~-0.03				R	±0.02	
	d1 h6						

UFX62 NEW

SQUARE TYPE WALCOWO-CZOŁOWE
4-Flute with extended neck 4-ostrzowe z szyjką

HSM Vmax	F	M	A	max	min	AIR
				○	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●	○					○						





D code Kod	R	D	d1	L	l1	l2	Shank Uchwyt	Z
UFX6202004002A030060	0,2	2.0	4	50	3	6	A	4
UFX6202004002A030080	0,2	2.0	4	50	3	8	A	4
UFX6202004002A030100	0,2	2.0	4	50	3	10	A	4
UFX6202004002A030120	0,2	2.0	4	50	3	12	A	4
UFX6202004002A030140	0,2	2.0	4	50	3	14	A	4
UFX6202004002A030160	0,2	2.0	4	50	3	16	A	4
UFX6202004002A030200	0,2	2.0	4	50	3	20	A	4
UFX6202004002A030220	0,2	2.0	4	60	3	22	A	4
UFX6202004002A030260	0,2	2.0	4	60	3	26	A	4
UFX6202004002A030300	0,2	2.0	4	70	3	30	A	4
UFX6202004003A030060	0,3	2.0	4	50	3	6	A	4
UFX6202004003A030080	0,3	2.0	4	50	3	8	A	4
UFX6202004003A030100	0,3	2.0	4	50	3	10	A	4
UFX6202004003A030120	0,3	2.0	4	50	3	12	A	4
UFX6202004003A030140	0,3	2.0	4	50	3	14	A	4
UFX6202004003A030160	0,3	2.0	4	50	3	16	A	4
UFX6202004003A030200	0,3	2.0	4	50	3	20	A	4
UFX6202004003A030220	0,3	2.0	4	60	3	22	A	4
UFX6202004003A030260	0,3	2.0	4	60	3	26	A	4
UFX6202004003A030300	0,3	2.0	4	70	3	30	A	4
UFX6202004005A030060	0,5	2.0	4	50	3	6	A	4
UFX6202004005A030080	0,5	2.0	4	50	3	8	A	4
UFX6202004005A030100	0,5	2.0	4	50	3	10	A	4
UFX6202004005A030120	0,5	2.0	4	50	3	12	A	4
UFX6202004005A030140	0,5	2.0	4	50	3	14	A	4
UFX6202004005A030160	0,5	2.0	4	50	3	16	A	4
UFX6202004005A030200	0,5	2.0	4	50	3	20	A	4
UFX6202004005A030220	0,5	2.0	4	60	3	22	A	4
UFX6202004005A030260	0,5	2.0	4	60	3	26	A	4
UFX6202004005A030300	0,5	2.0	4	70	3	30	A	4
UFX6202504001A040080	0,1	2.5	4	50	4	8	A	4
UFX6202504001A040100	0,1	2.5	4	50	4	10	A	4
UFX6202504001A040120	0,1	2.5	4	50	4	12	A	4
UFX6202504001A040140	0,1	2.5	4	50	4	14	A	4
UFX6202504001A040160	0,1	2.5	4	50	4	16	A	4
UFX6202504001A040200	0,1	2.5	4	50	4	20	A	4
UFX6202504001A040260	0,1	2.5	4	60	4	26	A	4
UFX6202504001A040300	0,1	2.5	4	70	4	30	A	4
UFX6202504002A040080	0,2	2.5	4	50	4	8	A	4
UFX6202504002A040100	0,2	2.5	4	50	4	10	A	4
UFX6202504002A040120	0,2	2.5	4	50	4	12	A	4
UFX6202504002A040140	0,2	2.5	4	50	4	14	A	4

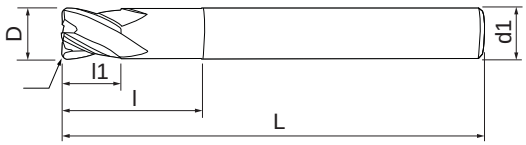
µm	D 0~-0.03				R	±0.02
	d1 h6					

UFX62 NEW

SQUARE TYPE WALCOWO-CZOŁOWE
4-Flute with extended neck 4-ostrzowe z szyjką

HSM Vmax	F	M	A	max	min	AIR
				○	●	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●	○					○						





D code Kod	R	D	d1	L	l1	l2	Shank Uchwyt	Z
UFX6202504002A040160	0,2	2.5	4	50	4	16	A	4
UFX6202504002A040200	0,2	2.5	4	50	4	20	A	4
UFX6202504002A040260	0,2	2.5	4	60	4	26	A	4
UFX6202504002A040300	0,2	2.5	4	70	4	30	A	4
UFX6202504003A040080	0,3	2.5	4	50	4	8	A	4
UFX6202504003A040100	0,3	2.5	4	50	4	10	A	4
UFX6202504003A040120	0,3	2.5	4	50	4	12	A	4
UFX6202504003A040140	0,3	2.5	4	50	4	14	A	4
UFX6202504003A040160	0,3	2.5	4	50	4	16	A	4
UFX6202504003A040200	0,3	2.5	4	50	4	20	A	4
UFX6202504003A040260	0,3	2.5	4	60	4	26	A	4
UFX6202504003A040300	0,3	2.5	4	70	4	30	A	4
UFX6202504005A040080	0,5	2.5	4	50	4	8	A	4
UFX6202504005A040100	0,5	2.5	4	50	4	10	A	4
UFX6202504005A040120	0,5	2.5	4	50	4	12	A	4
UFX6202504005A040140	0,5	2.5	4	50	4	14	A	4
UFX6202504005A040160	0,5	2.5	4	50	4	16	A	4
UFX6202504005A040200	0,5	2.5	4	50	4	20	A	4
UFX6202504005A040260	0,5	2.5	4	60	4	26	A	4
UFX6202504005A040300	0,5	2.5	4	70	4	30	A	4
UFX6203006001A045080	0,1	3.0	6	50	4.5	8	A	4
UFX6203006001A045100	0,1	3.0	6	50	4.5	10	A	4
UFX6203006001A045120	0,1	3.0	6	50	4.5	12	A	4
UFX6203006001A045140	0,1	3.0	6	60	4.5	14	A	4
UFX6203006001A045160	0,1	3.0	6	60	4.5	16	A	4
UFX6203006001A045200	0,1	3.0	6	60	4.5	20	A	4
UFX6203006001A045260	0,1	3.0	6	65	4.5	26	A	4
UFX6203006001A045300	0,1	3.0	6	70	4.5	30	A	4
UFX6203006001A045350	0,1	3.0	6	70	4.5	35	A	4
UFX6203006001A045400	0,1	3.0	6	80	4.5	40	A	4
UFX6203006002A045080	0,2	3.0	6	50	4.5	8	A	4
UFX6203006002A045100	0,2	3.0	6	50	4.5	10	A	4
UFX6203006002A045120	0,2	3.0	6	50	4.5	12	A	4
UFX6203006002A045140	0,2	3.0	6	60	4.5	14	A	4
UFX6203006002A045160	0,2	3.0	6	60	4.5	16	A	4
UFX6203006002A045200	0,2	3.0	6	60	4.5	20	A	4
UFX6203006002A045260	0,2	3.0	6	65	4.5	26	A	4
UFX6203006002A045300	0,2	3.0	6	70	4.5	30	A	4
UFX6203006002A045350	0,2	3.0	6	70	4.5	35	A	4
UFX6203006002A045400	0,2	3.0	6	80	4.5	40	A	4
UFX6203006003A045080	0,3	3.0	6	50	4.5	8	A	4
UFX6203006003A045100	0,3	3.0	6	50	4.5	10	A	4
UFX6203006003A045120	0,3	3.0	6	50	4.5	12	A	4

µm	D 0~-0.03				R	±0.02
	d1 h6					

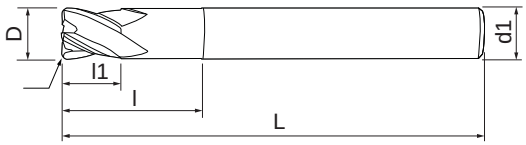
UFX62 NEW

SQUARE TYPE WALCOWO-CZOŁOWE

4-Flute with extended neck 4-ostrzowe z szyjką

HSM Vmax	F	M		A					max	min		AIR
									○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●	○					○						





D code Kod	R	D	d1	L	l1	l2	Shank Uchwyt	Z
UFX6203006003A045140	0,3	3.0	6	60	4.5	14	A	4
UFX6203006003A045160	0,3	3.0	6	60	4.5	16	A	4
UFX6203006003A045200	0,3	3.0	6	60	4.5	20	A	4
UFX6203006003A045260	0,3	3.0	6	65	4.5	26	A	4
UFX6203006003A045300	0,3	3.0	6	70	4.5	30	A	4
UFX6203006003A045350	0,3	3.0	6	70	4.5	35	A	4
UFX6203006003A045400	0,3	3.0	6	80	4.5	40	A	4
UFX6203006005A045080	0,5	3.0	6	50	4.5	8	A	4
UFX6203006005A045100	0,5	3.0	6	50	4.5	10	A	4
UFX6203006005A045120	0,5	3.0	6	50	4.5	12	A	4
UFX6203006005A045140	0,5	3.0	6	60	4.5	14	A	4
UFX6203006005A045160	0,5	3.0	6	60	4.5	16	A	4
UFX6203006005A045200	0,5	3.0	6	60	4.5	20	A	4
UFX6203006005A045260	0,5	3.0	6	65	4.5	26	A	4
UFX6203006005A045300	0,5	3.0	6	70	4.5	30	A	4
UFX6203006005A045350	0,5	3.0	6	70	4.5	35	A	4
UFX6203006005A045400	0,5	3.0	6	80	4.5	40	A	4
UFX6203006010A045080	1	3.0	6	50	4.5	8	A	4
UFX6203006010A045100	1	3.0	6	50	4.5	10	A	4
UFX6203006010A045120	1	3.0	6	50	4.5	12	A	4
UFX6203006010A045140	1	3.0	6	60	4.5	14	A	4
UFX6203006010A045160	1	3.0	6	60	4.5	16	A	4
UFX6203006010A045200	1	3.0	6	60	4.5	20	A	4
UFX6203006010A045260	1	3.0	6	65	4.5	26	A	4
UFX6203006010A045300	1	3.0	6	70	4.5	30	A	4
UFX6203006010A045350	1	3.0	6	70	4.5	35	A	4
UFX6203006010A045400	1	3.0	6	80	4.5	40	A	4
UFX6204006001A060100	0,1	4.0	6	50	6	10	A	4
UFX6204006001A060120	0,1	4.0	6	50	6	12	A	4
UFX6204006001A060140	0,1	4.0	6	60	6	14	A	4
UFX6204006001A060160	0,1	4.0	6	60	6	16	A	4
UFX6204006001A060200	0,1	4.0	6	60	6	20	A	4
UFX6204006001A060260	0,1	4.0	6	65	6	26	A	4
UFX6204006001A060300	0,1	4.0	6	70	6	30	A	4
UFX6204006001A060350	0,1	4.0	6	70	6	35	A	4
UFX6204006001A060400	0,1	4.0	6	80	6	40	A	4
UFX6204006001A060450	0,1	4.0	6	90	6	45	A	4
UFX6204006001A060500	0,1	4.0	6	100	6	50	A	4
UFX6204006002A060100	0,2	4.0	6	50	6	10	A	4
UFX6204006002A060120	0,2	4.0	6	50	6	12	A	4
UFX6204006002A060140	0,2	4.0	6	60	6	14	A	4
UFX6204006002A060160	0,2	4.0	6	60	6	16	A	4
UFX6204006002A060200	0,2	4.0	6	60	6	20	A	4

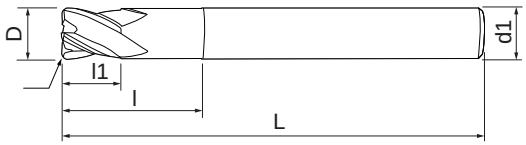
µm	D 0~-0.03				R	±0.02	
	d1 h6						

UFX62 NEW

SQUARE TYPE WALCOWO-CZOŁOWE
4-Flute with extended neck 4-ostrzowe z szyjką

HSM Vmax	F	M	A	max	min	AIR
				○	●	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●	○					○						





D code Kod	R	D	d1	L	l1	l2	Shank Uchwyt	Z
UFX6204006002A060260	0,2	4.0	6	65	6	26	A	4
UFX6204006002A060300	0,2	4.0	6	70	6	30	A	4
UFX6204006002A060350	0,2	4.0	6	70	6	35	A	4
UFX6204006002A060400	0,2	4.0	6	80	6	40	A	4
UFX6204006002A060450	0,2	4.0	6	90	6	45	A	4
UFX6204006002A060500	0,2	4.0	6	100	6	50	A	4
UFX6204006003A060100	0,3	4.0	6	50	6	10	A	4
UFX6204006003A060120	0,3	4.0	6	50	6	12	A	4
UFX6204006003A060140	0,3	4.0	6	60	6	14	A	4
UFX6204006003A060160	0,3	4.0	6	60	6	16	A	4
UFX6204006003A060200	0,3	4.0	6	60	6	20	A	4
UFX6204006003A060260	0,3	4.0	6	65	6	26	A	4
UFX6204006003A060300	0,3	4.0	6	70	6	30	A	4
UFX6204006003A060350	0,3	4.0	6	70	6	35	A	4
UFX6204006003A060400	0,3	4.0	6	80	6	40	A	4
UFX6204006003A060450	0,3	4.0	6	90	6	45	A	4
UFX6204006003A060500	0,3	4.0	6	100	6	50	A	4
UFX6204006005A060100	0,5	4.0	6	50	6	10	A	4
UFX6204006005A060120	0,5	4.0	6	50	6	12	A	4
UFX6204006005A060140	0,5	4.0	6	60	6	14	A	4
UFX6204006005A060160	0,5	4.0	6	60	6	16	A	4
UFX6204006005A060200	0,5	4.0	6	60	6	20	A	4
UFX6204006005A060260	0,5	4.0	6	65	6	26	A	4
UFX6204006005A060300	0,5	4.0	6	70	6	30	A	4
UFX6204006005A060350	0,5	4.0	6	70	6	35	A	4
UFX6204006005A060400	0,5	4.0	6	80	6	40	A	4
UFX6204006005A060450	0,5	4.0	6	90	6	45	A	4
UFX6204006005A060500	0,5	4.0	6	100	6	50	A	4
UFX6204006010A060100	1	4.0	6	50	6	10	A	4
UFX6204006010A060120	1	4.0	6	50	6	12	A	4
UFX6204006010A060140	1	4.0	6	60	6	14	A	4
UFX6204006010A060160	1	4.0	6	60	6	16	A	4
UFX6204006010A060200	1	4.0	6	60	6	20	A	4
UFX6204006010A060260	1	4.0	6	65	6	26	A	4
UFX6204006010A060300	1	4.0	6	70	6	30	A	4
UFX6204006010A060350	1	4.0	6	70	6	35	A	4
UFX6204006010A060400	1	4.0	6	80	6	40	A	4
UFX6204006010A060450	1	4.0	6	90	6	45	A	4
UFX6204006010A060500	1	4.0	6	100	6	50	A	4
UFX6205006001A080150	0,1	5.0	6	60	8	15	A	4
UFX6205006002A080150	0,2	5.0	6	60	8	15	A	4
UFX6205006003A080150	0,3	5.0	6	60	8	15	A	4

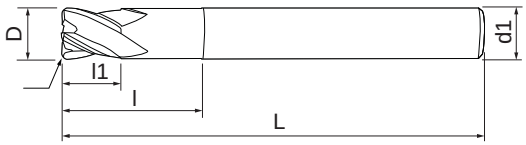
µm	D 0~-0.03				R	±0.02
	d1 h6					

UFX62 NEW

SQUARE TYPE WALCOWO-CZOŁOWE
4-Flute with extended neck 4-ostrzowe z szyjką

HSM Vmax	F	M		A					max	min		AIR
									○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●	○					○						





D code Kod	R	D	d1	L	l1	l2	Shank Uchwyt	Z
UFX6205006005A080150	0,5	5.0	6	60	8	15	A	4
UFX6205006010A080150	1	5.0	6	60	8	15	A	4
UFX6205006015A080150	1,5	5.0	6	60	8	15	A	4
UFX6205006020A080150	2	5.0	6	60	8	15	A	4
UFX6206006001A090200	0,1	6.0	6	60	9	20	A	4
UFX6206006002A090200	0,2	6.0	6	60	9	20	A	4
UFX6206006003A090200	0,3	6.0	6	60	9	20	A	4
UFX6206006005A090200	0,5	6.0	6	60	9	20	A	4
UFX6206006010A090200	1	6.0	6	60	9	20	A	4
UFX6206006015A090200	1,5	6.0	6	60	9	20	A	4
UFX6206006020A090200	2	6.0	6	60	9	20	A	4
UFX6206006003A150300	0,3	6.0	6	90	15	30	A	4
UFX6206006005A150300	0,5	6.0	6	90	15	30	A	4
UFX6206006010A150300	1	6.0	6	90	15	30	A	4
UFX6208008001A120250	0,1	8.0	8	70	12	25	A	4
UFX6208008002A120250	0,2	8.0	8	70	12	25	A	4
UFX6208008003A120250	0,3	8.0	8	70	12	25	A	4
UFX6208008005A120250	0,5	8.0	8	70	12	25	A	4
UFX6208008010A120250	1	8.0	8	70	12	25	A	4
UFX6208008015A120250	1,5	8.0	8	70	12	25	A	4
UFX6208008020A120250	2	8.0	8	70	12	25	A	4
UFX6208008003A200350	0,3	8.0	8	100	20	35	A	4
UFX6208008005A200350	0,5	8.0	8	100	20	35	A	4
UFX6208008010A200350	1	8.0	8	100	20	35	A	4
UFX6210010001A150300	0,1	10.0	10	75	15	30	A	4
UFX6210010002A150300	0,2	10.0	10	75	15	30	A	4
UFX6210010003A150300	0,3	10.0	10	75	15	30	A	4
UFX6210010005A150300	0,5	10.0	10	75	15	30	A	4
UFX6210010010A150300	1	10.0	10	75	15	30	A	4
UFX6210010015A150300	1,5	10.0	10	75	15	30	A	4
UFX6210010020A150300	2	10.0	10	75	15	30	A	4
UFX6210010003A250400	0,3	10.0	10	100	25	40	A	4
UFX6210010005A250400	0,5	10.0	10	100	25	40	A	4
UFX6210010010A250400	1	10.0	10	100	25	40	A	4
UFX6212012002A180320	0,2	12.0	12	80	18	32	A	4
UFX6212012003A180320	0,3	12.0	12	80	18	32	A	4
UFX6212012005A180320	0,5	12.0	12	80	18	32	A	4
UFX6212012010A180320	1	12.0	12	80	18	32	A	4
UFX6212012015A180320	1,5	12.0	12	80	18	32	A	4
UFX6212012020A180320	2	12.0	12	80	18	32	A	4
UFX6212012003A300450	0,3	12.0	12	110	30	45	A	4
UFX6212012005A300450	0,5	12.0	12	110	30	45	A	4

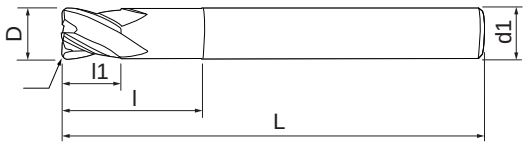
µm	D 0~-0.03				R	±0.02
	d1 h6					

UFX62 NEW

SQUARE TYPE WALCOWO-CZOŁOWE
4-Flute with extended neck 4-ostrzowe z szyjką

			HSM Vmax	F	M		A					max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●	○					○						





D code Kod	R	D	d1	L	l1	l2	Shank Uchwyt	Z
UFX6212012010A300450	1	12.0	12	110	30	45	A	4
UFX6216016005A200350	0,5	16.0	16	100	20	35	A	4
UFX6216016010A200350	1	16.0	16	100	20	35	A	4
UFX6216020005A350500	0,5	16.0	20	150	35	50	A	4
UFX6216020010A350500	1	16.0	20	150	35	50	A	4
UFX6220020005A250400	0,5	20.0	20	100	25	40	A	4
UFX6220020010A250400	1	20.0	20	100	25	40	A	4
UFX6220020005A400550	0,5	20.0	20	150	40	55	A	4
UFX6220020010A400550	1	20.0	20	150	40	55	A	4

µm	D 0~-0.03				R	±0.02
	d1 h6					

UFX62

Cutting Conditions Parametry skrawania



	Non-alloyed Steels Alloy Steels Cast Iron Stale niestopowe, żeliwo stopowe				Alloy Steels Heat Resistant Steels Stale stopowe, Stale żaroodporne				Hardened Steels Stale hartowane			
	~ 35 HRC				35 HRC ~ 45 HRC				45 HRC ~ 55 HRC			
D (mm)	ae	ap	RPM	mm/min	ae	ap	RPM	mm/min	ae	ap	RPM	mm/min
1.0	0.021	1.0	33100	360	0.016	1.0	21600	260	0.013	1.0	13200	140
1.0	0.012	1.0	29790	290	0.009	1.0	19440	210	0.007	1.0	11880	115
1.0	0.012	1.0	29790	290	0.009	1.0	19440	210	0.007	1.0	11880	115
1.0	0.008	1.0	29790	290	0.006	1.0	19440	210	0.005	1.0	11880	115
1.0	0.008	1.0	26480	230	0.006	1.0	17280	165	0.005	1.0	10560	90
1.0	0.005	1.0	19860	150	0.003	1.0	12960	110	0.003	1.0	7920	60
1.0	0.003	1.0	19860	150	0.002	1.0	12960	110	0.002	1.0	7920	60
1.0	0.003	1.0	9930	65	0.002	1.0	6480	45	0.002	1.0	3960	25
1.0	0.003	1.0	9930	65	0.002	1.0	6480	45	0.002	1.0	3960	25
1.2	0.036	1.2	29750	365	0.027	1.2	18900	265	0.022	1.2	11700	140
1.2	0.025	1.2	29750	365	0.019	1.2	18900	265	0.015	1.2	11700	140
1.2	0.025	1.2	29750	365	0.019	1.2	18900	265	0.015	1.2	11700	140
1.2	0.014	1.2	26780	295	0.011	1.2	17010	215	0.009	1.2	10530	115
1.2	0.009	1.2	26780	295	0.007	1.2	17010	215	0.005	1.2	10530	115
1.2	0.009	1.2	26780	295	0.007	1.2	17010	215	0.005	1.2	10530	115
1.2	0.005	1.2	23800	235	0.004	1.2	15120	170	0.003	1.2	9360	90
1.2	0.004	1.2	17850	155	0.003	1.2	11340	110	0.002	1.2	7020	60
1.5	0.045	1.5	26400	370	0.034	1.5	16200	270	0.027	1.5	10200	140
1.5	0.032	1.5	26400	370	0.024	1.5	16200	270	0.019	1.5	10200	140
1.5	0.018	1.5	23760	300	0.014	1.5	14580	220	0.011	1.5	9180	115
1.5	0.018	1.5	23760	300	0.014	1.5	14580	220	0.011	1.5	9180	115
1.5	0.018	1.5	23760	300	0.014	1.5	14580	220	0.011	1.5	9180	115
1.5	0.011	1.5	23760	300	0.008	1.5	14580	220	0.007	1.5	9180	115
1.5	0.011	1.5	21120	235	0.008	1.5	12960	175	0.007	1.5	8160	90
1.5	0.007	1.5	21120	235	0.005	1.5	12960	175	0.004	1.5	8160	90
1.5	0.007	1.5	21120	235	0.005	1.5	12960	175	0.004	1.5	8160	90
1.5	0.005	1.5	15840	155	0.003	1.5	9720	115	0.003	1.5	6120	60
2.0	0.060	2.0	21600	380	0.045	2.0	13800	280	0.036	2.0	8640	150
2.0	0.042	2.0	21600	380	0.032	2.0	13800	280	0.025	2.0	8640	150
2.0	0.042	2.0	21600	380	0.032	2.0	13800	280	0.025	2.0	8640	150
2.0	0.024	2.0	19440	310	0.018	2.0	12420	225	0.014	2.0	7780	120
2.0	0.024	2.0	19440	310	0.018	2.0	12420	225	0.014	2.0	7780	120
2.0	0.024	2.0	19440	310	0.018	2.0	12420	225	0.014	2.0	7780	120
2.0	0.015	2.0	19440	310	0.011	2.0	12420	225	0.009	2.0	7780	120
2.0	0.015	2.0	17280	245	0.011	2.0	11040	180	0.009	2.0	6910	95
2.0	0.015	2.0	17280	245	0.011	2.0	11040	180	0.009	2.0	6910	95
2.0	0.009	2.0	17280	245	0.007	2.0	11040	180	0.005	2.0	6910	95
2.5	0.053	2.5	18000	390	0.039	2.5	11400	300	0.032	2.5	7320	150
2.5	0.053	2.5	18000	390	0.039	2.5	11400	300	0.032	2.5	7320	150
2.5	0.053	2.5	18000	390	0.039	2.5	11400	300	0.032	2.5	7320	150
2.5	0.030	2.5	16200	315	0.023	2.5	10260	245	0.018	2.5	6590	120
2.5	0.030	2.5	16200	315	0.023	2.5	10260	245	0.018	2.5	6590	120
2.5	0.030	2.5	16200	315	0.023	2.5	10260	245	0.018	2.5	6590	120
2.5	0.019	2.5	14400	250	0.014	2.5	9120	190	0.011	2.5	5860	95
2.5	0.019	2.5	14400	250	0.014	2.5	9120	190	0.011	2.5	5860	95
3.0	0.090	3.0	15900	400	0.068	3.0	10300	310	0.054	3.0	6300	150
3.0	0.063	3.0	15900	400	0.047	3.0	10300	310	0.038	3.0	6300	150
3.0	0.063	3.0	15900	400	0.047	3.0	10300	310	0.038	3.0	6300	150
3.0	0.063	3.0	15900	400	0.047	3.0	10300	310	0.038	3.0	6300	150
3.0	0.036	3.0	14310	325	0.027	3.0	9270	250	0.022	3.0	5670	120
3.0	0.036	3.0	14310	325	0.027	3.0	9270	250	0.022	3.0	5670	120

UFX62

Cutting Conditions Parametry skrawania



	Non-alloyed Steels Alloy Steels Cast Iron Stale niestopowe, żeliwo stopowe				Alloy Steels Heat Resistant Steels Stale stopowe, Stale żaroodporne				Hardened Steels Stale hartowane			
	~ 35 HRC				35 HRC ~ 45 HRC				45 HRC ~ 55 HRC			
D (mm)	ae	ap	RPM	mm/min	ae	ap	RPM	mm/min	ae	ap	RPM	mm/min
3.0	0.023	3.0	14310	325	0.017	3.0	9270	250	0.014	3.0	5670	120
3.0	0.023	3.0	14310	325	0.017	3.0	9270	250	0.014	3.0	5670	120
3.0	0.023	3.0	12720	255	0.017	3.0	8240	200	0.014	3.0	5040	95
3.0	0.014	3.0	12720	255	0.010	3.0	8240	200	0.008	3.0	5040	95
4.0	0.120	4.0	12800	500	0.090	4.0	8200	360	0.072	4.0	5150	160
4.0	0.120	4.0	12800	500	0.090	4.0	8200	360	0.072	4.0	5150	160
4.0	0.084	4.0	12800	500	0.063	4.0	8200	360	0.050	4.0	5150	160
4.0	0.084	4.0	12800	500	0.063	4.0	8200	360	0.050	4.0	5150	160
4.0	0.084	4.0	12800	500	0.063	4.0	8200	360	0.050	4.0	5150	160
4.0	0.048	4.0	11520	405	0.036	4.0	7380	290	0.029	4.0	4640	130
4.0	0.048	4.0	11520	405	0.036	4.0	7380	290	0.029	4.0	4640	130
4.0	0.030	4.0	11520	405	0.023	4.0	7380	290	0.018	4.0	4640	130
4.0	0.030	4.0	11520	405	0.023	4.0	7380	290	0.018	4.0	4640	130
4.0	0.030	4.0	10240	320	0.023	4.0	6560	230	0.018	4.0	4120	100
4.0	0.030	4.0	10240	320	0.023	4.0	6560	230	0.018	4.0	4120	100
5.0	0.150	5.0	11000	510	0.113	5.0	7000	430	0.090	5.0	4560	200
6.0	0.126	6.0	9500	510	0.095	6.0	6000	430	0.076	6.0	3930	200
6.0	0.126	6.0	9500	510	0.095	6.0	6000	430	0.076	6.0	3930	200
8.0	0.168	8.0	7200	550	0.126	8.0	4550	430	0.101	8.0	3020	200
8.0	0.168	8.0	7200	550	0.126	8.0	4550	430	0.101	8.0	3020	200
10.0	0.300	10.0	6000	550	0.225	10.0	4000	430	0.180	10.0	2420	200
10.0	0.210	10.0	6000	550	0.158	10.0	4000	430	0.126	10.0	2420	200
12.0	0.360	12.0	5000	430	0.270	12.0	3340	380	0.216	12.0	2000	160
12.0	0.252	12.0	5000	430	0.189	12.0	3340	380	0.151	12.0	2000	160
16.0	0.480	16.0	3720	330	0.360	16.0	2520	280	0.288	16.0	1540	135
16.0	0.336	16.0	3720	330	0.252	16.0	2520	280	0.202	16.0	1540	135
20.0	0.600	20.0	3000	270	0.450	20.0	1950	210	0.360	20.0	1200	100
20.0	0.600	20.0	3000	270	0.450	20.0	1950	210	0.360	20.0	1200	100

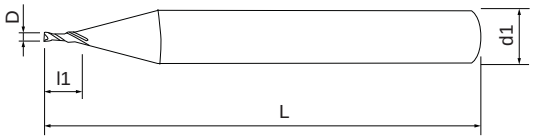
UFX67 NEW

SQUARE TYPE WALCOWO-CZOŁOWE

2 Flute 2 ostrzowe

HSM Vmax	F	M	30°	A	max	min	AIR
					○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, SI <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●	○					○	○	○				





D code Kod	D	d1	L	l1	Shank Uchwyt	Z
UFX670030400XA000040	0.03	4	40	0.04	A	2
UFX670040400XA001040	0.04	4	40	0.06	A	2
UFX670050400XA001040	0.05	4	40	0.07	A	2
UFX670060400XA001040	0.06	4	40	0.09	A	2
UFX670070400XA001040	0.07	4	40	0.1	A	2
UFX670080400XA001040	0.08	4	40	0.12	A	2
UFX670090400XA001040	0.09	4	40	0.13	A	2
UFX670100400XA002040	0.1	4	40	0.2	A	2
UFX670150400XA003040	0.15	4	40	0.3	A	2
UFX670200400XA004040	0.2	4	40	0.4	A	2
UFX670250400XA005040	0.25	4	40	0.5	A	2
UFX670300400XA006040	0.3	4	40	0.6	A	2
UFX670350400XA007040	0.35	4	40	0.7	A	2
UFX670400400XA008040	0.4	4	40	0.8	A	2
UFX670450400XA009040	0.45	4	40	0.9	A	2
UFX670500400XA010040	0.5	4	40	1.0	A	2
UFX670550400XA011040	0.55	4	40	1.1	A	2
UFX670600400XA012040	0.6	4	40	1.2	A	2
UFX670650400XA013040	0.65	4	40	1.3	A	2
UFX670700400XA014040	0.7	4	40	1.4	A	2
UFX670750400XA015040	0.75	4	40	1.5	A	2
UFX670800400XA016040	0.8	4	40	1.6	A	2
UFX670850400XA017040	0.85	4	40	1.7	A	2
UFX670900400XA018040	0.9	4	40	1.8	A	2
UFX670950400XA020040	0.95	4	40	2	A	2
UFX6701006000A025050	1.0	6	50	2.5	A	2
UFX6701206000A030050	1.2	6	50	3	A	2
UFX6701506000A040050	1.5	6	50	4	A	2
UFX6702006000A060050	2.0	6	50	6	A	2
UFX6702506000A070050	2.5	6	50	7	A	2
UFX6703006000A080050	3.0	6	50	8	A	2
UFX6703506000A100050	3.5	6	50	10	A	2
UFX6704006000A100050	4.0	6	50	10	A	2
UFX6704506000A140050	4.5	6	50	14	A	2
UFX6705006000A150060	5.0	6	60	15	A	2
UFX6705506000A150060	5.5	6	60	15	A	2
UFX6706006000A150060	6.0	6	60	15	A	2
UFX6706508000A180060	6.5	8	60	18	A	2
UFX6707008000A200060	7.0	8	60	20	A	2
UFX6707508000A200060	7.5	8	60	20	A	2
UFX6708008000A200070	8.0	8	70	20	A	2
UFX6708510000A220070	8.5	10	70	22	A	2
UFX6709010000A220070	9.0	10	70	22	A	2
UFX6709510000A240070	9.5	10	70	24	A	2

µm				
	D ≤ 3	0~-0.012	d1 h6	
	D > 3	0~-0.015		

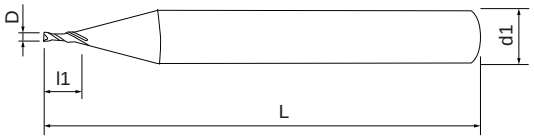
UFX67 NEW

SQUARE TYPE WALCOWO-CZOŁOWE

2 Flute 2 ostrzowe

HSM Vmax	F	M	30°	A				max	min		AIR
								○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, SI <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●	○					○	○	○				





D code Kod	D	d1	L	l1	Shank Uchwyt	Z
UFX6710010000A250075	10.0	10	75	25	A	2
UFX6710512000A260075	10.5	12	75	26	A	2
UFX6711012000A300075	11.0	12	75	30	A	2
UFX6711512000A300080	11.5	12	80	30	A	2
UFX6712012000A300080	12.0	12	80	30	A	2
UFX6713012000A350100	13.0	12	100	35	A	2
UFX6714012000A350100	14.0	12	100	35	A	2
UFX6714014000A350100	14.0	14	100	35	A	2
UFX6714016000A350100	14.0	16	100	35	A	2
UFX6715016000A380100	15.0	16	100	38	A	2
UFX6716016000A400100	16.0	16	100	40	A	2
UFX6717016000A420100	17.0	16	100	42	A	2
UFX6718016000A450100	18.0	16	100	45	A	2
UFX6718018000A450100	18.0	18	100	45	A	2
UFX6719020000A450100	19.0	20	100	45	A	2
UFX6720020000A450100	20.0	20	100	45	A	2
UFX6721020000A450100	21.0	20	100	45	A	2
UFX6722020000A450100	22.0	20	100	45	A	2
UFX6723025000A500120	23.0	25	120	50	A	2
UFX6724025000A500120	24.0	25	120	50	A	2
UFX6725025000A500120	25.0	25	120	50	A	2
UFX6701004000A025050	1.0	4	50	2.5	A	2
UFX6701104000A030050	1.1	4	50	3	A	2
UFX6701204000A030050	1.2	4	50	3	A	2
UFX6701304000A030050	1.3	4	50	3	A	2
UFX6701404000A040050	1.4	4	50	4	A	2
UFX6701504000A040050	1.5	4	50	4	A	2
UFX6701604000A040050	1.6	4	50	4	A	2
UFX6701704000A040050	1.7	4	50	4	A	2
UFX6701804000A050050	1.8	4	50	5	A	2
UFX6701904000A050050	1.9	4	50	5	A	2
UFX6702004000A060050	2.0	4	50	6	A	2
UFX6702104000A060050	2.1	4	50	6	A	2
UFX6702204000A060050	2.2	4	50	6	A	2
UFX6702304000A060050	2.3	4	50	6	A	2
UFX6702404000A060050	2.4	4	50	6	A	2
UFX6702504000A080050	2.5	4	50	8	A	2
UFX6702604000A080050	2.6	4	50	8	A	2
UFX6702704000A080050	2.7	4	50	8	A	2
UFX6702804000A080050	2.8	4	50	8	A	2
UFX6702904000A080050	2.9	4	50	8	A	2
UFX6703004000A080050	3.0	4	50	8	A	2
UFX6703504000A100050	3.5	4	50	10	A	2
UFX6704004000A100050	4.0	4	50	10	A	2

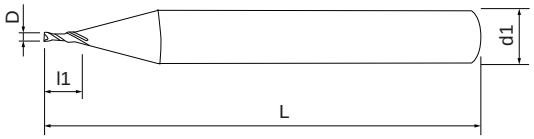
µm	D ≤ 3	0~-0.012	d1 h6	
	D > 3	0~-0.015		

UFX67 NEW

SQUARE TYPE WALCOWO-CZOŁOWE
2 Flute 2 ostrzowe

HSM Vmax	F	M	30°	A	max	min	AIR
					○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●	○					○	○	○				



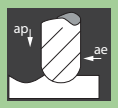


D code Kod	D	d1	L	l1	Shank Uchwyt	Z
UFX6704004000A100080	4.0	4	80	10	A	2
UFX6700103000A002040	0.1	3	40	0.2	A	2
UFX6700203000A004040	0.2	3	40	0.4	A	2
UFX6700303000A006040	0.3	3	40	0.6	A	2
UFX6700403000A008040	0.4	3	40	0.8	A	2
UFX6700503000A010040	0.5	3	40	1.0	A	2
UFX6700603000A012040	0.6	3	40	1.2	A	2
UFX6700703000A014040	0.7	3	40	1.4	A	2
UFX6700803000A016040	0.8	3	40	1.6	A	2
UFX6700903000A018040	0.9	3	40	1.8	A	2
UFX6701003000A025050	1.0	3	50	2.5	A	2
UFX6701203000A030050	1.2	3	50	3	A	2
UFX6701503000A040050	1.5	3	50	4	A	2
UFX6702003000A060050	2.0	3	50	6	A	2
UFX6702503000A070050	2.5	3	50	7	A	2
UFX6703003000A080050	3.0	3	50	8	A	2

µm				
	D ≤ 3	0~-0.012	d1 h6	
	D > 3	0~-0.015		

UFX67

Cutting Conditions Parametry skrawania



	Non-alloyed Steels Alloy Steels Cast Iron Stale niestopowe, żeliwo stopowe				Alloy Steels Heat Resistant Steels Stale stopowe, Stale żaroodporne		Stainless steel Stal nierdzewna		Hardened Steels Stale hartowane			
	~ 35 HRC				35 HRC ~ 45 HRC				45 HRC ~ 55 HRC			
D (mm)	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min	ae	ap	RPM	mm/min
0.1	0,1	0,015	42000	80	25200	47	21000	40	0,1	0,02	16800	16
0.2	0,2	0,03	42000	85	25200	50	21000	39	0,2	0,04	16800	17
0.3	0,3	0,045	39000	90	23400	54	19500	45	0,3	0,06	15600	18
0.4	0,4	0,06	39000	95	23400	57	19500	47	0,4	0,08	15600	19
0.5	0,5	0,075	36000	110	21600	66	18000	55	0,5	0,1	14400	22
0.6	0,6	0,09	32000	125	19200	76	16000	63	0,6	0,12	12800	25
0.7	0,7	0,105	28000	140	16800	85	14000	70	0,7	0,14	11200	28
0.8	0,8	0,12	25000	155	15000	95	12500	79	0,8	0,16	10000	32
0.9	0,9	0,135	23500	165	14100	98	11750	81	0,9	0,18	9400	33
1.0	1	0,15	21500	170	12900	101	10750	84	1	0,2	8600	34
1.2	1,2	0,24	18000	175	10800	104	9000	87	1,2	0,6	7200	35
1.5	1,5	0,3	15000	180	9000	107	7500	89	1,5	0,75	6000	36
2.0	2	0,4	11560	200	7560	125	6300	95	2	1	5040	37
2.5	2,5	0,5	10240	210	6560	135	5460	110	2,5	1,25	4200	39
3.0	3	0,6	8920	220	5560	145	4620	125	3	1,5	3360	42
3.5	3,5	1,75	8240	270	5090	170	4250	140	3,5	1,75	3150	42
4.0	4	2	7560	315	4620	190	3880	160	4	2	2940	42
4.5	4,5	2,25	6930	325	4200	195	3520	165	4,5	2,25	2630	47
5.0	5	2,5	6300	335	3780	200	3160	170	5	2,5	2320	53
5.5	5,5	2,75	5930	350	3570	215	3000	180	5,5	2,75	2160	55
6.0	6	3	5560	370	3360	230	2840	190	6	3	2000	58
6.5	6,5	3,25	5220	375	3150	225	2655	190	6,5	3,25	1920	63
7.0	7	3,5	4880	385	2940	220	2470	190	7	3,5	1840	68
7.5	7,5	3,75	4540	390	2730	215	2285	190	7,5	3,75	1760	74
8.0	8	4	4200	400	2520	210	2100	190	8	4	1680	79
8.5	8,5	4,25	3965	385	2390	200	1995	185	8,5	4,25	1600	74
9.0	9	4,5	3730	375	2260	190	1890	180	9	4,5	1520	68
9.5	9,5	4,75	3495	355	2130	180	1785	175	9,5	4,75	1440	63
10.0	10	5	3260	345	2000	170	1680	170	10	5	1360	63
10.5	10,5	5,25	3130	330	1920	160	1600	160	10,5	5,25	1310	61
11.0	11	5,5	3000	320	1840	150	1520	150	11	5,5	1260	58
11.5	11,5	5,75	2870	305	1760	140	1440	140	11,5	5,75	1210	58
12.0	12	6	2740	295	1680	135	1360	135	12	6	1160	58
13.0	13	6,5	2605	280	1600	130	1285	130	13	6,5	1095	55
14.0	14	7	2470	265	1520	125	1210	125	14	7	1030	49
15.0	15	7,5	2335	245	1440	120	1135	120	15	7,5	965	45
16.0	16	8	2200	230	1360	115	1060	115	16	8	900	42
17.0	17	8,5	2070	215	1285	105	1005	105	17	8,5	845	39
18.0	18	9	1940	205	1210	100	950	100	18	9	790	37
19.0	19	9,5	1810	190	1135	90	895	90	19	9,5	735	34
20.0	20	10	1680	180	1060	84	840	84	20	10	680	32
21.0	21	10,5	1615	170	1015	82	800	80	21	10,5	650	29
22.0	22	11	1550	165	970	80	775	76	22	11	620	27
23.0	23	11,5	1480	150	925	78	745	71	23	11,5	600	25
24.0	24	12	1425	140	885	76	715	67	24	12	570	23
25.0	25	12,5	1360	135	840	74	680	63	25	12,5	540	21

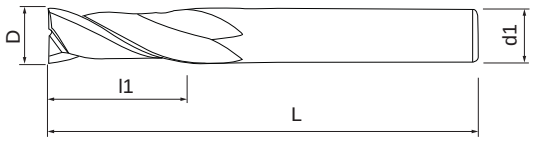
UFX71 NEW

SQUARE TYPE WALCOWO-CZOŁOWE

2 Flute Long Length 2 ostrzowe długie

HSM Vmax	F	M	30°	A	max	min	AIR
					○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●	○					○						





D code Kod	D	d1	L	l1	Shank Uchwyt	Z
UFX7101006000A030060	1.0	6	60	3	A	2
UFX7101006000A040060	1.0	6	60	4	A	2
UFX7101006000A050060	1.0	6	60	5	A	2
UFX7101006000A060060	1.0	6	60	6	A	2
UFX7101006000A070060	1.0	6	60	7	A	2
UFX7101006000A080060	1.0	6	60	8	A	2
UFX7101006000A100060	1.0	6	60	10	A	2
UFX7101006000A120060	1.0	6	60	12	A	2
UFX7101206000A040060	1.2	6	60	4	A	2
UFX7101206000A060060	1.2	6	60	6	A	2
UFX7101206000A080060	1.2	6	60	8	A	2
UFX7101206000A100060	1.2	6	60	10	A	2
UFX7101206000A120060	1.2	6	60	12	A	2
UFX7101506000A060060	1.5	6	60	6	A	2
UFX7101506000A080060	1.5	6	60	8	A	2
UFX7101506000A100060	1.5	6	60	10	A	2
UFX7101506000A120060	1.5	6	60	12	A	2
UFX7101506000A140060	1.5	6	60	14	A	2
UFX7101506000A160060	1.5	6	60	16	A	2
UFX7102006000A080060	2.0	6	60	8	A	2
UFX7102006000A100060	2.0	6	60	10	A	2
UFX7102006000A120060	2.0	6	60	12	A	2
UFX7102006000A140060	2.0	6	60	14	A	2
UFX7102006000A160060	2.0	6	60	16	A	2
UFX7102506000A100060	2.5	6	60	10	A	2
UFX7102506000A120060	2.5	6	60	12	A	2
UFX7102506000A160060	2.5	6	60	16	A	2
UFX7102506000A200060	2.5	6	60	20	A	2
UFX7102506000A260060	2.5	6	60	26	A	2
UFX7103003000A160100	3.0	3	100	16	A	2
UFX7103006000A100070	3.0	6	70	10	A	2
UFX7103006000A120070	3.0	6	70	12	A	2
UFX7103006000A140070	3.0	6	70	14	A	2
UFX7103006000A160070	3.0	6	70	16	A	2
UFX7103006000A200070	3.0	6	70	20	A	2
UFX7103006000A260070	3.0	6	70	26	A	2
UFX7103006000A300070	3.0	6	70	30	A	2
UFX7104004000A200100	4.0	4	100	20	A	2
UFX7104006000A120070	4.0	6	70	12	A	2
UFX7104006000A160070	4.0	6	70	16	A	2
UFX7104006000A200070	4.0	6	70	20	A	2
UFX7104006000A260070	4.0	6	70	26	A	2

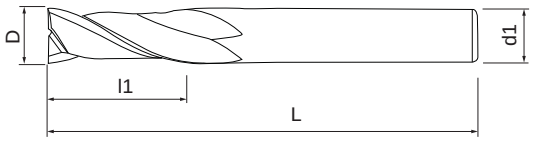
µm	D 0~-0.03	d1 h6		

UFX71 NEW

SQUARE TYPE WALCOWO-CZOŁOWE
2 Flute Long Length 2 ostrzowe długie

HSM Vmax	F	M	30°	A					max	min		AIR
									○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●	○					○						





D code Kod	D	d1	L	l1	Shank Uchwyt	Z
UFX7104006000A300070	4.0	6	70	30	A	2
UFX7105006000A200070	5.0	6	70	20	A	2
UFX7105006000A250070	5.0	6	70	25	A	2
UFX7105006000A250100	5.0	6	100	25	A	2
UFX7105006000A300080	5.0	6	80	30	A	2
UFX7105006000A350090	5.0	6	90	35	A	2
UFX7105006000A400100	5.0	6	100	40	A	2
UFX7106006000A150060	6.0	6	60	15	A	2
UFX7106006000A150080	6.0	6	80	15	A	2
UFX7106006000A200070	6.0	6	70	20	A	2
UFX7106006000A200090	6.0	6	90	20	A	2
UFX7106006000A250075	6.0	6	75	25	A	2
UFX7106006000A300080	6.0	6	80	30	A	2
UFX7106006000A300100	6.0	6	100	30	A	2
UFX7106006000A300150	6.0	6	150	30	A	2
UFX7106006000A350090	6.0	6	90	35	A	2
UFX7106006000A400090	6.0	6	90	40	A	2
UFX7106006000A400120	6.0	6	120	40	A	2
UFX7106006000A450150	6.0	6	150	45	A	2
UFX7108008000A250080	8.0	8	80	25	A	2
UFX7108008000A300080	8.0	8	80	30	A	2
UFX7108008000A300100	8.0	8	100	30	A	2
UFX7108008000A350090	8.0	8	90	35	A	2
UFX7108008000A400090	8.0	8	90	40	A	2
UFX7108008000A400120	8.0	8	120	40	A	2
UFX7108008000A400150	8.0	8	150	40	A	2
UFX7108008000A450100	8.0	8	100	45	A	2
UFX7108008000A500100	8.0	8	100	50	A	2
UFX7108008000A500150	8.0	8	150	50	A	2
UFX7110010000A300080	10.0	10	80	30	A	2
UFX7110010000A300100	10.0	10	100	30	A	2
UFX7110010000A350090	10.0	10	90	35	A	2
UFX7110010000A400090	10.0	10	90	40	A	2
UFX7110010000A400120	10.0	10	120	40	A	2
UFX7110010000A450100	10.0	10	100	45	A	2
UFX7110010000A500100	10.0	10	100	50	A	2
UFX7110010000A500150	10.0	10	150	50	A	2
UFX7110010000A500200	10.0	10	200	50	A	2
UFX7110010000A550150	10.0	10	150	55	A	2
UFX7110010000A600110	10.0	10	110	60	A	2
UFX7110010000A600200	10.0	10	200	60	A	2
UFX7112012000A350090	12.0	12	90	35	A	2

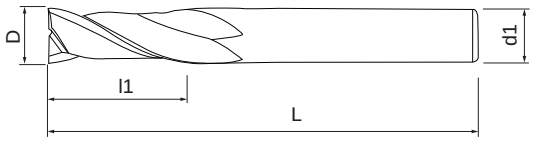
µm	D 0~-0.03	d1 h6		

UFX71 NEW

SQUARE TYPE WALCOWO-CZOŁOWE
2 Flute Long Length 2 ostrzowe długie

HSM Vmax	F	M	30°	A	max	min	AIR
					○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, SI <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●	○					○						





D code Kod	D	d1	L	l1	Shank Uchwyt	Z
UFX7112012000A400100	12.0	12	100	40	A	2
UFX7112012000A400120	12.0	12	120	40	A	2
UFX7112012000A450130	12.0	12	130	45	A	2
UFX7112012000A500100	12.0	12	100	50	A	2
UFX7112012000A500150	12.0	12	150	50	A	2
UFX7112012000A550110	12.0	12	110	55	A	2
UFX7112012000A600110	12.0	12	110	60	A	2
UFX7112012000A600150	12.0	12	150	60	A	2
UFX7112012000A600200	12.0	12	200	60	A	2
UFX7112012000A650150	12.0	12	150	65	A	2
UFX7112012000A700120	12.0	12	120	70	A	2
UFX7112012000A700200	12.0	12	200	70	A	2
UFX7114016000A500110	14.0	16	110	50	A	2
UFX7114016000A600150	14.0	16	150	60	A	2
UFX7116016000A400150	16.0	16	150	40	A	2
UFX7116016000A500110	16.0	16	110	50	A	2
UFX7116016000A500150	16.0	16	150	50	A	2
UFX7116016000A600120	16.0	16	120	60	A	2
UFX7116016000A700130	16.0	16	130	70	A	2
UFX7116016000A700150	16.0	16	150	70	A	2
UFX7116016000A700200	16.0	16	200	70	A	2
UFX7116016000A800150	16.0	16	150	80	A	2
UFX7116016000A900150	16.0	16	150	90	A	2
UFX7116016000A11X200	16.0	16	200	11	A	2
UFX7116016000A12X250	16.0	16	250	12	A	2
UFX7118020000A500120	18.0	20	120	50	A	2
UFX7118020000A700130	18.0	20	130	70	A	2
UFX7118020000A10X200	18.0	20	200	10	A	2
UFX7120020000A500110	20.0	20	110	50	A	2
UFX7120020000A500150	20.0	20	150	50	A	2
UFX7120020000A600130	20.0	20	130	60	A	2
UFX7120020000A700130	20.0	20	130	70	A	2
UFX7120020000A800150	20.0	20	150	80	A	2
UFX7120020000A900150	20.0	20	150	90	A	2
UFX7120020000A900200	20.0	20	200	90	A	2
UFX7120020000A11X200	20.0	20	200	11	A	2

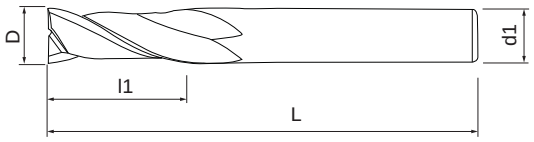
µm	D 0~-0.03	d1 h6		

UFX71 NEW

SQUARE TYPE WALCOWO-CZOŁOWE
2 Flute Long Length 2 ostrzowe długie

HSM Vmax	F	M	30°	A					max	min		AIR
									○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●	○					○						





D code Kod	D	d1	L	l1	Shank Uchwyt	Z
UFX7120020000A12X250	20.0	20	250	12	A	2
UFX7122020000A750150	22.0	20	150	75	A	2
UFX7122020000A11X200	22.0	20	200	11	A	2
UFX7125025000A700150	25.0	25	150	70	A	2
UFX7125025000A900150	25.0	25	150	90	A	2
UFX7125025000A11X200	25.0	25	200	11	A	2
UFX7125025000A12X250	25.0	25	250	12	A	2

µm				
	D 0~-0.03	d1 h6		

UFX71

Cutting Conditions Parametry skrawania



	Non-alloyed Steels Alloy Steels Cast Iron Stale niestopowe, żeliwo stopowe				Alloy Steels Heat Resistant Steels Stale stopowe, Stale żaroodporne		Hardened Steels Stale hartowane			
	~ 35 HRC				35 HRC ~ 45 HRC		45 HRC ~ 55 HRC			
D (mm)	ae	ap	RPM	mm/min	RPM	mm/min	ae	ap	RPM	mm/min
1.0	1	0,4	16000	70	12800	60	1	0,5	8000	30
1.0	1	0,4	16000	70	12800	60	1	0,5	8000	30
1.0	1	0,4	16000	70	12800	60	1	0,5	8000	30
1.0	1	0,4	14400	55	11520	50	1	0,5	7200	25
1.0	1	0,4	14400	55	11520	50	1	0,5	7200	25
1.0	1	0,4	14400	50	11520	45	1	0,5	7200	20
1.0	1	0,4	14400	50	11520	45	1	0,5	7200	20
1.0	1	0,4	12800	40	10240	35	1	0,5	6400	15
1.2	1,2	0,48	13500	75	10800	65	1,2	0,6	6750	30
1.2	1,2	0,48	13500	75	10800	65	1,2	0,6	6750	30
1.2	1,2	0,48	12150	60	9720	50	1,2	0,6	6080	25
1.2	1,2	0,48	12150	55	9720	45	1,2	0,6	6080	20
1.2	1,2	0,48	12150	55	9720	45	1,2	0,6	6080	20
1.5	1,5	0,6	11200	80	8960	70	1,5	0,75	5600	30
1.5	1,5	0,6	10080	70	8060	60	1,5	0,75	5040	30
1.5	1,5	0,6	10080	65	8060	55	1,5	0,75	5040	25
1.5	1,5	0,6	10080	60	8060	50	1,5	0,75	5040	25
1.5	1,5	0,6	10080	60	8060	50	1,5	0,75	5040	25
1.5	1,5	0,6	8960	45	7170	40	1,5	0,75	4480	20
2.0	2	0,8	9070	85	7260	70	2	1	4540	35
2.0	2	0,8	9070	85	7260	70	2	1	4540	35
2.0	2	0,8	8160	70	6530	60	2	1	4090	30
2.0	2	0,8	8160	70	6530	60	2	1	4090	30
2.0	2	0,8	8160	60	6530	50	2	1	4090	25
2.5	2,5	1	7700	95	6200	80	2,5	1,25	3850	40
2.5	2,5	1	7700	95	6200	80	2,5	1,25	3850	40
2.5	2,5	1	6930	75	5580	65	2,5	1,25	3470	30
2.5	2,5	1	6930	70	5580	55	2,5	1,25	3470	30
2.5	2,5	1	6160	55	4960	45	2,5	1,25	3080	20
3.0	3	1,2	6350	100	5150	85	3	1,5	3170	40
3.0	3	1,2	6350	100	5150	85	3	1,5	3170	40
3.0	3	1,2	6350	100	5150	85	3	1,5	3170	40
3.0	3	1,2	5720	90	4640	75	3	1,5	2850	40
3.0	3	1,2	5720	80	4640	70	3	1,5	2850	35
3.0	3	1,2	5720	70	4640	60	3	1,5	2850	30
3.0	3	1,2	5720	70	4640	60	3	1,5	2850	30
4.0	4	1,2	5150	120	4100	100	4	2	2580	50
4.0	4	1,2	5150	120	4100	100	4	2	2580	50
4.0	4	1,2	5150	120	4100	100	4	2	2580	50
4.0	4	1,2	4640	95	3690	85	4	2	2320	40
4.0	4	1,2	4640	95	3690	85	4	2	2320	40
5.0	5	1,5	4400	150	3480	125	5	2,5	2280	55
5.0	5	1,5	4400	150	3480	125	5	2,5	2280	55
5.0	5	1,5	3960	120	3130	100	5	2,5	2050	45
5.0	5	1,5	3960	120	3130	100	5	2,5	2050	45
5.0	5	1,5	3960	110	3130	90	5	2,5	2050	40
6.0	6	1,8	3800	180	3050	150	6	3	1970	70
6.0	6	1,8	3800	180	3050	150	6	3	1970	70
6.0	6	1,8	3800	180	3050	150	6	3	1970	70
6.0	6	1,8	3800	155	3050	130	6	3	1970	60
6.0	6	1,8	3420	140	2750	115	6	3	1770	55
6.0	6	1,8	3420	120	2750	100	6	3	1770	50

UFX71

Cutting Conditions Parametry skrawania



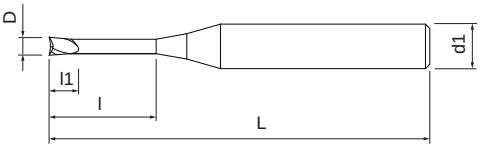
	Non-alloyed Steels Alloy Steels Cast Iron Stale niestopowe, żeliwo stopowe				Alloy Steels Heat Resistant Steels Stale stopowe, Stale żaroodporne		Hardened Steels Stale hartowane			
	~ 35 HRC				35 HRC ~ 45 HRC		45 HRC ~ 55 HRC			
D (mm)	ae	ap	RPM	mm/min	RPM	mm/min	ae	ap	RPM	mm/min
6.0	6	1,8	3420	120	2750	100	6	3	1770	50
8.0	8	2,4	2880	190	2280	150	8	4	1510	70
8.0	8	2,4	2880	190	2280	150	8	4	1510	70
8.0	8	2,4	2880	190	2280	150	8	4	1510	70
8.0	8	2,4	2880	160	2280	125	8	4	1510	60
8.0	8	2,4	2590	145	2050	115	8	4	1360	55
8.0	8	2,4	2590	130	2050	100	8	4	1360	50
10.0	10	3	2450	190	2000	150	10	5	1210	70
10.0	10	3	2450	190	2000	150	10	5	1210	70
10.0	10	3	2450	190	2000	150	10	5	1210	70
10.0	10	3	2450	160	2000	125	10	5	1210	60
10.0	10	3	2450	160	2000	125	10	5	1210	60
10.0	10	3	2210	145	1800	115	10	5	1090	55
10.0	10	3	2210	130	1800	100	10	5	1090	50
12.0	12	3,6	2000	150	1670	135	12	6	1010	55
12.0	12	3,6	2000	150	1670	135	12	6	1010	55
12.0	12	3,6	2000	130	1670	115	12	6	1010	45
12.0	12	3,6	2000	130	1670	115	12	6	1010	45
12.0	12	3,6	2000	130	1670	115	12	6	1010	45
12.0	12	3,6	2000	110	1670	100	12	6	1010	40
12.0	12	3,6	1800	100	1500	90	12	6	910	35
12.0	12	3,6	1800	100	1500	90	12	6	910	35
14.0	14	4,2	1850	125	1480	100	14	7	910	45
14.0	14	4,2	1850	125	1480	100	14	7	910	45
16.0	16	4,8	1700	140	1280	105	16	8	800	50
16.0	16	4,8	1700	140	1280	105	16	8	800	50
16.0	16	4,8	1700	120	1280	90	16	8	800	40
16.0	16	4,8	1700	120	1280	90	16	8	800	40
16.0	16	4,8	1700	105	1280	80	16	8	800	35
16.0	16	4,8	1530	95	1150	70	16	8	720	30
16.0	16	4,8	1530	95	1150	70	16	8	720	30
16.0	16	4,8	1530	95	1150	70	16	8	720	30
18.0	18	5,4	1450	120	1120	90	18	9	700	40
18.0	18	5,4	1450	100	1120	75	18	9	700	35
18.0	18	5,4	1310	80	1000	60	18	9	630	30
20.0	20	6	1220	100	950	75	20	10	600	35
20.0	20	6	1220	100	950	75	20	10	600	35
20.0	20	6	1220	85	950	65	20	10	600	30
20.0	20	6	1220	85	950	65	20	10	600	30
20.0	20	6	1220	75	950	55	20	10	600	25
20.0	20	6	1100	70	860	50	20	10	540	25
20.0	20	6	1100	70	860	50	20	10	540	25
22.0	22	6,6	1100	75	840	55	22	11	550	30
22.0	22	6,6	1100	70	840	50	22	11	550	25
25.0	25	7,5	980	80	750	60	25	12,5	480	30
25.0	25	7,5	980	70	750	50	25	12,5	480	25
25.0	25	7,5	980	70	750	50	25	12,5	480	25
25.0	25	7,5	980	60	750	45	25	12,5	480	25

UFX69 NEW

SQUARE TYPE WALCOWO-CZOŁOWE
2-Flute with extended neck 2-ostrzowe z szyjką

HSM Vmax	F	M	30°	A	max	min	AIR
					○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●	○					○	○	○				





D code Kod	D	d1	L	l1	Shank Uchwyt	Z
UFX6900104000A002003	0.1	4	40	0.15	A	2
UFX6900104000A002005	0.1	4	40	0.15	A	2
UFX6900104000A002010	0.1	4	40	0.15	A	2
UFX6900204000A003005	0.2	4	40	0.3	A	2
UFX6900204000A003010	0.2	4	40	0.3	A	2
UFX6900204000A003015	0.2	4	40	0.3	A	2
UFX6900204000A003020	0.2	4	40	0.3	A	2
UFX6900304000A005010	0.3	4	40	0.5	A	2
UFX6900304000A005015	0.3	4	40	0.5	A	2
UFX6900304000A005020	0.3	4	40	0.5	A	2
UFX6900304000A005025	0.3	4	40	0.5	A	2
UFX6900304000A005030	0.3	4	40	0.5	A	2
UFX6900304000A005040	0.3	4	40	0.5	A	2
UFX6900304000A005050	0.3	4	40	0.5	A	2
UFX6900404000A006010	0.4	4	40	0.6	A	2
UFX6900404000A006015	0.4	4	40	0.6	A	2
UFX6900404000A006020	0.4	4	40	0.6	A	2
UFX6900404000A006025	0.4	4	40	0.6	A	2
UFX6900404000A006030	0.4	4	40	0.6	A	2
UFX6900404000A006040	0.4	4	40	0.6	A	2
UFX6900404000A006050	0.4	4	40	0.6	A	2
UFX6900404000A006060	0.4	4	40	0.6	A	2
UFX6900404000A006080	0.4	4	40	0.6	A	2
UFX6900404000A006100	0.4	4	40	0.6	A	2
UFX6900504000A007010	0.5	4	45	0.7	A	2
UFX6900504000A007015	0.5	4	45	0.7	A	2
UFX6900504000A007020	0.5	4	45	0.7	A	2
UFX6900504000A007025	0.5	4	45	0.7	A	2
UFX6900504000A007030	0.5	4	45	0.7	A	2
UFX6900504000A007040	0.5	4	45	0.7	A	2
UFX6900504000A007050	0.5	4	45	0.7	A	2
UFX6900504000A007060	0.5	4	45	0.7	A	2
UFX6900504000A007080	0.5	4	45	0.7	A	2
UFX6900504000A007100	0.5	4	45	0.7	A	2
UFX6900504000A007120	0.5	4	45	0.7	A	2
UFX6900504000A007140	0.5	4	45	0.7	A	2
UFX6900504000A007160	0.5	4	45	0.7	A	2
UFX6900604000A009020	0.6	4	45	0.9	A	2
UFX6900604000A009030	0.6	4	45	0.9	A	2
UFX6900604000A009040	0.6	4	45	0.9	A	2
UFX6900604000A009050	0.6	4	45	0.9	A	2
UFX6900604000A009060	0.6	4	45	0.9	A	2

µm	D ≤ 3	0~-0.012	d1 h6	
	D > 3	0~-0.015		

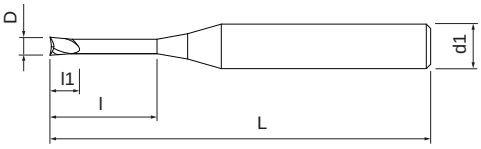
UFX69 NEW

SQUARE TYPE WALCOWO-CZOŁOWE

2-Flute with extended neck 2-ostrzowe z szyjką

HSM Vmax	F	M	30°	A					max	min		AIR
									○	●	●	●

P				H		M		K	N			S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●	○					○	○	○				





D code Kod	D	d1	L	l1	Shank Uchwyt	Z
UFX6900604000A009080	0.6	4	45	0.9	A	2
UFX6900604000A009100	0.6	4	45	0.9	A	2
UFX6900604000A009120	0.6	4	45	0.9	A	2
UFX6900604000A009140	0.6	4	45	0.9	A	2
UFX6900604000A009160	0.6	4	45	0.9	A	2
UFX6900704000A012020	0.7	4	45	1.2	A	2
UFX6900704000A012040	0.7	4	45	1.2	A	2
UFX6900704000A012060	0.7	4	45	1.2	A	2
UFX6900704000A012080	0.7	4	45	1.2	A	2
UFX6900704000A012100	0.7	4	45	1.2	A	2
UFX6900704000A012120	0.7	4	45	1.2	A	2
UFX6900804000A012020	0.8	4	45	1.2	A	2
UFX6900804000A012030	0.8	4	45	1.2	A	2
UFX6900804000A012040	0.8	4	45	1.2	A	2
UFX6900804000A012050	0.8	4	45	1.2	A	2
UFX6900804000A012060	0.8	4	45	1.2	A	2
UFX6900804000A012080	0.8	4	45	1.2	A	2
UFX6900804000A012100	0.8	4	45	1.2	A	2
UFX6900804000A012120	0.8	4	45	1.2	A	2
UFX6900804000A012140	0.8	4	45	1.2	A	2
UFX6900804000A012160	0.8	4	45	1.2	A	2
UFX6900804000A012200	0.8	4	45	1.2	A	2
UFX6900904000A013060	0.9	4	45	1.3	A	2
UFX6900904000A013080	0.9	4	45	1.3	A	2
UFX6900904000A013100	0.9	4	45	1.3	A	2
UFX6901004000A015020	1.0	4	50	1.5	A	2
UFX6901004000A015030	1.0	4	50	1.5	A	2
UFX6901004000A015040	1.0	4	50	1.5	A	2
UFX6901004000A015050	1.0	4	50	1.5	A	2
UFX6901004000A015060	1.0	4	50	1.5	A	2
UFX6901004000A015070	1.0	4	50	1.5	A	2
UFX6901004000A015080	1.0	4	50	1.5	A	2
UFX6901004000A015100	1.0	4	50	1.5	A	2
UFX6901004000A015120	1.0	4	50	1.5	A	2
UFX6901004000A015140	1.0	4	50	1.5	A	2
UFX6901004000A015160	1.0	4	50	1.5	A	2
UFX6901004000A015180	1.0	4	50	1.5	A	2
UFX6901004000A015200	1.0	4	50	1.5	A	2
UFX6901004000A015220	1.0	4	60	1.5	A	2
UFX6901004000A015260	1.0	4	60	1.5	A	2
UFX6901004000A015300	1.0	4	70	1.5	A	2
UFX6901004000A015400	1.0	4	80	1.5	A	2
UFX6901004000A015500	1.0	4	100	1.5	A	2

µm				
	D ≤ 3	0~-0.012	d1 h6	
	D > 3	0~-0.015		

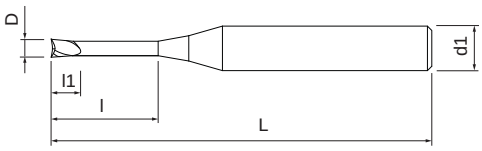
UFX69 NEW

SQUARE TYPE WALCOWO-CZOŁOWE

2-Flute with extended neck 2-ostrzowe z szyjką

HSM Vmax	F	M	30°	A	max	min	AIR
					○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●	○					○	○	○				





D code Kod	D	d1	L	l1	Shank Uchwyt	Z
UFX6901204000A018040	1.2	4	50	1.8	A	2
UFX6901204000A018060	1.2	4	50	1.8	A	2
UFX6901204000A018080	1.2	4	50	1.8	A	2
UFX6901204000A018100	1.2	4	50	1.8	A	2
UFX6901204000A018120	1.2	4	50	1.8	A	2
UFX6901204000A018140	1.2	4	50	1.8	A	2
UFX6901204000A018160	1.2	4	50	1.8	A	2
UFX6901204000A018200	1.2	4	50	1.8	A	2
UFX6901204000A018260	1.2	4	60	1.8	A	2
UFX6901204000A018300	1.2	4	70	1.8	A	2
UFX6901404000A021060	1.4	4	50	2.1	A	2
UFX6901404000A021080	1.4	4	50	2.1	A	2
UFX6901404000A021100	1.4	4	50	2.1	A	2
UFX6901404000A021140	1.4	4	50	2.1	A	2
UFX6901404000A021160	1.4	4	50	2.1	A	2
UFX6901404000A021200	1.4	4	50	2.1	A	2
UFX6901504000A023040	1.5	4	50	2.3	A	2
UFX6901504000A023050	1.5	4	50	2.3	A	2
UFX6901504000A023060	1.5	4	50	2.3	A	2
UFX6901504000A023070	1.5	4	50	2.3	A	2
UFX6901504000A023080	1.5	4	50	2.3	A	2
UFX6901504000A023100	1.5	4	50	2.3	A	2
UFX6901504000A023120	1.5	4	50	2.3	A	2
UFX6901504000A023140	1.5	4	50	2.3	A	2
UFX6901504000A023160	1.5	4	50	2.3	A	2
UFX6901504000A023180	1.5	4	50	2.3	A	2
UFX6901504000A023200	1.5	4	50	2.3	A	2
UFX6901504000A023220	1.5	4	60	2.3	A	2
UFX6901504000A023260	1.5	4	60	2.3	A	2
UFX6901504000A023300	1.5	4	70	2.3	A	2
UFX6901604000A023080	1.6	4	50	2.3	A	2
UFX6901604000A023100	1.6	4	50	2.3	A	2
UFX6901604000A023120	1.6	4	50	2.3	A	2
UFX6901604000A023160	1.6	4	50	2.3	A	2
UFX6901604000A023200	1.6	4	50	2.3	A	2
UFX6901804000A027080	1.8	4	50	2.7	A	2
UFX6901804000A027100	1.8	4	50	2.7	A	2
UFX6901804000A027120	1.8	4	50	2.7	A	2
UFX6901804000A027160	1.8	4	50	2.7	A	2
UFX6901804000A027200	1.8	4	50	2.7	A	2
UFX6902004000A030060	2.0	4	50	3	A	2
UFX6902004000A030080	2.0	4	50	3	A	2
UFX6902004000A030100	2.0	4	50	3	A	2

µm	D ≤ 3	0~-0.012	d1 h6	
	D > 3	0~-0.015		

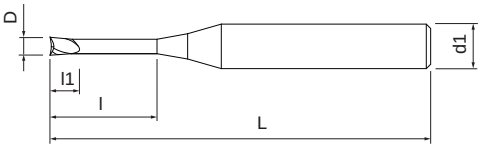
UFX69 NEW

SQUARE TYPE WALCOWO-CZOŁOWE

2-Flute with extended neck 2-ostrzowe z szyjką

HSM Vmax	F	M	30°	A				max	min		AIR
								○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●	○					○	○	○ ○				





D code Kod	D	d1	L	l1	Shank Uchwyt	Z
UFX6902004000A030120	2.0	4	50	3	A	2
UFX6902004000A030140	2.0	4	50	3	A	2
UFX6902004000A030160	2.0	4	50	3	A	2
UFX6902004000A030180	2.0	4	50	3	A	2
UFX6902004000A030200	2.0	4	50	3	A	2
UFX6902004000A030220	2.0	4	60	3	A	2
UFX6902004000A030260	2.0	4	60	3	A	2
UFX6902004000A030300	2.0	4	70	3	A	2
UFX6902004000A030350	2.0	4	70	3	A	2
UFX6902004000A030400	2.0	4	80	3	A	2
UFX6902004000A030450	2.0	4	90	3	A	2
UFX6902004000A030500	2.0	4	100	3	A	2
UFX6902004000A030600	2.0	4	110	3	A	2
UFX6902504000A040080	2.5	4	50	4	A	2
UFX6902504000A040100	2.5	4	50	4	A	2
UFX6902504000A040120	2.5	4	50	4	A	2
UFX6902504000A040140	2.5	4	50	4	A	2
UFX6902504000A040160	2.5	4	50	4	A	2
UFX6902504000A040180	2.5	4	50	4	A	2
UFX6902504000A040200	2.5	4	50	4	A	2
UFX6902504000A040220	2.5	4	60	4	A	2
UFX6902504000A040260	2.5	4	60	4	A	2
UFX6902504000A040300	2.5	4	70	4	A	2
UFX6902504000A040350	2.5	4	70	4	A	2
UFX6902504000A040400	2.5	4	80	4	A	2
UFX6902504000A040450	2.5	4	90	4	A	2
UFX6902504000A040500	2.5	4	100	4	A	2
UFX6903006000A045060	3.0	6	50	4.5	A	2
UFX6903006000A045080	3.0	6	50	4.5	A	2
UFX6903006000A045100	3.0	6	50	4.5	A	2
UFX6903006000A045120	3.0	6	50	4.5	A	2
UFX6903006000A045140	3.0	6	60	4.5	A	2
UFX6903006000A045160	3.0	6	60	4.5	A	2
UFX6903006000A045180	3.0	6	60	4.5	A	2
UFX6903006000A045200	3.0	6	60	4.5	A	2
UFX6903006000A045220	3.0	6	65	4.5	A	2
UFX6903006000A045260	3.0	6	65	4.5	A	2
UFX6903006000A045300	3.0	6	70	4.5	A	2
UFX6903006000A045350	3.0	6	70	4.5	A	2
UFX6903006000A045400	3.0	6	80	4.5	A	2
UFX6903006000A045450	3.0	6	90	4.5	A	2
UFX6903006000A045500	3.0	6	100	4.5	A	2
UFX6903006000A045600	3.0	6	100	4.5	A	2
UFX6904006000A060080	4.0	6	50	6	A	2
UFX6904006000A060100	4.0	6	50	6	A	2

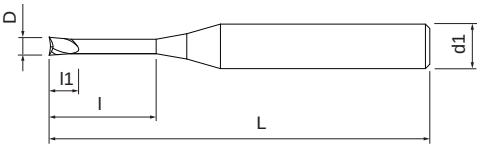
µm				
	D ≤ 3	0~-0.012	d1 h6	
	D > 3	0~-0.015		

UFX69 NEW

SQUARE TYPE WALCOWO-CZOŁOWE
2-Flute with extended neck 2-ostrzowe z szyjką

HSM Vmax	F	M	30°	A	max	min	AIR
					○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●	○					○	○	○				





D code Kod	D	d1	L	l1	Shank Uchwyt	Z
UFX6904006000A060120	4.0	6	50	6	A	2
UFX6904006000A060140	4.0	6	60	6	A	2
UFX6904006000A060160	4.0	6	60	6	A	2
UFX6904006000A060180	4.0	6	60	6	A	2
UFX6904006000A060200	4.0	6	60	6	A	2
UFX6904006000A060220	4.0	6	65	6	A	2
UFX6904006000A060260	4.0	6	65	6	A	2
UFX6904006000A060300	4.0	6	70	6	A	2
UFX6904006000A060350	4.0	6	70	6	A	2
UFX6904006000A060400	4.0	6	80	6	A	2
UFX6904006000A060450	4.0	6	90	6	A	2
UFX6904006000A060500	4.0	6	100	6	A	2
UFX6904006000A060600	4.0	6	100	6	A	2
UFX6905006000A080160	5.0	6	60	8	A	2
UFX6905006000A080200	5.0	6	60	8	A	2
UFX6905006000A080260	5.0	6	65	8	A	2
UFX6905006000A080300	5.0	6	70	8	A	2
UFX6905006000A080350	5.0	6	75	8	A	2
UFX6905006000A080400	5.0	6	80	8	A	2
UFX6905006000A080500	5.0	6	90	8	A	2
UFX6905006000A080600	5.0	6	100	8	A	2
UFX6906006000A090150	6.0	6	60	9	A	2
UFX6906006000A090200	6.0	6	60	9	A	2
UFX6906006000A090300	6.0	6	70	9	A	2
UFX6906006000A090320	6.0	6	90	9	A	2
UFX6908008000A120250	8.0	8	70	12	A	2
UFX6908008000A120300	8.0	8	80	12	A	2
UFX6908008000A120420	8.0	8	100	12	A	2
UFX6910010000A150300	10.0	10	75	15	A	2
UFX6910010000A150350	10.0	10	80	15	A	2
UFX6910010000A150450	10.0	10	100	15	A	2
UFX6912012000A200350	12.0	12	80	20	A	2
UFX6912012000A200400	12.0	12	90	20	A	2
UFX6912012000A200500	12.0	12	110	20	A	2

µm				
	D ≤ 3	0~-0.012	d1 h6	
	D > 3	0~-0.015		

UFX69

Cutting Conditions Parametry skrawania



	Non-alloyed Steels Alloy Steels Cast Iron Stale niestopowe, żeliwo stopowe			Alloy Steels Heat Resistant Steels Stale stopowe, Stale żaroodporne			Hardened Steels Stale hartowane		
	~ 35 HRC			35 HRC ~ 45 HRC			45 HRC ~ 55 HRC		
D (mm)	ap	RPM	mm/min	ap	RPM	mm/min	ap	RPM	mm/min
0.1	0.009	50000	315	0.007	46200	230	0.005	40600	170
0.1	0.006	50000	315	0.005	46200	230	0.004	40600	170
0.1	0.002	45000	255	0.002	41580	185	0.001	36540	140
0.2	0.018	38500	380	0.014	36300	270	0.010	32100	200
0.2	0.013	38500	380	0.010	36300	270	0.007	32100	200
0.2	0.007	34650	310	0.006	32670	220	0.004	28890	160
0.2	0.005	34650	310	0.004	32670	220	0.003	28890	160
0.3	0.019	34200	390	0.015	32300	270	0.011	28500	230
0.3	0.019	34200	390	0.015	32300	270	0.011	28500	230
0.3	0.011	30780	315	0.008	29070	220	0.006	25650	185
0.3	0.007	30780	315	0.005	29070	220	0.004	25650	185
0.3	0.007	30780	315	0.005	29070	220	0.004	25650	185
0.3	0.004	27360	250	0.003	25840	175	0.002	22800	145
0.3	0.003	20520	165	0.002	19380	115	0.002	17100	95
0.4	0.036	27400	540	0.028	25800	380	0.02	22800	280
0.4	0.025	27400	540	0.020	25800	380	0.014	22800	280
0.4	0.025	27400	540	0.020	25800	380	0.014	22800	280
0.4	0.014	24660	435	0.011	23220	310	0.008	20520	225
0.4	0.014	24660	435	0.011	23220	310	0.008	20520	225
0.4	0.009	24660	435	0.007	23220	310	0.005	20520	225
0.4	0.009	21920	345	0.007	20640	245	0.005	18240	180
0.4	0.005	21920	345	0.004	20640	245	0.003	18240	180
0.4	0.004	16440	225	0.003	15480	160	0.002	13680	120
0.4	0.004	8220	95	0.003	7740	70	0.002	6840	50
0.5	0.045	27400	540	0.035	25800	425	0.025	22800	285
0.5	0.045	27400	540	0.035	25800	425	0.025	22800	285
0.5	0.032	27400	540	0.025	25800	425	0.018	22800	285
0.5	0.032	27400	540	0.025	25800	425	0.018	22800	285
0.5	0.018	24660	435	0.014	23220	345	0.010	20520	230
0.5	0.018	24660	435	0.014	23220	345	0.010	20520	230
0.5	0.011	24660	435	0.009	23220	345	0.006	20520	230
0.5	0.011	21920	345	0.009	20640	270	0.006	18240	180
0.5	0.007	16440	225	0.005	15480	180	0.004	13680	120
0.5	0.005	16440	225	0.004	15480	180	0.003	13680	120
0.5	0.005	8220	95	0.004	7740	75	0.003	6840	50
0.5	0.005	8220	95	0.004	7740	75	0.003	6840	50
0.5	0.005	2740	25	0.004	2580	20	0.003	2280	15
0.6	0.038	27400	775	0.029	25800	545	0.021	22800	405
0.6	0.038	27400	775	0.029	25800	545	0.021	22800	405
0.6	0.022	24660	630	0.017	23220	440	0.012	20520	330
0.6	0.014	24660	630	0.011	23220	440	0.008	20520	330
0.6	0.014	24660	630	0.011	23220	440	0.008	20520	330
0.6	0.008	21920	495	0.006	20640	350	0.005	18240	260
0.6	0.005	16440	325	0.004	15480	230	0.003	13680	170
0.6	0.005	16440	325	0.004	15480	230	0.003	13680	170
0.6	0.005	8220	140	0.004	7740	100	0.003	6840	75
0.6	0.005	8220	140	0.004	7740	100	0.003	6840	75
0.7	0.063	27400	775	0.049	25800	545	0.035	22800	405
0.7	0.025	24660	630	0.020	23220	440	0.014	20520	330
0.7	0.016	24660	630	0.012	23220	440	0.009	20520	330
0.7	0.016	21920	495	0.012	20640	350	0.009	18240	260
0.7	0.009	21920	495	0.007	20640	350	0.005	18240	260
0.7	0.006	16440	325	0.005	15480	230	0.004	13680	170

UFX69

Cutting Conditions Parametry skrawania



	Non-alloyed Steels Alloy Steels Cast Iron Stale niestopowe, żeliwo stopowe			Alloy Steels Heat Resistant Steels Stale stopowe, Stale żaroodporne			Hardened Steels Stale hartowane		
	~ 35 HRC			35 HRC ~ 45 HRC			45 HRC ~ 55 HRC		
D (mm)	ap	RPM	mm/min	ap	RPM	mm/min	ap	RPM	mm/min
0.8	0.072	27400	775	0.056	25800	605	0.040	22800	450
0.8	0.050	27400	775	0.039	25800	605	0.028	22800	450
0.8	0.050	27400	775	0.039	25800	605	0.028	22800	450
0.8	0.029	24660	630	0.022	23220	490	0.016	20520	365
0.8	0.029	24660	630	0.022	23220	490	0.016	20520	365
0.8	0.018	24660	630	0.014	23220	490	0.010	20520	365
0.8	0.018	21920	495	0.014	20640	385	0.010	18240	290
0.8	0.011	21920	495	0.008	20640	385	0.006	18240	290
0.8	0.007	16440	325	0.006	15480	255	0.004	13680	190
0.8	0.007	16440	325	0.006	15480	255	0.004	13680	190
0.8	0.007	8220	140	0.006	7740	110	0.004	6840	80
0.9	0.032	22140	575	0.025	20970	440	0.018	18450	330
0.9	0.020	22140	575	0.016	20970	440	0.011	18450	330
0.9	0.020	19680	455	0.016	18640	350	0.011	16400	260
1.0	0.090	24600	1045	0.070	23300	890	0.050	20500	665
1.0	0.090	24600	1045	0.070	23300	890	0.050	20500	665
1.0	0.063	24600	1045	0.049	23300	890	0.035	20500	665
1.0	0.063	24600	1045	0.049	23300	890	0.035	20500	665
1.0	0.036	22140	845	0.028	20970	720	0.020	18450	540
1.0	0.036	22140	845	0.028	20970	720	0.020	18450	540
1.0	0.036	22140	845	0.028	20970	720	0.020	18450	540
1.0	0.023	22140	845	0.018	20970	720	0.013	18450	540
1.0	0.023	19680	670	0.018	18640	570	0.013	16400	425
1.0	0.014	19680	670	0.011	18640	570	0.008	16400	425
1.0	0.014	14760	440	0.011	13980	375	0.008	12300	280
1.0	0.009	14760	440	0.007	13980	375	0.005	12300	280
1.0	0.009	14760	440	0.007	13980	375	0.005	12300	280
1.0	0.009	7380	190	0.007	6990	160	0.005	6150	120
1.0	0.009	7380	190	0.007	6990	160	0.005	6150	120
1.0	0.009	7380	190	0.007	6990	160	0.005	6150	120
1.0	0.009	2460	50	0.007	2330	45	0.005	2050	35
1.0	0.006	2460	50	0.005	2330	45	0.003	2050	35
1.2	0.076	21900	930	0.059	20700	720	0.042	18200	485
1.2	0.076	21900	930	0.059	20700	720	0.042	18200	485
1.2	0.043	19710	755	0.034	18630	585	0.024	16380	395
1.2	0.027	19710	755	0.021	18630	585	0.015	16380	395
1.2	0.027	19710	755	0.021	18630	585	0.015	16380	395
1.2	0.027	17520	595	0.021	16560	460	0.015	14560	310
1.2	0.016	17520	595	0.013	16560	460	0.009	14560	310
1.2	0.011	13140	390	0.008	12420	300	0.006	10920	205
1.2	0.011	6570	165	0.008	6210	130	0.006	5460	85
1.2	0.011	6570	165	0.008	6210	130	0.006	5460	85
1.4	0.088	19200	815	0.069	18100	570	0.049	16000	425
1.4	0.050	17280	660	0.039	16290	460	0.028	14400	345
1.4	0.050	17280	660	0.039	16290	460	0.028	14400	345
1.4	0.032	17280	660	0.025	16290	460	0.018	14400	345
1.4	0.032	15360	520	0.025	14480	365	0.018	12800	270
1.4	0.019	15360	520	0.015	14480	365	0.011	12800	270
1.5	0.135	19200	905	0.105	18100	635	0.075	16000	475
1.5	0.095	19200	905	0.074	18100	635	0.053	16000	475
1.5	0.095	19200	905	0.074	18100	635	0.053	16000	475
1.5	0.095	19200	905	0.074	18100	635	0.053	16000	475
1.5	0.054	17280	735	0.042	16290	515	0.030	14400	385

UFX69

Cutting Conditions Parametry skrawania



	Non-alloyed Steels Alloy Steels Cast Iron Stale niestopowe, żeliwo stopowe			Alloy Steels Heat Resistant Steels Stale stopowe, Stale żaroodporne			Hardened Steels Stale hartowane		
	~ 35 HRC			35 HRC ~ 45 HRC			45 HRC ~ 55 HRC		
D (mm)	ap	RPM	mm/min	ap	RPM	mm/min	ap	RPM	mm/min
1.5	0.054	17280	735	0.042	16290	515	0.030	14400	385
1.5	0.054	17280	735	0.042	16290	515	0.030	14400	385
1.5	0.034	17280	735	0.026	16290	515	0.019	14400	385
1.5	0.034	15360	580	0.026	14480	405	0.019	12800	305
1.5	0.034	15360	580	0.026	14480	405	0.019	12800	305
1.5	0.020	15360	580	0.016	14480	405	0.011	12800	305
1.5	0.020	15360	580	0.016	14480	405	0.011	12800	305
1.5	0.014	11520	380	0.011	10860	265	0.008	9600	200
1.5	0.014	11520	380	0.011	10860	265	0.008	9600	200
1.6	0.101	17800	840	0.078	16800	655	0.056	14800	490
1.6	0.058	16020	680	0.045	15120	530	0.032	13320	395
1.6	0.058	16020	680	0.045	15120	530	0.032	13320	395
1.6	0.036	16020	680	0.028	15120	530	0.020	13320	395
1.6	0.036	14240	540	0.028	13440	420	0.020	11840	315
1.8	0.113	17800	840	0.088	16800	655	0.063	14800	490
1.8	0.065	16020	680	0.050	15120	530	0.036	13320	395
1.8	0.065	16020	680	0.050	15120	530	0.036	13320	395
1.8	0.041	16020	680	0.032	15120	530	0.023	13320	395
1.8	0.041	14240	540	0.032	13440	420	0.023	11840	315
2.0	0.180	14400	820	0.140	13600	620	0.100	12000	475
2.0	0.126	14400	820	0.098	13600	620	0.070	12000	475
2.0	0.126	14400	820	0.098	13600	620	0.070	12000	475
2.0	0.072	12960	665	0.056	12240	500	0.040	10800	385
2.0	0.072	12960	665	0.056	12240	500	0.040	10800	385
2.0	0.072	12960	665	0.056	12240	500	0.040	10800	385
2.0	0.045	12960	665	0.035	12240	500	0.025	10800	385
2.0	0.045	12960	665	0.035	12240	500	0.025	10800	385
2.0	0.045	11520	525	0.035	10880	395	0.025	9600	305
2.0	0.045	11520	525	0.035	10880	395	0.025	9600	305
2.0	0.027	11520	525	0.021	10880	395	0.015	9600	305
2.0	0.018	8640	345	0.014	8160	260	0.010	7200	200
2.0	0.018	8640	345	0.014	8160	260	0.010	7200	200
2.0	0.018	4320	150	0.014	4080	110	0.010	3600	85
2.0	0.018	4320	150	0.014	4080	110	0.010	3600	85
2.0	0.018	4320	150	0.014	4080	110	0.010	3600	85
2.5	0.158	12300	970	0.123	11600	680	0.088	10300	510
2.5	0.158	12300	970	0.123	11600	680	0.088	10300	510
2.5	0.158	12300	970	0.123	11600	680	0.088	10300	510
2.5	0.090	11070	785	0.070	10440	550	0.050	9270	415
2.5	0.090	11070	785	0.070	10440	550	0.050	9270	415
2.5	0.090	11070	785	0.070	10440	550	0.050	9270	415
2.5	0.090	11070	785	0.070	10440	550	0.050	9270	415
2.5	0.056	11070	785	0.044	10440	550	0.031	9270	415
2.5	0.056	9840	620	0.044	9280	435	0.031	8240	325
2.5	0.056	9840	620	0.044	9280	435	0.031	8240	325
2.5	0.034	9840	620	0.026	9280	435	0.019	8240	325
2.5	0.034	7380	405	0.026	6960	285	0.019	6180	215
2.5	0.023	7380	405	0.018	6960	285	0.013	6180	215
2.5	0.023	7380	405	0.018	6960	285	0.013	6180	215
3.0	0.270	10900	860	0.210	10300	605	0.150	6600	450
3.0	0.270	10900	860	0.210	10300	605	0.150	6600	450
3.0	0.189	10900	860	0.147	10300	605	0.105	6600	450
3.0	0.189	10900	860	0.147	10300	605	0.105	6600	450

UFX69

Cutting Conditions Parametry skrawania

	Non-alloyed Steels Alloy Steels Cast Iron Stale niestopowe, żeliwo stopowe			Alloy Steels Heat Resistant Steels Stale stopowe, Stale żaroodporne			Hardened Steels Stale hartowane		
	~ 35 HRC			35 HRC ~ 45 HRC			45 HRC ~ 55 HRC		
D (mm)	ap	RPM	mm/min	ap	RPM	mm/min	ap	RPM	mm/min
3.0	0.189	10900	860	0.147	10300	605	0.105	6600	450
3.0	0.108	9810	695	0.084	9270	490	0.060	5940	365
3.0	0.108	9810	695	0.084	9270	490	0.060	5940	365
3.0	0.108	9810	695	0.084	9270	490	0.060	5940	365
3.0	0.108	9810	695	0.084	9270	490	0.060	5940	365
3.0	0.068	9810	695	0.053	9270	490	0.038	5940	365
3.0	0.068	9810	695	0.053	9270	490	0.038	5940	365
3.0	0.068	8720	550	0.053	8240	385	0.038	5280	290
3.0	0.041	8720	550	0.032	8240	385	0.023	5280	290
3.0	0.041	8720	550	0.032	8240	385	0.023	5280	290
3.0	0.027"	6540	360	0.021	6180	255	0.015	3960	190
3.0	0.027	6540	360	0.021	6180	255	0.015	3960	190
4.0	0.360	8000	1300	0.280	7600	1160	0.200	6700	770
4.0	0.360	8000	1300	0.280	7600	1160	0.200	6700	770
4.0	0.360	8000	1300	0.280	7600	1160	0.200	6700	770
4.0	0.252	8000	1300	0.196	7600	1160	0.140	6700	770
4.0	0.252	8000	1300	0.196	7600	1160	0.140	6700	770
4.0	0.252	8000	1300	0.196	7600	1160	0.140	6700	770
4.0	0.252	8000	1300	0.196	7600	1160	0.140	6700	770
4.0	0.144	7200	1055	0.112	6840	940	0.080	6030	625
4.0	0.144	7200	1055	0.112	6840	940	0.080	6030	625
4.0	0.144	7200	1055	0.112	6840	940	0.080	6030	625
4.0	0.090	7200	1055	0.070	6840	940	0.050	6030	625
4.0	0.090	7200	1055	0.070	6840	940	0.050	6030	625
4.0	0.090	6400	830	0.070	6080	740	0.050	5360	495
4.0	0.090	6400	830	0.070	6080	740	0.050	5360	495
4.0	0.054	6400	830	0.042	6080	740	0.030	5360	495
5.0	0.315	6400	1155	0.245	6100	900	0.175	5400	605
5.0	0.315	6400	1155	0.245	6100	900	0.175	5400	605
5.0	0.180	5760	935	0.140	5490	730	0.100	4860	490
5.0	0.180	5760	935	0.140	5490	730	0.100	4860	490
5.0	0.180	5760	935	0.140	5490	730	0.100	4860	490
5.0	0.180	5760	935	0.140	5490	730	0.100	4860	490
5.0	0.113	5760	935	0.088	5490	730	0.063	4860	490
5.0	0.113	5120	740	0.088	4880	575	0.063	4320	385
6.0	0.540	5300	1055	0.420	5000	820	0.300	4400	550
6.0	0.378	5300	1055	0.294	5000	820	0.210	4400	550
6.0	0.378	5300	1055	0.294	5000	820	0.210	4400	550
6.0	0.216	4770	855	0.168	4500	665	0.120	3960	445
8.0	0.504	4000	950	0.392	3800	750	0.280	3300	500
8.0	0.504	4000	950	0.392	3800	750	0.280	3300	500
8.0	0.288	3600	770	0.224	3400	605	0.160	2950	405
10.0	0.900	3200	900	0.700	3050	680	0.500	2630	400
10.0	0.630	3200	900	0.490	3050	680	0.350	2630	400
10.0	0.630	3200	900	0.490	3050	680	0.350	2630	400
12.0	1.080	2650	800	0.840	2520	600	0.600	2180	350
12.0	0.756	2650	800	0.588	2520	600	0.420	2180	350
12.0	0.756	2650	800	0.588	2520	600	0.420	2180	350

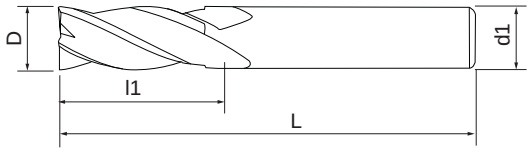
UFX70 NEW

SQUARE TYPE WALCOWO-CZOŁOWE

4 Flute Multiple Helix 4 ostrzowe wielokątowe

			HSM Vmax	F	M		A					max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, SI <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●	○					○	○	○				





D code Kod	D	d1	L	l1	Shank Uchwyt	Z
UFX7000804000A016040	0.8	4	40	1.6	A	4
UFX7000904000A018040	0.9	4	40	1.8	A	4
UFX7001006000A025050	1.0	6	50	2.5	A	4
UFX7001206000A030050	1.2	6	50	3	A	4
UFX7001506000A040050	1.5	6	50	4	A	4
UFX7002006000A060050	2.0	6	50	6	A	4
UFX7002506000A070050	2.5	6	50	7	A	4
UFX7003006000A080050	3.0	6	50	8	A	4
UFX7003506000A100050	3.5	6	50	10	A	4
UFX7004006000A100050	4.0	6	50	10	A	4
UFX7004506000A140050	4.5	6	50	14	A	4
UFX7005006000A150060	5.0	6	60	15	A	4
UFX7005506000A150060	5.5	6	60	15	A	4
UFX7006006000A150060	6.0	6	60	15	A	4
UFX7006508000A180060	6.5	8	60	18	A	4
UFX7007008000A200060	7.0	8	60	20	A	4
UFX7007508000A200060	7.5	8	60	20	A	4
UFX7008008000A200070	8.0	8	70	20	A	4
UFX7008510000A220070	8.5	10	70	22	A	4
UFX7009010000A220070	9.0	10	70	22	A	4
UFX7009510000A240070	9.5	10	70	24	A	4
UFX7010010000A250075	10.0	10	75	25	A	4
UFX7010512000A260075	10.5	12	75	26	A	4
UFX7011012000A300075	11.0	12	75	30	A	4
UFX7011512000A300080	11.5	12	80	30	A	4
UFX7012012000A300080	12.0	12	80	30	A	4
UFX7013012000A350100	13.0	12	100	35	A	4
UFX7014012000A350100	14.0	12	100	35	A	4
UFX7014014000A350100	14.0	14	100	35	A	4
UFX7014016000A350100	14.0	16	100	35	A	4
UFX7015016000A380100	15.0	16	100	38	A	4
UFX7016016000A400100	16.0	16	100	40	A	4
UFX7017016000A420100	17.0	16	100	42	A	4
UFX7018016000A450100	18.0	16	100	45	A	4
UFX7018018000A450100	18.0	18	100	45	A	4
UFX7019020000A450100	19.0	20	100	45	A	4
UFX7020020000A450100	20.0	20	100	45	A	4
UFX7021020000A450100	21.0	20	100	45	A	4
UFX7022020000A450100	22.0	20	100	45	A	4
UFX7023025000A500120	23.0	25	120	50	A	4
UFX7024025000A500120	24.0	25	120	50	A	4
UFX7025025000A500120	25.0	25	120	50	A	4

µm	D 0~-0.03	d1 h6		

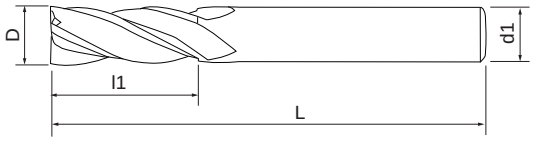
UFX75 NEW

SQUARE TYPE WALCOWO-CZOŁOWE

4 Flute Multiple Helix 4 ostrzowe wielokątowe

HSM Vmax	F	M	A	max	min	AIR
				○	●	●

P				H		M		K	N			S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, SI <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●	○					○						





D code Kod	D	d1	L	l1	Shank Uchwyt	Z
UFX7501006000A010040	1.0	6	40	1	A	4
UFX7501006000A020040	1.0	6	40	2	A	4
UFX7501006000A025050	1.0	6	50	2.5	A	4
UFX7501006000A030050	1.0	6	50	3	A	4
UFX7501006000A040050	1.0	6	50	4	A	4
UFX7501006000A060050	1.0	6	50	6	A	4
UFX7501206000A020040	1.2	6	40	2	A	4
UFX7501206000A030050	1.2	6	50	3	A	4
UFX7501206000A040050	1.2	6	50	4	A	4
UFX7501206000A060050	1.2	6	50	6	A	4
UFX7501506000A015040	1.5	6	40	1.5	A	4
UFX7501506000A030040	1.5	6	40	3	A	4
UFX7501506000A040050	1.5	6	50	4	A	4
UFX7501506000A060050	1.5	6	50	6	A	4
UFX7501506000A080050	1.5	6	50	8	A	4
UFX7501506000A100050	1.5	6	50	10	A	4
UFX7502006000A020040	2.0	6	40	2	A	4
UFX7502006000A040040	2.0	6	40	4	A	4
UFX7502006000A060050	2.0	6	50	6	A	4
UFX7502006000A080050	2.0	6	50	8	A	4
UFX7502006000A100050	2.0	6	50	10	A	4
UFX7502006000A120050	2.0	6	50	12	A	4
UFX7502506000A025040	2.5	6	40	2.5	A	4
UFX7502506000A050040	2.5	6	40	5	A	4
UFX7502506000A070050	2.5	6	50	7	A	4
UFX7502506000A100050	2.5	6	50	10	A	4
UFX7502506000A120050	2.5	6	50	12	A	4
UFX7503006000A030040	3.0	6	40	3	A	4
UFX7503006000A060040	3.0	6	40	6	A	4
UFX7503006000A080050	3.0	6	50	8	A	4
UFX7503006000A100050	3.0	6	50	10	A	4
UFX7503006000A120050	3.0	6	50	12	A	4
UFX7503006000A140050	3.0	6	50	14	A	4
UFX7504006000A040040	4.0	6	40	4	A	4
UFX7504006000A080040	4.0	6	40	8	A	4
UFX7504006000A100050	4.0	6	50	10	A	4
UFX7504006000A120050	4.0	6	50	12	A	4
UFX7504006000A140050	4.0	6	50	14	A	4
UFX7504006000A160050	4.0	6	50	16	A	4
UFX7505006000A050050	5.0	6	50	5	A	4
UFX7505006000A100050	5.0	6	50	10	A	4
UFX7505006000A150060	5.0	6	60	15	A	4

µm	D 0~-0.03	d1 h6		

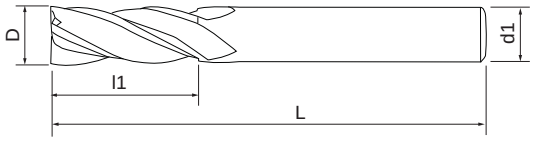
UFX75 NEW

SQUARE TYPE WALCOWO-CZOŁOWE

4 Flute Multiple Helix 4 ostrzowe wielokątowe

HSM Vmax	F	M		A					max	min		AIR
									○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●	○					○						





D code Kod	D	d1	L	l1	Shank Uchwyt	Z
UFX7505006000A200060	5.0	6	60	20	A	4
UFX7505006000A250060	5.0	6	60	25	A	4
UFX7506006000A060050	6.0	6	50	6	A	4
UFX7506006000A120050	6.0	6	50	12	A	4
UFX7506006000A150060	6.0	6	60	15	A	4
UFX7506006000A200060	6.0	6	60	20	A	4
UFX7506006000A250060	6.0	6	60	25	A	4
UFX7508008000A160060	8.0	8	60	16	A	4
UFX7508008000A200070	8.0	8	70	20	A	4
UFX7508008000A250070	8.0	8	70	25	A	4
UFX7508008000A300070	8.0	8	70	30	A	4
UFX7510010000A220065	10.0	10	65	22	A	4
UFX7510010000A250075	10.0	10	75	25	A	4
UFX7510010000A300075	10.0	10	75	30	A	4
UFX7510010000A350075	10.0	10	75	35	A	4
UFX7512012000A260070	12.0	12	70	26	A	4
UFX7512012000A300080	12.0	12	80	30	A	4
UFX7512012000A350080	12.0	12	80	35	A	4
UFX7512012000A400080	12.0	12	80	40	A	4
UFX7514016000A350100	14.0	16	100	35	A	4
UFX7516016000A320100	16.0	16	100	32	A	4
UFX7516016000A400100	16.0	16	100	40	A	4
UFX7518020000A450100	18.0	20	100	45	A	4
UFX7520020000A450100	20.0	20	100	45	A	4

µm				
	D 0~-0.03	d1 h6		

UFX70 / UFX75

Cutting Conditions Parametry skrawania



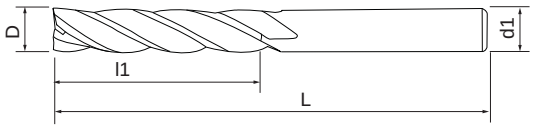
			Non-alloyed Steels Alloy Steels Cast Iron Stale niestopowe, żeliwo stopowe		**Alloy Steels Heat Resistant Steels** Stale stopowe, Stale żaroodporne		**Stainless Steels** Stale nierdzewne		**Hardened Steels** Stale hartowane	
			~ 35 HRC		**35 HRC ~ 45 HRC**				**45 HRC ~ 55 HRC**	
D (mm)	**ae**	**ap**	**RPM**	**mm/min**	**RPM**	**mm/min**	**RPM**	**mm/min**	**RPM**	**mm/min**
0.8	0,4	0,8	31250	235	18750	140	15630	120	12500	42
0.9	0,45	0,9	29300	245	17580	145	14650	120	11720	42
1.0	0,5	1	26800	250	16080	150	13400	125	10720	47
1.2	0,6	1,2	22500	265	13500	160	11250	130	9000	47
1.5	0,75	1,5	18750	270	11250	165	9380	135	7500	47
2.0	1	2	14450	295	9450	180	7880	145	6300	53
2.5	1,25	2,5	12800	315	8200	195	6830	165	5250	58
3.0	1,5	3	11150	335	6950	210	5780	180	4200	63
3.5	1,75	3,5	10300	465	6360	290	5310	235	3940	63
4.0	2	4	9450	600	5780	370	4850	295	3680	63
4.5	2,25	4,5	8660	615	5250	375	4400	305	3290	70
5.0	2,5	5	7880	630	4730	380	3950	315	2900	75
5.5	2,75	5,5	7410	660	4460	405	3750	330	2700	80
6.0	3	6	6950	695	4200	430	3550	345	2500	85
6.5	3,25	6,5	6530	710	3940	425	3320	350	2400	95
7.0	3,5	7	6100	720	3680	415	3090	355	2300	100
7.5	3,75	7,5	5680	735	3410	410	2860	360	2200	110
8.0	4	8	5250	745	3150	400	2630	370	2100	115
8.5	4,25	8,5	4960	720	2990	380	2490	355	2000	110
9.0	4,5	9	4660	695	2830	355	2360	340	1900	105
9.5	4,75	9,5	4370	665	2660	335	2230	330	1800	100
10.0	5	10	4080	640	2500	315	2100	315	1700	95
10.5	5,25	10,5	3910	620	2400	305	2000	300	1640	95
11.0	5,5	11	3750	595	2300	290	1900	285	1580	90
11.5	5,75	11,5	3590	570	2200	280	1800	270	1510	90
12.0	6	12	3430	545	2100	265	1700	250	1450	85
13.0	6,5	13	3260	520	2000	250	1620	240	1370	80
14.0	7	14	3090	490	1900	235	1540	230	1290	75
15.0	7,5	15	2920	460	1800	225	1460	220	1210	70
16.0	8	16	2750	440	1700	215	1380	210	1130	65
17.0	8,5	17	2590	410	1610	200	1290	200	1060	60
18.0	9	18	2430	385	1510	190	1210	185	990	55
19.0	9,5	19	2260	360	1420	180	1130	175	920	47
20.0	10	20	2100	335	1330	170	1050	160	850	42
21.0	10,5	21	2020	320	1270	165	1010	150	820	42
22.0	11	22	1940	310	1220	160	970	145	780	39
23.0	11,5	23	1860	295	1160	145	930	140	750	37
24.0	12	24	1780	280	1110	140	890	130	710	32
25.0	12,5	25	1700	265	1050	135	850	125	680	32

UFX73 NEW

SQUARE TYPE WALCOWO-CZOŁOWE
4 Flute Multiple Helix 4 ostrzowe wielokątowe

HSM Vmax	F	M	30°	A	max	min	AIR
					○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, SI <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●	○					○						





D code Kod	D	d1	L	l1	Shank Uchwyt	Z
UFX7301006000A030060	1.0	6	60	3	A	4
UFX7301006000A040060	1.0	6	60	4	A	4
UFX7301006000A050060	1.0	6	60	5	A	4
UFX7301006000A060060	1.0	6	60	6	A	4
UFX7301006000A070060	1.0	6	60	7	A	4
UFX7301006000A080060	1.0	6	60	8	A	4
UFX7301006000A100060	1.0	6	60	10	A	4
UFX7301006000A120060	1.0	6	60	12	A	4
UFX7301206000A040060	1.2	6	60	4	A	4
UFX7301206000A060060	1.2	6	60	6	A	4
UFX7301206000A080060	1.2	6	60	8	A	4
UFX7301206000A100060	1.2	6	60	10	A	4
UFX7301206000A120060	1.2	6	60	12	A	4
UFX7301506000A060060	1.5	6	60	6	A	4
UFX7301506000A080060	1.5	6	60	8	A	4
UFX7301506000A100060	1.5	6	60	10	A	4
UFX7301506000A120060	1.5	6	60	12	A	4
UFX7301506000A140060	1.5	6	60	14	A	4
UFX7301506000A160060	1.5	6	60	16	A	4
UFX7302006000A080060	2.0	6	60	8	A	4
UFX7302006000A100060	2.0	6	60	10	A	4
UFX7302006000A120060	2.0	6	60	12	A	4
UFX7302006000A140060	2.0	6	60	14	A	4
UFX7302006000A160060	2.0	6	60	16	A	4
UFX7302506000A100060	2.5	6	60	10	A	4
UFX7302506000A120060	2.5	6	60	12	A	4
UFX7302506000A160060	2.5	6	60	16	A	4
UFX7302506000A200060	2.5	6	60	20	A	4
UFX7302506000A260060	2.5	6	60	26	A	4
UFX7303003000A160100	3.0	3	100	16	A	4
UFX7303006000A100070	3.0	6	70	10	A	4
UFX7303006000A120070	3.0	6	70	12	A	4
UFX7303006000A140070	3.0	6	70	14	A	4
UFX7303006000A160070	3.0	6	70	16	A	4
UFX7303006000A200070	3.0	6	70	20	A	4
UFX7303006000A260070	3.0	6	70	26	A	4
UFX7303006000A300070	3.0	6	70	30	A	4
UFX7304004000A200100	4.0	4	100	20	A	4
UFX7304006000A120070	4.0	6	70	12	A	4
UFX7304006000A160070	4.0	6	70	16	A	4
UFX7304006000A200070	4.0	6	70	20	A	4
UFX7304006000A260070	4.0	6	70	26	A	4

µm	D 0~-0.03	d1 h6		

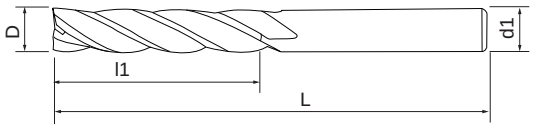
UFX73 NEW

SQUARE TYPE WALCOWO-CZOŁOWE

4 Flute Multiple Helix 4 ostrzowe wielokątowe

HSM Vmax	F	M	30°	A	max	min	AIR
					○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, SI <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●	○					○						





D code Kod	D	d1	L	l1	Shank Uchwyt	Z
UFX7304006000A300070	4.0	6	70	30	A	4
UFX7305006000A200070	5.0	6	70	20	A	4
UFX7305006000A250070	5.0	6	70	25	A	4
UFX7305006000A250100	5.0	6	100	25	A	4
UFX7305006000A300080	5.0	6	80	30	A	4
UFX7305006000A350090	5.0	6	90	35	A	4
UFX7305006000A400100	5.0	6	100	40	A	4
UFX7306006000A150060	6.0	6	60	15	A	4
UFX7306006000A150080	6.0	6	80	15	A	4
UFX7306006000A200070	6.0	6	70	20	A	4
UFX7306006000A200090	6.0	6	90	20	A	4
UFX7306006000A250075	6.0	6	75	25	A	4
UFX7306006000A300080	6.0	6	80	30	A	4
UFX7306006000A300100	6.0	6	100	30	A	4
UFX7306006000A300150	6.0	6	150	30	A	4
UFX7306006000A350090	6.0	6	90	35	A	4
UFX7306006000A400090	6.0	6	90	40	A	4
UFX7306006000A400120	6.0	6	120	40	A	4
UFX7306006000A450150	6.0	6	150	45	A	4
UFX7308008000A250080	8.0	8	80	25	A	4
UFX7308008000A300080	8.0	8	80	30	A	4
UFX7308008000A300100	8.0	8	100	30	A	4
UFX7308008000A350090	8.0	8	90	35	A	4
UFX7308008000A400090	8.0	8	90	40	A	4
UFX7308008000A400120	8.0	8	120	40	A	4
UFX7308008000A400150	8.0	8	150	40	A	4
UFX7308008000A450100	8.0	8	100	45	A	4
UFX7308008000A500100	8.0	8	100	50	A	4
UFX7308008000A500150	8.0	8	150	50	A	4
UFX7310010000A300080	10.0	10	80	30	A	4
UFX7310010000A300100	10.0	10	100	30	A	4
UFX7310010000A350090	10.0	10	90	35	A	4
UFX7310010000A400090	10.0	10	90	40	A	4
UFX7310010000A400120	10.0	10	120	40	A	4
UFX7310010000A450100	10.0	10	100	45	A	4
UFX7310010000A500100	10.0	10	100	50	A	4
UFX7310010000A500150	10.0	10	150	50	A	4
UFX7310010000A500200	10.0	10	200	50	A	4
UFX7310010000A550150	10.0	10	150	55	A	4
UFX7310010000A600110	10.0	10	110	60	A	4
UFX7310010000A600200	10.0	10	200	60	A	4
UFX7312012000A350090	12	12	90	35	A	4

µm	D 0~-0.03	d1 h6		

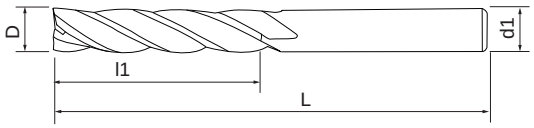
UFX73 NEW

SQUARE TYPE WALCOWO-CZOŁOWE

4 Flute Multiple Helix 4 ostrzowe wielokątowe

HSM Vmax	F	M	30°	A	max	min	AIR
					○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●	○					○						



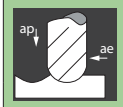


D code Kod	D	d1	L	l1	Shank Uchwyt	Z
UFX7312012000A400100	12.0	12	100	40	A	4
UFX7312012000A400120	12.0	12	120	40	A	4
UFX7312012000A450130	12.0	12	130	45	A	4
UFX7312012000A500100	12.0	12	100	50	A	4
UFX7312012000A500150	12.0	12	150	50	A	4
UFX7312012000A550110	12.0	12	110	55	A	4
UFX7312012000A600110	12.0	12	110	60	A	4
UFX7312012000A600150	12.0	12	150	60	A	4
UFX7312012000A600200	12.0	12	200	60	A	4
UFX7312012000A650150	12.0	12	150	65	A	4
UFX7312012000A700120	12.0	12	120	70	A	4
UFX7312012000A700200	12.0	12	200	70	A	4
UFX7314016000A500110	14.0	16	110	50	A	4
UFX7314016000A600150	14.0	16	150	60	A	4
UFX7316016000A400150	16.0	16	150	40	A	4
UFX7316016000A500110	16.0	16	110	50	A	4
UFX7316016000A500150	16.0	16	150	50	A	4
UFX7316016000A600120	16.0	16	120	60	A	4
UFX7316016000A700130	16.0	16	130	70	A	4
UFX7316016000A700150	16.0	16	150	70	A	4
UFX7316016000A700200	16.0	16	200	70	A	4
UFX7316016000A800150	16.0	16	150	80	A	4
UFX7316016000A900150	16.0	16	150	90	A	4
UFX7316016000A11X200	16.0	16	200	11	A	4
UFX7316016000A12X250	16.0	16	250	12	A	4
UFX7318020000A500120	18.0	20	120	50	A	4
UFX7318020000A700130	18.0	20	130	70	A	4
UFX7318020000A10X200	18	20	200	10	A	4
UFX7320020000A500110	20.0	20	110	50	A	4
UFX7320020000A500150	20.0	20	150	50	A	4
UFX7320020000A600130	20.0	20	130	60	A	4
UFX7320020000A700130	20.0	20	130	70	A	4
UFX7320020000A800150	20.0	20	150	80	A	4
UFX7320020000A900150	20.0	20	150	90	A	4
UFX7320020000A900200	20.0	20	200	90	A	4
UFX7320020000A11X200	20.0	20	200	11	A	4
UFX7320020000A12X250	20.0	20	250	12	A	4
UFX7322020000A750150	22.0	20	150	75	A	4
UFX7322020000A11X200	22.0	20	200	11	A	4
UFX7325025000A700150	25.0	25	150	70	A	4
UFX7325025000A900150	25.0	25	150	90	A	4
UFX7325025000A11X200	25.0	25	200	11	A	4
UFX7325025000A12X250	25.0	25	250	12	A	4

µm	D 0~-0.03	d1 h6		

UFX73

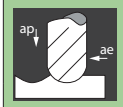
Cutting Conditions Parametry skrawania



	Non-alloyed Steels Alloy Steels Cast Iron Stale niestopowe, żeliwo stopowe				Alloy Steels Heat Resistant Steels Stale stopowe, Stale żaroodporne		Hardened Steels Stale hartowane			
	~ 35 HRC				35 HRC ~ 45 HRC		45 HRC ~ 55 HRC			
D (mm)	ae	ap	RPM	mm/min	RPM	mm/min	ae	ap	RPM	mm/min
1	0,05	2,5	19200	180	10940	70	0,02	2	6720	35
1	0,05	2,5	19200	180	10940	70	0,02	2	6720	35
1	0,05	2,5	19200	180	10940	70	0,02	2	6720	35
1	0,05	2,5	17280	145	9850	60	0,02	2	6050	30
1	0,05	2,5	17280	145	9850	60	0,02	2	6050	30
1	0,05	2,5	17280	130	9850	50	0,02	2	6050	25
1	0,05	2,5	17280	130	9850	50	0,02	2	6050	25
1	0,05	2,5	15360	100	8760	40	0,02	2	5380	20
1,2	0,06	3	16200	205	9230	80	0,024	2,4	5670	40
1,2	0,06	3	16200	205	9230	80	0,024	2,4	5670	40
1,2	0,06	3	14580	165	8310	65	0,024	2,4	5100	35
1,2	0,06	3	14580	145	8310	60	0,024	2,4	5100	30
1,2	0,06	3	14580	145	8310	60	0,024	2,4	5100	30
1,5	0,075	3,75	13800	215	7870	85	0,03	3	4830	45
1,5	0,075	3,75	12420	195	7080	80	0,03	3	4350	40
1,5	0,075	3,75	12420	175	7080	70	0,03	3	4350	35
1,5	0,075	3,75	12420	155	7080	60	0,03	3	4350	30
1,5	0,075	3,75	12420	155	7080	60	0,03	3	4350	30
1,5	0,075	3,75	11040	120	6290	50	0,03	3	3860	25
2	0,1	5	10580	240	6050	95	0,04	4	3780	55
2	0,1	5	10580	240	6050	95	0,04	4	3780	55
2	0,1	5	9530	195	5440	80	0,04	4	3400	45
2	0,1	5	9530	195	5440	80	0,04	4	3400	45
2	0,1	5	9530	175	5440	70	0,04	4	3400	40
2,5	0,125	6,25	8990	260	5170	110	0,05	5	3210	60
2,5	0,125	6,25	8990	260	5170	110	0,05	5	3210	60
2,5	0,125	6,25	8090	210	4650	85	0,05	5	2890	50
2,5	0,125	6,25	8090	185	4650	80	0,05	5	2890	45
2,5	0,125	6,25	7200	145	4130	60	0,05	5	2570	35
3	0,15	7,5	7400	275	4280	120	0,06	6	2640	65
3	0,15	7,5	7400	275	4280	120	0,06	6	2640	65
3	0,15	7,5	7400	275	4280	120	0,06	6	2640	65
3	0,15	7,5	6660	250	3860	110	0,06	6	2380	60
3	0,15	7,5	6660	225	3860	95	0,06	6	2380	55
3	0,15	7,5	6660	200	3860	85	0,06	6	2380	50
3	0,15	7,5	6660	200	3860	85	0,06	6	2380	50
4	0,2	10	6000	335	3410	140	0,08	8	2150	70
4	0,2	10	6000	335	3410	140	0,08	8	2150	70
4	0,2	10	6000	335	3410	140	0,08	8	2150	70
4	0,2	10	5400	270	3070	110	0,08	8	1930	60
4	0,2	10	5400	270	3070	110	0,08	8	1930	60
5	0,25	12,5	5120	430	2900	170	0,1	10	1900	85
5	0,25	12,5	5120	430	2900	170	0,1	10	1900	85
5	0,25	12,5	4610	350	2610	135	0,1	10	1710	70
5	0,25	12,5	4610	350	2610	135	0,1	10	1710	70
5	0,25	12,5	4610	310	2610	120	0,1	10	1710	60
6	0,3	15	4420	515	2520	215	0,12	12	1640	110
6	0,3	15	4420	515	2520	215	0,12	12	1640	110
6	0,3	15	4420	515	2520	215	0,12	12	1640	110
6	0,3	15	4420	440	2520	185	0,12	12	1640	90
6	0,3	15	3970	395	2270	165	0,12	12	1480	85
6	0,3	15	3970	350	2270	145	0,12	12	1480	75
6	0,3	15	3970	350	2270	145	0,12	12	1480	75

UFX73

Cutting Conditions Parametry skrawania



	Non-alloyed Steels Alloy Steels Cast Iron Stale niestopowe, żeliwo stopowe				Alloy Steels Heat Resistant Steels Stale stopowe, Stale żaroodporne		Hardened Steels Stale hartowane			
	~ 35 HRC				35 HRC ~ 45 HRC		45 HRC ~ 55 HRC			
D (mm)	ae	ap	RPM	mm/min	RPM	mm/min	ae	ap	RPM	mm/min
8	0,4	20	3360	550	1900	215	0,16	16	1260	110
8	0,4	20	3360	550	1900	215	0,16	16	1260	110
8	0,4	20	3360	550	1900	215	0,16	16	1260	110
8	0,4	20	3360	470	1900	185	0,16	16	1260	90
8	0,4	20	3020	420	1710	165	0,16	16	1130	85
8	0,4	20	3020	375	1710	145	0,16	16	1130	75
10	0,5	25	2820	550	1640	215	0,2	20	1010	110
10	0,5	25	2820	550	1640	215	0,2	20	1010	110
10	0,5	25	2820	550	1640	215	0,2	20	1010	110
10	0,5	25	2820	470	1640	185	0,2	20	1010	90
10	0,5	25	2820	470	1640	185	0,2	20	1010	90
10	0,5	25	2540	420	1480	165	0,2	20	910	85
10	0,5	25	2540	375	1480	145	0,2	20	910	75
12	0,6	30	2300	430	1390	190	0,24	24	840	85
12	0,6	30	2300	430	1390	190	0,24	24	840	85
12	0,6	30	2300	365	1390	165	0,24	24	840	70
12	0,6	30	2300	365	1390	165	0,24	24	840	70
12	0,6	30	2300	365	1390	165	0,24	24	840	70
12	0,6	30	2300	325	1390	145	0,24	24	840	65
12	0,6	30	2070	290	1250	130	0,24	24	760	55
12	0,6	30	2070	290	1250	130	0,24	24	760	55
14	0,7	35	2120	345	1230	145	0,28	28	760	65
14	0,7	35	2120	345	1230	145	0,28	28	760	65
16	0,8	40	1940	385	1070	150	0,32	32	670	70
16	0,8	40	1940	385	1070	150	0,32	32	670	70
16	0,8	40	1940	325	1070	130	0,32	32	670	60
16	0,8	40	1940	325	1070	130	0,32	32	670	60
16	0,8	40	1940	290	1070	115	0,32	32	670	55
16	0,8	40	1750	260	960	100	0,32	32	600	50
16	0,8	40	1750	260	960	100	0,32	32	600	50
16	0,8	40	1750	260	960	100	0,32	32	600	50
18	0,9	45	1680	330	940	130	0,36	36	590	65
18	0,9	45	1680	280	940	110	0,36	36	590	55
18	0,9	45	1510	225	850	85	0,36	36	530	45
20	1	50	1420	275	820	110	0,4	40	500	55
20	1	50	1420	275	820	110	0,4	40	500	55
20	1	50	1420	235	820	90	0,4	40	500	45
20	1	50	1420	235	820	90	0,4	40	500	45
20	1	50	1420	205	820	80	0,4	40	500	40
20	1	50	1270	185	730	75	0,4	40	450	35
20	1	50	1270	185	730	75	0,4	40	450	35
22	1,1	55	1260	205	820	90	0,44	44	500	45
22	1,1	55	1260	180	820	80	0,44	44	500	40
25	1,25	62,5	1100	215	820	110	0,5	50	500	55
25	1,25	62,5	1100	185	820	90	0,5	50	500	45
25	1,25	62,5	1100	185	820	90	0,5	50	500	45
25	1,25	62,5	1100	160	820	80	0,5	50	500	40

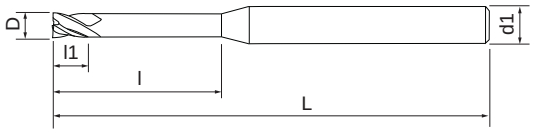
UFX74 NEW

SQUARE TYPE WALCOWO-CZOŁOWE

4 Flute with External Neck 4 ostrzowe z szyjką

HSM Vmax	F	M	30°	A	max	min	AIR
					○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●	○					○	○	○				





D code Kod	D	d1	L	l1	Shank Uchwyt	Z
UFX7401004000A015020	1.0	4	50	1.5	A	4
UFX7401004000A015030	1.0	4	50	1.5	A	4
UFX7401004000A015040	1.0	4	50	1.5	A	4
UFX7401004000A015050	1.0	4	50	1.5	A	4
UFX7401004000A015060	1.0	4	50	1.5	A	4
UFX7401004000A015070	1.0	4	50	1.5	A	4
UFX7401004000A015080	1.0	4	50	1.5	A	4
UFX7401004000A015100	1.0	4	50	1.5	A	4
UFX7401004000A015120	1.0	4	50	1.5	A	4
UFX7401004000A015140	1.0	4	50	1.5	A	4
UFX7401004000A015160	1.0	4	50	1.5	A	4
UFX7401004000A015180	1.0	4	50	1.5	A	4
UFX7401004000A015200	1.0	4	50	1.5	A	4
UFX7401004000A015220	1.0	4	60	1.5	A	4
UFX7401004000A015260	1.0	4	60	1.5	A	4
UFX7401004000A015300	1.0	4	70	1.5	A	4
UFX7401004000A015400	1.0	4	80	1.5	A	4
UFX7401004000A015500	1.0	4	100	1.5	A	4
UFX7401204000A018040	1.2	4	50	1.8	A	4
UFX7401204000A018060	1.2	4	50	1.8	A	4
UFX7401204000A018080	1.2	4	50	1.8	A	4
UFX7401204000A018100	1.2	4	50	1.8	A	4
UFX7401204000A018120	1.2	4	50	1.8	A	4
UFX7401204000A018140	1.2	4	50	1.8	A	4
UFX7401204000A018160	1.2	4	50	1.8	A	4
UFX7401204000A018200	1.2	4	50	1.8	A	4
UFX7401204000A018260	1.2	4	60	1.8	A	4
UFX7401204000A018300	1.2	4	70	1.8	A	4
UFX7401504000A023040	1.5	4	50	2.3	A	4
UFX7401504000A023050	1.5	4	50	2.3	A	4
UFX7401504000A023060	1.5	4	50	2.3	A	4
UFX7401504000A023070	1.5	4	50	2.3	A	4
UFX7401504000A023080	1.5	4	50	2.3	A	4
UFX7401504000A023100	1.5	4	50	2.3	A	4
UFX7401504000A023120	1.5	4	50	2.3	A	4
UFX7401504000A023140	1.5	4	50	2.3	A	4
UFX7401504000A023160	1.5	4	50	2.3	A	4
UFX7401504000A023180	1.5	4	50	2.3	A	4
UFX7401504000A023200	1.5	4	50	2.3	A	4
UFX7401504000A023220	1.5	4	60	2.3	A	4
UFX7401504000A023260	1.5	4	60	2.3	A	4
UFX7401504000A023300	1.5	4	70	2.3	A	4
UFX7402004000A030060	2.0	4	50	3	A	4

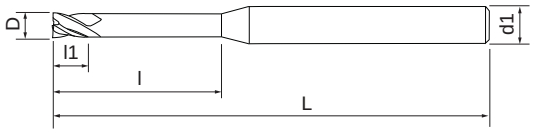
µm	D 0~-0.03	d1 h6		

UFX74 NEW

SQUARE TYPE WALCOWO-CZOŁOWE
4 Flute with External Neck 4 ostrzowe z szyjką

HSM Vmax	F	M	30°	A	max	min	AIR
					○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●	○					○	○	○				○





D code Kod	D	d1	L	l1	Shank Uchwyt	Z
UFX7402004000A030080	2.0	4	50	3	A	4
UFX7402004000A030100	2.0	4	50	3	A	4
UFX7402004000A030120	2.0	4	50	3	A	4
UFX7402004000A030140	2.0	4	50	3	A	4
UFX7402004000A030160	2.0	4	50	3	A	4
UFX7402004000A030180	2.0	4	50	3	A	4
UFX7402004000A030200	2.0	4	50	3	A	4
UFX7402004000A030220	2.0	4	60	3	A	4
UFX7402004000A030260	2.0	4	60	3	A	4
UFX7402004000A030300	2.0	4	70	3	A	4
UFX7402004000A030350	2.0	4	70	3	A	4
UFX7402004000A030400	2.0	4	80	3	A	4
UFX7402004000A030450	2.0	4	90	3	A	4
UFX7402004000A030500	2.0	4	100	3	A	4
UFX7402004000A030600	2.0	4	110	3	A	4
UFX7402504000A040080	2.5	4	50	4	A	4
UFX7402504000A040100	2.5	4	50	4	A	4
UFX7402504000A040120	2.5	4	50	4	A	4
UFX7402504000A040140	2.5	4	50	4	A	4
UFX7402504000A040160	2.5	4	50	4	A	4
UFX7402504000A040180	2.5	4	50	4	A	4
UFX7402504000A040200	2.5	4	50	4	A	4
UFX7402504000A040220	2.5	4	60	4	A	4
UFX7402504000A040260	2.5	4	60	4	A	4
UFX7402504000A040300	2.5	4	70	4	A	4
UFX7402504000A040350	2.5	4	70	4	A	4
UFX7402504000A040400	2.5	4	80	4	A	4
UFX7402504000A040450	2.5	4	90	4	A	4
UFX7402504000A040500	2.5	4	100	4	A	4
UFX7403006000A045060	3.0	6	50	4.5	A	4
UFX7403006000A045080	3.0	6	50	4.5	A	4
UFX7403006000A045100	3.0	6	50	4.5	A	4
UFX7403006000A045120	3.0	6	50	4.5	A	4
UFX7403006000A045140	3.0	6	60	4.5	A	4
UFX7403006000A045160	3.0	6	60	4.5	A	4
UFX7403006000A045180	3.0	6	60	4.5	A	4
UFX7403006000A045200	3.0	6	60	4.5	A	4
UFX7403006000A045220	3.0	6	65	4.5	A	4
UFX7403006000A045260	3.0	6	65	4.5	A	4
UFX7403006000A045300	3.0	6	70	4.5	A	4
UFX7403006000A045350	3.0	6	70	4.5	A	4
UFX7403006000A045400	3.0	6	80	4.5	A	4
UFX7403006000A045450	3.0	6	90	4.5	A	4

µm	D 0~-0.03	d1 h6		

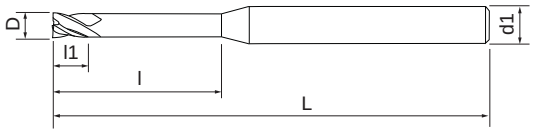
UFX74 NEW

SQUARE TYPE WALCOWO-CZOŁOWE

4 Flute with External Neck 4 ostrzowe z szyjką

HSM Vmax	F	M	30°	A	max	min	AIR
					○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●	○					○	○	○				○





D code Kod	D	d1	L	l1	Shank Uchwyt	Z
UFX7403006000A045500	3.0	6	100	4.5	A	4
UFX7403006000A045600	3.0	6	100	4.5	A	4
UFX7404006000A060080	4.0	6	50	6	A	4
UFX7404006000A060100	4.0	6	50	6	A	4
UFX7404006000A060120	4.0	6	50	6	A	4
UFX7404006000A060140	4.0	6	60	6	A	4
UFX7404006000A060160	4.0	6	60	6	A	4
UFX7404006000A060180	4.0	6	60	6	A	4
UFX7404006000A060200	4.0	6	60	6	A	4
UFX7404006000A060220	4.0	6	65	6	A	4
UFX7404006000A060260	4.0	6	65	6	A	4
UFX7404006000A060300	4.0	6	70	6	A	4
UFX7404006000A060350	4.0	6	70	6	A	4
UFX7404006000A060400	4.0	6	80	6	A	4
UFX7404006000A060450	4.0	6	90	6	A	4
UFX7404006000A060500	4.0	6	100	6	A	4
UFX7404006000A060600	4.0	6	100	6	A	4
UFX7405006000A080160	5.0	6	60	8	A	4
UFX7405006000A080200	5.0	6	60	8	A	4
UFX7405006000A080260	5.0	6	65	8	A	4
UFX7405006000A080300	5.0	6	70	8	A	4
UFX7405006000A080350	5.0	6	75	8	A	4
UFX7405006000A080400	5.0	6	80	8	A	4
UFX7405006000A080500	5.0	6	90	8	A	4
UFX7405006000A080600	5.0	6	100	8	A	4
UFX7406006000A090150	6.0	6	60	9	A	4
UFX7406006000A090200	6.0	6	60	9	A	4
UFX7406006000A090300	6.0	6	70	9	A	4
UFX7406006000A090320	6.0	6	90	9	A	4
UFX7408008000A120250	8.0	8	70	12	A	4
UFX7408008000A120300	8.0	8	80	12	A	4
UFX7408008000A120420	8.0	8	100	12	A	4
UFX7410010000A150300	10.0	10	75	15	A	4
UFX7410010000A150350	10.0	10	80	15	A	4
UFX7410010000A150450	10.0	10	100	15	A	4
UFX7412012000A200350	12.0	12	80	20	A	4
UFX7412012000A200400	12.0	12	90	20	A	4
UFX7412012000A200500	12.0	12	110	20	A	4

µm	D 0~-0.03	d1 h6		

UFX74

Cutting Conditions Parametry skrawania



	Non-alloyed Steels Alloy Steels Cast Iron Stale niestopowe, żeliwo stopowe				Alloy Steels Heat Resistant Steels Stale stopowe, Stale żaroodporne				Hardened Steels Stale hartowane			
	~ 35 HRC				35 HRC ~ 45 HRC				45 HRC ~ 55 HRC			
D (mm)	ae	ap	RPM	mm/min	ae	ap	RPM	mm/min	ae	ap	RPM	mm/min
1.0	0.021	1.0	22000	310	0.016	1.0	13500	180	0.013	1.0	8500	50
1.0	0.021	1.0	22000	310	0.016	1.0	13500	180	0.013	1.0	8500	50
1.0	0.015	1.0	22000	310	0.011	1.0	13500	180	0.009	1.0	8500	50
1.0	0.015	1.0	22000	310	0.011	1.0	13500	180	0.009	1.0	8500	50
1.0	0.008	1.0	19800	250	0.006	1.0	12150	145	0.005	1.0	7650	40
1.0	0.008	1.0	19800	250	0.006	1.0	12150	145	0.005	1.0	7650	40
1.0	0.008	1.0	19800	250	0.006	1.0	12150	145	0.005	1.0	7650	40
1.0	0.005	1.0	19800	250	0.004	1.0	12150	145	0.003	1.0	7650	40
1.0	0.005	1.0	17600	200	0.004	1.0	10800	115	0.003	1.0	6800	30
1.0	0.003	1.0	17600	200	0.002	1.0	10800	115	0.002	1.0	6800	30
1.0	0.003	1.0	13200	130	0.002	1.0	8100	75	0.002	1.0	5100	20
1.0	0.002	1.0	13200	130	0.002	1.0	8100	75	0.001	1.0	5100	20
1.0	0.002	1.0	13200	130	0.002	1.0	8100	75	0.001	1.0	5100	20
1.0	0.002	1.0	6600	55	0.002	1.0	4050	30	0.001	1.0	2550	10
1.0	0.002	1.0	6600	55	0.002	1.0	4050	30	0.001	1.0	2550	10
1.0	0.002	1.0	6600	55	0.002	1.0	4050	30	0.001	1.0	2550	10
1.0	0.002	1.0	2200	15	0.002	1.0	1350	10	0.001	1.0	850	5
1.0	0.002	1.0	2200	15	0.002	1.0	1350	10	0.001	1.0	850	5
1.2	0.018	1.2	19500	315	0.013	1.2	12100	185	0.011	1.2	7500	50
1.2	0.018	1.2	19500	315	0.013	1.2	12100	185	0.011	1.2	7500	50
1.2	0.010	1.2	17550	255	0.008	1.2	10890	150	0.006	1.2	6750	40
1.2	0.006	1.2	17550	255	0.005	1.2	10890	150	0.004	1.2	6750	40
1.2	0.006	1.2	17550	255	0.005	1.2	10890	150	0.004	1.2	6750	40
1.2	0.006	1.2	15600	200	0.005	1.2	9680	120	0.004	1.2	6000	30
1.2	0.004	1.2	15600	200	0.003	1.2	9680	120	0.002	1.2	6000	30
1.2	0.003	1.2	11700	130	0.002	1.2	7260	80	0.002	1.2	4500	20
1.2	0.003	1.2	5850	55	0.002	1.2	3630	35	0.002	1.2	2250	10
1.2	0.003	1.2	5850	55	0.002	1.2	3630	35	0.002	1.2	2250	10
1.5	0.032	1.5	17000	320	0.024	1.5	10700	190	0.019	1.5	6500	50
1.5	0.022	1.5	17000	320	0.017	1.5	10700	190	0.013	1.5	6500	50
1.5	0.022	1.5	17000	320	0.017	1.5	10700	190	0.013	1.5	6500	50
1.5	0.022	1.5	17000	320	0.017	1.5	10700	190	0.013	1.5	6500	50
1.5	0.013	1.5	15300	260	0.009	1.5	9630	155	0.008	1.5	5850	40
1.5	0.013	1.5	15300	260	0.009	1.5	9630	155	0.008	1.5	5850	40
1.5	0.013	1.5	15300	260	0.009	1.5	9630	155	0.008	1.5	5850	40
1.5	0.008	1.5	15300	260	0.006	1.5	9630	155	0.005	1.5	5850	40
1.5	0.008	1.5	13600	205	0.006	1.5	8560	120	0.005	1.5	5200	30
1.5	0.008	1.5	13600	205	0.006	1.5	8560	120	0.005	1.5	5200	30
1.5	0.005	1.5	13600	205	0.004	1.5	8560	120	0.003	1.5	5200	30
1.5	0.005	1.5	13600	205	0.004	1.5	8560	120	0.003	1.5	5200	30
1.5	0.003	1.5	10200	135	0.002	1.5	6420	80	0.002	1.5	3900	20
1.5	0.003	1.5	10200	135	0.002	1.5	6420	80	0.002	1.5	3900	20
2.0	0.042	2.0	13900	330	0.032	2.0	9070	200	0.025	2.0	6000	60
2.0	0.029	2.0	13900	330	0.022	2.0	9070	200	0.018	2.0	6000	60
2.0	0.029	2.0	13900	330	0.022	2.0	9070	200	0.018	2.0	6000	60
2.0	0.017	2.0	12510	265	0.013	2.0	8160	160	0.010	2.0	5400	50
2.0	0.017	2.0	12510	265	0.013	2.0	8160	160	0.010	2.0	5400	50
2.0	0.011	2.0	12510	265	0.008	2.0	8160	160	0.006	2.0	5400	50
2.0	0.011	2.0	12510	265	0.008	2.0	8160	160	0.006	2.0	5400	50
2.0	0.011	2.0	11120	210	0.008	2.0	7260	130	0.006	2.0	4800	40
2.0	0.011	2.0	11120	210	0.008	2.0	7260	130	0.006	2.0	4800	40
2.0	0.006	2.0	11120	210	0.005	2.0	7260	130	0.004	2.0	4800	40
2.0	0.004	2.0	8340	140	0.003	2.0	5440	85	0.003	2.0	3600	25

UFX74

Cutting Conditions Parametry skrawania



	Non-alloyed Steels Alloy Steels Cast Iron Stale niestopowe, żeliwo stopowe				Alloy Steels Heat Resistant Steels Stale stopowe, Stale żaroodporne				Hardened Steels Stale hartowane			
	~ 35 HRC				35 HRC ~ 45 HRC				45 HRC ~ 55 HRC			
D (mm)	ae	ap	RPM	mm/min	ae	ap	RPM	mm/min	ae	ap	RPM	mm/min
2.0	0.004	2.0	8340	140	0.003	2.0	5440	85	0.003	2.0	3600	25
2.0	0.004	2.0	4170	60	0.003	2.0	2720	35	0.003	2.0	1800	10
2.0	0.004	2.0	4170	60	0.003	2.0	2720	35	0.003	2.0	1800	10
2.0	0.004	2.0	4170	60	0.003	2.0	2720	35	0.003	2.0	1800	10
2.5	0.037	2.5	12000	350	0.028	2.5	7600	220	0.022	2.5	4500	60
2.5	0.037	2.5	12000	350	0.028	2.5	7600	220	0.022	2.5	4500	60
2.5	0.037	2.5	12000	350	0.028	2.5	7600	220	0.022	2.5	4500	60
2.5	0.021	2.5	10800	285	0.016	2.5	6840	180	0.013	2.5	4050	50
2.5	0.021	2.5	10800	285	0.016	2.5	6840	180	0.013	2.5	4050	50
2.5	0.021	2.5	10800	285	0.016	2.5	6840	180	0.013	2.5	4050	50
2.5	0.021	2.5	10800	285	0.016	2.5	6840	180	0.013	2.5	4050	50
2.5	0.013	2.5	10800	285	0.010	2.5	6840	180	0.008	2.5	4050	50
2.5	0.013	2.5	9600	225	0.010	2.5	6080	140	0.008	2.5	3600	40
2.5	0.013	2.5	9600	225	0.010	2.5	6080	140	0.008	2.5	3600	40
2.5	0.008	2.5	9600	225	0.006	2.5	6080	140	0.005	2.5	3600	40
2.5	0.008	2.5	7200	145	0.006	2.5	4560	90	0.005	2.5	2700	25
2.5	0.005	2.5	7200	145	0.004	2.5	4560	90	0.003	2.5	2700	25
2.5	0.005	2.5	7200	145	0.004	2.5	4560	90	0.003	2.5	2700	25
3.0	0.063	3.0	10700	380	0.047	3.0	6670	240	0.038	3.0	4030	70
3.0	0.063	3.0	10700	380	0.047	3.0	6670	240	0.038	3.0	4030	70
3.0	0.044	3.0	10700	380	0.033	3.0	6670	240	0.026	3.0	4030	70
3.0	0.044	3.0	10700	380	0.033	3.0	6670	240	0.026	3.0	4030	70
3.0	0.044	3.0	10700	380	0.033	3.0	6670	240	0.026	3.0	4030	70
3.0	0.025	3.0	9630	310	0.019	3.0	6000	195	0.015	3.0	3630	55
3.0	0.025	3.0	9630	310	0.019	3.0	6000	195	0.015	3.0	3630	55
3.0	0.025	3.0	9630	310	0.019	3.0	6000	195	0.015	3.0	3630	55
3.0	0.025	3.0	9630	310	0.019	3.0	6000	195	0.015	3.0	3630	55
3.0	0.016	3.0	9630	310	0.012	3.0	6000	195	0.009	3.0	3630	55
3.0	0.016	3.0	9630	310	0.012	3.0	6000	195	0.009	3.0	3630	55
3.0	0.016	3.0	8560	245	0.012	3.0	5340	155	0.009	3.0	3220	45
3.0	0.009	3.0	8560	245	0.007	3.0	5340	155	0.006	3.0	3220	45
3.0	0.009	3.0	8560	245	0.007	3.0	5340	155	0.006	3.0	3220	45
3.0	0.006	3.0	6420	160	0.005	3.0	4000	100	0.004	3.0	2420	30
3.0	0.006	3.0	6420	160	0.005	3.0	4000	100	0.004	3.0	2420	30
4.0	0.084	4.0	9070	680	0.063	4.0	5540	420	0.050	4.0	3530	70
4.0	0.084	4.0	9070	680	0.063	4.0	5540	420	0.050	4.0	3530	70
4.0	0.084	4.0	9070	680	0.063	4.0	5540	420	0.050	4.0	3530	70
4.0	0.059	4.0	9070	680	0.044	4.0	5540	420	0.035	4.0	3530	70
4.0	0.059	4.0	9070	680	0.044	4.0	5540	420	0.035	4.0	3530	70
4.0	0.059	4.0	9070	680	0.044	4.0	5540	420	0.035	4.0	3530	70
4.0	0.059	4.0	9070	680	0.044	4.0	5540	420	0.035	4.0	3530	70
4.0	0.034	4.0	8160	550	0.025	4.0	4990	340	0.020	4.0	3180	55
4.0	0.034	4.0	8160	550	0.025	4.0	4990	340	0.020	4.0	3180	55
4.0	0.034	4.0	8160	550	0.025	4.0	4990	340	0.020	4.0	3180	55
4.0	0.021	4.0	8160	550	0.016	4.0	4990	340	0.013	4.0	3180	55
4.0	0.021	4.0	8160	550	0.016	4.0	4990	340	0.013	4.0	3180	55
4.0	0.021	4.0	7260	435	0.016	4.0	4430	270	0.013	4.0	2820	45
4.0	0.021	4.0	7260	435	0.016	4.0	4430	270	0.013	4.0	2820	45
4.0	0.013	4.0	7260	435	0.009	4.0	4430	270	0.008	4.0	2820	45
5.0	0.074	5.0	7560	720	0.055	5.0	4530	430	0.044	5.0	2780	85
5.0	0.074	5.0	7560	720	0.055	5.0	4530	430	0.044	5.0	2780	85
5.0	0.042	5.0	6800	585	0.032	5.0	4080	350	0.025	5.0	2500	70
5.0	0.042	5.0	6800	585	0.032	5.0	4080	350	0.025	5.0	2500	70

UFX74

Cutting Conditions Parametry skrawania



	Non-alloyed Steels Alloy Steels Cast Iron Stale niestopowe, żeliwo stopowe				Alloy Steels Heat Resistant Steels Stale stopowe, Stale żaroodporne				Hardened Steels Stale hartowane			
	~ 35 HRC				35 HRC ~ 45 HRC				45 HRC ~ 55 HRC			
D (mm)	ae	ap	RPM	mm/min	ae	ap	RPM	mm/min	ae	ap	RPM	mm/min
5.0	0.042	5.0	6800	585	0.032	5.0	4080	350	0.025	5.0	2500	70
5.0	0.042	5.0	6800	585	0.032	5.0	4080	350	0.025	5.0	2500	70
5.0	0.026	5.0	6800	585	0.020	5.0	4080	350	0.016	5.0	2500	70
5.0	0.026	5.0	6050	460	0.020	5.0	3620	275	0.016	5.0	2220	55
6.0	0.126	6.0	6670	790	0.095	6.0	4030	490	0.076	6.0	2400	95
6.0	0.088	6.0	6670	790	0.066	6.0	4030	490	0.053	6.0	2400	95
6.0	0.088	6.0	6670	790	0.066	6.0	4030	490	0.053	6.0	2400	95
6.0	0.050	6.0	6000	640	0.038	6.0	3630	395	0.030	6.0	2160	75
8.0	0.118	8.0	5040	850	0.088	8.0	3020	450	0.071	8.0	2010	130
8.0	0.118	8.0	5040	850	0.088	8.0	3020	450	0.071	8.0	2010	130
8.0	0.067	8.0	4540	690	0.050	8.0	2720	365	0.040	8.0	1810	105
10.0	0.210	10.0	3910	730	0.158	10.0	2400	360	0.126	10.0	1630	105
10.0	0.147	10.0	3910	730	0.110	10.0	2400	360	0.088	10.0	1630	105
10.0	0.147	10.0	3910	730	0.110	10.0	2400	360	0.088	10.0	1630	105
12.0	0.252	12.0	3300	620	0.189	12.0	2010	300	0.151	12.0	1400	95
12.0	0.176	12.0	3300	620	0.132	12.0	2010	300	0.106	12.0	1400	95
12.0	0.176	12.0	3300	620	0.132	12.0	2010	300	0.106	12.0	1400	95

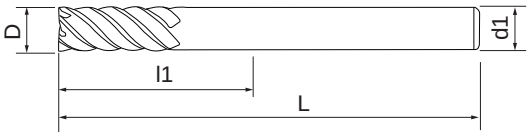
UFX77 NEW

SQUARE TYPE WALCOWO-CZOŁOWE

6 Flute 6 ostrzowe

			HSM Vmax	F	M	45°	A					max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●	○					○						○





D code Kod	D	d1	L	l1	Shank Uchwyt	Z
UFX7706006000A150060	6.0	6	60	15	A	6
UFX7706006000A200070	6.0	6	70	20	A	6
UFX7706006000A300080	6.0	6	80	30	A	6
UFX7706006000A300110	6.0	6	110	30	A	6
UFX7708008000A200070	8.0	8	70	20	A	6
UFX7708008000A300080	8.0	8	80	30	A	6
UFX7708008000A350090	8.0	8	90	35	A	6
UFX7708008000A400090	8.0	8	90	40	A	6
UFX7708008000A400130	8.0	8	130	40	A	6
UFX7710010000A250075	10.0	10	75	25	A	6
UFX7710010000A300080	10.0	10	80	30	A	6
UFX7710010000A400090	10.0	10	90	40	A	6
UFX7710010000A500100	10.0	10	100	50	A	6
UFX7710010000A500150	10.0	10	150	50	A	6
UFX7712012000A300080	12.0	12	80	30	A	6
UFX7712012000A400090	12.0	12	90	40	A	6
UFX7712012000A500100	12.0	12	100	50	A	6
UFX7712012000A600110	12.0	12	110	60	A	6
UFX7712012000A600150	12.0	12	150	60	A	6
UFX7716016000A400100	16.0	16	100	40	A	6
UFX7716016000A500110	16.0	16	110	50	A	6
UFX7716016000A600120	16.0	16	120	60	A	6
UFX7716016000A900150	16.0	16	150	90	A	6
UFX7716016000A11X200	16.0	16	200	110	A	6
UFX7716016000A11X250	16.0	16	250	110	A	6
UFX7720020000A450100	20.0	20	100	45	A	6
UFX7720020000A600120	20.0	20	120	60	A	6
UFX7720020000A700130	20.0	20	130	70	A	6
UFX7720020000A11X200	20.0	20	200	110	A	6
UFX7720020000A11X250	20.0	20	250	110	A	6
UFX7720020000A11X300	20.0	20	300	110	A	6

µm	D 0~-0.03	d1 h6		

UFX77

Cutting Conditions Parametry skrawania

Normal Speed / Standardowa prędkość



	Non-alloyed Steels Alloy Steels Cast Iron Stale niestopowe, żeliwo stopowe				Alloy Steels Heat Resistant Steels Stale stopowe, Stale żaroodporne				Hardened Steels Stale hartowane			
	~ 35 HRC				35 HRC ~ 45 HRC				45 HRC ~ 55 HRC			
D (mm)	ae	ap	RPM	mm/min	ae	ap	RPM	mm/min	ae	ap	RPM	mm/min
6.0	0,6	9	5840	2100	0,3	9	4075	1440	0,3	6	1660	220
6.0	0,6	9	5840	2100	0,3	9	4075	1440	0,3	6	1660	220
6.0	0,6	9	5840	1785	0,3	9	4075	1225	0,3	6	1660	190
8.0	0,8	12	4410	2100	0,4	12	3085	1440	0,4	8	1220	220
8.0	0,8	12	4410	2100	0,4	12	3085	1440	0,4	8	1220	220
8.0	0,8	12	4410	2100	0,4	12	3085	1440	0,4	8	1220	220
8.0	0,8	12	4410	1785	0,4	12	3085	1225	0,4	8	1220	190
10.0	1	15	3530	2100	0,5	15	2435	1440	0,5	10	1050	220
10.0	1	15	3530	2100	0,5	15	2435	1440	0,5	10	1050	220
10.0	1	15	3530	2100	0,5	15	2435	1440	0,5	10	1050	220
10.0	1	15	3530	1785	0,5	15	2435	1225	0,5	10	1050	190
12.0	1,2	18	2980	1765	0,6	18	2100	1220	0,6	12	880	190
12.0	1,2	18	2980	1765	0,6	18	2100	1220	0,6	12	880	190
12.0	1,2	18	2980	1500	0,6	18	2100	1035	0,6	12	880	165
12.0	1,2	18	2980	1325	0,6	18	2100	915	0,6	12	880	140
16.0	1,6	24	2205	1325	0,8	24	1555	925	0,8	16	670	135
16.0	1,6	24	2205	1325	0,8	24	1555	925	0,8	16	670	135
16.0	1,6	24	2205	1125	0,8	24	1555	790	0,8	16	670	115
16.0	1,6	24	1985	895	0,8	24	1395	625	0,8	16	610	95
16.0	1,6	24	1985	895	0,8	24	1395	625	0,8	16	610	95
20.0	2	30	1765	1060	1	30	1220	725	1	20	525	115
20.0	2	30	1765	1060	1	30	1220	725	1	20	525	115
20.0	2	30	1765	905	1	30	1220	615	1	20	525	100
20.0	2	30	1585	715	1	30	1090	490	1	20	475	80

High Speed / Wysoka prędkość



	Alloy Steels Heat Resistant Steels Stale stopowe, Stale żaroodporne				Hardened Steels Stale hartowane			
	35 HRC ~ 45 HRC				45 HRC ~ 55 HRC			
D (mm)	ae	ap	RPM	mm/min	ae	ap	RPM	mm/min
6.0	0,3	9	17640	6395	0,3	6	8820	3205
6.0	0,3	9	17640	6395	0,3	6	8820	3205
6.0	0,3	9	17640	5435	0,3	6	8820	2720
8.0	0,4	12	13230	6395	0,4	8	6615	3205
8.0	0,4	12	13230	6395	0,4	8	6615	3205
8.0	0,4	12	13230	6395	0,4	8	6615	3205
8.0	0,4	12	13230	5435	0,4	8	6615	2725
10.0	0,5	15	10480	6290	0,5	10	5290	3205
10.0	0,5	15	10480	6290	0,5	10	5290	3205
10.0	0,5	15	10480	6290	0,5	10	5290	3205
10.0	0,5	15	10480	5345	0,5	10	5290	2720
12.0	0,6	18	8820	5290	0,6	12	4410	2645
12.0	0,6	18	8820	5290	0,6	12	4410	2645
12.0	0,6	18	8820	4500	0,6	12	4410	2245
12.0	0,6	18	8820	3970	0,6	12	4410	1985
16.0	0,8	24	6615	3970	0,8	16	3320	1985
16.0	0,8	24	6615	3970	0,8	16	3320	1985
16.0	0,8	24	6615	3375	0,8	16	3320	1685
16.0	0,8	24	5955	2680	0,8	16	2980	1340
16.0	0,8	24	5955	2680	0,8	16	2980	1340
20.0	1	30	5290	3205	1	20	2645	1545
20.0	1	30	5290	3205	1	20	2645	1545
20.0	1	30	5290	2720	1	20	2645	1315
20.0	1	30	4765	2165	1	20	2385	1040

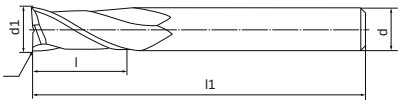
UFX18

TOROIDAL TOROIDALNE

2-Flute, Long Length 2-ostrzowe, długie

HSM Vmax	F	M	30°	A	B	max	min	AIR
						○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○	●	●	○											





D code Kod	R	d1	d2	l1	l3	Shank Uchwyt	Z
UFX18030003A06012050	0,3	3	6	50	12	A	2
UFX18040003A06015050	0,3	4	6	50	15	A	2
UFX18040005A06015050	0,5	4	6	50	15	A	2
UFX18050003A06020060	0,3	5	6	60	20	A	2
UFX18050005A06020060	0,5	5	6	60	20	A	2
UFX18060003A06020060	0,3	6	6	60	20	A	2
UFX18060005A06020060	0,5	6	6	60	20	A	2
UFX18060010A06020070	1	6	6	70	20	A	2
UFX18080003A08025070	0,3	8	8	70	25	A	2
UFX18080005A08025070	0,5	8	8	70	25	A	2
UFX18080010A08025070	1	8	8	70	25	A	2
UFX18080015A08025070	1,5	8	8	70	25	A	2
UFX18080020A08025070	2	8	8	70	25	A	2
UFX18100003A10030090	0,3	10	10	90	30	A	2
UFX18100005A10030090	0,5	10	10	90	30	A	2
UFX18100010A10030090	1	10	10	90	30	A	2
UFX18100015A10030090	1,5	10	10	90	30	A	2
UFX18100020A10030090	2	10	10	90	30	A	2
UFX18120005A12030090	0,5	12	12	90	30	A	2
UFX18120010A12030090	1	12	12	90	30	A	2
UFX18120015A12030090	1,5	12	12	90	30	A	2
UFX18120020A12030090	2	12	12	90	30	A	2
UFX18160005A16050110	0,5	16	16	110	50	A	2
UFX18160010A16050110	1	16	16	110	50	A	2
UFX18160015A16050110	1,5	16	16	110	50	A	2
UFX18160020A16050110	2	16	16	110	50	A	2
UFX18200005A20055110	0,5	20	20	110	55	A	2
UFX18200010A20055110	1	20	20	110	55	A	2
UFX18200015A20055110	1,5	20	20	110	55	A	2
UFX18200020A20055110	2	20	20	110	55	A	2

µm				
	D ≤ 3,0	-14 — -28	d1 ≤ 3,0	0 — -6
	D ≤ 6,0	20 — -38	d1 ≤ 6,0	0 — -8
	D ≤ 10	-25 — -47	d1 ≤ 10	0 — -9
	D ≤18	-32 — -59	d1 ≤18	0 — -11
	D ≤ 30	-40 — -73	d1 ≤ 30	0 — -13

UFX18

Cutting Conditions Parametry skrawania



			Steels Stale											
			<22HRC		22 - 32HRC		30 - 40HRC		38 - 45HRC		45 - 50HRC		50 - 55HRC	
D (mm)	ae	ap	RPM	mm/ min	RPM	mm/ min	RPM	mm/ min	RPM	mm/ min	RPM	mm/ min	RPM	mm/ min
3	1,50	0,03	28223	1394	24085	1069	19205	853	14642	650	14006	622	11555	462
	0,03	1,50	37773	1964	34271	1604	30770	1440	23767	1112	22292	1043	19958	842
4	2,00	0,04	21168	1490	18064	1145	14404	913	10982	696	10504	666	8666	494
	0,04	2,00	28330	2102	25704	1717	23077	1542	17825	1191	16719	1117	14969	901
5	2,50	0,05	16934	1599	14451	1228	11523	979	8785	747	8403	714	6933	530
	0,05	2,50	22664	2253	20563	1838	18462	1651	14260	1275	13375	1196	11975	965
6	3,00	0,06	14112	1600	12043	1228	9602	979	7321	747	7003	714	5777	530
	0,06	3,00	18886	2380	17136	1943	15385	1745	11884	1348	11146	1264	9979	1018
8	4,00	0,08	10584	1651	9032	1268	7202	1011	5491	771	5252	737	4333	548
	0,08	4,00	14165	2456	12852	2005	11539	1800	8913	1390	8360	1304	7484	1051
10	5,00	0,10	8467	1389	7226	1067	5761	850	4393	648	4202	620	3466	460
	0,10	5,00	11332	2067	10281	1688	9231	1516	7130	1171	6688	1098	5987	885
12	6,00	0,12	7056	1273	6021	978	4801	780	3661	595	3501	569	2889	422
	0,12	6,00	9443	1892	8568	1546	7692	1388	5942	1072	5573	1005	4990	810
16	8,00	0,16	5292	1092	4516	839	3601	669	2745	510	2625	480	2165	355
	0,16	8,00	7082	1625	6426	1327	5769	1191	4456	920	4175	850	3740	685
20	10,0	0,20	4234	978	3613	752	2881	599	2196	457	1965	410	1625	300
	0,20	10,0	5666	1455	5141	1189	4615	1067	3565	824	3130	725	2805	585



			Steels Stale				Cast Irons Żeliwa					
			55 - 60HRC		60 - 65HRC		<180HB		180 - 250HB		>250HB	
D (mm)	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
3	1,50	0,03	7470	299	6536	235	31619	1562	26844	1192	22812	1013
	0,03	1,50	13889	586	12022	457	40000	2080	38091	1783	34271	1604
4	2,00	0,04	5602	319	4902	252	23714	1669	20133	1276	17109	1085
	0,04	2,00	10417	627	9016	487	31751	2356	28568	1908	25704	1717
5	2,50	0,05	4482	342	3922	270	18971	1791	16106	1369	13687	1163
	0,05	2,50	8333	672	7213	522	25401	2525	22855	2043	20563	1838
6	3,00	0,06	3735	343	3268	270	15809	1793	13422	1369	11406	1163
	0,06	3,00	6944	708	6011	552	21168	2667	19046	2160	17136	1943
8	4,00	0,08	2801	354	2451	279	11857	1850	10067	1413	8555	1201
	0,08	4,00	5208	731	4508	570	15876	2753	14284	2228	12852	2005
10	5,00	0,10	2241	298	1961	235	9486	1556	8053	1189	6844	1010
	0,10	5,00	4167	616	3606	480	12701	2317	11427	1876	10281	1688
12	6,00	0,12	1867	273	1634	215	7905	1426	6711	1090	5703	926
	0,12	6,00	3472	564	3005	439	10584	2121	9523	1718	8568	1546
16	8,00	0,16	1555	250	1360	195	5925	1220	5050	935	4750	845
	0,16	8,00	2890	515	2500	400	7935	1820	7180	1480	7140	1415
20	10,0	0,20	1060	195	925	150	4740	1095	4040	840	3380	690
	0,20	10,0	1970	400	1705	310	6350	1630	5745	1325	5405	1225

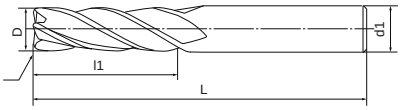
UFX19

TOROIDAL TOROIDALNE

4-Flute, Long Length 4-ostrzowe, długie

		HSM Vmax	F	M	30°	A	B					max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○	●	●	○					○	○	○				





D code Kod	R	D	d1	L	l1	Shank Uchwyt	Z
UFX19030003A06012050	0,3	3	6	50	12	A	4
UFX19040003A06015050	0,3	4	6	50	15	A	4
UFX19040005A06015050	0,5	4	6	50	15	A	4
UFX19050003A06020060	0,3	5	6	60	20	A	4
UFX19050005A06020060	0,5	5	6	60	20	A	4
UFX19060003A06020060	0,3	6	6	60	20	A	4
UFX19060005A06020060	0,5	6	6	60	20	A	4
UFX19060010A06020070	1	6	6	70	20	A	4
UFX19080003A08025070	0,3	8	8	70	25	A	4
UFX19080005A08025070	0,5	8	8	70	25	A	4
UFX19080010A08025070	1	8	8	70	25	A	4
UFX19080015A08025070	1,5	8	8	70	25	A	4
UFX19080020A08025070	2	8	8	70	25	A	4
UFX19100003A10030090	0,3	10	10	90	30	A	4
UFX19100005A10030090	0,5	10	10	90	30	A	4
UFX19100010A10030090	1	10	10	90	30	A	4
UFX19100015A10030090	1,5	10	10	90	30	A	4
UFX19100020A10030090	2	10	10	90	30	A	4
UFX19120005A12030090	0,5	12	12	90	30	A	4
UFX19120010A12030090	1	12	12	90	30	A	4
UFX19120015A12030090	1,5	12	12	90	30	A	4
UFX19120020A12030090	2	12	12	90	30	A	4
UFX19160005A16050110	0,5	16	16	110	50	A	4
UFX19160010A16050110	1	16	16	110	50	A	4
UFX19160015A16050110	1,5	16	16	110	50	A	4
UFX19160020A16050110	2	16	16	110	50	A	4
UFX19200005A20055110	0,5	20	20	110	55	A	4
UFX19200010A20055110	1	20	20	110	55	A	4
UFX19200015A20055110	1,5	20	20	110	55	A	4
UFX19200020A20055110	2	20	20	110	55	A	4

µm	D ≤ 3,0	-14 — -28	d1 ≤ 3,0	0 — -6
	D ≤ 6,0	20 — -38	d1 ≤ 6,0	0 — -8
	D ≤ 10	-25 — -47	d1 ≤ 10	0 — -9
	D ≤18	-32 — -59	d1 ≤18	0 — -11
	D ≤ 30	-40 — -73	d1 ≤ 30	0 — -13

UFX19

Cutting Conditions Parametry skrawania

			Steels Stale											
			<22HRC		22 - 32HRC		30 - 40HRC		38 - 45HRC		45 - 50HRC		50 - 55HRC	
D (mm)	ae	ap	RPM	mm/ min	RPM	mm/ min	RPM	mm/ min	RPM	mm/ min	RPM	mm/ min	RPM	mm/ min
3	1,50	0,03	28223	2788	24085	2138	19205	1706	14642	1300	14006	1244	11555	924
	0,03	1,50	37773	3928	34271	3208	30770	2880	23767	2224	22292	2086	19958	1684
4	2,00	0,04	21168	2980	18064	2290	14404	1826	10982	1392	10504	1332	8666	988
	0,04	2,00	28330	4204	25704	3434	23077	3084	17825	2382	16719	2234	14969	1802
5	2,50	0,05	16934	3198	14451	2456	11523	1958	8785	1494	8403	1428	6933	1060
	0,05	2,50	22664	4506	20563	3676	18462	3302	14260	2550	13375	2392	11975	1930
6	3,00	0,06	14112	3200	12043	2456	9602	1958	7321	1494	7003	1428	5777	1060
	0,06	3,00	18886	4760	17136	3886	15385	3490	11884	2696	11146	2528	9979	2036
8	4,00	0,08	10584	3302	9032	2536	7202	2022	5491	1542	5252	1474	4333	1096
	0,08	4,00	14165	4912	12852	4010	11539	3600	8913	2780	8360	2608	7484	2102
10	5,00	0,10	8467	2778	7226	2134	5761	1700	4393	1296	4202	1240	3466	920
	0,10	5,00	11332	4134	10281	3376	9231	3032	7130	2342	6688	2196	5987	1770
12	6,00	0,12	7056	2546	6021	1956	4801	1560	3661	1190	3501	1138	2889	844
	0,12	6,00	9443	3784	8568	3092	7692	2776	5942	2144	5573	2010	4990	1620
16	8,00	0,16	5292	2184	4516	1678	3601	1338	2745	1020	2625	960	2165	710
	0,16	8,00	7082	3250	6426	2654	5769	2382	4456	1840	4175	1700	3740	1370
20	10,0	0,20	4234	1956	3613	1504	2881	1198	2196	914	1965	820	1625	600
	0,20	10,0	5666	2910	5141	2378	4615	2134	3565	1648	3130	1450	2805	1170

			Steels Stale				Cast Iron Żeliwo					
			55 - 60HRC		60 - 65HRC		<180HB		180 - 250HB		>250HB	
D (mm)	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
3	1,50	0,03	7470	598	6536	470	31619	3124	26844	2384	22812	2026
	0,03	1,50	13889	1172	12022	914	40000	4160	38091	3566	34271	3208
4	2,00	0,04	5602	638	4902	504	23714	3338	20133	2552	17109	2170
	0,04	2,00	10417	1254	9016	974	31751	4712	28568	3816	25704	3434
5	2,50	0,05	4482	684	3922	540	18971	3582	16106	2738	13687	2326
	0,05	2,50	8333	1344	7213	1044	25401	5050	22855	4086	20563	3676
6	3,00	0,06	3735	686	3268	540	15809	3586	13422	2738	11406	2326
	0,06	3,00	6944	1416	6011	1104	21168	5334	19046	4320	17136	3886
8	4,00	0,08	2801	708	2451	558	11857	3700	10067	2826	8555	2402
	0,08	4,00	5208	1462	4508	1140	15876	5506	14284	4456	12852	4010
10	5,00	0,10	2241	596	1961	470	9486	3112	8053	2378	6844	2020
	0,10	5,00	4167	1232	3606	960	12701	4634	11427	3752	10281	3376
12	6,00	0,12	1867	546	1634	430	7905	2852	6711	2180	5703	1852
	0,12	6,00	3472	1128	3005	878	10584	4242	9523	3436	8568	3092
16	8,00	0,16	1555	500	1360	390	5925	2440	5050	1870	4750	1690
	0,16	8,00	2890	1030	2500	800	7935	3640	7180	2960	7140	2830
20	10,0	0,20	1060	390	925	300	4740	2190	4040	1680	3380	1380
	0,20	10,0	1970	800	1705	620	6350	3260	5745	2650	5405	2450

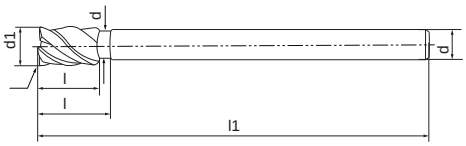
UFX05

TOROIDAL TOROIDALNE

4-Flute, Long Reach 4-ostrzowe, bardzo długie

		HSM Vmax	F	M	45°	A	B					max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○	●	●	○					○	○	○				





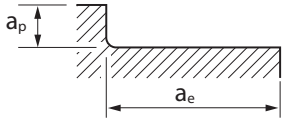
D code Kod	R	D1	d1	d2	L	l1	l2	Shank Uchwyt	Z
UFX05100005A08019130	0,5	10	8	7,5	130	15	19,2	A	4
UFX05100010A08019130	1	10	8	7,5	130	15	19,2	A	4
UFX05120005A10022150	0,5	12	10	9,5	150	18	22,2	A	4
UFX05120010A10022150	1	12	10	9,5	150	18	22,2	A	4
UFX05140005A12025160	0,5	14	12	11,5	160	21	25,2	A	4
UFX05140010A12025160	1	14	12	11,5	160	21	25,2	A	4
UFX05180005A16031180	0,5	18	16	15,5	180	27	31,2	A	4
UFX05180010A16031180	1	18	16	15,5	180	27	31,2	A	4
UFX05220005A20037200	0,5	22	20	19,5	200	33	37,2	A	4
UFX05220010A20037200	1	22	20	19,5	200	33	37,2	A	4

µm	
	D 0 — -0,02
	dz h6

UFX05

Cutting Conditions Parametry skrawania

CONTOUR CUTTING OBRÓBKA KONTUROWA

Material Materiał	Mild steels, Carbon steel. Cast iron Stal miękka, Stal węglowa, Żeliwo		Alloy steel, Tool steel Stal stopowa, Stal narzędziowa		Hardened steel, prehardened steel Stal hartowana, stal ulepszona		Hardened steel Stal hartowana					
	<22HRC		<30HRC		30 - 38HRC		38 - 45HRC		45 - 55HRC		55 - 60HRC	
D (mm)	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
10	6400	1300	6400	1000	4800	800	4800	700	4800	640	3180	420
12	5300	1300	5300	1000	4000	800	4000	700	4000	640	2650	420
14	4550	1300	4550	1000	3400	800	3400	700	3400	640	2270	420
18	3500	1300	3500	1000	2650	800	2650	700	2650	640	1750	420
22	2900	1300	2900	1000	2170	800	2170	700	2170	640	1450	420
Depth of cut Głębokość skrawania (ap×ae)	ap = 0,1xD ae = (0,03÷0,05)xD						ap=0,05xD ae=(0,02÷0,03)xD				ap=0,02xD ae=(0,02÷0,03)xD	

Above cutting conditions are for end mills whith overhang 4xd1. When the overhand of tools is bigger, please reduce above cutting conditions according to following values:

Przedstawione powyżej warunki skrawania dotyczą frezów wystających z oprawki na długość do 4 średnic narzędzia, Przy większych długościach, proszę zmniejszyć podane powyżej warunki skrawania o następujące wartości:

Type of milling Typ obróbki	Tool overhang Wystaje z oprawki na, (mm)	Speed Prędkość	Feed Posuw	ap×ae
Side milling Frezowanie obwodowe	5xD	10% - 20%	10% - 20%	
	6xD	40% - 60%	40% - 60%	(½ ap,⅓ ae)
Contour milling Frezowanie konturowe	5xD	40% - 50%	40% - 50%	
	6xD	40% - 60%	60% - 70%	(½ ap,½ ae)

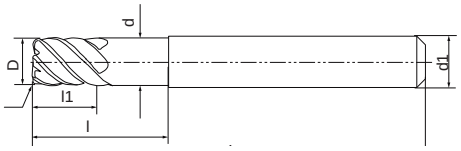
UFX97

TOROIDAL TOROIDALNE

6-Flute, Stub 6-ostrzowe, krótkie

HSM Vmax	F	M	45°	A	B					max	min		AIR
										○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○	●	●	○					○						





D code Kod	R	D	d1	d2	L	l1	l2	Shank Uchwyt	Z
UFX97060005A06006050	0,5	6	6	5,7	50	6	14	A	6
UFX97080005A08008060	0,5	8	8	7,65	60	8	24	A	6
UFX97100010A10010070	1	10	10	9,65	70	10	30	A	6
UFX97120010A12012075	1	12	12	11,6	75	12	30	A	6
UFX97060005B06006050	0,5	6	6	5,7	50	6	14	B	6
UFX97080005B08008060	0,5	8	8	7,65	60	8	24	B	6
UFX97100010B10010070	1	10	10	9,65	70	10	30	B	6
UFX97120010B12012075	1	12	12	11,6	75	12	30	B	6

Cutting Conditions Parametry skrawania



			Steels Stale							
			22 - 30HRC		30 - 45HRC		45 - 50HRC		50 - 55HRC	
D (mm)	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
3	0,30	0,05	30000	4197	30000	4197	30000	4197	25235	3530
4	0,40	0,06	30000	4800	30000	4800	25501	4080	19142	3063
5	0,40	0,09	30000	5400	24479	4406	20745	3734	15570	2803
6	0,50	0,10	25523	5054	20683	4095	17532	3471	13157	2605
8	0,60	0,15	19053	4344	15440	3520	13086	2984	9822	2239
10	0,60	0,25	14854	3862	12040	3130	10200	2652	7657	1991
12	0,70	0,30	12522	3506	10149	2842	8600	2408	6455	1807
16	0,80	0,50	8997	3239	7493	2697	6348	2285	4765	1715
20	1,00	0,60	6464	2992	5532	2559	4685	2168	3517	1627
25	1,25	0,75	4644	2763	4084	2428	3457	2056	2595	1543



			Steels Stale				Grey Cast Irons Żeliwa szare			
			55 - 60HRC		60 - 65HRC		180 - 250HB		>250HB	
D (mm)	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
3	0,30	0,05	15602	2183	10432	1459	30000	4197	30000	4197
4	0,40	0,06	11837	1894	7914	1266	30000	4800	30000	4800
5	0,40	0,09	9629	1733	6438	1159	30000	5400	30000	5400
6	0,50	0,10	8137	1611	5441	1077	29226	5787	25523	5054
8	0,60	0,15	6074	1385	4062	926	21755	4960	19053	4344
10	0,60	0,25	4735	1231	3166	823	16694	4340	14854	3862
12	0,70	0,30	3992	1118	2669	747	14175	3969	12522	3506
16	0,80	0,50	2947	1061	1970	709	10389	3740	9244	3328
20	1,00	0,60	2175	1006	1454	672	7614	3524	6824	3159
25	1,25	0,75	1605	954	1073	637	5580	3320	5037	2998

µm	D = 6	-15 — -38	d1 h6
	D > 9	-20 — -47	

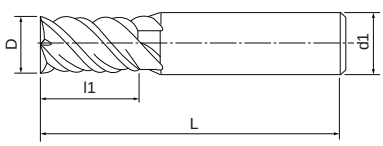
UFX20

TOROIDAL TOROIDALNE

4-Flute, Long Reach 4-ostrzowe, bardzo długie

		HSM Vmax	F	M	45°	A	B					max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●	●	●		○	●	●		○			○	○





D code new Nowy kod	D code kod	R	D	d1	L	l1	Shank Uchwyt	Z
UFX20030002A06008060	UFX200302	0,2	3	6	60	8	A	4
UFX20030005A06008060	UFX200305	0,5	3	6	60	8	A	4
UFX20040002A06011060	UFX200402	0,2	4	6	60	11	A	4
UFX20040005A06011060	UFX200405	0,5	4	6	60	11	A	4
UFX20040010A06011060	UFX200410	1	4	6	60	11	A	4
UFX20050002A06013060	UFX200502	0,2	5	6	60	13	A	4
UFX20050005A06013060	UFX200505	0,5	5	6	60	13	A	4
UFX20050010A06013060	UFX200510	1	5	6	60	13	A	4
UFX20060003A06013060	UFX200603	0,3	6	6	60	13	A	4
UFX20060005A06013060	UFX200605	0,5	6	6	60	13	A	4
UFX20060010A06013060	UFX200610	1	6	6	60	13	A	4
UFX20080003A08019060	UFX200803	0,3	8	8	60	19	A	4
UFX20080005A08019060	UFX200805	0,5	8	8	60	19	A	4
UFX20080010A08019060	UFX200810	1	8	8	60	19	A	4
UFX20080015A08019060	UFX200815	1,5	8	8	60	19	A	4
UFX20080020A08019060	UFX200820	2	8	8	60	19	A	4
UFX20100003A10022075	UFX201003	0,3	10	10	75	22	A	4
UFX20100005A10022075	UFX201005	0,5	10	10	75	22	A	4
UFX20100010A10022075	UFX201010	1	10	10	75	22	A	4
UFX20100015A10022075	UFX201015	1,5	10	10	75	22	A	4
UFX20100020A10022075	UFX201020	2	10	10	75	22	A	4
UFX20100030A10022075	UFX201030	3	10	10	75	22	A	4
UFX20120005A12026100	UFX201205	0,5	12	12	100	26	A	4
UFX20120010A12026100	UFX201210	1	12	12	100	26	A	4
UFX20120015A12026100	UFX201215	1,5	12	12	100	26	A	4
UFX20120020A12026100	UFX201220	2	12	12	100	26	A	4
UFX20120030A12026100	UFX201230	3	12	12	100	26	A	4
UFX20160010A16032100	UFX201610	1	16	16	100	32	A	4
UFX20160015A16035100	UFX201615	1,5	16	16	100	35	A	4
UFX20160020A16035100	UFX201620	2	16	16	100	35	A	4
UFX20160030A16035100	UFX201630	3	16	16	100	35	A	4
UFX20200010A20040100	UFX202010	1	20	20	100	40	A	4
UFX20200015A20040100	UFX202015	1,5	20	20	100	40	A	4
UFX20200020A20040100	UFX202020	2	20	20	100	40	A	4
UFX20200030A20040100	UFX202030	3	20	20	100	40	A	4

µm	D 0 — -20		

UFX20

Cutting Conditions Parametry skrawania

Material Materiał	Mild steels, Carbon steel. Cast iron Stal miękka, Stal węglowa, Żeliwo				Alloy steel, Tool steel Stal stopowa, Stal narzędziowa				Hardened steel, Prehardened steel (Free-cutting) Stal hartowana, Stal ulepszona (automatowa)				Hardened steel, Stainless steel Stal hartowana, Stal nierdzewna				Hardened steel, Titanium alloys, Heat resistant alloy steel Stal hartowana, Stopy tytanu, Stal stopowa żaroodporna				Hardened steel Stal hartowana			
	<750N/mm²				<30HRC				30 - 38HRC				38 - 45HRC				45 - 55HRC				55 - 60HRC			
D (mm)	FO		HFO		FO		HFO		FO		HFO		FO		HFO		FO		HFO		FO		HFO	
	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
3	10070	926	20140	2043	7885	722	20140	2280	6650	532	20140	1235	6270	527	15105	1093	5733	461	10070	646	3040	181	8075	418
4	7553	950	15105	1948	5890	779	15105	2185	4988	537	15105	1235	4703	561	11305	1188	4513	489	7553	755	2280	181	6033	437
5	6033	998	12065	1805	4703	803	12065	2043	3990	561	12065	1188	3753	599	9073	1283	3610	508	6033	798	1805	181	4845	485
6	5035	1188	10070	2898	3943	898	10070	2518	3325	665	10070	1900	3135	627	7553	1378	3040	518	5035	865	1520	181	4038	580
8	3800	1188	7553	2660	2945	850	7553	2280	2518	627	7553	1805	2328	608	5653	1330	2280	527	3800	817	1140	166	3040	546
10	3040	1045	6033	2423	2375	812	6033	2090	1995	575	6033	1758	1853	561	4513	1283	1805	499	3040	789	907	152	2423	485
12	2518	1045	5035	2423	1948	808	5035	2090	1663	537	5035	1710	1568	508	3800	1283	1520	451	2518	789	755	152	1995	485
16	1900	907	3800	1805	1473	708	3800	1805	1235	475	3800	1615	1188	423	2850	1283	1140	380	1900	789	565	152	1520	485
20	1520	727	3040	1473	1188	565	3040	1473	998	432	3040	1473	936	375	2280	1093	907	337	1520	694	451	152	1188	485

Depth of cut
Głębokość skrawania

FO	ap	ae
	1.5xD	0.2xD

HFO	ap	ae
d1<6	1.5xD	0.02xD
6≤d1	1.5xD	0.05xD

aeMax=0.5mm

FO	ap	ae
	1.5xD	0.1xD

HFO	ap	ae
D<6	1.5xD	0.01xD
6≤d1	1.5xD	0.02xD

aeMax=0.5mm

FO	ap	ae
	1xD	0.05xD

HFO	ap	ae
D<6	1xD	0.01xD
6≤D	1xD	0.02xD

aeMax=0.5mm

Material Materiał	Mild steels, Carbon steel. Cast iron Stal miękka, Stal węglowa, Żeliwo				Alloy steel, Tool steel Stal stopowa, Stal narzędziowa				Hardened steel, Prehardened steel (Free-cutting) Stal hartowana, Stal ulepszona (automatowa)				Hardened steel, Stainless steel Stal hartowana, Stal nierdzewna				Hardened steel, Titanium alloys, Heat resistant alloy steel Stal hartowana, Stopy tytanu, Stal stopowa żaroodporna		Hardened steel Stal hartowana	
	<750N/mm²				<30HRC				30 - 38HRC				38 - 45HRC				45 - 55HRC		55 - 60HRC	
D (mm)	FR		HFR		FR		HFR		FR		HFR		FR		HFR		FR		FR	
	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
3	8075	670	12065	998	6033	911	10070	888	5558	432	9073	708	5225	380	6033	437	4228	304	1995	105
4	6033	670	9073	1093	4513	641	7553	950	4180	432	6793	708	3943	428	4893	532	3183	342	1520	114
5	4845	679	7268	1140	3610	627	6650	1045	3325	451	6033	822	3135	451	3943	565	2518	366	1188	119
6	4038	679	3468	1473	3040	532	5558	1093	2755	475	5035	865	2613	470	3515	637	2138	380	998	119
8	3040	627	4513	1378	2280	523	4180	1235	2090	518	3800	936	1948	489	2660	656	1568	394	755	119
10	2423	580	3610	1330	1805	508	3325	1140	1663	451	3040	822	1568	447	2138	603	1283	361	603	109
12	1995	580	3040	1188	1520	451	2755	1093	1378	428	2518	774	1330	418	1758	565	1045	337	504	109
16	1520	580	2280	998	1140	409	2090	917	1045	352	1900	641	998	352	1330	475	793	285	380	84
20	1188	485	1805	798	907	361	1663	732	831	333	1520	603	789	314	1045	423	637	252	304	85

Depth of cut
Głębokość skrawania

FR ap=0.5xD

HFR ap=0.2xD
apMax=3mm

ap=0.05xD

(H)FO (mm/min) — (HIGH SPEED) SIDE CUTTING

(H)FR (mm/min) — (HIGH SPEED) SLOTTING

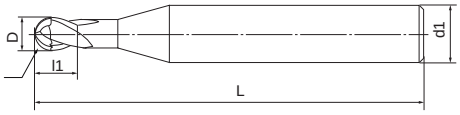
UFX65

BALL NOSE KULISTE

2-Flute, Miniature 2-ostrzowe, miniaturowe

HSM Vmax	F	M	30°	A	B					max	min		AIR
										○	●	●	●

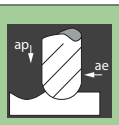
P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○	●	●	○					○						





D code Kod	R	D	d1	L	l1	Shank Uchwyt	Z
UFX65004002A03001040	0,2	0,4	3	40	0,7	A	2
UFX65005003A03001040	0,25	0,5	3	40	0,9	A	2
UFX65006003A03001040	0,3	0,6	3	40	1,1	A	2
UFX65007004A03002040	0,35	0,7	3	40	1,5	A	2
UFX65008004A03002040	0,4	0,8	3	40	2	A	2
UFX65009005A03002040	0,45	0,9	3	40	2,2	A	2
UFX65010005A03003040	0,5	1	3	40	2,5	A	2
UFX65011006A03003040	0,55	1,1	3	40	3	A	2
UFX65012006A03003040	0,6	1,2	3	40	3	A	2
UFX65013007A03004040	0,65	1,3	3	40	3,5	A	2
UFX65014007A03004040	0,7	1,4	3	40	3,5	A	2
UFX65015008A03004040	0,75	1,5	3	40	4	A	2
UFX65020010A03005040	1	2	3	40	5	A	2
UFX65030015A03008040	1,5	3	3	40	8	A	2

Cutting Conditions Parametry skrawania

	Non-alloyed, alloy steels, cast iron Stale stopowe, niestopowe, żeliwo					Hardened steel Stal hartowana		
	30 - 45HRC					45 - 55HRC		
D (mm)	ae	ap	RPM	mm/min	ae	ap	RPM	mm/min
0,4	0,020	0,060	30000	490	0,020	0,040	30000	225
0,5	0,025	0,075	30000	490	0,025	0,050	30000	225
0,6	0,030	0,090	30000	600	0,030	0,060	30000	300
0,8	0,040	0,120	27000	650	0,040	0,080	27000	380
1,0	0,075	0,150	25000	650	0,050	0,150	25000	400
1,2	0,090	0,180	24000	670	0,060	0,180	24000	410
1,5	0,1125	0,225	23000	700	0,075	0,225	23000	430
2,0	0,150	0,300	19000	570	0,100	0,300	19000	320
3,0	0,225	0,450	14000	480	0,150	0,450	14000	280

µm	d1 0 — - 6		R	± 0,01
	D -14 — -28			

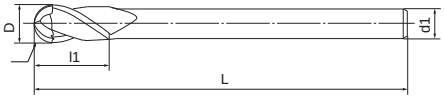
UFX76

BALL NOSE KULISTE

2-Flute, Long Length 2-ostrzowe, długie

HSM Vmax	F	M	30°	A	B	max	min	AIR
						○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○	●	●	○	○				○						





D code Kod	R	D	d1	L	l1	Shank Uchwyt	Z
UFX76010005A03003038	0,5	1	3	38	3	A	2
UFX76012006A03003038	0,6	1,2	3	38	3	A	2
UFX76015008A03003038	0,75	1,5	3	38	3	A	2
UFX76020010A06003050	1	2	6	50	3	A	2
UFX76025013A06004050	1,25	2,5	6	50	4	A	2
UFX76030015A06004050	1,5	3	6	50	4	A	2
UFX76040020A06005054	2	4	6	54	5	A	2
UFX76050025A06006054	2,5	5	6	54	6	A	2
UFX76060030A06007054	3	6	6	54	7	A	2
UFX76070035A08008058	3,5	7	8	58	8	A	2
UFX76080040A08009058	4	8	8	58	9	A	2
UFX76090045A10010066	4,5	9	10	66	10	A	2
UFX76100050A10011066	5	10	10	66	11	A	2
UFX76120060A12012073	6	12	12	73	12	A	2
UFX76140070A14014075	7	14	14	75	14	A	2
UFX76160080A16016082	8	16	16	82	16	A	2
UFX76180090A18018084	9	18	18	84	18	A	2
UFX76200100A20020092	10	20	20	92	20	A	2
UFX76250125A25025104	12,5	25	25	104	25	A	2

µm	D ≤ 3,0	-14 — -28	d1 ≤ 3,0	0 — -6	R	± 0,02
	D ≤ 6,0	20 — -38	d1 ≤ 6,0	0 — -8		
	D ≤ 10	-25 — -47	d1 ≤ 10	0 — -9		
	D ≤18	-32 — -59	d1 ≤18	0 — -11		
	D ≤ 30	-40 — -73	d1 ≤ 30	0 — -13		

UFX76

Cutting Conditions Parametry skrawania

			Steels Stale							
			22 - 30HRC		30 - 45HRC		45 - 50HRC		50 - 55HRC	
D (mm)	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
1	0,10	0,02	40000	2128	40000	2128	40000	2128	40000	2128
2	0,20	0,03	40000	4480	40000	4480	40000	4480	40000	4480
3	0,30	0,05	40000	5600	40000	5600	40000	5600	40000	5600
4	0,40	0,06	40000	8000	40000	8000	39601	7920	29727	5945
5	0,40	0,09	40000	9000	34559	7776	32215	7248	24180	5440
6	0,50	0,10	36033	8918	29200	7227	27225	6738	20433	5057
8	0,60	0,15	26261	7666	21798	6212	20322	5792	15252	4347
10	0,60	0,25	20970	6815	16998	5524	15840	5148	11891	3865
12	0,70	0,30	17678	6187	14328	5015	13355	4674	10024	3508
16	0,80	0,50	13051	5873	10578	4760	9858	4436	7400	3330
20	1,00	0,60	10485	5242	8499	4250	7920	3960	5945	2972

			Steels Stale				Grey Cast Irons Żeliwa szare			
			55 - 60HRC		60 - 65HRC		180 - 250HB		>250HB	
D (mm)	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
1	0,10	0,02	40000	2128	35332	1880	40000	2128	40000	2128
2	0,20	0,03	27056	3030	18303	2050	40000	4480	40000	4480
3	0,30	0,05	17825	2496	12096	1693	40000	5600	40000	5600
4	0,40	0,06	18382	3676	12290	2458	40000	8000	40000	8000
5	0,40	0,09	14953	3364	9998	2250	40000	9000	40000	9000
6	0,50	0,10	12636	3127	8450	2091	40000	9900	36033	8918
8	0,60	0,15	9432	2688	6307	1797	30713	8753	26898	7666
10	0,60	0,25	7353	2390	4916	1598	23568	7660	20970	6815
12	0,70	0,30	6199	2170	4145	1451	20011	7004	17678	6187
16	0,80	0,50	4576	2059	3059	1377	14667	6600	13051	5873
20	1,00	0,60	3676	1838	2458	1229	11784	5892	10485	5242

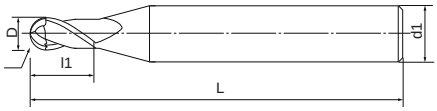
UFX13

BALL NOSE KULISTE

2-Flute, Long Length 2-ostrzowe, długie

HSM Vmax	F	M	30°	A	B	max	min	AIR
						○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○	●	●	○	○				○						





D code new Nowy kod	D code kod	R	D	d1	L	l1	Shank Uchwyt	Z
UFX13010005A04003050	UFX13010	0,5	1	4	50	2,5	A	2
UFX13010005A06003050	UFX13901	0,5	1	6	50	2,5	A	2
UFX13012006A04003050	UFX13012	0,6	1,2	4	50	3	A	2
UFX13015008A04004050	UFX13015	0,75	1,5	4	50	4	A	2
UFX13015008A06004050	UFX13902	0,75	1,5	6	50	4	A	2
UFX13020010A06005050	UFX13020	1	2	6	50	5	A	2
UFX13025013A06006060	UFX13025	1,25	2,5	6	60	6	A	2
UFX13030015A06008060	UFX13030	1,5	3	6	60	8	A	2
UFX13035018A06008070	UFX13035	1,75	3,5	6	70	8	A	2
UFX13040020A06008070	UFX13040	2	4	6	70	8	A	2
UFX13050025A06010080	UFX13050	2,5	5	6	80	10	A	2
UFX13060030A06012090	UFX13060	3	6	6	90	12	A	2
UFX13070035A08014090	UFX13070	3,5	7	8	90	14	A	2
UFX13080040A08014100	UFX13080	4	8	8	100	14	A	2
UFX13090045A10018100	UFX13090	4,5	9	10	100	18	A	2
UFX13100050A10018100	UFX13100	5	10	10	100	18	A	2
UFX13120060A12022110	UFX13120	6	12	12	110	22	A	2
UFX13140070A14026110	UFX13140	7	14	14	110	26	A	2
UFX13140070A16026110	UFX13903	7	14	16	110	26	A	2
UFX13160080A16030140	UFX13160	8	16	16	140	30	A	2
UFX13180090A18034140	UFX13180	9	18	18	140	34	A	2
UFX13200100A20038160	UFX13200	10	20	20	160	38	A	2
UFX13250125A25050180	UFX13250	12,5	25	25	180	50	A	2

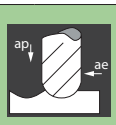
µm					R	
	D ≤ 3,0	-14 — -28	d1 ≤ 3,0	0 — -6		± 0,02
	D ≤ 6,0	20 — -38	d1 ≤ 6,0	0 — -8		
	D ≤ 10	-25 — -47	d1 ≤ 10	0 — -9		
	D ≤18	-32 — -59	d1 ≤18	0 — -11		
	D ≤ 30	-40 — -73	d1 ≤ 30	0 — -13		

UFX13

Cutting Conditions Parametry skrawania



			Steels Stale							
			22 - 30HRC		30 - 45HRC		45 - 50HRC		50 - 55HRC	
D (mm)	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
1	0,10	0,02	34000	1805	34000	1805	34000	1805	34000	1805
1,5	0,15	0,03	34000	3100	34000	3100	34000	3100	34000	3100
2	0,20	0,03	34000	3805	34000	3805	34000	3805	34000	3805
3	0,30	0,05	34000	4760	34000	4760	33910	4745	24530	3430
4	0,40	0,06	34000	5440	29420	4705	25700	4110	18600	2975
5	0,40	0,09	30245	5445	23970	4310	20940	3765	15150	2725
6	0,50	0,10	25565	5060	20245	4005	17675	3500	12805	2535
7	0,50	0,15	21220	4540	16770	3585	14645	3130	10590	2265
8	0,60	0,15	19070	4345	15115	3445	13190	3005	9535	2170
10	0,60	0,25	14880	3865	11765	3060	10280	2670	7440	1930
12	0,70	0,30	12535	3505	9920	2775	8680	2430	6265	1755
16	0,80	0,50	9265	3335	7320	2635	6390	2300	4630	1665
20	1,00	0,60	7440	2975	5880	2350	5140	2055	3720	1485



			Steels Stale				Grey Cast Irons Żeliwa szare			
			55 - 60HRC		60 - 65HRC		180 - 250HB		>250HB	
D (mm)	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
1	0,10	0,02	34000	1805	30030	1595	34000	1805	34000	1805
1,5	0,30	0,30	14610	395	9740	265	34000	920	34000	920
2	0,40	0,40	10955	435	7265	290	34000	1360	34000	1360
3	0,20	0,03	19115	2675	12985	1815	34000	4760	34000	4760
4	0,30	0,05	13390	2140	9130	1460	34000	5440	34000	5440
5	0,40	0,09	9360	1685	6330	1135	34000	6120	30300	5450
6	0,50	0,10	7935	1570	5365	1060	29265	5790	25610	5070
7	0,50	0,15	6570	1405	4440	950	24310	5200	21220	4540
8	0,60	0,15	5915	1345	3990	905	21845	4980	19105	4355
10	0,60	0,25	4595	1195	3110	805	17045	4430	14880	3865
12	0,70	0,30	3875	1085	2615	730	14360	4020	12555	3515
16	0,80	0,50	2855	1025	1940	700	10600	3815	9265	3335
20	1,00	0,60	2300	915	1555	620	8520	3405	7440	2975

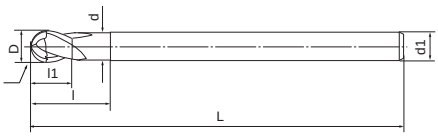
UFX78

BALL NOSE KULISTE

2-Flute, With Neck 2-ostrzowe, ze zwężoną szyjką

HSM Vmax	F	M	30°	A	B	max	min	AIR
						○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
	●	●	○	○				○						





D code new Nowy kod	D code kod	R	d1	d2	d3	l1	l2	l3	Shank Uchwyt	Z
UFX78010005A04001050	UFX78010	0,5	1	4	0,95	50	2,2	1	A	2
UFX78010005A06001050	UFX78901	0,5	1	6	0,95	50	2,2	1	A	2
UFX78012006A04001050	UFX78012	0,6	1,2	4	1,1	50	2,6	1,2	A	2
UFX78015008A04002050	UFX78015	0,75	1,5	4	1,4	50	3	1,5	A	2
UFX78020010A06002050	UFX78020	1	2	6	1,9	50	4	2	A	2
UFX78025013A06003060	UFX78025	1,25	2,5	6	2,4	60	5	2,5	A	2
UFX78030015A06003060	UFX78030	1,5	3	6	2,9	60	6	3	A	2
UFX78040020A06004070	UFX78040	2	4	6	3,9	70	8	4	A	2
UFX78050025A06005080	UFX78050	2,5	5	6	4,9	80	10	5	A	2
UFX78060030A06006090	UFX78060	3	6	6	5,9	90	12	6	A	2
UFX78070035A08007090	UFX78070	3,5	7	8	6,9	90	14	7	A	2
UFX78080040A08008100	UFX78080	4	8	8	7,9	100	16	8	A	2
UFX78090045A10009100	UFX78090	4,5	9	10	8,9	100	18	9	A	2
UFX78100050A10010100	UFX78100	5	10	10	9,9	100	20	10	A	2
UFX78120060A12012110	UFX78120	6	12	12	11,9	110	24	12	A	2
UFX78140070A14014110	UFX78140	7	14	14	13,8	110	28	14	A	2
UFX78160080A16016140	UFX78160	8	16	16	15,8	140	32	16	A	2
UFX78180090A18018140	UFX78180	9	18	18	17,8	140	36	18	A	2
UFX78200100A20020160	UFX78200	10	20	20	19,8	160	40	20	A	2
UFX78250125A25025180	UFX78250	12,5	25	25	24,8	180	50	25	A	2

µm	D ≤ 3,0	-14 — -28	d1 ≤ 3,0	0 — -6	R	± 0,02
	D ≤ 6,0	20 — -38	d1 ≤ 6,0	0 — -8		
	D ≤ 10	-25 — -47	d1 ≤ 10	0 — -9		
	D ≤18	-32 — -59	d1 ≤18	0 — -11		
	D ≤ 30	-40 — -73	d1 ≤ 30	0 — -13		

UFX78

Cutting Conditions Parametry skrawania



			Steels Stale							
			22 - 30HRC		30 - 45HRC		45 - 50HRC		50 - 55HRC	
D (mm)	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
1	0,10	0,02	34000	1805	34000	1805	34000	1805	34000	1805
1,5	0,15	0,03	34000	3100	34000	3100	34000	3100	34000	3100
2	0,20	0,03	34000	3805	34000	3805	34000	3805	34000	3805
3	0,30	0,05	34000	4760	34000	4760	33910	4745	24530	3430
4	0,40	0,06	34000	5440	29420	4705	25700	4110	18600	2975
5	0,40	0,09	30245	5445	23970	4310	20940	3765	15150	2725
6	0,50	0,10	25565	5060	20245	4005	17675	3500	12805	2535
7	0,50	0,15	21220	4540	16770	3585	14645	3130	10590	2265
8	0,60	0,15	19070	4345	15115	3445	13190	3005	9535	2170
10	0,60	0,25	14880	3865	11765	3060	10280	2670	7440	1930
12	0,70	0,30	12535	3505	9920	2775	8680	2430	6265	1755
16	0,80	0,50	9265	3335	7320	2635	6390	2300	4630	1665
20	1,00	0,60	7440	2975	5880	2350	5140	2055	3720	1485



			Steels Stale				Grey Cast Irons Żeliwa szare			
			55 - 60HRC		60 - 65HRC		180 - 250HB		>250HB	
D (mm)	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
1	0,10	0,02	34000	1805	30030	1595	34000	1805	34000	1805
1,5	0,30	0,30	14610	395	9740	265	34000	920	34000	920
2	0,40	0,40	10955	435	7265	290	34000	1360	34000	1360
3	0,20	0,03	19115	2675	12985	1815	34000	4760	34000	4760
4	0,30	0,05	13390	2140	9130	1460	34000	5440	34000	5440
5	0,40	0,09	9360	1685	6330	1135	34000	6120	30300	5450
6	0,50	0,10	7935	1570	5365	1060	29265	5790	25610	5070
7	0,50	0,15	6570	1405	4440	950	24310	5200	21220	4540
8	0,60	0,15	5915	1345	3990	905	21845	4980	19105	4355
10	0,60	0,25	4595	1195	3110	805	17045	4430	14880	3865
12	0,70	0,30	3875	1085	2615	730	14360	4020	12555	3515
16	0,80	0,50	2855	1025	1940	700	10600	3815	9265	3335
20	1,00	0,60	2300	915	1555	620	8520	3405	7440	2975

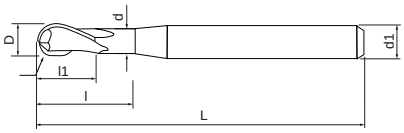
UFX53

BALL NOSE KULISTE

2-Flute 2-ostrzowe



P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
		○	●	●				○						





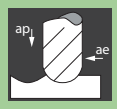
D code Kod	R	D	d1	d2	L	l1	l2	Shank Uchwyt	Z
UFX53010001A04001050	0,5	1.0	4	0.95	50	1	2.2	A	2
UFX53012001A04001050	0,6	1.2	4	1.1	50	1.2	2.6	A	2
UFX53015001A04002050	0,75	1.5	4	1.4	50	1.5	3	A	2
UFX53020001A06002050	1	2.0	6	1.9	50	2	4	A	2
UFX53030002A06003060	1,5	3.0	6	2.9	60	3	6	A	2
UFX53040002A06004070	2	4.0	6	3.9	70	4	8	A	2
UFX53050003A06005080	2,5	5.0	6	4.9	80	5	10	A	2
UFX53060003A06006090	3	6.0	6	5.9	90	6	12	A	2
UFX53070004A08007090	3,5	7.0	8	6.9	90	7	14	A	2
UFX53080004A08008100	4	8.0	8	7.9	100	8	16	A	2
UFX53090005A10009100	4,5	9.0	10	8.9	100	9	18	A	2
UFX53100005A10010100	5	10.0	10	9.9	100	10	20	A	2
UFX53120006A12012110	6	12.0	12	11.9	110	12	24	A	2
UFX53140007A14014110	7	14.0	14	13.8	110	14	28	A	2
UFX53160008A16016140	8	16.0	16	15.8	140	16	32	A	2
UFX53180009A18018140	9	18.0	18	17.8	140	18	36	A	2
UFX53200010A20020160	10	20.0	20	19.8	160	20	40	A	2
UFX53250013A25025180	12,5	25.0	25	24.8	180	25	50	A	2

µm	D 0~-0.03				R	± 0,01
	d1 h6					

UFX53

Cutting Conditions Parametry skrawania

Normal Speed / Standardowa prędkość

			Hardened Steels Stale hartowane		Hardened Steels Stale hartowane		Hardened Steels Stale hartowane		Hardened Steels Stale hartowane	
			45 HRC ~ 50 HRC		50 HRC ~ 55 HRC		55 HRC ~ 60 HRC		60 HRC ~ 70 HRC	
D (mm)	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
R0.5 x1.0	0,1	0,05	20000	460	20000	400	20000	350	20000	240
R0.75x1.5	0,15	0,075	16300	640	16100	580	16000	570	14200	360
R1.0 X2.0	0,2	0,1	14500	800	14200	740	13850	760	11300	465
R1.25X2.5	0,25	0,125	13400	950	13000	890	12600	920	9600	560
R1.5 X3.0	0,3	0,15	12700	1100	12300	1050	11800	1000	8400	660
R2.0 X4.0	0,4	0,2	10600	1100	10300	1050	9800	1000	6650	650
R2.5 X5.0	0,5	1,25	9400	1100	9050	1050	8600	950	5600	680
R3.0 X6.0	0,6	1,5	8600	1150	8250	1100	7850	950	4850	700
R4.0 X8.0	0,8	2	7000	1050	6700	1000	6350	950	3800	650
R5.0 X10.0	1	3	6050	1000	5800	960	5450	900	3200	620
R6.0 X12.0	1,2	3,6	5450	1000	5200	960	4900	900	2750	610
R8.0 X16.0	1,6	4,8	4350	870	4150	830	3900	820	2150	265
R10.0X20.0	2	6	3500	690	3300	650	3150	630	1700	220

High Speed / Wysoka prędkość

			Hardened Steels Stale hartowane		Hardened Steels Stale hartowane		Hardened Steels Stale hartowane	
			45 HRC ~ 50 HRC		50 HRC ~ 55 HRC		55 HRC ~ 70 HRC	
D (mm)	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min
R0.5 X 1.0	0,1	0,05	20000	770	20000	700	20000	410
R0.75 X 1.5	0,15	0,075	16300	1050	16100	980	16000	580
R1.0 X 2.0	0,2	0,1	14500	1300	14200	1230	13850	700
R1.25X 2.5	0,25	0,125	13400	1500	13000	1430	12600	780
R1.5 X 3.0	0,3	0,15	12700	1750	12300	1670	11800	860
R2.0 X 4.0	0,4	0,2	10600	1700	10300	1620	9800	860
R2.5 X 5.0	0,5	1,25	9400	1650	9050	1570	8600	860
R3.0 X 6.0	0,6	1,5	8600	1750	8250	1670	7850	865
R4.0 X 8.0	0,8	2	7000	1550	6700	1460	6350	890
R5.0 X 10.0	1	3	6050	1450	5800	1360	5450	870
R6.0 X 12.0	1,2	3,6	5450	1420	5200	1330	4900	785
R8.0 X 16.0	1,6	4,8	4350	1230	4150	1130	3900	485
R10.0X 20.0	2	6	3500	1000	3300	900	3150	410

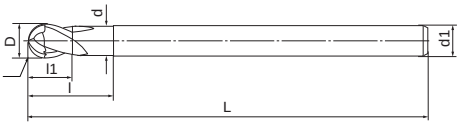
UFX99

BALL NOSE KULISTE

2-Flute 2-ostrzowe

HSM Vmax	F	M	30°	A	B					max	min		AIR
										○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○	●	●	○	○				○						





D code new Nowy kod	D code kod	R	D	d1	d2	L	l1	l2	Shank Uchwyt	Z
UFX99030015A06008070	UFX99030	1,5	3	6	-	70	8	-	A	2
UFX99040020A06008070	UFX99040	2	4	6	-	70	8	-	A	2
UFX99050025A06012080	UFX99050	2,5	5	6	-	80	12	-	A	2
UFX99060030A06012080	UFX99060	3	6	6	5,8	80	12	22	A	2
UFX99070035A08014090	UFX99070	3,5	7	8	-	90	14	-	A	2
UFX99080040A08014090	UFX99080	4	8	8	7,8	90	14	27	A	2
UFX99100050A10018100	UFX99100	5	10	10	9,8	100	18	31	A	2
UFX99120060A12022110	UFX99120	6	12	12	11,8	110	22	35	A	2
UFX99140070A12026120	UFX99140	7	14	12	0	120	26	-	A	2
UFX99160080A16030140	UFX99160	8	16	16	15,8	140	30	50	A	2
UFX99180090A16034140	UFX99180	9	18	16	0	140	34	-	A	2
UFX99200100A20038160	UFX99200	10	20	20	19,8	160	38	58	A	2
UFX99250125A25055180	UFX99250	12,5	25	25	24,8	180	55	75	A	2

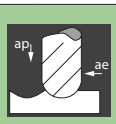
µm					R	
	D < 6,0	0 — -28				R ≤ 6,5 ± 0,01
	D ≥ 6,0	0 — -38				R ≤ 6,5 ± 0,02

UFX99

Cutting Conditions Parametry skrawania



			Steels Stale							
			22 - 30HRC		30 - 45HRC		45 - 50HRC		50 - 55HRC	
D (mm)	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
3	0,30	0,05	40000	5596	39678	5551	33619	4703	25235	3530
4	0,40	0,06	37135	5942	30100	4816	25501	4080	19142	3063
5	0,40	0,09	30205	5437	24479	4406	20745	3734	15570	2803
6	0,50	0,10	25523	5054	20683	4095	17532	3471	13157	2605
8	0,60	0,15	19053	4344	15440	3520	13086	2984	9822	2239
10	0,60	0,25	14854	3862	12040	3130	10200	2652	7657	1991
12	0,70	0,30	12522	3506	10149	2842	8600	2408	6455	1807
16	0,80	0,50	8997	3239	7493	2697	6348	2285	4765	1715
20	1,00	0,60	6464	2992	5532	2559	4685	2168	3517	1627
25	1,25	0,75	4644	2763	4084	2428	3457	2056	2595	1543



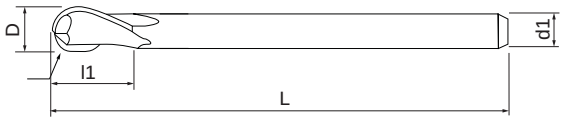
			Steels Stale				Grey Cast Irons Żeliwa szare			
			55 - 60HRC		60 - 65HRC		180 - 250HB		>250HB	
D (mm)	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
3	0,30	0,05	15602	2183	10432	1459	40000	5596	40000	5596
4	0,40	0,06	11837	1894	7914	1266	40000	6400	37135	5942
5	0,40	0,09	9629	1733	6438	1159	34297	6173	30205	5437
6	0,50	0,10	8137	1611	5441	1077	29226	5787	25523	5054
8	0,60	0,15	6074	1385	4062	926	21755	4960	19053	4344
10	0,60	0,25	4735	1231	3166	823	16694	4340	14854	3862
12	0,70	0,30	3992	1118	2669	747	14175	3969	12522	3506
16	0,80	0,50	2947	1061	1970	709	10389	3740	9244	3328
20	1,00	0,60	2175	1006	1454	672	7614	3524	6824	3159
25	1,25	0,75	1605	954	1073	637	5580	3320	5037	2998

UFX51 NEW

BALL NOSE KULISTE
2-Flute 2-ostrzowe

		HSM Vmax	F	M	30°	A						max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○	●	●	○					○						





D code Kod	R	D	d1	L	l1	Shank Uchwyt	Z
UFX5100104Y50A001040	0,05	0,1	4	40	0,1	A	2
UFX5100104Y50A002040	0,05	0,1	4	40	0,2	A	2
UFX5100103Y50A002040	0,05	0,1	3	40	0,2	A	2
UFX5100204Y75A002040	0,075	0,15	4	40	0,15	A	2
UFX5100204Y75A003040	0,075	0,15	4	40	0,3	A	2
UFX5100203Y75A003040	0,075	0,15	3	40	0,3	A	2
UFX5100204001A002040	0,1	0,2	4	40	0,2	A	2
UFX5100204001A004040	0,1	0,2	4	40	0,4	A	2
UFX5100203001A004040	0,1	0,2	3	40	0,4	A	2
UFX5100304X15A003040	0,15	0,3	4	40	0,3	A	2
UFX5100304X15A006040	0,15	0,3	4	40	0,6	A	2
UFX5100303X15A006040	0,15	0,3	3	40	0,6	A	2
UFX5100404002A004040	0,2	0,4	4	40	0,4	A	2
UFX5100404002A008040	0,2	0,4	4	40	0,8	A	2
UFX5100403002A008040	0,2	0,4	3	40	0,8	A	2
UFX5100504X25A005040	0,25	0,5	4	40	0,5	A	2
UFX5100504X25A010040	0,25	0,5	4	40	1	A	2
UFX5100503X25A010040	0,25	0,5	3	40	1	A	2
UFX5100604003A006040	0,3	0,6	4	40	0,6	A	2
UFX5100604003A012040	0,3	0,6	4	40	1,2	A	2
UFX5100603003A012040	0,3	0,6	3	40	1,2	A	2
UFX5100704X35A007040	0,35	0,7	4	40	0,7	A	2
UFX5100704X35A014040	0,35	0,7	4	40	1,4	A	2
UFX5100703X35A014040	0,35	0,7	3	40	1,4	A	2
UFX5100804004A008040	0,4	0,8	4	40	0,8	A	2
UFX5100804004A016040	0,4	0,8	4	40	1,6	A	2
UFX5100803004A016040	0,4	0,8	3	40	1,6	A	2
UFX5100904X45A009040	0,45	0,9	4	40	0,9	A	2
UFX5100904X45A018040	0,45	0,9	4	40	1,8	A	2
UFX5100903X45A018040	0,45	0,9	3	40	1,8	A	2
UFX5101006005A015040	0,5	1	6	40	1,5	A	2
UFX5101003005A025050	0,5	1	3	50	2,5	A	2
UFX5101004005A025050	0,5	1	4	50	2,5	A	2
UFX5101006005A025050	0,5	1	6	50	2,5	A	2
UFX5101006005A025070	0,5	1	6	70	2,5	A	2
UFX5101006005A025100	0,5	1	6	100	2,5	A	2
UFX5101206006A020040	0,6	1,2	6	40	2	A	2
UFX5101203006A030050	0,6	1,2	3	50	3	A	2
UFX5101204006A030050	0,6	1,2	4	50	3	A	2
UFX5101206006A030050	0,6	1,2	6	50	3	A	2
UFX5101206006A030070	0,6	1,2	6	70	3	A	2
UFX5101206006A030100	0,6	1,2	6	100	3	A	2
UFX5101506X75A025040	0,75	1,5	6	40	2,5	A	2
UFX5101503X75A040050	0,75	1,5	3	50	4	A	2

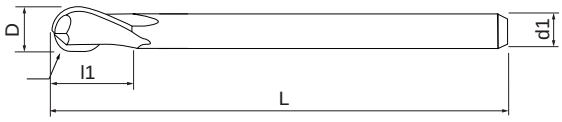
µm	D ≤ 3	0~-0.012			R	R ≤ 3 ±0.005
	D > 6,0	0~-0.015				R > 3 ± 0.010

UFX51 NEW

BALL NOSE KULISTE
2-Flute 2-ostrzowe

HSM Vmax	F	M	30°	A						max	min		AIR
										○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, SI <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○	●	●	○					○						





D code Kod	R	D	d1	L	l1	Shank Uchwyt	Z
UFX5101504X75A040050	0,75	1,5	4	50	4	A	2
UFX5101506X75A040050	0,75	1,5	6	50	4	A	2
UFX5101506X75A040070	0,75	1,5	6	70	4	A	2
UFX5101506X75A040100	0,75	1,5	6	100	4	A	2
UFX5102006010A030040	1	2	6	40	3	A	2
UFX5102003010A050050	1	2	3	50	5	A	2
UFX5102004010A050050	1	2	4	50	5	A	2
UFX5102006010A050050	1	2	6	50	5	A	2
UFX5102006010A050080	1	2	6	80	5	A	2
UFX5102006010A050100	1	2	6	100	5	A	2
UFX5102506013A040040	1,25	2,5	6	40	4	A	2
UFX5102503013A060060	1,25	2,5	3	60	6	A	2
UFX5102504013A060060	1,25	2,5	4	60	6	A	2
UFX5102506013A060060	1,25	2,5	6	60	6	A	2
UFX5102506013A060080	1,25	2,5	6	80	6	A	2
UFX5102506013A060100	1,25	2,5	6	100	6	A	2
UFX5103006015A045040	1,5	3	6	40	4,5	A	2
UFX5103003015A060060	1,5	3	3	60	6	A	2
UFX5103004015A060060	1,5	3	4	60	6	A	2
UFX5103006015A060060	1,5	3	6	60	6	A	2
UFX5103006015A060080	1,5	3	6	80	6	A	2
UFX5103006015A060100	1,5	3	6	100	6	A	2
UFX5103506018A080070	1,75	3,5	6	70	8	A	2
UFX5104006020A060050	2	4	6	50	6	A	2
UFX5104004020A080070	2	4	4	70	8	A	2
UFX5104006020A080070	2	4	6	70	8	A	2
UFX5104004020A080100	2	4	4	100	8	A	2
UFX5104004020A080120	2	4	4	120	8	A	2
UFX5104006020A080100	2	4	6	100	8	A	2
UFX5104006020A080120	2	4	6	120	8	A	2
UFX5104506023A090080	2,25	4,5	6	80	9	A	2
UFX5105006025A075060	2,5	5	6	60	7,5	A	2
UFX5105006025A100080	2,5	5	6	80	10	A	2
UFX5105005025A100080	2,5	5	5	80	10	A	2
UFX5105506028A110090	2,75	5,5	6	90	11	A	2
UFX5106006030A090050	3	6	6	50	9	A	2
UFX5106006030A090060	3	6	6	60	9	A	2
UFX5106006030A090080	3	6	6	80	9	A	2
UFX5106006030A120090	3	6	6	90	12	A	2
UFX5106006030A120110	3	6	6	110	12	A	2
UFX5106006030A120130	3	6	6	130	12	A	2
UFX5106006030A120150	3	6	6	150	12	A	2
UFX5106508033A130090	3,25	6,5	8	90	13	A	2
UFX5107008035A140090	3,5	7	8	90	14	A	2

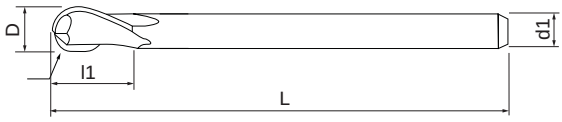
µm	D ≤ 3	0~-0.012			R	R ≤ 3 ±0.005
	D > 6,0	0~-0.015				R > 3 ± 0.010

UFX51 NEW

BALL NOSE KULISTE
2-Flute 2-ostrzowe

HSM Vmax	F	M	30°	A					max	min		AIR
									○	●	●	●

P				H		M		K	N			S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○	●	●	○					○						





D code Kod	R	D	d1	L	l1	Shank Uchwyt	Z
UFX5108008040A120050	4	8	8	50	12	A	2
UFX5108008040A120060	4	8	8	60	12	A	2
UFX5108008040A120080	4	8	8	80	12	A	2
UFX5108008040A120090	4	8	8	90	12	A	2
UFX5108008040A140100	4	8	8	100	14	A	2
UFX5108008040A140130	4	8	8	130	14	A	2
UFX5108008040A140150	4	8	8	150	14	A	2
UFX5108510043A160100	4,25	8,5	10	100	16	A	2
UFX5109010045A180100	4,5	9	10	100	18	A	2
UFX5110010050A150050	5	10	10	50	15	A	2
UFX5110010050A150060	5	10	10	60	15	A	2
UFX5110010050A150080	5	10	10	80	15	A	2
UFX5110010050A150090	5	10	10	90	15	A	2
UFX5110010050A180100	5	10	10	100	18	A	2
UFX5110010050A180130	5	10	10	130	18	A	2
UFX5110010050A180150	5	10	10	150	18	A	2
UFX5110010050A180180	5	10	10	180	18	A	2
UFX5110010050A180200	5	10	10	200	18	A	2
UFX5111012055A200100	5,5	11	12	100	20	A	2
UFX5112012060A180060	6	12	12	60	18	A	2
UFX5112012060A180080	6	12	12	80	18	A	2
UFX5112012060A180090	6	12	12	90	18	A	2
UFX5112012060A180100	6	12	12	100	18	A	2
UFX5112012060A220110	6	12	12	110	22	A	2
UFX5112012060A220130	6	12	12	130	22	A	2
UFX5112012060A220150	6	12	12	150	22	A	2
UFX5112012060A220180	6	12	12	180	22	A	2
UFX5112012060A220200	6	12	12	200	22	A	2
UFX5113012065A240100	6,5	13	12	100	24	A	2
UFX5114012070A260100	7	14	12	100	26	A	2
UFX5114014070A260100	7	14	14	100	26	A	2
UFX5114016070A260100	7	14	16	100	26	A	2
UFX5115016075A280140	7,5	15	16	140	28	A	2
UFX5116016080A240100	8	16	16	100	24	A	2
UFX5116016080A240130	8	16	16	130	24	A	2
UFX5116016080A300150	8	16	16	150	30	A	2
UFX5116016080A300180	8	16	16	180	30	A	2
UFX5116016080A300200	8	16	16	200	30	A	2
UFX5118016090A340150	9	18	16	150	34	A	2
UFX5118018090A340150	9	18	18	150	34	A	2
UFX5120020100A300100	10	20	20	100	30	A	2
UFX5120020100A300130	10	20	20	130	30	A	2
UFX5120020100A380150	10	20	20	150	38	A	2
UFX5120020100A380200	10	20	20	200	38	A	2
UFX5125025125A500120	12,5	25	25	120	50	A	2
UFX5125025125A500180	12,5	25	25	180	50	A	2

µm					R	
	D ≤ 3	0~-0.012				R ≤ 3 ±0.005
	D > 6,0	0~-0.015				R > 3 ± 0.010

UFX51

Cutting Conditions Parametry skrawania

			**Non-alloyed Steels Alloy Steels Cast Iron** Stale niestopowe, żeliwo stopowe		**Alloy Steels Heat Resistant Steels** Stale stopowe, Stale żaroodporne		**Hardened Steels** Stale hartowane	
			~ 35 HRC		**35 HRC ~ 45 HRC**		**45 HRC ~ 55 HRC**	
D (mm)	**ae**	**ap**	**RPM**	**mm/min**	**RPM**	**mm/min**	**RPM**	**mm/min**
R0.05 X 0.1	0,008	0,005	40000	550	40000	500	33000	400
R0.1 X 0.2	0,016	0,01	30000	720	30000	630	27000	575
R0.15 X 0.3	0,024	0,015	30000	900	30000	810	27000	720
R0.2 X 0.4	0,032	0,02	30000	1140	30000	1020	27000	900
R0.25 X 0.5	0,04	0,025	30000	1440	30000	1260	27000	1140
R0.3 X 0.6	0,048	0,03	30000	1740	30000	1500	27000	1320
R0.35 X 0.7	0,056	0,035	30000	2040	30000	1740	27000	1560
R0.4 X 0.8	0,064	0,04	30000	2340	30000	1980	27000	1800
R0.45 X 0.9	0,072	0,045	30000	2610	30000	2250	27000	2040
R0.5 X 1.0	0,08	0,05	30000	2880	30000	2520	27000	2280
R0.G X 1.2	0,096	0,06	30000	3060	28800	2580	25800	2310
R0.75 X 1.5	0,12	0,075	30000	3240	28800	2700	25800	2400
R1.0 X 2.0	0,16	0,1	29820	3420	28680	2880	24000	2400
R1.25 X 2.5	0,2	0,125	23800	3510	22900	3030	19200	2400
R1.5 X 3.0	0,24	0,15	19860	3600	19080	3180	16000	2400
R1.75 X 3.5	0,28	0,175	17000	3600	16400	3180	13700	2400
R2.0 X 4.0	0,32	0,2	14900	3600	14340	3180	12000	2400
R2.25 X 4.5	0,36	0,225	13030	3540	12510	3060	10500	2325
R2.5 X 5.0	0,4	0,25	11160	3480	10680	2940	9000	2250
R2.75 X 5.5	0,44	0,275	9750	3195	9360	2700	7800	2055
R3.0 X 6.0	0,48	0,3	8340	2910	8040	2460	6600	1860
R3.25 X 6.5	0,52	0,325	7780	2780	7500	2340	6200	1780
R3.5 X 7.0	0,56	0,35	7220	2650	6960	2220	5800	1700
R4.0 X 8.0	0,64	0,4	6660	2520	6420	2100	5400	1620
R4.25 X 8.5	0,68	0,425	6300	2420	6060	2020	5100	1560
R4.5 X 9.0	0,72	0,45	5940	2320	5700	1940	4800	1500
R5.0 X 10.0	0,8	0,5	5580	2220	5340	1860	4500	1440
R5.5 X 11.0	0,88	0,55	4875	1995	4670	1680	3930	1290
R6.0 X 12.0	0,96	0,6	4170	1770	4000	1500	3360	1140
R6.5 X 13.0	1,04	0,65	3960	1725	3800	1500	3200	1110
R7.0 X 14.0	1,12	0,7	3750	1680	3600	1500	3030	1080
R7.5 X 15.0	1,2	0,75	3550	1635	3400	1500	2870	1050
R8.0 X 16.0	1,28	0,8	3340	1590	3210	1320	2700	1020
R9.0 X 18.0	1,44	0,9	3005	1500	2895	1245	2430	960
R10.0 X 20.0	1,6	1	2670	1410	2580	1170	2160	900
R12.5 X 25.0	2	1,25	2130	1150	2060	950	1730	730

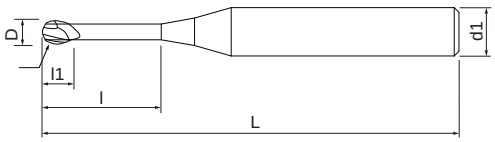
UFX56 NEW

BALL NOSE KULISTE

2-Flute with extended neck 2-ostrzowe z szyjką

HSM Vmax	F	M	30°	A	max	min	AIR
					○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○	●	●	○					○						





D code Kod	R	D	d1	L	l1	l2	Shank Uchwyt	Z
UFX5600104Y50A001002	0,05	0,1	4	40	0,1	0,2	A	2
UFX5600104Y50A001003	0,05	0,1	4	40	0,1	0,3	A	2
UFX5600104Y50A001005	0,05	0,1	4	40	0,1	0,5	A	2
UFX5600104Y50A001010	0,05	0,1	4	40	0,1	1	A	2
UFX5600204001A002005	0,1	0,2	4	40	0,2	0,5	A	2
UFX5600204001A002010	0,1	0,2	4	40	0,2	1	A	2
UFX5600204001A002015	0,1	0,2	4	40	0,2	1,5	A	2
UFX5600204001A002020	0,1	0,2	4	40	0,2	2	A	2
UFX5600204001A002030	0,1	0,2	4	40	0,2	3	A	2
UFX5600304X15A003010	0,15	0,3	4	40	0,3	1	A	2
UFX5600304X15A003015	0,15	0,3	4	40	0,3	1,5	A	2
UFX5600304X15A003020	0,15	0,3	4	40	0,3	2	A	2
UFX5600304X15A003025	0,15	0,3	4	40	0,3	2,5	A	2
UFX5600304X15A003030	0,15	0,3	4	40	0,3	3	A	2
UFX5600304X15A003040	0,15	0,3	4	40	0,3	4	A	2
UFX5600304X15A003050	0,15	0,3	4	40	0,3	5	A	2
UFX5600404002A004010	0,2	0,4	4	40	0,4	1	A	2
UFX5600404002A004015	0,2	0,4	4	40	0,4	1,5	A	2
UFX5600404002A004020	0,2	0,4	4	40	0,4	2	A	2
UFX5600404002A004025	0,2	0,4	4	40	0,4	2,5	A	2
UFX5600404002A004030	0,2	0,4	4	40	0,4	3	A	2
UFX5600404002A004040	0,2	0,4	4	40	0,4	4	A	2
UFX5600404002A004050	0,2	0,4	4	40	0,4	5	A	2
UFX5600404002A004060	0,2	0,4	4	40	0,4	6	A	2
UFX5600404002A004080	0,2	0,4	4	40	0,4	8	A	2
UFX5600404002A004100	0,2	0,4	4	40	0,4	10	A	2
UFX5600504X25A005010	0,25	0,5	4	45	0,5	1	A	2
UFX5600504X25A005015	0,25	0,5	4	45	0,5	1,5	A	2
UFX5600504X25A005020	0,25	0,5	4	45	0,5	2	A	2
UFX5600504X25A005025	0,25	0,5	4	45	0,5	2,5	A	2
UFX5600504X25A005030	0,25	0,5	4	45	0,5	3	A	2
UFX5600504X25A005040	0,25	0,5	4	45	0,5	4	A	2
UFX5600504X25A005050	0,25	0,5	4	45	0,5	5	A	2
UFX5600504X25A005060	0,25	0,5	4	45	0,5	6	A	2
UFX5600504X25A005080	0,25	0,5	4	45	0,5	8	A	2
UFX5600504X25A005100	0,25	0,5	4	45	0,5	10	A	2
UFX5600504X25A005120	0,25	0,5	4	45	0,5	12	A	2
UFX5600504X25A005140	0,25	0,5	4	45	0,5	14	A	2
UFX5600504X25A005160	0,25	0,5	4	45	0,5	16	A	2
UFX5600604003A006010	0,3	0,6	4	45	0,6	1	A	2
UFX5600604003A006020	0,3	0,6	4	45	0,6	2	A	2
UFX5600604003A006030	0,3	0,6	4	45	0,6	3	A	2
UFX5600604003A006040	0,3	0,6	4	45	0,6	4	A	2
UFX5600604003A006050	0,3	0,6	4	45	0,6	5	A	2
UFX5600604003A006060	0,3	0,6	4	45	0,6	6	A	2
UFX5600604003A006080	0,3	0,6	4	45	0,6	8	A	2

µm	D 0~-0.012				R	±0.005	
	d1 h6						

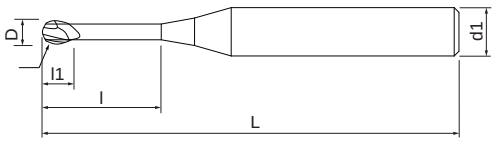
UFX56 NEW

BALL NOSE KULISTE

2-Flute with extended neck 2-ostrzowe z szyjką

HSM Vmax	F	M	30°	A						max	min		AIR
										○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, SI <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○	●	●	○					○						





D code Kod	R	D	d1	L	l1	l2	Shank Uchwyt	Z
UFX5600604003A006100	0,3	0,6	4	45	0,6	10	A	2
UFX5600604003A006120	0,3	0,6	4	45	0,6	12	A	2
UFX5600604003A006140	0,3	0,6	4	45	0,6	14	A	2
UFX5600604003A006160	0,3	0,6	4	45	0,6	16	A	2
UFX5600704X35A007020	0,35	0,7	4	45	0,7	2	A	2
UFX5600704X35A007040	0,35	0,7	4	45	0,7	4	A	2
UFX5600704X35A007060	0,35	0,7	4	45	0,7	6	A	2
UFX5600704X35A007080	0,35	0,7	4	45	0,7	8	A	2
UFX5600704X35A007100	0,35	0,7	4	45	0,7	10	A	2
UFX5600704X35A007120	0,35	0,7	4	45	0,7	12	A	2
UFX5600804004A008010	0,4	0,8	4	45	0,8	1	A	2
UFX5600804004A008020	0,4	0,8	4	45	0,8	2	A	2
UFX5600804004A008030	0,4	0,8	4	45	0,8	3	A	2
UFX5600804004A008040	0,4	0,8	4	45	0,8	4	A	2
UFX5600804004A008050	0,4	0,8	4	45	0,8	5	A	2
UFX5600804004A008060	0,4	0,8	4	45	0,8	6	A	2
UFX5600804004A008080	0,4	0,8	4	45	0,8	8	A	2
UFX5600804004A008100	0,4	0,8	4	45	0,8	10	A	2
UFX5600804004A008120	0,4	0,8	4	45	0,8	12	A	2
UFX5600804004A008140	0,4	0,8	4	45	0,8	14	A	2
UFX5600804004A008160	0,4	0,8	4	45	0,8	16	A	2
UFX5600804004A008200	0,4	0,8	4	45	0,8	20	A	2
UFX5600904X45A009040	0,45	0,9	4	45	0,9	4	A	2
UFX5600904X45A009060	0,45	0,9	4	45	0,9	6	A	2
UFX5600904X45A009080	0,45	0,9	4	45	0,9	8	A	2
UFX5600904X45A009100	0,45	0,9	4	45	0,9	10	A	2
UFX5601004005A010020	0,5	1	4	50	1	2	A	2
UFX5601004005A010030	0,5	1	4	50	1	3	A	2
UFX5601004005A010040	0,5	1	4	50	1	4	A	2
UFX5601004005A010050	0,5	1	4	50	1	5	A	2
UFX5601004005A010060	0,5	1	4	50	1	6	A	2
UFX5601004005A010070	0,5	1	4	50	1	7	A	2
UFX5601004005A010080	0,5	1	4	50	1	8	A	2
UFX5601004005A010090	0,5	1	4	50	1	9	A	2
UFX5601004005A010100	0,5	1	4	50	1	10	A	2
UFX5601004005A010120	0,5	1	4	50	1	12	A	2
UFX5601004005A010140	0,5	1	4	50	1	14	A	2
UFX5601004005A010160	0,5	1	4	50	1	16	A	2
UFX5601004005A010180	0,5	1	4	50	1	18	A	2
UFX5601004005A010200	0,5	1	4	50	1	20	A	2
UFX5601004005A010220	0,5	1	4	60	1	22	A	2
UFX5601004005A010260	0,5	1	4	60	1	26	A	2
UFX5601004005A010300	0,5	1	4	70	1	30	A	2
UFX5601004005A010400	0,5	1	4	80	1	40	A	2
UFX5601004005A010500	0,5	1	4	100	1	50	A	2
UFX5601204006A012040	0,6	1,2	4	50	1,2	4	A	2

µm	D 0~-0.012				R	±0.005	
	d1 h6						

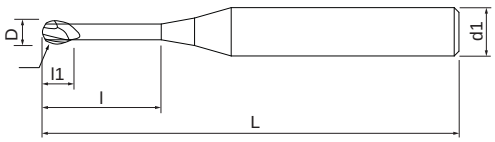
UFX56 NEW

BALL NOSE KULISTE

2-Flute with extended neck 2-ostrzowe z szyjką

HSM Vmax	F	M	30°	A	max	min	AIR
					○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○	●	●	○					○						





D code Kod	R	D	d1	L	l1	l2	Shank Uchwyt	Z
UFX5601204006A012060	0,6	1,2	4	50	1,2	6	A	2
UFX5601204006A012080	0,6	1,2	4	50	1,2	8	A	2
UFX5601204006A012100	0,6	1,2	4	50	1,2	10	A	2
UFX5601204006A012120	0,6	1,2	4	50	1,2	12	A	2
UFX5601204006A012160	0,6	1,2	4	50	1,2	16	A	2
UFX5601204006A012200	0,6	1,2	4	50	1,2	20	A	2
UFX5601204006A012260	0,6	1,2	4	60	1,2	26	A	2
UFX5601404007A014060	0,7	1,4	4	50	1,4	6	A	2
UFX5601404007A014080	0,7	1,4	4	50	1,4	8	A	2
UFX5601404007A014100	0,7	1,4	4	50	1,4	10	A	2
UFX5601404007A014120	0,7	1,4	4	50	1,4	12	A	2
UFX5601404007A014160	0,7	1,4	4	50	1,4	16	A	2
UFX5601504X75A015030	0,75	1,5	4	50	1,5	3	A	2
UFX5601504X75A015040	0,75	1,5	4	50	1,5	4	A	2
UFX5601504X75A015050	0,75	1,5	4	50	1,5	5	A	2
UFX5601504X75A015060	0,75	1,5	4	50	1,5	6	A	2
UFX5601504X75A015070	0,75	1,5	4	50	1,5	7	A	2
UFX5601504X75A015080	0,75	1,5	4	50	1,5	8	A	2
UFX5601504X75A015100	0,75	1,5	4	50	1,5	10	A	2
UFX5601504X75A015120	0,75	1,5	4	50	1,5	12	A	2
UFX5601504X75A015140	0,75	1,5	4	50	1,5	14	A	2
UFX5601504X75A015160	0,75	1,5	4	50	1,5	16	A	2
UFX5601504X75A015180	0,75	1,5	4	50	1,5	18	A	2
UFX5601504X75A015200	0,75	1,5	4	50	1,5	20	A	2
UFX5601504X75A015220	0,75	1,5	4	60	1,5	22	A	2
UFX5601504X75A015260	0,75	1,5	4	60	1,5	26	A	2
UFX5601504X75A015300	0,75	1,5	4	70	1,5	30	A	2
UFX5601504X75A015350	0,75	1,5	4	70	1,5	35	A	2
UFX5601504X75A015400	0,75	1,5	4	80	1,5	40	A	2
UFX5601604008A016040	0,8	1,6	4	50	1,6	4	A	2
UFX5601604008A016060	0,8	1,6	4	50	1,6	6	A	2
UFX5601604008A016080	0,8	1,6	4	50	1,6	8	A	2
UFX5601604008A016100	0,8	1,6	4	50	1,6	10	A	2
UFX5601604008A016120	0,8	1,6	4	50	1,6	12	A	2
UFX5601604008A016160	0,8	1,6	4	50	1,6	16	A	2
UFX5601604008A016200	0,8	1,6	4	50	1,6	20	A	2
UFX5601804009A018040	0,9	1,8	4	50	1,8	4	A	2
UFX5601804009A018060	0,9	1,8	4	50	1,8	6	A	2
UFX5601804009A018080	0,9	1,8	4	50	1,8	8	A	2
UFX5601804009A018100	0,9	1,8	4	50	1,8	10	A	2
UFX5601804009A018120	0,9	1,8	4	50	1,8	12	A	2
UFX5601804009A018160	0,9	1,8	4	50	1,8	16	A	2
UFX5601804009A018200	0,9	1,8	4	50	1,8	20	A	2
UFX5602004010A020040	1	2	4	50	2	4	A	2
UFX5602004010A020060	1	2	4	50	2	6	A	2

µm	D 0~-0.012				R	±0.005	
	d1 h6						

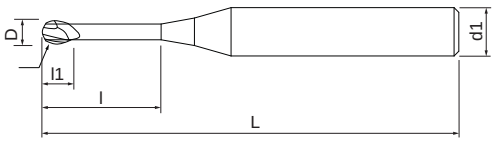
UFX56 NEW

BALL NOSE KULISTE

2-Flute with extended neck 2-ostrzowe z szyjką

HSM Vmax	F	M	30°	A	max	min	AIR
					○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○	●	●	○					○						





D code Kod	R	D	d1	L	l1	l2	Shank Uchwyt	Z
UFX5602004010A020080	1	2	4	50	2	8	A	2
UFX5602004010A020100	1	2	4	50	2	10	A	2
UFX5602004010A020120	1	2	4	50	2	12	A	2
UFX5602004010A020140	1	2	4	50	2	14	A	2
UFX5602004010A020160	1	2	4	50	2	16	A	2
UFX5602004010A020180	1	2	4	50	2	18	A	2
UFX5602004010A020200	1	2	4	50	2	20	A	2
UFX5602004010A020220	1	2	4	60	2	22	A	2
UFX5602004010A020260	1	2	4	60	2	26	A	2
UFX5602004010A020300	1	2	4	70	2	30	A	2
UFX5602004010A020350	1	2	4	70	2	35	A	2
UFX5602004010A020400	1	2	4	80	2	40	A	2
UFX5602004010A020450	1	2	4	90	2	45	A	2
UFX5602004010A020500	1	2	4	100	2	50	A	2
UFX5602004010A020600	1	2	4	110	2	60	A	2
UFX5602504013A025080	1,25	2,5	4	50	2,5	8	A	2
UFX5602504013A025100	1,25	2,5	4	50	2,5	10	A	2
UFX5602504013A025120	1,25	2,5	4	50	2,5	12	A	2
UFX5602504013A025160	1,25	2,5	4	50	2,5	16	A	2
UFX5602504013A025200	1,25	2,5	4	50	2,5	20	A	2
UFX5602504013A025220	1,25	2,5	4	60	2,5	22	A	2
UFX5602504013A025260	1,25	2,5	4	60	2,5	26	A	2
UFX5602504013A025300	1,25	2,5	4	70	2,5	30	A	2
UFX5602504013A025350	1,25	2,5	4	70	2,5	35	A	2
UFX5602504013A025400	1,25	2,5	4	80	2,5	40	A	2
UFX5602504013A025450	1,25	2,5	4	90	2,5	45	A	2
UFX5602504013A025500	1,25	2,5	4	100	2,5	50	A	2
UFX5603006015A030060	1,5	3	6	50	3	6	A	2
UFX5603006015A030080	1,5	3	6	50	3	8	A	2
UFX5603006015A030100	1,5	3	6	50	3	10	A	2
UFX5603006015A030120	1,5	3	6	50	3	12	A	2
UFX5603006015A030140	1,5	3	6	60	3	14	A	2
UFX5603006015A030160	1,5	3	6	60	3	16	A	2
UFX5603006015A030180	1,5	3	6	60	3	18	A	2
UFX5603006015A030200	1,5	3	6	60	3	20	A	2
UFX5603006015A030220	1,5	3	6	65	3	22	A	2
UFX5603006015A030260	1,5	3	6	65	3	26	A	2
UFX5603006015A030300	1,5	3	6	70	3	30	A	2
UFX5603006015A030350	1,5	3	6	70	3	35	A	2
UFX5603006015A030400	1,5	3	6	80	3	40	A	2
UFX5603006015A030450	1,5	3	6	90	3	45	A	2
UFX5603006015A030500	1,5	3	6	100	3	50	A	2
UFX5603006015A030600	1,5	3	6	100	3	60	A	2
UFX5604006020A040080	2	4	6	50	4	8	A	2
UFX5604006020A040100	2	4	6	50	4	10	A	2

µm	D 0~-0.012				±0.005	
	d1 h6					

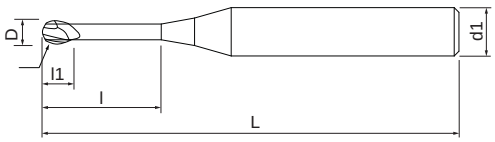
UFX56 NEW

BALL NOSE KULISTE

2-Flute with extended neck 2-ostrzowe z szyjką

HSM Vmax	F	M	30°	A					max	min		AIR
									○	●	●	●

P				H		M		K	N			S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○	●	●	○					○						





D code Kod	R	D	d1	L	l1	l2	Shank Uchwyt	Z
UFX5604006020A040120	2	4	6	50	4	12	A	2
UFX5604006020A040140	2	4	6	60	4	14	A	2
UFX5604006020A040160	2	4	6	60	4	16	A	2
UFX5604006020A040180	2	4	6	60	4	18	A	2
UFX5604006020A040200	2	4	6	60	4	20	A	2
UFX5604006020A040220	2	4	6	65	4	22	A	2
UFX5604006020A040260	2	4	6	65	4	26	A	2
UFX5604006020A040300	2	4	6	70	4	30	A	2
UFX5604006020A040350	2	4	6	70	4	35	A	2
UFX5604006020A040400	2	4	6	80	4	40	A	2
UFX5604006020A040450	2	4	6	90	4	45	A	2
UFX5604006020A040500	2	4	6	100	4	50	A	2
UFX5604006020A040550	2	4	6	100	4	55	A	2
UFX5604006020A040600	2	4	6	100	4	60	A	2
UFX5605006025A060150	2,5	5	6	60	6	15	A	2
UFX5605006025A060200	2,5	5	6	60	6	20	A	2
UFX5605006025A060260	2,5	5	6	65	6	26	A	2
UFX5605006025A060300	2,5	5	6	70	6	30	A	2
UFX5605006025A060350	2,5	5	6	70	6	35	A	2
UFX5605006025A060400	2,5	5	6	80	6	40	A	2
UFX5605006025A060450	2,5	5	6	90	6	45	A	2
UFX5605006025A060500	2,5	5	6	100	6	50	A	2
UFX5605006025A060550	2,5	5	6	100	6	55	A	2
UFX5605006025A060600	2,5	5	6	100	6	60	A	2
UFX5606006030A080200	3	6	6	60	8	20	A	2
UFX5606006030A080300	3	6	6	60	8	30	A	2
UFX5606006030A120200	3	6	6	90	12	20	A	2
UFX5606006030A120300	3	6	6	90	12	30	A	2
UFX5608008040A100250	4	8	8	70	10	25	A	2
UFX5608008040A100350	4	8	8	70	10	35	A	2
UFX5608008040A140250	4	8	8	100	14	25	A	2
UFX5608008040A140350	4	8	8	100	14	35	A	2
UFX5610010050A120300	5	10	10	75	12	30	A	2
UFX5610010050A120400	5	10	10	75	12	40	A	2
UFX5610010050A180300	5	10	10	100	18	30	A	2
UFX5610010050A180400	5	10	10	100	18	40	A	2
UFX5612012060A140320	6	12	12	80	14	32	A	2
UFX5612012060A140450	6	12	12	80	14	45	A	2
UFX5612012060A220320	6	12	12	110	22	32	A	2
UFX5612012060A220450	6	12	12	110	22	45	A	2
UFX5600506X25A005010	0,25	0,5	6	45	0,5	1	A	2
UFX5600506X25A005020	0,25	0,5	6	45	0,5	2	A	2
UFX5600506X25A005040	0,25	0,5	6	45	0,5	4	A	2
UFX5600606003A006010	0,3	0,6	6	45	0,6	1	A	2
UFX5600606003A006020	0,3	0,6	6	45	0,6	2	A	2

µm	D 0~-0.012				R	±0.005	
	d1 h6						

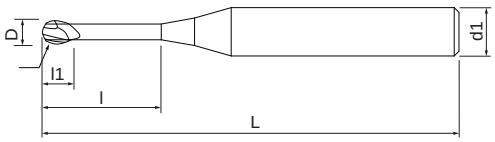
UFX56 NEW

BALL NOSE KULISTE

2-Flute with extended neck 2-ostrzowe z szyjką

HSM Vmax	F	M	30°	A	max	min	AIR
					○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, SI <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○	●	●	○					○						





D code Kod	R	D	d1	L	l1	l2	Shank Uchwyt	Z
UFX5600606003A006030	0,3	0,6	6	45	0,6	3	A	2
UFX5600606003A006040	0,3	0,6	6	45	0,6	4	A	2
UFX5600606003A006050	0,3	0,6	6	45	0,6	5	A	2
UFX5600606003A006060	0,3	0,6	6	45	0,6	6	A	2
UFX5600606003A006080	0,3	0,6	6	45	0,6	8	A	2
UFX5600606003A006100	0,3	0,6	6	45	0,6	10	A	2
UFX5600606003A006120	0,3	0,6	6	45	0,6	12	A	2
UFX5600606003A006140	0,3	0,6	6	45	0,6	14	A	2
UFX5600606003A006160	0,3	0,6	6	45	0,6	16	A	2
UFX5600806004A008010	0,4	0,8	6	45	0,8	1	A	2
UFX5600806004A008020	0,4	0,8	6	45	0,8	2	A	2
UFX5600806004A008030	0,4	0,8	6	45	0,8	3	A	2
UFX5600806004A008040	0,4	0,8	6	45	0,8	4	A	2
UFX5600806004A008050	0,4	0,8	6	45	0,8	5	A	2
UFX5600806004A008060	0,4	0,8	6	45	0,8	6	A	2
UFX5600806004A008080	0,4	0,8	6	45	0,8	8	A	2
UFX5600806004A008100	0,4	0,8	6	45	0,8	10	A	2
UFX5600806004A008120	0,4	0,8	6	45	0,8	12	A	2
UFX5600806004A008140	0,4	0,8	6	45	0,8	14	A	2
UFX5600806004A008160	0,4	0,8	6	45	0,8	16	A	2
UFX5600806004A008200	0,4	0,8	6	45	0,8	20	A	2
UFX5601006005A010020	0,5	1	6	50	1	2	A	2
UFX5601006005A010030	0,5	1	6	50	1	3	A	2
UFX5601006005A010040	0,5	1	6	50	1	4	A	2
UFX5601006005A010050	0,5	1	6	50	1	5	A	2
UFX5601006005A010060	0,5	1	6	50	1	6	A	2
UFX5601006005A010070	0,5	1	6	50	1	7	A	2
UFX5601006005A010080	0,5	1	6	50	1	8	A	2
UFX5601006005A010090	0,5	1	6	50	1	9	A	2
UFX5601006005A010100	0,5	1	6	50	1	10	A	2
UFX5601006005A010120	0,5	1	6	50	1	12	A	2
UFX5601006005A010140	0,5	1	6	50	1	14	A	2
UFX5601006005A010160	0,5	1	6	50	1	16	A	2
UFX5601006005A010180	0,5	1	6	50	1	18	A	2
UFX5601006005A010200	0,5	1	6	50	1	20	A	2
UFX5601006005A010220	0,5	1	6	60	1	22	A	2
UFX5601006005A010260	0,5	1	6	60	1	26	A	2
UFX5601006005A010300	0,5	1	6	70	1	30	A	2
UFX5601506X75A015030	0,75	1,5	6	50	1,5	3	A	2
UFX5601506X75A015040	0,75	1,5	6	50	1,5	4	A	2
UFX5601506X75A015060	0,75	1,5	6	50	1,5	6	A	2
UFX5601506X75A015080	0,75	1,5	6	50	1,5	8	A	2
UFX5601506X75A015100	0,75	1,5	6	50	1,5	10	A	2
UFX5601506X75A015120	0,75	1,5	6	50	1,5	12	A	2
UFX5601506X75A015140	0,75	1,5	6	50	1,5	14	A	2

µm	D 0~-0.012				R	±0.005	
	d1 h6						

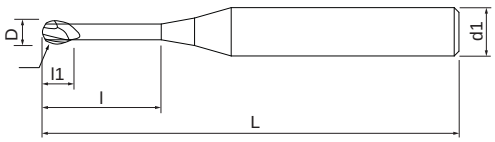
UFX56 NEW

BALL NOSE KULISTE

2-Flute with extended neck 2-ostrzowe z szyjką

HSM Vmax	F	M	30°	A						max	min		AIR
										○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○	●	●	○					○						





D code Kod	R	D	d1	L	l1	l2	Shank Uchwyt	Z
UFX5601506X75A015160	0,75	1,5	6	50	1,5	16	A	2
UFX5601506X75A015180	0,75	1,5	6	50	1,5	18	A	2
UFX5601506X75A015200	0,75	1,5	6	50	1,5	20	A	2
UFX5601506X75A015220	0,75	1,5	6	60	1,5	22	A	2
UFX5601506X75A015260	0,75	1,5	6	60	1,5	26	A	2
UFX5601506X75A015300	0,75	1,5	6	70	1,5	30	A	2
UFX5601506X75A015350	0,75	1,5	6	70	1,5	35	A	2
UFX5601506X75A015400	0,75	1,5	6	80	1,5	40	A	2
UFX5602006010A020040	1	2	6	50	2	4	A	2
UFX5602006010A020060	1	2	6	50	2	6	A	2
UFX5602006010A020080	1	2	6	50	2	8	A	2
UFX5602006010A020100	1	2	6	50	2	10	A	2
UFX5602006010A020120	1	2	6	50	2	12	A	2
UFX5602006010A020140	1	2	6	50	2	14	A	2
UFX5602006010A020160	1	2	6	50	2	16	A	2
UFX5602006010A020180	1	2	6	50	2	18	A	2
UFX5602006010A020200	1	2	6	50	2	20	A	2
UFX5602006010A020220	1	2	6	60	2	22	A	2
UFX5602006010A020260	1	2	6	60	2	26	A	2
UFX5602006010A020300	1	2	6	70	2	30	A	2
UFX5602006010A020350	1	2	6	70	2	35	A	2
UFX5602006010A020400	1	2	6	80	2	40	A	2
UFX5602006010A020450	1	2	6	90	2	45	A	2
UFX5602006010A020500	1	2	6	100	2	50	A	2

µm	D 0~-0.012				R	±0.005
	d1 h6					

UFX56

Cutting Conditions Parametry skrawania



	Non-alloyed Steels Alloy Steels Cast Iron Stale niestopowe, żeliwo stopowe			Alloy Steels Heat Resistant Steels Stale stopowe, Stale żaroodporne			Hardened Steels Stale hartowane		
	~ 35 HRC			35 HRC ~ 45 HRC			45 HRC ~ 55 HRC		
D (mm)	ap	RPM	mm/min	ap	RPM	mm/min	ap	RPM	mm/min
0.1	0.009	50000	240	0.007	50000	215	0.005	50000	190
0.1	0.009	50000	240	0.007	50000	215	0.005	50000	190
0.1	0.006	50000	240	0.005	50000	215	0.004	50000	190
0.1	0.002	45000	195	0.002	45000	175	0.001	45000	155
0.2	0.018	50000	335	0.014	50000	310	0.010	43200	260
0.2	0.013	50000	335	0.010	50000	310	0.007	43200	260
0.2	0.007	45000	270	0.006	45000	250	0.004	38880	210
0.2	0.005	45000	270	0.004	45000	250	0.003	38880	210
0.2	0.003	45000	270	0.003	45000	250	0.002	38880	210
0.3	0.019	50000	475	0.015	50000	430	0.011	42800	365
0.3	0.019	50000	475	0.015	50000	430	0.011	42800	365
0.3	0.011	45000	385	0.008	45000	350	0.006	38520	295
0.3	0.007	45000	385	0.005	45000	350	0.004	38520	295
0.3	0.007	45000	385	0.005	45000	350	0.004	38520	295
0.3	0.004	40000	305	0.003	40000	275	0.002	34240	235
0.3	0.003	30000	200	0.002	30000	180	0.002	25680	155
0.4	0.036	41000	490	0.028	38800	425	0.020	34200	340
0.4	0.025	41000	490	0.020	38800	425	0.014	34200	340
0.4	0.025	41000	490	0.020	38800	425	0.014	34200	340
0.4	0.014	36900	395	0.011	34920	345	0.008	30780	275
0.4	0.014	36900	395	0.011	34920	345	0.008	30780	275
0.4	0.009	36900	395	0.007	34920	345	0.005	30780	275
0.4	0.009	32800	315	0.007	31040	270	0.005	27360	220
0.4	0.005	32800	315	0.004	31040	270	0.003	27360	220
0.4	0.004	24600	205	0.003	23280	180	0.002	20520	145
0.4	0.004	12300	90	0.003	11640	75	0.002	10260	60
0.5	0.045	34200	685	0.035	32300	580	0.025	28500	515
0.5	0.045	34200	685	0.035	32300	580	0.025	28500	515
0.5	0.032	34200	685	0.025	32300	580	0.018	28500	515
0.5	0.032	34200	685	0.025	32300	580	0.018	28500	515
0.5	0.018	30780	555	0.014	29070	470	0.010	25650	415
0.5	0.018	30780	555	0.014	29070	470	0.010	25650	415
0.5	0.011	30780	555	0.009	29070	470	0.006	25650	415
0.5	0.011	27360	440	0.009	25840	370	0.006	22800	330
0.5	0.007	20520	290	0.005	19380	245	0.004	17100	215
0.5	0.005	20520	290	0.004	19380	245	0.003	17100	215
0.5	0.005	10260	125	0.004	9690	105	0.003	8550	95
0.5	0.005	10260	125	0.004	9690	105	0.003	8550	95
0.5	0.005	3420	35	0.004	3230	30	0.003	2850	25
0.6	0.038	34200	1025	0.029	32300	840	0.021	28500	685
0.6	0.038	34200	1025	0.029	32300	840	0.021	28500	685
0.6	0.038	34200	1025	0.029	32300	840	0.021	28500	685
0.6	0.022	30780	830	0.017	29070	680	0.012	25650	555
0.6	0.014	30780	830	0.011	29070	680	0.008	25650	555
0.6	0.014	30780	830	0.011	29070	680	0.008	25650	555
0.6	0.008	27360	655	0.006	25840	540	0.005	22800	440
0.6	0.005	20520	430	0.004	19380	355	0.003	17100	290
0.6	0.005	20520	430	0.004	19380	355	0.003	17100	290
0.6	0.005	10260	185	0.004	9690	150	0.003	8550	125
0.6	0.005	10260	185	0.004	9690	150	0.003	8550	125
0.7	0.063	34200	1130	0.049	32300	930	0.035	28500	765
0.7	0.025	30780	915	0.020	29070	755	0.014	25650	620
0.7	0.016	30780	915	0.012	29070	755	0.009	25650	620

UFX56

Cutting Conditions Parametry skrawania



	Non-alloyed Steels Alloy Steels Cast Iron Stale niestopowe, żeliwo stopowe			Alloy Steels Heat Resistant Steels Stale stopowe, Stale żaroodporne			Hardened Steels Stale hartowane		
	~ 35 HRC			35 HRC ~ 45 HRC			45 HRC ~ 55 HRC		
D (mm)	ap	RPM	mm/min	ap	RPM	mm/min	ap	RPM	mm/min
0.7	0.016	27360	725	0.012	25840	595	0.009	22800	490
0.7	0.009	27360	725	0.007	25840	595	0.005	22800	490
0.7	0.006	20520	475	0.005	19380	390	0.004	17100	320
0.8	0.072	34200	1230	0.056	32300	1035	0.040	28500	855
0.8	0.050	34200	1230	0.039	32300	1035	0.028	28500	855
0.8	0.050	34200	1230	0.039	32300	1035	0.028	28500	855
0.8	0.029	30780	995	0.022	29070	840	0.016	25650	695
0.8	0.029	30780	995	0.022	29070	840	0.016	25650	695
0.8	0.018	30780	995	0.014	29070	840	0.010	25650	695
0.8	0.018	27360	785	0.014	25840	660	0.010	22800	545
0.8	0.011	27360	785	0.008	25840	660	0.006	22800	545
0.8	0.007	20520	515	0.006	19380	435	0.004	17100	360
0.8	0.007	20520	515	0.006	19380	435	0.004	17100	360
0.8	0.007	10260	220	0.006	9690	185	0.004	8550	155
0.9	0.032	29250	1120	0.025	27630	935	0.018	24390	775
0.9	0.032	29250	1120	0.025	27630	935	0.018	24390	775
0.9	0.020	29250	1120	0.016	27630	935	0.011	24390	775
0.9	0.020	26000	885	0.016	24560	740	0.011	21680	610
1.0	0.090	30800	1540	0.070	29100	1310	0.050	25700	1075
1.0	0.090	30800	1540	0.070	29100	1310	0.050	25700	1075
1.0	0.063	30800	1540	0.049	29100	1310	0.035	25700	1075
1.0	0.063	30800	1540	0.049	29100	1310	0.035	25700	1075
1.0	0.036	27720	1245	0.028	26190	1060	0.020	23130	870
1.0	0.036	27720	1245	0.028	26190	1060	0.020	23130	870
1.0	0.036	27720	1245	0.028	26190	1060	0.020	23130	870
1.0	0.023	27720	1245	0.018	26190	1060	0.013	23130	870
1.0	0.023	24640	985	0.018	23280	840	0.013	20560	690
1.0	0.014	24640	985	0.011	23280	840	0.008	20560	690
1.0	0.014	18480	645	0.011	17460	550	0.008	15420	450
1.0	0.009	18480	645	0.007	17460	550	0.005	15420	450
1.0	0.009	18480	645	0.007	17460	550	0.005	15420	450
1.0	0.009	9240	275	0.007	8730	235	0.005	7710	195
1.0	0.009	9240	275	0.007	8730	235	0.005	7710	195
1.0	0.009	9240	275	0.007	8730	235	0.005	7710	195
1.0	0.009	3080	75	0.007	2910	65	0.005	2570	55
1.0	0.006	3080	75	0.005	2910	65	0.003	2570	55
1.2	0.076	26300	1375	0.059	24800	1150	0.042	21900	950
1.2	0.076	26300	1375	0.059	24800	1150	0.042	21900	950
1.2	0.043	23670	1115	0.034	22320	930	0.024	19710	770
1.2	0.027	23670	1115	0.021	22320	930	0.015	19710	770
1.2	0.027	23670	1115	0.021	22320	930	0.015	19710	770
1.2	0.016	21040	880	0.013	19840	735	0.009	17520	610
1.2	0.011	15780	580	0.008	14880	485	0.006	13140	400
1.2	0.011	7890	245	0.008	7440	205	0.006	6570	170
1.4	0.088	21500	1295	0.069	20300	1100	0.049	18000	935
1.4	0.050	19350	1050	0.039	18270	890	0.028	16200	755
1.4	0.050	19350	1050	0.039	18270	890	0.028	16200	755
1.4	0.032	17200	830	0.025	16240	705	0.018	14400	600
1.5	0.135	23900	1580	0.105	22600	1355	0.075	20000	1075
1.5	0.095	23900	1580	0.074	22600	1355	0.053	20000	1075
1.5	0.095	23900	1580	0.074	22600	1355	0.053	20000	1075
1.5	0.095	23900	1580	0.074	22600	1355	0.053	20000	1075
1.5	0.054	21510	1280	0.042	20340	1100	0.030	18000	870

UFX56

Cutting Conditions Parametry skrawania



	Non-alloyed Steels Alloy Steels Cast Iron Stale niestopowe, żeliwo stopowe			Alloy Steels Heat Resistant Steels Stale stopowe, Stale żaroodporne			Hardened Steels Stale hartowane		
	~ 35 HRC			35 HRC ~ 45 HRC			45 HRC ~ 55 HRC		
D (mm)	ap	RPM	mm/min	ap	RPM	mm/min	ap	RPM	mm/min
1.5	0.054	21510	1280	0.042	20340	1100	0.030	18000	870
1.5	0.054	21510	1280	0.042	20340	1100	0.030	18000	870
1.5	0.034	21510	1280	0.026	20340	1100	0.019	18000	870
1.5	0.034	19120	1010	0.026	18080	865	0.019	16000	690
1.5	0.034	19120	1010	0.026	18080	865	0.019	16000	690
1.5	0.02	19120	1010	0.016	18080	865	0.011	16000	690
1.5	0.02	19120	1010	0.016	18080	865	0.011	16000	690
1.5	0.014	14340	665	0.011	13560	570	0.008	12000	450
1.5	0.014	14340	665	0.011	13560	570	0.008	12000	450
1.5	0.010	7170	285	0.008	6780	245	0.005	6000	195
1.5	0.010	7170	285	0.008	6780	245	0.005	6000	195
1.6	0.101	22200	1555	0.078	21000	1300	0.056	18500	1110
1.6	0.101	22200	1555	0.078	21000	1300	0.056	18500	1110
1.6	0.101	22200	1555	0.078	21000	1300	0.056	18500	1110
1.6	0.058	19980	1260	0.045	18900	1055	0.032	16650	900
1.6	0.058	19980	1260	0.045	18900	1055	0.032	16650	900
1.6	0.036	19980	1260	0.028	18900	1055	0.020	16650	900
1.6	0.036	17760	995	0.028	16800	830	0.020	14800	710
1.8	0.113	22200	1780	0.088	21000	1470	0.063	18500	1225
1.8	0.113	22200	1780	0.088	21000	1470	0.063	18500	1225
1.8	0.113	22200	1780	0.088	21000	1470	0.063	18500	1225
1.8	0.065	19980	1440	0.050	18900	1190	0.036	16650	990
1.8	0.065	19980	1440	0.050	18900	1190	0.036	16650	990
1.8	0.041	19980	1440	0.032	18900	1190	0.023	16650	990
1.8	0.041	17760	1140	0.032	16800	940	0.023	14800	785
2.0	0.180	18000	1795	0.140	17000	1525	0.100	15000	1285
2.0	0.126	18000	1795	0.098	17000	1525	0.070	15000	1285
2.0	0.126	18000	1795	0.098	17000	1525	0.070	15000	1285
2.0	0.072	16200	1455	0.056	15300	1235	0.040	13500	1040
2.0	0.072	16200	1455	0.056	15300	1235	0.040	13500	1040
2.0	0.072	16200	1455	0.056	15300	1235	0.040	13500	1040
2.0	0.045	16200	1455	0.035	15300	1235	0.025	13500	1040
2.0	0.045	16200	1455	0.035	15300	1235	0.025	13500	1040
2.0	0.045	14400	1150	0.035	13600	975	0.025	12000	820
2.0	0.045	14400	1150	0.035	13600	975	0.025	12000	820
2.0	0.027	14400	1150	0.021	13600	975	0.015	12000	820
2.0	0.018	10800	755	0.014	10200	640	0.010	9000	540
2.0	0.018	10800	755	0.014	10200	640	0.010	9000	540
2.0	0.018	5400	325	0.014	5100	275	0.010	4500	230
2.0	0.018	5400	325	0.014	5100	275	0.010	4500	230
2.0	0.018	5400	325	0.014	5100	275	0.010	4500	230
2.5	0.158	15800	1925	0.123	14900	1605	0.088	13200	1305
2.5	0.158	15800	1925	0.123	14900	1605	0.088	13200	1305
2.5	0.158	15800	1925	0.123	14900	1605	0.088	13200	1305
2.5	0.090	14220	1560	0.070	13410	1300	0.050	11880	1055
2.5	0.090	14220	1560	0.070	13410	1300	0.050	11880	1055
2.5	0.056	14220	1560	0.044	13410	1300	0.031	11880	1055
2.5	0.056	12640	1230	0.044	11920	1025	0.031	10560	835
2.5	0.056	12640	1230	0.044	11920	1025	0.031	10560	835
2.5	0.034	12640	1230	0.026	11920	1025	0.019	10560	835
2.5	0.034	9480	810	0.026	8940	675	0.019	7920	550
2.5	0.023	9480	810	0.018	8940	675	0.013	7920	550

UFX56

Cutting Conditions Parametry skrawania



	Non-alloyed Steels Alloy Steels Cast Iron Stale niestopowe, żeliwo stopowe			Alloy Steels Heat Resistant Steels Stale stopowe, Stale żaroodporne			Hardened Steels Stale hartowane		
	~ 35 HRC				35 HRC ~ 45 HRC		45 HRC ~ 55 HRC		
D (mm)	ap	RPM	mm/min	ap	RPM	mm/min	ap	RPM	mm/min
2.5	0.023	9480	810	0.018	8940	675	0.013	7920	550
3.0	0.270	13700	2050	0.210	12900	1730	0.150	11400	1435
3.0	0.270	13700	2050	0.210	12900	1730	0.150	11400	1435
3.0	0.189	13700	2050	0.147	12900	1730	0.105	11400	1435
3.0	0.189	13700	2050	0.147	12900	1730	0.105	11400	1435
3.0	0.189	13700	2050	0.147	12900	1730	0.105	11400	1435
3.0	0.108	12330	1660	0.084	11610	1400	0.060	10260	1160
3.0	0.108	12330	1660	0.084	11610	1400	0.060	10260	1160
3.0	0.108	12330	1660	0.084	11610	1400	0.060	10260	1160
3.0	0.108	12330	1660	0.084	11610	1400	0.060	10260	1160
3.0	0.068	12330	1660	0.053	11610	1400	0.038	10260	1160
3.0	0.068	12330	1660	0.053	11610	1400	0.038	10260	1160
3.0	0.068	10960	1310	0.053	10320	1105	0.038	9120	920
3.0	0.041	10960	1310	0.032	10320	1105	0.023	9120	920
3.0	0.041	10960	1310	0.032	10320	1105	0.023	9120	920
3.0	0.027"	8220	860	0.021	7740	725	0.015	6840	605
3.0	0.027	8220	860	0.021	7740	725	0.015	6840	605
4.0	0.360	9800	1965	0.280	9300	1670	0.200	8200	1395
4.0	0.360	9800	1965	0.280	9300	1670	0.200	8200	1395
4.0	0.360	9800	1965	0.280	9300	1670	0.200	8200	1395
4.0	0.252	9800	1965	0.196	9300	1670	0.140	8200	1395
4.0	0.252	9800	1965	0.196	9300	1670	0.140	8200	1395
4.0	0.252	9800	1965	0.196	9300	1670	0.140	8200	1395
4.0	0.252	9800	1965	0.196	9300	1670	0.140	8200	1395
4.0	0.144	8820	1590	0.112	8370	1355	0.080	7380	1130
4.0	0.144	8820	1590	0.112	8370	1355	0.080	7380	1130
4.0	0.144	8820	1590	0.112	8370	1355	0.080	7380	1130
4.0	0.090	8820	1590	0.070	8370	1355	0.050	7380	1130
4.0	0.090	8820	1590	0.070	8370	1355	0.050	7380	1130
4.0	0.090	7840	1260	0.070	7440	1070	0.050	6560	895
4.0	0.090	7840	1260	0.070	7440	1070	0.050	6560	895
4.0	0.054	7840	1260	0.042	7440	1070	0.030	6560	895
5.0	0.315	7700	1845	0.245	7300	1455	0.175	6400	1285
5.0	0.315	7700	1845	0.245	7300	1455	0.175	6400	1285
5.0	0.180	6930	1495	0.140	6570	1180	0.100	5760	1040
5.0	0.180	6930	1495	0.140	6570	1180	0.100	5760	1040
5.0	0.180	6930	1495	0.140	6570	1180	0.100	5760	1040
5.0	0.180	6930	1495	0.140	6570	1180	0.100	5760	1040
5.0	0.113	6930	1495	0.088	6570	1180	0.063	5760	1040
5.0	0.113	6160	1180	0.088	5840	930	0.063	5120	820
6.0	0.378	6500	1900	0.294	6200	1600	0.210	5500	1330
6.0	0.378	6500	1900	0.294	6200	1600	0.210	5500	1330
8.0	0.504	4850	1800	0.392	4600	1500	0.280	4000	1280
8.0	0.504	4850	1800	0.392	4600	1500	0.280	4000	1280
10.0	0.900	3850	1650	0.700	3680	1400	0.500	3200	1200
10.0	0.630	3850	1650	0.490	3680	1400	0.350	3200	1200
12.0	1.080	3200	1520	0.840	3050	1300	0.600	2650	1100
12.0	0.756	3200	1520	0.588	3050	1300	0.420	2650	1100

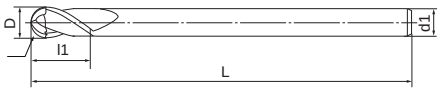
UFX38

BALL NOSE KULISTE

2-Flute, Long Length 2-ostrzowe, długie

HSM Vmax	F	M	30°	A	B					max	min		AIR
										○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○	●	●	○	○				○						





D code new Nowy kod	D code kod	R	D	d1	L	l1	Shank Uchwyt	Z
UFX38020010A03006080	UFX38020	1	2	3	80	6	A	2
UFX38030015A03008100	UFX38030	1,5	3	3	100	8	A	2
UFX38040020A04008100	UFX38040	2	4	4	100	8	A	2
UFX38050025A06010120	UFX38050	2,5	5	6	120	10	A	2
UFX38060030A06010120	UFX38060	3	6	6	120	10	A	2
UFX38080040A08014140	UFX38080	4	8	8	140	14	A	2
UFX38100050A10018180	UFX38100	5	10	10	180	18	A	2
UFX38120060A12022200	UFX38120	6	12	12	200	22	A	2
UFX38160080A16030250	UFX38160	8	16	16	250	30	A	2
UFX38200100A20038250	UFX38200	10	20	20	250	38	A	2

Cutting Conditions Parametry skrawania



			Steels Stale							
			22 - 30HRC		30 - 45HRC		45 - 50HRC		50 - 55HRC	
D (mm)	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
3	0,30	0,05	34000	4760	33005	4620	28765	4025	20830	2915
4	0,40	0,06	31655	5065	25025	4000	21845	3495	15825	2530
5	0,40	0,09	25755	4635	20400	3670	17800	3200	12875	2315
6	0,50	0,10	21735	4300	17225	3410	15015	2970	10910	2160
8	0,60	0,15	16230	3700	12850	2925	11225	2560	8115	1850
10	0,60	0,25	12660	3290	10010	2600	8735	2270	6330	1645
12	0,70	0,30	10660	2985	8450	2365	7370	2060	5340	1495
16	0,80	0,50	8980	2705	7140	2150	6220	1875	4510	1360
20	1,00	0,60	7560	2455	6030	1955	5245	1700	3805	1235



			Steels Stale				Grey Cast Irons Żeliwa szare			
			55 - 60HRC		60 - 65HRC		180 - 250HB		>250HB	
D (mm)	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
3	0,30	0,05	12895	1805	8745	1220	34000	4760	34000	4760
4	0,40	0,06	9805	1565	6625	1060	34000	5440	31655	5065
5	0,40	0,09	8005	1440	5410	970	29490	5305	25755	4635
6	0,50	0,10	6760	1335	4550	900	24890	4925	21780	4310
8	0,60	0,15	5035	1145	3415	775	18600	4240	16265	3705
10	0,60	0,25	3920	1020	2650	685	14500	3770	12660	3290
12	0,70	0,30	3310	925	2230	620	12220	3420	10685	2990
16	0,80	0,50	2795	840	1875	565	10295	3105	9015	2715
20	1,00	0,60	2365	765	1580	510	8675	2815	7610	2470

µm	D ≤ 3,0	-14 — -28	D ≤18	-32 — -59	d1 ≤ 6,0	0 — -8	d1 ≤ 30	0 — -13	R	± 0,02
	D ≤ 6,0	20 — -38	D ≤ 30	-40 — -73	d1 ≤ 10	0 — -9				
	D ≤ 10	-25 — -47	d2 ≤ 3,0	0 — -6	d1 ≤18	0 — -11				

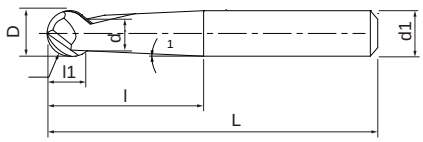
UFX41

BALL NOSE KULISTE

2-Flute, Long Length 2-ostrzowe, długie

HSM Vmax	F	M	30°	A	max	min	AIR
					○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○	●	●	○	○				○						





D code Kod	R	D	d1	d2	L	l1	l2	Shank Uchwyt	Z
UFX41030002A06004080	1,5	3.0	6	2.5	80	4	30	A	2
UFX41040002A06005080	2	4.0	6	3.3	80	5	30	A	2
UFX41050003A06006080	2,5	5.0	6	4.1	80	6	43	A	2
UFX41060003A06007100	3	6.0	6	4.7	100	7	30	A	2
UFX41080004A08009100	4	8.0	8	6.5	100	9	36	A	2
UFX41100005A10011100	5	10.0	10	8.2	100	11	43	A	2
UFX41120006A12013100	6	12.0	12	9.8	100	13	52	A	2
UFX41160008A16015150	8	16.0	16	13.4	150	15	61	A	2

µm	D 0~-0.03				µm	± 0,01
	d1 h6					

UFX41

Cutting Conditions Parametry skrawania

Normal Speed / Standardowa prędkość

			**Non-alloyed, alloy steels, cast iron** Stale stopowe, niestopowe, żeliwo		**Austenitic Heat Resistant Steel** Stal żaroodporna austenityczna		**Hardened Steels** Stale hartowane	
			30HRC		**30 - 40HRC**		**45 - 65HRC**	
D (mm)	**ae**	**ap**	**RPM**	**mm/min**	**RPM**	**mm/min**	**RPM**	**mm/min**
R1.5 x 3.0	0,15	0,06	35000	2800	33000	2600	12000	900
R2.0 x 4.0	0,2	0,08	26000	2300	25000	2200	9000	800
R2.5 x 5.0	0,25	0,1	21000	2100	20000	2000	7000	700
R3.0 x 6.0	0,3	0,12	17000	1900	16000	1800	6000	650
R4.0 x 8.0	0,4	0,16	13000	1700	12000	1600	4500	550
R5.0 x 10.0	0,5	0,2	10500	1450	10000	1400	3500	500
R6.0 x 12.0	0,6	0,24	9000	1400	8000	1300	3000	450
R8.0 x 16.0	0,8	0,32	6000	1200	5500	1100	2000	400

High Speed / Wysoka prędkość

			**Non-alloyed, alloy steels, cast iron** Stale stopowe, niestopowe, żeliwo		**Austenitic Heat Resistant Steel** Stal żaroodporna austenityczna		**Hardened Steels** Stale hartowane	
			30HRC		**30 - 40HRC**		**45 - 65HRC**	
D (mm)	**ae**	**ap**	**RPM**	**mm/min**	**RPM**	**mm/min**	**RPM**	**mm/min**
R1.5 x 3.0	0,15	0,06	47000	3700	44000	3500	17000	1400
R2.0 x 4.0	0,2	0,08	35000	3200	33000	3000	13000	1200
R2.5 x 5.0	0,25	0,1	28000	2800	27000	2600	10000	1100
R3.0 x 6.0	0,3	0,12	23000	2600	22000	2400	8000	950
R4.0 x 8.0	0,4	0,16	18000	2300	17000	2100	6000	850
R5.0 x 10.0	0,5	0,2	14000	2000	13000	1900	5000	750
R6.0 x 12.0	0,6	0,24	12000	1800	11000	1800	4000	700
R8.0 x 16.0	0,8	0,32	9000	1600	8000	1500	3300	600

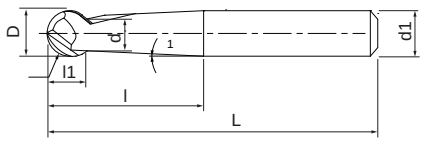
UFX42

BALL NOSE KULISTE

2-Flute, Long Length 2-ostrzowe, długie

HSM Vmax	F	M	30°	A	max	min		AIR
					○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○	●	●	○	○				○						





D code Kod	R	D	d1	d2	L	l1	l2	Shank Uchwyt	Z
UFX42050003A06006080	2,5	5.0	6	4.1	80	6	43	A	4
UFX42060003A06007100	3	6.0	6	4.7	100	7	30	A	4
UFX42080004A08009100	4	8.0	8	6.5	100	9	36	A	4
UFX42100005A10011100	5	10.0	10	8.2	100	11	43	A	4
UFX42120006A12013100	6	12.0	12	9.8	100	13	52	A	4
UFX42160008A16015150	8	16.0	16	13.4	150	15	61	A	4

µm	D 0~-0.03				µm	± 0,01
	d1 h6					

UFX42

Cutting Conditions Parametry skrawania

Normal Speed / Standardowa prędkość

			**Non-alloyed, alloy steels, cast iron** Stale stopowe, niestopowe, żeliwo		**Austenitic Heat Resistant Steel** Stal żaroodporna austenityczna		**Hardened Steels** Stale hartowane	
			30HRC		**30 - 40HRC**		**45 - 65HRC**	
D (mm)	**ae**	**ap**	**RPM**	**mm/min**	**RPM**	**mm/min**	**RPM**	**mm/min**
R2.5 x 5.0	0,25	0,1	21000	4000	20000	4000	7000	1400
R3.0 x 6.0	0,3	0,12	17000	4000	16000	3500	6000	1300
R4.0 x 8.0	0,4	0,16	13000	3500	12000	3000	4500	1100
R5.0 x 10.0	0,5	0,2	10500	3000	10000	2500	3500	1000
R6.0 x 12.0	0,6	0,24	9000	2800	8000	2500	3000	950
R8.0 x 16.0	0,8	0,32	6000	2800	5500	2200	2000	800

High Speed / Wysoka prędkość

			**Non-alloyed, alloy steels, cast iron** Stale stopowe, niestopowe, żeliwo		**Austenitic Heat Resistant Steel** Stal żaroodporna austenityczna		**Hardened Steels** Stale hartowane	
			30HRC		**30 - 40HRC**		**45 - 65HRC**	
D (mm)	**ae**	**ap**	**RPM**	**mm/min**	**RPM**	**mm/min**	**RPM**	**mm/min**
R2.5 x 5.0	0,25	0,1	28000	5600	27000	5300	11000	2100
R3.0 x 6.0	0,3	0,12	23000	5100	22000	4900	9000	1900
R4.0 x 8.0	0,4	0,16	18000	4600	17000	4300	7000	1700
R5.0 x 10.0	0,5	0,2	14000	3900	13000	3700	5000	1400
R6.0 x 12.0	0,6	0,24	12000	3700	11000	3500	4500	1300
R8.0 x 16.0	0,8	0,32	9000	3100	8000	3000	3300	1100

UFX63

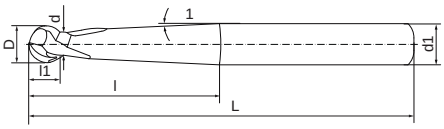
BALL NOSE KULISTE

2-Flute, Long, Sphere Type 2-ostrzowe, długie, sferyczne

HSM Vmax | F | M | 30° | A | max | min | AIR

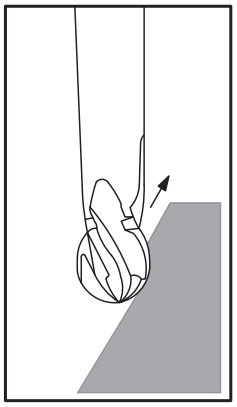
P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○	●	●	○	○				○						

										○	●	●	●

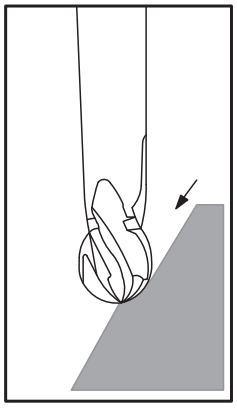




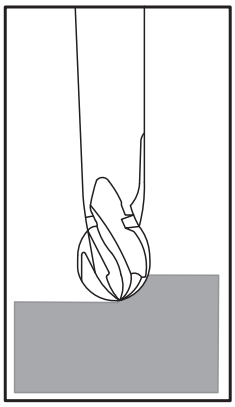
D code new Nowy kod	D code kod	R	D	d1	d2	L	l1	l2	Shank Uchwyt	Z
UFX63030015A06002080	UFX63030	1,5	3	6	2,5	80	2,3	30	A	2
UFX63040020A06003080	UFX63040	2	4	6	3,3	80	3,1	30	A	2
UFX63050025A06004080	UFX63050	2,5	5	6	4,1	80	3,9	38	A	2
UFX63060030A06005100	UFX63060	3	6	6	4,7	100	4,9	28	A	2
UFX63080040A08006100	UFX63080	4	8	8	6,5	100	6,3	33	A	2
UFX63100050A10008100	UFX63100	5	10	10	8,2	100	7,9	40	A	2
UFX63120060A12010100	UFX63120	6	12	12	9,8	100	9,5	49	A	2
UFX63160080A16012150	UFX63160	8	16	16	13,4	150	12,4	59	A	2



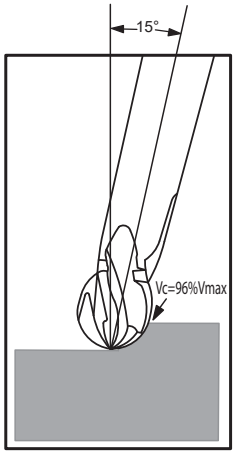
Favourable back milling
Zalecana obróbka wsteczna



Unfavourable drilling
Nie zalecane wiercenie



Unfavourable profiling
Nie zalecane profilowanie



Favourable profiling
Zalecana obróbka profilowa

µm					R	
	D ≤ 3,0	-14 — -28	d1 ≤ 3,0	0 — -6		± 0,01
	D ≤ 6,0	20 — -38	d1 ≤ 6,0	0 — -8		
	D ≤ 10	-25 — -47	d1 ≤ 10	0 — -9		
	D ≤18	-32 — -59	d1 ≤18	0 — -11		
	D ≤ 30	-40 — -73	d1 ≤ 30	0 — -13		

UFX63

Cutting Conditions Parametry skrawania

Normal Speed / Standardowa prędkość

			**Non-alloyed, alloy steels, cast iron** Stale stopowe, niestopowe, żeliwo		**Austenitic Heat Resistant Steel** Stal żaroodporna austenityczna		**Hardened Steels** Stale hartowane	
			30HRC		**30 - 40HRC**		**45 - 65HRC**	
D (mm)	**ae**	**ap**	**RPM**	**mm/min**	**RPM**	**mm/min**	**RPM**	**mm/min**
R1.5 x 3.0	0,15	0,06	35000	2800	33000	2600	12000	900
R2.0 x 4.0	0,2	0,08	26000	2300	25000	2200	9000	800
R2.5 x 5.0	0,25	0,1	21000	2100	20000	2000	7000	700
R3.0 x 6.0	0,3	0,12	17000	1900	16000	1800	6000	650
R4.0 x 8.0	0,4	0,16	13000	1700	12000	1600	4500	550
R5.0 x 10.0	0,5	0,2	10500	1450	10000	1400	3500	500
R6.0 x 12.0	0,6	0,24	9000	1400	8000	1300	3000	450
R8.0 x 16.0	0,8	0,32	6000	1200	5500	1100	2000	400

High Speed / Wysoka prędkość

			**Non-alloyed, alloy steels, cast iron** Stale stopowe, niestopowe, żeliwo		**Austenitic Heat Resistant Steel** Stal żaroodporna austenityczna		**Hardened Steels** Stale hartowane	
			30HRC		**30 - 40HRC**		**45 - 65HRC**	
D (mm)	**ae**	**ap**	**RPM**	**mm/min**	**RPM**	**mm/min**	**RPM**	**mm/min**
R1.5 x 3.0	0,15	0,06	47000	3700	44000	3500	17000	1400
R2.0 x 4.0	0,2	0,08	35000	3200	33000	3000	13000	1200
R2.5 x 5.0	0,25	0,1	28000	2800	27000	2600	10000	1100
R3.0 x 6.0	0,3	0,12	23000	2600	22000	2400	8000	950
R4.0 x 8.0	0,4	0,16	18000	2300	17000	2100	6000	850
R5.0 x 10.0	0,5	0,2	14000	2000	13000	1900	5000	750
R6.0 x 12.0	0,6	0,24	12000	1800	11000	1800	4000	700
R8.0 x 16.0	0,8	0,32	9000	1600	8000	1500	3300	600

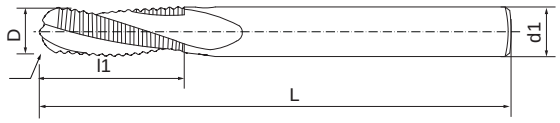
UFX33

BALL NOSE KULISTE

3,4-Flute, Long 3,4-ostrzowe, długie

HSM Vmax	F	M	20°	A	B					max	min		AIR
										○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○	●	●	○					○	○	○				





D code new Nowy kod	D code kod	R	D	d1	L	l1	Shank Uchwyt	Z
UFX33060030A06016057	UFX33060	3	6	6	57	16	A	3
UFX33080040A08016063	UFX33080	4	8	8	63	16	A	3
UFX33100050A10022072	UFX33100	5	10	10	72	22	A	4
UFX33120060A12026083	UFX33120	6	12	12	83	26	A	4
UFX33140070A14026083	UFX33140	7	14	14	83	26	A	4
UFX33160080A16032092	UFX33160	8	16	16	92	32	A	4
UFX33180090A18032092	UFX33180	9	18	18	92	32	A	4
UFX33200100A20038104	UFX33200	10	20	20	104	38	A	4

Cutting Conditions Parametry skrawania

			Non-alloyed, alloy steels, cast iron Stale stopowe, niestopowe, żeliwo		Austenitic Heat Resistant Steel Stal żaroodporna austenityczna						Hardened Steels Stale hartowane			
			30HRC		30 - 38HRC		38 - 45HRC				45 - 55HRC		55 - 65HRC	
D (mm)	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min	ae	ap	RPM	mm/min	RPM	mm/min
6	1,8	9	15600	2320	12400	840	8400	570	0,3	6	3400	260	2400	190
8	2,4	12	11600	2320	9200	840	6300	570	0,4	8	2400	240	1800	180
10	3	15	9200	2320	7600	840	5100	570	0,5	10	2000	290	1300	190
12	3,6	18	8000	2400	6000	800	4200	570	0,6	12	1680	260	1200	190
14	4,2	21	6800	2400	5200	840	3600	570	0,7	14	1400	200	900	130
16	4,8	24	6000	2400	4800	760	3300	510	0,8	16	1200	160	800	110
18	5,4	27	5200	2320	4400	720	2700	420	0,9	18	1100	150	700	100
20	6	30	4800	2160	3600	560	2400	360	1	20	1000	150	660	100

The above table shows cutting condition for side milling.
For slotting, please reduce only the feed rate by 20%.
Please reduce the revolution by 40% and the feed
rate by 60% in the case of slotting of Austenitic Heat Resistant Steel.

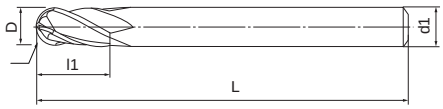
µm	D ≤ 3,0	-14 — -28	d1 ≤ 3,0	0 — -6	R	± 0,02
	D ≤ 6,0	20 — -38	d1 ≤ 6,0	0 — -8		
	D ≤ 10	-25 — -47	d1 ≤ 10	0 — -9		
	D ≤18	-32 — -59	d1 ≤18	0 — -11		
	D ≤ 30	-40 — -73	d1 ≤ 30	0 — -13		

UFX15

BALL NOSE KULISTE
4-Flute, Long Length 4-ostrzowe, długie

		HSM Vmax	F	M	30°	A	B					max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○	●	●	○	○				○						

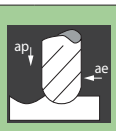


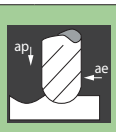


D code new Nowy kod	D code kod	R	D	d1	L	l1	Shank Uchwyt	Z
UFX15010005A04003050	UFX15010	0,5	1	4	50	2,5	A	4
UFX15010005A06003050	UFX15901	0,5	1	6	50	2,5	A	4
UFX15015008A04004050	UFX15015	0,75	1,5	4	50	4	A	4
UFX15015008A06004050	UFX15902	0,75	1,5	6	50	4	A	4
UFX15020010A06005050	UFX15020	1	2	6	50	5	A	4
UFX15030015A06008060	UFX15030	1,5	3	6	60	8	A	4
UFX15040020A06008070	UFX15040	2	4	6	70	8	A	4
UFX15050025A06010080	UFX15050	2,5	5	6	80	10	A	4
UFX15060030A06012090	UFX15060	3	6	6	90	12	A	4
UFX15070035A08014090	UFX15070	3,5	7	8	90	14	A	4
UFX15080040A08014100	UFX15080	4	8	8	100	14	A	4
UFX15090045A10018100	UFX15090	4,5	9	10	100	18	A	4
UFX15100050A10018100	UFX15100	5	10	10	100	18	A	4
UFX15120060A12022110	UFX15120	6	12	12	110	22	A	4
UFX15140070A14026110	UFX15140	7	14	14	110	26	A	4
UFX15140070A16026110	UFX15903	7	14	16	110	26	A	4
UFX15160080A16030140	UFX15160	8	16	16	140	30	A	4
UFX15180090A18034140	UFX15180	9	18	18	140	34	A	4
UFX15200100A20038160	UFX15200	10	20	20	160	38	A	4
UFX15250125A25050180	UFX15250	12,5	25	25	180	50	A	4

µm					R	
	D ≤ 3,0	-14 — -28	d1 ≤ 3,0	0 — -6		± 0,02
	D ≤ 6,0	20 — -38	d1 ≤ 6,0	0 — -8		
	D ≤ 10	-25 — -47	d1 ≤ 10	0 — -9		
	D ≤18	-32 — -59	d1 ≤18	0 — -11		
	D ≤ 30	-40 — -73	d1 ≤ 30	0 — -13		

Cutting Conditions Parametry skrawania

			Steels Stale							
			22 - 30HRC		30 - 45HRC		45 - 50HRC		50 - 55HRC	
D (mm)	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
1	0,10	0,02	30000	3360	30000	3360	30000	3360	30000	3360
2	0,20	0,03	30000	6720	30000	6720	30000	6720	30000	6720
3	0,30	0,05	30000	8400	30000	8400	30000	8400	29178	8170
4	0,40	0,06	30000	7680	29444	7538	25704	6580	18621	4767
5	0,40	0,09	29794	8581	23555	6784	20563	5922	14897	4290
6	0,50	0,10	24828	7866	19629	6219	17136	5429	12414	3933
8	0,60	0,15	18621	6793	14722	5371	12852	4688	9311	3396
10	0,60	0,25	14897	6197	11777	4899	10281	4277	7448	3099
12	0,70	0,30	12414	5562	9815	4397	8568	3838	6207	2781
16	0,80	0,50	9311	5363	7361	4240	6426	3701	4655	2681

			Steels Stale				Grey Cast Irons Żeliwa szare			
			55 - 60HRC		60 - 65HRC		180 - 250HB		>250HB	
D (mm)	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
1	0,10	0,02	30000	3360	30000	3360	30000	3360	30000	3360
2	0,20	0,03	27056	6060	18303	4100	30000	6720	30000	6720
3	0,30	0,05	18038	5050	12202	3416	30000	8400	30000	8400
4	0,40	0,06	11539	2954	7799	1996	30000	7680	30000	7680
5	0,40	0,09	9231	2659	6239	1797	30000	8640	29794	8581
6	0,50	0,10	7692	2437	5199	1647	28436	9008	24828	7866
8	0,60	0,15	5769	2105	3899	1422	21327	7780	18621	6793
10	0,60	0,25	4615	1920	3119	1298	17061	7098	14897	6197
12	0,70	0,30	3846	1723	2600	1165	14218	6370	12414	5562
16	0,80	0,50	2885	1662	1950	1123	10663	6142	9311	5363

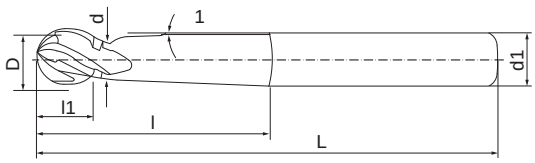
UFX64

BALL NOSE KULISTE

4-Flute, Long, Sphere Type 4-ostrzowe, długie, sferyczne

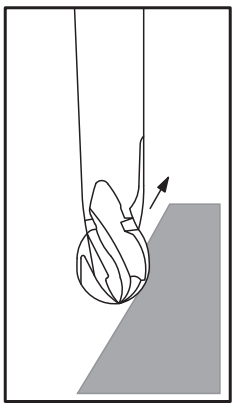
HSM Vmax	F	M	30°	A	max	min	AIR
					○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○	●	●	○	○				○						

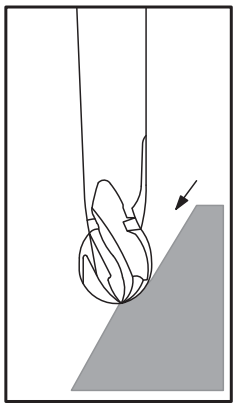




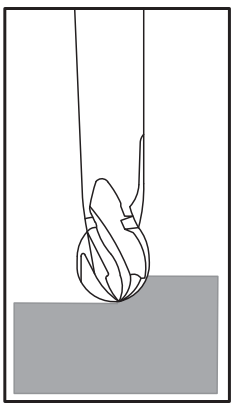
D code new Nowy kod	D code kod	R	D	d1	d2	L	l1	l2	Shank Uchwyt	Z
UFX64050025A06004080	UFX64050	2,5	5	6	4,1	80	3,9	38	A	4
UFX64060030A06005100	UFX64060	3	6	6	4,7	100	4,9	28	A	4
UFX64080040A08006100	UFX64080	4	8	8	6,5	100	6,3	33	A	4
UFX64100050A10008100	UFX64100	5	10	10	8,2	100	7,9	40	A	4
UFX64120060A12010100	UFX64120	6	12	12	9,8	100	9,5	49	A	4
UFX64160080A16012150	UFX64160	8	16	16	13,4	150	12,4	59	A	4



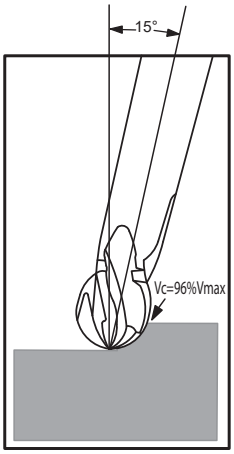
Favourable back milling
Zalecana obróbka wsteczna



Unfavourable drilling
Nie zalecane wiercenie



Unfavourable profiling
Nie zalecane profilowanie



Favourable profiling
Zalecana obróbka profilowa

µm	D ≤ 3,0	-14 — -28	d1 ≤ 3,0	0 — -6	R	± 0,02
	D ≤ 6,0	20 — -38	d1 ≤ 6,0	0 — -8		
	D ≤ 10	-25 — -47	d1 ≤ 10	0 — -9		
	D ≤18	-32 — -59	d1 ≤18	0 — -11		
	D ≤ 30	-40 — -73	d1 ≤ 30	0 — -13		

UFX64

Cutting Conditions Parametry skrawania

			Steels Stale							
			22 - 30HRC		30 - 45HRC		45 - 50HRC		50 - 55HRC	
D (mm)	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
5	0,4	0,09	30205	10874	24479	8812	20745	7468	15570	5606
6	0,5	0,10	25523	10108	20683	8190	17532	6942	13157	5210
8	0,6	0,15	19053	8688	15440	7040	13086	5968	9822	4478
10	0,6	0,25	14854	7724	12040	6260	10200	5304	7657	3982
12	0,7	0,30	12522	7012	10149	5684	8600	4816	6455	3614
16	0,8	0,50	9244	6656	7493	5394	6348	4570	4765	3430

			Steels Stale				Grey Cast Irons Żeliwa szare			
			55 - 60HRC				180 - 250HB		>250HB	
D (mm)	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
5	0,4	0,09	9629	3466	6438	2318	34297	12346	30205	10874
6	0,5	0,10	8137	3222	5441	2154	29226	11574	25523	10108
8	0,6	0,15	6074	2770	4062	1852	21755	9920	19053	8688
10	0,6	0,25	4735	2462	3166	1646	16694	8680	14854	7724
12	0,7	0,30	3992	2236	2669	1494	14175	7938	12522	7012
16	0,8	0,50	2947	2122	1970	1418	10389	7480	9244	6656

Designed to machine in 5-Axis for tool steel, alloy steel, mold steel and other high hardened materials
Zalecane są do obróbki w 5-osiach do stali narzędziowej, stopowej oraz innych bardzo twardych materiałów

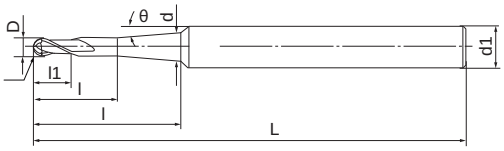
UFX02

TAPER STOŻKOWE

2-Flute, Taper Neck 2-ostrzowe. ze stożkową szyjką

		HSM Vmax	F	M	30°	A	B					max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○	●	●	○											





D code Kod	R	D	d1	d2	L	l1	l2	l3	θ	Shank Uchwyt	Z
UFX02010005A06004060	0,5	1	6	2	60	2	23	4	1°30′	A	2
UFX02010005A06004061	0,5	1	6	4,3	60	2	23	4	5°	A	2
UFX02010005A06004080	0,5	1	6	5	80	2	42	4	3°	A	2
UFX02020010A06006060	1	2	6	2,9	60	4	23	6	1°30′	A	2
UFX02020010A06006061	1	2	6	5	60	4	23	6	5°	A	2
UFX02020010A06006080	1	2	6	5,7	80	4	41	6	3°	A	2
UFX02030015A06008070	1,5	3	6	5,6	70	6	32	8	3°	A	2
UFX02030015A06008090	1,5	3	6	5,3	90	6	52	8	1°30′	A	2
UFX02040020A06010070	2	4	6	6	70	8	28	10	3°	A	2
UFX02040020A06010090	2	4	6	6	90	8	49	10	1°30′	A	2
UFX02050025A08012090	2,5	5	8	8	90	10	41	12	3°	A	2
UFX02050025A08012110	2,5	5	8	7,6	110	10	61	12	1°30′	A	2
UFX02060030A08015090	3	6	8	8	90	12	34	15	3°	A	2
UFX02060030A08015110	3	6	8	8	110	12	53	15	1°30′	A	2
UFX02080040A10017100	4	8	10	10	100	14	36	17	3°	A	2
UFX02080040A10017120	4	8	10	10	120	14	55	17	1°30′	A	2
UFX02100050A12021110	5	10	12	12	110	18	40	21	3°	A	2
UFX02100050A12021130	5	10	12	12	130	18	59	21	1°30′	A	2
UFX02120060A16025140	6	12	16	16	140	22	63	25	3°	A	2
UFX02120060A16025160	6	12	16	15	160	22	83	25	1°30′	A	2

µm	D < 6,0	0 — -28	d1 h6		R	± 0,01
	D ≥ 6,0	0 — -38				

UFX02

Cutting Conditions Parametry skrawania

			Steels Stale							
			22 - 30HRC		30 - 45HRC		45 - 50HRC		50 - 55HRC	
D (mm)	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
1	0,10	0,02	34000	1805	34000	1805	34000	1805	34000	1805
1,5	0,15	0,03	34000	3100	34000	3100	34000	3100	34000	3100
2	0,20	0,03	34000	3805	34000	3805	34000	3805	34000	3805
3	0,30	0,05	34000	4760	34000	4760	33910	4745	24530	3430
4	0,40	0,06	34000	5440	29420	4705	25700	4110	18600	2975
5	0,40	0,09	30245	5445	23970	4310	20940	3765	15150	2725
6	0,50	0,10	25565	5060	20245	4005	17675	3500	12805	2535
7	0,50	0,15	21220	4540	16770	3585	14645	3130	10590	2265
8	0,60	0,15	19070	4345	15115	3445	13190	3005	9535	2170
10	0,60	0,25	14880	3865	11765	3060	10280	2670	7440	1930
12	0,70	0,30	12535	3505	9920	2775	8680	2430	6265	1755

			Steels Stale				Grey Cast Irons Żeliwa szare			
			55 - 60HRC		60 - 65HRC		180 - 250HB		>250HB	
D (mm)	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
1	0,10	0,02	30000	1595	26495	1410	30000	1595	30000	1595
1,5	0,15	0,03	26100	2380	17665	1610	30000	2735	30000	2735
2	0,20	0,03	20290	2270	13725	1535	30000	3360	30000	3360
3	0,30	0,05	13365	1870	9070	1265	30000	4200	30000	4200
4	0,40	0,06	10145	1620	6860	1095	30000	4800	30000	4800
5	0,40	0,09	8260	1485	5585	1005	30000	5400	26735	4810
6	0,50	0,10	7000	1385	4730	935	25820	5110	22595	4470
7	0,50	0,15	5795	1240	3920	835	21450	4590	18720	4005
8	0,60	0,15	5220	1190	3520	800	19275	4395	16860	3840
10	0,60	0,25	4055	1055	2745	710	15040	3910	13130	3410
12	0,70	0,30	3420	955	2305	645	12670	3545	11080	3100

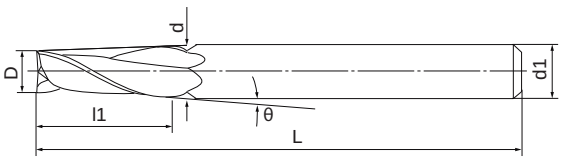
UFX37

TAPER STOŻKOWE

2-Flute, Taper, Short Length 2-ostrzowe, stożkowe, krótkie

HSM Vmax	F	M	30°	A	B					max	min		AIR
										○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○	●	●	○					○						





D code new Nowy kod	D code kod	D	d1	d2	L	l1	θ	Shank Uchwyt	Z
UFX37020000A04006045	UFX37913	2	4	2,1	45	6	30′	A	2
UFX37021000A04006045	UFX37020	2	4	2,21	45	6	1°	A	2
UFX37022000A04006045	UFX37901	2	4	2,42	45	6	2°	A	2
UFX37023000A04006045	UFX37902	2	4	2,63	45	6	3°	A	2
UFX37030000A06010055	UFX37914	3	6	3,17	55	10	30′	A	2
UFX37031000A06010055	UFX37030	3	6	3,35	55	10	1°	A	2
UFX37032000A06010055	UFX37903	3	6	3,7	55	10	2°	A	2
UFX37033000A06010055	UFX37904	3	6	4,05	55	10	3°	A	2
UFX37040000A06015055	UFX37915	4	6	4,26	55	15	30′	A	2
UFX37041000A06015055	UFX37040	4	6	4,52	55	15	1°	A	2
UFX37042000A06015055	UFX37905	4	6	5,05	55	15	2°	A	2
UFX37043000A06015055	UFX37906	4	6	5,57	55	15	3°	A	2
UFX37050000A06015060	UFX37916	5	6	5,23	60	15	30′	A	2
UFX37051000A06015060	UFX37050	5	6	5,47	60	15	1°	A	2
UFX37052000A06015060	UFX37907	5	6	5,94	60	15	2°	A	2
UFX37053000A06015060	UFX37908	5	6	6,41	60	15	3°	A	2
UFX37060000A06020060	UFX37917	6	6	6,35	60	20	30′	A	2
UFX37061000A06020060	UFX37060	6	6	6,7	60	20	1°	A	2
UFX37062000A06020060	UFX37909	6	6	7,4	60	20	2°	A	2
UFX37063000A08020065	UFX37910	6	8	8,1	65	20	3°	A	2
UFX37080000A08025070	UFX37918	8	8	8,44	70	25	30′	A	2
UFX37081000A08025070	UFX37080	8	8	8,87	70	25	1°	A	2
UFX37082000A08025070	UFX37911	8	8	9,75	70	25	2°	A	2
UFX37080000A10025075	UFX37912	8	10	10,62	75	25	3°	A	2

Cutting Conditions Parametry skrawania

			Cast Iron Żeliwo		Carbon Steel, Cast Iron Stal węglowa, żeliwo		Alloy steel, Tool steel Stal stopowa, Stal narzędziowa		Alloy Steel, Prehardened Steel Stal stopowa, stal ulepszona		Alloy Steel, Stainless Steel Stal stopowa, stal nierdzewna		Hardened steel Stal hartowana	
					<22HRC		<30HRC		30 - 38HRC		38 - 45HRC		45 - 65HRC	
D (mm)	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
2,0	0,04	5,00	8900	190	7950	155	7950	130	6650	90	6200	90	5250	40
2,5	0,05	6,25	7100	190	6200	145	6200	125	5300	90	4950	90	4200	40
3,0	0,06	7,50	5900	190	5150	145	5150	125	4450	90	4100	90	3500	40
4,0	0,08	10,00	4450	190	3850	145	3850	125	3300	90	3100	85	2600	40
5,0	0,10	12,50	3550	190	3100	145	3100	125	2650	90	2450	85	2100	40
6,0	0,12	15,00	2950	190	2600	145	2600	125	2200	90	2050	85	1750	40
8,0	0,16	20,00	2200	180	1950	145	1950	125	1650	90	1550	85	1300	40

µm	D < 6,0	0 — -28	d1 h6		R	± 0,01
	D ≥ 6,0	0 — -38				

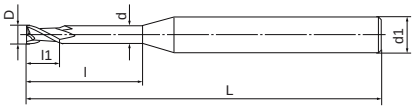
UFX83

FOR RIB PROCESSING DO ŻEBER

2-Flute, Ball Nose, Micro, For Rib Processing 2-ostrzowe, kuliste, mikro, do żeber

HSM Vmax	F	M	30°	A	max	min	AIR
					○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, SI <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○	●	●	○					○						





D code Kod	D	d1	d2	L	l1	l2	Shank Uchwyt	Z
UFX83004000A04002045	0,4	4	0,37	45	0,6	2	A	2
UFX83004000A04003045	0,4	4	0,37	45	0,6	3	A	2
UFX83004000A04004045	0,4	4	0,37	45	0,6	4	A	2
UFX83004000A04005045	0,4	4	0,37	45	0,6	5	A	2
UFX83005000A04002045	0,5	4	0,45	45	0,7	2	A	2
UFX83005000A04004045	0,5	4	0,45	45	0,7	4	A	2
UFX83005000A04006045	0,5	4	0,45	45	0,7	6	A	2
UFX83005000A04008045	0,5	4	0,45	45	0,7	8	A	2
UFX83006000A04002045	0,6	4	0,55	45	0,9	2	A	2
UFX83006000A04004045	0,6	4	0,55	45	0,9	4	A	2
UFX83006000A04006045	0,6	4	0,55	45	0,9	6	A	2
UFX83006000A04008045	0,6	4	0,55	45	0,9	8	A	2
UFX83006000A04010045	0,6	4	0,55	45	0,9	10	A	2
UFX83007000A04002045	0,7	4	0,65	45	1	2	A	2
UFX83007000A04003045	0,7	4	0,65	45	1	3	A	2
UFX83007000A04004045	0,7	4	0,65	45	1	4	A	2
UFX83007000A04006045	0,7	4	0,65	45	1	6	A	2
UFX83007000A04008045	0,7	4	0,65	45	1	8	A	2
UFX83007000A04010045	0,7	4	0,65	45	1	10	A	2
UFX83008000A04004045	0,8	4	0,75	45	1,2	4	A	2
UFX83008000A04006045	0,8	4	0,75	45	1,2	6	A	2
UFX83008000A04008045	0,8	4	0,75	45	1,2	8	A	2
UFX83008000A04010045	0,8	4	0,75	45	1,2	10	A	2
UFX83008000A04012045	0,8	4	0,75	45	1,2	12	A	2
UFX83009000A04006045	0,9	4	0,85	45	1,35	6	A	2
UFX83009000A04008045	0,9	4	0,85	45	1,35	8	A	2
UFX83009000A04010045	0,9	4	0,85	45	1,35	10	A	2
UFX83009000A04001050	0,9	4	0,85	50	1,35	15	A	2
UFX83010000A04004045	1	4	0,95	45	1,5	4	A	2
UFX83010000A04006045	1	4	0,95	45	1,5	6	A	2
UFX83010000A04008045	1	4	0,95	45	1,5	8	A	2
UFX83010000A04010045	1	4	0,95	45	1,5	10	A	2
UFX83010000A04012045	1	4	0,95	45	1,5	12	A	2
UFX83010000A04002050	1	4	0,95	50	1,5	16	A	2
UFX83010000A04002055	1	4	0,95	55	1,5	20	A	2
UFX83012000A04006045	1,2	4	1,15	45	1,8	6	A	2
UFX83012000A04008045	1,2	4	1,15	45	1,8	8	A	2
UFX83012000A04010045	1,2	4	1,15	45	1,8	10	A	2
UFX83012000A04012045	1,2	4	1,15	45	1,8	12	A	2
UFX83012000A04002050	1,2	4	1,15	50	1,8	16	A	2
UFX83014000A04006045	1,4	4	1,35	45	2,1	6	A	2
UFX83014000A04008045	1,4	4	1,35	45	2,1	8	A	2
UFX83014000A04010045	1,4	4	1,35	45	2,1	10	A	2
UFX83014000A04012045	1,4	4	1,35	45	2,1	12	A	2
UFX83014000A04014050	1,4	4	1,35	50	2,1	14	A	2
UFX83014000A04016050	1,4	4	1,35	50	2,1	16	A	2

µm	D 0 — -16				R	± 0,01	
	d1 0 — -8						

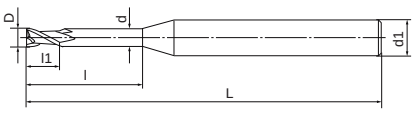
UFX83

FOR RIB PROCESSING DO ŻEBER

2-Flute, Ball Nose, Micro, For Rib Processing 2-ostrzowe, kuliste, mikro, do żeber

HSM Vmax	F	M	30°	A	max	min	AIR
					○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○	●	●	○					○						





D code Kod	D	d1	d2	L	l1	l2	Shank Uchwyt	Z
UFX83014000A04002055	1,4	4	1,35	55	2,1	22	A	2
UFX83015000A04006045	1,5	4	1,45	45	2,3	6	A	2
UFX83015000A04008045	1,5	4	1,45	45	2,3	8	A	2
UFX83015000A04010045	1,5	4	1,45	45	2,3	10	A	2
UFX83015000A04012045	1,5	4	1,45	45	2,3	12	A	2
UFX83015000A04014050	1,5	4	1,45	50	2,3	14	A	2
UFX83015000A04016050	1,5	4	1,45	50	2,3	16	A	2
UFX83015000A04018055	1,5	4	1,45	55	2,3	18	A	2
UFX83015000A04020055	1,5	4	1,45	55	2,3	20	A	2
UFX83016000A04006045	1,6	4	1,55	45	2,4	6	A	2
UFX83016000A04008045	1,6	4	1,55	45	2,4	8	A	2
UFX83016000A04010045	1,6	4	1,55	45	2,4	10	A	2
UFX83016000A04012045	1,6	4	1,55	45	2,4	12	A	2
UFX83016000A04014050	1,6	4	1,55	50	2,4	14	A	2
UFX83016000A04016050	1,6	4	1,55	50	2,4	16	A	2
UFX83016000A04018055	1,6	4	1,55	55	2,4	18	A	2
UFX83016000A04020055	1,6	4	1,55	55	2,4	20	A	2
UFX83016000A04002060	1,6	4	1,55	60	2,4	26	A	2
UFX83018000A04006045	1,8	4	1,75	45	2,7	6	A	2
UFX83018000A04008045	1,8	4	1,75	45	2,7	8	A	2
UFX83018000A04010045	1,8	4	1,75	45	2,7	10	A	2
UFX83018000A04012045	1,8	4	1,75	45	2,7	12	A	2
UFX83018000A04014050	1,8	4	1,75	50	2,7	14	A	2
UFX83018000A04016050	1,8	4	1,75	50	2,7	16	A	2
UFX83018000A04018055	1,8	4	1,75	55	2,7	18	A	2
UFX83018000A04020055	1,8	4	1,75	55	2,7	20	A	2
UFX83018000A04003060	1,8	4	1,75	60	2,7	25	A	2
UFX83020000A04006045	2	4	1,95	45	3	6	A	2
UFX83020000A04008045	2	4	1,95	45	3	8	A	2
UFX83020000A04010045	2	4	1,95	45	3	10	A	2
UFX83020000A04012045	2	4	1,95	45	3	12	A	2
UFX83020000A04014050	2	4	1,95	50	3	14	A	2
UFX83020000A04016050	2	4	1,95	50	3	16	A	2
UFX83020000A04018055	2	4	1,95	55	3	18	A	2
UFX83020000A04020055	2	4	1,95	55	3	20	A	2
UFX83020000A04003060	2	4	1,95	60	3	25	A	2
UFX83020000A04003070	2	4	1,95	70	3	30	A	2
UFX83025000A04008045	2,5	4	2,4	45	3,7	8	A	2
UFX83025000A04010045	2,5	4	2,4	45	3,7	10	A	2
UFX83025000A04012045	2,5	4	2,4	45	3,7	12	A	2
UFX83025000A04004050	2,5	4	2,4	50	3,7	14	A	2
UFX83025000A04016055	2,5	4	2,4	55	3,7	16	A	2
UFX83025000A04018055	2,5	4	2,4	55	3,7	18	A	2
UFX83025000A04004060	2,5	4	2,4	60	3,7	20	A	2
UFX83025000A04004070	2,5	4	2,4	70	3,7	25	A	2

µm	D 0 — -16				R	± 0,01	
	d1 0 — -8						

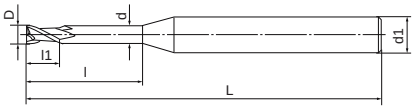
UFX83

FOR RIB PROCESSING DO ŻEBER

2-Flute, Ball Nose, Micro, For Rib Processing 2-ostrzowe, kuliste, mikro, do żeber

HSM Vmax | F | M | 30° | A | max | min | AIR

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○	●	●	○					○						





D code Kod	D	d1	d2	L	l1	l2	Shank Uchwyt	Z
UFX83025000A04004080	2,5	4	2,4	80	3,7	30	A	2
UFX83030000A06008045	3	6	2,85	45	4,5	8	A	2
UFX83030000A06010045	3	6	2,85	45	4,5	10	A	2
UFX83030000A06012045	3	6	2,85	45	4,5	12	A	2
UFX83030000A06005050	3	6	2,85	50	4,5	14	A	2

Cutting Conditions Parametry skrawania



		Carbon Steel, Cast Iron Stal węglowa, żeliwo			Alloy steel, Tool steel Stal stopowa, Stal narzędziowa			Treated & pretreated steels			Stainless steel Stal nierdzewna			Treated steels			Treated steels		
		75 MPA			30 HRC			30 - 38 HRC			38 - 45 HRC			45 - 55 HRC			55 - 60 HRC		
D mm	ae mm	ap	RPM	mm/ min	ap	RPM	mm/ min	ap	RPM	mm/ min	ap	RPM	mm/ min	ap	RPM	mm/ min	ap	RPM	mm/ min
0.4	0.4	0.029	50.000	700	0.026	50.000	630	0.022	50.000	560	0.017	50.000	560	0.012	40.000	420	0.006	40.000	336
0.4	0.4	0.013	50.000	600	0.012	50.000	540	0.010	50.000	480	0.008	50.000	480	0.005	40.000	360	0.003	39.809	287
0.5	0.5	0.049	50.000	900	0.044	50.000	810	0.037	40.000	576	0.029	40.000	576	0.020	40.000	540	0.010	31.847	344
0.5	0.5	0.005	50.000	800	0.005	40.000	576	0.004	40.000	512	0.003	40.000	512	0.002	40.000	480	0.001	31.847	306
0.6	0.6	0.059	40.000	800	0.053	40.000	720	0.044	40.000	640	0.035	40.000	640	0.024	37.155	557	0.012	26.539	318
0.6	0.6	0.043	40.000	800	0.039	40.000	720	0.032	40.000	640	0.026	40.000	640	0.018	37.155	557	0.009	26.539	318
0.6	0.6	0.008	40.000	720	0.007	40.000	648	0.006	40.000	576	0.005	40.000	576	0 003	37.155	502	0.002	26.539	287
0.6	0.6	0.005	40.000	640	0.005	40.000	576	0.004	40.000	512	0.003	40.000	512	0.002	37.155	446	0.001	26.539	255
0.7	0.7	0.068	40.000	960	0.061	40.000	864	0.051	40.000	768	0.041	40.000	768	0.028	31.847	573	0.014	22.748	328
0.7	0.7	0.050	40.000	800	0.045	40.000	720	0.038	40.000	640	0.030	40.000	640	0.021	31.847	478	0.010	22.748	273
0.7	0.7	0.018	40.000	720	0.016	40.000	648	0.014	40.000	576	0.011	40.000	576	0.007	31.847	430	0.004	22.748	246
0.7	0.7	0.009	40.000	720	0.008	40.000	648	0.007	40.000	576	0.005	40.000	576	0.004	31.847	430	0.002	22.748	246
0.8	0.8	0.057	40.000	1.120	0.051	40.000	1.008	0.043	39.809	892	0.034	39.809	892	0.023	27.866	585	0.011	19.904	334
0.8	0.8	0.036	40.000	1.120	0.032	40.000	1.008	0.027	39.809	892	0.022	39.809	892	0.015	27.866	585	0.007	19.904	334
0.8	0.8	0.010	40.000	960	0.009	40.000	864	0.008	39.809	764	0.006	39.809	764	0.004	27.866	502	0.002	19.904	287
0.8	0.8	0.007	40.000	960	0.006	40.000	864	0.005	39.809	764	0.004	39.809	764	0.003	27.866	502	0.001	19.904	287
0.9	0.9	0.064	40.000	1.280	0.058	38.924	1.121	0.048	35.386	906	0.038	35.386	906	0.026	24.770	594	0.013	17.693	340
0.9	0.9	0.007	40.000	1.120	0.006	38.924	981	0.005	35.386	793	0.004	35.386	793	0.003	24.770	520	0.001	17.693	297
DOC*																			

µm	D 0 — -16				R	± 0,01
	d1 0 — -8					

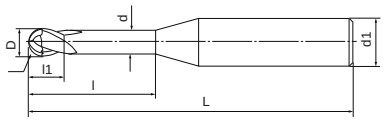
UFX86

FOR RIB PROCESSING DO ŻEBER

2-Flute, Ball Nose, Micro, For Rib Processing 2-ostrzowe, kuliste, mikro, do żeber

HSM Vmax	F	M	30°	A	B					max	min		AIR
										○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○	●	●	○					○						





D code Kod	R	D	d1	d2	L	l1	l2	Shank Uchwyt	Z
UFX86004002A04001045	0,2	0,4	4	0,37	45	0,6	1	A	2
UFX86004002A04002045	0,2	0,4	4	0,37	45	0,6	2	A	2
UFX86004002A04003045	0,2	0,4	4	0,37	45	0,6	3	A	2
UFX86005003A04002045	0,25	0,5	4	0,45	45	0,7	2	A	2
UFX86005003A04004045	0,25	0,5	4	0,45	45	0,7	4	A	2
UFX86005003A04006045	0,25	0,5	4	0,45	45	0,7	6	A	2
UFX86005003A04008045	0,25	0,5	4	0,45	45	0,7	8	A	2
UFX86006003A04002045	0,3	0,6	4	0,55	45	0,9	2	A	2
UFX86006003A04004045	0,3	0,6	4	0,55	45	0,9	4	A	2
UFX86006003A03001035	0,3	0,6	3	0,55	35	0,9	6	A	2
UFX86006003A04006045	0,3	0,6	4	0,55	45	0,9	6	A	2
UFX86006003A04008045	0,3	0,6	4	0,55	45	0,9	8	A	2
UFX86008004A04002045	0,4	0,8	4	0,75	45	1,2	2	A	2
UFX86008004A04004045	0,4	0,8	4	0,75	45	1,2	4	A	2
UFX86008004A04006045	0,4	0,8	4	0,75	45	1,2	6	A	2
UFX86008004A04008045	0,4	0,8	4	0,75	45	1,2	8	A	2
UFX86008004A04010045	0,4	0,8	4	0,75	45	1,2	10	A	2
UFX86010005A04003045	0,5	1	4	0,95	45	1,5	3	A	2
UFX86010005A04004045	0,5	1	4	0,95	45	1,5	4	A	2
UFX86010005A04005045	0,5	1	4	0,95	45	1,5	5	A	2
UFX86010005A04006045	0,5	1	4	0,95	45	1,5	6	A	2
UFX86010005A04007045	0,5	1	4	0,95	45	1,5	7	A	2
UFX86010005A04008045	0,5	1	4	0,95	45	1,5	8	A	2
UFX86010005A04009045	0,5	1	4	0,95	45	1,5	9	A	2
UFX86010005A04010045	0,5	1	4	0,95	45	1,5	10	A	2
UFX86010005A04012045	0,5	1	4	0,95	45	1,5	12	A	2
UFX86010005A04014050	0,5	1	4	0,95	50	1,5	14	A	2
UFX86010005A04016050	0,5	1	4	0,95	50	1,5	16	A	2
UFX86010005A04002055	0,5	1	4	0,95	55	1,5	20	A	2
UFX86012006A04008045	0,6	1,2	4	1,15	45	1,8	8	A	2
UFX86012006A04012045	0,6	1,2	4	1,15	45	1,8	12	A	2
UFX86014007A04008045	0,7	1,4	4	1,35	45	2,1	8	A	2
UFX86014007A04012045	0,7	1,4	4	1,35	45	2,1	12	A	2
UFX86014007A04002050	0,7	1,4	4	1,35	50	2,1	16	A	2
UFX86015008A04006045	0,75	1,5	4	1,45	45	2,3	6	A	2
UFX86015008A04008045	0,75	1,5	4	1,45	45	2,3	8	A	2
UFX86015008A04010045	0,75	1,5	4	1,45	45	2,3	10	A	2
UFX86015008A04012045	0,75	1,5	4	1,45	45	2,3	12	A	2
UFX86015008A04002050	0,75	1,5	4	1,45	50	2,3	16	A	2
UFX86015008A04002055	0,75	1,5	4	1,45	55	2,3	20	A	2
UFX86016008A04008045	0,8	1,6	4	1,55	45	2,4	8	A	2
UFX86016008A04012045	0,8	1,6	4	1,55	45	2,4	12	A	2
UFX86016008A04002050	0,8	1,6	4	1,55	50	2,4	16	A	2
UFX86016008A04002055	0,8	1,6	4	1,55	55	2,4	20	A	2
UFX86018009A04008045	0,9	1,8	4	1,75	45	2,7	8	A	2

µm	0,6 ≤ D ≤ 3,0	-14 — -28	D = 0,6	0,0 ≤ d1≤ -6,0	R	± 0,01
	3,0 < D ≤ 4,0	-20 — -38	0,6 < D ≤ 4,0	0,0 ≤ d1≤ -8,0		

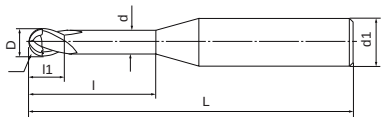
UFX86

FOR RIB PROCESSING DO ŻEBER

2-Flute, Ball Nose, Micro, For Rib Processing 2-ostrzowe, kuliste, mikro, do żeber

HSM Vmax	F	M	30°	A	B	max	min	AIR
						○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○	●	●	○					○						





D code Kod	R	D	d1	d2	L	l1	l2	Shank Uchwyt	Z
UFX86018009A04012045	0,9	1,8	4	1,75	45	2,7	12	A	2
UFX86018009A04003050	0,9	1,8	4	1,75	50	2,7	16	A	2
UFX86018009A04003055	0,9	1,8	4	1,75	55	2,7	20	A	2
UFX86020010A04004045	1	2	4	1,95	45	3	4	A	2
UFX86020010A04006045	1	2	4	1,95	45	3	6	A	2
UFX86020010A04008045	1	2	4	1,95	45	3	8	A	2
UFX86020010A04010045	1	2	4	1,95	45	3	10	A	2
UFX86020010A04012050	1	2	4	1,95	50	3	12	A	2
UFX86020010A04014050	1	2	4	1,95	50	3	14	A	2
UFX86020010A04016050	1	2	4	1,95	50	3	16	A	2
UFX86020010A04003055	1	2	4	1,95	55	3	20	A	2
UFX86020010A04022060	1	2	4	1,95	60	3	22	A	2
UFX86020010A04025060	1	2	4	1,95	60	3	25	A	2
UFX86020010A04003070	1	2	4	1,95	70	3	30	A	2
UFX86030015A06008050	1,5	3	6	2,85	50	4,5	8	A	2
UFX86030015A06010050	1,5	3	6	2,85	50	4,5	10	A	2
UFX86030015A06012050	1,5	3	6	2,85	50	4,5	12	A	2
UFX86030015A06005055	1,5	3	6	2,85	55	4,5	16	A	2
UFX86030015A06005060	1,5	3	6	2,85	60	4,5	20	A	2
UFX86030015A06005065	1,5	3	6	2,85	65	4,5	25	A	2
UFX86030015A06005070	1,5	3	6	2,85	70	4,5	30	A	2
UFX86030015A06005080	1,5	3	6	2,85	80	4,5	35	A	2
UFX86040020A06010060	2	4	6	3,85	60	6	10	A	2
UFX86040020A06012060	2	4	6	3,85	60	6	12	A	2
UFX86040020A06016060	2	4	6	3,85	60	6	16	A	2
UFX86040020A06006065	2	4	6	3,85	65	6	20	A	2
UFX86040020A06025070	2	4	6	3,85	70	6	25	A	2
UFX86040020A06030070	2	4	6	3,85	70	6	30	A	2
UFX86040020A06006080	2	4	6	3,85	80	6	35	A	2
UFX86040020A06040090	2	4	6	3,85	90	6	40	A	2
UFX86040020A06045090	2	4	6	3,85	90	6	45	A	2
UFX86040020A06006100	2	4	6	3,85	100	6	50	A	2
UFX86050025A06016060	2,5	5	6	4,85	60	7,5	16	A	2
UFX86050025A06020060	2,5	5	6	4,85	60	7,5	20	A	2
UFX86050025A06008070	2,5	5	6	4,85	70	7,5	25	A	2
UFX86050025A06030080	2,5	5	6	4,85	80	7,5	30	A	2
UFX86050025A06035080	2,5	5	6	4,85	80	7,5	35	A	2
UFX86060030A06009080	3	6	6	5,85	80	9	20	A	2
UFX86060030A06009090	3	6	6	5,85	90	9	30	A	2
UFX86060030A06009100	3	6	6	5,85	100	9	40	A	2
UFX86060030A06009110	3	6	6	5,85	110	9	50	A	2
UFX86020010A03006080	1	2	3		80	6		A	2
UFX86030015A03008100	1,5	3	3		100	8		A	2
UFX86040020A04008100	2	4	4		100	8		A	2
UFX86050025A06010120	2,5	5	6		120	10		A	2

µm	0,6 ≤ D ≤ 3,0	-14 — -28	D = 0,6	0,0 ≤ d1≤ -6,0	± 0,01
	3,0 < D ≤ 4,0	-20 — -38	0,6 < D ≤ 4,0	0,0 ≤ d1≤ -8,0	

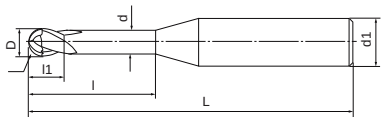
UFX86

FOR RIB PROCESSING DO ŻEBER

2-Flute, Ball Nose, Micro, For Rib Processing 2-ostrzowe, kuliste, mikro, do żeber

HSM Vmax	F	M	30°	A	B	max	min	AIR
						○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○	●	●	○					○						





D code Kod	R	D	d1	d2	L	l1	l2	Shank Uchwyt	Z
UFX86060030A06010120	3	6	6		120	10		A	2
UFX86080040A08014140	4	8	8		140	14		A	2
UFX86100050A10018180	5	10	10		180	18		A	2
UFX86120060A12022200	6	12	12		200	22		A	2
UFX86160080A16030250	8	16	16		250	30		A	2
UFX86200100A20038250	10	20	20		250	38		A	2

µm	0,6 ≤ D ≤ 3,0	-14 — -28	D = 0,6	0,0 ≤ d1≤ -6,0	R	± 0,01
	3,0 < D ≤ 4,0	-20 — -38	0,6 < D ≤ 4,0	0,0 ≤ d1≤ -8,0		

UFX86

Cutting Conditions Parametry skrawania



		Carbon Steel, Cast Iron Stal węglowa, żeliwo			Alloy steel, Tool steel Stal stopowa, Stal narzędziowa			Treated & pretreated steels			Treated & pretreated steels			Treated steels			Treated steels		
		75 MPA			30 HRC			30 - 38 HRC			38 - 45 HRC			45 - 55 HRC			55 - 60 HRC		
D mm	ae mm	ap	RPM	mm/ min	ap	RPM	mm/ min	ap	RPM	mm/ min	ap	RPM	mm/ min	ap	RPM	mm/ min	ap	RPM	mm/ min
0.4	0.4	0.040	50.000	900	0.036	50.000	810	0.032	50.000	720	0.032	50.000	720	0.029	40.000	540	0.020	40.000	432
0.4	0.4	0.020	50.000	800	0.018	50.000	720	0.016	50.000	640	0.016	50.000	640	0.014	40.000	480	0.010	39.809	382
0.5	0.5	0.020	50.000	1.500	0.018	50.000	1.350	0.016	40.000	960	0.016	40.000	960	0.014	40.000	900	0.010	31.847	573
0.5	0.5	0.010	50.000	900	0.009	40.000	648	0.008	40.000	576	0.008	40.000	576	0.007	40.000	540	0.005	31.847	344
0.6	0.6	0.030	40.000	1.280	0.027	40.000	1.152	0.024	40.000	1.024	0.024	40.000	1.024	0.021	40.000	960	0.015	26.539	510
0.6	0.6	0.030	40.000	1.040	0.027	40.000	936	0.024	40.000	832	0.024	40.000	832	0.021	40.000	780	0.015	26.539	414
0.6	0.6	0.017	40.000	880	0.015	40.000	792	0.014	40.000	704	0.014	40.000	704	0.012	37.155	613	0.009	26.539	350
0.8	0.8	0.050	40.000	1.440	0.045	40.000	1.296	0.040	40.000	1.152	0.040	40.000	1.152	0.036	27.866	752	0.025	19.904	430
0.8	0.8	0.040	40.000	1.440	0.036	40.000	1.296	0.032	40.000	1.152	0.032	40.000	1.152	0.029	27.866	752	0.020	19.904	430
0.8	0.8	0.030	40.000	1.200	0.027	40.000	1.080	0.024	40.000	960	0.024	40.000	960	0.021	27.866	627	0.015	19.904	358
0.8	0.8	0.020	40.000	1.200	0.018	40.000	1.080	0.016	40.000	960	0.016	40.000	960	0.014	27.866	627	0.010	19.904	358
1	1	0.100	40.000	2.000	0.090	40.000	1.800	0.080	40.000	1.600	0.080	40.000	1.600	0.071	22.293	836	0.050	15.924	478
1	1	0.070	40.000	1.760	0.063	40.000	1.584	0.056	40.000	1.408	0.056	40.000	1.408	0.050	22.293	736	0.035	15.924	420
1	1	0.050	40.000	1.760	0.045	40.000	1.584	0.040	40.000	1.408	0.040	40.000	1.408	0.036	22.293	736	0.025	15.924	420
1	1	0.030	40.000	1.200	0.027	40.000	1.080	0.024	40.000	960	0.024	40.000	960	0.021	22.293	502	0.015	15.924	287
1	1	0.025	40.000	1.200	0.023	40.000	1.080	0.020	40.000	960	0.020	40.000	960	0.018	22.293	502	0.013	15.924	287
1	1	0.020	40.000	1.200	0.018	40.000	1.080	0.016	40.000	960	0.016	40.000	960	0.014	22.293	502	0.010	15.924	287
1.2	1.2	0.040	31.847	1.656	0.036	29.193	1.366	0.032	26.539	1.104	0.032	26.539	1.104	0.029	18.577	725	0.020	13.270	414
1.2	1.2	0.020	31.847	1.274	0.018	29.193	1.051	0.016	26.539	849	0.016	26.539	849	0.014	18.577	557	0.010	13.270	318
1.4	1.4	0.060	27.298	1.638	0.054	25.023	1.351	0.048	22.748	1.092	0.048	22.748	1.092	0.043	15.924	717	0.030	11.374	409
1.4	1.4	0.040	27.298	1.638	0.036	25.023	1.351	0.032	22.748	1.092	0.032	22.748	1.092	0.029	15.924	717	0.020	11.374	409
1.5	1.5	0.070	25.478	1.682	0.063	23.355	1.387	0.056	21.231	1.121	0.056	21.231	1.121	0.050	14.862	736	0.035	10.616	420
1.5	1.5	0.040	25.478	1.274	0.036	23.355	1.051	0.032	21.231	849	0.032	21.231	849	0.029	14.862	557	0.020	10.616	318
1.6	1.6	0.070	23.885	1.672	0.063	21.895	1.379	0.056	19.904	1.115	0.056	19.904	1.115	0.050	13.933	731	0.035	9.952	418
1.6	1.6	0.040	23.885	1.194	0.036	21.895	985	0.032	19.904	796	0.032	19.904	796	0.029	13.933	522	0.020	9.952	299
1.8	1.8	0.080	21.231	1.741	0.072	19.462	1.436	0.064	17.693	1.161	0.064	17.693	1.161	0.057	12.385	762	0.040	8.846	435
1.8	1.8	0.050	21.231	1.146	0.045	19.462	946	0.040	17.693	764	0.040	17.693	764	0.036	12.385	502	0.025	8.846	287
2	2	0.180	19.108	1.911	0.162	17.516	1.576	0.144	15.924	1.274	0.144	15.924	1.274	0.129	11.146	836	0.090	7.962	478
2	2	0.150	19.108	1.720	0.135	17.516	1.419	0.120	15.924	1.146	0.120	15.924	1.146	0.107	11.146	752	0.075	7.962	430
2	2	0.150	19.108	1.643	0.135	17.516	1.356	0.120	15.924	1.096	0.120	15.924	1.096	0.107	11.146	719	0.075	7.962	411
2	2	0.050	19.108	1.032	0.045	17.516	851	0.040	15.924	688	0.040	15.924	688	0.036	11.146	451	0.025	7.962	258
2	2	0.050	19.108	1.032	0.045	17.516	851	0.040	15.924	688	0.040	15.924	688	0.036	11.146	451	0.025	7.962	258
2	2	0.040	19.108	955	0.036	17.516	788	0.032	15.924	637	0.032	15.924	637	0.029	11.146	418	0.020	7.962	239
3	3	0.200	12.739	2.038	0.180	11.677	1.682	0.160	10.616	1.359	0.160	10.616	1.359	0.143	7.431	892	0.100	5.308	510
3	3	0.200	12.739	2.038	0.180	11.677	1.682	0.160	10.616	1.359	0.160	10.616	1.359	0.143	7.431	892	0.100	5.308	510
3	3	0.100	12.739	1.452	0.090	11.677	1.198	0.080	10.616	968	0.080	10.616	968	0.071	7.431	635	0.050	5.308	363
3	3	0.080	12.739	1.401	0.072	11.677	1.156	0.064	10.616	934	0.064	10.616	934	0.057	7.431	613	0.040	5.308	350
4	4	0.200	9.554	2.293	0.180	8.758	1.892	0.160	7.962	1.529	0.160	7.962	1.529	0.143	5.573	1.003	0.100	3.981	573
4	4	0.200	9.554	1.911	0.180	8.758	1.576	0.160	7.962	1.274	0.160	7.962	1.274	0.143	5.573	836	0.100	3.981	478
4	4	0.200	9.554	1.911	0.180	8.758	1.576	0.160	7.962	1.274	0.160	7.962	1.274	0.143	5.573	836	0.100	3.981	478
4	4	0.150	9.554	1.146	0.135	8.758	946	0.120	7.962	764	0.120	7.962	764	0.107	5.573	502	0.075	3.981	287
4	4	0.100	9.554	1.146	0.090	8.758	946	0.080	7.962	764	0.080	7.962	764	0.071	5.573	502	0.050	3.981	287
4	4	0.100	9.554	955	0.090	8.758	788	0.080	7.962	637	0.080	7.962	637	0.071	5.573	418	0.050	3.981	239
5	5	0.250	7.643	1.987	0.225	7.006	1.639	0.200	6.369	1.325	0.200	6.369	1.325	0.179	4.459	869	0.125	3.185	497
5	5	0.250	7.643	1.529	0.225	7.006	1.261	0.200	6.369	1.019	0.200	6.369	1.019	0.179	4.459	669	0.125	3.185	382
6	6	0.420	6.369	1.783	0.378	5.839	1.471	0.336	5.308	1.189	0.336	5.308	1.189	0.300	3.715	780	0.210	2.654	446
6	6	0.200	6.369	1.401	0.180	5.839	1.156	0.160	5.308	9.34	0.160	5.308	934	0.143	3.715	613	0.100	2.654	350
DOC*																			

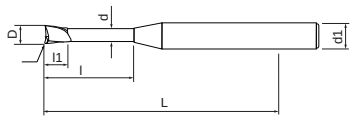
UFX66

FOR RIB PROCESSING DO ŻEBER

2-Flute 2-ostrzowe

HSM Vmax	F	M	25°	A	max	min	AIR
					○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○	●	●	○					○						





D code Kod	R	D	d1	d2	L	l1	l2	Shank Uchwyt	Z
UFX66005001A04002045	0,05	0.5	4	0.45	45	0.7	2	A	2
UFX66005001A04004045	0,05	0.5	4	0.45	45	0.7	4	A	2
UFX66005001A04006045	0,05	0.5	4	0.45	45	0.7	6	A	2
UFX66005001A04008045	0,05	0.5	4	0.45	45	0.7	8	A	2
UFX66006001A04002045	0,05	0.6	4	0.55	45	0.9	2	A	2
UFX66006001A04004045	0,05	0.6	4	0.55	45	0.9	4	A	2
UFX66006001A04006045	0,05	0.6	4	0.55	45	0.9	6	A	2
UFX66006001A04008045	0,05	0.6	4	0.55	45	0.9	8	A	2
UFX66006001A04010045	0,05	0.6	4	0.55	45	0.9	10	A	2
UFX66007001A04002045	0,1	0.7	4	0.65	45	1	2	A	2
UFX66007001A04003045	0,1	0.7	4	0.65	45	1	3	A	2
UFX66007001A04004045	0,1	0.7	4	0.65	45	1	4	A	2
UFX66007001A04006045	0,1	0.7	4	0.65	45	1	6	A	2
UFX66007001A04008045	0,1	0.7	4	0.65	45	1	8	A	2
UFX66007001A04010045	0,1	0.7	4	0.65	45	1	10	A	2
UFX66008001A04004045	0,1	0.8	4	0.75	45	1.2	4	A	2
UFX66008001A04006045	0,1	0.8	4	0.75	45	1.2	6	A	2
UFX66008001A04008045	0,1	0.8	4	0.75	45	1.2	8	A	2
UFX66008001A04010045	0,1	0.8	4	0.75	45	1.2	10	A	2
UFX66008001A04012045	0,1	0.8	4	0.75	45	1.2	12	A	2
UFX66009001A04006045	0,1	0.9	4	0.85	45	1.35	6	A	2
UFX66009001A04008045	0,1	0.9	4	0.85	45	1.35	8	A	2
UFX66009001A04010045	0,1	0.9	4	0.85	45	1.35	10	A	2
UFX66009001A04015050	0,1	0.9	4	0.85	50	1.35	15	A	2
UFX66010001A04004045	0,1	1.0	4	0.95	45	1.5	4	A	2
UFX66010001A04006045	0,1	1.0	4	0.95	45	1.5	6	A	2
UFX66010001A04008045	0,1	1.0	4	0.95	45	1.5	8	A	2
UFX66010001A04010045	0,1	1.0	4	0.95	45	1.5	10	A	2
UFX66010001A04012045	0,1	1.0	4	0.95	45	1.5	12	A	2
UFX66010001A04016050	0,1	1.0	4	0.95	50	1.5	16	A	2
UFX66010001A04020055	0,1	1.0	4	0.95	55	1.5	20	A	2
UFX66012002A04006045	0,2	1.2	4	1.15	45	1.8	6	A	2
UFX66012002A04008045	0,2	1.2	4	1.15	45	1.8	8	A	2
UFX66012002A04010045	0,2	1.2	4	1.15	45	1.8	10	A	2
UFX66012002A04012045	0,2	1.2	4	1.15	45	1.8	12	A	2
UFX66012002A04016050	0,2	1.2	4	1.15	50	1.8	16	A	2
UFX66014002A04006045	0,2	1.4	4	1.35	45	2.1	6	A	2
UFX66014002A04008045	0,2	1.4	4	1.35	45	2.1	8	A	2
UFX66014002A04010045	0,2	1.4	4	1.35	45	2.1	10	A	2
UFX66014002A04012045	0,2	1.4	4	1.35	45	2.1	12	A	2
UFX66014002A04014050	0,2	1.4	4	1.35	50	2.1	14	A	2
UFX66014002A04016050	0,2	1.4	4	1.35	50	2.1	16	A	2

D	0~-0.015
d1	h6

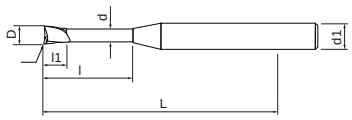
UFX66

FOR RIB PROCESSING DO ŻEBER

2-Flute 2-ostrzowe

HSM Vmax	F	M	25°	A						max	min		AIR
										○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, SI <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○	●	●	○					○						





D code Kod	R	D	d1	d2	L	l1	l2	Shank Uchwyt	Z
UFX66014002A04022055	0,2	1.4	4	1.35	55	2.1	22	A	2
UFX66015002A04006045	0,2	1.5	4	1.45	45	2.3	6	A	2
UFX66015002A04008045	0,2	1.5	4	1.45	45	2.3	8	A	2
UFX66015002A04010045	0,2	1.5	4	1.45	45	2.3	10	A	2
UFX66015002A04012045	0,2	1.5	4	1.45	45	2.3	12	A	2
UFX66015002A04014050	0,2	1.5	4	1.45	50	2.3	14	A	2
UFX66015002A04016050	0,2	1.5	4	1.45	50	2.3	16	A	2
UFX66015002A04018055	0,2	1.5	4	1.45	55	2.3	18	A	2
UFX66015002A04020055	0,2	1.5	4	1.45	55	2.3	20	A	2
UFX66016002A04006045	0,2	1.6	4	1.55	45	2.4	6	A	2
UFX66016002A04008045	0,2	1.6	4	1.55	45	2.4	8	A	2
UFX66016002A04010045	0,2	1.6	4	1.55	45	2.4	10	A	2
UFX66016002A04012045	0,2	1.6	4	1.55	45	2.4	12	A	2
UFX66016002A04014050	0,2	1.6	4	1.55	50	2.4	14	A	2
UFX66016002A04016050	0,2	1.6	4	1.55	50	2.4	16	A	2
UFX66016002A04018055	0,2	1.6	4	1.55	55	2.4	18	A	2
UFX66016002A04020055	0,2	1.6	4	1.55	55	2.4	20	A	2
UFX66016002A04026060	0,2	1.6	4	1.55	60	2.4	26	A	2
UFX66018002A04006045	0,2	1.8	4	1.75	45	2.7	6	A	2
UFX66018002A04008045	0,2	1.8	4	1.75	45	2.7	8	A	2
UFX66018002A04010045	0,2	1.8	4	1.75	45	2.7	10	A	2
UFX66018002A04012045	0,2	1.8	4	1.75	45	2.7	12	A	2
UFX66018002A04014050	0,2	1.8	4	1.75	50	2.7	14	A	2
UFX66018002A04016050	0,2	1.8	4	1.75	50	2.7	16	A	2
UFX66018002A04018055	0,2	1.8	4	1.75	55	2.7	18	A	2
UFX66018002A04020055	0,2	1.8	4	1.75	55	2.7	20	A	2
UFX66018002A04025060	0,2	1.8	4	1.75	60	2.7	25	A	2
UFX66020002A04006045	0,2	2.0	4	1.95	45	3	6	A	2
UFX66020002A04008045	0,2	2.0	4	1.95	45	3	8	A	2
UFX66020002A04010045	0,2	2.0	4	1.95	45	3	10	A	2
UFX66020002A04012045	0,2	2.0	4	1.95	45	3	12	A	2
UFX66020002A04014050	0,2	2.0	4	1.95	50	3	14	A	2
UFX66020002A04016050	0,2	2.0	4	1.95	50	3	16	A	2
UFX66020002A04018055	0,2	2.0	4	1.95	55	3	18	A	2
UFX66020002A04020055	0,2	2.0	4	1.95	55	3	20	A	2
UFX66020002A04025060	0,2	2.0	4	1.95	60	3	25	A	2
UFX66020002A04030070	0,2	2.0	4	1.95	70	3	30	A	2
UFX66025002A04008045	0,2	2.5	4	2.40	45	3.7	8	A	2
UFX66025002A04010045	0,2	2.5	4	2.40	45	3.7	10	A	2
UFX66025002A04012045	0,2	2.5	4	2.40	45	3.7	12	A	2
UFX66025002A04014050	0,2	2.5	4	2.40	50	3.7	14	A	2
UFX66025002A04016055	0,2	2.5	4	2.40	55	3.7	16	A	2

µm	D 0~-0.015
	d1 h6

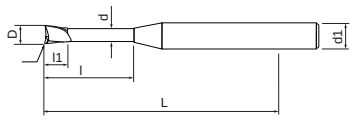
UFX66

FOR RIB PROCESSING DO ŻEBER

2-Flute 2-ostrzowe



P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○	●	●	○					○						





D code Kod	R	D	d1	d2	L	l1	l2	Shank Uchwyt	Z
UFX66025002A04018055	0,2	2.5	4	2.40	55	3.7	18	A	2
UFX66025002A04020060	0,2	2.5	4	2.40	60	3.7	20	A	2
UFX66025002A04025070	0,2	2.5	4	2.40	70	3.7	25	A	2
UFX66025002A04030080	0,2	2.5	4	2.40	80	3.7	30	A	2
UFX66030003A06008045	0,3	3.0	6	2.85	45	4.5	8	A	2
UFX66030003A06010045	0,3	3.0	6	2.85	45	4.5	10	A	2
UFX66030003A06012045	0,3	3.0	6	2.85	45	4.5	12	A	2
UFX66030003A06014050	0,3	3.0	6	2.85	50	4.5	14	A	2
UFX66030003A06016055	0,3	3.0	6	2.85	55	4.5	16	A	2
UFX66030003A06018055	0,3	3.0	6	2.85	55	4.5	18	A	2
UFX66030003A06020060	0,3	3.0	6	2.85	60	4.5	20	A	2
UFX66030003A06025065	0,3	3.0	6	2.85	65	4.5	25	A	2
UFX66030003A06030070	0,3	3.0	6	2.85	70	4.5	30	A	2
UFX66030003A06035080	0,3	3.0	6	2.85	80	4.5	35	A	2
UFX66030003A06040090	0,3	3.0	6	2.85	90	4.5	40	A	2
UFX66040003A06012050	0,3	4.0	6	3.85	50	6	12	A	2
UFX66040003A06016060	0,3	4.0	6	3.85	60	6	16	A	2
UFX66040003A06020060	0,3	4.0	6	3.85	60	6	20	A	2
UFX66040003A06025070	0,3	4.0	6	3.85	70	6	25	A	2
UFX66040003A06030070	0,3	4.0	6	3.85	70	6	30	A	2
UFX66040003A06035080	0,3	4.0	6	3.85	80	6	35	A	2
UFX66040003A06040090	0,3	4.0	6	3.85	90	6	40	A	2
UFX66040003A06045090	0,3	4.0	6	3.85	90	6	45	A	2
UFX66040003A06050100	0,3	4.0	6	3.85	100	6	50	A	2
UFX66050005A06016060	0,5	5.0	6	4.85	60	7.5	16	A	2
UFX66050005A06020060	0,5	5.0	6	4.85	60	7.5	20	A	2
UFX66050005A06025070	0,5	5.0	6	4.85	70	7.5	25	A	2
UFX66050005A06030080	0,5	5.0	6	4.85	80	7.5	30	A	2
UFX66050005A06035080	0,5	5.0	6	4.85	80	7.5	35	A	2
UFX66050005A06040080	0,5	5.0	6	4.85	80	7.5	40	A	2
UFX66050005A06050110	0,5	5.0	6	4.85	110	7.5	50	A	2
UFX66060005A06020080	0,5	6.0	6	5.85	80	9	20	A	2
UFX66060005A06030090	0,5	6.0	6	5.85	90	9	30	A	2
UFX66060005A06040100	0,5	6.0	6	5.85	100	9	40	A	2
UFX66060005A06050110	0,5	6.0	6	5.85	110	9	50	A	2

µm	D 0~-0.015
	d1 h6

UFX66

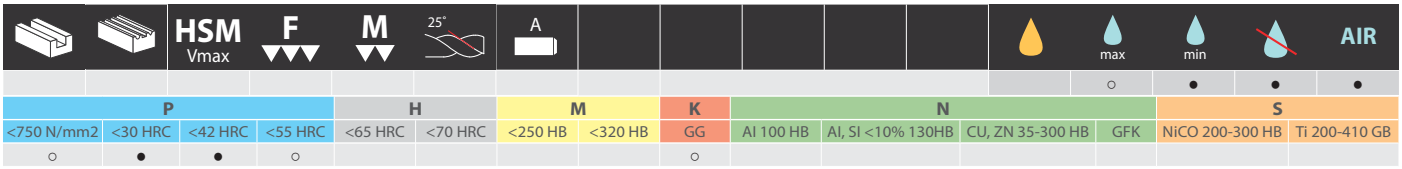
Cutting Conditions Parametry skrawania

	**Non-alloyed, alloy steels, cast iron** Stale stopowe, niestopowe, żeliwo			**Austenitic Heat Resistant Steel** Stal żaroodporna austenityczna			**Hardened Steels** Stale hartowane		
	30HRC			**30 HRC - 45 HRC**			**45 HRC - 55HRC**		
D (mm)	**ap**	**RPM**	**mm/min**	**ap**	**RPM**	**mm/min**	**ap**	**RPM**	**mm/min**
0.4	0.007~0.018	31000~40000	200~440	0.007~0.018	22500~28000	85~340	0.004-0.008	14300-17000	30-90
0.5	0.009~0.022	31000~40000	200~440	0.009~0.022	22500~28000	85~340	0.004-0.009	14300-17000	30~90
0.6	0.011 ~0.026	31000~40000	250~570	0.011~0.026	22500~28000	110~430	0.005-0.011	14300-17000	40-110
0.7	0.012~0.031	31000~40000	250~570	0.012~0.031	22500~28000	110~430	0.006-0.013	14300-17000	40-110
0.8	0.014~0.035	27000~35000	280~630	0.014~0.035	19500~24500	120~480	0.007-0.015	12500-14800	45-125
0.9	0.030~0.060	25000~31500	280~720	0.030~0.060	17500~22500	160~540	0.008-0.016	11000-12500	55-130
1.0	0.045~0.090	22500~28000	280~810	0.045~0.090	15700~20000	190~600	0.009-0.018	10000-12500	65-130
1.2	0.055~0.100	18500~22500	280~900	0.055~0.100	13000~16500	190~600	0.010-0.022	8300-10500	65-130
1.4	0.062~0.125	16000~20000	280~900	0.062~0.125	11500~14000	190~600	0.012-0.025	7200-9000	65-130
1.5	0.070~0.135	14500~18500	280~900	0.070~0.135	10500~13500	190~600	0.014-0.028	6700-8200	65-130
1.6	0.075~0.145	14000~18000	280~900	0.075~0.145	10200~12800	190~600	0.015-0.030	6400-8000	65-130
1.8	0.080~0.160	13000~16500	280~900	0.080~0.160	9200~11500	190~600	0.016-0.032	5700-7200	65-130
2.0	0.090~0.180	12000~14500	280~900	0.090~0.180	8300~10500	190~600	0.018-0.035	5300~6600	65-130
2.5	0.112~0.235	9500~12000	280~900	0.112~0.235	6700~8500	190~600	0.022-0.045	4300~5300	65-130
3.0	0.135~0.270	8000~10000	280~900	0.135~0.270	5500~7000	190~600	0.028-0.055	3500-4400	65-130
4.0	0.180~0.360	6000~7500	280~900	0.180~0.360	4100~5300	190~600	0.036-0.072	2600~3300	65-130
5.0	0.225~0.450	4800~6000	280~900	0.225~0.450	3300~4200	190~600	0.045-0.090	2100-2600	65-130
6.0	0.270~0.540	4000~5000	280~900	0.270~0.540	2800~3500	190~600	0.054-0.108	1750-2600	65-130

UFX89

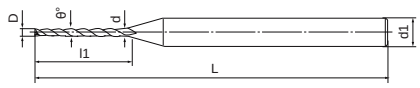
FOR RIB PROCESSING DO ŻEBER

4-Flute, Taper 4-ostrzowe, stożkowe



P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○	●	●	○					○						

				AIR
○	●	●	●	





D code new Nowy kod	D code kod	D	d1	d2	L	l1	Shank Uchwyt	Z
UFX89010000A01108045	UFX89952	1	4	1,14	45	8	A	4
UFX89010000A01212045	UFX89954	1	4	1,21	45	12	A	4
UFX89010000A01308045	UFX89010	1	4	1,28	45	8	A	4
UFX89010000A01412045	UFX89959	1	4	1,42	45	12	A	4
UFX89010000A01408045	UFX89960	1	4	1,42	45	8	A	4
UFX89010000A01612045	UFX89962	1	4	1,63	45	12	A	4
UFX89010000A01608045	UFX89963	1	4	1,56	45	8	A	4
UFX89010000A01812045	UFX89965	1	4	1,84	45	12	A	4
UFX89012000A01308045	UFX89968	1,2	4	1,34	45	8	A	4
UFX89012000A01412045	UFX89970	1,2	4	1,41	45	12	A	4
UFX89012000A01508045	UFX89012	1,2	4	1,48	45	8	A	4
UFX89012000A01612045	UFX89977	1,2	4	1,62	45	12	A	4
UFX89012000A01608045	UFX89979	1,2	4	1,62	45	8	A	4
UFX89012000A01812045	UFX89981	1,2	4	1,83	45	12	A	4
UFX89012000A01808045	UFX89983	1,2	4	1,76	45	8	A	4
UFX89012000A02012045	UFX89985	1,2	4	2,04	45	12	A	4
UFX89015000A01608045	UFX89987	1,5	4	1,64	45	8	A	4
UFX89015000A01712045	UFX89991	1,5	4	1,71	45	12	A	4
UFX89015000A01816050	UFX89992	1,5	4	1,78	50	16	A	4
UFX89015000A01808045	UFX89015	1,5	4	1,78	45	8	A	4
UFX89015000A01912045	UFX89801	1,5	4	1,92	45	12	A	4
UFX89015000A02116050	UFX89802	1,5	4	2,06	50	16	A	4
UFX89015000A01908045	UFX89804	1,5	4	1,92	45	8	A	4
UFX89015000A02112045	UFX89806	1,5	4	2,13	45	12	A	4
UFX89015000A02316050	UFX89807	1,5	4	2,34	50	16	A	4
UFX89015000A02108045	UFX89809	1,5	4	2,06	45	8	A	4
UFX89015000A02312045	UFX89811	1,5	4	2,34	45	12	A	4
UFX89015000A02616050	UFX89812	1,5	4	2,62	50	16	A	4
UFX89020000A02212045	UFX89869	2	4	2,21	45	12	A	4
UFX89020000A02316050	UFX89870	2	4	2,28	50	16	A	4
UFX89020000A02412045	UFX89878	2	4	2,42	45	12	A	4
UFX89020000A02616050	UFX89879	2	4	2,56	50	16	A	4
UFX89020000A02612045	UFX89883	2	4	2,63	45	12	A	4
UFX89020000A02816050	UFX89884	2	4	2,84	50	16	A	4
UFX89020000A02812045	UFX89888	2	4	2,84	45	12	A	4
UFX89020000A03116050	UFX89889	2	4	3,12	50	16	A	4

µm	d1 0 — -8		0 — -15		±5´

UFX89

Cutting Conditions Parametry skrawania

		**Carbon Steel, Cast Iron** Stal węglowa, żeliwo			**Alloy steel, Tool steel** Stal stopowa, Stal narzędziowa			**Treated & pretreated steels**			**Treated & pretreated steels**			**Hardened steel** Stal hartowana		
		Rm <750N/mm²			**30HRC**			**30 - 38HRC**			**38 - 45HRC**			**45 - 55HRC**		
D (mm)	**ae**	**ap**	**RPM**	**mm/ min**	**ap**	**RPM**	**mm/ min**	**ap**	**RPM**	**mm/ min**	**ap**	**RPM**	**mm/ min**	**ap**	**RPM**	**mm/ min**
1	1	0,035	40000	1760	0,035	40000	1672	0,035	38217	1059	0,035	28662	1135	0,018	23885	946
1	1	0,025	40000	1440	0,025	40000	1368	0,025	38217	867	0,025	28662	929	0,013	23885	774
1,2	1,2	0,040	39809	2229	0,040	37155	1977	0,040	31847	1124	0,040	23885	1204	0,020	19904	1003
1,2	1,2	0,030	39809	1752	0,030	37155	1553	0,030	31847	883	0,030	23885	946	0,015	19904	788
1,5	1,5	0,050	31847	2166	0,050	29724	1920	0,050	25478	1091	0,050	19108	1169	0,025	15924	975
1,5	1,5	0,035	31847	1911	0,035	29724	1694	0,035	25478	963	0,035	19108	1032	0,018	15924	860
1,5	1,5	0,030	31847	1720	0,030	29724	1525	0,030	25478	867	0,030	19108	929	0,015	15924	774
2	2	0,055	23885	1911	0,055	22293	1694	0,055	19108	963	0,055	14331	1032	0,028	11943	860
2	2	0,050	23885	1672	0,050	22293	1482	0,050	19108	843	0,050	14331	903	0,025	11943	752

UFX90

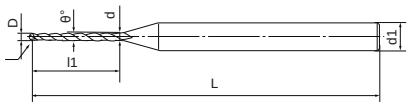
FOR RIB PROCESSING DO ŻEBER

4-Flute, Taper 4-ostrzowe, stożkowe



P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○	●	●	○					○						

				○	●	●	●		





D code new Nowy kod	D code kod	R	D	d1	d2	L	l1	θ°	Z
UFX90010005A01108045	UFX90909	0,5	1	4	1,14	45	8	1°30′	4
UFX90010005A01212045	UFX90911	0,5	1	4	1,21	45	12	1°30′	4
UFX90010005A01308045	UFX90010	0,5	1	4	1,28	45	8	1°	4
UFX90010005A01412045	UFX90916	0,5	1	4	1,42	45	12	1°	4
UFX90010005A01408045	UFX90917	0,5	1	4	1,42	45	8	1°30′	4
UFX90010005A01612045	UFX90919	0,5	1	4	1,63	45	12	1°30′	4
UFX90010005A01608045	UFX90920	0,5	1	4	1,56	45	8	2°	4
UFX90010005A01812045	UFX90922	0,5	1	4	1,84	45	12	2°	4
UFX90012006A01308045	UFX90923	0,6	1,2	4	1,34	45	8	1°30′	4
UFX90012006A01412045	UFX90925	0,6	1,2	4	1,41	45	12	1°30′	4
UFX90012006A01508045	UFX90012	0,6	1,2	4	1,48	45	8	1°	4
UFX90012006A01612045	UFX90932	0,6	1,2	4	1,62	45	12	1°	4
UFX90012006A01608045	UFX90934	0,6	1,2	4	1,62	45	8	1°30′	4
UFX90012006A01812045	UFX90936	0,6	1,2	4	1,83	45	12	1°30′	4
UFX90012006A01808045	UFX90938	0,6	1,2	4	1,76	45	8	2°	4
UFX90012006A02012045	UFX90940	0,6	1,2	4	2,04	45	12	2°	4
UFX90015008A01608045	UFX90942	0,75	1,5	4	1,64	45	8	1°30′	4
UFX90015008A01712045	UFX90944	0,75	1,5	4	1,71	45	12	1°30′	4
UFX90015008A01816050	UFX90945	0,75	1,5	4	1,78	50	16	1°30′	4
UFX90015008A01808045	UFX90015	0,75	1,5	4	1,78	45	8	1°	4
UFX90015008A01912045	UFX90953	0,75	1,5	4	1,92	45	12	1°	4
UFX90015008A02116050	UFX90954	0,75	1,5	4	2,06	50	16	1°	4
UFX90015008A01908045	UFX90956	0,75	1,5	4	1,92	45	8	1°30′	4
UFX90015008A02112045	UFX90958	0,75	1,5	4	2,13	45	12	1°30′	4
UFX90015008A02316050	UFX90959	0,75	1,5	4	2,34	50	16	1°30′	4
UFX90015008A02108045	UFX90961	0,75	1,5	4	2,06	45	8	2°	4
UFX90015008A02312045	UFX90963	0,75	1,5	4	2,34	45	12	2°	4
UFX90015008A02616050	UFX90964	0,75	1,5	4	2,62	50	16	2°	4
UFX90020010A02212045	UFX90816	1	2	4	2,21	45	12	1°30′	4
UFX90020010A02316050	UFX90817	1	2	4	2,28	50	16	1°30′	4
UFX90020010A02412045	UFX90825	1	2	4	2,42	45	12	1°	4
UFX90020010A02616050	UFX90826	1	2	4	2,56	50	16	1°	4
UFX90020010A02612045	UFX90830	1	2	4	2,63	45	12	1°30′	4
UFX90020010A02816050	UFX90831	1	2	4	2,84	50	16	1°30′	4
UFX90020010A02812045	UFX90835	1	2	4	2,84	45	12	2°	4
UFX90020010A03116050	UFX90836	1	2	4	3,12	50	16	2°	4

µm	d1 0 — -8		0 — -15		±5´	R	±0,01

UFX90

Cutting Conditions Parametry skrawania

		**Carbon Steel, Cast Iron** Stal węglowa, żeliwo			**Alloy steel, Tool steel** Stal stopowa, Stal narzędziowa			**Treated & pretreated steels**			**Treated & pretreated steels**			**Hardened steel** Stal hartowana		
		Rm <750N/mm²			**30HRC**			**30 - 38HRC**			**38 - 45HRC**			**45 - 55HRC**		
D (mm)	**ae**	**ap**	**RPM**	**mm/ min**	**ap**	**RPM**	**mm/ min**	**ap**	**RPM**	**mm/ min**	**ap**	**RPM**	**mm/ min**	**ap**	**RPM**	**mm/ min**
1	1	0,035	40000	1760	0,035	40000	1672	0,035	38217	1059	0,035	28662	1135	0,018	23885	946
1	1	0,025	40000	1440	0,025	40000	1368	0,025	38217	867	0,025	28662	929	0,013	23885	774
1,2	1,2	0,040	39809	2229	0,040	37155	1977	0,040	31847	1124	0,040	23885	1204	0,020	19904	1003
1,2	1,2	0,030	39809	1752	0,030	37155	1553	0,030	31847	883	0,030	23885	946	0,015	19904	788
1,5	1,5	0,050	31847	2166	0,050	29724	1920	0,050	25478	1091	0,050	19108	1169	0,025	15924	975
1,5	1,5	0,035	31847	1911	0,035	29724	1694	0,035	25478	963	0,035	19108	1032	0,018	15924	860
1,5	1,5	0,030	31847	1720	0,030	29724	1525	0,030	25478	867	0,030	19108	929	0,015	15924	774
2	2	0,055	23885	1911	0,055	22293	1694	0,055	19108	963	0,055	14331	1032	0,028	11943	860
2	2	0,050	23885	1672	0,050	22293	1482	0,050	19108	843	0,050	14331	903	0,025	11943	752

UFJ

UFJ END MILLS
FREZY UFJ







UFJ END MILLS are designed for HSM machining of stainless steels, titanium, Inconel and materials difficult to cut under 45 HRC.

FREZY UFJ przeznaczone są do obróbki szybkościowej (OS) stali nierdzewnej, tytanu, inconelu oraz materiałów ciężko obrabialnych poniżej 45 HRC.

TIZ IMPLEMENTS

P H K N S

UFJ END MILLS are designed for HSM machining of Stainless Steels, Titanium, Inconel, difficult to cut materials under HRC45.

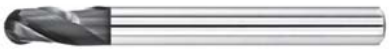
FREZY UFJ przede wszystkim zalecane są do obróbki szybkościowej (OS) stali nierdzewnej, tytanu, inconelu, ciężko obrabialnych materiałów o twardości do 45HRC.

NOTE:

- If the rigidity of the machine or the work material installation is very low, or chattering and noise is generated, please reduce RPM and FEED rate proportionally.
- Cutting conditions may be considerably different due to the tool overhang, depth of cut, and machining tool condition, please use the catalogue cutting parameters as a reference starting point.
- If the depth of cut is shallow, the RPM and FEED rate can be increased.
- For hardened materials air blow/air oil mist is recommended.
- A high-speed spindle is recommended, when using a reduced RPM, the FEED rate must be reduced proportionally.
- High pressure coolant and air blow are recommended to dispose of chips efficiency.
- Use a rigid machine and work clamping method.
- Down (climb) cutting is recommended.
- We recommend that you set the width of cut as small as possible (about 5% of dia.) and divide the machining into several passes and work on high cutting parameters. There will be much higher tool life and surface roughness
- When drilling, please set the FEED rate 30% below the normal rate.
- When cutting austenitic stainless steel and heat resistant steel, the use of non-water soluble fluid is strongly recommended.

UWAGA:

- Jeżeli sztywność obrabiarki lub mocowanie obrabianego przedmiotu nie są wystarczające lub występują wibracje i nadmierny hałas, należy proporcjonalnie zmniejszyć obroty i posuw.
- Parametry skrawania mogą być różne w zależności od długości narzędzia wystającego z oprawki, głębokości skrawania oraz stanu obrabiarki. Proszę stosować parametry skrawania podane w katalogu jako wyjściowy punkt odniesienia.
- Przy zmniejszeniu głębokości skrawania, obroty i posuw mogą być zwiększone.
- Przy obróbce twardych materiałów zaleca się stosowanie mgły olejowej.
- Zalecane jest stosowanie wysokoobrotowych obrabiarek. W przypadku mniejszych prędkości obrotowych posuw powinien być zmniejszony proporcjonalnie.
- Dla efektywnego odprowadzania wiórów zalecane jest stosowanie chłodziwa pod dużym ciśnieniem i nadmuchu powietrza
- Zalecane jest stosowanie sztywnych obrabiarek oraz systemów mocowania.
- Zalecane jest frezowanie współbieżne.
- Zalecamy stosowanie możliwie najmniejszej szerokości skrawania - około 5% średnicy roboczej narzędzia i podzielenie operacji obróbki na kilka przejść przy większych parametrach skrawania, co znacznie wydłuży żywotność narzędzia oraz polepszy jakość obrabianej powierzchni.
- Przy zagłębianiu zalecane jest ustawienie posuwu wgłębnego na poziomie o 30% mniejszym od posuwu roboczego.
- Przy obróbce austenitycznej stali nierdzewnej i stali żaroodpornej zaleca się bez-względne stosowanie oleju nie emulgującego.

EDP No.		Z	Angle Kąt	Materials Materiały	D / R	Pag. / Str.
UFJ70		3	45°	P H N S	D 2 - 20	4 - 5
UFJ72		4		P H N S	D 3 - 20	6 - 7
UFJ73		4		P H N S	D 3 - 25	8 - 9
UFJ74		5		P H N S	D 6 - 25	10 - 11
UFJ75		4		P K N	D 3 - 20	12 - 13
UFJ76		4		P K N	D 3 - 25	14 - 15
UFJ17		4	45°	P N S	D 6 - 20	16
UFJ19		3 - 6	45°	P N S	D 4 - 25	17
UFJ21		4 - 6	45°	P N S	D 6 - 20	18
UFJ15		6 - 8	45°	P N S	D 6 - 25	19
UFJ01		4	45°	P H	D 6 - 25	20 - 24
UFJ02		4	45°	P H	D 6 - 25	20 - 24
UFJ03		4	45°	P H	D 6 - 25	21 - 24
UFJ22		4	45°	P H	D 6 - 20	22 - 24
UFJ11		2	30°	P N S	D 1 - 25	25 - 26
UFJ13		4	45°	P N S	D 2 - 25	27 - 28
UFJ30		3 - 4	45°	P N S	D 6 - 25	29
UFJ08		4 - 6	30°	P N S	D 3 - 25	30
UFJ09		3 - 5	30°	P N S	D 6 - 25	31
UFJ35		5	40°	P N S	D 6 - 25	32
UFJ35		5	40°	N S	D 6 - 25	32
UFJ36		4		P K N	D 3 - 20	33
UFJ37		4		P K N	D 3 - 20	34
UFJ38		4		P N S	D 3 - 20	35
UFJ39		4		P N S	D 3 - 20	36
UFJ77		4		P N S	R 1,5 - 12,5	37

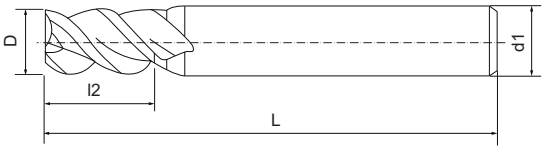
UFJ70

SQUARE TYPE WALCOWO-CZOŁOWE

3 Flute, Medium length 3 ostrzowe, średniej długości

			HSM Vmax	F	M	45°	A					max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	○			●					●	●			○	





D code new Nowy kod	D code kod	D	d1	L	l1	Z	Shank Uchwyt
UFJ70020000A06004050	UFJ70020	2	6	50	4	3	A
UFJ70025000A06005050	UFJ70025	2,5	6	50	5	3	A
UFJ70030000A06006050	UFJ70030	3	6	50	6	3	A
UFJ70035000A06008050	UFJ70035	3,5	6	50	8	3	A
UFJ70040000A06008050	UFJ70040	4	6	50	8	3	A
UFJ70045000A06010050	UFJ70045	4,5	6	50	10	3	A
UFJ70050000A06010050	UFJ70050	5	6	50	10	3	A
UFJ70055000A06013050	UFJ70055	5,5	6	50	13	3	A
UFJ70060000A06013060	UFJ70060	6	6	60	13	3	A
UFJ70065000A08016060	UFJ70065	6,5	8	60	16	3	A
UFJ70070000A08016060	UFJ70070	7	8	60	16	3	A
UFJ70075000A08016060	UFJ70075	7,5	8	60	16	3	A
UFJ70080000A08019060	UFJ70080	8	8	60	19	3	A
UFJ70085000A10019075	UFJ70085	8,5	10	75	19	3	A
UFJ70090000A10019075	UFJ70090	9	10	75	19	3	A
UFJ70095000A10019075	UFJ70095	9,5	10	75	19	3	A
UFJ70100000A10022075	UFJ70100	10	10	75	22	3	A
UFJ70110000A12022075	UFJ70110	11	12	75	22	3	A
UFJ70120000A12026100	UFJ70120	12	12	100	26	3	A
UFJ70130000A14026100	UFJ70130	13	14	100	26	3	A
UFJ70140000A14026100	UFJ70140	14	14	100	26	3	A
UFJ70150000A16026100	UFJ70150	15	16	100	26	3	A
UFJ70160000A16030100	UFJ70160	16	16	100	30	3	A
UFJ70200000A20032100	UFJ70200	20	20	100	32	3	A

µm	d1 ≤ 6	< 3 - 5
	d1 = 8	< 5 - 7
	d1 = 10,12	< 6 - 8
	d1 > 16	< 8 - 10
	d2 ±20	

UFJ70

Cutting Conditions Parametry skrawania

Work Material Materiał			**Carbon Steels Alloy steels (-30HRC)** Stali węglowych, stali stopowych (-30HRC)		**Mold steels (30-45HRC)** Stal Do Produkcji Form i Wykrojników (30-45HRC)		**Stainless steels** Stale nierdzewne	
d1 (mm)	**ae**	**ap**	**RPM**	**mm/min**	**RPM**	**mm/min**	**RPM**	**mm/min**
2	0,20	3,00	11000	600	7200	310	6000	210
3	0,30	4,50	8500	770	5300	380	4400	220
4	0,80	6,00	7200	850	4400	480	3700	250
5	1,00	7,50	5300	940	3200	490	2700	270
8	1,60	12,0	4000	1000	2400	560	2000	280
10	2,00	15,0	3200	1000	1900	480	1600	300
12	2,40	18,0	2700	950	1600	440	1300	300
16	3,20	24,0	2000	720	1200	350	1000	260
20	4,00	30,0	1600	600	1000	230	800	240

Work Material Materiał			**Carbon Steels Alloy steels (-30HRC)** Stali węglowych, stali stopowych (-30HRC)		**Mold steels (30-45HRC)** Stal Do Produkcji Form i Wykrojników (30-45HRC)		**Stainless steels** Stale nierdzewne			
d1 (mm)	**ae**	**ap**	**RPM**	**mm/min**	**RPM**	**mm/min**	**ae**	**ap**	**RPM**	**mm/min**
2	2,00	2,00	11000	500	7200	260	2,00	1,00	6000	130
3	3,00	3,00	8500	640	5300	320	3,00	1,50	4200	130
4	4,00	4,00	7200	650	4400	370	4,00	2,00	3400	140
6	6,00	6,00	5300	720	3200	380	6,00	3,00	2200	140
8	8,00	8,00	4000	780	2400	430	8,00	4,00	1600	140
10	10,0	10,0	3200	770	1900	370	10,0	5,00	1300	150
12	12,0	12,0	2700	730	1600	340	12,0	6,00	1100	150
16	16,0	16,0	2000	600	1200	290	16,0	8,00	800	130
20	20,0	20,0	1600	500	1000	240	20,0	10,0	640	120

Work Material Materiał		**Carbon Steels Alloy steels (-30HRC)** Stali węglowych, stali stopowych (-30HRC)		**Mold steels (30-45HRC)** Stal Do Produkcji Form i Wykro-jników (30-45HRC)		**Stainless steels** Stale nierdzewne		
d1 (mm)	**ap**	**RPM**	**mm/min**	**RPM**	**mm/min**	**ap**	**RPM**	**mm/min**
2	2,00	11000	200	7200	140	1,00	6000	30
3	3,00	8500	250	5300	180	1,50	4400	50
4	4,00	7200	300	4400	210	2,00	3700	60
6	6,00	5300	300	3200	210	3,00	2700	70
8	8,00	4000	320	2400	220	4,00	2000	80
10	10,0	3200	340	1900	240	5,00	1600	70
12	12,0	2700	320	1600	220	6,00	1300	70
16	16,0	2000	250	1200	180	8,00	1000	55
20	20,0	1500	200	1000	140	10,0	800	55

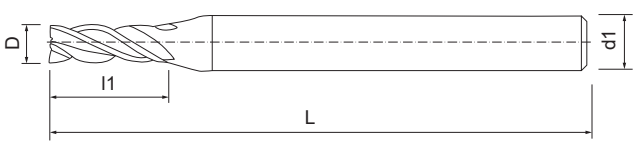
UFJ72

SQUARE TYPE WALCOWO-CZOŁOWE

4-Flute, Short 4-ostrzowe, krótkie

		HSM Vmax	F	M	A								max	min		AIR
													○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	○			●					●	●			○	



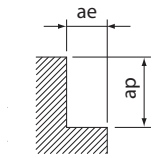


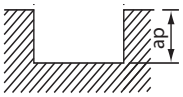
D code Kod	D	d1	L	l1	Z	Shank Uchwyt
UFJ72030000A06007054	3	6	54	7	4	A
UFJ72040000A06008054	4	6	54	8	4	A
UFJ72050000A06010054	5	6	54	10	4	A
UFJ72060000A06010054	6	6	54	10	4	A
UFJ72080000A08012058	8	8	58	12	4	A
UFJ72100000A10014066	10	10	66	14	4	A
UFJ72120000A12016073	12	12	73	16	4	A
UFJ72140000A14018075	14	14	75	18	4	A
UFJ72160000A16022082	16	16	82	22	4	A
UFJ72180000A18024084	18	18	84	24	4	A
UFJ72200000A20026092	20	20	92	26	4	A

µm		
	d1 h6	
	D 0 — -30	

UFJ72

Cutting Conditions Parametry skrawania

Work Material Materiał	Carbon steel Cast iron Stal węglowa, Żeliwo ~750N/mm²		Alloy Steel Stal stopowa		Hardened steel Stal hartowana		Hardened steel Stainless steel Stal hartowana Stal nierdzewna		Stainless Steel, Titanium Alloys Stal nierdzewna, Stopy tytanu		Inconel Inconel	
			~30HRC		30~40HRC		30~45HRC		45~55HRC			
d1 (mm)	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
3	12750	1122	9741	857	8262	638	7803	627	7548	556	3876	224
4	9945	1224	7701	1005	6528	694	6171	724	5967	643	3060	245
5	8109	1326	6273	1071	5355	740	5049	791	4896	683	2499	250
6	6885	1632	5355	1224	4539	908	4284	852	4131	709	2142	255
8	5151	1581	4029	1122	3417	831	3213	826	3111	689	1632	230
10	4182	1479	3264	1071	2754	740	2601	729	2499	648	1275	219
12	3468	1428	2703	1020	2295	734	2142	689	2091	617	1071	214
16	2601	1224	2040	959	1734	648	1632	566	1581	515	780	214
20	2091	1005	1632	770	1377	602	1275	525	1275	469	648	204
25	1683	898	1275	689	1122	546	1020	495	1010	403	520	189
Depth of cut Głębokość skrawania			ap ≤1.5D / ae ≤0.2D				ap ≤1.5D / ae ≤0.1D				ap ≤1.5D / ae ≤0.05D	

Work Material Materiał	Carbon steel Cast iron Stal węglowa, Żeliwo ~750N/mm²		Alloy Steel Stal stopowa		Hardened steel Stal hartowana		Hardened steel Stainless steel Stal hartowana Stal nierdzewna		Stainless Steel, Titanium Alloys Stal nierdzewna, Stopy tytanu		Inconel Inconel	
			~30HRC		30~40HRC		30~45HRC		45~55HRC			
d1 (mm)	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
3	10710	745	8721	694	8007	530	7599	469	7344	449	2550	128
4	7905	745	6528	791	6018	530	5661	525	5508	505	1938	138
5	6324	750	5202	770	4794	556	4539	556	4386	546	1530	148
6	5253	755	4335	648	4029	587	3774	581	3672	556	1275	148
8	3927	612	3264	561	3009	561	2856	536	2754	520	964	158
10	3162	592	2601	551	2397	490	2295	485	2193	464	775	148
12	2652	571	2193	485	1989	469	1887	449	1836	444	643	148
16	1989	566	1632	439	1530	377	1428	377	1377	372	485	112
20	1581	485	1326	388	1224	362	1122	337	1122	337	388	112
25	1275	459	1020	372	964	321	908	291	882	240	306	107
Depth of cut Głębokość skrawania			ap ≤1D ap_{MAX}=12mm				ap ≤0.5D				ap ≤0.2D	

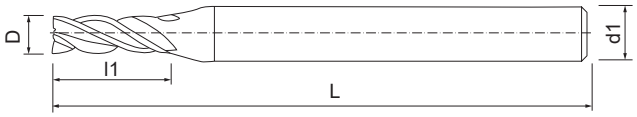
UFJ73

SQUARE TYPE WALCOWO-CZOŁOWE

4-Flute, Medium 4-ostrzowe, średniej długości

		HSM Vmax	F	M	A								max	min		AIR
													○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	○			●					●	●			○	



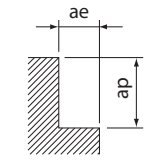


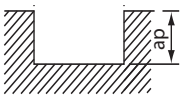
D code Kod	D	d1	L	l1	Z	Shank Uchwyt
UFJ73030000A06008057	3	6	57	8	4	A
UFJ73040000A06011057	4	6	57	11	4	A
UFJ73050000A06013057	5	6	57	13	4	A
UFJ73060000A06013057	6	6	57	13	4	A
UFJ73080000A08019063	8	8	63	19	4	A
UFJ73100000A10022072	10	10	72	22	4	A
UFJ73120000A12026083	12	12	83	26	4	A
UFJ73140000A14026083	14	14	83	26	4	A
UFJ73160000A16032092	16	16	92	32	4	A
UFJ73180000A18032092	18	18	92	32	4	A
UFJ73200000A20038104	20	20	104	38	4	A
UFJ73250000A25038104	25	25	104	38	4	A

µm	d1 h6	
	D 0 — -30	

UFJ73

Cutting Conditions Parametry skrawania

Work Material Materiał	Carbon steel Cast iron Stal węglowa, Żeliwo ~750N/mm²		Alloy Steel Stal stopowa		Hardened steel Stal hartowana		Hardened steel Stainless steel Stal hartowana Stal nierdzwena		Hardened Steel Titanium Alloy Stal hartowana Stopy tytanu		Inconel Inconel	
			~30HRC		30~40HRC		30~45HRC		45~55HRC			
d1 (mm)	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
3	12750	1122	9741	857	8262	638	7803	627	7548	556	3876	224
4	9945	1224	7701	1005	6528	694	6171	724	5967	643	3060	245
5	8109	1326	6273	1071	5355	740	5049	791	4896	683	2499	250
6	6885	1632	5355	1224	4539	908	4284	852	4131	709	2142	255
8	5151	1581	4029	1122	3417	831	3213	826	3111	689	1632	230
10	4182	1479	3264	1071	2754	740	2601	729	2499	648	1275	219
12	3468	1428	2703	1020	2295	734	2142	689	2091	617	1071	214
16	2601	1224	2040	959	1734	648	1632	566	1581	515	780	214
20	2091	1005	1632	770	1377	602	1275	525	1275	469	648	204
25	1683	898	1275	689	1122	546	1020	495	1010	403	520	189
Depth of cut Głębokość skrawania			ap ≤1.5D	ae ≤0.2D			ap ≤1.5D	ae ≤0.1D			ap ≤1.5D	ae ≤0.05D

Work Material Materiał	Carbon steel Cast iron Stal węglowa, Żeliwo ~750N/mm²		Alloy Steel Stal stopowa		Hardened steel Stal hartowana		Hardened steel Stainless steel Stal hartowana Stal nierdzwena		Hardened Steel Titanium Alloy Stal hartowana Stopy tytanu		Inconel Inconel	
			~30HRC		30~40HRC		30~45HRC		45~55HRC			
d1 (mm)	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
3	10710	745	8721	694	8007	530	7599	469	7344	449	2550	128
4	7905	745	6528	791	6018	530	5661	525	5508	505	1938	138
5	6324	750	5202	770	4794	556	4539	556	4386	546	1530	148
6	5253	755	4335	648	4029	587	3774	581	3672	556	1275	148
8	3927	612	3264	561	3009	561	2856	536	2754	520	964	158
10	3162	592	2601	551	2397	490	2295	485	2193	464	775	148
12	2652	571	2193	485	1989	469	1887	449	1836	444	643	148
16	1989	566	1632	439	1530	377	1428	377	1377	372	485	112
20	1581	485	1326	388	1224	362	1122	337	1122	337	388	112
25	1275	459	1020	372	964	321	908	291	882	240	306	107
Depth of cut Głębokość skrawania			ap ≤1D ap_{MAX}=12mm				ap ≤0.5D				ap ≤0.2D	

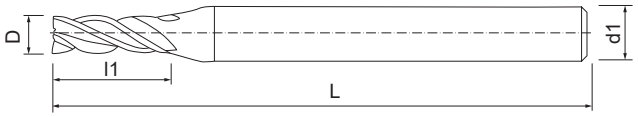
UFJ74

SQUARE TYPE WALCOWO-CZOŁOWE

5-Flute, Medium 5-ostrzowe, średniej długości

		HSM Vmax	F	M	A							max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	○			●					●	●			○	



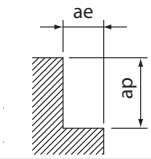


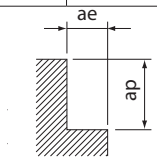
D code Kod	D	d1	L	l1	Z	Shank Uchwyt
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UFJ74080000A08019063	8	8	63	19	5	A
UFJ74100000A10022072	10	10	72	22	5	A
UFJ74120000A12026083	12	12	83	26	5	A
UFJ74140000A14026083	14	14	83	26	5	A
UFJ74160000A16032092	16	16	92	32	5	A
UFJ74180000A18032092	18	18	92	32	5	A
UFJ74200000A20038104	20	20	104	38	5	A
UFJ74250000A25038104	25	25	104	38	5	A
UFJ74060000B06013057	6	6	57	13	5	A
UFJ74080000B08019063	8	8	63	19	5	A
UFJ74100000B10022072	10	10	72	22	5	A
UFJ74120000B12026083	12	12	83	26	5	A
UFJ74140000B14026083	14	14	83	26	5	A
UFJ74160000B16032092	16	16	92	32	5	A
UFJ74180000B18032092	18	18	92	32	5	A
UFJ74200000B20038104	20	20	104	38	5	A
UFJ74250000B25038104	25	25	104	38	5	A

µm	d1 h6	
	D 0 — -30	

UFJ74

Cutting Conditions Parametry skrawania

Work Material Materiał	Carbon steel Cast iron Stal węglowa, Żeliwo ~750N/mm²		Alloy Steel Stal stopowa		Hardened steel Stal hartowana		Hardened steel Stainless steel Stal hartowana Stal nierdzwena		Hardened Steel Titanium Alloy Stal hartowana Stopy tytanu		Inconel Inconel	
			~30HRC		30~40HRC		30~45HRC		45~55HRC			
d1 (mm)	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
6	7242	1955	5610	1488	4794	1105	4488	1063	4386	893	2244	306
8	5457	1913	4233	1360	3570	1020	3366	1020	3264	850	1683	281
10	4386	1785	3417	1318	2907	935	2703	893	2652	786	1377	264
12	3672	1700	2856	1275	2397	893	2295	833	2193	744	1122	259
16	2754	1488	2142	1148	1785	786	1683	684	1632	625	852	259
20	2193	1233	1683	935	1428	723	1377	633	1326	565	683	255
25	1734	1105	1377	829	1173	659	1071	599	1071	489	546	225
Depth of cut Głębokość skrawania			ap ≤1.5D	ae ≤0.2D			ap ≤1.5D	ae ≤0.1D			ap ≤1.5D	ae ≤0.05D

Work Material Materiał	Carbon steel Cast iron Stal węglowa, Żeliwo ~750N/mm²		Alloy Steel Stal stopowa		Hardened steel Stal hartowana		Hardened steel Stainless steel Stal hartowana Stal nierdzwena		Hardened Steel Titanium Alloy Stal hartowana Stopy tytanu		Inconel Inconel	
			~30HRC		30~40HRC		30~45HRC		45~55HRC			
d1 (mm)	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
6	14280	4845	11220	3621	9333	2703	8772	2550	8517	2142	4386	760
8	10710	4692	8211	3366	6987	2499	6579	2448	6375	2091	3315	689
10	8568	3978	6630	3060	5661	2244	5304	2142	5151	1938	2652	653
12	7140	3876	5559	2958	4692	2193	4437	2040	4284	1836	2193	638
16	5355	3621	4182	2856	3519	1938	3315	1683	3213	1530	1683	632
20	4284	2958	3315	2295	2805	1785	2652	1581	2601	1377	1326	622
25	3417	2652	2652	2040	2244	1632	2142	1479	2040	1173	1071	561
Depth of cut Głębokość skrawania			ap ≤1.5D	ae ≤0.05D			ap ≤1.5D	ae ≤0.02D			ap ≤1D	ae ≤0.02D
			ap_{MAX}=0.5mm				ap_{MAX}=0.5mm				ap_{MAX}=0.5mm	

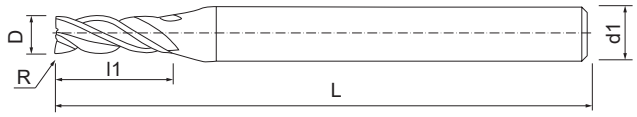
UFJ75

SQUARE TYPE WALCOWO-CZOŁOWE

4-Flute, Medium 4-ostrzowe, średniej długości

		HSM Vmax	F	M	A							max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	○						○	○	○				





D code new Nowy kod	D code kod	R	D	d1	L	l1	Z	Shank Uchwyt
UFJ75030000A06005050	UFJ75030		3	6	50	5	4	A
UFJ75030003A06005050	UFJ75030R	0,3	3	6	50	5	4	A
UFJ75040000A06008054	UFJ75040		4	6	54	8	4	A
UFJ75040003A06008054	UFJ75040R	0,3	4	6	54	8	4	A
UFJ75050000A06009054	UFJ75050		5	6	54	9	4	A
UFJ75050003A06009054	UFJ75050R	0,3	5	6	54	9	4	A
UFJ75060000A06010054	UFJ75060		6	6	54	10	4	A
UFJ75060004A06010054	UFJ75060R	0,4	6	6	54	10	4	A
UFJ75080000A08012058	UFJ75080		8	8	58	12	4	A
UFJ75080004A08012058	UFJ75080R	0,4	8	8	58	12	4	A
UFJ75100000A10014066	UFJ75100		10	10	66	14	4	A
UFJ75100004A10014066	UFJ75100R	0,4	10	10	66	14	4	A
UFJ75120000A12016073	UFJ75120		12	12	73	16	4	A
UFJ75120006A12016073	UFJ75120R	0,6	12	12	73	16	4	A
UFJ75140000A14008075	UFJ75140		14	14	75	8	4	A
UFJ75140006A14008075	UFJ75140R	0,6	14	14	75	8	4	A
UFJ75160000A16022082	UFJ75160		16	16	82	22	4	A
UFJ75160008A16022082	UFJ75160R	0,8	16	16	82	22	4	A
UFJ75180000A18024084	UFJ75180		18	18	84	24	4	A
UFJ75180008A18024084	UFJ75180R	0,8	18	18	84	24	4	A
UFJ75200000A20026092	UFJ75200		20	20	92	26	4	A
UFJ75200008A20026092	UFJ75200R	0,8	20	20	92	26	4	A

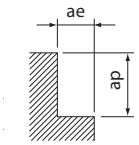
µm	d1 h6	
	D 0 — -30	

UFJ75

Cutting Conditions Parametry skrawania

Work Material Materiał	Steel, Cast iron Stal, Żeliwo				Steel, Cast iron Stal, Żeliwo				Steel, Cast iron Stal, Żeliwo				Hardened steel Stal hartowana				Hardened steel Stal hartowana 55- HRC			
	<30 HRC				30-45 HRC				<45 HRC				45-55 HRC				55- HRC			
d1 (mm)	RPM	mm/ min	ap	ae	RPM	mm/ min	ap	ae	RPM	mm/ min	ap	ae	RPM	mm/ min	ap	ae	RPM	mm/ min	ap	ae
3	14149	289	4,5	1,5	9430	190	4,5	1,5	20000	3450	3	0.30	16000	2800	3	0.15	5400	600	3	0.15
4	10610	347	6	2	7070	230	6	2	15000	3000	4	0.40	12000	2400	4	0.20	4000	480	4	0.2
5	8489	389	7,5	2,5	5660	260	7,5	2,5	12000	2400	5	0.50	9000	1800	5	0.25	3200	380	5	0.2
6	7072	457	9	3	4715	305	9	3	10000	2100	6	0.60	7000	1400	6	0.30	2700	320	6	0.2
8	5303	583	12	4	3535	385	12	4	8000	1500	8	0.80	5600	1100	8	0.40	2000	240	8	0.20
10	4678	725	15	5	3115	480	15	5	6400	1400	10	1.00	4500	950	10	0.50	1600	210	10	0.30
12	3896	730	18	6	2600	485	18	6	5400	1200	12	1.00	3800	860	12	0.50	1300	160	12	0.30
14	3339	651	21	7	2225	435	21	7	4600	1020	14	1	3300	730	14	0,5	1100	140	14	0,3
16	2924	620	24	8	1950	410	24	8	2400	550	16	3.00	1200	280	16	0.80	1000	130	16	0.30
18	2599	614	27	9	1730	410	27	9	2130	490	18	3	1100	250	18	0,8	900	110	18	0,3
20	2336	609	30	10	1560	405	30	10	1900	480	20	4.00	1000	240	20	1.00	800	100	20	0.30
25	1869	473	37,5	12,5	1245	315	37,5	12,5	1500	380	25	4	800	190	25	1	460	80	25	0,3

Depth of cut Głębokość skrawania



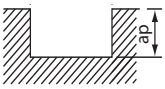
ap	ae
≤1.5D	≤0.2D

ap	ae
≤1.5D	≤0.1D

ap	ae
≤1.5D	≤0.05D

Work Material Materiał	Steel, Cast iron Stal, Żeliwo				Steel, Cast iron Stal, Żeliwo				Steel, Cast iron Stal, Żeliwo				Hardened steel Stal hartowana				Hardened steel Stal hartowana 55- HRC			
	<30 HRC				30-45 HRC				<45 HRC				45-55 HRC				55- HRC			
d1 (mm)	RPM	mm/ min	ap	ae	RPM	mm/ min	ap	ae	RPM	mm/ min	ap	ae	RPM	mm/ min	ap	ae	RPM	mm/ min	ap	ae
3	14149	289	3	3	9900	200	4,5	1,5	16000	2070	0.30	3	12800	1680	0.15	3	4320	360	0.15	3
4	10610	347	4	4	7430	240	6	2	12000	1800	0.40	4	9600	1440	0.20	4	3200	288	0.2	4
5	8489	389	5	5	5940	270	7,5	2,5	9600	1440	0.50	5	7200	1080	0.25	5	2560	228	0.2	5
6	7072	457	6	6	4950	320	9	3	8000	1260	0.60	6	5600	840	0.30	6	2160	192	0.2	6
8	5303	583	8	8	3700	400	12	4	6400	900	0.80	8	4480	660	0.40	8	1600	144	0.20	8
10	4678	725	10	10	3270	500	15	5	5120	840	1.00	10	3600	570	0.50	10	1280	126	0.30	10
12	3896	730	12	12	2730	510	18	6	4320	720	1.00	12	3040	516	0.50	12	1040	96	0.30	12
14	3339	651	14	14	2340	460	21	7	3700	620	1	14	2600	442		14	890	82	0,3	14
16	2924	620	16	16	2050	430	24	8	1920	330	3.00	16	960	168	0.80	16	800	78	0.30	16
18	2599	614	18	18	1820	430	27	9	1700	290	3	18	853	149		18	710	69	0,3	18
20	2336	609	20	20	1640	425	30	10	1520	288	4	20	800	144	1.00	20	640	60	0.30	20
25	1869	473	25	25	1300	330	37,5	12,5	1220	230		25	640	115		25	512	48	0,3	25

Depth of cut Głębokość skrawania



ap
≤1D ap_{MAX}=12mm

ap
≤0.5D

ap
≤0.2D

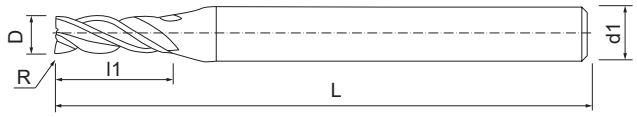
UFJ76

SQUARE TYPE WALCOWO-CZOŁOWE

4-Flute, Medium 4-ostrzowe, średniej długości

		HSM Vmax	F	M	A							max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	○						○	○	○				





D code Kod	R	D	d1	L	l1	Z	Shank Uchwyt
UFJ76030000A06008057	-	3	6	57	8	4	A
UFJ76030003A06008057	0,3	3	6	57	8	4	A
UFJ76040000A06011057	-	4	6	57	11	4	A
UFJ76040003A06011057	0,3	4	6	57	11	4	A
UFJ76050000A06013057	-	5	6	57	13	4	A
UFJ76050003A06013057	0,3	5	6	57	13	4	A
UFJ76060000A06013057	-	6	6	57	13	4	A
UFJ76060004A06013057	0,4	6	6	57	13	4	A
UFJ76080000A08019063	-	8	8	63	19	4	A
UFJ76080004A08019063	0,4	8	8	63	19	4	A
UFJ76100000A10022072	-	10	10	72	22	4	A
UFJ76100004A10022072	0,4	10	10	72	22	4	A
UFJ76120000A12026083	-	12	12	83	26	4	A
UFJ76120006A12026083	0,6	12	12	83	26	4	A
UFJ76140000A14026083	-	14	14	83	26	4	A
UFJ76140006A14026083	0,6	14	14	83	26	4	A
UFJ76160000A16032092	-	16	16	92	32	4	A
UFJ76160008A16032092	0,8	16	16	92	32	4	A
UFJ76180000A18032092	-	18	18	92	32	4	A
UFJ76180008A18032092	0,8	18	18	92	32	4	A
UFJ76200000A20038104	-	20	20	104	38	4	A
UFJ76200008A20038104	0,8	20	20	104	38	4	A
UFJ76250000A25038104	-	25	25	104	38	4	A
UFJ76250008A25038104	0,8	25	25	104	38	4	A

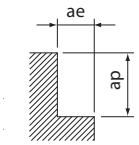
µm	d1 h6	
	D 0 — -30	

UFJ76

Cutting Conditions Parametry skrawania

Work Material Materiał	Steel, Cast iron Stal, Żeliwo				Steel, Cast iron Stal, Żeliwo				Steel, Cast iron Stal, Żeliwo				Hardened steel Stal hartowana				Hardened steel Stal hartowana 55- HRC			
	<30 HRC				30-45 HRC				<45 HRC				45-55 HRC				55- HRC			
d1 (mm)	RPM	mm/ min	ap	ae	RPM	mm/ min	ap	ae	RPM	mm/ min	ap	ae	RPM	mm/ min	ap	ae	RPM	mm/ min	ap	ae
3	14149	289	4,5	1,5	9430	190	4,5	1,5	20000	3450	3	0.30	16000	2800	3	0.15	5400	600	3	0.15
4	10610	347	6	2	7070	230	6	2	15000	3000	4	0.40	12000	2400	4	0.20	4000	480	4	0.2
5	8489	389	7,5	2,5	5660	260	7,5	2,5	12000	2400	5	0.50	9000	1800	5	0.25	3200	380	5	0.2
6	7072	457	9	3	4715	305	9	3	10000	2100	6	0.60	7000	1400	6	0.30	2700	320	6	0.2
8	5303	583	12	4	3535	385	12	4	8000	1500	8	0.80	5600	1100	8	0.40	2000	240	8	0.20
10	4678	725	15	5	3115	480	15	5	6400	1400	10	1.00	4500	950	10	0.50	1600	210	10	0.30
12	3896	730	18	6	2600	485	18	6	5400	1200	12	1.00	3800	860	12	0.50	1300	160	12	0.30
14	3339	651	21	7	2225	435	21	7	4600	1020	14	1	3300	730	14	0,5	1100	140	14	0,3
16	2924	620	24	8	1950	410	24	8	2400	550	16	3.00	1200	280	16	0.80	1000	130	16	0.30
18	2599	614	27	9	1730	410	27	9	2130	490	18	3	1100	250	18	0,8	900	110	18	0,3
20	2336	609	30	10	1560	405	30	10	1900	480	20	4.00	1000	240	20	1.00	800	100	20	0.30
25	1869	473	37,5	12,5	1245	315	37,5	12,5	1500	380	25	4	800	190	25	1	460	80	25	0,3

Depth of cut Głębokość skrawania



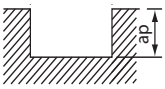
ap	ae
≤1.5D	≤0.2D

ap	ae
≤1.5D	≤0.1D

ap	ae
≤1.5D	≤0.05D

Work Material Materiał	Steel, Cast iron Stal, Żeliwo				Steel, Cast iron Stal, Żeliwo				Steel, Cast iron Stal, Żeliwo				Hardened steel Stal hartowana				Hardened steel Stal hartowana 55- HRC			
	<30 HRC				30-45 HRC				<45 HRC				45-55 HRC				55- HRC			
d1 (mm)	RPM	mm/ min	ap	ae	RPM	mm/ min	ap	ae	RPM	mm/ min	ap	ae	RPM	mm/ min	ap	ae	RPM	mm/ min	ap	ae
3	14149	289	3	3	9900	200	4,5	1,5	16000	2070	0.30	3	12800	1680	0.15	3	4320	360	0.15	3
4	10610	347	4	4	7430	240	6	2	12000	1800	0.40	4	9600	1440	0.20	4	3200	288	0.2	4
5	8489	389	5	5	5940	270	7,5	2,5	9600	1440	0.50	5	7200	1080	0.25	5	2560	228	0.2	5
6	7072	457	6	6	4950	320	9	3	8000	1260	0.60	6	5600	840	0.30	6	2160	192	0.2	6
8	5303	583	8	8	3700	400	12	4	6400	900	0.80	8	4480	660	0.40	8	1600	144	0.20	8
10	4678	725	10	10	3270	500	15	5	5120	840	1.00	10	3600	570	0.50	10	1280	126	0.30	10
12	3896	730	12	12	2730	510	18	6	4320	720	1.00	12	3040	516	0.50	12	1040	96	0.30	12
14	3339	651	14	14	2340	460	21	7	3700	620	1	14	2600	442		14	890	82	0,3	14
16	2924	620	16	16	2050	430	24	8	1920	330	3.00	16	960	168	0.80	16	800	78	0.30	16
18	2599	614	18	18	1820	430	27	9	1700	290	3	18	853	149		18	710	69	0,3	18
20	2336	609	20	20	1640	425	30	10	1520	288	4	20	800	144	1.00	20	640	60	0.30	20
25	1869	473	25	25	1300	330	37,5	12,5	1220	230		25	640	115		25	512	48	0,3	25

Depth of cut Głębokość skrawania



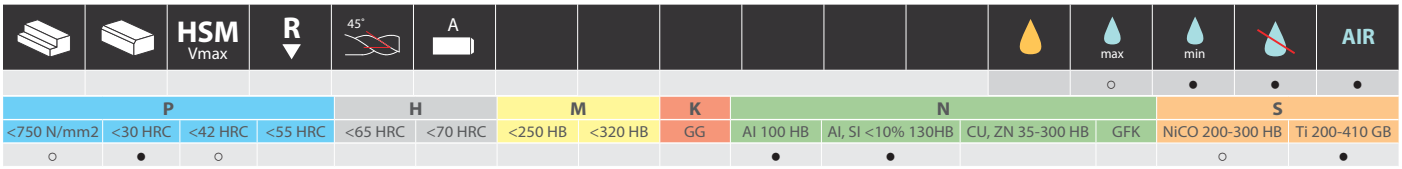
ap
≤1D ap_{MAX}=12mm

ap
≤0.5D

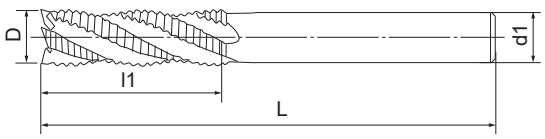
ap
≤0.2D

UFJ17

SQUARE TYPE WALCOWO-CZOŁOWE
Multiflute Wieloostrzowe



P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○	●	○							●	●			○	●





D code new Nowy kod	D code kod	D	d1	L	l1	Z	Shank Uchwyt
UFJ17060000A06007054	UFJ17060	6	6	54	7	4	A
UFJ17080000A08009058	UFJ17080	8	8	58	9	4	A
UFJ17100000A10014066	UFJ17100	10	10	66	14	4	A
UFJ17120000A12016073	UFJ17120	12	12	73	16	4	A
UFJ17160000A16022082	UFJ17160	16	16	82	22	5	A
UFJ17200000A20026092	UFJ17200	20	20	92	26	6	A

Cutting Conditions Parametry skrawania

ap ae	Alloy Steel, Tool Steel Stal stopowa, stal narzędziowa						Stainless Steel, Titanium Alloys Stal nierdzewna, Stopy tytanu				Inconel Inconel			
	ae	ap	30HRC		30 - 45HRC									
d1(mm)			RPM	mm/min	RPM	mm/min	ae	ap	RPM	mm/min	ae	ap	RPM	mm/min
6	1,8	9	15600	2320	12400	840	0,9	9	8400	570	0,3	3	2400	190
8	2,4	12	11600	2320	9200	840	1,2	12	6300	570	0,4	4	1800	180
10	3	15	9200	2320	7600	840	1,5	15	5100	570	0,5	5	1300	190
12	3,6	18	8000	2400	6000	800	1,8	18	4200	570	0,6	6	1200	190
14	4,2	21	6800	2400	5200	840	2,1	21	3600	570	0,7	7	900	130
16	4,8	24	6000	2400	4800	760	2,4	24	3300	510	0,8	8	800	110
18	5,4	27	5200	2320	4400	720	2,7	27	2700	420	0,9	9	700	100
20	6	30	4800	2160	3600	560	3	30	2400	360	1	10	660	100

ap	Alloy Steel, Tool Steel Stal stopowa, stal narzędziowa				Stainless Steel, Titanium Alloys Stal nierdzewna, Stopy tytanu			Inconel Inconel		
	ap	30HRC		30 - 45HRC						
d1(mm)		RPM	mm/min	RPM	mm/min	ap	RPM	mm/min	ap	RPM	mm/min
6	3	15600	2320	12400	840	1,5	8400	570	0,3	2400	190
8	4	11600	2320	9200	840	2	6300	570	0,4	1800	180
10	5	9200	2320	7600	840	2,5	5100	570	0,5	1300	190
12	6	8000	2400	6000	800	1,8	4200	570	0,6	1200	190
14	7	6800	2400	5200	840	2,1	3600	570	0,7	900	130
16	8	6000	2400	4800	760	2,4	3300	510	0,8	800	110
18	9	5200	2320	4400	720	1,8	2700	420	0,9	700	100
20	10	4800	2160	3600	560	2	2400	360	1	660	100

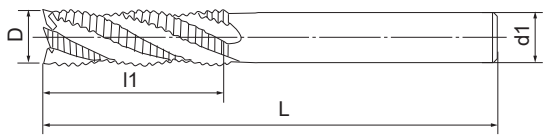
µm						
	D ≤ 3,0	0 — -40	D ≤ 30	0 — -84	d1 ≤ 18	0 — -11
	D ≤ 6,0	0 — -48	d1 ≤ 3	0 — -6	d1 ≤ 30	0 — -13
	D ≤ 10	0 — -58	d1 ≤ 6	0 — -8		
	D ≤ 18	0 — -70	d1 ≤ 10	0 — -9		

UFJ19

SQUARE TYPE WALCOWO-CZOŁOWE
Multiflute Wieloostrzowe

		HSM Vmax	R	45°	A							max	min		AIR
												○	●	●	●

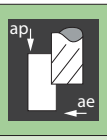
P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○	●	○							●	●			○	●





D code Kod	D	d1	L	l1	Z	Shank Uchwyt
UFJ19040000A06011057	4	6	57	11	3	A
UFJ19050000A06013057	5	6	57	13	4	A
UFJ19060000A06016057	6	6	57	16	4	A
UFJ19070000A08016063	7	8	63	16	4	A
UFJ19080000A08016063	8	8	63	16	4	A
UFJ19090000A10019072	9	10	72	19	4	A
UFJ19100000A10022072	10	10	72	22	4	A
UFJ19120000A12026083	12	12	83	26	4	A
UFJ19140000A14026083	14	14	83	26	5	A
UFJ19160000A16032092	16	16	92	32	5	A
UFJ19200000A20038104	20	20	104	38	6	A
UFJ19250000A25045121	25	25	121	45	6	A

Cutting Conditions Parametry skrawania



d1(mm)	Alloy Steel, Tool Steel Stal stopowa, stal narzędziowa						Stainless Steel, Titanium Alloys Stal nierdzewna, Stopy tytanu				Inconel Inconel			
	ae	ap	30HRC		30 - 45HRC		ae	ap	RPM	mm/min	ae	ap	RPM	mm/min
			RPM	mm/min	RPM	mm/min								
6	1,8	9	15600	2320	12400	840	0,9	9	8400	570	0,3	3	2400	190
8	2,4	12	11600	2320	9200	840	1,2	12	6300	570	0,4	4	1800	180
10	3	15	9200	2320	7600	840	1,5	15	5100	570	0,5	5	1300	190
12	3,6	18	8000	2400	6000	800	1,8	18	4200	570	0,6	6	1200	190
14	4,2	21	6800	2400	5200	840	2,1	21	3600	570	0,7	7	900	130
16	4,8	24	6000	2400	4800	760	2,4	24	3300	510	0,8	8	800	110
18	5,4	27	5200	2320	4400	720	2,7	27	2700	420	0,9	9	700	100
20	6	30	4800	2160	3600	560	3	30	2400	360	1	10	660	100
25	7,5	37,5	4300	2150	3200	620	3,75	37,5	2160	410	1,25	12,5	600	100



d1(mm)	Alloy Steel, Tool Steel Stal stopowa, stal narzędziowa					Stainless Steel, Titanium Alloys Stal nierdzewna, Stopy tytanu			Inconel Inconel		
	ap	30HRC		30 - 45HRC		ap	RPM	mm/min	ap	RPM	mm/min
		RPM	mm/min	RPM	mm/min						
6	3	15600	2320	12400	840	1,5	8400	570	0,3	2400	190
8	4	11600	2320	9200	840	2	6300	570	0,4	1800	180
10	5	9200	2320	7600	840	2,5	5100	570	0,5	1300	190
12	6	8000	2400	6000	800	1,8	4200	570	0,6	1200	190
14	7	6800	2400	5200	840	2,1	3600	570	0,7	900	130
16	8	6000	2400	4800	760	2,4	3300	510	0,8	800	110
18	9	5200	2320	4400	720	1,8	2700	420	0,9	700	100
20	10	4800	2160	3600	560	2	2400	360	1	660	100
25	12,5	4300	2150	3200	620	2,5	2160	410	1,25	600	100

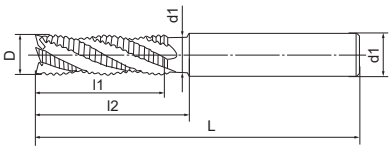
µm										
	D ≤ 3,0	0 — -40	D ≤ 10	0 — -58	D ≤ 30	0 — -84	d1 ≤ 6	0 — -8	d1 ≤ 18	0 — -11
	D ≤ 6,0	0 — -48	D ≤ 18	0 — -70	d1 ≤ 3	0 — -6	d1 ≤ 10	0 — -9	d1 ≤ 30	0 — -13

UFJ21

SQUARE TYPE WALCOWO-CZOŁOWE
Multiflute Wieloostrzowe

		HSM Vmax	R	45°	A							max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, SI <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○	●	○							●	●			○	●

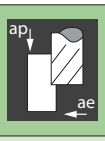




D code new Nowy kod	D code kod	D	d1	d2	L	l1	l2	Z	Shank Uchwyt
UFJ21060000A06016057	UFJ21060	6	6	5,5	57	20	16	4	A
UFJ21080000A08016063	UFJ21080	8	8	7,5	63	26	16	4	A
UFJ21100000A10022072	UFJ21100	10	10	9,5	72	31	22	4	A
UFJ21120000A12026083	UFJ21120	12	12	11,5	83	37	26	4	A
UFJ21160000A16032100	UFJ21160	16	16	15,5	100	51	32	5	A
UFJ21200000A20038110	UFJ21200	20	20	19,2	110	59	38	6	A

Cutting Conditions Parametry skrawania

SIDE CUTTING / FREZOWANIE OBWODOWE



	Alloy Steel, Tool Steel Stal stopowa, stal narzędziowa						Stainless Steel, Titanium Alloys Stal nierdzewna, Stopy tytanu				Inconel Inconel			
	ae	ap	30HRC		30 - 45HRC									
d1(mm)			RPM	mm/min	RPM	mm/min	ae	ap	RPM	mm/min	ae	ap	RPM	mm/min
6	1,8	9	15600	2320	12400	840	0,9	9	8400	570	0,3	3	2400	190
8	2,4	12	11600	2320	9200	840	1,2	12	6300	570	0,4	4	1800	180
10	3	15	9200	2320	7600	840	1,5	15	5100	570	0,5	5	1300	190
12	3,6	18	8000	2400	6000	800	1,8	18	4200	570	0,6	6	1200	190
14	4,2	21	6800	2400	5200	840	2,1	21	3600	570	0,7	7	900	130
16	4,8	24	6000	2400	4800	760	2,4	24	3300	510	0,8	8	800	110
18	5,4	27	5200	2320	4400	720	2,7	27	2700	420	0,9	9	700	100
20	6	30	4800	2160	3600	560	3	30	2400	360	1	10	660	100

SLOTTING / FREZOWANIE ROWKÓW



	Alloy Steel, Tool Steel Stal stopowa, stal narzędziowa					Stainless Steel, Titanium Alloys Stal nierdzewna, Stopy tytanu			Inconel Inconel		
	ap	30HRC		30 - 45HRC							
d1(mm)		RPM	mm/min	RPM	mm/min	ap	RPM	mm/min	ap	RPM	mm/min
6	3	15600	2320	12400	840	1,5	8400	570	0,3	2400	190
8	4	11600	2320	9200	840	2	6300	570	0,4	1800	180
10	5	9200	2320	7600	840	2,5	5100	570	0,5	1300	190
12	6	8000	2400	6000	800	1,8	4200	570	0,6	1200	190
14	7	6800	2400	5200	840	2,1	3600	570	0,7	900	130
16	8	6000	2400	4800	760	2,4	3300	510	0,8	800	110
18	9	5200	2320	4400	720	1,8	2700	420	0,9	700	100
20	10	4800	2160	3600	560	2	2400	360	1	660	100

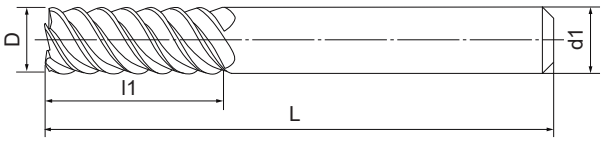
µm										
	D ≤ 3,0	0 — -40	D ≤ 10	0 — -58	D ≤ 30	0 — -84	d1 ≤ 6	0 — -8	d1 ≤ 18	0 — -11
	D ≤ 6,0	0 — -48	D ≤ 18	0 — -70	d1 ≤ 3	0 — -6	d1 ≤ 10	0 — -9	d1 ≤ 30	0 — -13

UFJ15

SQUARE TYPE WALCOWO-CZOŁOWE
Multiflute Wieloostrzowe

			HSM Vmax	R	45°	A						max	min		AIR
												○	●	●	●

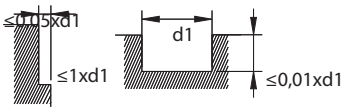
P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, SI <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○	●	○							●	●			○	●





D code Kod	D	d1	L	l1	Z	Shank Uchwyt
UFJ15060000A06013057	6	6	57	13	6	A
UFJ15070000A08016063	7	8	63	16	6	A
UFJ15080000A08019063	8	8	63	19	6	A
UFJ15090000A10019072	9	10	72	19	6	A
UFJ15100000A10022072	10	10	72	22	6	A
UFJ15120000A12026083	12	12	83	26	6	A
UFJ15140000A14026083	14	14	83	26	6	A
UFJ15160000A16032092	16	16	92	32	6	A
UFJ15180000A18032092	18	18	92	32	8	A
UFJ15200000A20038104	20	20	104	38	8	A
UFJ15250000A25044104	25	25	104	44	8	A

Cutting Conditions Parametry skrawania

Work Material Materiał	Carbon Steel, Alloy Steel Stal węglowa, stal stopowa		Alloy Steel, Tool Steel Stal stopowa, stal narzędziowa		Titanium Tytan		Nickel, Inconel Nikiel,Inconel	
	<30HRC		30 - 45HRC					
d1 (mm)	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
6	20000	8100	14000	5400	8000	2700	2100	710
8	16000	7200	11200	4680	6000	2200	1600	590
10	12800	6000	8800	4080	5000	2000	1200	480
12	10800	5580	7600	3720	4000	1760	1000	440
16	8000	3600	5600	2520	3000	1350	800	360
20	6400	2880	4400	1980	2400	1150	640	300
Depth of cut Głębokość skrawania								

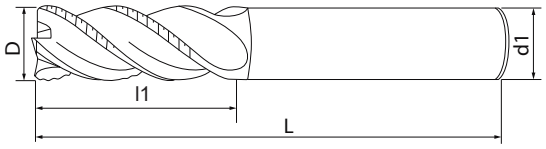
µm	D ≤ 3,0	0 — -40	D ≤ 30	0 — -84	d1 ≤ 18	0 — -11
	D ≤ 6,0	0 — -48	d1 ≤ 3	0 — -6	d1 ≤ 30	0 — -13
	D ≤ 10	0 — -58	d1 ≤ 6	0 — -8		
	D ≤ 18	0 — -70	d1 ≤ 10	0 — -9		

UFJ01

SQUARE TYPE WALCOWO-CZOŁOWE
4-Flute 4-ostrzowe

HSM Vmax	M	R	45°	A	max	min		AIR
					○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
	●	●	●	○										





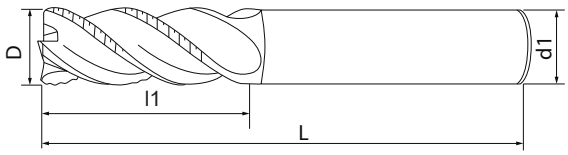
D code new Nowy kod	D code kod	D	d1	L	l1	Z	Shank Uchwyt
UFJ01060000A06013060	UFJ01060	6	6	60	13	4	A
UFJ01080000A08019060	UFJ01080	8	8	60	19	4	A
UFJ01100000A10022075	UFJ01100	10	10	75	22	4	A
UFJ01120000A12026100	UFJ01120	12	12	100	26	4	A
UFJ01160000A16035100	UFJ01160	16	16	100	35	4	A
UFJ01200000A20040100	UFJ01200	20	20	100	40	4	A
UFJ01250000A25050110	UFJ01250	25	25	110	50	4	A

UFJ02

SQUARE TYPE WALCOWO-CZOŁOWE
4-Flute 4-ostrzowe

HSM Vmax	M	R	45°	A	max	min		AIR
					○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
	●	●	●	○										





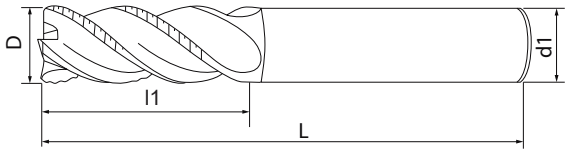
D code new Nowy kod	D code kod	D	d1	L	l1	Z	Shank Uchwyt
UFJ02060000A06020060	UFJ02060	6	6	60	20	4	A
UFJ02080000A08025075	UFJ02080	8	8	75	25	4	A
UFJ02100000A10030080	UFJ02100	10	10	80	30	4	A
UFJ02120000A12035100	UFJ02120	12	12	100	35	4	A
UFJ02160000A16045110	UFJ02160	16	16	110	45	4	A
UFJ02200000A20050125	UFJ02200	20	20	125	50	4	A
UFJ02250000A25060125	UFJ02250	25	25	125	60	4	A

UFJ03

SQUARE TYPE WALCOWO-CZOŁOWE
4-Flute 4-ostrzowe

		HSM Vmax	M	R	45°	A						max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
	●	●	●	○										





D code new Nowy kod	D code kod	D	d1	L	l1	Z	Shank Uchwyt
UFJ03060000A06025075	UFJ03060	6	6	75	25	4	A
UFJ03080000A08030075	UFJ03080	8	8	75	30	4	A
UFJ03100000A10035080	UFJ03100	10	10	80	35	4	A
UFJ03120000A12040100	UFJ03120	12	12	100	40	4	A
UFJ03160000A16055110	UFJ03160	16	16	110	55	4	A
UFJ03200000A20060125	UFJ03200	20	20	125	60	4	A
UFJ03250000A25080160	UFJ03250	25	25	160	80	4	A

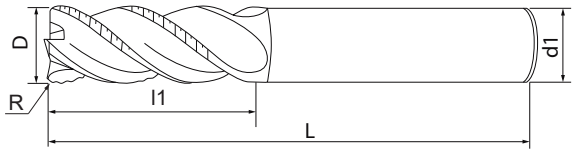
UFJ22

SQUARE TYPE WALCOWO-CZOŁOWE

4-Flute 4-ostrzowe

		HSM Vmax	M	R	45°	A						max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
	●	●	●	○										





D code new Nowy kod	D code kod	R	D	d1	L	l1	Z	Shank Uchwyt
UFJ22060003A06013060	UFJ220603	0.3	6	6	60	13	4	A
UFJ22060005A06013060	UFJ220605	0.5	6	6	60	13	4	A
UFJ22060010A06013060	UFJ220610	1	6	6	60	13	4	A
UFJ22080003A08019060	UFJ220803	0.3	8	8	60	19	4	A
UFJ22080005A08019060	UFJ220805	0.5	8	8	60	19	4	A
UFJ22080010A08019060	UFJ220810	1	8	8	60	19	4	A
UFJ22080015A08019060	UFJ220815	1.5	8	8	60	19	4	A
UFJ22080020A08019060	UFJ220820	2	8	8	60	19	4	A
UFJ22100003A10022075	UFJ221003	0.3	10	10	75	22	4	A
UFJ22100005A10022075	UFJ221005	0.5	10	10	75	22	4	A
UFJ22100010A10022075	UFJ221010	1	10	10	75	22	4	A
UFJ22100015A10022075	UFJ221015	1.5	10	10	75	22	4	A
UFJ22100020A10022075	UFJ221020	2	10	10	75	22	4	A
UFJ22100030A10022075	UFJ221030	3	10	10	75	22	4	A
UFJ22120005A12026100	UFJ221205	0.5	12	12	100	26	4	A
UFJ22120010A12026100	UFJ221210	1	12	12	100	26	4	A
UFJ22120015A12026100	UFJ221215	1.5	12	12	100	26	4	A
UFJ22120020A12026100	UFJ221220	2	12	12	100	26	4	A
UFJ22120030A12026100	UFJ221230	3	12	12	100	26	4	A
UFJ22160010A16035100	UFJ221610	1	16	16	100	35	4	A
UFJ22160015A16035100	UFJ221615	1.5	16	16	100	35	4	A
UFJ22160020A16035100	UFJ221620	2	16	16	100	35	4	A
UFJ22160030A16035100	UFJ221630	3	16	16	100	35	4	A
UFJ22200010A20040100	UFJ222010	1	20	20	100	40	4	A
UFJ22200015A20040100	UFJ222015	1.5	20	20	100	40	4	A
UFJ22200020A20040100	UFJ222020	2	20	20	100	40	4	A
UFJ22200030A20040100	UFJ222030	3	20	20	100	40	4	A

UFJ01/UFJ02/UFJ03/UFJ22

Cutting Conditions Parametry skrawania

IDE MILLING / FREZOWANIE OBWODOWE

Work Material Materiał	**Mild steels, Carbon steels, Cast iron /** Stal stopowa, Stal węglowa, Żeliwo		**Alloy steels, Tool steels** Stal stopowa, Stal narzędziowa		**Hardened steels, Prehardened steels /** Stal ulepszana i hartowana		**Stainless steel** Stal nierdzewna		**Hardened steels, Titanium alloys, Heat resistant alloys steels /** Stal hartowana, Stopy tytanu, Stal żarood-porna		**Hardened steels /** Stal hartowana	
	<750N/mm²		**<30HRC**		**30-38HRC**		**38-45HRC**		**45-55HRC**		**55-60HRC**	
Diameter Średnica **[mm]**	**RPM**	**Mm/min**	**RPM**	**Mm/min**	**RPM**	**Mm/min**	**RPM**	**Mm/min**	**RPM**	**Mm/min**	**RPM**	**Mm/min**
6	4240	1250	3320	945	2800	700	2640	660	2560	545	1280	190
8	3200	1250	2480	895	2120	660	1960	640	1920	555	960	175
10	2560	1100	2000	855	1680	605	1560	590	1520	525	764	160
12	2120	1100	1640	850	1400	565	1320	535	1280	475	636	160
16	1600	955	1240	745	1040	500	1000	445	960	400	476	160
20	1280	765	1000	595	840	455	788	395	764	355	380	160
25	1060	640	850	510	700	420	660	330	640	310	320	140
ap / ae			ap	ae			ap	ae		ap	ae	
			1.5D	0.2D			1.5D	0.1D		1D	0.05D	

SLOTTING / FREZOWANIE ROWKA

Work Material Materiał	**Mild steels, Carbon steels, Cast iron /** Stal stopowa, Stal węglowa, Żeliwo		**Alloy steels, Tool steels** Stal stopowa, Stal narzędziowa		**Hardened steels, Prehardened steels /** Stal ulepszana i hartowana		**Stainless steel** Stal nierdzewna		**Hardened steels, Titanium alloys, Heat resistant alloys steels /** Stal hartowana, Stopy tytanu, Stal żarood-porna		**Hardened steels /** Stal hartowana	
	<750N/mm2		**<30HRC**		**30-38HRC**		**38-45HRC**		**45-55HRC**		**55-60HRC**	
Diameter Średnica **[mm]**	**RPM**	**Mm/min**	**RPM**	**Mm/min**	**RPM**	**Mm/min**	**RPM**	**Mm/min**	**RPM**	**Mm/min**	**RPM**	**Mm/min**
6	3400	715	2560	560	2320	500	2200	495	1800	400	840	125
8	2560	660	1920	550	1760	545	1640	515	1320	415	636	125
10	2040	610	1520	535	1400	475	1320	470	1080	380	508	115
12	1680	610	1280	475	1160	450	1120	440	880	355	424	115
16	1280	610	960	430	880	370	840	370	668	300	320	88
20	1000	510	764	380	700	350	664	330	536	265	256	85
25	910	480	710	340	600	290	570	280	550	260	240	80
ap	ap=0,5D								ap=0.05D			

UFJ01/UFJ02/UFJ03/UFJ22

Cutting Conditions Parametry skrawania

HSM SIDE MILLIG / HSM FREZOWANIE OBWODOWE

Work material materiał obrabiany	**Mild steels, Carbon steels, Cast iron /** Stal stopowa, Stal węglowa, Żeliwo		**Alloy steels, Tool steels** Stal stopowa, Stal narzędziowa		**Hardened steels, Prehardened steels /** Stal ulepszana i hartowana		**Stainless steel** Stal nierdzewna		**Hardened steels, Titanium alloys, Heat resistant alloys steels /** Stal hartowana, Stopy tytanu, Stal żaroodpornaсталь		**Hardened steels /** Stal hartowanaStal hatrowana, Stal nierdzewna	
	<750N/mm2		**<30HRC**		**30-38HRC**		**38-45HRC**		**45-55HRC**		**55-60HRC**	
Diameter Średnica**[mm]**	**RPM**	**Mm/min**	**RPM**	**Mm/ min**	**RPM**	**Mm/ min**	**RPM**	**Mm/ min**	**RPM**	**Mm/ min**	**RPM**	**Mm/ min**
6	8480	3050	8480	2650	8480	2000	6360	1450	4240	910	3400	610
8	6360	2800	6360	2400	6360	1900	4760	1400	3200	860	2560	575
10	5080	2550	5080	2200	5080	1850	3800	1350	2560	830	2040	510
12	4240	2550	4240	2200	4240	1800	3200	1350	2120	830	1680	510
16	3200	1900	3200	1900	3200	1700	2400	1350	1600	830	1280	510
20	2560	1550	2560	1550	2560	1550	1920	1150	1280	730	1000	510
25	2280	1400	2280	1400	2280	1400	1500	900	1200	700	800	420
ap / ae	d<Ø6: ap 1,5D, ae 0,02D Ø6<d<Ø25: ap 1,5D, ae 0,05D						d<Ø6: ap 1,5D, ae 0,01D Ø6<d<Ø25: ap 1,5D, ae 0,02D		d<Ø6: ap 1D, ae 0,01D Ø6<d<Ø25: ap 1D, ae 0,02D			

HSM SLOTTING / HSM FREZOWANIE ROWKA

Work material materiał obrabianymateriał obrabiany	**Mild steels, Carbon steels, Cast iron /** Stal stopowa, Stal węglowa, Żeliwo		**Alloy steels, Tool steels** Stal stopowa, Stal narzędziowa		**Hardened steels, Prehardened steels /** Stal ulepszana i hartowana		**Hardened steels, Stainless steels /** Stal hatrowana, Stal nierdzewna	
	<750N/mm2		**<30HRC**		**30-38HRC**		**38-45HRC**	
Diameter Średnica**[mm]**	**RPM**	**Mm/min**	**RPM**	**Mm/min**	**RPM**	**Mm/min**	**RPM**	**Mm/min**
6	2920	1550	4680	1150	4240	910	2960	670
8	3800	1450	3520	1300	3200	985	2240	690
10	3040	1400	2800	1200	2560	865	1800	635
12	2560	1250	2320	1150	2120	815	1480	595
16	1920	1050	1760	965	1600	675	1120	500
20	1520	840	1400	770	1280	635	880	445
25	1280	720	1000	560	1100	590	660	370
ap	ap=0,2D ap max = 3mm							

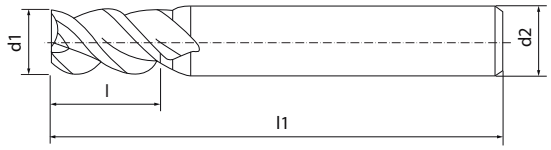
UFJ11

SQUARE TYPE WALCOWO-CZOŁOWE

2 Flute, Short Length 2 ostrzowe, krótkie

		HSM Vmax	F	M	30°	A						max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○	●	○							●	●				●



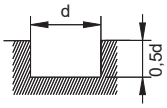


D code Kod	D	d1	L	l1	Z	Shank Uchwyt
UFJ11010000A04003040	1	4	40	2,5	2	A
UFJ11010000A06003040	1	6	40	2,5	2	A
UFJ11015000A04004040	1,5	4	40	4	2	A
UFJ11015000A06004040	1,5	6	40	4	2	A
UFJ11020000A04006040	2	4	40	6	2	A
UFJ11020000A06006040	2	6	40	6	2	A
UFJ11025000A04008040	2,5	4	40	8	2	A
UFJ11025000A06008040	2,5	6	40	8	2	A
UFJ11030000A06008045	3	6	45	8	2	A
UFJ11035000A06010045	3,5	6	45	10	2	A
UFJ11040000A06011045	4	6	45	11	2	A
UFJ11045000A06011045	4,5	6	45	11	2	A
UFJ11050000A06013050	5	6	50	13	2	A
UFJ11055000A06013050	5,5	6	50	13	2	A
UFJ11060000A06013050	6	6	50	13	2	A
UFJ11065000A08016060	6,5	8	60	16	2	A
UFJ11070000A08016060	7	8	60	16	2	A
UFJ11075000A08016060	7,5	8	60	16	2	A
UFJ11080000A08019060	8	8	60	19	2	A
UFJ11085000A10019070	8,5	10	70	19	2	A
UFJ11090000A10019070	9	10	70	19	2	A
UFJ11095000A10019070	9,5	10	70	19	2	A
UFJ11100000A10022070	10	10	70	22	2	A
UFJ11110000A12022075	11	12	75	22	2	A
UFJ11120000A12026075	12	12	75	26	2	A
UFJ11140000A16026085	14	16	85	26	2	A
UFJ11160000A16032100	16	16	100	32	2	A
UFJ11180000A16032100	18	16	100	32	2	A
UFJ11200000A20038105	20	20	105	38	2	A
UFJ11220000A20038105	22	20	105	38	2	A
UFJ11250000A25045120	25	25	120	45	2	A

UFJ11

Cutting Conditions Parametry skrawania

Work material materiał obrabianymateriał obrabiany	**Carbon Steels Alloy steels (-30HRC)** Stali węglowych, stali stopowych (-30HRC)		**Carbon Steels Alloy steels (30-45HRC)** Stali węglowych, stali stopowych **(30 - 45HRC)**		**Stainless steel** Stal nierdzewna	
d1 (mm)	**RPM**	**mm/min**	**RPM**	**mm/min**	**RPM**	**mm/min**
2	11560	190	7560	120	6300	90
3	8920	210	5560	140	4620	120
4	7560	300	4620	180	3880	150
5	6300	320	3780	190	3160	160
6	5560	350	3360	220	2840	180
8	4200	380	2520	200	2100	180
10	3260	330	2000	160	1680	160
12	2740	280	1680	130	1360	130
16	2200	220	1360	110	1060	110
20	1680	170	1060	80	840	80
25	1360	130	840	70	680	60



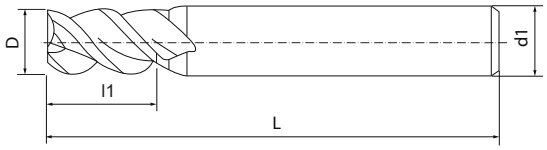
UFJ13

SQUARE TYPE WALCOWO-CZOŁOWE

4 Flute, Short Length 4 ostrzowe, krótkie

		HSM Vmax	F	M	45°	A						max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○	●	○							●	●				●



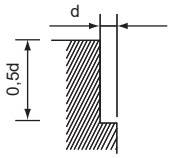


D code Kod	D	d1	L	l1	Z	Shank Uchwyt
UFJ13020000A04006040	2	4	40	6	4	A
UFJ13020000A06006040	2	6	40	6	4	A
UFJ13025000A04008040	2,5	4	40	8	4	A
UFJ13025000A06008040	2,5	6	40	8	4	A
UFJ13030000A06008045	3	6	45	8	4	A
UFJ13035000A06010045	3,5	6	45	10	4	A
UFJ13040000A06011045	4	6	45	11	4	A
UFJ13045000A06011045	4,5	6	45	11	4	A
UFJ13050000A06013050	5	6	50	13	4	A
UFJ13055000A06013050	5,5	6	50	13	4	A
UFJ13060000A06013050	6	6	50	13	4	A
UFJ13065000A08016060	6,5	8	60	16	4	A
UFJ13070000A08016060	7	8	60	16	4	A
UFJ13075000A08016060	7,5	8	60	16	4	A
UFJ13080000A08019060	8	8	60	19	4	A
UFJ13085000A10019070	8,5	10	70	19	4	A
UFJ13090000A10019070	9	10	70	19	4	A
UFJ13095000A10019070	9,5	10	70	19	4	A
UFJ13100000A10022070	10	10	70	22	4	A
UFJ13110000A12022075	11	12	75	22	4	A
UFJ13120000A12026075	12	12	75	26	4	A
UFJ13140000A16026085	14	16	85	26	4	A
UFJ13160000A16032100	16	16	100	32	4	A
UFJ13180000A16032100	18	16	100	32	4	A
UFJ13200000A20038105	20	20	105	38	4	A
UFJ13220000A20038105	22	20	105	38	4	A
UFJ13250000A25045120	25	25	120	45	4	A

UFJ13

Cutting Conditions Parametry skrawania

Work material materiał obrabianymateriał obrabiany	**Carbon Steels Alloy steels (-30HRC)** Stali węglowych, stali stopowych (-30HRC)		**Carbon Steels Alloy steels (30-45HRC)** Stali węglowych, stali stopowych **(30 - 45HRC)**		**Stainless steel** Stal nierdzewna	
d1 (mm)	**RPM**	**mm/min**	**RPM**	**mm/min**	**RPM**	**mm/min**
2	11560	280	7560	170	6300	140
3	8920	320	5560	200	4620	170
4	7560	570	4620	350	3880	280
5	6300	600	3780	360	3160	300
6	5560	660	3360	410	2840	330
8	4200	710	2520	380	2100	350
10	3260	610	2000	300	1680	300
12	2740	520	1680	250	1360	240
16	2200	410	1360	200	1060	200
20	1680	320	1060	160	840	150
25	1360	250	840	130	680	120



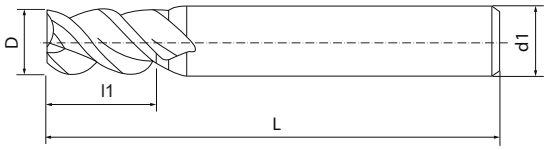
UFJ30

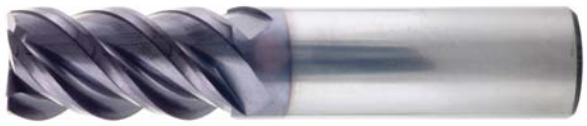
SQUARE TYPE WALCOWO-CZOŁOWE

3-4 Flute, Long Length 3-4 ostrzowe, długie

		HSM Vmax	F	M	R	45°	A					max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○	●	○							●	●			○	●

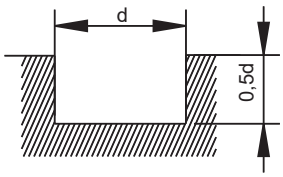


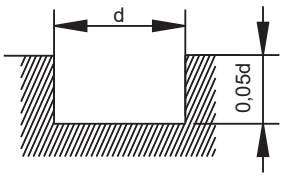


D code Kod	D	d1	L	l1	Z	Shank Uchwyt
UFJ30060000A06013050	6	6	50	13	3	A
UFJ30080000A08019060	8	8	60	19	3	A
UFJ30100000A10022070	10	10	70	22	3	A
UFJ30120000A12025075	12	12	75	25	3	A
UFJ30160000A16032090	16	16	90	32	3	A
UFJ30180000A18032090	18	18	90	32	3	A
UFJ30200000A20038100	20	20	100	38	4	A
UFJ30250000A25045120	25	25	120	45	4	A

Cutting Conditions Parametry skrawania

Work material materiał obrabianymateriał obrabiany	Carbon Steels Alloy steels (-30HRC) Stali węglowych, stali stopowych (-30HRC)		Carbon Steels Alloy steels (30-45HRC) Stali węglowych, stali stopowych (30 - 45HRC)		Stainless steel Stal nierdzewna		Inconel Inconel	
d1 (mm)	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
6	5560	310	3360	200	2840	160	1160	40
8	4200	340	2520	180	2100	160	840	40
10	3260	300	2000	140	1680	140	670	40
12	2740	250	1680	120	1370	120	560	30
16	2200	200	1360	100	1050	100	420	25
18	1940	175	1210	85	950	85	370	20
20	1680	150	1060	70	840	70	320	20
25	1360	115	840	60	670	60	270	15





UFJ08

SQUARE TYPE WALCOWO-CZOŁOWE
4-6 Flute, Short Length 4-6 ostrzowe, krótkie

		HSM Vmax	F	M	R	30°	B					max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○	●	○							●	●			○	●



D code Kod	D	d1	L	l1	Z	Shank Uchwyt
UFJ08030000B06008052	3	6	52	8	4	B
UFJ08040000B06011055	4	6	55	11	4	B
UFJ08050000B06013057	5	6	57	13	4	B
UFJ08060000B06013057	6	6	57	13	4	B
UFJ08080000B10019069	8	10	69	19	4	B
UFJ08100000B10022072	10	10	72	22	4	B
UFJ08120000B12026083	12	12	83	26	4	B
UFJ08140000B12026083	14	12	83	26	4	B
UFJ08160000B16032092	16	16	92	32	6	B
UFJ08180000B16032092	18	16	92	32	6	B
UFJ08200000B20038104	20	20	104	38	6	B
UFJ08250000B25045121	25	25	121	45	6	B

Cutting Conditions Parametry skrawania

Work material materiał obrabianymateriał obrabiany	Carbon Steels Alloy steels (-30HRC) Stali węglowych, stali stopowych (-30HRC)				Carbon Steels Alloy steels (30-45HRC) Stali węglowych, stali stopowych (30 - 45HRC)				Stainless steels Stale nierdzewne				Inconel Inconel			
d1 (mm)	RPM	mm/min	ae	ap	RPM	mm/min	ae	ap	RPM	mm/ min	ae	ap	RPM	mm/ min	ae	ap
6	15600	1390	3	6	12400	500	3	6	8400	340	1,5	6	2400	115	0,3	6
8	11600	1390	4	8	9200	500	4	8	6300	340	2	8	1800	110	0,4	8
10	9200	1390	5	10	7600	500	5	10	5100	340	2,5	10	1300	115	0,5	10
12	8000	1440	6	12	6000	480	6	12	4200	340	1,8	12	1200	115	0,6	12
14	6800	1440	7	14	5200	500	7	14	3600	340	2,1	14	900	80	0,7	14
16	6000	1440	8	16	4800	460	8	16	3300	310	2,4	16	800	65	0,8	16
18	5200	1390	9	18	4400	430	9	18	2700	250	1,8	18	700	60	0,9	18
20	4800	1300	10	20	3600	340	10	20	2400	220	2	20	660	60	1	20
25	4300	1290	12,5	25	3200	370	12,5	25	2160	250	2,5	25	600	65	1,25	25

D 0 +0,03	
d1 = h6	

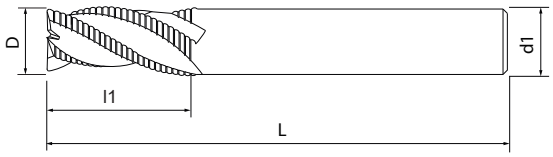
UFJ09

SQUARE TYPE WALCOWO-CZOŁOWE

3-5 Flute, Short Roughing 3-5 ostrzowe, krótkie, zgrubne

		HSM Vmax	F	M	R	30°	A	B				max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○	●	○							●	●			○	●





D code HA Kod HA	D code HB Kod HB	D	d1	L	l1	Z	Shank Uchwyt
UFJ09060000A06007054	UFJ09060000B06007054	6	6	54	7	3	A/B
UFJ09070000A08008058	UFJ09070000B08008058	7	8	58	8	3	A/B
UFJ09080000A08009058	UFJ09080000B08009058	8	8	58	9	3	A/B
UFJ09090000A10013066	UFJ09090000B10013066	9	10	66	13	4	A/B
UFJ09100000A10014066	UFJ09100000B10014066	10	10	66	14	4	A/B
UFJ09120000A12016073	UFJ09120000B12016073	12	12	73	16	4	A/B
UFJ09140000A14018075	UFJ09140000B14018075	14	14	75	18	4	A/B
UFJ09160000A16022082	UFJ09160000B16022082	16	16	82	22	4	A/B
UFJ09180000A18024084	UFJ09180000B18024084	18	18	84	24	4	A/B
UFJ09200000A20026092	UFJ09200000B20026092	20	20	92	26	4	A/B
UFJ09250000A25025110	UFJ09250000B25025110	25	25	110	25	5	A/B

Cutting Conditions Parametry skrawania

Work material materiał obrabianymateriał obrabiany	Carbon Steels Alloy steels (-30HRC) Stali węglowych, stali stopowych (-30HRC)				Carbon Steels Alloy steels (30-45HRC) Stali węglowych, stali stopowych (30 - 45HRC)				Stainless steels Stale nierdzewne				Inconel Inconel			
d1 (mm)	RPM	mm/min	ae	ap	RPM	mm/min	ae	ap	RPM	mm/ min	ae	ap	RPM	mm/ min	ae	ap
6	15600	1390	3	6	12400	500	3	6	8400	340	1,5	6	2400	115	0,3	6
8	11600	1390	4	8	9200	500	4	8	6300	340	2	8	1800	110	0,4	8
10	9200	1390	5	10	7600	500	5	10	5100	340	2,5	10	1300	115	0,5	10
12	8000	1440	6	12	6000	480	6	12	4200	340	1,8	12	1200	115	0,6	12
14	6800	1440	7	14	5200	500	7	14	3600	340	2,1	14	900	80	0,7	14
16	6000	1440	8	16	4800	460	8	16	3300	310	2,4	16	800	65	0,8	16
18	5200	1390	9	18	4400	430	9	18	2700	250	1,8	18	700	60	0,9	18
20	4800	1300	10	20	3600	340	10	20	2400	220	2	20	660	60	1	20
25	4300	1290	12,5	25	3200	370	12,5	25	2160	250	2,5	25	600	65	1,25	25

µm	D 0 +0,03
	d1 = h6

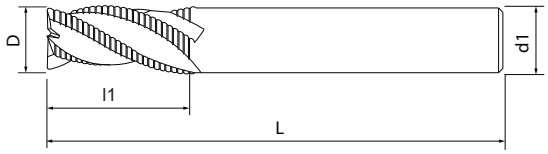
UFJ35

SQUARE TYPE WALCOWO-CZOŁOWE

5-Flute, Corner Radius Roughing 5-ostrzowe, z promieniem,zgrubne

		HSM Vmax	F	40°	A	B						max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
									○	○			○	●





D code HA Kod HA	D code HB Kod HB	R	D	d1	L	l1	Z	Shank Uchwyt
UFJ35060000A06016057	UFJ35060000B06016057	0,2	6	6	57	16	5	A/B
UFJ35080000A08016063	UFJ35080000B08016063	0,2	8	8	63	16	5	A/B
UFJ35100000A10022072	UFJ35100000B10022072	0,3	10	10	72	22	5	A/B
UFJ35120000A12026083	UFJ35120000B12026083	0,3	12	12	83	26	5	A/B
UFJ35140000A14026083	UFJ35140000B14026083	0,3	14	14	83	26	5	A/B
UFJ35160000A16032092	UFJ35160000B16032092	0,3	16	16	92	32	5	A/B
UFJ35200000A20038104	UFJ35200000B20038104	0,3	20	20	104	38	5	A/B
UFJ35250000A25045121	UFJ35250000B25045121	0,3	25	25	121	45	5	A/B

Cutting Conditions Parametry skrawania

Work material Materiał obrabiany	Stainless steel Stal nierdzewna				Titanium Tytan				Inconel Inconel			
d1 (mm)	RPM	mm/min	ae	ap	RPM	mm/min	ae	ap	RPM	mm/min	ae	ap
6	4250	530	9	0,9	3450	380	9	0,9	2100	210	9	0,9
8	3200	545	12	1,2	2600	405	12	1,2	1600	200	12	1,2
10	2550	520	15	1,5	2050	390	15	1,5	1250	230	15	1,5
12	2100	535	18	1,2	1700	390	18	1,2	1050	210	18	1,2
14	1800	515	21	1,4	1500	390	21	1,4	900	210	21	1,4
16	1600	505	24	1,6	1300	375	24	1,6	800	210	24	1,6
20	1250	505	30	1	1050	390	30	1	650	200	30	1
25	1000	455	37,5	1,25	850	355	37,5	1,25	500	170	37,5	1,25

	Tolerance range	1 - 3	3 - 6	6 - 10	10 - 18	18 - 30
µm	h10	0 - 40	0 - 48	0 - 58	0 - 70	0 - 84
	h6	0 - 6	0 - 8	0 - 9	0 - 11	0 - 13

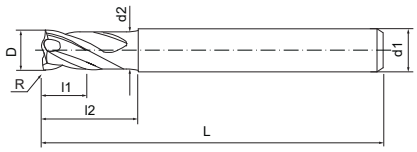
UFJ36

SQUARE TYPE WALCOWO-CZOŁOWE

4-Flute, with Extended Neck 4-ostrzowe, ze zwężaną szyjką

HSM Vmax	F	A	B	max	min	AIR
				○	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	○						○	○	○				





D code HA Kod HA	D code HB Kod HB	R	D	d1	d2	L	l1	l2	Z	Shank Uchwyt
UFJ36030000A06007012	UFJ36030000B06007012		3	6	2,7	54	7	12	4	A/B
UFJ36030000A06007017	UFJ36030000B06007017		3	6	2,7	57	7	17	4	A/B
UFJ36040000A06008015	UFJ36040000B06008015		4	6	3,7	57	8	15	4	A/B
UFJ36040000A06008022	UFJ36040000B06008022		4	6	3,7	63	8	22	4	A/B
UFJ36050000A06010017	UFJ36050000B06010017		5	6	4,7	57	10	17	4	A/B
UFJ36050000A06010027	UFJ36050000B06010027		5	6	4,7	67	10	27	4	A/B
UFJ36060000A06010015	UFJ36060000B06010015		6	6	5,5	57	10	15	4	A/B
UFJ36060000A06010020	UFJ36060000B06010020		6	6	5,5	62	10	20	4	A/B
UFJ36060000A06010032	UFJ36060000B06010032		6	6	5,5	74	10	32	4	A/B
UFJ36080000A08012020	UFJ36080000B08012020		8	8	7,5	63	12	20	4	A/B
UFJ36080000A08012030	UFJ36080000B08012030		8	8	7,5	73	12	30	4	A/B
UFJ36080000A08012046	UFJ36080000B08012046		8	8	7,5	90	12	46	4	A/B
UFJ36100000A10014025	UFJ36100000B10014025		10	10	9,2	72	14	25	4	A/B
UFJ36100000A10014035	UFJ36100000B10014035		10	10	9,2	82	14	35	4	A/B
UFJ36100000A10014055	UFJ36100000B10014055		10	10	9,2	102	14	55	4	A/B
UFJ36120000A12016030	UFJ36120000B12016030		12	12	11	83	16	30	4	A/B
UFJ36120000A12016040	UFJ36120000B12016040		12	12	11	93	16	40	4	A/B
UFJ36120000A12016064	UFJ36120000B12016064		12	12	11	117	16	64	4	A/B
UFJ36160000A16022038	UFJ36160000B16022038		16	16	15	92	22	38	4	A/B
UFJ36160000A16022055	UFJ36160000B16022055		16	16	15	109	22	55	4	A/B
UFJ36160000A16022087	UFJ36160000B16022087		16	16	15	141	22	87	4	A/B
UFJ36200000A20026050	UFJ36200000B20026050		20	20	19	104	26	50	4	A/B
UFJ36200000A20026070	UFJ36200000B20026070		20	20	19	124	26	70	4	A/B
UFJ36200000A20026110	UFJ36200000B20026110		20	20	19	164	26	110	4	A/B

Cutting Conditions Parametry skrawania

Work material Materiał obrabiany	Carbon Steels Alloy steels (-30HRC) Stali węglowych, stali stopowych (-30HRC)				Carbon Steels Alloy steels (30-45HRC) Stali węglowych, stali stopowych (30 - 45HRC)			
d1 (mm)	RPM	mm/min	ae	ap	RPM	mm/min	ae	ap
3	13475	275	4,5	1,5	9430	190	4,5	1,5
4	10105	330	6	2	7070	230	6	2
5	8085	370	7,5	2,5	5660	260	7,5	2,5
6	6735	435	9	3	4715	305	9	3
8	5050	555	12	4	3535	385	12	4
10	4455	690	15	5	3115	480	15	5
12	3710	695	18	6	2600	485	18	6
14	3180	620	21	7	2225	435	21	7
16	2785	590	24	8	1950	410	24	8
18	2475	585	27	9	1730	410	27	9
20	2225	580	30	10	1560	405	30	10
25	1780	450	37,5	12,5	1245	315	37,5	12,5

D 0 +0,03	
d1 = h6	

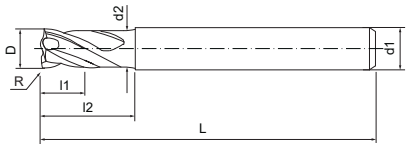
UFJ37

SQUARE TYPE WALCOWO-CZOŁOWE

4-Flute, with Extended Neck, Corner Radius 4-ostrzowe, z zwężaną szyjką . z promieniem

		HSM Vmax	F	A	B							max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	○						○	○	○				





D code HA Kod HA	D code HB Kod HB	R	D	d1	d2	L	l1	l2	Z	Shank Uchwyt
UFJ37003120A03006007	UFJ37003120B03006007	0,3	3	6	2,7	54	7	12	4	A/B
UFJ37003170A03006007	UFJ37003170B03006007	0,3	3	6	2,7	57	7	17	4	A/B
UFJ37003150A04006008	UFJ37003150B04006008	0,3	4	6	3,7	57	8	15	4	A/B
UFJ37003220A04006008	UFJ37003220B04006008	0,3	4	6	3,7	63	8	22	4	A/B
UFJ37003170A05006010	UFJ37003170B05006010	0,3	5	6	4,7	57	10	17	4	A/B
UFJ37003270A05006010	UFJ37003270B05006010	0,3	5	6	4,7	67	10	27	4	A/B
UFJ37005150A06006010	UFJ37005150B06006010	0,5	6	6	5,5	57	10	15	4	A/B
UFJ37005200A06006010	UFJ37005200B06006010	0,5	6	6	5,5	62	10	20	4	A/B
UFJ37005320A06006010	UFJ37005320B06006010	0,5	6	6	5,5	74	10	32	4	A/B
UFJ37005200A08008012	UFJ37005200B08008012	0,5	8	8	7,5	63	12	20	4	A/B
UFJ37005300A08008012	UFJ37005300B08008012	0,5	8	8	7,5	73	12	30	4	A/B
UFJ37005460A08008012	UFJ37005460B08008012	0,5	8	8	7,5	90	12	46	4	A/B
UFJ37005250A10010014	UFJ37005250B10010014	0,5	10	10	9,2	72	14	25	4	A/B
UFJ37005350A10010014	UFJ37005350B10010014	0,5	10	10	9,2	82	14	35	4	A/B
UFJ37005550A10010014	UFJ37005550B10010014	0,5	10	10	9,2	102	14	55	4	A/B
UFJ37007300A12012016	UFJ37007300B12012016	0,7	12	12	11	83	16	30	4	A/B
UFJ37007400A12012016	UFJ37007400B12012016	0,7	12	12	11	93	16	40	4	A/B
UFJ37007640A12012016	UFJ37007640B12012016	0,7	12	12	11	117	16	64	4	A/B
UFJ37010380A16016022	UFJ37010380B16016022	1	16	16	15	92	22	38	4	A/B
UFJ37010550A16016022	UFJ37010550B16016022	1	16	16	15	109	22	55	4	A/B
UFJ37010870A16016022	UFJ37010870B16016022	1	16	16	15	141	22	87	4	A/B
UFJ37010500A20020026	UFJ37010500B20020026	1	20	20	19	104	26	50	4	A/B
UFJ37010700A20020026	UFJ37010700B20020026	1	20	20	19	124	26	70	4	A/B
UFJ37010110B20020026	UFJ370101100B20020026	1	20	20	19	164	26	110	4	A/B

Cutting Conditions Parametry skrawania

Work material Materiał obrabianyMateriał obrabiany	Carbon Steels Alloy steels (-30HRC) Stali węglowych, stali stopowych (-30HRC)				Carbon Steels Alloy steels (30 - 45HRC) Stali węglowych, stali stopowych (30 - 45HRC)			
d1 (mm)	RPM	mm/min	ae	ap	RPM	mm/min	ae	ap
3	13475	275	4,5	1,5	9430	190	4,5	1,5
4	10105	330	6	2	7070	230	6	2
5	8085	370	7,5	2,5	5660	260	7,5	2,5
6	6735	435	9	3	4715	305	9	3
8	5050	555	12	4	3535	385	12	4
10	4455	690	15	5	3115	480	15	5
12	3710	695	18	6	2600	485	18	6
14	3180	620	21	7	2225	435	21	7
16	2785	590	24	8	1950	410	24	8
18	2475	585	27	9	1730	410	27	9
20	2225	580	30	10	1560	405	30	10
25	1780	450	37,5	12,5	1245	315	37,5	12,5

D 0 +0,03	
d1 = h6	

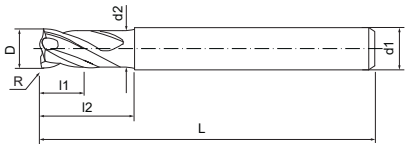
UFJ38

SQUARE TYPE WALCOWO-CZOŁOWE

4-Flute, with Extended Neck 4-ostrzowe, ze zwężaną szyjką

HSM Vmax	F	A	B	max	min	AIR
				○	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	○								●	●			○	●





D code HA Kod HA	D code HB Nowy kod HB	D	d1	d2	L	l1	l2	Z	Shank Uchwyt
UFJ38030000A06007012	UFJ38030000B06007012	3	6	2,7	54	7	12	4	A/B
UFJ38030000A06007017	UFJ38030000B06007017	3	6	2,7	57	7	17	4	A/B
UFJ38040000A06008015	UFJ38040000B06008015	4	6	3,7	57	8	15	4	A/B
UFJ38040000A06008022	UFJ38040000B06008022	4	6	3,7	63	8	22	4	A/B
UFJ38050000A06010017	UFJ38050000B06010017	5	6	4,7	57	10	17	4	A/B
UFJ38050000A06010027	UFJ38050000B06010027	5	6	4,7	67	10	27	4	A/B
UFJ38060000A06010015	UFJ38060000B06010015	6	6	5,5	57	10	15	4	A/B
UFJ38060000A06010020	UFJ38060000B06010020	6	6	5,5	62	10	20	4	A/B
UFJ38060000A06010032	UFJ38060000B06010032	6	6	5,5	74	10	32	4	A/B
UFJ38080000A08012020	UFJ38080000B08012020	8	8	7,5	63	12	20	4	A/B
UFJ38080000A08012030	UFJ38080000B08012030	8	8	7,5	73	12	30	4	A/B
UFJ38080000A08012046	UFJ38080000B08012046	8	8	7,5	90	12	46	4	A/B
UFJ38100000A10014025	UFJ38100000B10014025	10	10	9,2	72	14	25	4	A/B
UFJ38100000A10014035	UFJ38100000B10014035	10	10	9,2	82	14	35	4	A/B
UFJ38100000A10014055	UFJ38100000B10014055	10	10	9,2	102	14	55	4	A/B
UFJ38120000A12016030	UFJ38120000B12016030	12	12	11	83	16	30	4	A/B
UFJ38120000A12016040	UFJ38120000B12016040	12	12	11	93	16	40	4	A/B
UFJ38120000A12016064	UFJ38120000B12016064	12	12	11	117	16	64	4	A/B
UFJ38160000A16022038	UFJ38160000B16022038	16	16	15	92	22	38	4	A/B
UFJ38160000A16022055	UFJ38160000B16022055	16	16	15	109	22	55	4	A/B
UFJ38160000A16022087	UFJ38160000B16022087	16	16	15	141	22	87	4	A/B
UFJ38200000A20026050	UFJ38200000B20026050	20	20	19	104	26	50	4	A/B
UFJ38200000A20026070	UFJ38200000B20026070	20	20	19	124	26	70	4	A/B
UFJ38200000A20026110	UFJ38200000B20026110	20	20	19	164	26	110	4	A/B

Cutting Conditions Parametry skrawania

Work material materiał obrabianyMateriał obrabiany			Alloy steels Cast iron Stale stopowe, Żeliwo (-HB230)		Stainless steel Stal nierdzewna (30 - 45HRC)		Stainless steel Stal nierdzewna (30 - 45HRC)		Titanium Tytan		Inconel Inconel	
d1 (mm)	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
3	4,5	1,5	13475	275	10185	195	14260	205	10185	205	2715	55
4	6	2	10105	330	7600	250	14260	255	7600	255	2005	55
5	7,5	2,5	8085	370	6110	310	8655	310	6110	310	1630	80
6	9	3	6735	435	5095	360	7130	360	5095	360	1355	95
8	12	4	5050	555	3820	435	5345	465	3280	465	1015	125
10	15	5	4455	690	3055	590	4275	585	3055	585	815	155
12	18	6	3710	695	2545	565	3565	565	2545	565	675	150
14	21	7	3180	620	2180	520	3055	520	2180	520	580	140
16	24	8	2785	590	1910	480	2670	480	1910	480	505	130
18	27	9	2475	585	1695	475	2375	475	1695	475	450	125
20	30	10	2225	580	1525	470	2140	470	1525	470	405	125
25	37,5	12,5	1780	450	1215	380	1710	380	1215	380	320	110

D 0 +0,03	
d1 = h6	

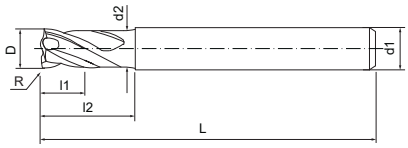
UFJ39

SQUARE TYPE WALCOWO-CZOŁOWE

4 Flute, with Extended Neck, Corner Radius 4 ostrzowe, z zwężaną szyjką . z promieniem

HSM Vmax	F	A	B	max	min	AIR
				○	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	○								●	●			○	●





D code HA Kod HA	D code HB Kod HB	R	D	d1	d2	L	l1	l2	Z	Shank Uchwyt
UFJ39003120A03006007	UFJ39003120B03006007	0,3	3	6	2,7	54	7	12	4	A/B
UFJ39003170A03006007	UFJ39003170B03006007	0,3	3	6	2,7	57	7	17	4	A/B
UFJ39003150A04006008	UFJ39003150B04006008	0,3	4	6	3,7	57	8	15	4	A/B
UFJ39003220A04006008	UFJ39003220B04006008	0,3	4	6	3,7	63	8	22	4	A/B
UFJ39003170A05006010	UFJ39003170B05006010	0,3	5	6	4,7	57	10	17	4	A/B
UFJ39003270A05006010	UFJ39003270B05006010	0,3	5	6	4,7	67	10	27	4	A/B
UFJ39005150A06006010	UFJ39005150B06006010	0,5	6	6	5,5	57	10	15	4	A/B
UFJ39005200A06006010	UFJ39005200B06006010	0,5	6	6	5,5	62	10	20	4	A/B
UFJ39005320A06006010	UFJ39005320B06006010	0,5	6	6	5,5	74	10	32	4	A/B
UFJ39005200A08008012	UFJ39005200B08008012	0,5	8	8	7,5	63	12	20	4	A/B
UFJ39005300A08008012	UFJ39005300B08008012	0,5	8	8	7,5	73	12	30	4	A/B
UFJ39005460A08008012	UFJ39005460B08008012	0,5	8	8	7,5	90	12	46	4	A/B
UFJ39005250A10010014	UFJ39005250B10010014	0,5	10	10	9,2	72	14	25	4	A/B
UFJ39005350A10010014	UFJ39005350B10010014	0,5	10	10	9,2	82	14	35	4	A/B
UFJ39005550A10010014	UFJ39005550B10010014	0,5	10	10	9,2	102	14	55	4	A/B
UFJ39007300A12012016	UFJ39007300B12012016	0,7	12	12	11	83	16	30	4	A/B
UFJ39007400A12012016	UFJ39007400B12012016	0,7	12	12	11	93	16	40	4	A/B
UFJ39007640A12012016	UFJ39007640B12012016	0,7	12	12	11	117	16	64	4	A/B
UFJ39010380A16016022	UFJ39010380B16016022	1	16	16	15	92	22	38	4	A/B
UFJ39010550A16016022	UFJ39010550B16016022	1	16	16	15	109	22	55	4	A/B
UFJ39010870A16016022	UFJ39010870B16016022	1	16	16	15	141	22	87	4	A/B
UFJ39010500A20020026	UFJ39010500B20020026	1	20	20	19	104	26	50	4	A/B
UFJ39010700A20020026	UFJ39010700B20020026	1	20	20	19	124	26	70	4	A/B
UFJ39010000A20020026	UFJ39010000B20020026	1	20	20	19	164	26	110	4	A/B

Cutting Conditions Parametry skrawania

Work material materiał obrabianyMateriał obrabiany			Mild steels, Carbon steels, Cast iron / Stal stopowa, Stal węglowa, Żeliwo (-HB230)		Stainless steel Stal nierdzewna (30 - 45HRC)		Stainless steel Stal nierdzewna (30 - 45HRC)		Titanium Tytan		Inconel Inconel	
d1 (mm)	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
3	4,5	1,5	13475	275	10185	195	14260	205	10185	205	2715	55
4	6	2	10105	330	7600	250	14260	255	7600	255	2005	55
5	7,5	2,5	8085	370	6110	310	8655	310	6110	310	1630	80
6	9	3	6735	435	5095	360	7130	360	5095	360	1355	95
8	12	4	5050	555	3820	435	5345	465	3280	465	1015	125
10	15	5	4455	690	3055	590	4275	585	3055	585	815	155
12	18	6	3710	695	2545	565	3565	565	2545	565	675	150
14	21	7	3180	620	2180	520	3055	520	2180	520	580	140
16	24	8	2785	590	1910	480	2670	480	1910	480	505	130
18	27	9	2475	585	1695	475	2375	475	1695	475	450	125
20	30	10	2225	580	1525	470	2140	470	1525	470	405	125
25	37,5	12,5	1780	450	1215	380	1710	380	1215	380	320	110

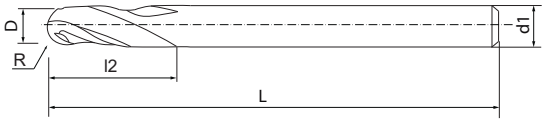
D 0 +0,03	
d1 = h6	

UFJ77

SQUARE TYPE WALCOWO-CZOŁOWE
4 Flute, Medium 4-ostrzowe, średniej długości

		HSM Vmax	F	M	A							max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	○								●	●			○	●



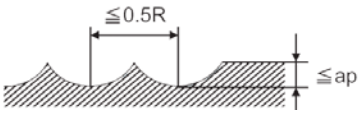


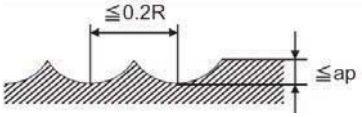
D code new Nowy kod	D code kod	R	D	d1	L	l1	Z	Shank Uchwyt
UFJ77030015A06008057	UFJ77060	1,5	3	6	57	8	4	A
UFJ77040020A06011057	UFJ77080	2	4	6	57	11	4	A
UFJ77050025A06013057	UFJ77100	2,5	5	6	57	13	4	A
UFJ77060030A06013057	UFJ77120	3	6	6	57	13	4	A
UFJ77080040A08019063	UFJ77140	4	8	8	63	19	4	A
UFJ77100050A10022072	UFJ77160	5	10	10	72	22	4	A
UFJ77120060A12026083	UFJ77180	6	12	12	83	26	4	A
UFJ77160080A16032092	UFJ77200	8	16	16	92	32	4	A
UFJ77200100A20038104	UFJ77250	10	20	20	104	38	4	A
UFJ77250125A25038104	UFJ77250	12,5	25	25	104	38	4	A

Cutting Conditions Parametry skrawania

Work Material Materiał	Hardened steel, Alloy Steel Stal hartowana, Stal stopowa				ap (mm)	Austentic steel Titanium Alloys Stal Austenityczna Stopy tytanu				ap (mm)	Inconel Inconel				ap (mm)
	α≤15°		α>15°			α≤15°		α>15°			α≤15°		α>15°		
R (mm)	RPM	mm/ min	RPM	mm/ min		RPM	mm/ min	RPM	mm/ min		RPM	mm/ min	RPM	mm/ min	
R3	16000	4800	10600	2100	0.5	12000	3200	8000	1400	0.5	3200	500	2100	210	0.25
R4	12000	4300	8000	1900	0.8	9000	3200	6000	1400	0.8	2400	430	1600	190	0.4
R5	9600	4100	6400	1800	1	7200	3000	4800	1300	1	2000	420	1300	180	0.5
R6	8000	4000	5300	1800	1.2	6000	3000	4000	1300	1.2	1700	350	1100	150	0.6
R8	6000	3200	4000	1400	1.6	4500	2500	3000	1100	1.6	1200	300	800	130	0.8
R10	4800	3000	3200	1300	2	3600	2300	2400	1000	2	1000	250	640	100	1

Depth of cut
Głębokość skrawania





UFD

DIAMOND COATING
FREZY Z POWŁOKĄ DIAMENTOWĄ



DIAMOND COATING UFD END MILLS are designed for HSM and dry machining of graphite, high silicon aluminum, magnesium alloys, plastics, glass and carbon fiber reinforced plastics. IMPOSSIBLE FOR STEELS !!!

FREZY Z POWŁOKĄ DIAMENTOWĄ UFD przeznaczone są do obróbki szybkościowej oraz na sucho grafitu, stopów aluminium o wysokiej zawartości krzemu oraz metali nieżelaznych, stopów magnezu, tworzyw sztucznych, tworzyw z włókna szklanego i włókna węglowego. NIE STOSOWAĆ DO STALI !!!

TIZ IMPLEMENTS

DIAMOND COATING UFD END MILLS ARE DESIGNED FOR HSM AND DRY MACHING OF GRAPHITE, HIGH SILICON ALUMINIUM, MAGNESIUM ALLOYS, PLASTICS, GLASS AND CARBON FIBER REINFORCED PLASTICS, GREEN COMPACT.
IMPOSSIBLE FOR STEELS !!!

FREZY WALCOWO-CZOŁOWE UFD Z POWŁOKĄ DIAMENTOWĄ PRZEDE WSZYSTKIM ZALECANE SĄ DO OBRÓBKI SZYBKOŚCIOWEJ NA SUCHO (OS) GRAFITU, STOPÓW ALUMINIUM O WYSOKIEJ ZAWARTOŚCI KRZEMU ORAZ METALI NIEŻELAZNYCH, STOPÓW MAGNEZU, TWORZYW SZTUCZNYCH, TWORZYW WZMOCNIONYCH WŁÓKNEM SZKLANYM I WĘGLOWYM, PRASÓWKI SUROWEJ.
NIE STOSOWAĆ DO STALI !!!

NOTE:

- If the rigidity of the machine or the work material installation is very low, or chattering and noise is generated, please reduce RPM and FEED rate proportionally.
- Cutting conditions may be considerably different due to the tool overhang, depth of cut, and machining tool condition, please use the catalogue cutting parameters as a reference starting point.
- If the depth of cut is shallow, the RPM and FEED rate can be increased.
- A high-speed spindle is recommended, when using a reduced RPM, the FEED rate must be reduced proportionally.
- High pressure coolant and air blow are recommended to dispose of chips efficiency.
- Use a rigid machine and work clamping method.
- Down (climb) cutting is recommended.
- We recommend that you set the width of cut as small as possible (about 5% of dia.) and divide the machining into several passes and work on high cutting parameters. There will be much higher tool life and surface roughness.
- When drilling, please set the FEED rate 30% below the normal rate.

UWAGA:

- Jeżeli sztywność obrabiarki lub mocowanie obrabianego przedmiotu nie są wystarczające lub występują wibracje i nadmierny hałas, należy proporcjonalnie zmniejszyć obroty i posuw.
- Parametry skrawania mogą być różne w zależności od długości narzędzia wystającego z oprawki, głębokości skrawania oraz stanu obrabiarki. Proszę stosować parametry skrawania podane w katalogu jako wyjściowy punkt odniesienia.
- Przy zmniejszeniu głębokości skrawania, obroty i posuw mogą być zwiększone.
- Zalecane jest stosowanie wysokoobrotowych obrabiarek, w przypadku mniejszych prędkości obrotowych, posuw powinien być zmniejszony proporcjonalnie.
- Dla efektywnego odprowadzania wiórów zalecane jest stosowanie nadmuchu powietrza lub chłodziwa pod dużym ciśnieniem.
- Zalecane jest stosowanie sztywnych obrabiarek oraz systemów mocowania.
- Zalecane jest frezowanie współbieżne.
- Zalecamy stosowanie możliwie najmniejszej szerokości skrawania - około 5% średnicy roboczej narzędzia i podzielenie operacji obróbki na kilka przejść przy większych parametrach skrawania, co znacznie wydłuży żywotność narzędzia oraz polepszy jakość obrabianej powierzchni.
- Przy zagłębianiu zalecane jest ustawienie posuwu wgłębnego na poziomie o 30% mniejszym od posuwu roboczego.

EDP No.		Z	Angle Kąt	Materials Materiały	D / R	Pag. / Str.
UFD27		2	30°	N	D 0,5 - 12	4 - 5
UFD24		2	30°	N	D 1 - 2	6
UFD25		4	30°	N	D 0,5 - 1	7
UFD96		2	30°	N	D 0,2 - 6	8 - 9
UFD13		3	30°	N	D 2 - 12	10
UFD14		3	40°	N	D 2 - 12	11
UFD97		2	30°	N	D 0,2 - 6	12 - 13
UFD80		2	30°	N	R 1 - 6	14
UFD51		2	30°	N	R 1 - 6	15
UFD50		2	30°	N	R 1 - 6	16
UFD81		2	30°	N	R 1 - 6	17
UFD16		2	30°	N	R 0,2 - 2	18

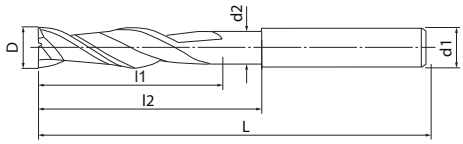
UFD27

SQUARE TYPE WALCOWO-CZOŁOWE

2 Flute, Long length 2-ostrzowe, długie

		HSM Vmax	F	M	30°	A						max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
									○	○		●		

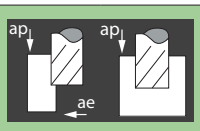




D code new nowy kod	D code kod	D	d1	d2	L	l1	l2	Z	Shank Uchwyt
UFD27005000A03002040	UFD27005	0,5	3	0,45	40	1	2	2	A
UFD27006000A03003040	UFD27006	0,6	3	0,55	40	2	3	2	A
UFD27007000A03004040	UFD27007	0,7	3	0,65	40	2	4	2	A
UFD27008000A03005040	UFD27008	0,8	3	0,75	40	2	5	2	A
UFD27009000A03006040	UFD27009	0,9	3	0,85	40	2	6	2	A
UFD27010000A04008075	UFD27010	1	4	0,95	75	3	8	2	A
UFD27015000A04010075	UFD27015	1,5	4	1,45	75	4	10	2	A
UFD27020000A04016100	UFD27020	2	4	1,9	100	6	16	2	A
UFD27025000A04020100	UFD27025	2,5	4	2,4	100	8	20	2	A
UFD27030000A06030100	UFD27030	3	6	2,8	100	8	30	2	A
UFD27035000A06035100	UFD27035	3,5	6	3,2	100	10	35	2	A
UFD27040000A06040100	UFD27040	4	6	3,7	100	20	40	2	A
UFD27050000A06050125	UFD27050	5	6	4,6	125	25	50	2	A
UFD27060000A06060140	UFD27060	6	6	5,6	140	30	60	2	A
UFD27070000A06000140	UFD27070	7	6	-	140	35		2	A
UFD27080000A08080150	UFD27080	8	8	7,4	150	40	80	2	A
UFD27090000A08000150	UFD27090	9	8	-	150	45		2	A
UFD27100000A10080150	UFD27100	10	10	9,4	150	50	80	2	A
UFD27110000A10000150	UFD27110	11	10	-	150	50		2	A
UFD27120000A12080150	UFD27120	12	12	11,4	150	55	80	2	A

UFD27

Cutting Conditions Parametry Skrawania



			Graphite Grafit	
d1 (mm)	**ae**	**ap**	**RPM**	**mm/min**
0,5	0,50	0,05	40000	400
	0,10	0,10	40000	560
	0,01	0,01	40100	640
1	1,00	0,10	40000	800
	0,20	0,20	40000	960
	0,02	0,02	40100	1200
1,5	1,50	0,15	39900	1110
	0,30	0,30	39900	1430
	0,03	0,03	39900	1590
2	2,00	0,20	39800	1270
	0,40	0,20	39800	1590
	0,04	0,04	39800	1990
3	3,00	0,30	39800	1910
	0,90	0,90	39800	1990
	0,06	0,06	39800	2780
4	4,00	0,40	39800	2540
	1,20	1,20	39800	3180
	0,08	0,08	39800	3980
5	5,00	0,50	38200	3050
	1,50	1,50	38200	3820
	0,10	0,10	38200	4580
6	6,00	0,60	31800	3050
	1,80	1,80	31800	4130
	0,12	0,12	42450	5940
8	8,00	0,80	23800	3040
	2,40	2,40	23800	3800
	0,16	0,16	31800	5400
10	10,00	1,00	19100	3050
	3,00	3,00	19100	3820
	0,20	0,20	25450	5590
12	12,00	1,20	15900	3180
	3,60	3,60	15900	3810
	0,24	0,24	21200	5510

µm	0,5 < D < 3,0	-14 — -28	6,0 < D < 10	-25 — -47	d1 h6
	3,0 < D < 6,0	-20 — -38	10 < D < 12	-32 — -59	

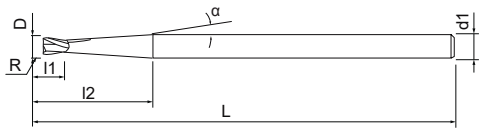
UFD24

SQUARE TYPE WALCOWO-CZOŁOWE

2 Flute, Miniature 2 ostrzowe, miniaturowe

HSM Vmax	F	M	30°	A					max	min		AIR
									○	●	●	●

P				H		M		K	N			S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
									○	○		●		





D code Kod	R	D	d1	α	L	l1	l2	Z	Shank Uchwyt
UFD24010001A03030060	0,1	1	3	2°	60	2	30	2	A
UFD24010001A03070100	0,1	1	3	1°	100	2	70	2	A
UFD24015002A03030060	0,15	1,5	3	1°30′	60	3	30	2	A
UFD24015002A03050100	0,15	1,5	3	1°	100	3	50	2	A
UFD24020002A03030060	0,15	2	3	1°	60	4	30	2	A
UFD24020002A04070100	0,15	2	4	1°	100	4	70	2	A

Cutting Conditions Parametry Skrawania

SLOTTING / FREZOWANIE ROWKÓW

	**Graphite** Grafit	
d1 (mm)	RPM	mm/min
0.4	40000	640
0.6	40000	640
0.8	40000	800
1.0	40000	960
1.2	40000	1200
1.5	40000	1440
2.0	40000	1600
3.0	27000	1900
4.0	20000	2300
5.0	16000	2300
6.0	14000	2300
ap=0.5D1 ae=D		

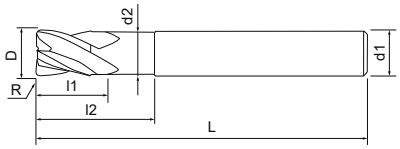
UFD25

SQUARE TYPE WALCOWO-CZOŁOWE

4 Flute, Short Length 4 ostrzowe, krótkie

			HSM Vmax	F	M	30°	A					max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, SI <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
									○	○		●		





D code Kod	R	D	d1	d2	L	l1	l2	Z	Shank Uchwyt
UFD25060005A06040080	0,5	6	6	5,9	80	40	10	4	A
UFD25080005A08040080	0,5	8	8	7,8	80	40	10	4	A
UFD25080010A08060100	1	8	8	7,8	100	60	10	4	A
UFD25100005A10025075	0,5	10	10	0	75	0	25	4	A
UFD25100005A10040080	0,5	10	10	9,8	80	40	12	4	A
UFD25100010A10040080	1	10	10	9,8	80	40	12	4	A
UFD25100005A10080125	0,5	10	10	9,8	125	80	12	4	A
UFD25120005A12025080	0,5	12	12	0	80	0	25	4	A
UFD25120005A12040080	0,5	12	12	11,8	80	40	15	4	A
UFD25120010A12040080	1	12	12	11,8	80	40	15	4	A
UFD25120010A12080125	1	12	12	11,8	125	80	15	4	A

Cutting Conditions Parametry Skrawania

SIDE CUTTING / FREZOWANIE OBWODOWE

	Graphite Grafit	
d1 (mm)	RPM	mm/min
0.6	40000	5600
0.8	32000	5600
10.0	26000	5700
12.0	21000	5450
ap=0,3D1 ae=0.3D1		

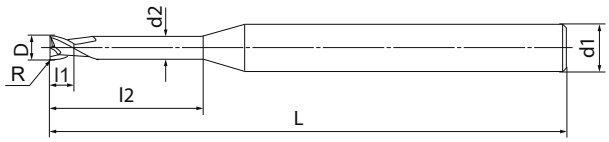
UFD96

TOROIDAL TOROIDALNE

2 Flute, Miniature 2 ostrzowe, miniaturowe

			HSM Vmax	F	M	30°	A					max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
									○	○		●		



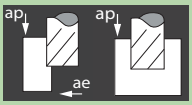


D code Kod	R	D	d1	d2	L	l1	l2	Z	Shank Uchwyt
UFD96002X50A03000040		0,2	3		40	0,3		2	A
UFD96003X50A03000040		0,3	3		40	0,5		2	A
UFD96004X50A03000040		0,4	3		40	0,6		2	A
UFD96005X50A03003040	0,05	0,5	3	0,45	40	0,7	2,5	2	A
UFD96005X50A03004040	0,05	0,5	3	0,45	40	0,7	4	2	A
UFD96006X50A03003040	0,05	0,6	3	0,55	40	0,9	3	2	A
UFD96006X50A03005040	0,05	0,6	3	0,55	40	0,9	5	2	A
UFD96008X50A03004040	0,05	0,8	3	0,75	40	1,2	4	2	A
UFD96008X50A03007040	0,05	0,8	3	0,75	40	1,2	7	2	A
UFD96010X50A03005040	0,1	1	3	0,95	40	1,5	5	2	A
UFD96010X50A03009040	0,1	1	3	0,95	40	1,5	8,5	2	A
UFD96010X50A03012040	0,1	1	3	0,95	40	1,5	12	2	A
UFD96012X50A03006050	0,1	1,2	3	1,15	50	1,8	6	2	A
UFD96012X50A03010050	0,1	1,2	3	1,15	50	1,8	10	2	A
UFD96015X50A03008050	0,15	1,5	3	1,4	50	2,2	7,5	2	A
UFD96015X50A03012050	0,15	1,5	3	1,4	50	2,2	12	2	A
UFD96015X50A03018050	0,15	1,5	3	1,4	50	2,2	18	2	A
UFD96020X50A03010060	0,15	2	3	1,9	60	2,2	10	2	A
UFD96020X50A03016060	0,15	2	3	1,9	60	2,2	16	2	A
UFD96020X50A03025060	0,15	2	3	1,9	60	2,2	25	2	A
UFD96030X50A04010065	0,2	3	4	2,9	65	3	10	2	A
UFD96030X50A04015065	0,2	3	4	2,9	65	3	15	2	A
UFD96030X50A04020065	0,2	3	4	2,9	65	3	20	2	A
UFD96030X50A04025075	0,2	3	4	2,9	75	3	25	2	A
UFD96030X50A04030075	0,2	3	4	2,9	75	3	30	2	A
UFD96040X50A06020065	0,2	4	6	3,9	65	4	20	2	A
UFD96040X50A06030075	0,2	4	6	3,9	75	4	30	2	A
UFD96040X50A06040090	0,2	4	6	3,9	90	4	40	2	A
UFD96050X50A06020075	0,3	5	6	4,9	75	5	20	2	A
UFD96050X50A06030075	0,3	5	6	4,9	75	5	30	2	A
UFD96050X50A06040090	0,3	5	6	4,9	90	5	40	2	A
UFD96050X50A06050090	0,3	5	6	4,9	90	5	50	2	A
UFD96060X50A06030075	0,3	6	6	5,9	75	6	30	2	A
UFD96060X50A06040090	0,3	6	6	5,9	90	6	40	2	A
UFD96060X50A06050090	0,3	6	6	5,9	90	6	50	2	A
UFD96060X50A06060100	0,3	6	6	5,9	100	6	60	2	A

µm	D 0 — -15	
	d1 0 — -6	

UFD96

Cutting Conditions Parametry Skrawania



			Graphite Grafit	
d1 (mm)	ae	ap	RPM	mm/min
0,6	0,60	0,09	40000	480
	0,18	0,30	40000	640
	0,01	0,01	40000	800
0,8	0,80	0,12	40000	640
	0,24	0,40	40000	800
	0,02	0,02	40000	960
1,0	1,00	0,15	40000	800
	0,30	0,50	40000	960
	0,02	0,02	40000	1200
1,2	1,20	0,18	40000	960
	0,36	0,60	40000	1200
	0,02	0,02	40000	1440
1,5	1,50	0,23	40000	1120
	0,45	0,75	40000	1440
	0,03	0,03	40000	1600
2,0	2,00	0,30	40000	1280
	0,60	1,00	40000	1600
	0,04	0,04	40000	2000

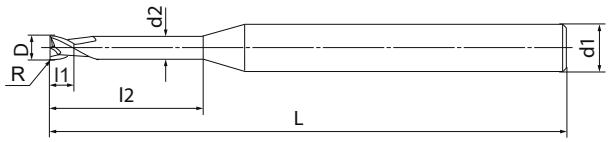
UFD13

TOROIDAL TOROIDALNE

3 Flute, Short Length 3 ostrzowe, krótkie

			HSM Vmax	F	M	30°	A					max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
									○	○		●		





D code new nowy kod	D code kod	R	D	d1	L	l1	Z	Shank Uchwyt
UFD13020002A03006040	UFD13020	0,15	2	3	40	6	3	A
UFD13030002A03012040	UFD13030	0,15	3	3	40	12	3	A
UFD13040002A04014050	UFD13040	0,2	4	4	50	14	3	A
UFD13050003A05016050	UFD13050	0,3	5	5	50	16	3	A
UFD13060003A06020065	UFD13060	0,3	6	6	65	20	3	A
UFD13080005A08020065	UFD13080	0,5	8	8	65	20	3	A
UFD13100005A10025075	UFD13100	0,5	10	10	75	25	3	A
UFD13120005A12025075	UFD13120	0,5	12	12	75	25	3	A

Cutting Conditions Parametry Skrawania

			Graphite Grafit					Graphite Grafit			
			≤180HB		>180HB			≤180HB		>180HB	
d1 (mm)	ae	ap	RPM	mm/min	RPM	mm/min	ap	RPM	mm/min	RPM	mm/min
2	0,67	3,00	40000	1140	40000	1032	1,00	40000	900	40000	816
	0,13	3,00	40000	2676	40000	2412	0,50	40000	1260	40000	1140
	0,03	3,00	40000	4200	40000	3780	0,10	40000	2328	40000	2100
3	1,00	4,50	40000	1668	39683	1488	1,50	40000	1320	36075	10714
	0,20	4,50	40000	3924	40000	3528	0,75	40000	1920	40000	1188
	0,05	4,50	40000	5400	40000	4860	0,15	40000	3624	40000	3264
4	1,33	6,00	33136	1612	29791	1306	2,00	30080	1218	27056	990
	0,27	6,00	40000	3316	40000	2981	1,00	35810	1676	32229	1353
	0,07	6,00	40000	4887	40000	4396	0,20	40000	3264	40000	2940
5	1,67	7,50	26474	1539	23801	1248	2,50	24064	1169	21645	948
	0,33	7,50	39239	4527	35340	3660	1,25	28648	1701	25783	1377
	0,08	7,50	40000	7960	40000	7158	0,25	40000	4668	38134	4004
6	2,00	9,00	22069	1575	19841	1273	3,00	20054	1191	18038	963
	0,40	9,00	32574	5081	29338	4119	1,50	23873	1740	21486	1411
	0,10	9,00	40000	9756	40000	8784	0.30	35332	5109	31778	4128
8	2,67	12,00	16548	1553	14878	1258	4,00	15040	1177	13528	954
	0,53	12,00	24489	5118	22056	4150	2,00	17905	1772	16114	1435
	0,13	12,00	35050	11706	31552	9483	0,40	26499	5406	23833	4375
10	3,33	15,00	13247	1630	11909	1319	5,00	12032	1234	10823	999
	0,67	15,00	19532	5178	17591	4195	2,50	14324	1788	12892	1446
	0,17	15,00	27667	10635	24907	8619	0,50	21199	5253	19067	4255
12	4,00	18,00	11035	1608	9921	1300	6,00	10027	1218	9019	987
	0,80	18,00	16287	5653	14669	4581	3,00	11937	1983	10743	1608
	0,20	18,00	23131	10755	20823	8714	0,60	17666	5665	15889	4585

µm	2,0 < D < 6,0	-10 — -50	d1 h6
	6,0 < D < 12	0 — -60	

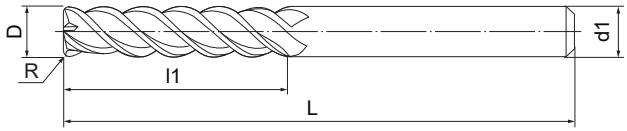
UFD14

TOROIDAL TOROIDALNE

3 Flute, Long Length 3 ostrzowe, długie

			HSM Vmax	F	M	40°	A					max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
									○	○		●		





D code new nowy kod	D code kod	R	D	d1	L	l1	Z	Shank Uchwyt
UFD14020002A03009060	UFD14020	0,15	2	3	60	9	3	A
UFD14030002A03030060	UFD14030	0,15	3	3	60	30	3	A
UFD14040002A04030060	UFD14040	0,2	4	4	60	30	3	A
UFD14050003A05035070	UFD14050	0,3	5	5	70	35	3	A
UFD14060003A06040100	UFD14060	0,3	6	6	100	40	3	A
UFD14080005A08040100	UFD14080	0,5	8	8	100	40	3	A
UFD14100005A10040100	UFD14100	0,5	10	10	100	40	3	A
UFD14120005A12045100	UFD14120	0,5	12	12	100	45	3	A

Cutting Conditions Parametry Skrawania

			Graphite Grafit					Graphite Grafit			
			≤180HB		>180HB			≤180HB		>180HB	
d1 (mm)	ae	ap	RPM	mm/min	RPM	mm/min	ap	RPM	mm/min	RPM	mm/min
2	0,67	3,00	40000	1032	40000	924	1,00	40000	780	40000	708
	0,13	3,00	40000	2412	40000	2172	0,50	40000	1140	40000	1032
	0,03	3,00	40000	3780	40000	3408	0,10	40000	2100	40000	1896
3	1,00	4,50	39683	1488	35651	1209	1,50	36075	1071	32468	867
	0,20	4,50	40000	3528	40000	3180	0,75	40000	1728	38834	1515
	0,05	4,50	40000	4860	40000	4380	0,15	40000	3264	40000	2940
4	1,33	6,00	29822	1305	26812	1058	2,00	27072	987	24351	801
	0,27	6,00	40000	2985	39542	2652	1,00	32229	1357	29006	1096
	0,07	6,00	40000	4398	40000	3957	0,20	40000	2937	40000	2646
5	1,67	7,50	23827	1247	21421	1011	2,50	21658	947	19481	768
	0,33	7,50	35315	3667	31806	2965	1,25	25783	1378	23205	1115
	0,08	7,50	40000	7164	4000	6442	0,25	38159	4008	34320	3243
6	2,00	9,00	19863	1276	17857	1032	3,00	18048	964	16234	780
	0,40	9,00	29316	4116	26404	3336	1,50	21486	1410	19337	1143
	0,10	9,00	40000	8780	37481	7407	0.30	31799	4138	28600	3343
8	2,67	12,00	14894	1258	13390	1019	4,00	13536	954	12175	772
	0,53	12,00	22040	4146	19850	3362	2,00	16114	1435	14503	1163
	0,13	12,00	31545	9482	28397	7681	0,40	23849	4378	21450	3544
10	3,33	15,00	11922	1320	10718	1068	5,00	10829	999	9740	810
	0,67	15,00	17579	4194	15832	3398	2,50	12892	1448	11602	1171
	0,17	15,00	24901	8614	22416	6981	0,50	19079	4254	17160	3447
12	4,00	18,00	11035	1608	8929	1053	6,00	9024	987	8117	800
	0,80	18,00	14658	4578	13202	3711	3,00	10743	1607	9669	1302
	0,20	18,00	20817	8712	18740	7058	0,60	15900	4589	14300	3714

µm	2,0 < D < 6,0	-10 — -50	d1 h6
	6,0 < D < 12	0 — -60	

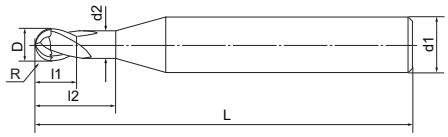
UFD97

BALL NOSE KULISTE

2 Flute, Miniature 2 ostrzowe, miniaturowe

		HSM Vmax	F	M	30°	A						max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
									○	○		●		



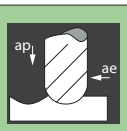


D code Kod	R	D	d1	d2	L	l1	l2	Z	Shank Uchwyt
UFD97002001A03000040	0,1	0,2	3	-	40	0,2		2	A
UFD97003002A03000040	0,15	0,3	3	-	40	0,3		2	A
UFD97004002A03000040	0,2	0,4	3	-	40	0,4		2	A
UFD97005003A03003040	0,25	0,5	3	0,45	40	0,5	2,5	2	A
UFD97006003A03003040	0,3	0,6	3	0,55	40	0,6	3	2	A
UFD97006003A03005040	0,3	0,6	3	0,55	40	0,6	5	2	A
UFD97008004A03004040	0,4	0,8	3	0,75	40	0,8	4	2	A
UFD97008004A03007040	0,4	0,8	3	0,75	40	0,8	7	2	A
UFD97010005A03005040	0,5	1	3	0,95	40	1	5	2	A
UFD97010005A03009040	0,5	1	3	0,95	40	1	8,5	2	A
UFD97010005A03012040	0,5	1	3	0,95	40	1	12	2	A
UFD97012006A03006050	0,6	1,2	3	1,15	50	1,2	6	2	A
UFD97012006A03010050	0,6	1,2	3	1,15	50	1,2	10	2	A
UFD97015008A03008050	0,75	1,5	3	1,4	50	1,5	7,5	2	A
UFD97015008A03012050	0,75	1,5	3	1,4	50	1,5	12	2	A
UFD97015008A03018050	0,75	1,5	3	1,4	50	1,5	18	2	A
UFD97020010A03010060	1	2	3	1,9	60	2,2	10	2	A
UFD97020010A03016060	1	2	3	1,9	60	2,2	16	2	A
UFD97020010A03025060	1	2	3	1,9	60	2,2	25	2	A
UFD97030015A04010065	1,5	3	4	2,9	65	3	10	2	A
UFD97030015A04015065	1,5	3	4	2,9	65	3	15	2	A
UFD97030015A04020065	1,5	3	4	2,9	65	3	20	2	A
UFD97030015A04025075	1,5	3	4	2,9	75	3	25	2	A
UFD97030015A04030075	1,5	3	4	2,9	75	3	30	2	A
UFD97040020A06020065	2	4	6	3,9	65	4	20	2	A
UFD97040020A06030075	2	4	6	3,9	75	4	30	2	A
UFD97040020A06040090	2	4	6	3,9	90	4	40	2	A
UFD97050025A06020065	2,5	5	6	4,9	65	5	20	2	A
UFD97050025A06030075	2,5	5	6	4,9	75	5	30	2	A
UFD97050025A06040090	2,5	5	6	4,9	90	5	40	2	A
UFD97050025A06050090	2,5	5	6	4,9	90	5	50	2	A
UFD97060030A06030075	3	6	6	5,9	75	6	30	2	A
UFD97060030A06040090	3	6	6	5,9	90	6	40	2	A
UFD97060030A06050090	3	6	6	5,9	90	6	50	2	A
UFD97060030A06060100	3	6	6	5,9	100	6	60	2	A

µm	D -14 — -28	
	d1 -14 — -28	

UFD97

Cutting Conditions Parametry Skrawania

			**Graphite** Grafit	
d1 (mm)	ae	ap	RPM	mm/min
0,6	0,60	0,09	40000	480
	0,18	0,30	40000	640
	0,01	0,01	40000	800
0,8	0,80	0,12	40000	640
	0,24	0,40	40000	800
	0,02	0,02	40000	960
1,0	1,00	0,15	40000	800
	0,30	0,50	40000	960
	0,02	0,02	40000	1200
1,2	1,20	0,18	40000	960
	0,36	0,60	40000	1200
	0,02	0,02	40000	1440
1,5	1,50	0,23	40000	1120
	0,45	0,75	40000	1440
	0,03	0,03	40000	1600
2,0	2,00	0,30	40000	1280
	0,60	1,00	40000	1600
	0,04	0,04	40000	2000

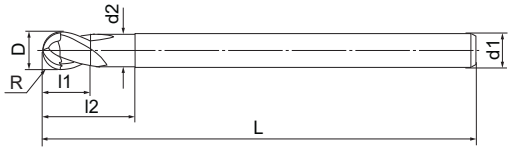
UFD80

BALL NOSE KULISTE

2 Flute, Short Length 2 ostrzowe, krótkie

		HSM Vmax	F	M	30°	A						max	min		AIR
												○	●	●	●

P				H		M		K	N			S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
									○	○		●		





D code new Nowy kod	D code Kod	R	D	d1	d2	L	l1	l2	Z	Shank Uchwyt
UFD80020010A06005060	UFD80020	1	2	6	1,9	60	3	5	2	A
UFD80025013A06006060	UFD80025	1,25	2,5	6	2,4	60	4	6	2	A
UFD80030015A06007060	UFD80030	1,5	3	6	2,8	60	4,5	6,5	2	A
UFD80035018A06007065	UFD80035	1,75	3,5	6	3,2	65	5	7	2	A
UFD80040020A06008065	UFD80040	2	4	6	3,7	65	6	8	2	A
UFD80050025A06010065	UFD80050	2,5	5	6	4,6	65	7,5	10	2	A
UFD80060030A06012075	UFD80060	3	6	6	5,6	75	9	12	2	A
UFD80080040A08025075	UFD80080	4	8	8	7,4	75	12	25	2	A
UFD80100050A10030080	UFD80100	5	10	10	9,4	80	15	30	2	A
UFD80120060A12036090	UFD80120	6	12	12	11,4	90	18	36	2	A

Cutting Conditions Parametry Skrawania



			Graphite Grafit			
			≤180HB		>180HB	
d1 (mm)	ae	ap	RPM	mm/min	RPM	mm/min
2,0	0,20	0,03	40000	4320	40000	3888
2,5	0,25	0,04	40000	4668	40000	4197
3,0	0,30	0,05	40000	5023	40000	4520
4,0	0,40	0,06	40000	5544	40000	4989
5,0	0,40	0,09	40000	7920	40000	7128
6,0	0,50	0,10	40000	8712	40000	7841
8,0	0,60	0,15	40000	9900	40000	8914
10,0	0,60	0,25	40000	11088	40000	9979
12,0	0,70	0,30	40000	11880	40000	10692

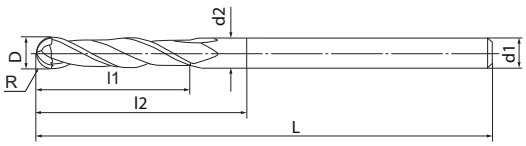
µm	D < 3,0	-14 — -28	D ≤ 30	-40 — -73	d1< 18	0 — -11	R	± 0,01
	D < 6,0	-20 — -38	D < 3,0	0 — -6	d1 ≤ 30	0 — -13		
	D < 10	-25 — -47	d1 < 6,0	0 — -8				
	D < 18	-32 — -59	d1 < 10	0 — -9				

UFD51

BALL NOSE KULISTE
2 Flute, Short Length, 2 ostrzowe, krótkie

HSM Vmax	F	M	30°	A							max	min		AIR
											○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
									○	○		●		





D code new Nowy kod	D code Kod	R	D	d1	d2	L	l1	l2	Z	Shank Uchwyt
UFD51020010A04020080	UFD51020	1	2	4	1,95	80	10	20	2	A
UFD51030015A04025080	UFD51030	1,5	3	4	2,9	80	15	25	2	A
UFD51040020A04030080	UFD51040	2	4	4	3,9	80	20	30	2	A
UFD51050025A06050100	UFD51050	2,5	5	6	4,9	100	30	50	2	A
UFD51060030A06050100	UFD51060	3	6	6	5,5	100	30	50	2	A
UFD51070035A06000100		3,5	7	6	-	100	30		2	A
UFD51080040A08060110	UFD51080	4	8	8	7,5	110	40	60	2	A
UFD51090045A08000110		4,5	9	8	-	110	40		2	A
UFD51100050A10070120	UFD51100	5	10	10	9,5	120	50	70	2	A
UFD51120060A12075130	UFD51120	6	12	12	11,5	130	55	75	2	A

Cutting Conditions Parametry Skrawania



			Graphite Grafit			
			≤180HB		>180HB	
d1 (mm)	ae	ap	RPM	mm/min	RPM	mm/min
2,0	1,40	1,40	40000	1177	40000	957
	0,20	0,03	40000	2469	40000	2222
3,0	2,10	2,10	40000	1202	40000	976
	0,30	0,05	40000	3528	40000	3175
4,0	2,80	2,80	38402	1227	34578	996
	0,40	0,06	40000	5040	40000	4536
5,0	3,50	3,50	30722	1253	27662	1015
	0,40	0,09	40000	7200	40000	6480
6,0	4,20	4,20	25602	1280	23052	1037
	0,50	0,10	40000	7920	40000	7128
7,0	4,9	4,9	22401	1285	20170	1041
	0,5	0,5	40000	8460	40000	7616
8,0	5,60	5,60	19201	1291	17289	1045
	0,60	0,15	40000	9000	40000	8104
10,0	7,00	7,00	15361	1318	13831	1069
	0,60	0,25	40000	10080	40000	9072
12,0	8,50	8,50	12764	1396	11493	1130
	0,70	0,30	40000	10800	38531	9363

µm	D < 3,0	-14 — -28	D ≤ 30	-40 — -73	d1< 18	0 — -11	R	± 0,01
	D < 6,0	-20 — -38	D < 3,0	0 — -6	d1 ≤ 30	0 — -13		
	D < 10	-25 — -47	d1 < 6,0	0 — -8				
	D < 18	-32 — -59	d1 < 10	0 — -9				

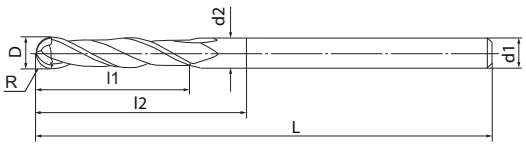
UFD50

BALL NOSE KULISTE

2 Flute, Short Length 2 ostrzowe, krótkie

		HSM Vmax	F	M	30°	A						max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
									○	○		●		





D code new Nowy kod	D code Kod	R	D	d1	d2	L	l1	l2	Z	Shank Uchwyt
UFD50020010A04020100	UFD50020	1	2	4	1,95	100	20	10	2	A
UFD50030015A04025100	UFD50030	1,5	3	4	2,9	100	25	15	2	A
UFD50040020A04030100	UFD50040	2	4	4	3,9	100	30	20	2	A
UFD50050025A06050120	UFD50050	2,5	5	6	4,9	120	50	30	2	A
UFD50060030A06050150	UFD50060	3	6	6	5,5	150	50	30	2	A
UFD50070035A06000150		3,5	7	6	-	150		30	2	A
UFD50080040A08060150	UFD50080	4	8	8	7,5	150	60	40	2	A
UFD50090045A08000150		4,5	9	8	-	150		40	2	A
UFD50100050A10070180		5	10	10	9,5	180	70	50	2	A
UFD50120060A12075200		6	12	12	11,5	200	75	55	2	A

Cutting Conditions Parametry Skrawania



			Graphite Grafit			
			≤180HB		>180HB	
d1 (mm)	ae	ap	RPM	mm/min	RPM	mm/min
2,0	1,40	1,40	16000	600	14400	490
	0,20	0,03	40000	7920	40000	7120
3,0	2,10	2,10	12000	620	10800	500
	0,30	0,05	40000	9000	39700	8040
4,0	2,80	2,80	9600	650	8600	520
	0,40	0,06	35300	8890	31700	7200
5,0	3,50	3,50	8000	700	7200	560
	0,40	0,09	29400	7940	26400	6430
6,0	4,20	4,20	20000	750	18000	610
	0,50	0,10	40000	7920	40000	7120
8,0	5,60	5,60	15000	770	13500	630
	0,60	0,15	40000	9000	40000	8100

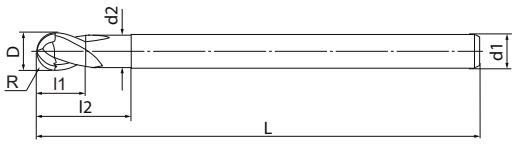
µm	D < 3,0	-14 — -28	D ≤ 30	-40 — -73	d1< 18	0 — -11	R	± 0,01
	D < 6,0	-20 — -38	D < 3,0	0 — -6	d1 ≤ 30	0 — -13		
	D < 10	-25 — -47	d1 < 6,0	0 — -8				
	D < 18	-32 — -59	d1 < 10	0 — -9				

UFD81

BALL NOSE KULISTE
3 Flute, Short Length 3 ostrzowe, krótkie

HSM Vmax	F	M	30°	A						max	min		AIR
										○	●	●	●

P				H		M		K	N			S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
									○	○		●		





D code new Nowy kod	D code Kod	R	D	d1	d2	L	l1	l2	Z	Shank Uchwyt
UFD81020010A06005060	UFD81020	1	2	6	1,9	60	5	3	3	A
UFD81025013A06006060	UFD81025	1,25	2,5	6	2,4	60	6	4	3	A
UFD81030015A06007060	UFD81030	1,5	3	6	2,8	60	6,5	4,5	3	A
UFD81035018A06007065	UFD81035	1,75	3,5	6	3,2	65	7	5	3	A
UFD81040020A06008065	UFD81040	2	4	6	3,7	65	8	6	3	A
UFD81050025A06010065	UFD81050	2,5	5	6	4,6	65	10	7,5	3	A
UFD81060030A06012075	UFD81060	3	6	6	5,6	75	12	9	3	A
UFD81080040A08025075	UFD81080	4	8	8	7,4	75	25	12	3	A
UFD81100050A10030080	UFD81100	5	10	10	9,4	80	30	15	3	A
UFD81120060A12036090	UFD81120	6	12	12	11,4	90	36	18	3	A

Cutting Conditions Parametry Skrawania



			Graphite Grafit			
			≤180HB		>180HB	
d1 (mm)	ae	ap	RPM	mm/min	RPM	mm/min
2,0	1,4	1,00	40000	1468	40000	1634
	0,2	0,03	40000	4074	40000	3666
3,0	2,1	1,50	40000	1760	40000	1762
	0,3	0,05	40000	5821	40000	5238
4,0	2,8	2,00	40000	2109	40000	1900
	0,4	0,06	40000	8316	40000	7484
5,0	3,5	2,50	37549	2527	33810	2048
	0,4	0,09	40000	11880	40000	10692
6,0	4,2	3,00	31291	2581	28175	2091
	0,5	0,10	40000	13068	40000	11761
8,0	5,6	4,00	23468	2604	31131	2109
	0,6	0,15	40000	14850	40000	13371
10,0	7,0	5,00	18775	2659	16905	2155
	0,6	0,25	40000	16632	40000	14968
12,0	8,5	6,00	15601	2815	14047	2280
	0,7	0,30	40000	17820	40000	16038

µm	D < 3,0	-14 — -28	D ≤ 30	-40 — -73	d1< 18	0 — -11	R	± 0,01
	D < 6,0	-20 — -38	D < 3,0	0 — -6	d1 ≤ 30	0 — -13		
	D < 10	-25 — -47	d1 < 6,0	0 — -8				
	D < 18	-32 — -59	d1 < 10	0 — -9				

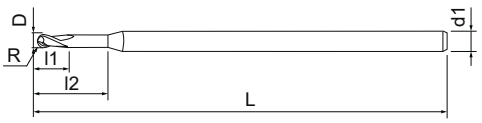
UFD16

BALL NOSE KULISTE

2 Flute, Miniature 2 ostrzowe, miniaturowe

HSM Vmax	F	M	30°	A						max	min		AIR
										○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, SI <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
									○	○		●		





D code Kod	R	D	d1	d2	L	l1	l2	Z	Shank Uchwyt
UFD16004002A04004045	0,2	0,4	4	0,36	45	0,6	4	2	A
UFD16004002A04006045	0,2	0,4	4	0,36	45	0,6	6	2	A
UFD16006003A04004045	0,3	0,6	4	0,56	45	1	4	2	A
UFD16006003A04006045	0,3	0,6	4	0,56	45	1	6	2	A
UFD16006003A04008045	0,3	0,6	4	0,56	45	1	8	2	A
UFD16010005A04006045	0,5	1	4	0,95	45	1,5	6	2	A
UFD16010005A04008045	0,5	1	4	0,95	45	1,5	8	2	A
UFD16010005A04012045	0,5	1	4	0,95	45	1,5	12	2	A
UFD16015008A04012045	0,75	1,5	4	1,45	45	1,75	12	2	A
UFD16020010A04008060	1	2	4	1,95	60	3	8	2	A
UFD16020010A04012060	1	2	4	1,95	60	3	12	2	A
UFD16020010A04016060	1	2	4	1,95	60	3	16	2	A
UFD16040020A04016060	2	4	4	3,9	60	6	16	2	A

Cutting Conditions Parametry Skrawania

SLOTTING / FREZOWANIE ROWKÓW

	**Graphite** Grafit	
d1 (mm)	RPM	mm/min
R0.2×0.4	40000	600
R0.3×0.6	40000	800
R0.4×0.8	40000	960
R0.5×1.0	40000	1200
R0.6×1.2	40000	1440
R0.75×1.5	40000	1600
R1.0×2.0	40000	2000
R1.5×3.0	27000	2200
R2.0×4.0	20000	2900
R2.5×5.0	16000	2900
R3.0×6.0	14000	2900
ap=0.2D1 ae=0.2D1		

D -14 — -28	
d1 -14 — -28	

UFA

UFA END MILLS
FREZY UFA



UFA END MILLS are designed for HSM machining of aluminum and it's alloys, copper, graphite (economic type),non-ferrous materials.

FREZY UFA przeznaczone są do obróbki szybkościowej (OS) aluminium i jego stopów, miedzi, grafitu (wariant ekonomiczny) oraz materiałów nieżelaznych.

TIZ IMPLEMENTS

UFA END MILLS are designed for HSM machining of aluminium and it's alloys, copper, graphite (economic type), non-ferrous materials.

FREZY WALCOWO-CZOŁOWE UFA przede wszystkim zalecane są do obróbki szybkościowej (OS) aluminium i jego stopów, miedzi, grafitu (wykonanie ekonomiczne) oraz materiałów nieżelaznych.

NOTE:

- If the rigidity of the machine or the work material installation is very low, or chattering and noise is generated, please reduce RPM and FEED rate proportionally.
- Cutting conditions may be considerably different due to the tool overhang, depth of cut, and machining tool condition, please use the catalogue cutting parameters as a reference starting point.
- If the depth of cut is shallow, the RPM and FEED rate can be increased.
- A high-speed spindle is recommended, when using a reduced RPM, the FEED rate must be reduced proportionally.
- High pressure coolant and air blow are recommended to dispose of chips efficiency.
- Use a rigid machine and work clamping method.
- Down (climb) cutting is recommended.
- We recommend that you set the width of cut as small as possible (about 5% of dia.) and divide the machining into several passes and work on high cutting parameters. There will be much higher tool life and surface roughness.
- When drilling, please set the FEED rate 30% below the normal rate.

UWAGA:

- Jeżeli sztywność obrabiarki lub mocowanie obrabianego przedmiotu nie są wystarczające lub występują wibracje i nadmierny hałas, należy proporcjonalnie zmniejszyć obroty i posuw.
- Parametry skrawania mogą być różne w zależności od długości narzędzia wystającego z oprawki, głębokości skrawania oraz stanu obrabiarki. Proszę stosować parametry skrawania podane w katalogu jako wyjściowy punkt odniesienia.
- Przy zmniejszeniu głębokości skrawania, obroty i posuw mogą być zwiększone.
- Zalecane jest stosowanie wysokoobrotowych obrabiarek, w przypadku mniejszych prędkości obrotowych, posuw powinien być zmniejszony proporcjonalnie.
- Dla efektywnego odprowadzania wiórów zalecane jest stosowanie nadmuchu powietrza lub chłodziwa pod dużym ciśnieniem.
- Zalecane jest stosowanie sztywnych obrabiarek oraz systemów mocowania.
- Zalecane jest frezowanie współbieżne.
- Zalecamy stosowanie możliwie najmniejszej szerokości skrawania - około 5% średnicy roboczej narzędzia i podzielenie operacji obróbki na kilka przejść przy większych parametrach skrawania, co znacznie wydłuży żywotność narzędzia oraz polepszy jakość obrabianej powierzchni.
- Przy zagłębianiu zalecane jest ustawienie posuwu wgłębnego na poziomie o 30% mniejszym od posuwu roboczego.

EDP No.		Z	Angle Kąt	Materials Materiały	D / R	Pag. / Str.
UFA40		2	30°	N	D 0,5 - 12	5 - 6
UFA26		2	45°	N	D 1 - 20	7 - 8
UFA28		2	55°	N	D 3 - 20	9
UFA37		3	55°	N	D 6 - 20	10
UFA38		3	55°	N	D 3 - 20	11
UFA25		3	55°	N	D 4 - 25	12 - 13
UFA23		2	30°	N	D 1 - 12	14
UFA33		3	45°	N	D 1 - 20	15
UFA41		2	30°	N	D 1 - 2	16
UFA11		1	30°	N	D 2 - 12	17
UFA14		2	25°	N	D 2 - 20	18
UFA17		2	45°	N	D 3 - 20	19
UFA12		2	45°	N	D 3 - 20	20
UFA18		2	45°	N	D 4 - 20	21
UFA19		2	45°	N	D 3 - 20	22
UFA20		3	45°	N	D 3 - 20	23
UFA21		3	45°	N	D 3 - 20	24
UFA27		3	30°	N	D 6 - 25	25
UFA32		3	30°	N	D 6 - 20	26
UFA42		2	30°	N	D 0,2 - 6	27 - 28
UFA30		2	25°	N	D 2 - 20	29
UFA09		2	30°	N	D 4 - 20	30
UFA43		3	40°	N	D 2- 12	31 - 32
UFA44		3	40°	N	D 2 - 12	33 - 34

EDP No.		Z	Angle Kąt	Materials Materiały	D / R	Pag. / Str.
UFA99		3	40°	N	D 3 - 20	35 - 36
UFA45		4	30°	N	D 6 - 12	37 - 38
UFA56		3	40°	N	D 10 - 20	39 - 40
UFA68		3	30°	N	D 8 - 20	41
UFA46		2	30°	N	R 0,5 - 1	42
UFA47		2	30°	N	R 0,1 - 3	43 - 44
UFA48		2	30°	N	R 1 - 6	45 - 46
UFA10		2	30°	N	R 3 - 10	47
UFA49		2	30°	N	R 1 - 6	48
UFA50		2	30°	N	R 1 - 6	49
UFA51		3	25°	N	R 1 - 6	50
UFA07		2	30°	N	R 0,5 - 6	51
UFA08		3	40°	N	R 1 - 8	52
UFA15		2	50°	N	R 3 - 10	53
UFA31		3	40°	N	R 1 - 8	54

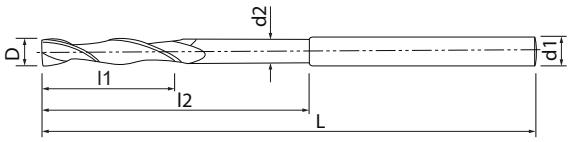
UFA40

SQUARE TYPE WALCOWO-CZOŁOWE

2-Flute, Long Length 2-ostrzowe, długie

HSM Vmax	F	M	30°	A	max	min	AIR
					○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
									○	○		●		



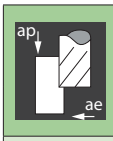


D code new Nowy kod	D code Kod	D	d1	d2	L	l1	l2	Z	Shank Uchwyt
UFA40005000A03002040	UFA40005	0,5	3	0,45	40	1	2	2	A
UFA40006000A03003040	UFA40006	0,6	3	0,55	40	2	3	2	A
UFA40007000A03004040	UFA40007	0,7	3	0,65	40	2	4	2	A
UFA40008000A03005040	UFA40008	0,8	3	0,75	40	2	5	2	A
UFA40009000A03006040	UFA40009	0,9	3	0,85	40	2	6	2	A
UFA40010000A04008075	UFA40010	1	4	0,95	75	3	8	2	A
UFA40015000A04010075	UFA40015	1,5	4	1,45	75	4	10	2	A
UFA40020000A04016100	UFA40020	2	4	1,9	100	6	16	2	A
UFA40025000A04020100	UFA40025	2,5	4	2,4	100	8	20	2	A
UFA40030000A06030100	UFA40030	3	6	2,8	100	8	30	2	A
UFA40035000A06035100	UFA40035	3,5	6	3,2	100	10	35	2	A
UFA40040000A06040100	UFA40040	4	6	3,7	100	20	40	2	A
UFA40050000A06050125	UFA40050	5	6	4,6	125	25	50	2	A
UFA40060000A06060140	UFA40060	6	6	5,6	140	30	60	2	A
UFA40070000A06000140	UFA40070	7	6	-	140	35		2	A
UFA40080000A08080150	UFA40080	8	8	7,4	150	40	80	2	A
UFA40090000A08000150	UFA40090	9	8	-	150	45		2	A
UFA40100000A10080150	UFA40100	10	10	9,4	150	50	80	2	A
UFA40110000A10000150	UFA40110	11	10	-	150	50		2	A
UFA40120000A12080150	UFA40120	12	12	11,4	150	55	80	2	A

UFA40

Cutting Conditions Parametry skrawania

SIDE MILLING / FREZOWANIE OBWODOWE

	**Aluminium alloys** Stopy aluminium				**Aluminium alloys Si<13%** Stopy aluminium Si<13%				**Magnesium alloys, Copper alloys** Stopy magnezu i miedzi			
	FO		**HFO**		**FO**		**HFO**		**FO**		**HFO**	
d1 (mm)	**RPM**	**mm/min**	**RPM**	**mm/min**	**RPM**	**mm/min**	**RPM**	**mm/min**	**RPM**	**mm/min**	**RPM**	**mm/min**
0,5	22840	80	35700	250	22840	80	35700	220	22840	70	35700	200
0,6	22840	90	35700	290	22840	90	35700	270	22840	80	35700	250
0,8	22840	100	35700	380	22840	100	35700	360	20700	90	35700	290
1	22840	100	35700	450	22840	100	35700	430	16420	100	29980	310
1,2	22840	100	35700	540	22840	100	35700	520	13560	100	25700	310
1,4	22840	110	35700	630	22840	110	35700	570	11780	100	22130	310
1,5	22840	120	35700	720	22840	120	34270	570	11060	100	21060	310
1,6	22840	140	35700	770	22840	140	32130	570	10350	100	19990	310
1,8	22840	160	35700	840	22840	160	29270	570	9280	100	18920	340
2	22840	190	35700	910	22840	190	27130	570	8210	100	17130	340
2,5	17850	270	34270	950	17850	270	22130	570	6780	110	14280	340
3	14990	310	28560	950	14990	310	18560	570	5670	110	12130	340
4	11060	330	23560	1020	11060	330	14280	610	4240	120	9990	360
5	8920	340	22130	1270	8920	340	13700	750	3390	130	8920	430
6	7490	370	18560	1270	7490	370	11350	770	2820	140	7490	450
8	5670	400	13920	1320	5670	400	8560	820	2100	130	5640	450
10	4530	450	11060	1450	4530	450	6850	860	1670	160	4530	500
12	3780	470	9280	1450	3780	470	5710	860	1390	170	3780	500
DOC*	ae	ap	ae	ap	ae	ap	ae	ap	ae	ap	ae	ap
	0,1d1	1,5d1	0,1d1	1d1	0,1d1	1,5d1	0,1d1	1d1	0,1d1	1,5d1	0,05d1	1d1

(H)FO— mm/min (HIGH SPEED) SIDE CUTTING FREZOWANIE OBWODOWE (SZYBKOŚCIOWE)
(H)FR— mm/min (HIGH SPEED) SLOTTING FREZOWANIE ROWKÓW (SZYBKOŚCIOWE)

*DOC - Deapth Of Cut Głębokość skrawania

Use rigid and precise machine tool and toolholder.
When milling aluminum alloys, use water soluble cutting fluid.
Please note the following points when machining Mg alloys:
To select appropriate cutting fluid, consult lubricant manufacturers.
Chips must be handled carefully, because they can cause a fire.

Stosować sztywną i precyzyjną obrabiarkę i oprawkę narzędziową.
Do frezowania stopów aluminium używać chłodziwa rozpuszczalnego w wodzie.
Przy obróbce stopów magnezu należy zwrócić uwagę na następujące punkty:
Aby wybrać odpowiednie chłodziwo skonsultować się z producentem środków smarujących.
Usuwać wióry ostrożnie, gdyż mogą spowodować pożar.

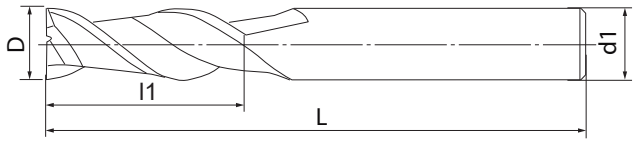
µm	0 < D ≤ 1	3-5	d1 ≤ 6	< 3 - 5	d1 > 16	< 8 - 10
	1,1 ≤ D ≤ 7,9	5-7	d1 = 8	< 5 - 7		
	D ≥ 8	15-17	d1 = 10,12	< 6 - 8		

UFA26

SQUARE TYPE WALCOWO-CZOŁOWE
2-Flute, Short Length 2-ostrzowe, krótkie

		HSM Vmax	F	M	45°	A						max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
									○	○		●		

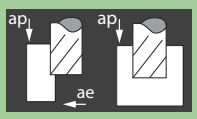




D code new Nowy kod	D code Kod	D	d1	L	l1	Z	Shank Uchwyt
UFA26010000A04003040	UFA26010	1	4	40	3	2	A
UFA26015000A04004040	UFA26015	1,5	4	40	4	2	A
UFA26020000A04006040	UFA26020	2	4	40	6	2	A
UFA26025000A04008040	UFA26025	2,5	4	40	8	2	A
UFA26030000A06008045	UFA26030	3	6	45	8	2	A
UFA26035000A06010045	UFA26035	3,5	6	45	10	2	A
UFA26040000A06011045	UFA26040	4	6	45	11	2	A
UFA26045000A06011050	UFA26045	4,5	6	50	11	2	A
UFA26050000A06013050	UFA26050	5	6	50	13	2	A
UFA26055000A06013050	UFA26055	5,5	6	50	13	2	A
UFA26060000A06013050	UFA26060	6	6	50	13	2	A
UFA26070000A08016060	UFA26070	7	8	60	16	2	A
UFA26080000A08019060	UFA26080	8	8	60	19	2	A
UFA26090000A10019070	UFA26090	9	10	70	19	2	A
UFA26100000A10022070	UFA26100	10	10	70	22	2	A
UFA26110000A12022075	UFA26110	11	12	75	22	2	A
UFA26120000A12026075	UFA26120	12	12	75	26	2	A
UFA26160000A16032090	UFA26160	16	16	90	32	2	A
UFA26200000A20038100	UFA26200	20	20	100	38	2	A

UFA26

Cutting Conditions Parametry skrawania



			Aluminium i Magnesium Aluminium i Magnez		Aluminium alloys Stopy aluminium					
			Rm<200N/mm²		< 0.5% Si Rm<400N/mm²		0.5%- 10% Si Rm<400N/mm²		> 10% Si Rm<400N/mm²	
d1 (mm)	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
2	1,33	3,00	40000	1083	40000	1083	40000	1083	28680	621
	0,66	3,00	40000	1642	40000	1642	40000	1642	35360	1160
	0,03	3,00	40000	4200	40000	4200	40000	4200	40000	3360
	2,00	1,00	40000	1920	40000	1920	40000	1920	40000	1536
3	2,00	4,50	40000	1920	40000	1920	38197	1833	19099	733
	1,00	4,50	40000	2384	40000	2384	40000	2384	23428	1115
	0,05	4,50	40000	7560	40000	7560	40000	7560	40000	6048
	3,00	1,50	40000	2280	40000	2280	40000	2280	22239	1014
4	2,66	6,00	40000	5170	40000	2884	28680	2068	14340	827
	1,33	6,00	40000	6651	40000	3782	35070	3315	17598	1332
	0,07	6,00	40000	9282	40000	9289	40000	9289	39773	7390
	4,00	2,00	40000	5170	40000	3600	33423	3008	16679	1201
5	3,33	7,50	40000	3378	40000	3362	22928	1927	11464	771
	1,66	7,50	40000	3362	40000	4290	28083	3012	14092	1209
	0,08	7,50	40000	10160	40000	10160	40000	10160	32513	6607
	5,00	2,50	40000	4080	40000	4080	26738	2727	13344	1089
6	4,00	9,00	40000	3720	40000	3720	19099	1776	9549	710
	2,00	9,00	40000	4784	40000	4784	23343	2792	11714	1120
	0,10	9,00	40000	11640	40000	11640	40000	11640	15364	1908
	6,00	3,00	40000	4560	40000	4560	22282	2540	11120	1014
8	5,33	12,00	40000	4562	38212	4358	14328	1634	7164	654
	2,66	12,00	40000	5936	40000	5936	17535	2602	8799	1045
	0,13	12,00	40000	12600	40000	12600	40000	12600	20221	5096
	8,00	4,00	40000	5640	40000	5640	16711	2356	8340	941
10	6,66	15,00	40000	5966	30577	4773	11464	1789	5732	716
	3,33	15,00	40000	8068	40000	8068	14015	2827	7033	1134
	0,17	15,00	40000	13800	40000	5640	31979	11033	15989	4413
	10,00	5,00	40000	7680	38197	7334	13369	2567	6672	1025
12	8,00	18,00	37831	5921	25465	4736	9549	1776	4775	711
	4,00	18,00	40000	9576	33444	8006	11671	2794	5857	1122
	0,20	18,00	40000	15176	40000	15176	26738	10144	13369	4059
	12,00	6,00	39789	9072	38197	7334	11141	2540	5560	1014
16	10,66	24,00	25285	6243	19106	4472	7164	1677	3582	671
	5,33	24,00	31362	9487	25090	7590	8757	2649	4394	1064
	0,27	24,00	40000	17384	40000	17384	20012	8697	10006	3478
	16,00	8,00	29842	8594	23873	6875	8356	2407	4170	961
20	13,33	30,00	19102	5559	15281	4447	5730	1668	2865	667
	6,66	30,00	25094	8954	20075	7163	7007	2500	3516	1003
	0,33	30,00	40000	19320	40000	19320	16096	7774	8048	3110
	20,00	10,00	23873	8523	19099	6818	6658	2387	3336	953

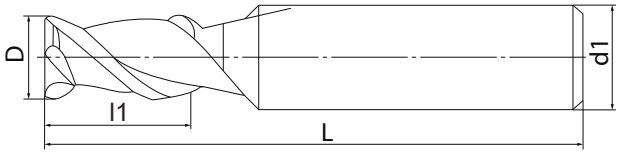
µm	1,0 < D < 3,0	-14 — -28	10 < D < 12	-32 — -59		
	3,0 < D < 6,0	-20 — -38	d1 h6			
	6,0 < D < 10	-25 — -47				

UFA28

SQUARE TYPE WALCOWO-CZOŁOWE
2-Flute, Long length 2-ostrzowe, długie

HSM Vmax	F	M	55°	A						max	min		AIR
										○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
									○	○		●		





D code new Nowy kod	D code Kod	D	d1	L	l1	Z	Shank Uchwyt
UFA28030000A06012060	UFA280302	3	6	12	60	2	A
UFA28040000A06016060	UFA280402	4	6	16	60	2	A
UFA28050000A06020060	UFA280502	5	6	20	60	2	A
UFA28060000A06025075	UFA280602	6	6	25	75	2	A
UFA28080000A08032075	UFA280802	8	8	32	75	2	A
UFA28100000A10045100	UFA281002	10	10	45	100	2	A
UFA28120000A12045100	UFA281202	12	12	45	100	2	A
UFA28160000A16065150	UFA281602	16	16	65	150	2	A
UFA28200000A20075150	UFA282002	20	20	75	150	2	A

Cutting Conditions Parametry skrawania

SIDE MILLING / FREZOWANIE OBWODOWE



			Aluminium alloys Stopy aluminium		Aluminium alloys Stopy aluminium Si<13%		Copper alloys Stopy miedzi			
d1 (mm)	ae	ap	RPM	mm/min	RPM	mm/min	ae	ap	RPM	mm/min
3	0,3	4,5	32000	495	29000	430	0,15	4,5	12700	135
5	0,5	7,5	19000	495	17000	430	0,25	7,5	7600	135
6	0,6	9	16000	495	14000	430	0,3	9	6400	135
8	0,8	12	12000	495	10700	430	0,4	12	4800	135
10	1	15	10000	495	8600	430	0,5	15	3800	135
12	1,2	18	8000	495	7200	430	0,6	18	3200	135
16	1,6	24	6000	495	5400	430	0,8	24	2400	135
20	2	30	4800	495	4300	430	1	30	1900	135

SLOTTING / FREZOWANIE ROWKÓW



		Aluminium alloys Stopy aluminium		Aluminium alloys Stopy aluminium Si<13%		Copper alloys Stopy miedzi	
d1 (mm)	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min
3	3	22400	120	20300	105	8890	30
5	5	13300	120	11900	105	5320	30
6	6	11200	120	9800	105	4480	30
8	8	8400	120	7490	105	3360	30
10	10	7000	120	6020	105	2660	30
12	12	5600	120	5040	105	2240	30
16	16	4200	120	3780	105	1680	30
20	20	3360	120	3010	105	1330	30

µm	0 < D ≤ 1	3-5	d1 ≤ 6	< 3 - 5	d1 > 16	< 8 - 10
	1,1 ≤ D ≤ 7,9	5-7	d1 = 8	< 5 - 7		
	D ≥ 8	15-17	d1 = 10,12	< 6 - 8		

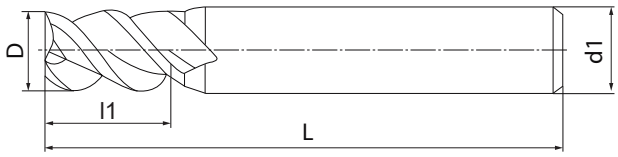
UFA37

SQUARE TYPE WALCOWO-CZOŁOWE

3-Flute, Short length 3-ostrzowe, krótkie

		HSM Vmax	F	M	R	55°	A					max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
									○	○		●		





D code new Nowy kod	D code Kod	D	d1	L	l1	Z	Shank Uchwyt
UFA37060000A06018050	UFA370603	6	6	50	18	3	A
UFA37080000A08020060	UFA370803	8	8	60	20	3	A
UFA37100000A10030075	UFA371003	10	10	75	30	3	A
UFA37120000A12032075	UFA371203	12	12	75	32	3	A
UFA37160000A16045100	UFA371603	16	16	100	45	3	A
UFA37200000A20045100	UFA372003	20	20	100	45	3	A

Cutting Conditions Parametry skrawania

SIDE MILLING / FREZOWANIE OBWODOWE



			Aluminium alloys Stopy aluminium		Aluminium alloys Si<13% Stopy aluminium Si<13%		Copper alloys Stopy miedzi			
d1 (mm)	ae	ap	RPM	mm/min	RPM	mm/min	ae	ap	RPM	mm/min
3	0,3	4,5	28800	670	26100	580	0,15	4,5	11430	180
5	0,5	7,5	17100	670	15300	580	0,25	7,5	6840	180
6	0,6	9	14400	670	12600	580	0,3	9	5760	180
8	0,8	12	10800	670	9630	580	0,4	12	4320	180
10	1	15	9000	670	7740	580	0,5	15	3420	180
12	1,2	18	7200	670	6480	580	0,6	18	2880	180
16	1,6	24	5400	670	4860	580	0,8	24	2160	180
20	2	30	4320	670	3870	580	1	30	1710	180

SLOTTING / FREZOWANIE ROWKÓW



		Aluminium alloys Stopy aluminium		Aluminium alloys Si<13% Stopy aluminium Si<13%		Copper alloys Stopy miedzi	
d1 (mm)	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min
3	3	20160	160	18270	140	8000	40
5	5	11970	160	10710	140	4790	40
6	6	10080	160	8820	140	4030	40
8	8	7560	160	6740	140	3020	40
10	10	6300	160	5420	140	2390	40
12	12	5040	160	4540	140	2020	40
16	16	3780	160	3400	140	1510	40
20	20	3020	160	2710	140	1200	40

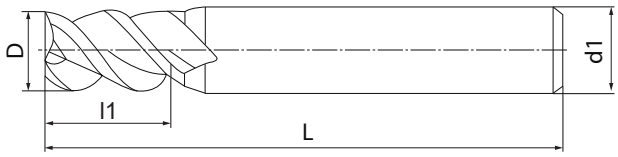
µm	0 < D ≤ 1	3-5	d1 ≤ 6	< 3 - 5	d1 > 16	< 8 - 10
	1,1 ≤ D ≤ 7,9	5-7	d1 = 8	< 5 - 7		
	D ≥ 8	15-17	d1 = 10,12	< 6 - 8		

UFA38

SQUARE TYPE WALCOWO-CZOŁOWE
3-Flute, Long length 3-ostrzowe, długie

		HSM Vmax	F	M	R	55°	A					max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
									○	○		●		





D code new Nowy kod	D code Kod	D	d1	L	l1	Z	Shank Uchwyt
UFA38030000A06012060	UFA380303	3	6	60	12	3	A
UFA38040000A06016060	UFA380403	4	6	60	16	3	A
UFA38050000A06020060	UFA380503	5	6	60	20	3	A
UFA38060000A06025075	UFA380603	6	6	75	25	3	A
UFA38080000A08032075	UFA380B03	8	8	75	32	3	A
UFA38100000A10045100	UFA381003	10	10	100	45	3	A
UFA38120000A12045100	UFA381203	12	12	100	45	3	A
UFA38160000A16065150	UFA381603	16	16	150	65	3	A
UFA38200000A20075150	UFA382003	20	20	150	75	3	A

Cutting Conditions Parametry skrawania

SIDE MILLING / FREZOWANIE OBWODOWE



			Aluminium alloys Stopy aluminium		Aluminium alloys Si<13% Stopy aluminium Si<13%		Copper alloys Stopy miedzi			
d1 (mm)	ae	ap	RPM	mm/min	RPM	mm/min	ae	ap	RPM	mm/min
3	0,3	4,5	32000	740	29000	645	0,15	4,5	12700	200
5	0,5	7,5	19000	740	17000	645	0,25	7,5	7600	200
6	0,6	9	16000	740	14000	645	0,3	9	6400	200
8	0,8	12	12000	740	10700	645	0,4	12	4800	200
10	1	15	10000	740	8600	645	0,5	15	3800	200
12	1,2	18	8000	740	7200	645	0,6	18	3200	200
16	1,6	24	6000	740	5400	645	0,8	24	2400	200
20	2	30	4800	740	4300	645	1	30	1900	200

SLOTTING / FREZOWANIE ROWKÓW



		Aluminium alloys Stopy aluminium		Aluminium alloys Si<13% Stopy aluminium Si<13%		Copper alloys Stopy miedzi	
d1 (mm)	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min
3	**3**	**22400**	**180**	**20300**	**155**	**8890**	**45**
5	5	13300	180	11900	155	5320	45
6	6	11200	180	9800	155	4480	45
8	8	8400	180	7490	155	3360	45
10	10	7000	180	6020	155	2660	45
12	12	5600	180	5040	155	2240	45
16	16	4200	180	3780	155	1680	45
20	20	3360	180	3010	155	1330	45

µm	0 < D ≤ 1	3-5	d1 ≤ 6	< 3 - 5	d1 > 16	< 8 - 10
	1,1 ≤ D ≤ 7,9	5-7	d1 = 8	< 5 - 7		
	D ≥ 8	15-17	d1 = 10,12	< 6 - 8		

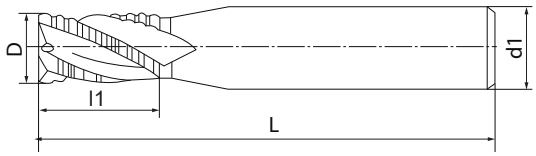
UFA25

SQUARE TYPE WALCOWO-CZOŁOWE

3-Flute, Short length 3-ostrzowe, krótkie

		HSM Vmax	F	M	R	55°	A					max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
									○	○		●		





D code new Nowy kod	D code Kod	D	d1	L	l1	Z	Shank Uchwyt
UFA25040000A06008050	UFA250403	4	6	50	8	3	A
UFA25050000A06013050	UFA250503	5	6	50	13	3	A
UFA25060000A06015050	UFA250603	6	6	50	15	3	A
UFA25065000A08016060	UFA250653	6,5	8	60	16	3	A
UFA25070000A08016060	UFA250703	7	8	60	16	3	A
UFA25075000A08020060	UFA250753	7,5	8	60	20	3	A
UFA25080000A08020060	UFA250803	8	8	60	20	3	A
UFA25085000A10020075	UFA250853	8,5	10	75	20	3	A
UFA25090000A10020075	UFA250903	9	10	75	20	3	A
UFA25095000A10022075	UFA250953	9,5	10	75	22	3	A
UFA25100000A10025075	UFA251003	10	10	75	25	3	A
UFA25110000A12030075	UFA251103	11	12	75	30	3	A
UFA25120000A12030075	UFA251203	12	12	75	30	3	A
UFA25130000A14030075	UFA251303	13	14	75	30	3	A
UFA25140000A16032075	UFA251403	14	16	75	32	3	A
UFA25150000A16032075	UFA251503	15	16	75	32	3	A
UFA25160000A16035100	UFA251603	16	16	100	35	3	A
UFA25170000A20035100	UFA251703	17	20	100	35	3	A
UFA25180000A20035100	UFA251803	18	20	100	35	3	A
UFA25200000A20045100	UFA252003	20	20	100	45	3	A
UFA25250000A25050105	UFA252503	25	25	105	50	3	A

µm	0 < D ≤ 1	3-5	d1 ≤ 6	< 3 - 5	d1 > 16	< 8 - 10
	1,1 ≤ D ≤ 7,9	5-7	d1 = 8	< 5 - 7		
	D ≥ 8	15-17	d1 = 10,12	< 6 - 8		

UFA25

Cutting Conditions Parametry skrawania

SIDE MILLING / FREZOWANIE OBWODOWE



			Aluminium alloys Stopy aluminium		**Aluminium alloys** Stopy aluminium Si<13%	
d1 (mm)	**ae max**	**ap max**	**RPM**	**mm/min**	**RPM**	**mm/min**
10	5	10	30000	10450	19000	5130
12	6	12	30000	11400	16000	5030
16	8	16	24000	11400	12000	4650
18	9	18	21000	11400	10500	4460
20	10	20	19000	10450	9500	4370
22	11	22	17000	10450	8500	4080
25	12,5	25	15000	10450	7500	4080

SLOTTING / FREZOWANIE ROWKÓW



		Aluminium alloys Stopy aluminium		**Aluminium alloys** Stopy aluminium Si<13%	
d1 (mm)	**ap**	**RPM**	**mm/min**	**RPM**	**mm/min**
10	7,5	30000	8170	19000	4080
12	9	30000	9400	16000	4080
16	12	24000	9210	12000	3800
18	13,5	21000	9020	10500	3610
20	15	19000	8640	9500	3510
22	16,5	17000	8260	8500	3230
25	18,75	15000	8170	7500	3230

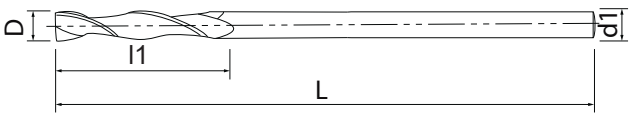
UFA23

SQUARE TYPE WALCOWO-CZOŁOWE

2-Flute, Long length 2-ostrzowe, długie

			HSM Vmax	F	M	30°	A					max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
									○	○		●		





D code new Nowy kod	D code Kod	D	d1	L	l1	Z	Shank Uchwyt
UFA23010000A06003050	UFA23010	1	6	50	3	2	A
UFA23020000A06006050	UFA23020	2	6	50	6	2	A
UFA23030000A06008050	UFA23030	3	6	50	8	2	A
UFA23040000A06010050	UFA23040	4	6	50	10	2	A
UFA23050000A06013050	UFA23050	5	6	50	13	2	A
UFA23060000A06015050	UFA23060	6	6	50	15	2	A
UFA23080000A08020060	UFA23080	8	8	60	20	2	A
UFA23100000A10025075	UFA23100	10	10	75	25	2	A
UFA23120000A12030075	UFA23120	12	12	75	30	2	A

Cutting Conditions Parametry skrawania

Work material / materiał obrabiany	**Aluminum alloy** / Stopy Aluminium			
Diameter / Średnica	**Slotting** / Frezowanie rowków		**Side milling** / Frezowanie obwodowe	
	RPM	**mm/min**	**RPM**	**mm/min**
1	32000	3200	32000	6400
2	23000	2300	23000	4600
3	16000	1600	16000	3200
4	12000	1200	12000	2400
5	9600	1920	9600	1920
6	8000	1600	8000	1600
8	6000	1200	6000	1200
10	12000	2400	4800	960
12	10000	2000	4000	800
ap / ae	ap=0,5D ae=1D		ap=2,5D ae=0,1D	

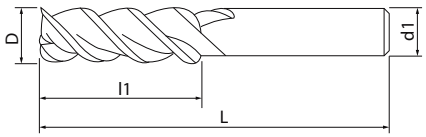
µm	0 < D ≤ 1	3-5	d1 ≤ 6	< 3 - 5	d1 > 16	< 8 - 10
	1,1 ≤ D ≤ 7,9	5-7	d1 = 8	< 5 - 7		
	D ≥ 8	15-17	d1 = 10,12	< 6 - 8		

UFA33

SQUARE TYPE WALCOWO-CZOŁOWE
3-Flute 3-ostrzowe

HSM Vmax	F	M	45°	A	max	min		AIR
					○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
									○	○		●		





D code new Nowy kod	D code kod	D	d1	L	l1	Z	Shank Uchwyt
UFA33010000A04003050	UFA33010	1	3	50	4	3	A
UFA33015000A04004050		1,5	4	50	4	3	A
UFA33020000A04006050	UFA33020	2	6	50	4	3	A
UFA33025000A04007050		2,5	7	50	4	3	A
UFA33030000A06008050	UFA33030	3	8	50	6	3	A
UFA33030000A06009050		3	9	50	6	3	A
UFA33040000A06010050	UFA33040	4	10	50	6	3	A
UFA33040000A06012050		4	12	50	6	3	A
UFA33050000A06013050	UFA33050	5	13	50	6	3	A
UFA33050000A06015050		5	15	50	6	3	A
UFA33060000A06015050	UFA33060	6	15	50	6	3	A
UFA33060000A06018060		6	18	60	6	3	A
UFA33080000A08020060	UFA33080	8	20	60	8	3	A
UFA33100000A10025075	UFA33100	10	25	75	10	3	A
UFA34100000A10030075		10	30	75	10	3	A
UFA33120000A12030075	UFA33120	12	30	75	12	3	A
UFA33120000A12032075		12	32	75	12	3	A
UFA33160000A16045100		16	45	100	16	3	A
UFA33200000A20045100		20	45	100	20	3	A

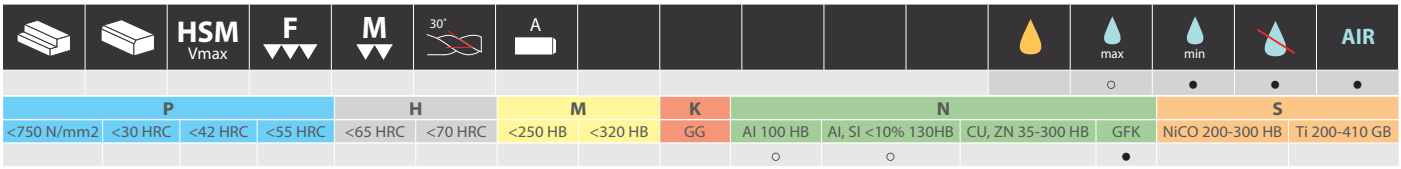
Cutting Conditions Parametry skrawania

Work material / Materiał obrabiany	Aluminum alloy Stopy Aluminium			
Diameter / Średnica	Slotting / Frezowanie rowków		Side milling / Frezowanie obwodowe	
	RPM	mm/min	RPM	mm/min
1	32000	4800	32000	9600
2	23000	3450	23000	6900
3	16000	2400	16000	4800
4	12000	1800	12000	3600
5	9600	2880	9600	2880
6	8000	2400	8000	2400
8	6000	1800	6000	1800
10	12000	3600	4800	1440
12	10000	3000	4000	1200
ap / ae	ap=0,5D ae=1D		ap=2,5D ae=0,1D	

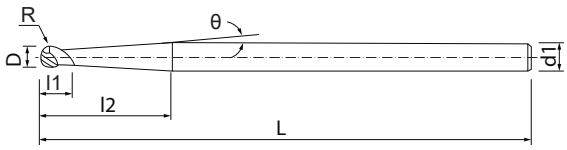
UFA41

TOROIDAL TOROIDALNE

2-Flute, With Tapper Neck 2-ostrzowe, ze stożkową szyjką



P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
									○	○		●		





D code new Nowy kod	D code kod	R	D	d1	L	l1	l2	Z	Shank Uchwyt
UFA41010001A03030060	UFA41100	0,1	1	3	60	2	30	2	A
UFA41010001A03070100	UFA41101	0,1	1	3	100	2	70	2	A
UFA41015002A03030060	UFA41150	0,15	1,5	3	60	3	30	2	A
UFA41015002A03050100	UFA41151	0,15	1,5	3	100	3	50	2	A
UFA41020002A03030060	UFA41200	0,15	2	3	60	4	30	2	A
UFA41020002A04070100	UFA41201	0,15	2	4	100	4	70	2	A

Cutting Conditions Parametry skrawania



	Aluminium alloys Stopy aluminium				Aluminium alloys Stopy aluminium Si<13%				Magnesium alloys, Copper alloys Stopy magnezu i miedzi			
	FO		HFO		FO		HFO		FO		HFO	
d1 (mm)	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
1	28800	170	45000	900	28800	170	45000	900	20700	120	37800	630
1,5	28800	220	40500	1080	28800	220	40500	1080	13900	130	26500	670
2	22900	270	30600	1080	22900	270	30600	1080	10300	130	21600	670
DOC*	ae	ap	ae	ap	ae	ap	ae	ap	ae	ap	ae	ap
	0,1xd1	1,2xd1	0,1xd1	1xd1	0,1xd1	1,2xd1	0,1xd1	1xd1	0,1xd1	1xd1	0,05xd1	1xd1



	Aluminium alloys Stopy aluminium				Aluminium alloys Stopy aluminium Si<13%				Magnesium alloys, Copper alloys Stopy magnezu i miedzi			
	FR		HFR		FR		HFR		FR		HFR	
d1 (mm)	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
1	28800	170	45000	900	28800	170	45000	900	20700	120	37800	630
1,5	28800	220	40500	1080	28800	220	40500	1080	13900	130	26500	670
2	22900	270	30600	1080	22900	270	30600	1080	10300	130	21600	670
DOC*	ae	ap	ae	ap	ae	ap	ae	ap	ae	ap	ae	ap
	1xd1	0,3xd1	1xd1	0,15xd1	1xd1	0,3xd1	1xd1	0,15xd1	1xd1	0,3xd1	1xd1	0,1xd1

(H)FO— mm/min (HIGH SPEED) SIDE CUTTING FREZOWANIE OBWODOWE (SZYBKOŚCIOWE)

(H)FR— mm/min (HIGH SPEED) SLOTTING FREZOWANIE ROWKÓW (SZYBKOŚCIOWE)

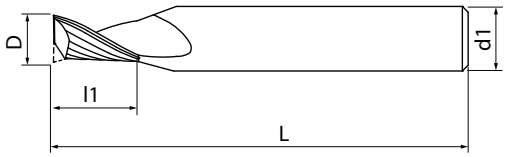
µm	D<2.0	0 — -15
	D>2.0	0 — -20
	d1 h6	

UFA11

SQUARE TYPE WALCOWO-CZOŁOWE
1-Flute 1-ostrzowe

			HSM Vmax	F	M	30°	A					max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
									●	●	●			





D code Kod	D	d1	L	l1	Z	Shank Uchwyt
UFA11020000A03008050	2	3	50	8	1	A
UFA11030000A03012050	3	3	50	12	1	A
UFA11040000A04015060	4	4	60	15	1	A
UFA11050000A05017060	5	5	60	17	1	A
UFA11060000A06020065	6	6	65	20	1	A
UFA11080000A08022065	8	8	65	22	1	A
UFA11100000A10025075	10	10	75	25	1	A
UFA11120000A12030080	12	12	80	30	1	A

Cutting Conditions Parametry skrawania

Material Materiał	Acrylic Akryl				Aluminium, Aluminium alloys Aluminium, Stopy aluminium			
d1 (mm)	RPM	FEED	ap(mm)	ae(mm)	RPM	FEED	ap(mm)	ae(mm)
2	32000	2200	3	2	23000	1500	3	2
3	25000	2400	4,5	3	18000	1700	4,5	3
4	20000	2400	6	4	15000	1800	6	4
5	15000	2200	7,5	5	12000	1800	7,5	5
6	13500	2300	9	6	10000	1800	9	6
8	10000	2400	12	8	7800	1900	12	8
10	8000	2400	15	10	6000	2000	15	10
12	6700	2300	18	12	5000	2200	18	12

µm	D 0 — 0,03	
	d1 h6	

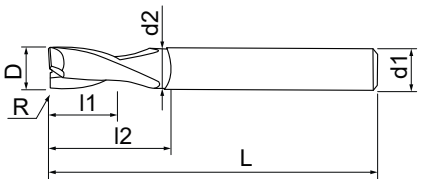
UFA14

SQUARE TYPE WALCOWO-CZOŁOWE

2-Flute, Corner Radius 2-ostrzowe z promieniem

			HSM Vmax	F	M	25°	A					max	min		AIR
												○	•	•	•

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
									•	•				





D code Kod	R	D	d1	d2	L	l1	l2	Z	Shank Uchwyt
UFA14002000A02003003	0,2	2	3	1,9	40	3	6	2	A
UFA14002000A03003004	0,2	3	3	2,9	40	4	8	2	A
UFA14002000A04004005	0,2	4	4	3,8	50	5	12	2	A
UFA14002000A05005008	0,2	5	5	4,8	50	8	14	2	A
UFA14002000A06006008	0,2	6	6	5,7	65	8	18	2	A
UFA14002000A08008010	0,2	8	8	7,7	70	10	22	2	A
UFA14002000A10010014	0,2	10	10	9,7	80	14	28	2	A
UFA14002000A12012016	0,2	12	12	11,5	90	16	35	2	A
UFA14002000A16016020	0,2	16	16	15,5	90	20	40	2	A
UFA14002000A20020025	0,2	20	20	19,5	100	25	50	2	A

Cutting Conditions Parametry skrawania

Material Materiał	Aluminium, Aluminium alloys Aluminium, Stopy aluminium							
d1 (mm)	RPM	FEED	ap(mm)	ae(mm)	RPM	FEED	ap(mm)	ae(mm)
2	10400	460	1	2	10400	810	2	0,5
3	10400	720	1,5	3	10400	960	3	0,75
4	10400	960	2	4	10400	1120	4	1
5	10400	1040	2,5	5	10400	1360	5	1,25
6	10400	1200	3	6	10400	1600	6	1,5
8	8000	1440	4	8	8000	1840	8	2
10	8000	1760	5	10	8000	2160	10	2,5
12	8000	2160	6	12	8000	2720	12	6
16	6400	2000	8	16	6400	2480	16	8
20	4000	1600	10	20	4000	2000	20	10

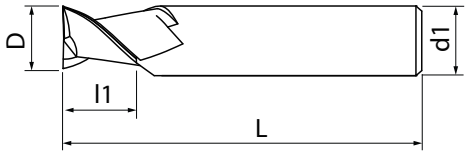
µm	D 0 — 0,03	
	d1 h6	

UFA17

SQUARE TYPE WALCOWO-CZOŁOWE
2-Flute Short Length 2-ostrzowe krótkie

			HSM Vmax	F	M	45°	A					max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, SI <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
									●	●				





D code Kod	D	d1	L	l1	Z	Shank Uchwyt
UFA17030000A06005050	3	6	50	5	2	A
UFA17040000A06008054	4	6	54	8	2	A
UFA17050000A06009054	5	6	54	9	2	A
UFA17060000A06010054	6	6	54	10	2	A
UFA17080000A08012058	8	8	58	12	2	A
UFA17100000A10014066	10	10	66	14	2	A
UFA17120000A12016073	12	12	73	16	2	A
UFA17140000A14018075	14	14	75	18	2	A
UFA17160000A16022082	16	16	82	22	2	A
UFA17180000A18024084	18	18	84	24	2	A
UFA17200000A20026092	20	20	92	26	2	A

Cutting Conditions Parametry skrawania

Material Materiał	Aluminium, Aluminium alloys Aluminium, Stopy aluminium							
d1 (mm)	RPM	FEED	ap(mm)	ae(mm)	RPM	FEED	ap(mm)	ae(mm)
3	10000	700	1,5	3	10000	900	3	0,75
4	10000	900	2	4	10000	1100	4	1
5	10000	1000	2,5	5	10000	1300	5	1,25
6	10000	1200	3	6	10000	1500	6	1,5
8	8000	1400	4	8	8000	1800	8	2
10	8000	1700	5	10	8000	2100	10	2,5
12	8000	2100	6	12	8000	2600	12	6
14	6000	1800	7	14	6000	2200	14	7
16	6000	1900	8	16	6000	2400	16	8
18	4000	1400	9	18	4000	1800	18	9
20	4000	1600	10	20	4000	1900	20	10

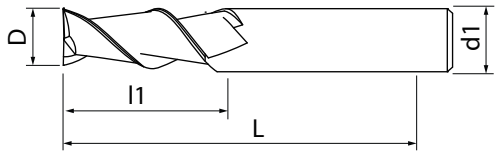
µm	D 0 — 0,015	
	d1 h6	

UFA12

SQUARE TYPE WALCOWO-CZOŁOWE
2-Flute Long Length 2-ostrzowe długie

			HSM Vmax	F	M	45°	A	B				max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, SI <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
									●	●				





D code new HA Nowy kod	D code new HB Nowy kod	D	d1	L	l1	Z	Shank Uchwyt
UFA12030000A06008057	UFA12030000B06008057	3	6	57	8	2	A
UFA12040000A06011057	UFA12040000B06011057	4	6	57	11	2	A
UFA12050000A06013057	UFA12050000B06013057	5	6	57	13	2	A
UFA12060000A06013057	UFA12060000B06013057	6	6	57	13	2	A
UFA12080000A08019063	UFA12080000B08019063	8	8	63	19	2	A
UFA12100000A10022072	UFA12100000B10022072	10	10	72	22	2	A
UFA12120000A12026083	UFA12120000B12026083	12	12	83	26	2	A
UFA12140000A14026083	UFA12140000B14026083	14	14	83	26	2	A
UFA12160000A16032092	UFA12160000B16032092	16	16	92	32	2	A
UFA12180000A18032092	UFA12180000B18032092	18	18	92	32	2	A
UFA12200000A20038104	UFA12200000B20038104	20	20	104	38	2	A

Cutting Conditions Parametry skrawania

Material Materiał	Aluminium, Aluminium alloys Aluminium, Stopy aluminium							
d1 (mm)	RPM	FEED	ap(mm)	ae(mm)	RPM	FEED	ap(mm)	ae(mm)
3	10000	700	1,5	3	10000	900	3	0,75
4	10000	900	2	4	10000	1100	4	1
5	10000	1000	2,5	5	10000	1300	5	1,25
6	10000	1200	3	6	10000	1500	6	1,5
8	8000	1400	4	8	8000	1800	8	2
10	8000	1700	5	10	8000	2100	10	2,5
12	8000	2100	6	12	8000	2600	12	6
14	6000	1800	7	14	6000	2200	14	7
16	6000	1900	8	16	6000	2400	16	8
18	4000	1400	9	18	4000	1800	18	9
20	4000	1600	10	20	4000	1900	20	10

µm	D 0 — 0,015	
	d1 h6	

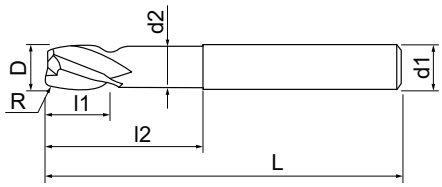
UFA18

SQUARE TYPE WALCOWO-CZOŁOWE

2-Flute Corner Radius with Neck 2-ostrzowe z promieniem z zwężaną szyjką

HSM Vmax	F	M	45°	A	max	min	AIR
					○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
									●	●				





D code Kod	R	D	d1	d2	L	l1	l2	Z	Shank Uchwyt
UFA18003000A04006005	0,3	4	6	3,6	50	5	10	2	A
UFA18005000A06006008	0,5	6	6	5,4	60	8	20	2	A
UFA18006000A08008010	0,6	8	8	7,2	70	10	30	2	A
UFA18008000A10010012	0,8	10	10	9	80	12	36	2	A
UFA18010000A12012014	1	12	12	11	90	14	40	2	A
UFA18013000A16016018	1,3	16	16	14,5	100	18	45	2	A
UFA18016000A20020024	1,6	20	20	18	100	24	45	2	A

Cutting Conditions Parametry skrawania

Material Materiał	Aluminium, Aluminium alloys Aluminium, Stopy aluminium								Copper alloys Stopy miedzi							
d1 (mm)	RPM	FEED	ap(mm)	ae(mm)	RPM	FEED	ap(mm)	ae(mm)	RPM	FEED	ap(mm)	ae(mm)	RPM	FEED	ap(mm)	ae(mm)
4	10400	960	2	4	10400	1120	4	1	3120	240	2	4	3120	280	4	1
6	10400	1200	3	6	10400	1600	6	1,5	3120	305	3	6	3120	400	6	1,5
8	8000	1440	4	8	8000	1840	8	2	2400	360	4	8	2400	465	8	2
10	8000	1760	5	10	8000	2160	10	2,5	2400	440	5	10	2400	545	10	2,5
12	8000	2160	6	12	8000	2720	12	6	2400	545	6	12	2400	680	12	6
16	6400	2000	8	16	6400	2480	16	8	1920	505	8	16	1920	625	16	8
20	4000	1600	10	20	4000	2000	20	10	1200	400	10	20	1200	505	20	10

D 0 — 0,03	
d1 h6	

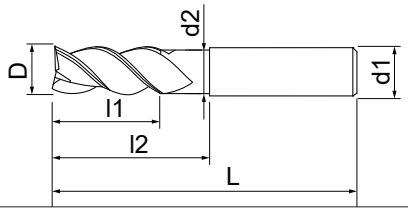
UFA19

SQUARE TYPE WALCOWO-CZOŁOWE

3-Flute with Neck 3-ostrzowe z zwężaną szyjką

HSM Vmax	F	M	45°	A				max	min		AIR
								○	•	•	•

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
									•	•				





D code Kod	D	d1	d2	L	l1	l2	Z	Shank Uchwyt
UFA19030000A06008012	3	6	2,7	57	8	12	3	A
UFA19040000A06011018	4	6	3,7	57	11	18	3	A
UFA19050000A06013018	5	6	4,7	57	13	18	3	A
UFA19060000A06013018	6	6	5,7	57	13	18	3	A
UFA19080000A08021025	8	8	7,4	63	21	25	3	A
UFA19100000A10022030	10	10	9,2	72	22	30	3	A
UFA19120000A12026036	12	12	11	83	26	36	3	A
UFA19160000A16036042	16	16	15	92	36	42	3	A
UFA19200000A20041052	20	20	19	104	41	52	3	A

Cutting Conditions Parametry skrawania

Material Materiał	Aluminium, Aluminium alloys Aluminium, Stopy aluminium							
d1 (mm)	RPM	FEED	ap(mm)	ae(mm)	RPM	FEED	ap(mm)	ae(mm)
3	7000	940	6	0,45	7000	730	1,5	3
4	7000	1150	8	0,6	7000	940	2	4
5	7000	1360	10	0,75	7000	1050	2,5	5
6	7000	1580	12	0,9	7000	1250	3	6
8	5600	1900	16	1,2	5600	1470	4	8
9	5600	2050	18	1,35	5600	1630	4,5	9
10	5600	2200	20	1,5	5600	1780	5	10
12	5600	2740	24	1,8	5600	2200	6	12
16	4200	2520	32	2,4	4200	1990	8	16
20	2800	2000	40	3	2800	1680	10	20

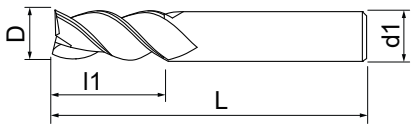
µm	D 0 — 0,015	
	d1 h6	

UFA20

SQUARE TYPE WALCOWO-CZOŁOWE
3-Flute Long Length 3-ostrzowe dugie

HSM Vmax	F	M	45°	A	max	min	AIR
					○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
									●	●				





D code Kod	D	d1	L	l1	Z	Shank Uchwyt
UFA20030000A06012057	3	6	57	12	3	A
UFA20040000A06015057	4	6	57	15	3	A
UFA20050000A06020057	5	6	57	20	3	A
UFA20060000A06020065	6	6	65	20	3	A
UFA20080000A08022065	8	8	65	22	3	A
UFA20100000A10025070	10	10	70	25	3	A
UFA20120000A12025075	12	12	75	25	3	A
UFA20160000A16035090	16	16	90	35	3	A
UFA20200000A20040100	20	20	100	40	3	A

Cutting Conditions Parametry skrawania

Material Materiał	Aluminium, Aluminium alloys Aluminium, Stopy aluminium							
d1 (mm)	RPM	FEED	ap(mm)	ae(mm)	RPM	FEED	ap(mm)	ae(mm)
3	7000	940	6	0,45	7000	730	1,5	3
4	7000	1150	8	0,6	7000	940	2	4
5	7000	1360	10	0,75	7000	1050	2,5	5
6	7000	1580	12	0,9	7000	1250	3	6
8	5600	1900	16	1,2	5600	1470	4	8
9	5600	2050	18	1,35	5600	1630	4,5	9
10	5600	2200	20	1,5	5600	1780	5	10
12	5600	2740	24	1,8	5600	2200	6	12
16	4200	2520	32	2,4	4200	1990	8	16
20	2800	2000	40	3	2800	1680	10	20

µm	D 0 — 0,015
	d1 h6

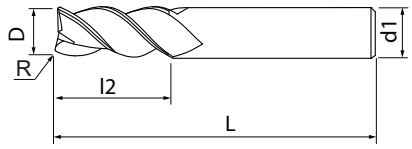
UFA21

SQUARE TYPE WALCOWO-CZOŁOWE

3-Flute Long Length Croner Radius 3-ostrzowe dugie z promieniem

HSM Vmax	F	M	45°	A	max	min		AIR
					○	•	•	•

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, SI <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
									•	•				





D code Kod	R	D	d1	L	l1	Z	Shank Uchwyt
UFA21005000A03006012	0,5	3	6	57	12	3	A
UFA21010000A03006012	1	3	6	57	12	3	A
UFA21005000A04006015	0,5	4	6	57	15	3	A
UFA21010000A04006015	1	4	6	57	15	3	A
UFA21005000A05006020	0,5	5	6	57	20	3	A
UFA21010000A05006020	1	5	6	57	20	3	A
UFA21005000A06006020	0,5	6	6	65	20	3	A
UFA21010000A06006020	1	6	6	65	20	3	A
UFA21005000A08008022	0,5	8	8	65	22	3	A
UFA21010000A08008022	1	8	8	65	22	3	A
UFA21005000A10010025	0,5	10	10	70	25	3	A
UFA21010000A10010025	1	10	10	70	25	3	A
UFA21020000A10010025	2	10	10	70	25	3	A
UFA21005000A12012025	0,5	12	12	75	25	3	A
UFA21010000A12012025	1	12	12	75	25	3	A
UFA21020000A12012025	2	12	12	75	25	3	A
UFA21005000A16016035	0,5	16	16	90	35	3	A
UFA21010000A16016035	1	16	16	90	35	3	A
UFA21020000A16016035	2	16	16	90	35	3	A
UFA21005000A20020040	0,5	20	20	100	40	3	A
UFA21010000A20020040	1	20	20	100	40	3	A
UFA21020000A20020040	2	20	20	100	40	3	A

Cutting Conditions Parametry skrawania

Material Materiał	Aluminium, Aluminium alloys Aluminium, Stopy aluminium							
d1 (mm)	RPM	FEED	ap(mm)	ae(mm)	RPM	FEED	ap(mm)	ae(mm)
3	10000	1490	7,5	0,45	10000	1160	1,5	3
4	10000	1820	10	0,6	10000	1490	2	4
5	10000	2150	12,5	0,75	10000	1650	2,5	5
6	10000	2480	15	0,9	10000	1980	3	6
8	8000	3000	20	1,2	8000	2310	4	8
10	8000	3470	25	1,5	8000	2810	5	10
12	8000	4290	30	1,8	8000	3470	6	12
16	6000	3960	40	2,4	6000	3140	8	16
20	4000	3140	50	3	4000	2640	10	20

µm	D 0 — 0,015	
	d1 h6	

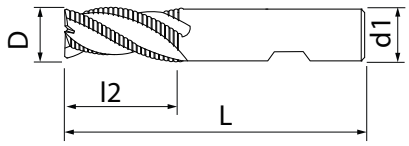
UFA27

SQUARE TYPE WALCOWO-CZOŁOWE

3-Flute Long Length 3-ostrzowe dugie

HSM Vmax	F	M	30°	A					max	min		AIR
									○	•	•	•

P				H		M		K	N			S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
									•	•				





D code HA Kod HA	D code HB Kod HB	D	d1	L	l1	Z	Shank Uchwyt
UFA27060000A06016057	UFA27060000B06016057	6	6	57	16	3	A
UFA27070000A08016063	UFA27070000B08016063	7	8	63	16	3	A
UFA27080000A08016063	UFA27080000B08016063	8	8	63	16	3	A
UFA27090000A10019072	UFA27090000B10019072	9	10	72	19	3	A
UFA27100000A10022072	UFA27100000B10022072	10	10	72	22	3	A
UFA27120000A12026083	UFA27120000B12026083	12	12	83	26	3	A
UFA27140000A14026083	UFA27140000B14026083	14	14	83	26	3	A
UFA27160000A16032092	UFA27160000B16032092	16	16	92	32	3	A
UFA27180000A18032092	UFA27180000B18032092	18	18	92	32	3	A
UFA27200000A20038104	UFA27200000B20038104	20	20	104	38	3	A
UFA27250000A25045121	UFA27250000B25045121	25	25	121	45	3	A

Cutting Conditions Parametry skrawania

Material Materiał	Aluminium, Aluminium alloys Aluminium, Stopy aluminium							
d1 (mm)	RPM	FEED	ap(mm)	ae(mm)	RPM	FEED	ap(mm)	ae(mm)
6	13500	6800	9	6	10500	5300	9	3
8	10500	5300	12	8	8000	4000	12	4
10	8500	4300	15	10	6500	3500	15	5
12	8500	4200	18	12	6400	3200	18	6
16	6400	3200	24	16	4800	2400	24	8
20	5100	2500	30	20	3850	1900	30	10

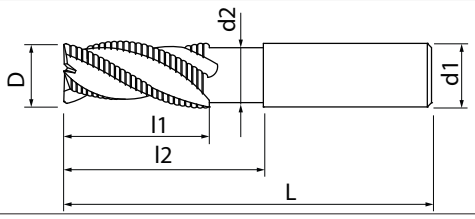
UFA32

SQUARE TYPE WALCOWO-CZOŁOWE

3-Flute Long Length With Neck 3-ostrzowe dugie z zwężaną szyjką

HSM Vmax	F	M	30°	A	max	min		AIR
					○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, SI <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
									●	●				





D code HA Kod HA	D code HB Kod HB	D	d1	d2	L	l1	l2	Z	Shank Uchwyt
UFA32060000A06016020	UFA32060000B06016020	6	6	5	57	16	20	3	A
UFA32080000A08016025	UFA32080000B08016025	8	8	7	63	16	25	3	A
UFA32100000A10022030	UFA32100000B10022030	10	10	9	72	22	30	3	A
UFA32120000A12026036	UFA32120000B12026036	12	12	10,5	83	26	36	3	A
UFA32160000A16032042	UFA32160000B16032042	16	16	14,5	92	32	42	3	A
UFA32200000A20038052	UFA32200000B20038052	20	20	18,5	104	38	52	3	A

Cutting Conditions Parametry skrawania

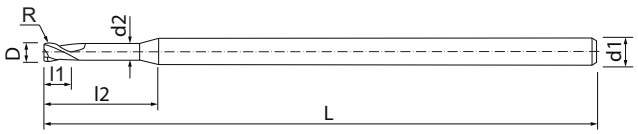
Material Materiał	Aluminium, Aluminium alloys Aluminium, Stopy aluminium							
d1 (mm)	RPM	FEED	ap(mm)	ae(mm)	RPM	FEED	ap(mm)	ae(mm)
6	13500	6800	9	6	10500	5300	9	3
8	10500	5300	12	8	8000	4000	12	4
10	8500	4300	15	10	6500	3500	15	5
12	8500	4200	18	12	6400	3200	18	6
16	6400	3200	24	16	4800	2400	24	8
20	5100	2500	30	20	3850	1900	30	10

UFA42

TOROIDAL TOROIDALNE
2-Flute, Miniature 2-ostrzowe, miniaturowe

		HSM Vmax	F	M	30°	A						max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
									○	○		●		



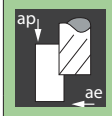


D code new Nowy kod	D code Kod	R	D	d1	d2	L	l1	l2	Z	Shank Uchwyt
UFA42002000A03000040	UFA42020		0,2	3	-	40	0,3		2	A
UFA42003000A03000040	UFA42030		0,3	3	-	40	0,45		2	A
UFA42004000A03000040	UFA42040		0,4	3	-	40	0,6		2	A
UFA42005001A03003040	UFA42050	0,05	0,5	3	0,45	40	0,7	2,5	2	A
UFA42005001A03004040	UFA42051	0,05	0,5	3	0,45	40	0,7	4	2	A
UFA42006001A03003040	UFA42060	0,05	0,6	3	0,55	40	0,9	3	2	A
UFA42006001A03005040	UFA42061	0,05	0,6	3	0,55	40	0,9	5	2	A
UFA42008001A03004040	UFA42080	0,05	0,8	3	0,75	40	1,2	4	2	A
UFA42008001A03007040	UFA42081	0,05	0,8	3	0,75	40	1,2	7	2	A
UFA42010001A03005040	UFA42100	0,1	1	3	0,95	40	1,5	5	2	A
UFA42010001A03009040	UFA42101	0,1	1	3	0,95	40	1,5	8,5	2	A
UFA42010001A03012040	UFA42102	0,1	1	3	0,95	40	1,5	12	2	A
UFA42012001A03006050	UFA42120	0,1	1,2	3	1,15	50	1,8	6	2	A
UFA42012001A03010050	UFA42121	0,1	1,2	3	1,15	50	1,8	10	2	A
UFA42015002A03008050	UFA42150	0,15	1,5	3	1,4	50	2,2	7,5	2	A
UFA42015002A03012050	UFA42151	0,15	1,5	3	1,4	50	2,2	12	2	A
UFA42015002A03018050	UFA42152	0,15	1,5	3	1,4	50	2,2	18	2	A
UFA42020002A03010060	UFA42200	0,15	2	3	1,9	60	2,2	10	2	A
UFA42020002A03016060	UFA42201	0,15	2	3	1,9	60	2,2	16	2	A
UFA42020002A03025060	UFA42202	0,15	2	3	1,9	60	2,2	25	2	A
UFA42030002A04010065	UFA42300	0,2	3	4	2,9	65	3	10	2	A
UFA42030002A04015065	UFA42301	0,2	3	4	2,9	65	3	15	2	A
UFA42030002A04020065	UFA42302	0,2	3	4	2,9	65	3	20	2	A
UFA42030002A04025075	UFA42303	0,2	3	4	2,9	75	3	25	2	A
UFA42030002A04030075	UFA42304	0,2	3	4	2,9	75	3	30	2	A
UFA42040002A06020065	UFA42400	0,2	4	6	3,9	65	4	20	2	A
UFA42040002A06030075	UFA42401	0,2	4	6	3,9	75	4	30	2	A
UFA42040002A06040090	UFA42402	0,2	4	6	3,9	90	4	40	2	A
UFA42050003A06020075	UFA42500	0,3	5	6	4,9	75	5	20	2	A
UFA42050003A06030075	UFA42501	0,3	5	6	4,9	75	5	30	2	A
UFA42050003A06040090	UFA42502	0,3	5	6	4,9	90	5	40	2	A
UFA42050003A06050090	UFA42503	0,3	5	6	4,9	90	5	50	2	A
UFA42060003A06030075	UFA42600	0,3	6	6	5,9	75	6	30	2	A
UFA42060003A06040090	UFA42601	0,3	6	6	5,9	90	6	40	2	A
UFA42060003A06050090	UFA42602	0,3	6	6	5,9	90	6	50	2	A
UFA42060003A06060100	UFA42603	0,3	6	6	5,9	100	6	60	2	A

µm	D<2.0	0 — -15
	D>2.0	0 — -20
	d1 h6	

UFA42

Cutting Conditions Parametry skrawania



	Aluminium alloys Stopy aluminium				Aluminium alloys Si<13% Stopy aluminium Si<13%				Magnesium alloys, Copper alloys Stopy magnezu i miedzi			
	FO		HFO		FO		HFO		FO		HFO	
d1 (mm)	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
0,5	30400	90	47500	490	30400	90	47500	490	30400	90	47500	400
1	30400	170	47500	900	30400	170	47500	900	21800	120	39900	630
1,5	30400	220	42700	1080	30400	220	42700	1080	14700	130	28000	670
2	24200	270	32300	1080	24200	270	32300	1080	10900	130	22800	670
2,5	19000	380	25600	1080	19000	380	25600	1080	9000	150	19000	670
3	16100	450	21800	1080	16100	450	21800	1080	7500	190	16100	670
4	11800	460	16100	1080	11800	460	16100	1080	5600	210	12300	670
5	9500	480	12800	1080	9500	480	12800	1080	4500	220	9500	670
6	8000	540	10400	1080	8000	540	10400	1080	3700	220	7600	670
DOC*	ae	ap	ae	ap	ae	ap	ae	ap	ae	ap	ae	ap
	0,1xd1	1,2xd1	0,1xd1	1xd1	0,1xd1	1,2xd1	0,1xd1	1xd1	0,1xd1	1xd1	0,05xd1	1xd1



	Aluminium alloys Stopy aluminium				Aluminium alloys Si<13% Stopy aluminium Si<13%				Magnesium alloys, Copper alloys Stopy magnezu i miedzi			
	FR		HFR		FR		HFR		FR		HFR	
d1 (mm)	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
0,5	30400	90	47500	490	30400	90	47500	490	30400	90	47500	400
1	30400	170	47500	900	30400	170	47500	900	21800	120	39900	630
1,5	30400	220	42700	1080	30400	220	42700	1080	14700	130	28000	670
2	24200	270	32300	1080	24200	270	32300	1080	10900	130	22800	670
2,5	19000	380	25600	1080	19000	380	25600	1080	9000	150	19000	670
3	16100	450	21800	1080	16100	450	21800	1080	7500	190	16100	670
4	11800	460	16100	1080	11800	460	16100	1080	5600	210	12300	670
5	9500	480	12800	1080	9500	480	12800	1080	4500	220	9500	670
6	8000	540	10400	1080	8000	540	10400	1080	3700	220	7600	670
DOC*	ae	ap	ae	ap	ae	ap	ae	ap	ae	ap	ae	ap
	1xd1	0,3xd1	1xd1	0,15xd1	1xd1	0,3xd1	1xd1	0,15xd1	1xd1	0,3xd1	1xd1	0,1xd1

(H)FO— mm/min (HIGH SPEED) SIDE CUTTING FREZOWANIE OBWODOWE (SZYBKOŚCIOWE)

(H)FR— mm/min (HIGH SPEED) SLOTTING FREZOWANIE ROWKÓW (SZYBKOŚCIOWE)

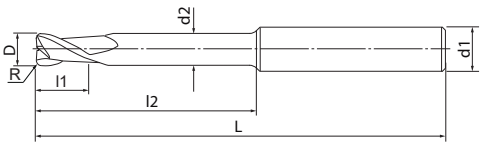
*DOC - Deapth Of Cut Głębokość skrawania

UFA30

TOROIDAL TOROIDALNE
2-Flute 2-ostrzowe

HSM Vmax	F	M	25°	A	max	min		AIR
					○	●	●	●

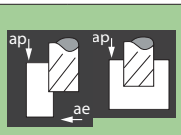
P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
									○	○		●		





D code new Nowy kod	D code Kod	R	D	d1	d2	L	l1	l2	Z	Shank Uchwyt
UFA30020002A03006040	UFA30020	0,2	2	3	1,9	40	3	6	2	A
UFA30030002A03008040	UFA30030	0,2	3	3	2,9	40	4	8	2	A
UFA30040002A04012050	UFA30040	0,2	4	4	3,8	50	5	12	2	A
UFA30050002A05014050	UFA30050	0,2	5	5	4,8	50	8	14	2	A
UFA30060002A06018065	UFA30060	0,2	6	6	5,7	65	8	18	2	A
UFA30080002A08022070	UFA30080	0,2	8	8	7,7	70	10	22	2	A
UFA30100002A10028080	UFA30100	0,2	10	10	9,7	80	14	28	2	A
UFA30120002A12035090	UFA30120	0,2	12	12	11,5	90	16	35	2	A
UFA30160002A16040090	UFA30160	0,2	16	16	15,5	90	20	40	2	A
UFA30200002A20050100	UFA30200	0,2	20	20	19,5	100	25	50	2	A

Cutting Conditions Parametry skrawania



			Aluminium i Magnesium Aluminium i Magnez		Aluminium alloys Stop aluminium					
			Rm<200N/mm²		< 0.5% Si Rm<400N/mm²		0.5%- 10% Si Rm<400N/mm²		> 10% Si Rm<400N/mm²	
d1 (mm)	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
3	2,10	2,10	30000	1728	30000	1728	30000	1728	23419	1079
	1,50	0,03	30000	5160	30000	5160	30000	5160	30000	4128
	0,03	1,50	30000	5670	30000	5670	30000	5670	30000	4536
4	2,80	2,80	30000	2725	30000	2725	30000	2725	17564	1276
	2,00	0,04	30000	6390	30000	6390	30000	6390	30000	5112
	0,04	2,00	30000	7020	30000	7020	30000	7020	30000	5616
6	4,20	4,20	30000	3452	30000	3452	23421	2695	11710	1078
	3,00	0,06	30000	8010	30000	8010	30000	8010	26526	5666
	0,06	3,00	30000	8808	30000	8808	30000	8808	30000	7044
8	5,60	5,60	30000	4266	30000	4266	17566	2498	8782	999
	4,00	0,08	30000	9000	30000	9000	30000	9000	19894	4775
	0,08	4,00	30000	9900	30000	9900	30000	9900	27852	7353
10	7,10	7,10	30000	5751	30000	5751	13926	2670	6963	1068
	5,00	0,10	30000	9300	30000	9300	30000	9300	15915	3947
	0,10	5,00	30000	9900	30000	9900	30000	9900	22282	5882
12	8,50	8,50	30000	6836	30000	6836	11613	2646	5806	1058
	6,00	0,12	30000	9900	30000	9900	26526	8754	13263	3501
	0,12	6,00	30000	11382	30000	11382	30000	11382	18568	5637
16	11,30	11,30	28002	7266	22394	5811	7850	2037	3925	815
	8,00	0,16	30000	10206	30000	10206	17905	6091	8952	2436
	0,16	8,00	30000	11734	30000	11734	25067	9805	12533	3921
20	14,10	14,10	24911	8912	19923	7127	6987	2500	3494	1000
	10,00	0,20	30000	12600	30000	12600	15915	6684	7958	2674
	0,20	10,00	30000	13860	30000	13860	22282	10294	11141	4118

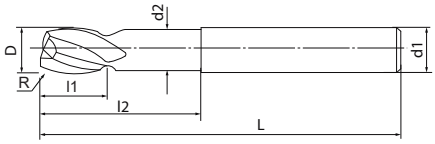
µm								
	D ≤ 3,0	0 — -40	D ≤18	0 — -70	d1 ≤ 6	0 — -8	d1 ≤ 30	0 — -13
	D ≤ 6,0	0 — -48	D ≤ 30	0 — -84	d1 ≤ 10	0 — -9		
	D ≤ 10	0 — -58	d1 ≤ 3	0 — -6	d1 ≤ 18	0 — -11		

UFA09

TOROIDAL TOROIDALNE
2-Flute 2-ostrzowe

HSM Vmax	F	M	30°	A				max	min		AIR
								○	●	●	●

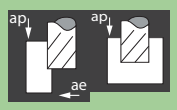
P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
									○	○		●		





D code new Nowy kod	D code Kod	R	D	d1	d2	L	l1	l2	Z	Shank Uchwyt
UFA09040003A06010050	UFA09040	0,3	4	6	3,6	50	5	10	2	A
UFA09060005A06020060	UFA09060	0,5	6	6	5,4	60	8	20	2	A
UFA09080006A08030070	UFA09080	0,6	8	8	7,2	70	10	30	2	A
UFA09100008A10036080	UFA09100	0,8	10	10	9	80	12	36	2	A
UFA09120010A12040090	UFA09120	1	12	12	11	90	14	40	2	A
UFA09160013A16045100	UFA09160	1,3	16	16	14,5	100	18	45	2	A
UFA09200016A20045100	UFA09200	1,6	20	20	18	100	24	45	2	A

Cutting Conditions Parametry skrawania



			Aluminium and Magnesium Aluminium i Magnez		Aluminium alloys Stopy aluminium					
			Rm<200N/mm²		< 0.5% Si Rm<400N/mm²		0.5%- 10% Si Rm<400N/mm²		> 10% Si Rm<400N/mm²	
d1 (mm)	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
4	2,80	2,80	40000	3634	40000	3634	40000	3634	17564	1276
	2,00	0,04	40000	8520	40000	8520	40000	8520	39789	6780
	0,04	2,00	40000	9360	40000	9360	40000	9360	40000	7488
6	4,20	4,20	40000	4603	40000	4603	23421	2695	11710	1078
	3,00	0,06	40000	10680	40000	10680	40000	10680	26526	5666
	0,06	3,00	40000	11744	40000	11744	40000	11744	37136	8720
8	5,60	5,60	40000	5119	40000	5119	17566	2498	8782	999
	4,00	0,08	40000	10800	40000	10800	40000	10800	19894	4775
	0,08	4,00	40000	11880	40000	11880	40000	11880	27852	7353
10	7,10	7,10	40000	7668	40000	7668	13926	2670	6963	1068
	5,00	0,10	40000	12400	40000	12400	40000	12400	15915	3947
	0,10	5,00	40000	13200	40000	13200	40000	13200	22282	5882
12	8,50	8,50	40000	7647	29821	6115	10451	2143	5226	857
	6,00	0,12	40000	11880	40000	11880	23873	7090	11937	2836
	0,12	6,00	40000	13658	40000	13658	40000	13658	16711	4566
16	11,30	11,30	40000	9293	22394	5811	7850	2037	3925	815
	8,00	0,16	40000	13608	40000	13608	17905	6091	8952	2436
	0,16	8,00	40000	15646	40000	15646	25067	9805	12533	3921
20	14,10	14,10	40000	7219	17930	5773	6987	2500	3494	1000
	10,00	0,20	40000	15120	40000	15120	15915	6684	7958	2674
	0,20	10,00	40000	16632	40000	16632	22282	10294	11141	4118

µm	d1 ≤ 6,0	-20 — -38	d1 ≤ 30	-40 — -73	d2 ≤ 18	0 — -11		
	d1 ≤ 10	-25 — -47	d2 ≤ 6	0 — -8	d2 ≤ 30	0 — -13		
	d1 ≤18	-32 — -59	d2 ≤ 10	0 — -9				

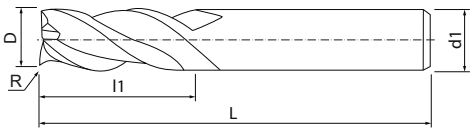
UFA43

TOROIDAL TOROIDALNETOROIDALNE

3-Flute, Short Length 3-ostrzowe, krótkie

		HSM Vmax	F	M	40°	A						max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
									○	○		●		





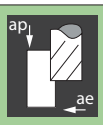
D code new Nowy kod	D code Kod	R	D	d1	L	l1	Z	Shank Uchwyt
UFA43020002A03006040	UFA43020	0,15	2	3	40	6	3	A
UFA43030002A03012040	UFA43030	0,15	3	3	40	12	3	A
UFA43040002A04014050	UFA43040	0,2	4	4	50	14	3	A
UFA43050003A05016050	UFA43050	0,3	5	5	50	16	3	A
UFA43060003A06020065	UFA43060	0,3	6	6	65	20	3	A
UFA43080005A08020065	UFA43080	0,5	8	8	65	20	3	A
UFA43100005A10025075	UFA43100	0,5	10	10	75	25	3	A
UFA43120005A12025075	UFA43120	0,5	12	12	75	25	3	A

µm	D 0 — -30	d1 h6

UFA43

Cutting Conditions Parametry skrawania

SIDE MILLING / FREZOWANIE OBWODOWE

			**Aluminium alloys** Stopy aluminium		**Aluminium alloys Si<13%** Stopy aluminium Si<13%		**Magnesium alloys, Copper alloys** Stopy magnezu i miedzi	
d1 (mm)	**ae**	**ap**	**RPM**	**mm/min**	**RPM**	**mm/min**	**RPM**	**mm/min**
3	0,3	4,5	19900	850	19900	850	7500	280
4	0,4	6	14700	990	14700	990	5600	310
5	0,5	7,5	11800	990	11800	990	4500	340
6	0,6	9	9900	1080	9900	1080	3700	360
8	0,8	12	7500	1170	7500	1170	2800	400
10	1	15	6000	1350	6000	1350	2200	430
12	1,2	18	5000	1390	5000	1390	1800	450

SLOTTING/ FREZOWANIE ROWKÓW

		**Aluminium alloys** Stopy aluminium		**Aluminium alloys Si<13%** Stopy aluminium Si<13%		**Magnesium alloys, Copper alloys** Stopy magnezu i miedzi	
d1 (mm)	**ap**	**RPM**	**mm/min**	**RPM**	**mm/min**	**RPM**	**mm/min**
3	1,5	19900	600	19900	600	7500	290
4	2	14700	630	14700	630	5600	320
5	2,5	11800	670	11800	670	4500	340
6	3	9900	730	9900	730	3700	360
8	4	7500	770	7500	770	2800	400
10	5	6000	870	6000	870	2200	420
12	6	5000	940	5000	940	1800	450

Use rigid and precise machine tool and toolholder.
When milling aluminum alloys, use water soluble cutting fluid.
Please note the following points when machining Mg alloys:
To select appropriate cutting fluid, consult lubricant manufacturers.
Chips must be handled carefully, because they can cause a fire.

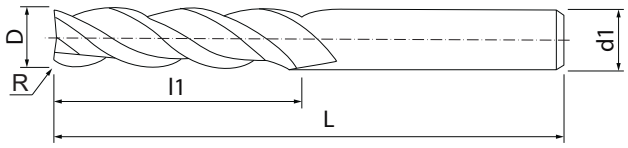
Stosować sztywną i precyzyjną obrabiarkę i oprawkę narzędziową.
Do frezowania stopów aluminium używać chłodziwa rozpuszczalnego w wodzie.
Przy obróbce stopów magnezu należy zwrócić uwagę na następujące punkty:
Aby wybrać odpowiednie chłodziwo skonsultować się z producentem środków smarujących.
Usuwać wióry ostrożnie, gdyż mogą spowodować pożar.

UFA44

TOROIDAL TOROIDALNE
3-Flute 3-ostrzowe

		HSM Vmax	F	M	40°	A						max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
									○	○		●		





D code new Nowy kod	D code Kod	R	D	d1	L	l1	Z	Shank Uchwyt
UFA44020002A03009060	UFA44020	0,15	2	3	60	9	3	A
UFA44030002A03030060	UFA44030	0,15	3	3	60	30	3	A
UFA44040002A04030060	UFA44040	0,2	4	4	60	30	3	A
UFA44050003A05035070	UFA44050	0,3	5	5	70	35	3	A
UFA44060003A06040100	UFA44060	0,3	6	6	100	40	3	A
UFA44080005A08040100	UFA44080	0,5	8	8	100	40	3	A
UFA44100005A10040100	UFA44100	0,5	10	10	100	40	3	A
UFA44120005A12045100	UFA44120	0,5	12	12	100	45	3	A

	D 0 — -30	d1 h6
µm		

UFA44

Cutting Conditions Parametry skrawania

SIDE MILLING/ FREZOWANIE OBWODOWE

			**Aluminium alloys** Stopy aluminium		**Aluminium alloys Si<13%** Stopy aluminium Si<13%		**Magnesium alloys, Copper alloys** Stopy magnezu i miedzi	
d1 (mm)	**ae**	**ap**	**RPM**	**mm/min**	**RPM**	**mm/min**	**RPM**	**mm/min**
3	0,3	4,5	19900	710	19900	710	7500	240
4	0,4	6	14700	820	14700	820	5600	260
5	0,5	7,5	11800	820	11800	820	4500	280
6	0,6	9	9900	900	9900	900	3700	300
8	0,8	12	7500	970	7500	970	2800	330
10	1	15	6000	1120	6000	1120	2200	360
12	1,2	18	5000	1160	5000	1160	1800	380

SLOTTING/ FREZOWANIE ROWKÓW

		**Aluminium alloys** Stopy aluminium		**Aluminium alloys Si<13%** Stopy aluminium Si<13%		**Magnesium alloys, Copper alloys** Stopy magnezu i miedzi	
d1 (mm)	**ap**	**RPM**	**mm/min**	**RPM**	**mm/min**	**RPM**	**mm/min**
3	1,5	19900	500	19900	500	7500	240
4	2	14700	520	14700	520	5600	270
5	2,5	11800	550	11800	550	4500	280
6	3	9900	610	9900	610	3700	300
8	4	7500	640	7500	640	2800	340
10	5	6000	720	6000	720	2200	350
12	6	5000	780	5000	780	1800	380

Use rigid and precise machine tool and toolholder.
When milling aluminum alloys, use water soluble cutting fluid.
Please note the following points when machining Mg alloys:
To select appropriate cutting fluid, consult lubricant manufacturers.
Chips must be handled carefully, because they can cause a fire.

Stosować sztywną i precyzyjną obrabiarkę i oprawkę narzędziową.
Do frezowania stopów aluminium używać chłodziwa rozpuszczalnego w wodzie.
Przy obróbce stopów magnezu należy zwrócić uwagę na następujące punkty:
Aby wybrać odpowiednie chłodziwo skonsultować się z producentem środków smarujących.
Usuwać wióry ostrożnie, gdyż mogą spowodować pożar.

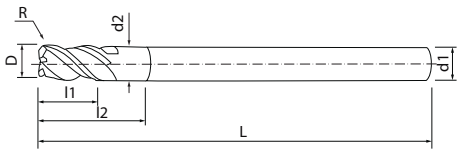
UFA99

TOROIDAL TOROIDALNE

3-Flute, Long Length with Neck 3-ostrzowe, długie ze zwężoną szyjką

			HSM Vmax	F	M	R	40°	A				max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
									○	○		●		





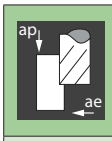
D code new Nowy kod	D code Kod	R	D	d1	d2	L	l1	l2	Z	Shank Uchwyt
UFA99030005A06009050	UFA9903005	0,5	3	6	2,7	50	4,5	9	3	A
UFA99040005A06012050	UFA9904005	0,5	4	6	3,6	50	6	12	3	A
UFA99040010A06012050	UFA9904010	1	4	6	3,6	50	6	12	3	A
UFA99050005A06015060	UFA9905005	0,5	5	6	4,5	60	7,5	15	3	A
UFA99060003A06015060	UFA9906003	0,3	6	6	5,4	60	9	15	3	A
UFA99060005A06015060	UFA9906005	0,5	6	6	5,4	60	9	15	3	A
UFA99060010A06015060	UFA9906010	1	6	6	5,4	60	9	15	3	A
UFA99080005A08020075	UFA9908005	0,5	8	8	7,2	75	12	20	3	A
UFA99080010A08020075	UFA9908010	1	8	8	7,2	75	12	20	3	A
UFA99100005A10025075	UFA9910005	0,5	10	10	9	75	15	25	3	A
UFA99100010A10025075	UFA9910010	1	10	10	9	75	15	25	3	A
UFA99120005A12030100	UFA9912005	0,5	12	12	11	100	18	30	3	A
UFA99120010A12030100	UFA9912010	1	12	12	11	100	18	30	3	A
UFA99160005A16040105	UFA9916005	0,5	16	16	15	105	24	40	3	A
UFA99160010A16040105	UFA9916010	1	16	16	15	105	24	40	3	A
UFA99160030A16040105	UFA9916030	3	16	16	15	105	24	40	3	A
UFA99200005A20050125	UFA9920005	0,5	20	20	19	125	30	50	3	A
UFA99200010A20050125	UFA9920010	1	20	20	19	125	30	50	3	A
UFA99200030A20050125	UFA9920030	3	20	20	19	125	30	50	3	A

µm	D 0 — -30	d1 h6

UFA99

Cutting Conditions Parametry skrawania

SIDE MILLING / FREZOWANIE OBWODOWE



	Aluminium alloys Stopy aluminium				**Aluminium alloys Si<13%** Stopy aluminium Si<13%				**Magnesium alloys, Copper alloys** Stopy magnezu i miedzi			
	FO		**HFO**		**FO**		**HFO**		**FO**		**HFO**	
d1 (mm)	**RPM**	**mm/min**	**RPM**	**mm/min**	**RPM**	**mm/min**	**RPM**	**mm/min**	**RPM**	**mm/min**	**RPM**	**mm/min**
3	21000	770	40000	145	21000	770	24000	880	7950	325	17000	625
4	15500	810	32000	1700	15500	810	19200	1000	5950	375	14300	800
5	12500	860	32000	2200	12500	860	19200	1350	4750	385	12700	925
6	10500	950	26500	2400	10500	950	15900	1450	3950	400	10600	960
8	8000	1000	20000	2500	8000	1000	12000	1500	2950	460	8000	1130
10	6350	1150	16000	2800	6350	1150	9600	1700	2350	475	6350	1150
12	5300	1200	13300	2950	5300	1200	8000	1800	1950	510	5300	1250
16	3950	1200	10000	3000	3950	1200	6000	1800	1450	510	4000	1250
20	3150	1200	8000	3000	3150	1200	4800	1800	1150	510	3200	1250
DOC*	ae	ap	ae	ap	ae	ap	ae	ap	ae	ap	ae	ap
	1xd1	0,2xd1	1xd1	0,1xd1	1xd1	0,2xd1	1xd1	0,1xd1	1xd1	0,2xd1	1xd1	0,1xd1

SLOTTING / FREZOWANIE ROWKÓW



	Aluminium alloys Stopy aluminium				**Aluminium alloys Si<13%** Stopy aluminium Si<13%				**Magnesium alloys, Copper alloys** Stopy magnezu i miedzi	
	FR		**HFR**		**FR**		**HFR**		**FR**	
d1 (mm)	**RPM**	**mm/min**	**RPM**	**mm/min**	**RPM**	**mm/min**	**RPM**	**mm/min**	**RPM**	**mm/min**
3	21000	731	40000	1377	21000	731	24000	836	7950	3087
4	15500	769	32000	1615	15500	769	19200	950	5950	3562
5	12500	817	32000	2090	12500	817	19200	1282	4750	3657
6	10500	902	26500	2280	10500	902	15900	1377	3950	380
8	8000	950	20000	2375	8000	950	12000	1425	2950	437
10	6350	1092	16000	2660	6350	1092	9600	1615	2350	4512
12	5300	1140	13300	2802	5300	1140	8000	1710	1950	4845
16	3950	1140	10000	2850	3950	1140	6000	1710	1450	4845
20	3150	1140	8000	2850	3150	1140	4800	1710	1150	4845
DOC*	ap=0,5xd1		ap=0,25xd1		ap=0,5xd1		ap=0,25xd1		ap=0,5xd1	

(H)FO - (HIGH SPEED) SIDE MILLING FREZOWANIE OBWODOWE (SZYBKOŚCIOWE)(HFR) - (HIGH SPEED) SLOTTING FREZOWANIE ROWKÓW (SZYBKOŚCIOWE)

*DOC - Deapth Of Cut Głębokość skrawania

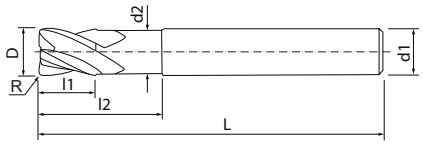
UFA45

TOROIDAL TOROIDALNE

3-Flute, Long Length with Neck 3-ostrzowe, długie ze zwężoną szyjką

HSM Vmax	F	M	30°	A						max	min		AIR
										○	●	●	●

P				H		M		K	N			S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
									○	○		●		





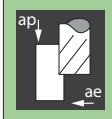
D code new Nowy kod	D code kod	R	D	d1	d2	L	l1	l2	Z	Shank Uchwyt
UFA45060005A06040080	UFA45060	0,5	6	6	5,9	80	10	40	4	A
UFA45080005A08040080	UFA45080	0,5	8	8	7,8	80	10	40	4	A
UFA45080010A08060100	UFA45081	1	8	8	7,8	100	10	60	4	A
UFA45100005A10000075	UFA45100	0,5	10	10	-	75	25		4	A
UFA45100005A10040080	UFA45101	0,5	10	10	9,8	80	12	40	4	A
UFA45100010A10040080	UFA45102	1	10	10	9,8	80	12	40	4	A
UFA45100005A10080125	UFA45103	0,5	10	10	9,8	125	12	80	4	A
UFA45120005A12000080	UFA45120	0,5	12	12	-	80	25		4	A
UFA45120005A12040080	UFA45121	0,5	12	12	11,8	80	15	40	4	A
UFA45120010A12040080	UFA45122	1	12	12	11,8	80	15	40	4	A
UFA45120010A12080125	UFA45123	1	12	12	11,8	125	15	80	4	A

µm	D 0 — -30	d1 h6

UFA45

Cutting Conditions Parametry skrawania

SIDE MILLING / FREZOWANIE OBWODOWE



	Aluminium alloys Stopy aluminium				Aluminium alloys Si<13% Stopy aluminium Si<13%				Magnesium alloys, Copper alloys Stopy magnezu i miedzi			
	FO		HFO		FO		HFO		FO		HFO	
d1 (mm)	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
3	21000	1430	40000	2730	21000	1430	24000	1620	7950	420	17000	810
4	15500	1620	32000	3310	15500	1620	19200	2010	5950	470	14300	1040
5	12500	1690	32000	4220	12500	1650	19200	2530	4750	500	12700	1200
6	10500	1820	26500	4550	10500	1820	15900	2790	3950	520	10600	1240
8	7950	1950	20000	4870	7950	1950	12000	2920	2950	590	8000	1460
10	6350	2210	16000	5590	6350	2210	9600	3350	2350	610	6350	1490
12	5300	2270	13300	5720	5300	2270	8000	3440	1950	660	5300	1620
16	3950	2270	10000	5720	3950	2270	6000	3440	1450	660	4000	1620
20	3150	2270	8000	5720	3150	2270	4800	3440	1150	660	3200	1620
DOC*	ae	ap	ae	ap	ae	ap	ae	ap	ae	ap	ae	ap
	0,2xd1	1xd1	0,1xd1	1xd1	0,2xd1	1xd1	0,1xd1	1xd1	0,2xd1	1xd1	0,1xd1	1xd1

(H)FO - (HIGH SPEED) SIDE MILLING FREZOWANIE OBWODOWE (SZYBKOŚCIOWE)

DOC* - Deapth Of Cut Głębokość skrawania

If the chip disposal is a grater concern then the surface finish on work material, the feed speed should be increased by 50%.
Use rigid and precise machine tool and toolholder.
Use water soluble cutting fluid.
Please adjust the speed and feed when the cutting depth is deep or when machine of low rigidity is used.
Please note the following points when machining Mg alloy:
To select appropriate cutting fluid, consult lubricant manufacturers.
Chips must be handled carefully, because they can cause a fire.

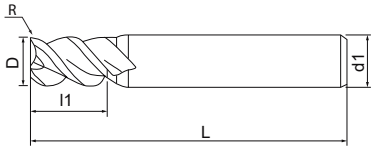
Jeżeli szybkość usuwania wiórów jest ważniejsza od jakości powierzchni obrobionej wyrobu, prędkość posuwu powinna być zwiększona o 50%.
Stosować sztywną i precyzyjną obrabiarkę i oprawkę narzędziową.
Używać chłodziwa rozpuszczalnego w wodzie.
Skorygować prędkość obrotową i posuw, gdy głębokość skrawania jest duża lub gdy używana jest obrabiarka o małej sztywności.
Przy obróbce stopów magnezu należy zwrócić uwagę na następujące punkty:
Aby wybrać odpowiednie chłodziwo skonsultować się z producentem środków smarujących.
Usuwać wióry ostrożnie, gdyż mogą spowodować pożar.

UFA56

TOROIDAL TOROIDALNE
3-Flute 3-ostrzowe

					HSM Vmax	M	R	40°	A				max	min		AIR
													○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
									○	○		●		





D code new Nowy kod	D code kod	R	D	d1	L	l1	Z	Shank Uchwyt
UFA56100004A10022075	UFA5610004	0.4	10	22	75	10	3	A
UFA56100005A10022075	UFA5610005	0.5	10	22	75	10	3	A
UFA56100007A10022075	UFA56100075	0.75	10	22	75	10	3	A
UFA56100008A10022075	UFA5610008	0.8	10	22	75	10	3	A
UFA56100010A10022075	UFA5610010	1	10	22	75	10	3	A
UFA56100012A10022075	UFA5610012	1.2	10	22	75	10	3	A
UFA56100015A10022075	UFA5610015	1.5	10	22	75	10	3	A
UFA56100020A10022075	UFA5610020	2	10	22	75	10	3	A
UFA56100025A10022075	UFA5610025	2.5	10	22	75	10	3	A
UFA56100030A10022075	UFA5610030	3	10	22	75	10	3	A
UFA56120005A12026075	UFA5612005	0.5	12	26	75	12	3	A
UFA56120010A12026075	UFA5612010	1	12	26	75	12	3	A
UFA56120015A12026075	UFA5612015	1.5	12	26	75	12	3	A
UFA56120020A12026075	UFA5612020	2	12	26	75	12	3	A
UFA56120030A12026075	UFA5612030	3	12	26	75	12	3	A
UFA56160010A16032100	UFA5616010	1	16	32	100	16	3	A
UFA56160015A16032100	UFA5616015	1.5	16	32	100	16	3	A
UFA56160020A16032100	UFA5616020	2	16	32	100	16	3	A
UFA56160030A16032100	UFA5616030	3	16	32	100	16	3	A
UFA56200010A20038105	UFA5620010	1	20	38	105	20	3	A
UFA56200015A20038105	UFA5620015	1.5	20	38	105	20	3	A
UFA56200020A20038105	UFA5620020	2	20	38	105	20	3	A
UFA56200030A20038105	UFA5620030	3	20	38	105	20	3	A

µm	D 0 — -30	d1 h6

UFA56

Cutting Conditions Parametry skrawania

SLOTTING / FREZOWANIE ROWKA

Work material materiał obrabiany	**Aluminum alloy expanding material** Stopy aluminium ciągliwe		**Aluminum alloy casting Si<13%** Stopy aluminium Si<13%	
Diameter / Średnica	**RPM**	**Mm/min**	**RPM**	**Mm/min**
3	40000	1450	24000	800
4	32000	1680	19200	1000
5	29000	2000	17500	1200
6	26500	2400	15900	1450
8	20000	2500	12000	1500
10	16000	2800	9600	1700
12	13300	2950	7980	1780
16	10000	3000	6000	1800
20	8000	3000	4800	1800
ap	ap=0,25D			

SIDE MILLING / FREZOWANIE OBWODOWE

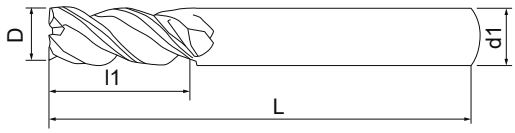
Work material materiał obrabiany	**Aluminum alloy expanding material** Stopy aluminium ciągliwe		**Aluminum alloy casting Si<13%** Stopy aluminium Si<13%		**Copper alloy** Stopy miedzi	
Diameter / Średnica	**RPM**	**Mm/min**	**RPM**	**Mm/min**	**RPM**	**Mm/min**
3	40000	2080	24000	1260	17000	620
4	32000	2550	19200	1550	14300	800
5	29000	3000	17500	1850	12500	880
6	26500	3500	15900	2150	10600	960
8	20000	3750	12000	2250	8000	1130
10	16000	4300	9600	2580	6350	1150
12	13300	4400	7980	2650	5300	1250
16	10000	4400	6000	2650	4000	1250
20	8000	4400	4800	2650	3200	1250
ap / ae	ap=1D ae=0,1D					

UFA68

TOROIDAL TOROIDALNE
3-Flute 3-ostrzowe

HSM Vmax	M	R	45°	A			max	min		AIR
							○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
									○	○		●		





D code new Nowy kod	D code kod	D	d1	L	l1	Z	Shank Uchwyt
UFA68080000A08019060	UFA68080	8	8	60	19	3	A
UFA68100000A10022075	UFA68100	10	10	75	22	3	A
UFA68120000A12026075	UFA68120	12	12	75	26	3	A
UFA68160000A16032100	UFA68160	16	16	100	32	3	A
UFA68200000A20038100	UFA68200	20	20	100	38	3	A

Cutting Conditions Parametry skrawania

SIDE MILLING / FREZOWANIE OBWODOWE

Work material Materiał obrabiany			Unalloyed aluminium Aluminium niestopowe		Aluminium alloys Si<6% Stopy aluminium Si<6%		Copper Stopy miedzi		Thermoplastics Tworzywa i materiały termo-plastyczne	
D	ap [mm]	ae [mm]	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
3	4,5	1,2	38000	3000	60000	4500	60000	4300	60000	5400
4	6,0	1,6	28000	3300	59000	6300	48000	4500	60000	7200
5	7,5	2,0	23000	3350	57000	7700	39000	4600	60000	9000
6	9,0	2,4	19000	3350	48000	7800	32000	4700	60000	10000
8	12,0	3,2	14000	3350	36000	7700	24000	4700	48000	11000
10	15,0	4,0	12000	3350	29000	7700	20000	4800	39000	11000
12	18,0	4,8	9500	2600	24000	7800	16000	4700	32000	11000
16	24,0	6,4	7000	3000	18000	7800	12000	4700	24000	11000
20	30,0	8,0	5500	2800	15000	7800	10000	4600	20000	11000
25	37,5	10,0	4500	2500	12000	7800	8000	4500	17000	10000

SLOTING / FREZOWANIE ROWKÓW

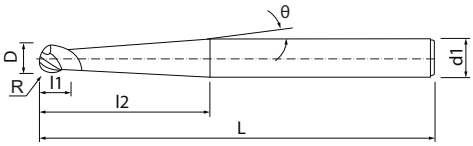
Work material Materiał obrabiany			Unalloyed aluminium Aluminium niestopowe		Aluminium alloys Si<6% Stopy aluminium Si<6%		Copper Stopy miedzi		Thermoplastics Tworzywa i materiały termo-plastyczne	
D	ap	ae	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
3	1,5	3	32000	1700	60000	3500	43000	1800	60000	3500
4	2,0	4	24000	1800	60000	4500	32000	1850	60000	4500
5	2,5	5	20000	2000	51000	4500	26000	1900	60000	6200
6	3,0	6	16000	1900	43000	4500	22000	1900	60000	7200
8	4,0	00	12000	1950	33000	4500	16000	2000	48000	7600
10	5,0	10	10000	1900	26000	4500	13000	2000	39000	7600
12	6,0	12	8000	1950	22000	4500	11000	2000	32000	7600
16	8,0	16	6000	1900	16000	4500	8000	2000	24000	7600
20	10,0	20	5000	1900	13000	4500	7000	2000	20000	7600
25	12,5	25	4000	1900	12000	4500	5500	1900	17000	7600

UFA46

BALL NOSE KULISTE
2-Flute 2-ostrzowe2

		HSM Vmax	F	M	30°	A						max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
									○	○		●		





D code new Nowy kod	D code kod	R	D	d1	θ	L	l1	l2	Z	Shank Uchwyt
UFA46010005A03000040	UFA46100	0,5	1	3	8°30′	40	2		2	A
UFA46010005A03030060	UFA46101	0,5	1	3	2°	60	2	30	2	A
UFA46010005A03070100	UFA46102	0,5	1	3	1°	100	2	70	2	A
UFA46015008A03000040	UFA46150	0,75	1,5	3	6°15′	40	3		2	A
UFA46015008A03030060	UFA46151	0,75	1,5	3	1°30′	60	3	30	2	A
UFA46015008A03058100	UFA46152	0,75	1,5	3	45′	100	3	58	2	A
UFA46020010A03000040	UFA46200	1	2	3	4°15′	40	4		2	A
UFA46020010A03030060	UFA46201	1	2	3	1°	60	4	30	2	A
UFA46020010A04070100	UFA46202	1	2	4	1°	100	4	70	2	A

Cutting Conditions Parametry skrawania

			Graphite Grafit	
d1 (mm)	**ae**	**ap**	**RPM**	**mm/min**
0,6	0,120	0,012	40000	840
0,8	0,160	0,016	40000	1000
1	0,200	0,020	40000	1260
1,2	0,240	0,024	40000	1470
1,5	0,300	0,030	40000	1680
2	0,400	0,040	40000	2100

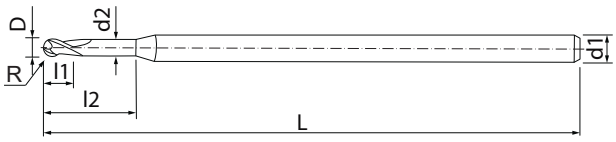
µm	D<2.0	0 — -15	R	± 0,01	
	D>2.0	0 — -20			
	d1 h6				

UFA47

BALL NOSE KULISTE
2-Flute, Micro 2-ostrzowe, mikro

		HSM Vmax	F	M	30°	A						max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
									○	○		●		





D code new Nowy kod	D code kod	R	D	d1	d2	L	l1	l2	Z	Shank Uchwyt
UFA47002001A03000040	UFA47020	0,1	0,2	3	-	40	0,2		2	A
UFA47003002A03000040	UFA47030	0,15	0,3	3	-	40	0,3		2	A
UFA47004002A03000040	UFA47040	0,2	0,4	3	-	40	0,4		2	A
UFA47005003A03003040	UFA47050	0,25	0,5	3	0,45	40	0,5	2,5	2	A
UFA47006003A03003040	UFA47060	0,3	0,6	3	0,55	40	0,6	3	2	A
UFA47006003A03005040	UFA47061	0,3	0,6	3	0,55	40	0,6	5	2	A
UFA47008004A03004040	UFA47080	0,4	0,8	3	0,75	40	0,8	4	2	A
UFA47008004A03007040	UFA47081	0,4	0,8	3	0,75	40	0,8	7	2	A
UFA47010005A03005040	UFA47100	0,5	1	3	0,95	40	1	5	2	A
UFA47010005A03009040	UFA47101	0,5	1	3	0,95	40	1	8,5	2	A
UFA47010005A03012040	UFA47102	0,5	1	3	0,95	40	1	12	2	A
UFA47012006A03006050	UFA47120	0,6	1,2	3	1,15	50	1,2	6	2	A
UFA47012006A03010050	UFA47121	0,6	1,2	3	1,15	50	1,2	10	2	A
UFA47015008A03008050	UFA47150	0,75	1,5	3	1,4	50	1,5	7,5	2	A
UFA47015008A03012050	UFA47151	0,75	1,5	3	1,4	50	1,5	12	2	A
UFA47015008A03018050	UFA47152	0,75	1,5	3	1,4	50	1,5	18	2	A
UFA47020010A03010060	UFA47200	1	2	3	1,9	60	2,2	10	2	A
UFA47020010A03016060	UFA47201	1	2	3	1,9	60	2,2	16	2	A
UFA47020010A03025060	UFA47202	1	2	3	1,9	60	2,2	25	2	A
UFA47030015A04010065	UFA47300	1,5	3	4	2,9	65	3	10	2	A
UFA47030015A04015065	UFA47301	1,5	3	4	2,9	65	3	15	2	A
UFA47030015A04020065	UFA47302	1,5	3	4	2,9	65	3	20	2	A
UFA47030015A04025075	UFA47303	1,5	3	4	2,9	75	3	25	2	A
UFA47030015A04030075	UFA47304	1,5	3	4	2,9	75	3	30	2	A
UFA47040020A06020065	UFA47400	2	4	6	3,9	65	4	20	2	A
UFA47040020A06030075	UFA47401	2	4	6	3,9	75	4	30	2	A
UFA47040020A06040090	UFA47402	2	4	6	3,9	90	4	40	2	A
UFA47050025A06020065	UFA47500	2,5	5	6	4,9	65	5	20	2	A
UFA47050025A06030075	UFA47501	2,5	5	6	4,9	75	5	30	2	A
UFA47050025A06040090	UFA47502	2,5	5	6	4,9	90	5	40	2	A
UFA47050025A06050090	UFA47503	2,5	5	6	4,9	90	5	50	2	A
UFA47060030A06030075	UFA47600	3	6	6	5,9	75	6	30	2	A
UFA47060030A06040090	UFA47601	3	6	6	5,9	90	6	40	2	A
UFA47060030A06050090	UFA47602	3	6	6	5,9	90	6	50	2	A
UFA47060030A06060100	UFA47603	3	6	6	5,9	100	6	60	2	A

µm	D<2.0	0 — -15	± 0,01	
	D>2.0	0 — -20		
	d1 h6			

UFA47

Cutting Conditions Parametry skrawania

CONVENTIONAL MILLING / FREZOWANIE KONWENCJONALNE

			**Aluminium alloys** Stopy aluminium		**Aluminium alloys Si<13%** Stopy aluminium Si<13%		**Magnesium alloys, Copper alloys** Stopy magnezu i miedzi	
d1 (mm)	**ae**	**ap**	**RPM**	**mm/min**	**RPM**	**mm/min**	**RPM**	**mm/min**
1	0,2	0,1	26000	760	26000	760	26000	760
2	0,4	0,2	25000	995	25000	995	19000	760
3	0,6	0,3	17000	995	17000	995	12500	760
4	0,8	0,4	12500	995	12500	995	9500	760
6	1,2	0,6	9100	995	9100	995	7200	760

HIGH-SPEED MILLING / FREZOWANIE SZYBKOŚCIOWE

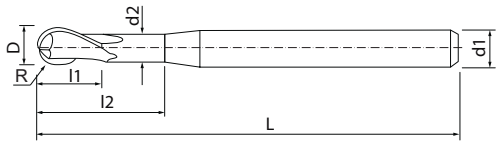
			**Aluminium alloys** Stopy aluminium		**Aluminium alloys Si<13%** Stopy aluminium Si<13%		**Magnesium alloys, Copper alloys** Stopy magnezu i miedzi			
d1 (mm)	**ae**	**ap**	**RPM**	**mm/min**	**RPM**	**mm/min**	**ae**	**ap**	**RPM**	**mm/min**
1	0,1	0,05	35000	990	28000	950	0,05	0,02	23000	850
2	0,2	0,1	35000	1330	28000	1140	0,1	0,04	23000	850
3	0,3	0,15	23000	1330	18500	1140	0,15	0,06	15000	850
4	0,4	0,2	17500	1330	14000	1140	0,2	0,08	11500	850
6	0,6	0,3	13300	1330	10500	1140	0,3	0,12	8800	850

UFA48

BALL NOSE KULISTE
2-Flute, Micro 2-ostrzowe, mikro

HSM Vmax	F	M	30°	A	max	min	AIR
					○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
									○	○		●		





D code new Nowy kod	D code kod	R	D	d1	d2	L	l1	l2	Z	Shank Uchwyt
UFA48020010A06005060	UFA48020	1	2	6	1,9	60	3	5	2	A
UFA48025013A06006060	UFA48025	1,25	2,5	6	2,4	60	4	6	2	A
UFA48030015A06007060	UFA48030	1,5	3	6	2,8	60	4,5	6,5	2	A
UFA48035018A06007065	UFA48035	1,75	3,5	6	3,2	65	5	7	2	A
UFA48040020A06008065	UFA48040	2	4	6	3,7	65	6	8	2	A
UFA48050025A06010065	UFA48050	2,5	5	6	4,6	65	7,5	10	2	A
UFA48060030A06012075	UFA48060	3	6	6	5,6	75	9	12	2	A
UFA48080040A08025075	UFA48080	4	8	8	7,4	75	12	25	2	A
UFA48100050A10030080	UFA48100	5	10	10	9,4	80	15	30	2	A
UFA48120060A12036090	UFA48120	6	12	12	11,4	90	18	36	2	A

µm	d1<2.0	0 — -30	± 0,01	
	d2 h6			

UFA48

Cutting Conditions Parametry skrawania

CONVENTIONAL MILLING / FREZOWANIE KONWENCJONALNE

			**Aluminium alloys** Stopy aluminium		**Aluminium alloys Si<13%** Stopy aluminium Si<13%		**Magnesium alloys, Copper alloys** Stopy magnezu i miedzi	
d1 (mm)	**ae**	**ap**	**RPM**	**mm/min**	**RPM**	**mm/min**	**RPM**	**mm/min**
2	0,4	0,2	31800	1470	31800	1470	23900	1090
3	0,6	0,3	21200	1470	21200	1470	15900	1090
4	0,8	0,4	15900	1470	15900	1470	11900	1090
6	1,2	0,6	10600	1520	10600	1520	7950	1090
8	1,6	0,8	7950	1850	7950	1850	5950	1375
10	2	1	6350	1660	6350	1660	4750	1235
12	2,4	1,2	5300	1565	5300	1565	3950	1140

HIGH-SPEED MILLING / FREZOWANIE SZYBKOŚCIOWE

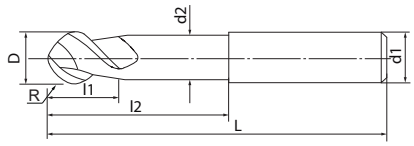
			**Aluminium alloys** Stopy aluminium		**Aluminium alloys Si<13%** Stopy aluminium Si<13%		**Magnesium alloys, Copper alloys** Stopy magnezu i miedzi			
d1 (mm)	**ae**	**ap**	**RPM**	**mm/min**	**RPM**	**mm/min**	**ae**	**ap**	**RPM**	**mm/min**
2	0,2	0,1	50000	2090	47700	1995	0,1	0,04	39800	1660
3	0,3	0,15	50000	3135	31800	1995	0,15	0,06	26500	1660
4	0,4	0,2	39800	3325	23800	1995	0,2	0,08	19900	1660
6	0,6	0,3	26500	3370	15900	2040	0,3	0,12	13000	1710
8	0,8	0,4	19500	4275	11900	2515	0,4	0,16	9900	2135
10	1	0,5	15500	3845	9550	2325	0,5	0,2	7950	1900
12	1,2	0,6	13000	3560	7950	2135	0,6	0,24	6600	1805

UFA10

BALL NOSE KULISTE
2-Flute, Short Length 2-ostrzowe, krótkie

HSM Vmax	F	M	30°	A							max	min		AIR
											○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
									○	○		●		





D code new Nowy kod	D code kod	R	D	d1	d2	L	l1	l2	Z	Shank Uchwyt
UFA10060030A06025055	UFA10060	3	6	6	5,4	55	5,5	25	2	A
UFA10080040A08030065	UFA10080	4	8	8	7,2	65	7	30	2	A
UFA10100050A10035075	UFA10100	5	10	10	9	75	8,5	35	2	A
UFA10120060A12040075	UFA10120	6	12	12	11	75	10,5	40	2	A
UFA10160080A16050090	UFA10160	8	16	16	14,5	90	14	50	2	A
UFA10200100A20050100	UFA10200	10	20	20	18	100	17	50	2	A

Cutting Conditions Parametry skrawania



			Aluminium and Magnesium Aluminium i Magnez		Aluminium alloys Stopy aluminium					
			Rm<200N/mm²		< 0,5% Si Rm<400N/mm²		0,5% - 10% Si Rm<400N/mm²		> 10% Si Rm<400N/mm²	
d1 (mm)	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
6	4,20	4,20	40000	5064	40000	5064	33727	4269	16862	1708
	0,60	0,30	40000	11748	40000	11748	40000	11748	38197	8975
	6,00	3,00	40000	5016	40000	5016	33461	4196	16730	1678
8	5,60	5,60	40000	6257	40000	6257	25295	3957	12626	1582
	0,80	0,40	40000	13200	40000	13200	40000	13200	28648	7563
	8,00	4,00	40000	6204	40000	6204	25096	3892	12548	1557
10	7,10	7,10	40000	8435	40000	8435	20053	4229	10027	1692
	1,00	0,50	40000	13640	40000	13640	40000	13640	22918	6252
	10,0	5,00	40000	8448	40000	8448	20076	4240	10038	1696
12	8,50	8,50	40000	10026	40000	10026	16722	4191	8361	1676
	1,20	0,60	40000	14520	40000	14520	38197	13866	19099	5546
	12,0	6,00	40000	10032	40000	10032	16730	4196	8365	1678
16	11,30	11,30	40000	12686	35831	11364	12560	3983	6280	1593
	1,60	0,80	40000	16632	40000	16632	28648	11912	14324	4765
	16,0	8,00	40000	12672	35810	11345	12548	3975	6274	1590
20	14,10	14,10	35872	14117	28689	11290	10062	3960	5031	1584
	2,00	1,00	40000	18480	40000	18480	22918	10588	11459	4235
	20,0	10,0	35821	14067	28648	11250	10038	3942	5019	1577

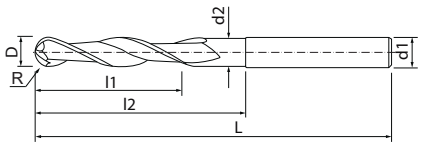
µm	D ±20		R	± 0,01	
	d1 h6				

UFA49

BALL NOSE KULISTE
2-Flute, Long Length 2-ostrzowe, długie

		HSM Vmax	F	M	30°	A						max	min		AIR
												○	●	●	●

P				H		M		K	N			S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
									○	○		●		

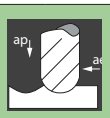




D code new Nowy kod	D code kod	R	D	d1	d2	L	l1	l2	Z	Shank Uchwyt
UFA49020010A04020080	UFA49020	1	2	4	1,95	80	10	20	2	A
UFA49030015A04025080	UFA49030	1,5	3	4	2,9	80	15	25	2	A
UFA49040020A04030080	UFA49040	2	4	4	3,9	80	20	30	2	A
UFA49050025A06050100	UFA49050	2,5	5	6	4,9	100	30	50	2	A
UFA49060030A06050100	UFA49060	3	6	6	5,5	100	30	50	2	A
UFA49070035A06000100	UFA49070	3,5	7	6	-	100	30		2	A
UFA49080040A08060110	UFA49080	4	8	8	7,5	110	40	60	2	A
UFA49090045A08000110	UFA49090	4,5	9	8	-	110	40		2	A
UFA49100050A10070120	UFA49100	5	10	10	9,5	120	50	70	2	A
UFA49120060A12075130	UFA49120	6	12	12	11,5	130	55	75	2	A

Cutting Conditions Parametry skrawania

CONVENTIONAL MILLING/ FREZOWANIE KONWENCJONALNE

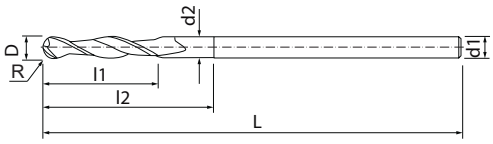
			Aluminium alloys Stopy aluminium		Aluminium alloys Si<13% Stopy aluminium Si<13%		Magnesium alloys, Copper alloys Stopy magnezu i miedzi	
d1 (mm)	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min
2	0,4	0,2	30210	1160	30210	1160	22705	860
3	0,6	0,3	20140	1160	20140	1160	15105	860
4	0,8	0,4	15105	1160	15105	1160	11305	860
6	1,2	0,6	10070	1200	10070	1200	7550	860
8	1,6	0,8	7550	1460	7550	1460	5650	1085
10	2	1	6030	1310	6030	1310	4510	975
12	2,4	1,2	5035	1235	5035	1235	3750	900

UFA50

BALL NOSE KULISTE
2-Flute, Long Reach 2-ostrzowe, bardzo długie

		HSM Vmax	F	M	30°	A						max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
									○	○		●		





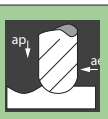
D code new Nowy kod	D code kod	R	D	d1	d2	L	l1	l2	Z	Shank Uchwyt
UFA50020010A04020100	UFA50020	1	2	4	1,95	100	10	20	2	A
UFA50030015A04025100	UFA50030	1,5	3	4	2,9	100	15	25	2	A
UFA50040020A04030100	UFA50040	2	4	4	3,9	100	20	30	2	A
UFA50050025A06050120	UFA50050	2,5	5	6	4,9	120	30	50	2	A
UFA50060030A06050150	UFA50060	3	6	6	5,5	150	30	50	2	A
UFA50070035A06000150	UFA50070	3,5	7	6	-	150	30		2	A
UFA50080040A08060150	UFA50080	4	8	8	7,5	150	40	60	2	A
UFA50090045A08000150	UFA50090	4,5	9	8	-	150	40		2	A
UFA50100050A10070180	UFA50100	5	10	10	9,5	180	50	70	2	A
UFA50120060A12075200	UFA50120	6	12	12	11,5	200	55	75	2	A

Cutting Conditions Parametry skrawania

CONVENTIONAL MILLING / FREZOWANIE KONWENCJONALNE

			Aluminium alloys Stopy aluminium		Aluminium alloys Si<13% Stopy aluminium Si<13%		Magnesium alloys, Copper alloys Stopy magnezu i miedzi	
d1 (mm)	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min
2	0,4	0,2	30210	1085	30210	1085	22705	860
3	0,6	0,3	20140	1085	20140	1085	15105	860
4	0,8	0,4	15105	1085	15105	1085	11305	860
6	1,2	0,6	10070	1120	10070	1120	7550	860
8	1,6	0,8	7550	1365	7550	1365	5650	1085
10	2	1	6030	1225	6030	1225	4510	975
12	2,4	1,2	5035	1155	5035	1155	3750	900

HIGH-SPEED MILLING / FREZOWANIE SZYBKOŚCIOWE

			Aluminium alloys Stopy aluminium		Aluminium alloys Si<13% Stopy aluminium Si<13%		Magnesium alloys, Copper alloys Stopy magnezu i miedzi			
d1 (mm)	ae	ap	RPM	mm/min	RPM	mm/min	ae	ap	RPM	mm/min
2	0,2	0,1	47500	1540	45315	1470	0,10	0,04	37810	1225
3	0,3	0,15	47500	2310	30210	1470	0,15	0,06	25175	1225
4	0,4	0,2	37810	2450	22610	1470	0,20	0,08	18905	1225
6	0,6	0,3	25175	2485	15105	1505	0,30	0,12	12350	1260
8	0,8	0,4	18525	3150	11305	1855	0,40	0,16	9405	1575
10	1	0,5	14725	2835	9070	1715	0,50	0,20	7550	1400
12	1,2	0,6	12350	2625	7550	1575	0,60	0,24	6270	1330

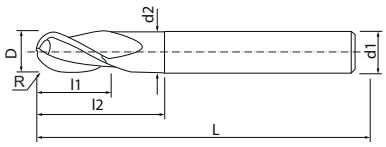
µm	D 0 — -30		R	± 0,01
	d1 h6			

UFA51

BALL NOSE KULISTE
3-Flute, Short Length 3-ostrzowe, krótkie

		HSM Vmax	F	M	25°	A						max	min		AIR
												○	●	●	●

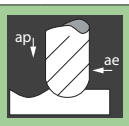
P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
									○	○		●		





D code new Nowy kod	D code kod	R	D	d1	d2	L	l1	l2	Z	Shank Uchwyt
UFA51020010A06005060	UFA51020	1	2	6	1,9	60	3	5	3	A
UFA51025013A06006060	UFA51025	1,25	2,5	6	2,4	60	4	6	3	A
UFA51030015A06007060	UFA51030	1,5	3	6	2,8	60	4,5	6,5	3	A
UFA51035018A06007065	UFA51035	1,75	3,5	6	3,2	65	5	7	3	A
UFA51040020A06008065	UFA51040	2	4	6	3,7	65	6	8	3	A
UFA51050025A06010065	UFA51050	2,5	5	6	4,6	65	7,5	10	3	A
UFA51060030A06012075	UFA51060	3	6	6	5,6	75	9	12	3	A
UFA51080040A08025075	UFA51080	4	8	8	7,4	75	12	25	3	A
UFA51100050A10030080	UFA51100	5	10	10	9,4	80	15	30	3	A
UFA51120060A12036090	UFA51120	6	12	12	11,4	90	18	36	3	A

Cutting Conditions Parametry skrawania



			Aluminium alloys Stopy aluminium		Aluminium alloys Si<13% Stopy aluminium Si<13%	
d1 (mm)	ae max	ap max	RPM	mm/min	RPM	mm/min
1,0	0,20	0,10	40000	3000	40000	2400
1,5	0,30	0,15	40000	3300	40000	2700
2,0	0,40	0,20	40000	4200	40000	3300
2,5	0,50	0,25	40000	4800	32000	3000
3,0	0,60	0,30	40000	6000	32000	3900
4,0	0,80	0,40	30000	6300	24000	4050
5,0	1,00	0,50	24000	6600	19000	4200
6,0	1,20	0,60	20000	6000	16000	3900
8,0	1,60	0,80	15000	5400	12000	3450
10,0	2,00	1,00	12000	5400	9600	3450
12,0	2,40	1,20	10000	4800	8000	3000

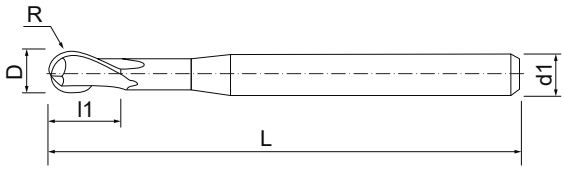
µm	D 0 — -30		R	± 0,01
	d1 h6			

UFA07

BALL NOSE KULISTE
2-Flute, Micro 2-ostrzowe, mikro

HSM Vmax	F	M	30°	A	max	min		AIR
					○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
									○	○		●		





D code new Nowy kod	D code kod	R	D	d1	L	l1	Z	Shank Uchwyt
UFA07010005A04050002	UFA07010	0,5	1	4	50	2	2	A
UFA07020010A04050004	UFA07020	1	2	4	50	4	2	A
UFA07030015A04050006	UFA07030	1,5	3	4	50	6	2	A
UFA07040020A04050008	UFA07040	2	4	4	50	8	2	A
UFA07050025A06050010	UFA07050	2,5	5	6	50	10	2	A
UFA07060030A06050012	UFA07060	3	6	6	50	12	2	A
UFA07080040A08060016	UFA07080	4	8	8	60	16	2	A
UFA07100050A10075020	UFA07100	5	10	10	75	20	2	A
UFA07120060A12075024	UFA07120	6	12	12	75	24	2	A

Cutting Conditions Parametry skrawania

CONVENTIONAL MILLING / FREZOWANIE KONWENCJONALNE

			Aluminium alloys Stopy aluminium		Aluminium alloys Si<13% Stopy aluminium Si<13%		Magnesium alloys, Copper alloys Stopy magnezu i miedzi	
d1 (mm)	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min
2	0,4	0,2	31800	1470	31800	1470	23900	1090
3	0,6	0,3	21200	1470	21200	1470	15900	1090
4	0,8	0,4	15900	1470	15900	1470	11900	1090
6	1,2	0,6	10600	1520	10600	1520	7950	1090
8	1,6	0,8	7950	1850	7950	1850	5950	1375
10	2	1	6350	1660	6350	1660	4750	1235
12	2,4	1,2	5300	1565	5300	1565	3950	1140

HIGH-SPEED MILLING / FREZOWANIE SZYBKOŚCIOWE

			Aluminium alloys Stopy aluminium		Aluminium alloys Stopy aluminium Si<13%		Magnesium alloys, Copper alloys Stopy magnezu i miedzi			
d1 (mm)	ae	ap	RPM	mm/min	RPM	mm/min	ae	ap	RPM	mm/min
2	0,2	0,1	50000	2090	47700	1995	0,1	0,04	39800	1660
3	0,3	0,15	50000	3135	31800	1995	0,15	0,06	26500	1660
4	0,4	0,2	39800	3325	23800	1995	0,2	0,08	19900	1660
6	0,6	0,3	26500	3370	15900	2040	0,3	0,12	13000	1710
8	0,8	0,4	19500	4275	11900	2515	0,4	0,16	9900	2135
10	1	0,5	15500	3845	9550	2325	0,5	0,2	7950	1900
12	1,2	0,6	13000	3560	7950	2135	0,6	0,24	6600	1805

µm	D 0 — -30		± 0,01	
	d1 h6			

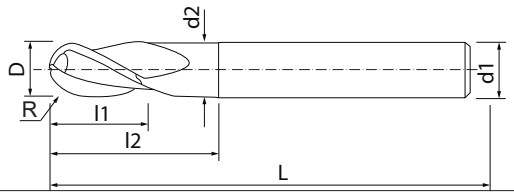
UFA08

BALL NOSE KULISTE

3-Flute, Micro 3-ostrzowe, mikro

			HSM Vmax	F	M	40°	A					max	min		AIR
												○	●	●	●

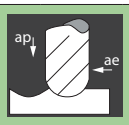
P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
									○	○		●		





D code new Nowy kod	D code kod	R	D	d1	d2	L	l1	l2	Z	Shank Uchwyt
UFA08020010A06005060		1	2	6	1,9	60	5	3	3	A
UFA08025013A06006060		1,25	2,5	6	2,4	60	6	4	3	A
UFA08030015A06007060		1,5	3	6	2,8	60	6,5	4,5	3	A
UFA08035018A06007065		1,75	3,5	6	3,2	65	7	5	3	A
UFA08040020A06008065		2	4	6	3,7	65	8	6	3	A
UFA08050025A06010065		2,5	5	6	4,6	65	10	7,5	3	A
UFA08060030A06012075		3	6	6	5,6	75	12	9	3	A
UFA08080040A08025075		4	8	8	7,4	75	25	12	3	A
UFA08100050A10030080		5	10	10	9,4	80	30	15	3	A
UFA08120060A12036090		6	12	12	11,4	90	36	18	3	A
UFA08160080A16040100		8	16	16	15,4	100	40	24	3	A

Cutting Conditions Parametry skrawania



d1 (mm)	ae max	ap max	Aluminium alloys Stopy aluminium RPM	Aluminium alloys Stopy aluminium mm/min	Copper alloy Stop miedzi RPM	Copper alloy Stop miedzi mm/min
2	1	0,4	27000	950	8000	240
2,5	1,25	0,5	22000	950	6500	240
3	1,5	0,6	18000	950	5500	240
4	2	0,8	18000	1250	5500	310
5	2,5	1	18000	1350	5500	340
6	3	1,2	18000	1750	5500	440
8	4	1,6	14000	2000	4200	500
10	5	2	14000	2350	4200	580
12	6	2,4	14000	3000	4200	750
16	8	3,2	11000	2700	330	670

µm	D 0 — -30		R	± 0,01	
	d1 h6				

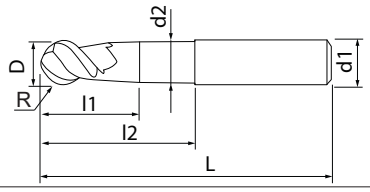
UFA15

BALL NOSE KULISTE

2-Flute WIth Neck 2-ostrzowe z zwężaną szyjką

HSM Vmax	F	M	50°	A					max	min		AIR
									○	•	•	•

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, SI <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
									•	•				





D code new Nowy kod	D code kod	R	D	d1	d2	L	l1	l2	Z	Shank Uchwyt
UFA15030000A06006006		3	6	6	5,4	55	5,5	25	2	A
UFA15040000A08008007		4	8	8	7,2	65	7	30	2	A
UFA15050000A10010009		5	10	10	9	75	8,5	35	2	A
UFA15060000A12012011		6	12	12	11	75	10,5	40	2	A
UFA15080000A16016014		8	16	16	14,5	90	14	50	2	A
UFA15100000A20020017		10	20	20	18	100	17	50	2	A

Cutting Conditions Parametry skrawania

Material Materiał	Aluminium, Aluminium alloys Aluminium, Stopy aluminium				Copper alloys Stopy miedzi			
d1 (mm)	RPM	FEED	ap(mm)	ae(mm)	RPM	FEED	ap(mm)	ae(mm)
R3,0 x 6,0	14400	1400	1,2	3	4400	350	1,2	3
R4,0 x 8,0	11200	1600	1,6	4	3360	400	1,6	4
R5,0 x 10,0	11200	1880	2	5	3360	465	2	5
R6,0 x 12,0	11200	2400	2,4	6	3360	600	2,4	6
R8,0 x 16,0	8800	2160	3,2	8	2640	535	3,2	8
R10,0 x 20,0	5600	1760	4	10	1680	440	4	10

µm	D ±0.02	
	d1 h6	

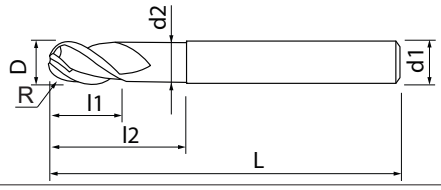
UFA31

BALL NOSE KULISTE

3-Flute WIth Neck 3-ostrzowe z zwężaną szyjką

HSM Vmax	F	M	40°	A					max	min		AIR
									○	●	●	●

P				H		M		K	N			S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, SI <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
									●	●				





D code new Nowy kod	D code kod	R	D	d1	d2	L	l1	l2	Z	Shank Uchwyt
UFA31010000A02006003		1	2	6	1,9	60	3	5	3	A
UFA31013000A02506004		1,25	2,5	6	2,4	60	4	6	3	A
UFA31015000A03006005		1,5	3	6	2,8	60	4,5	6,5	3	A
UFA31018000A03506005		1,75	3,5	6	3,2	65	5	7	3	A
UFA31020000A04006006		2	4	6	3,7	65	6	8	3	A
UFA31025000A05006008		2,5	5	6	4,6	65	7,5	10	3	A
UFA31030000A06006009		3	6	6	5,6	75	9	12	3	A
UFA31040000A08008012		4	8	8	7,4	75	12	25	3	A
UFA31050000A10010015		5	10	10	9,4	80	15	30	3	A
UFA31060000A12012018		6	12	12	11,4	90	18	36	3	A
UFA31080000A16016024		8	16	16	15,4	100	24	40	3	A

Cutting Conditions Parametry skrawania

Material Materiał	Aluminium, Aluminium alloys Aluminium, Stopy aluminium				Copper alloys Stopy miedzi			
d1 (mm)	RPM	FEED	ap(mm)	ae(mm)	RPM	FEED	ap(mm)	ae(mm)
R1,0 x 2,0	21600	760	0,4	1	6400	190	0,4	1
R1,25 x 2,5	17600	760	0,5	1,25	5200	190	0,5	1,25
R1,5 x 3,0	14400	760	0,6	1,5	4400	190	0,6	1,5
R1,75 x 3,5	14400	800	0,7	1,75	4400	190	0,7	1,75
R2,0 x 4,0	14400	1000	0,8	2	4400	250	0,8	2
R2,5 x 5,0	14400	1080	1	2,5	4400	270	1	2,5
R3,0 x 6,0	14400	1400	1,2	3	4400	350	1,2	3
R4,0 x 8,0	11200	1600	1,6	4	3360	400	1,6	4
R5,0 x 10,0	11200	1880	2	5	3360	465	2	5
R6,0 x 12,0	11200	2400	2,4	6	3360	600	2,4	6
R8,0 x 16,0	8800	2160	3,2	8	2640	535	3,2	8

µm	D 0 — 0,03	
	d1 h6	

UFC

UFC END MILLS
UFC END MILLS



UFC END MILLS are designed for HSM and dry machining of copper.

FREZY UFC zalecane są przede wszystkim do obróbki szybkościowej (OS) na sucho miedzi.

TIZ IMPLEMENTS

DESCRIPTION - UFC OPIS - UFC

UFC END Mills are designed for HSM and dry machining of copper.

NOTE:

- If the rigidity of the machine or the work material installation is very low, or chattering and noise is generated, please reduce RPM and FEED rate proportionally.
- Cutting conditions may be considerably different due to the tool overhang, depth of cut, and machining tool condition, please use the catalogue cutting parameters as a reference starting point.
- If the depth of cut is shallow, the RPM and FEED rate can be increased.
- A high-speed spindle is recommended, when using a reduced RPM, the FEED rate must be reduced proportionally.
- High pressure coolant and air blow are recommended to dispose of chips efficiency.
- Use a rigid machine and work clamping method.
- Down (climb) cutting is recommended.
- We recommend that you set the width of cut as small as possible (about 5% of dia.) and divide the machining into several passes and work on high cutting parameters. There will be much higher tool life and surface roughness.
- When drilling, please set the FEED rate 30% below the normal rate.

UWAGA:

- Jeżeli sztywność obrabiarki lub mocowanie obrabianego przedmiotu nie są wystarczające lub występują wibracje i nadmierny hałas, należy proporcjonalnie zmniejszyć obroty i posuw.
- Parametry skrawania mogą być różne w zależności od długości narzędzia wystającego z oprawki, głębokości skrawania oraz stanu obrabiarki. Proszę stosować parametry skrawania podane w katalogu jako wyjściowy punkt odniesienia.
- Przy zmniejszeniu głębokości skrawania, obroty i posuw mogą być zwiększone.
- Zalecane jest stosowanie wysokoobrotowych obrabiarek, w przypadku mniejszych prędkości obrotowych, posuw powinien być zmniejszony proporcjonalnie.
- Dla efektywnego odprowadzania wiórów zalecane jest stosowanie nadmuchu powietrza lub chłodziwa pod dużym ciśnieniem.
- Zalecane jest stosowanie sztywnych obrabiarek oraz systemów mocowania.
- Zalecane jest frezowanie współbieżne.
- Zalecamy stosowanie możliwie najmniejszej szerokości skrawania - około 5% średnicy roboczej narzędzia i podzielenie operacji obróbki na kilka przejść przy większych parametrach skrawania, co znacznie wydłuży żywotność narzędzia oraz polepszy jakość obrabianej powierzchni.
- Przy zagłębianiu zalecane jest ustawienie posuwu wgłębnego na poziomie o 30% mniejszym od posuwu roboczego.

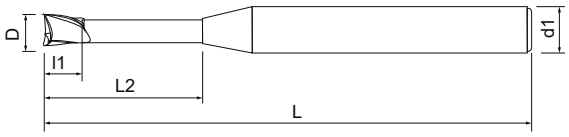
EDP No.		Z	Angle Kąt	Materials Materiały	D / R	Pag. / Str.
UFC13		2	30°	N	D 0,5 - 4	4 - 5
UFC14		2	30°	N	D 1 - 12	6 - 7
UFC64		2	30°	N	D 2 - 12	8 - 9
UFC10		2	30°	N	R 0,25 - 6	10 - 11
UFC11		2	30°	N	R 0,5 - 6	12
UFC33		2	30°	N	D 0,6 - 4	13 - 14
UFC32		2	30°	N	D 0,5 - 6	15 - 16
UFC12		2	30°	N	D 1,0 - 12	17 - 18

UFC13

SQUARE TYPE WALCOWO-CZOŁOWE
2-Flute 2-ostrzowe

		HSM Vmax	F	M	30°	A						max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, SI <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
									○	○	●			





D code Kod	D	d1	L	l1	l2	Z	Shank Uchwyt
UFC13005000A04002045	0.5	4	45	0.7	2	2	A
UFC13005000A04004045	0.5	4	45	0.7	4	2	A
UFC13005000A04006045	0.5	4	45	0.7	6	2	A
UFC13005000A04008045	0.5	4	45	0.7	8	2	A
UFC13005000A04010045	0.5	4	45	0.7	10	2	A
UFC13006000A04002045	0.6	4	45	0.9	2	2	A
UFC13006000A04004045	0.6	4	45	0.9	4	2	A
UFC13006000A04006045	0.6	4	45	0.9	6	2	A
UFC13006000A04008045	0.6	4	45	0.9	8	2	A
UFC13006000A04010045	0.6	4	45	0.9	10	2	A
UFC13008000A04004045	0.8	4	45	1.2	4	2	A
UFC13008000A04006045	0.8	4	45	1.2	6	2	A
UFC13008000A04008045	0.8	4	45	1.2	8	2	A
UFC13008000A04010045	0.8	4	45	1.2	10	2	A
UFC13008000A04012045	0.8	4	45	1.2	12	2	A
UFC13010000A04004045	1.0	4	45	1.5	4	2	A
UFC13010000A04006045	1.0	4	45	1.5	6	2	A
UFC13010000A04008045	1.0	4	45	1.5	8	2	A
UFC13010000A04010045	1.0	4	45	1.5	10	2	A
UFC13010000A04012045	1.0	4	45	1.5	12	2	A
UFC13015000A04006045	1.5	4	45	2.3	6	2	A
UFC13015000A04008045	1.5	4	45	2.3	8	2	A
UFC13015000A04010045	1.5	4	45	2.3	10	2	A
UFC13015000A04012045	1.5	4	45	2.3	12	2	A
UFC13015000A04016050	1.5	4	50	2.3	16	2	A
UFC13020000A04008045	2.0	4	45	3	8	2	A
UFC13020000A04010045	2.0	4	45	3	10	2	A
UFC13020000A04012045	2.0	4	45	3	12	2	A
UFC13020000A04016050	2.0	4	50	3	16	2	A
UFC13030000A06008050	3.0	6	50	4.5	8	2	A
UFC13030000A06010050	3.0	6	50	4.5	10	2	A
UFC13030000A06012050	3.0	6	50	4.5	12	2	A
UFC13030000A06016060	3.0	6	60	4.5	16	2	A
UFC13030000A06020060	3.0	6	60	4.5	20	2	A
UFC13040000A06010050	4.0	6	50	6	10	2	A
UFC13040000A06012050	4.0	6	50	6	12	2	A
UFC13040000A06016060	4.0	6	60	6	16	2	A
UFC13040000A06020060	4.0	6	60	6	20	2	A
UFC13040000A06025060	4.0	6	60	6	25	2	A
UFC13060000A06020060	6.0	6	60	8	20	2	A
UFC13060000A06030090	6.0	6	90	8	30	2	A
UFC13080000A08020070	8.0	8	70	12	20	2	A
UFC13100000A10025080	10.0	10	80	15	25	2	A
UFC13120000A12025080	12.0	12	80	18	25	2	A

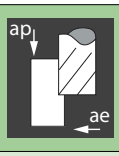
UFC13

Cutting Conditions Parametry skrawania

SLOTTING / FREZOWANIE ROWKÓW

	**Aluminiuim** Aluminium		**Unalloyed Copper** Miedź niestopowa		**Thermoplasitcs** Termoplastic	
d1 (mm)	**RPM**	**FEED**	**RPM**	**FEED**	**RPM**	**FEED**
0.5	50000	160	50000	160	50000	140
0.6	50000	200	50000	190	50000	170
0.8	50000	260	43000	225	50000	220
1.0	50000	330	35000	230	50000	280
2.0	25400	330	12700	165	38100	429
3.0	17600	530	8700	265	26100	689
4.0	13000	560	6500	280	19500	728
6.0	8700	560	4350	280	13050	728
8.0	6600	560	3300	280	9900	728
10.0	5200	560	2600	280	7800	728
12.0	4400	570	2200	285	6600	741
ap=0.5D ae=D						

SIDE CUTTING / FREZOWANIE OBWODOWE

	**Aluminiuim** Aluminium		**Unalloyed Copper** Miedź niestopowa		**Thermoplasitcs** Termoplastic	
d1 (mm)	**RPM**	**FEED**	**RPM**	**FEED**	**RPM**	**FEED**
0.5	50000	170	50000	160	50000	130
0.6	50000	210	45000	175	50000	160
0.8	50000	280	34000	170	50000	210
1.0	50000	288	27500	180	50000	263
2.0	25400	288	13700	180	27400	288
3.0	17600	456	9300	285	18600	456
4.0	13000	480	7000	300	14000	480
6.0	8700	512	4800	320	9600	512
8.0	6600	480	3500	300	7000	480
10.0	5200	480	2800	300	5600	480
12.0	4400	512	2400	320	4800	512
ap=1D ae=0,5D						

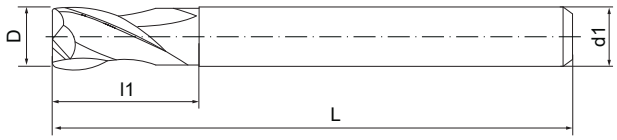
UFC14

SQUARE TYPE WALCOWO-CZOŁOWE

2-Flute 2-ostrzowe

		HSM Vmax	F	M	30°	A						max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
									○	○	●			



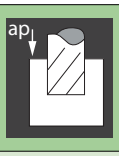


D code Kod	D	d1	L	l1	Z	Shank Uchwyt
UFC14010000A06003050	1	6	50	2,5	2	A
UFC14015000A06004050	1,5	6	50	4	2	A
UFC14020000A06006050	2	6	50	6	2	A
UFC14025000A06008050	2,5	6	50	8	2	A
UFC14030000A06010050	3	6	50	10	2	A
UFC14040000A06012050	4	6	50	12	2	A
UFC14050000A06015060	5	6	60	15	2	A
UFC14060000A06015060	6	6	60	15	2	A
UFC14080000A08020065	8	8	65	20	2	A
UFC14100000A10025070	10	10	70	25	2	A
UFC14120000A12030080	12	12	80	30	2	A

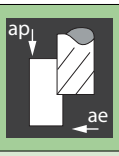
UFC14

Cutting Conditions Parametry skrawania

SLOTTING / FREZOWANIE ROWKÓW

	**Aluminiuim** Aluminium		**Unalloyed Copper** Miedź niestopowa		**Thermoplasitcs** Termoplastic	
d1 (mm)	**RPM**	**FEED**	**RPM**	**FEED**	**RPM**	**FEED**
0.5	50000	160	50000	160	50000	140
0.6	50000	200	50000	190	50000	170
0.8	50000	260	43000	225	50000	220
1.0	50000	330	35000	230	50000	280
2.0	25400	330	12700	165	38100	429
3.0	17600	530	8700	265	26100	689
4.0	13000	560	6500	280	19500	728
6.0	8700	560	4350	280	13050	728
8.0	6600	560	3300	280	9900	728
10.0	5200	560	2600	280	7800	728
12.0	4400	570	2200	285	6600	741
ap=0.5D ae=D						

SIDE CUTTING / FREZOWANIE OBWODOWE

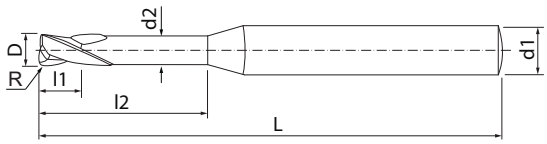
	**Aluminiuim** Aluminium		**Unalloyed Copper** Miedź niestopowa		**Thermoplasitcs** Termoplastic	
d1 (mm)	**RPM**	**FEED**	**RPM**	**FEED**	**RPM**	**FEED**
0.5	50000	170	50000	160	50000	130
0.6	50000	210	45000	175	50000	160
0.8	50000	280	34000	170	50000	210
1.0	50000	288	27500	180	50000	263
2.0	25400	288	13700	180	27400	288
3.0	17600	456	9300	285	18600	456
4.0	13000	480	7000	300	14000	480
6.0	8700	512	4800	320	9600	512
8.0	6600	480	3500	300	7000	480
10.0	5200	480	2800	300	5600	480
12.0	4400	512	2400	320	4800	512
ap=1D ae=0,5D						

UFC64

TOROIDAL TOROIDALNE
2-Flute 2-ostrzowe

		HSM Vmax	F	M	30°	A						max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
									○	○	●			





D code Kod	D code kod	R	D	d1	d2	L	l1	l2	Z	Shank Uchwyt
UFC640206A06006055	UFC64912	0,3	2	6	1,95	55	3	6	2	A
UFC640206A06010055	UFC64913	0,3	2	6	1,95	55	3	10	2	A
UFC640207A06006055	UFC64914	0,5	2	6	1,95	55	3	6	2	A
UFC640208A06010055	UFC64020	0,5	2	6	1,95	55	3	10	2	A
UFC640209A06014055	UFC64916	0,5	2	6	1,95	55	3	14	2	A
UFC6403010A06010055	UFC64030	0,5	3	6	2,85	55	4	10	2	A
UFC6403011A06012055	UFC64915	0,5	3	6	2,85	55	4	12	2	A
UFC6403012A06016055	UFC64901	0,5	3	6	2,85	55	4	16	2	A
UFC6403013A06020055	UFC64902	0,5	3	6	2,85	55	4	20	2	A
UFC6404014A06012055	UFC64040	0,5	4	6	3,85	55	5	12	2	A
UFC6404015A06016055	UFC64903	0,5	4	6	3,85	55	5	16	2	A
UFC6404016A06020055	UFC64904	0,5	4	6	3,85	55	5	20	2	A
UFC6406017A06020060	UFC64060	0,5	6	6	5,85	60	7	20	2	A
UFC6406018A06020060	UFC64905	1	6	6	5,85	60	7	20	2	A
UFC6406019A06020060	UFC64906	1,5	6	6	5,85	60	7	20	2	A
UFC6408020A08025060	UFC64911	0,5	8	8	7,7	60	9	25	2	A
UFC6408021A08025060	UFC64080	1	8	8	7,7	60	9	25	2	A
UFC6408022A08025060	UFC64907	1,5	8	8	7,7	60	9	25	2	A
UFC6410023A10032070	UFC64100	1	10	10	9,7	70	11	32	2	A
UFC6410024A10032070	UFC64908	1,5	10	10	9,7	70	11	32	2	A
UFC6412025A12038080	UFC64910	0,5	12	12	11,7	80	12	38	2	A
UFC6412026A12038080	UFC64120	1	12	12	11,7	80	12	38	2	A
UFC6412027A12038080	UFC64909	1,5	12	12	11,7	80	12	38	2	A

µm	D≤6	0 — -12	R	D≤6	±0,010
	D>6	0 — -15		D>6	±0,015

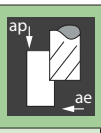
UFC64

Cutting Conditions Parametry skrawania

SLOTTING / FREZOWANIE ROWKÓW

			**Wrought Aluminium** Aluminium przerabiane plastycznie		**Non-alloyed Copper** Miedź niestopowa		**Thermoplastics** Tworzywa sztuczne termoplastyczne	
d1 (mm)	**ae**	**ap**	**RPM**	**mm/min**	**RPM**	**mm/min**	**RPM**	**mm/min**
3	3	1,5	50000	2730	44500	2465	50000	2205
4	4	2	50000	3870	33400	2205	50000	2730
6	6	3	44500	4905	22300	2205	50000	4410
8	8	4	33400	4790	16700	2205	50000	5985
10	10	5	26700	5010	13370	2205	40000	5775
12	12	6	22200	4895	11100	2205	33500	5880
16	16	8	16700	4965	8350	2205	25000	5775
20	20	10	13400	4885	6700	2205	20000	5880
25	25	12,5	10700	4935	5350	2205	16000	5775

SIDE MILLING / FREZOWANIE OBWOD

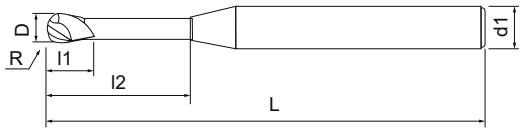
			**Wrought Aluminium** Aluminium przerabiane plastycznie		**Non-alloyed Copper** Miedź niestopowa		**Thermoplastics** Tworzywa sztuczne termoplastyczne	
d1 (mm)	**ae**	**ap**	**RPM**	**mm/min**	**RPM**	**mm/min**	**RPM**	**mm/min**
3	1,5	3	50000	4410	50000	3885	50000	3885
4	2	4	50000	5565	50000	4935	50000	5250
6	3	6	50000	8245	33400	5145	50000	7875
8	4	8	37500	8245	25000	4935	50000	8820
10	5	10	30000	8245	20000	5040	40000	8820
12	6	12	25000	8245	16700	4935	33500	8820
16	8	16	18500	6510	12500	4935	25000	8820
20	10	20	15000	7560	10000	4935	20000	8820
25	12,5	25	12000	6985	8000	4935	16000	8820

UFC10

BALLNOSE KULISTE
2-Flute 2-ostrzowe

		HSM Vmax	F	M	30°	A						max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, SI <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
									○	○	●			





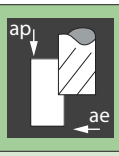
D code Kod	R	D	d1	L	l1	l2	Z	Shank Uchwyt
UFC10005003A04002045	0,25	0,5	4	45	0,5	2	2	A
UFC10005003A04004045	0,25	0,5	4	45	0,5	4	2	A
UFC10005003A04006045	0,25	0,5	4	45	0,5	6	2	A
UFC10005003A04008045	0,25	0,5	4	45	0,5	8	2	A
UFC10005003A04010045	0,25	0,5	4	45	0,5	10	2	A
UFC10006003A04002045	0,3	0,6	4	45	0,6	2	2	A
UFC10006003A04004045	0,3	0,6	4	45	0,6	4	2	A
UFC10006003A04006045	0,3	0,6	4	45	0,6	6	2	A
UFC10006003A04008045	0,3	0,6	4	45	0,6	8	2	A
UFC10006003A04010045	0,3	0,6	4	45	0,6	10	2	A
UFC10008004A04004045	0,4	0,8	4	45	0,8	4	2	A
UFC10008004A04006045	0,4	0,8	4	45	0,8	6	2	A
UFC10008004A04008045	0,4	0,8	4	45	0,8	8	2	A
UFC10008004A04010045	0,4	0,8	4	45	0,8	10	2	A
UFC10008004A04012045	0,4	0,8	4	45	0,8	12	2	A
UFC10010005A04004045	0,5	1	4	45	1	4	2	A
UFC10010005A04006045	0,5	1	4	45	1	6	2	A
UFC10010005A04008045	0,5	1	4	45	1	8	2	A
UFC10010005A04010045	0,5	1	4	45	1	10	2	A
UFC10010005A04012045	0,5	1	4	45	1	12	2	A
UFC10015008A04006045	0,75	1,5	4	45	1,5	6	2	A
UFC10015008A04008045	0,75	1,5	4	45	1,5	8	2	A
UFC10015008A04010045	0,75	1,5	4	45	1,5	10	2	A
UFC10015008A04012045	0,75	1,5	4	45	1,5	12	2	A
UFC10015008A04016050	0,75	1,5	4	50	1,5	16	2	A
UFC10020010A04006045	1	2	4	45	3	6	2	A
UFC10020010A04008045	1	2	4	45	3	8	2	A
UFC10020010A04010045	1	2	4	45	3	10	2	A
UFC10020010A04012045	1	2	4	45	3	12	2	A
UFC10020010A04016050	1	2	4	50	3	16	2	A
UFC10030015A06010050	1,5	3	6	50	4	10	2	A
UFC10030015A06012050	1,5	3	6	50	4	12	2	A
UFC10030015A06016060	1,5	3	6	60	4	16	2	A
UFC10030015A06020060	1,5	3	6	60	4	20	2	A
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UFC10040020A06016060	2	4	6	60	5	16	2	A
UFC10040020A06020060	2	4	6	60	5	20	2	A
UFC10040020A06025060	2	4	6	60	5	25	2	A
UFC10060030A06020060	3	6	6	60	8	20	2	A
UFC10060030A06030090	3	6	6	90	8	30	2	A
UFC10080040A08020070	4	8	8	70	10	20	2	A
UFC10100050A10025080	5	10	10	80	12	25	2	A
UFC10120060A12025080	6	12	12	80	14	25	2	A

µm	d1 h6		R	±0,005	

UFC10

Cutting Conditions Parametry skrawania

SLOTTING / FREZOWANIE ROWKÓW

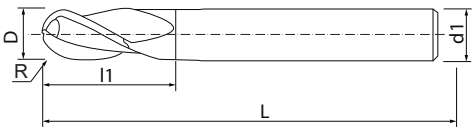
	**Aluminiuim** Aluminium		**Unalloyed Copper** Miedź niestopowa		**Thermoplasitcs** Termoplastic	
d1 (mm)	**RPM**	**FEED**	**RPM**	**FEED**	**RPM**	**FEED**
0.5	50000	500	50000	500	50000	380
0.6	50000	700	50000	650	50000	450
0.8	50000	850	44000	770	50000	600
1.0	50000	1000	35000	770	50000	630
2.0	39600	1716	19800	780	50000	1250
3.0	26000	1584	13000	720	39000	1512
4.0	19000	1606	9500	730	28500	1533
5.0	15400	1606	7700	730	23100	1533
6.0	13000	1584	6500	720	19500	1512
8.0	10000	1584	5000	720	15000	1512
10.0	8000	1606	4000	730	12000	1533
12.0	6600	1606	3300	730	9900	1533
ap=0.02D ae=0.05D						

UFC11

BALLNOSE KULISTE
2-Flute 2-ostrzowe

		HSM Vmax	F	M	30°	A						max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
									○	○	●			

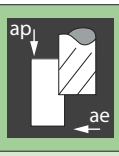




D code Kod	R	D	d1	L	l1	Z	Shank Uchwyt
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UFC11015008A06004050	0,75	1,5	6	50	4	2	A
UFC11020010A06005050	1	2	6	50	5	2	A
UFC11030015A06008060	1,5	3	6	60	8	2	A
UFC11040020A06008070	2	4	6	70	8	2	A
UFC11050025A06012090	2,5	5	6	90	12	2	A
UFC11060030A06012090	3	6	6	90	12	2	A
UFC11080040A08018100	4	8	8	100	16	2	A
UFC11100050A10020100	5	10	10	100	20	2	A
UFC11120060A12025110	6	12	12	110	25	2	A

Cutting Conditions Parametry skrawania

SLOTTING / FREZOWANIE ROWKÓW



	Aluminiuim Aluminium		**Unalloyed Copper** Miedź niestopowa		**Thermoplasitcs** Termoplastic	
d1 (mm)	**RPM**	**FEED**	**RPM**	**FEED**	**RPM**	**FEED**
1.0	50000	1000	42000	930	50000	750
2.0	47520	2068	24000	940	50000	1500
3.0	31200	1914	15800	870	47400	1800
4.0	22800	1936	11500	880	34500	1825
5.0	18500	1936	9300	880	28000	1825
6.0	15600	1892	7800	860	23500	1800
8.0	12000	1892	6000	860	18000	1800
10.0	9600	1936	4800	880	14500	1825
12.0	8000	1914	4000	870	12000	1825
8.0	10000	1584	5000	720	15000	1512
10.0	8000	1606	4000	730	12000	1533
12.0	6600	1606	3300	730	9900	1533
ap=0.02D ae=0.05D						

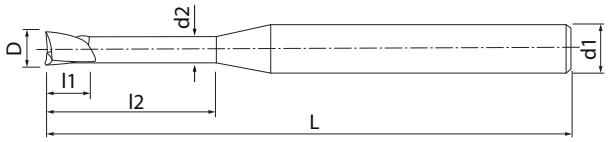
UFC33

FOR RIB PROCESSING DO ŻEBER

2-Flute 2-ostrzowe

		HSM Vmax	F	M	30°	A						max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
									○	○	●			





D code Kod	D code kod	D	d1	d2	L	l1	l2	Z	Shank Uchwyt
UFC3300630A04004040	UFC33604	0,6	4	-	40	0,9	4	2	A
UFC3300631A04006040	UFC33606	0,6	4	-	40	0,9	6	2	A
UFC3300832A04006040	UFC33806	0,8	4	-	40	1,2	6	2	A
UFC3300833A04008040	UFC33808	0,8	4	-	40	1,2	8	2	A
UFC3301034A06000060	UFC33100	1	6	-	60	2,5		2	A
UFC3301035A04004045	UFC33104	1	4	0,95	45	1,5	4	2	A
UFC3301036A04006045	UFC33106	1	4	0,95	45	1,5	6	2	A
UFC3301037A04008045	UFC33108	1	4	0,95	45	1,5	8	2	A
UFC3301038A04010045	UFC33110	1	4	0,95	45	1,5	10	2	A
UFC3301539A06000060	UFC33150	1,5	6	-	60	4		2	A
UFC3301540A04006045	UFC33156	1,5	4	1,45	45	2,5	6	2	A
UFC3301541A04008045	UFC33158	1,5	4	1,45	45	2,5	8	2	A
UFC3301542A04010045	UFC33151	1,5	4	1,45	45	2,5	10	2	A
UFC3301543A04012045	UFC33152	1,5	4	1,45	45	2,5	12	2	A
UFC3301544A04016050	UFC33157	1,5	4	1,45	50	2,5	16	2	A
UFC3302045A06000060	UFC33200	2	6	-	60	5		2	A
UFC3302046A04006045	UFC33206	2	4	1,95	45	3	6	2	A
UFC3302047A04008045	UFC33208	2	4	1,95	45	3	8	2	A
UFC3302048A04010045	UFC33201	2	4	1,95	45	3	10	2	A
UFC3302049A04012045	UFC33202	2	4	1,95	45	3	12	2	A
UFC3302050A04014045	UFC33204	2	4	1,95	45	3	14	2	A
UFC3302051A04016050	UFC33216	2	4	1,95	50	3	16	2	A
UFC3303052A06000060	UFC33300	3	6	-	60	8		2	A
UFC3303053A04010050	UFC33310	3	4	2,85	50	4,5	10	2	A
UFC3303054A04012050	UFC33312	3	4	2,85	50	4,5	12	2	A
UFC3303055A04016050	UFC33316	3	4	2,85	50	4,5	16	2	A
UFC3303056A04020050	UFC33320	3	4	2,85	50	4,5	20	2	A
UFC3304057A06000070	UFC33400	4	6	-	70	10		2	A
UFC3304058A06012060	UFC33412	4	6	3,85	60	6	12	2	A
UFC3304059A06016060	UFC33416	4	6	3,85	60	6	16	2	A
UFC3304060A06020060	UFC33420	4	6	3,85	60	6	20	2	A
UFC3304061A06026070	UFC33426	4	6	3,85	70	6	26	2	A

µm	D≤6	0 — -12
	D>6	0 — -15

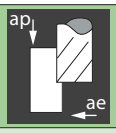
UFC33

Cutting Conditions Parametry skrawania

SLOTTING / FREZOWANIE ROWKÓW

			**Unalloyed Copper** Miedź niestopowa	
d1 (mm)	**ae**	**ap**	**RPM**	**mm/min**
1	1	0,1	35000	240
1,5	1,5	0,15	17000	180
2	2	0,2	12700	175
3	3	0,3	8700	280
4	4	0,4	6500	295
6	6	0,6	4300	315

SIDE MILLING / FREZOWANIE OBWOD

			**Unalloyed Copper** Miedź niestopowa	
d1 (mm)	**ae**	**ap**	**RPM**	**mm/min**
1	0,05	1,5	27500	190
1,5	0,075	2,25	18000	185
2	0,1	3	13700	190
3	0,15	4,5	9300	300
4	0,2	6	7000	315
6	0,3	7,5	4600	335

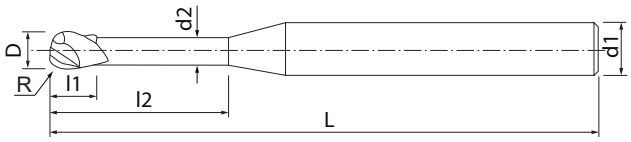
UFC32

FOR RIB PROCESSING DO ŻEBER

2-Flute 2-ostrzowe

		HSM Vmax	F	M	30°	A						max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
									○	○	●			



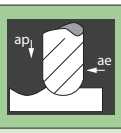


D code Kod	D code kod	D	d1	d2	L	l1	l2	Z	Shank Uchwyt
UFC3200564A04002045	UFC320502	0,5	4	0,45	45	0,75	2	2	A
UFC3200565A04006045	UFC320506	0,5	4	0,45	45	0,75	6	2	A
UFC3200666A04002045	UFC320602	0,6	4	0,45	45	1	2	2	A
UFC3200667A04004045	UFC320604	0,6	4	0,45	45	1	4	2	A
UFC3200668A04006045	UFC320606	0,6	4	0,55	45	1	6	2	A
UFC3200669A04008045	UFC320608	0,6	4	0,55	45	1	8	2	A
UFC3200670A04010045	UFC320610	0,6	4	0,55	45	1	10	2	A
UFC3200871A04002045	UFC320802	0,8	4	0,55	45	1,2	2	2	A
UFC3200872A04004045	UFC320804	0,8	4	0,55	45	1,2	4	2	A
UFC3200873A04006045	UFC320806	0,8	4	0,75	45	1,2	6	2	A
UFC3200874A04008045	UFC320808	0,8	4	0,75	45	1,2	8	2	A
UFC3200875A04010045	UFC320810	0,8	4	0,75	45	1,2	10	2	A
UFC3201076A06000060	UFC321000	1	6	-	60	2,5		2	A
UFC3201077A04004045	UFC321004	1	4	0,75	45	1,5	4	2	A
UFC3201078A04006045	UFC321006	1	4	0,75	45	1,5	6	2	A
UFC3201079A04008045	UFC321008	1	4	0,95	45	1,5	8	2	A
UFC3201080A04010045	UFC321010	1	4	0,95	45	1,5	10	2	A
UFC3201581A06000060	UFC321500	1,5	6	-	60	4		2	A
UFC3201582A04006045	UFC321506	1,5	4	0,95	45	2,5	6	2	A
UFC3201583A04008045	UFC321508	1,5	4	0,95	45	2,5	8	2	A
UFC3201584A04010045	UFC321510	1,5	4	1,45	45	2,5	10	2	A
UFC3201585A04012045	UFC321512	1,5	4	1,45	45	2,5	12	2	A
UFC3201586A04016050	UFC321516	1,5	4	1,45	50	2,5	16	2	A
UFC3202087A06000060	UFC322000	2	6	-	60	5		2	A
UFC3202088A04006045	UFC322006	2	4	1,95	45	3	6	2	A
UFC3202089A04008045	UFC322008	2	4	1,95	45	3	8	2	A
UFC3202090A04010045	UFC322010	2	4	1,95	45	3	10	2	A
UFC3202091A04012045	UFC322012	2	4	1,95	45	3	12	2	A
UFC3202092A04014050	UFC322014	2	4	1,95	50	3	14	2	A
UFC3202093A04016050	UFC322016	2	4	1,95	50	3	16	2	A
UFC3203094A06000060	UFC323000	3	6	-	60	8		2	A
UFC3203095A06010050	UFC323010	3	6	2,85	50	4,5	10	2	A
UFC3203096A06012050	UFC323012	3	6	2,85	50	4,5	12	2	A
UFC3203097A06016050	UFC323016	3	6	2,85	50	4,5	16	2	A
UFC3203098A06020060	UFC323020	3	6	2,85	60	4,5	20	2	A
UFC3204099A06000070	UFC324000	4	6	-	70	8		2	A
UFC32040100A06012060	UFC324012	4	6	3,85	60	6	12	2	A
UFC32040101A06016060	UFC324016	4	6	3,85	60	6	16	2	A
UFC32040102A06020060	UFC324020	4	6	3,85	60	6	20	2	A
UFC32040103A06026070	UFC324026	4	6	3,85	70	6	26	2	A
UFC32060104A06020065	UFC326020	6	6	5,85	65	6	20	2	A
UFC32060105A06026075	UFC326026	6	6	5,85	75	12	26	2	A
UFC32060106A06030090	UFC326030	6	6	5,85	90	12	30	2	A

µm	d1 h6		R	±0,005	

UFC32

Cutting Conditions Parametry skrawania

			**Unalloyed Copper** Miedź niestopowa	
d1 (mm)	**ae**	**ap**	**RPM**	**mm/min**
0,5	0,050	0,02	35000	810
0,75	0,075	0,03	25000	790
1	0,01	0,04	19800	820
1,5	0,015	0,06	13000	760
2	0,02	0,08	9500	770
3	0,03	0,12	6500	760

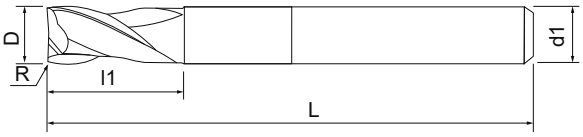
UFC12

FOR RIB PROCESSING DO ŻEBER

2-Flute 2-ostrzowe

		HSM Vmax	F	M	30°	A						max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
									○	○	●			





D code Kod	R	D	d1	L	l1	l2	Z	Shank Uchwyt
UFC12010001A04004045	0,1	1	4	45	1,5	4	2	A
UFC12010001A04006045	0,1	1	4	45	1,5	6	2	A
UFC12010001A04008045	0,1	1	4	45	1,5	8	2	A
UFC12010002A04004045	0,2	1	4	45	1,5	4	2	A
UFC12010002A04006045	0,2	1	4	45	1,5	6	2	A
UFC12010002A04008045	0,2	1	4	45	1,5	8	2	A
UFC12015001A04006045	0,1	1,5	4	45	2,3	6	2	A
UFC12015001A04008045	0,1	1,5	4	45	2,3	8	2	A
UFC12015001A04010045	0,1	1,5	4	45	2,3	10	2	A
UFC12015002A04006045	0,2	1,5	4	45	2,3	6	2	A
UFC12015002A04008045	0,2	1,5	4	45	2,3	8	2	A
UFC12015002A04010045	0,2	1,5	4	45	2,3	10	2	A
UFC12020002A04008045	0,2	2	4	45	3	8	2	A
UFC12020002A04010045	0,2	2	4	45	3	10	2	A
UFC12020002A04012045	0,2	2	4	45	3	12	2	A
UFC12020005A04008045	0,5	2	4	45	3	8	2	A
UFC12020005A04010045	0,5	2	4	45	3	10	2	A
UFC12020005A04012045	0,5	2	4	45	3	12	2	A
UFC12030002A06010050	0,2	3	6	50	4,5	10	2	A
UFC12030002A06012050	0,2	3	6	50	4,5	12	2	A
UFC12030002A06016060	0,2	3	6	60	4,5	16	2	A
UFC12030003A06010050	0,3	3	6	50	4,5	10	2	A
UFC12030003A06012050	0,3	3	6	50	4,5	12	2	A
UFC12030003A06016060	0,3	3	6	60	4,5	16	2	A
UFC12040002A06012050	0,2	4	6	50	6	12	2	A
UFC12040002A06016060	0,2	4	6	60	6	16	2	A
UFC12040002A06020060	0,2	4	6	60	6	20	2	A
UFC12040005A06012050	0,5	4	6	50	6	12	2	A
UFC12040005A06016060	0,5	4	6	60	6	16	2	A
UFC12040005A06020060	0,5	4	6	60	6	20	2	A
UFC12060003A06020060	0,3	6	6	60	9	20	2	A
UFC12060005A06020060	0,5	6	6	60	9	20	2	A
UFC12060010A06020060	1	6	6	60	9	20	2	A
UFC12080003A08025065	0,3	8	8	65	12	25	2	A
UFC12080005A08025065	0,5	8	8	65	12	25	2	A
UFC12080010A08025065	1	8	8	65	12	25	2	A
UFC12100005A10030070	0,5	10	10	70	15	30	2	A
UFC12100010A10030070	1	10	10	70	15	30	2	A
UFC12120005A12032080	0,5	12	12	80	18	32	2	A
UFC12120010A12032080	1	12	12	80	18	32	2	A

µm	D≤6	0 — -12		
	D>6	0 — -15		

UFC12

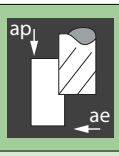
Cutting Conditions Parametry skrawania

SLOTTING / FREZOWANIE ROWKÓW



	Aluminiuim Aluminium		**Unalloyed Copper** Miedź niestopowa		**Thermoplasitcs** Termoplastic	
d1 (mm)	**RPM**	**FEED**	**RPM**	**FEED**	**RPM**	**FEED**
1.0	50000	1000	50000	1000	50000	700
2.0	50000	1800	50000	1700	50000	1400
3.0	50000	2600	44500	2350	50000	2100
4.0	50000	3680	33400	2100	50000	2600
5.0	50000	4300	27000	2100	50000	3400
6.0	44500	4670	22300	2100	50000	4200
8.0	33400	4560	16700	2100	50000	5700
10.0	26700	4770	13370	2100	40000	5500
12.0	22200	4660	11100	2100	33500	5600
ap=0.5D ae=D						

SIDE CUTTING / FREZOWANIE OBWODOWE



	Aluminiuim Aluminium		**Unalloyed Copper** Miedź niestopowa		**Thermoplasitcs** Termoplastic	
d1 (mm)	**RPM**	**FEED**	**RPM**	**FEED**	**RPM**	**FEED**
1.0	50000	1400	50000	1200	50000	1200
2.0	50000	2800	50000	2500	50000	2500
3.0	50000	4200	50000	3700	50000	3700
4.0	50000	5300	50000	4700	50000	5000
5.0	50000	6500	40000	4800	50000	6500
6.0	50000	7850	33400	4900	50000	7500
8.0	37500	7850	25000	4700	50000	8400
10.0	30000	7850	20000	4800	40000	8400
12.0	25000	7850	16700	4700	33500	8400
ap=1D ae=0,5D						

PMT

POWDER END MILLS
FREZY PROSZKOWE







POWDER END MILLS PMT for high productivity on conventional milling machines for materials up to 40 HRC.

FREZY PROSZKOWE PMT przeznaczone są do wysokowydajnej obróbki materiałów >40 HRC na obrabiarkach konwencjonalnych.

TIZ IMPLEMENTS

P K N

POWDER METAL END MILLS PMT for high productivity on conventional milling machines for materials up to HRC40.

FREZY WALCOWO-CZOŁOWE PMT proszkowe do wysokowydajnej obróbki materiałów do 40 HRC na obrabiarkach konwencjonalnych.

- PM-T END MILLS are #1 choice power milling!! High productivity!! For conventional milling machine.
- Frezy walcowo-czołowe PMT są podstawowym wyborem dla wydajnego frezowania!! Wysoka wydajność!! Do stosowania na obrabiarkach konwencjonalnych.

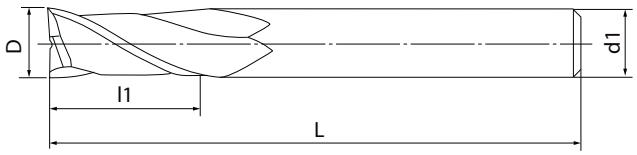
EDP No.		Z	Angle Kąt	Materials Materiały	D / R	Pag. / Str.
PMT36		2	30°	P K N	D 1 - 25	3 - 4
PMT29		2	30°	P K N	D 1 - 25	5 - 6
PMT42		3	30°	P K N	D 1 - 25	7 - 8
PMT30		3	30°	P K N	D 1 - 25	9 - 10
PMT38		4	30°	P K N	D 1 - 25	11
PMT31		4	30°	P K N	D 2 - 25	12
PMT41		3 - 5	30°	P K N	D 6 - 25	13
PMT53		4	30°	P K N	D 6 - 25	14
PMT55		4	30°	P K N	D 4 - 20	15
PMT35		3 - 5	30°	P K N	D 6 - 25	14
PMT26		3 - 6	30°	P K N	D 4 - 25	15 - 16
PMT57		3 - 6	45°	P K N	D 4 - 25	19
PMT33		3 - 5	30°	P K N	D 6 - 25	17 - 17
PMT59		4 - 5		P K N	D 6 - 25	22
PMT34		3 - 5	30°	P K N	D 6 - 25	18
PMT40		2	30°	P K N	R 0,5 - 12,5	19
PMT32		2	30°	P K N	R 1 - 12,5	20

PMT36

SQUARE TYPE WALCOWO-CZOŁOWE
2-Flute, Short Length 2-ostrzowe ,krótkie

		HSM Vmax	M	R	30°	A						max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●							●	●	●	○			





D code new Nowy kod	D code kod	D	d1	L	l1	Z	Shank Uchwyt
PMT36010000A06003047	PMT36010	1	6	47	2,5	2	A
PMT36020000A06004048	PMT36020	2	6	48	4	2	A
PMT36030000A06005049	PMT36030	3	6	49	5	2	A
PMT36040000A06007051	PMT36040	4	6	51	7	2	A
PMT36050000A06008052	PMT36050	5	6	52	8	2	A
PMT36060000A06008052	PMT36060	6	6	52	8	2	A
PMT36070000A10010060	PMT36070	7	10	60	10	2	A
PMT36080000A10011061	PMT36080	8	10	61	11	2	A
PMT36090000A10011061	PMT36090	9	10	61	11	2	A
PMT36100000A10013063	PMT36100	10	10	63	13	2	A
PMT36120000A12016073	PMT36120	12	12	73	16	2	A
PMT36140000A12016073	PMT36140	14	12	73	16	2	A
PMT36160000A16019079	PMT36160	16	16	79	19	2	A
PMT36180000A16019079	PMT36180	18	16	79	19	2	A
PMT36200000A20022088	PMT36200	20	20	88	22	2	A
PMT36220000A20022088	PMT36220	22	20	88	22	2	A
PMT36250000A25026102	PMT36250	25	25	102	26	2	A

µm						
	D ≤ 3,0	-14 — -28	D ≤ 30	-40 — -73	d1 ≤ 18	0 — -11
	D ≤ 6,0	-20 — -38	d1 ≤ 3	0 — -6	d1 ≤ 30	0 — -13
	D ≤ 10	-25 — -47	d1 ≤ 6	0 — -8		
	D ≤18	-32 — -59	d1 ≤ 10	0 — -9		

PMT36

Cutting Conditions Parametry skrawania

SLOTTING / FREZOWANIE ROWKÓW

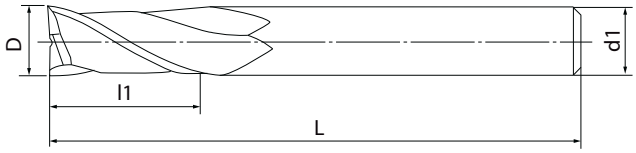
			**Structural steels, carbon steels** Stal konstrukcyjna, węglowa		**Structural steels, carbon steels, cast irons** Stal konstrukcyjna, węglowa, żeliwo		**Carbon steels, alloy steels, tool steels** Stal węglowa, stopowa, narzędziowa		**Prehardened steels, alloy steels, tool steels** Stal ulepszona, stopowa, narzędziowa		**Alloy steels, tool steels, austenitic stainless steels** Stal stopowa, narzędziowa, kwasoodporna	
					<20 HRC		**20 - 30 HRC**		**30 - 35 HRC**		**35 - 40 HRC**	
			<500 N/mm²		**500 - 800 N/mm²**		**800 - 1000 N/mm²**		**1000 - 1100 N/mm²**		**1100 - 1300 N/mm²**	
D1 mm	**ae**	**ap**	**RPM**	**mm/min**	**RPM**	**mm/min**	**RPM**	**mm/min**	**RPM**	**mm/min**	**RPM**	**mm/min**
2	2	1	7000	115	5900	90	4900	80	3150	65	2000	40
3	3	1,5	5000	160	4100	135	3350	115	2300	80	1800	62
4	4	2	4300	230	3600	175	3150	160	2000	92	1600	75
5	5	2,5	3900	255	3250	200	2600	185	1700	102	1350	75
6	6	3	3500	265	2900	210	2300	190	1450	110	1150	85
8	8	4	2600	275	2200	240	1800	200	1150	115	890	85
10	10	5	2100	300	1800	265	1450	230	900	125	700	102
12	12	6	1800	275	1450	240	1150	210	740	115	580	85
14	14	7	1600	265	1250	210	1000	195	630	110	500	80
16	16	8	1350	265	1150	195	890	180	560	102	440	80
18	18	9	1150	240	950	195	790	160	500	100	400	75
20	20	10	950	220	780	165	700	150	440	92	360	70
22	22	11	840	185	710	150	600	125	400	80	320	55
25	25	12,5	750	155	630	140	490	115	360	75	250	52

PMT29

SQUARE TYPE WALCOWO-CZOŁOWE
2-Flute, Long Length 2-ostrzowe, długie

HSM Vmax	M	R	30°	A	max	min	AIR
					○	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●							●	●	●	○			





D code new Nowy kod	D code Kod	D	d1	L	l1	Z	Shank Uchwyt
PMT29010000A06003047	PMT29010	1	6	47	3	2	A
PMT29020000A06007051	PMT29020	2	6	51	7	2	A
PMT29030000A06008052	PMT29030	3	6	52	8	2	A
PMT29040000A06011055	PMT29040	4	6	55	11	2	A
PMT29050000A06013057	PMT29050	5	6	57	13	2	A
PMT29060000A06013057	PMT29060	6	6	57	13	2	A
PMT29070000A10016066	PMT29070	7	10	66	16	2	A
PMT29080000A10019069	PMT29080	8	10	69	19	2	A
PMT29090000A10019069	PMT29090	9	10	69	19	2	A
PMT29100000A10022072	PMT29100	10	10	72	22	2	A
PMT29120000A12026083	PMT29120	12	12	83	26	2	A
PMT29140000A12026083	PMT29140	14	12	83	26	2	A
PMT29160000A16032092	PMT29160	16	16	92	32	2	A
PMT29180000A16032092	PMT29180	18	16	92	32	2	A
PMT29200000A20038104	PMT29200	20	20	104	38	2	A
PMT29220000A20038104	PMT29220	22	20	104	38	2	A
PMT29250000A25045121	PMT29250	25	25	121	45	2	A

µm						
	D ≤ 3,0	-14 — -28	D ≤ 30	-40 — -73	d1 ≤ 18	0 — -11
	D ≤ 6,0	-20 — -38	d1 ≤ 3	0 — -6	d1 ≤ 30	0 — -13
	D ≤ 10	-25 — -47	d1 ≤ 6	0 — -8		
	D ≤18	-32 — -59	d1 ≤ 10	0 — -9		

PMT29

Cutting Conditions Parametry skrawania

SLOTTING / FREZOWANIE ROWKÓW

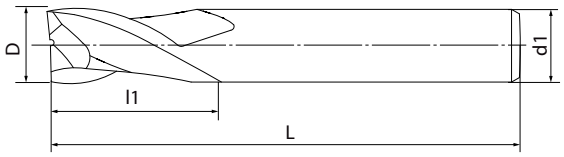
			**Structural steels, carbon steels** Stal konstrukcyjna, węglowa		**Structural steels, carbon steels, cast irons** Stal konstrukcyjna, węglowa, żeliwo		**Carbon steels, alloy steels, tool steels** Stal węglowa, stopowa, narzędziowa		**Prehardened steels, alloy steels, tool steels** Stal ulepszona, stopowa, narzędziowa		**Alloy steels, tool steels, austenitic stainless steels** Stal stopowa, narzędziowa, kwasoodporna	
					<20 HRC		**20 - 30 HRC**		**30 - 35 HRC**		**35 - 40 HRC**	
			<500 N/mm²		**500 - 800 N/mm²**		**800 - 1000 N/mm²**		**1000 - 1100 N/mm²**		**1100 - 1300 N/mm²**	
D1 mm	**ae**	**ap**	**RPM**	**mm/min**	**RPM**	**mm/min**	**RPM**	**mm/min**	**RPM**	**mm/min**	**RPM**	**mm/min**
2	2	1	7000	115	5900	90	4900	80	3150	65	2000	40
3	3	1,5	5000	160	4100	135	3350	115	2300	80	1800	62
4	4	2	4300	230	3600	175	3150	160	2000	92	1600	75
5	5	2,5	3900	255	3250	200	2600	185	1700	102	1350	75
6	6	3	3500	265	2900	210	2300	190	1450	110	1150	85
8	8	4	2600	275	2200	240	1800	200	1150	115	890	85
10	10	5	2100	300	1800	265	1450	230	900	125	700	102
12	12	6	1800	275	1450	240	1150	210	740	115	580	85
14	14	7	1600	265	1250	210	1000	195	630	110	500	80
16	16	8	1350	265	1150	195	890	180	560	102	440	80
18	18	9	1150	240	950	195	790	160	500	100	400	75
20	20	10	950	220	780	165	700	150	440	92	360	70
22	22	11	840	185	710	150	600	125	400	80	320	55
25	25	12,5	750	155	630	140	490	115	360	75	250	52

PMT42

SQUARE TYPE WALCOWO-CZOŁOWE
3-Flute, Short Length 3-ostrzowe, krótkie

		HSM Vmax	M	R	30°	A						max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●							●	●	●	○			





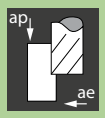
D code new Nowy kod	D code Kod	D	d1	L	l1	Z	Shank Uchwyt
PMT42010000A06003047	PMT42010	1	6	47	2,5	3	A
PMT42020000A06004048	PMT42020	2	6	48	4	3	A
PMT42030000A06005049	PMT42030	3	6	49	5	3	A
PMT42040000A06007051	PMT42040	4	6	51	7	3	A
PMT42050000A06008052	PMT42050	5	6	52	8	3	A
PMT42060000A06008052	PMT42060	6	6	52	8	3	A
PMT42070000A10010060	PMT42070	7	10	60	10	3	A
PMT42080000A10011061	PMT42080	8	10	61	11	3	A
PMT42090000A10011061	PMT42090	9	10	61	11	3	A
PMT42100000A10013063	PMT42100	10	10	63	13	3	A
PMT42120000A12016073	PMT42120	12	12	73	16	3	A
PMT42140000A12016073	PMT42140	14	12	73	16	3	A
PMT42160000A16019079	PMT42160	16	16	79	19	3	A
PMT42180000A16019079	PMT42180	18	16	79	19	3	A
PMT42200000A20022088	PMT42200	20	20	88	22	3	A
PMT42220000A20022088	PMT42220	22	20	88	22	3	A
PMT42250000A25026102	PMT42250	25	25	102	26	3	A

µm						
	D ≤ 3,0	-14 — -28	D ≤ 30	-40 — -73	d1 ≤ 18	0 — -11
	D ≤ 6,0	-20 — -38	d1 ≤ 3	0 — -6	d1 ≤ 30	0 — -13
	D ≤ 10	-25 — -47	d1 ≤ 6	0 — -8		
	D ≤18	-32 — -59	d1 ≤ 10	0 — -9		

PMT42

Cutting Conditions Parametry skrawania

SIDE MILLING / FREZOWANIE OBWODOWE

			**Structural steels, carbon steels** Stal konstrukcyjna, węglowa		**Structural steels, carbon steels, cast irons** Stal konstrukcyjna, węglowa, żeliwo		**Carbon steels, alloy steels, tool steels** Stal węglowa, stopowa, narzędziowa		**Prehardened steels, alloy steels, tool steels** Stal ulepszona, stopowa, narzędziowa		**Alloy steels, tool steels, austenitic stainless steels** Stal stopowa, narzędziowa, kwasoodporna	
					<20 HRC		**20 - 30 HRC**		**30 - 35 HRC**		**35 - 40 HRC**	
			<500 N/mm²		**500 - 800 N/mm²**		**800 - 1000 N/mm²**		**1000 - 1100 N/mm²**		**1100 - 1300 N/mm²**	
D1 mm	**ae**	**ap**	**RPM**	**mm/min**	**RPM**	**mm/min**	**RPM**	**mm/min**	**RPM**	**mm/min**	**RPM**	**mm/min**
2	0,2	3	6500	70	5500	55	4800	45	3000	35	1900	28
3	0,3	4,5	4600	102	3900	85	3350	52	2200	45	1800	45
4	0,4	6	4300	140	3600	115	3000	80	1900	52	1500	55
5	0,5	7,5	3800	160	3200	130	2600	92	1700	62	1300	55
6	0,6	9	3350	230	2800	190	2300	140	1450	92	1100	75
8	0,8	12	2600	240	2200	210	1800	150	1150	102	890	85
10	1	15	100	250	1800	210	1400	160	890	115	680	92
12	1,2	18	1800	275	1450	230	1200	170	740	115	580	92
14	1,4	21	1600	250	1350	220	1000	160	660	110	500	85
16	1,6	24	1350	240	1150	210	890	150	560	102	440	85
18	1,8	27	1150	240	890	190	790	150	500	95	400	80
20	2	30	950	230	790	190	700	140	440	92	360	80
22	2,2	33	840	230	730	195	600	150	400	95	315	85
25	2,5	37,5	750	240	630	210	490	160	360	102	250	85

SLOTTING / FREZOWANIE ROWKÓW

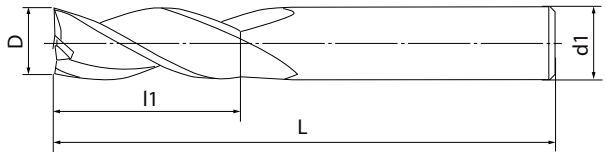
			**Structural steels, carbon steels** Stal konstrukcyjna, węglowa		**Structural steels, carbon steels, cast irons** Stal konstrukcyjna, węglowa, żeliwo		**Carbon steels, alloy steels, tool steels** Stal węglowa, stopowa, narzędziowa		**Prehardened steels, alloy steels, tool steels** Stal ulepszona, stopowa, narzędziowa		**Alloy steels, tool steels, austenitic stainless steels** Stal stopowa, narzędziowa, kwasoodporna	
					<20 HRC		**20 - 30 HRC**		**30 - 35 HRC**		**35 - 40 HRC**	
			<500 N/mm²		**500 - 800 N/mm²**		**800 - 1000 N/mm²**		**1000 - 1100 N/mm²**		**1100 - 1300 N/mm²**	
D1 mm	**ae**	**ap**	**RPM**	**mm/min**	**RPM**	**mm/min**	**RPM**	**mm/min**	**RPM**	**mm/min**	**RPM**	**mm/min**
2	2	1	8200	100	6800	80	5500	65	3800	50	2400	40
3	3	1,5	5800	145	4800	120	3800	75	2700	65	2200	65
4	4	2	5200	185	4400	155	3500	110	2300	75	1900	75
5	5	2,5	4700	210	4000	175	2900	125	2000	85	1700	75
6	6	3	4200	300	3600	250	2600	190	1800	125	1500	100
8	8	4	3200	330	2600	270	2000	200	1300	140	1100	115
10	10	5	2500	350	2100	290	1600	210	1000	150	890	125
12	12	6	2100	350	1800	300	1400	230	900	150	740	125
14	14	7	1800	350	1500	285	1150	210	780	140	630	120
16	16	8	1600	330	1300	275	1000	200	660	140	550	115
18	18	9	1350	310	1150	265	890	195	580	130	500	110
20	20	10	1250	300	1050	255	780	190	520	125	440	110
22	22	11	1150	310	950	265	740	195	470	130	400	110
25	25	12,5	1000	330	840	275	630	210	420	135	360	120

PMT30

SQUARE TYPE WALCOWO-CZOŁOWE
3-Flute, Short Length 3-ostrzowe, krótkie

		HSM Vmax	M	R	30°	A						max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●							●	●	●	○			





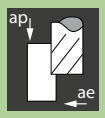
D code new Nowy kod	D code Kod	D	d1	L	l1	Z	Shank Uchwyt
PMT30010000A06003047	PMT30010	1	6	47	3	3	A
PMT30020000A06007051	PMT30020	2	6	51	7	3	A
PMT30030000A06008052	PMT30030	3	6	52	8	3	A
PMT30040000A06011055	PMT30040	4	6	55	11	3	A
PMT30050000A06013057	PMT30050	5	6	57	13	3	A
PMT30060000A06013057	PMT30060	6	6	57	13	3	A
PMT30070000A10016066	PMT30070	7	10	66	16	3	A
PMT30080000A10019069	PMT30080	8	10	69	19	3	A
PMT30090000A10019069	PMT30090	9	10	69	19	3	A
PMT30100000A10022072	PMT30100	10	10	72	22	3	A
PMT30120000A12026083	PMT30120	12	12	83	26	3	A
PMT30140000A12026083	PMT30140	14	12	83	26	3	A
PMT30160000A16032092	PMT30160	16	16	92	32	3	A
PMT30180000A16032092	PMT30180	18	16	92	32	3	A
PMT30200000A20038104	PMT30200	20	20	104	38	3	A
PMT30220000A20038104	PMT30220	22	20	104	38	3	A
PMT30250000A25045121	PMT30250	25	25	121	45	3	A

µm						
	D ≤ 3,0	-14 — -28	D ≤ 30	-40 — -73	d1 ≤ 18	0 — -11
	D ≤ 6,0	-20 — -38	d1 ≤ 3	0 — -6	d1 ≤ 30	0 — -13
	D ≤ 10	-25 — -47	d1 ≤ 6	0 — -8		
	D ≤18	-32 — -59	d1 ≤ 10	0 — -9		

PMT30

Cutting Conditions Parametry skrawania

SIDE MILLING / FREZOWANIE OBWODOWE

			**Structural steels, carbon steels** Stal konstrukcyjna, węglowa		**Structural steels, carbon steels, cast irons** Stal konstrukcyjna, węglowa, żeliwo		**Carbon steels, alloy steels, tool steels** Stal węglowa, stopowa, narzędziowa		**Prehardened steels, alloy steels, tool steels** Stal ulepszona, stopowa, narzędziowa		**Alloy steels, tool steels, austenitic stainless steels** Stal stopowa, narzędziowa, kwasoodporna	
					<20 HRC		**20 - 30 HRC**		**30 - 35 HRC**		**35 - 40 HRC**	
			<500 N/mm²		**500 - 800 N/mm²**		**800 - 1000 N/mm²**		**1000 - 1100 N/mm²**		**1100 - 1300 N/mm²**	
D1 mm	**ae**	**ap**	**RPM**	**mm/min**	**RPM**	**mm/min**	**RPM**	**mm/min**	**RPM**	**mm/min**	**RPM**	**mm/min**
2	0,2	3	6500	70	5500	55	4800	45	3000	35	1900	28
3	0,3	4,5	4600	102	3900	85	3350	52	2200	45	1800	45
4	0,4	6	4300	140	3600	115	3000	80	1900	52	1500	55
5	0,5	7,5	3800	160	3200	130	2600	92	1700	62	1300	55
6	0,6	9	3350	230	2800	190	2300	140	1450	92	1100	75
8	0,8	12	2600	240	2200	210	1800	150	1150	102	890	85
10	1	15	100	250	1800	210	1400	160	890	115	680	92
12	1,2	18	1800	275	1450	230	1200	170	740	115	580	92
14	1,4	21	1600	250	1350	220	1000	160	660	110	500	85
16	1,6	24	1350	240	1150	210	890	150	560	102	440	85
18	1,8	27	1150	240	890	190	790	150	500	95	400	80
20	2	30	950	230	790	190	700	140	440	92	360	80
22	2,2	33	840	230	730	195	600	150	400	95	315	85
25	2,5	37,5	750	240	630	210	490	160	360	102	250	85

SLOTTING / FREZOWANIE ROWKÓW

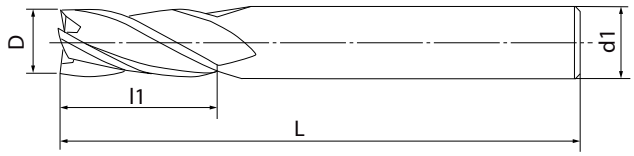
			**Structural steels, carbon steels** Stal konstrukcyjna, węglowa		**Structural steels, carbon steels, cast irons** Stal konstrukcyjna, węglowa, żeliwo		**Carbon steels, alloy steels, tool steels** Stal węglowa, stopowa, narzędziowa		**Prehardened steels, alloy steels, tool steels** Stal ulepszona, stopowa, narzędziowa		**Alloy steels, tool steels, austenitic stainless steels** Stal stopowa, narzędziowa, kwasoodporna	
					<20 HRC		**20 - 30 HRC**		**30 - 35 HRC**		**35 - 40 HRC**	
			<500 N/mm²		**500 - 800 N/mm²**		**800 - 1000 N/mm²**		**1000 - 1100 N/mm²**		**1100 - 1300 N/mm²**	
D1 mm	**ae**	**ap**	**RPM**	**mm/min**	**RPM**	**mm/min**	**RPM**	**mm/min**	**RPM**	**mm/min**	**RPM**	**mm/min**
2	2	1	8200	100	6800	80	5500	65	3800	50	2400	40
3	3	1,5	5800	145	4800	120	3800	75	2700	65	2200	65
4	4	2	5200	185	4400	155	3500	110	2300	75	1900	75
5	5	2,5	4700	210	4000	175	2900	125	2000	85	1700	75
6	6	3	4200	300	3600	250	2600	190	1800	125	1500	100
8	8	4	3200	330	2600	270	2000	200	1300	140	1100	115
10	10	5	2500	350	2100	290	1600	210	1000	150	890	125
12	12	6	2100	350	1800	300	1400	230	900	150	740	125
14	14	7	1800	350	1500	285	1150	210	780	140	630	120
16	16	8	1600	330	1300	275	1000	200	660	140	550	115
18	18	9	1350	310	1150	265	890	195	580	130	500	110
20	20	10	1250	300	1050	255	780	190	520	125	440	110
22	22	11	1150	310	950	265	740	195	470	130	400	110
25	25	12,5	1000	330	840	275	630	210	420	135	360	120

PMT38

SQUARE TYPE WALCOWO-CZOŁOWE
4-Flute, Short Length 4-ostrzowy, krótki

		HSM Vmax	M	R	30°	A						max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●							●	●	●	○			





D code new Nowy kod	D code Kod	D	d1	L	l1	Z	Shank Uchwyt
PMT38010000A06003049	PMT38010	1	6	49	3	4	A
PMT38020000A06007051	PMT38020	2	6	51	7	4	A
PMT38030000A06008052	PMT38030	3	6	52	8	4	A
PMT38040000A06011055	PMT38040	4	6	55	11	4	A
PMT38050000A06013057	PMT38050	5	6	57	13	4	A
PMT38060000A06013057	PMT38060	6	6	57	13	4	A
PMT38070000A10016066	PMT38070	7	10	66	16	4	A
PMT38080000A10019069	PMT38080	8	10	69	19	4	A
PMT38090000A10019069	PMT38090	9	10	69	19	4	A
PMT38100000A10022072	PMT38100	10	10	72	22	4	A
PMT38120000A12026083	PMT38120	12	12	83	26	4	A
PMT38140000A12026083	PMT38140	14	12	83	26	4	A
PMT38160000A16032092	PMT38160	16	16	92	32	4	A
PMT38180000A16032092	PMT38180	18	16	92	32	4	A
PMT38200000A20038104	PMT38200	20	20	104	38	4	A
PMT38220000A20038104	PMT38220	22	20	104	38	4	A
PMT38250000A25045121	PMT38250	25	25	121	45	4	A

Cutting Conditions Parametry skrawania

Material Materiał			Structural steels, carbon steels Stal konstrukcyjna, węglowa		Structural Steel, Carbon Steel, Cast iron Stal węglowa, stal konstrukcyjna, żeliwo		Carbon Steel, Alloy Steel Stal węglowa, stal stopowa		Alloy Steel, Tool Steel, Prehardened Steel Stal stopowa, stal narzędziowa, stal ulepszona		Alloy steel, tool steel, austenitic stainless steel Stal stopowa, narzędziowa, nierdzewna austenityczna	
					<20 HRC		20 - 30HRC		30 - 35HRC		35 - 40HRC	
			<500 N/mm²		500 - 800N/mm²		800 - 1000N/mm²		1000 - 1100N/mm²		1100 - 1300N/mm²	
d1(mm)	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
2	0,2	3	9200	290	8400	240	6100	170	4100	125	3300	85
3	0,3	4,5	6600	410	6000	350	4400	250	2700	180	2400	125
4	0,4	6	5300	480	4700	400	3600	300	2300	200	2000	150
5	0,5	7,5	4400	510	4000	420	2900	320	2000	220	1700	160
6	0,6	9	3900	540	3600	450	2600	330	1800	230	1450	180
8	0,8	12	3100	570	2600	480	2000	370	1400	240	1150	185
10	1	15	2300	630	2100	530	1600	380	1000	265	890	200
12	1,2	18	2000	570	1800	480	1400	370	890	240	720	185
14	1,4	21	1800	550	1600	460	1100	350	790	230	630	170
16	1,6	24	1600	510	1400	430	1000	340	680	220	550	165
18	1,8	27	1500	460	1250	400	890	310	630	195	500	150
20	2	30	1250	440	1050	370	780	275	530	175	440	140
22	2,2	33	1050	410	950	320	680	255	470	160	400	130
25	2,5	37,5	1000	370	840	305	630	230	420	150	360	125

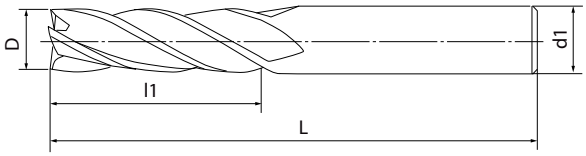
µm	D 0 — 30		
	d1 h6		

PMT31

SQUARE TYPE WALCOWO-CZOŁOWE
4-Flute, Long Length 4-ostrzowy, długi

		HSM Vmax	F	M	R	30°	B					max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●							●	●	●	○			





D code new Nowy kod	D code Kod	D	d1	L	l1	Z	Shank Uchwyt
PMT31020000A06010054	PMT31020	2	6	54	10	4	B
PMT31030000A06012056	PMT31030	3	6	56	12	4	B
PMT31040000A06019063	PMT31040	4	6	63	19	4	B
PMT31050000A06024068	PMT31050	5	6	68	24	4	B
PMT31060000A06024068	PMT31060	6	6	68	24	4	B
PMT31070000A10030080	PMT31070	7	10	80	30	4	B
PMT31080000A10038088	PMT31080	8	10	88	38	4	B
PMT31090000A10038088	PMT31090	9	10	88	38	4	B
PMT31100000A10045095	PMT31100	10	10	95	45	4	B
PMT31120000A12053110	PMT31120	12	12	110	53	4	B
PMT31140000A12053110	PMT31140	14	12	110	53	4	B
PMT31160000A16063123	PMT31160	16	16	123	63	4	B
PMT31180000A16063123	PMT31180	18	16	123	63	4	B
PMT31200000A20075141	PMT31200	20	20	141	75	4	B
PMT31220000A20075141	PMT31220	22	20	141	75	4	B
PMT31250000A25090166	PMT31250	25	25	166	90	4	B

Cutting Conditions Parametry skrawania

Material Materiał			Structural steels, carbon steels Stal konstrukcyjna, węglowa		Structural Steel, Carbon Steel, Cast iron Stal węglowa, stal konstrukcyjna, żeliwo		Carbon Steel, Alloy Steel Stal węglowa, stal stopowa		Alloy Steel, Tool Steel, Prehardened Steel Stal stopowa, stal narzędziowa, stal ulepszona		Alloy steel, tool steel, austenitic stainless steel Stal stopowa, narzędziowa, nierdzewna austenityczna	
					<20 HRC		20 - 30HRC		30 - 35HRC		35 - 40HRC	
			<500 N/mm²		500 - 800N/mm²		800 - 1000N/mm²		1000 - 1100N/mm²		1100 - 1300N/mm²	
d1(mm)	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
2	0,2	3	9200	290	8400	240	6100	170	4100	125	3300	85
3	0,3	4,5	6600	410	6000	350	4400	250	2700	180	2400	125
4	0,4	6	5300	480	4700	400	3600	300	2300	200	2000	150
5	0,5	7,5	4400	510	4000	420	2900	320	2000	220	1700	160
6	0,6	9	3900	540	3600	450	2600	330	1800	230	1450	180
8	0,8	12	3100	570	2600	480	2000	370	1400	240	1150	185
10	1	15	2300	630	2100	530	1600	380	1000	265	890	200
12	1,2	18	2000	570	1800	480	1400	370	890	240	720	185
14	1,4	21	1800	550	1600	460	1100	350	790	230	630	170
16	1,6	24	1600	510	1400	430	1000	340	680	220	550	165
18	1,8	27	1500	460	1250	400	890	310	630	195	500	150
20	2	30	1250	440	1050	370	780	275	530	175	440	140
22	2,2	33	1050	410	950	320	680	255	470	160	400	130
25	2,5	37,5	1000	370	840	305	630	230	420	150	360	125

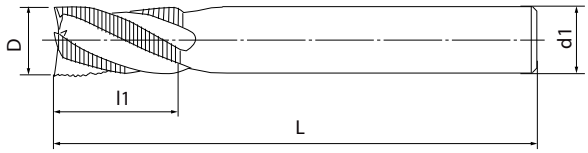
µm	D 0 — 30		
	d1 h6		

PMT41

SQUARE TYPE WALCOWO-CZOŁOWE
Multi Flute, Fine Pitch Wieloostrzowy, łamacz drobny

		HSM Vmax	F	M	R	30°	B					max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●							●	●	●	○			





D code new Nowy kod	D code Kod	D	d1	L	l1	Z	Shank Uchwyt
PMT41060000A06013057	PMT41060	6	6	13	57	3	B
PMT41070000A10016066	PMT41070	7	10	16	66	3	B
PMT41080000A10019069	PMT41080	8	10	19	69	3	B
PMT41090000A10019069	PMT41090	9	10	19	69	3	B
PMT41100000A10022072	PMT41100	10	10	22	72	4	B
PMT41120000A12026083	PMT41120	12	12	26	83	4	B
PMT41140000A12026083	PMT41140	14	12	26	83	4	B
PMT41160000A16032092	PMT41160	16	16	32	92	4	B
PMT41180000A16032092	PMT41180	18	16	32	92	4	B
PMT41200000A20038104	PMT41200	20	20	38	104	4	B
PMT41220000A20038104	PMT41220	22	20	38	104	5	B
PMT41250000A25045121	PMT41250	25	25	45	121	5	B

Cutting Conditions Parametry skrawania

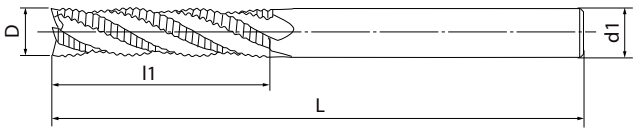
			Structural steels, carbon steels Stal konstrukcyjna, węglowa		Carbon Steel, Cast iron Stal węglowa, żeliwo		Carbon Steel, Alloy Steel Stal węglowa, stal stopowa		Alloy Steel, Tool Steel, Prehardened Steel Stal stopowa, stal narzędziowa, stal ulepszona		Stainless steel Stal nierdzewna	
					<20 HRC		20 - 30HRC		30 - 40HRC		30 - 40HRC	
			-500N/mm²		500 - 800N/mm²		800 - 1000N/mm²		1000 - 1300N/mm²		1000 - 1300N/mm²	
d1 (mm)	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
6	3	9	2800	230	2200	180	1600	115	1300	105	1300	105
8	4	12	2400	290	1900	230	1400	160	1050	125	1050	125
10	5	15	1900	415	1500	315	1050	195	890	160	890	160
12	6	18	1600	415	1200	330	900	230	740	180	740	180
14	7	21	1400	415	1050	330	760	230	630	180	630	180
16	8	24	1200	415	950	330	660	230	550	180	550	180
18	9	27	1050	415	890	330	610	230	490	180	490	180
20	10	30	960	425	760	330	530	230	440	180	440	180
22	11	33	890	425	650	330	470	230	400	180	400	180
25	12,5	37,5	790	415	600	315	420	220	360	180	360	180

PMT35

SQUARE TYPE WALCOWO-CZOŁOWE
Multi Flute, Fine Pitch Wieloostrzowy, łamacz drobny

		HSM Vmax	R	30°	B							max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●							●	●	●	○			





D code new Nowy kod	D code Kod	D	d1	L	l1	Z	Shank Uchwyt
PMT35060000A06024068	PMT35060	6	6	24	68	3	B
PMT35070000A10030080	PMT35070	7	10	30	80	3	B
PMT35080000A10038088	PMT35080	8	10	38	88	3	B
PMT35090000A10038088	PMT35090	9	10	38	88	3	B
PMT35100000A10045095	PMT35100	10	10	45	95	4	B
PMT35120000A12053110	PMT35120	12	12	53	110	4	B
PMT35140000A12053110	PMT35140	14	12	53	110	4	B
PMT35160000A16063123	PMT35160	16	16	63	123	4	B
PMT35180000A16063123	PMT35180	18	16	63	123	4	B
PMT35200000A20075141	PMT35200	20	20	75	141	4	B
PMT35220000A20075141	PMT35220	22	20	75	141	5	B
PMT35250000A25090166	PMT35250	25	25	90	166	5	B

Cutting Conditions Parametry skrawania



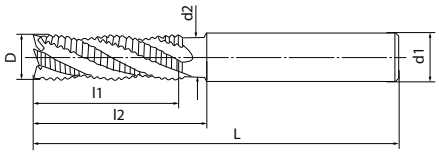
			Structural steels, carbon steels Stal konstrukcyjna, węglowa		Structural steels, carbon steels, cast irons Stal konstrukcyjna, węglowa, żeliwo		Carbon steels, alloy steels, tool steels Stal węglowa, stopowa, narzędziowa		Prehardened steels, alloy steels, tool steels Stal ulepszona, stopowa, narzędziowa	
					<20 HRC		20 - 30 HRC		30 - 40 HRC	
			<500 N/mm²		500 - 800 N/mm²		800 - 1000 N/mm²		1000 - 1200 N/mm²	
D1 mm	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
6	3	9	2800	230	2200	180	1600	115	1300	105
8	4	12	2400	290	1900	230	1400	160	1050	125
10	5	15	1900	415	1500	315	1050	195	890	160
12	6	18	1600	415	1200	330	900	230	740	180
14	7	21	1400	415	1050	330	760	230	630	180
16	8	24	1200	415	950	330	660	230	550	180
18	9	27	1050	415	890	330	610	230	490	180
20	10	30	960	425	760	330	530	230	440	180
22	11	33	890	425	650	330	470	230	400	180
25	12,5	37,5	790	415	600	315	420	220	360	180

PMT26

SQUARE TYPE WALCOWO-CZOŁOWE
Multi Flute, Short Wieloostrzowy, krótkie

		HSM Vmax	R	30°	A	B						max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●							●	●	●	○			





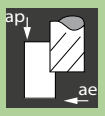
D code HA Kod HA	D code HB Kod HB	D	d1	d2	L	l1	l2	Z	Shank Uchwyt
PMT26040000A06000057	PMT26040000B06000057	4	6	-	57	11		3	A/B
PMT26050000A06000057	PMT26050000B06000057	5	6	-	57	13		4	A/B
PMT26060000A06000057	PMT26060000B06000057	6	6	-	57	13		4	A/B
PMT26070000A10000066	PMT26070000B10000066	7	10	-	66	16		4	A/B
PMT26080000A10000069	PMT26080000B10000069	8	10	-	69	19		4	A/B
PMT26090000A10000069	PMT26090000B10000069	9	10		69	19		4	A/B
PMT26100000A10031072	PMT26100000B10031072	10	10	9,5	72	22	31	4	A/B
PMT26120000A12037083	PMT26120000B12037083	12	12	11,5	83	26	37	4	A/B
PMT26140000A12000083	PMT26140000B12000083	14	12	-	83	26		5	A/B
PMT26160000A16044092	PMT26160000B16044092	16	16	15	92	32	44	5	A/B
PMT26180000A16000092	PMT26180000B16000092	18	16	-	92	32		6	A/B
PMT26200000A20054104	PMT26200000B20054104	20	20	19	104	38	54	6	A/B
PMT26250000A25063121	PMT26250000B25063121	25	25	24	121	45	63	6	A/B

µm	D ≤ 6	± 60	D ≤ 6	0 — -8
	d1≤10	± 75	d1≤10	0 — -9
	D ≤18	± 90	d1 ≤18	0 — -11
	d1 ≤30	± 105	d1 ≤30	0 — -13

PMT26

Cutting Conditions Parametry skrawania

SIDE MILLING / FREZOWANIE OBWODOWE



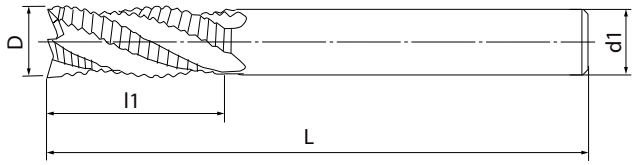
			Structural steels, carbon steels Stal konstrukcyjna, węglowa		**Structural steels, carbon steels, cast irons** Stal konstrukcyjna, węglowa, żeliwo		**Carbon steels, alloy steels, tool steels** Stal węglowa, stopowa, narzędziowa		**Prehardened steels, alloy steels, tool steels** Stal ulepszona, stopowa, narzędziowa		**Stainless steel** Stal nierdzewna	
					<20 HRC		**20 - 30 HRC**		**30 - 40 HRC**			
			<500 N/mm²		**500 - 800 N/mm²**		**800 - 1000 N/mm²**		**1000 - 1200 N/mm²**			
D1 mm	**ae**	**ap**	**RPM**	**mm/min**	**RPM**	**mm/min**	**RPM**	**mm/min**	**RPM**	**mm/min**	**RPM**	**mm/min**
6	3	9	2800	230	2200	180	1600	115	1300	105	1450	110
8	4	12	2400	290	1900	230	1400	160	1050	125	1200	140
10	5	15	1900	415	1500	315	1050	195	890	160	950	170
12	6	18	1600	415	1200	330	900	230	740	180	800	205
14	7	21	1400	415	1050	330	760	230	630	180	690	205
16	8	24	1200	415	950	330	660	230	550	180	600	205
18	9	27	1050	415	890	330	610	230	490	180	550	205
20	10	30	960	425	760	330	530	230	440	180	480	205
22	11	33	890	425	650	330	470	230	400	180	430	205
25	12,5	37,5	790	415	600	315	420	220	360	180	390	200
25	12,5	37,5	1253	738	947	558	626	369	474	250		

PMT33

SQUARE TYPE WALCOWO-CZOŁOWE
Croase Form, Short Łamacz zgrubny, krótkie

HSM Vmax	R	30°	B	max	min		AIR
				○	•	•	•

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
•	•							•	•	•	○			



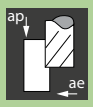


D code new Nowy kod	D code Kod	D	d1	L	l1	Z	Shank Uchwyt
PMT33060000A06013057	PMT33060	6	6	57	13	3	B
PMT33070000A10016066	PMT33070	7	10	66	16	3	B
PMT33080000A10019069	PMT33080	8	10	69	19	3	B
PMT33090000A10019069	PMT33090	9	10	69	19	3	B
PMT33100000A10022072	PMT33100	10	10	72	22	4	B
PMT33120000A12026083	PMT33120	12	12	83	26	4	B
PMT33140000A12026083	PMT33140	14	12	83	26	4	B
PMT33160000A16032092	PMT33160	16	16	92	32	4	B
PMT33180000A16032092	PMT33180	18	16	92	32	4	B
PMT33200000A20038104	PMT33200	20	20	104	38	4	B
PMT33220000A20038104	PMT33220	22	20	104	38	5	B
PMT33250000A25045121	PMT33250	25	25	121	45	5	B

PMT33

Cutting Conditions Parametry skrawania

SIDE MILLING / FREZOWANIE OBWODOWE



			Structural steel, carbon steel Stal konstrukcyjna, węglowa		Structural steel, carbon steel, cast iron Stal konstrukcyjna, węglowa, żeliwo		Carbon steel, alloy steel, tool steel Stal węglowa, stopowa, narzędziowa		Prehardened steel, alloy steel, tool steel Stal ulepszona, stopowa, narzędziowa	
					<20HRC		20 - 30HRC		30 - 40HRC	
			500N/mm²		500 - 800N/mm²		800 - 1000N/mm²		1000 - 1200N/mm²	
d1(mm)	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
6	3	9	2800	230	2200	180	1600	115	1300	105
8	4	12	2400	290	1900	230	1400	160	1050	125
10	5	15	1900	415	1500	315	1050	195	890	160
12	6	18	1600	415	1200	330	900	230	740	180
14	7	21	1400	415	1050	330	760	230	630	180
16	8	24	1200	415	950	330	660	230	550	180
18	9	27	1050	415	890	330	610	230	490	180
20	10	30	960	425	760	330	530	230	440	180
22	11	33	890	425	650	330	470	230	400	180
25	12,5	37,5	790	415	600	315	420	220	360	180

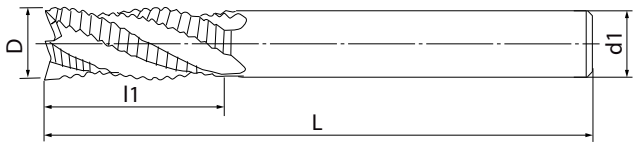
µm	D ≤ 6	± 60	D ≤ 6	0 — -8
	d1≤10	± 75	d1≤10	0 — -9
	D ≤18	± 90	d1 ≤18	0 — -11
	d1 ≤30	± 105	d1 ≤30	0 — -13

PMT34

SQUARE TYPE WALCOWO-CZOŁOWE
Multi Flute, Short Wieloostrzowy, krótkie

HSM Vmax	R	B	max	min	AIR
			○	•	•	•

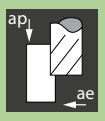
P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
•	•							•	•	•	○			





D code new Nowy kod	D code Kod	D	d1	L	l1	Z	Shank Uchwyt
PMT34060000A06024068	PMT34060	6	6	68	24	3	B
PMT34070000A10030080	PMT34070	7	10	80	30	3	B
PMT34080000A10038088	PMT34080	8	10	88	38	3	B
PMT34090000A10038088	PMT34090	9	10	88	38	3	B
PMT34100000A10045095	PMT34100	10	10	95	45	4	B
PMT34120000A12053110	PMT34120	12	12	110	53	4	B
PMT34140000A12053110	PMT34140	14	12	110	53	4	B
PMT34160000A16063123	PMT34160	16	16	123	63	4	B
PMT34180000A16063123	PMT34180	18	16	123	63	4	B
PMT34200000A20075141	PMT34200	20	20	141	75	4	B
PMT34220000A20075141	PMT34220	22	20	141	75	5	B
PMT34250000A25090166	PMT34250	25	25	166	90	5	B

Cutting Conditions Parametry skrawania



			Structural steel, carbon steel Stal konstrukcyjna, węglowa		Structural steel, carbon steel, cast iron Stal konstrukcyjna, węglowa, żeliwo		Carbon steel, alloy steel, tool steel Stal węglowa, stopowa, narzędziowa		Prehardened steel, alloy steel, tool steel Stal ulepszona, stopowa, narzędziowa	
					<20HRC		20 - 30HRC		30 - 40HRC	
			<500N/mm²		500 - 800N/mm²		800 - 1000N/mm²		1000 - 1200N/mm²	
d1(mm)	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
6	3	9	2800	230	2200	180	1600	115	1300	105
8	4	12	2400	290	1900	230	1400	160	1050	125
10	5	15	1900	415	1500	315	1050	195	890	160
12	6	18	1600	415	1200	330	900	230	740	180
14	7	21	1400	415	1050	330	760	230	630	180
16	8	24	1200	415	950	330	660	230	550	180
18	9	27	1050	415	890	330	610	230	490	180
20	10	30	960	425	760	330	530	230	440	180
22	11	33	890	425	650	330	470	230	400	180
25	12,5	37,5	790	415	600	315	420	220	360	180

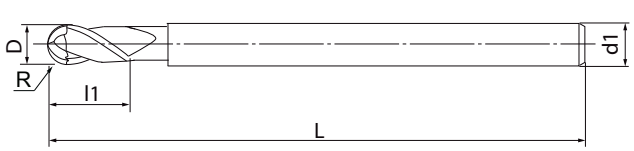
µm	D ≤ 10	± 75	d1 ≤ 18	0 — -11
	D ≤ 18	± 90	d1 ≤ 30	0 — -13
	D ≤ 30	± 105		
	d1 ≤ 10	0 — -9		

PMT40

BALL NOSE KULISTE
2-Flute, Short Length 2-ostrzowe, krótkie

HSM Vmax	M	R	30°	B						max	min		AIR
										○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●							●	●	●	○			





D code new Nowy kod	D code Kod	R	D	d1	L	l1	Z	Shank Uchwyt
PMT40010005A06003047	PMT40010	0,5	1	6	47	2,5	2	B
PMT40020010A06004048	PMT40020	1	2	6	48	4	2	B
PMT40030015A06005049	PMT40030	1,5	3	6	49	5	2	B
PMT40040020A06007051	PMT40040	2	4	6	51	7	2	B
PMT40050025A06008052	PMT40050	2,5	5	6	52	8	2	B
PMT40060030A06008052	PMT40060	3	6	6	52	8	2	B
PMT40070035A10010060	PMT40070	3,5	7	10	60	10	2	B
PMT40080040A10011061	PMT40080	4	8	10	61	11	2	B
PMT40090045A10011061	PMT40090	4,5	9	10	61	11	2	B
PMT40100050A10013063	PMT40100	5	10	10	63	13	2	B
PMT40120060A12016073	PMT40120	6	12	12	73	16	2	B
PMT40140070A12016073	PMT40140	7	14	12	73	16	2	B
PMT40160080A16019079	PMT40160	8	16	16	79	19	2	B
PMT40180090A16019079	PMT40180	9	18	16	79	19	2	B
PMT40200100A20022088	PMT40200	10	20	20	88	22	2	B
PMT40220110A20022088	PMT40220	11	22	20	88	22	2	B
PMT40250125A25026102	PMT40250	12,5	25	25	102	26	2	B

Cutting Conditions Parametry skrawania



			Structural steel, carbon steel Stal konstrukcyjna, węglowa		Structural steel, carbon steel, cast iron Stal konstrukcyjna, węglowa, żeliwo		Carbon steel, alloy steel, tool steel Stal węglowa, stopowa, narzędziowa		Prehardened steel, alloy steel, tool steel Stal ulepszona, stopowa, narzędziowa	
					<20HRC		20 - 30HRC		30 - 40HRC	
			<500N/mm²		500 - 800N/mm²		800 - 1000N/mm²		1000 - 1200N/mm²	
d1(mm)	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
3	1,5	0,6	7300	340	5800	230	3900	125	2000	55
4	2	0,8	6000	430	4620	290	3000	160	1600	75
6	3	1,2	4400	480	3500	320	2300	180	1200	85
8	4	1,3	3350	530	2600	350	1800	200	890	85
10	5	2	2750	600	2100	400	1400	230	680	102
12	6	2,4	2300	530	1800	350	1200	200	580	85
16	8	3,2	1700	480	1300	320	890	180	440	80
20	10	4	1350	420	1000	280	680	150	360	70
25	12,5	5	950	310	740	210	470	115	250	52

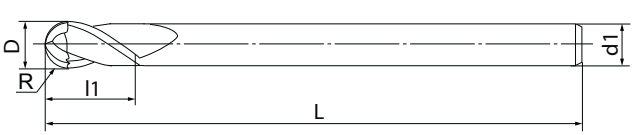
µm	D 30 — 0	µm	±0,02
	d1 h6		

PMT32

BALL NOSE KULISTE
2-Flute, Long Length 2-ostrzowe, długie

			HSM Vmax	M	R	B						max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●							●	●	●	○			





D code new Nowy kod	D code Kod	R	D	d1	L	l1	Z	Shank Uchwyt
PMT32020010A06007054	PMT32020	1	2	6	54	7	2	B
PMT32030015A06008056	PMT32030	1,5	3	6	56	8	2	B
PMT32040020A06011063	PMT32040	2	4	6	63	11	2	B
PMT32050025A06013068	PMT32050	2,5	5	6	68	13	2	B
PMT32060030A06013068	PMT32060	3	6	6	68	13	2	B
PMT32070035A10016080	PMT32070	3,5	7	10	80	16	2	B
PMT32080040A10019088	PMT32080	4	8	10	88	19	2	B
PMT32090045A10019088	PMT32090	4,5	9	10	88	19	2	B
PMT32100050A10022095	PMT32100	5	10	10	95	22	2	B
PMT32120060A12026110	PMT32120	6	12	12	110	26	2	B
PMT32140070A12026110	PMT32140	7	14	12	110	26	2	B
PMT32160080A16032123	PMT32160	8	16	16	123	32	2	B
PMT32180090A16032123	PMT32180	9	18	16	123	32	2	B
PMT32200100A20038141	PMT32200	10	20	20	141	38	2	B
PMT32220110A20038141	PMT32220	11	22	20	141	38	2	B
PMT32250125A25045166	PMT32250	12,5	25	25	166	45	2	B

Cutting Conditions Parametry skrawania



			Structural steel, carbon steel Stal konstrukcyjna, węglowa		Structural steel, carbon steel, cast iron Stal konstrukcyjna, węglowa, żeliwo		Carbon steel, alloy steel, tool steel Stal węglowa, stopowa, narzędziowa		Prehardened steel, alloy steel, tool steel Stal ulepszona, stopowa, narzędziowa	
					<20HRC		20 - 30HRC		30 - 40HRC	
			<500N/mm²		500 - 800N/mm²		800 - 1000N/mm²		1000 - 1200N/mm²	
d1(mm)	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
3	1,5	0,6	7300	340	5800	230	3900	125	2000	55
4	2	0,8	6000	430	4620	290	3000	160	1600	75
6	3	1,2	4400	480	3500	320	2300	180	1200	85
8	4	1,3	3350	530	2600	350	1800	200	890	85
10	5	2	2750	600	2100	400	1400	230	680	102
12	6	2,4	2300	530	1800	350	1200	200	580	85
16	8	3,2	1700	480	1300	320	890	180	440	80
20	10	4	1350	420	1000	280	680	150	360	70
25	12,5	5	950	310	740	210	470	115	250	52

µm	D 30 — 0	µm	±0,02
	d1 h6		

NOTE:
- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- 2 flute design for slotting
- 3 flute design possess the advantage of 2 flute and 4 flute end mill.
- 4 flute allows for better work piece finishes.
- Designed for milling of radius bottom slots, fillets and special contours.
- Fast chip ejection.

UWAGI:
- Odpowiednie do obróbki na sucho oraz w wysokich temperaturach.
- Doskonałe i wysoko wydajne frezy.
- Konstrukcja 2 zębowa zaprojektowana do rowkowania.
- Konstrukcja 3 zębowa łączy zalety konstrukcji 2 i 4 zębowowych frezów.
- Konstrukcja 4 zębowa pozwalana na lepszą obróbkę wykończeniową.
- Frezy przeznaczone do frezowania gniazd, promieni i do specjalnych konturów.
- Szybkie wyrzucanie wióra.

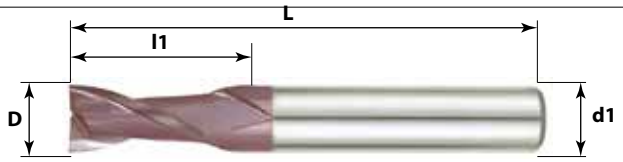
EDP No.		Z	Materials Materiały	D / R	Pag. / Str.
UCX10		2	P M K N S	D1-20	UCX3-UCX5
UCX11		4	P M K N S	D1-20	UCX6-UCX8
UCX13		2	P M K N S	R0.5-10	UCX9-UCX11
UCX14		3~5	P M K N S	D6-25	UCX12-UCX13
UCX15		4	P M K N S	R1-R10	UCX14-UCX15
UCX18		2	P M K N	D2-12	UCX16-UCX18
UCX19		4	P M K N	D2-20	UCX19-UCX22
UCX83		2	P M K N	D0.4-4	UCX23-UCX25
UCX86		2	P M K N	R0.2-2	UCX26-UCX28
UCX95		3	P M K N S	D0.5-20	UCX29-UCX33

UCX10

SQUARE TYPE WALCOWO-CZOŁOWE
2-Flute 2-ostrzowe

HSM Vmax	F	M	30°	A					max	min		AIR
									○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●				○	○	○	○	○	○		○	○



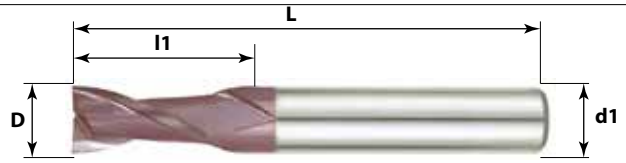
D code new Nowy kod	D	d1	l1	L	Shank Uchwyt
UCX10010000A04003040	1	4	3	40	HA
UCX10010000A03003039	1	3	3	39	HA
UCX10015000A04005040	1,5	4	4,5	40	HA
UCX10015000A03005039	1,5	3	5	39	HA
UCX10020000A02008032	2	2	8	32	HA
UCX10020000A03007039	2	3	7	39	HA
UCX10020000B06003050	2	6	3	50	HB
UCX10025000A02508032	2,5	2,5	8	32	HA
UCX10025000A03007039	2,5	3	7	39	HA
UCX10030000A03012032	3	3	12	32	HA
UCX10030000A03009039	3	3	9	39	HA
UCX10030000B06004050	3	6	4	50	HB
UCX10030000A03020060	3	3	20	60	HA
UCX10035000A03512032	3,5	3,5	12	32	HA
UCX10035000B06004050	3,5	6	4	50	HB
UCX10035000A03507050	3,5	3,5	7	50	HA
UCX10040000A04012040	4	4	12	40	HA
UCX10040000A04014051	4	4	14	51	HA
UCX10040000B06005054	4	6	5	54	HB
UCX10040000A04008050	4	4	8	50	HA
UCX10040000A04020060	4	4	20	60	HA
UCX10045000A04514050	4,5	4,5	14	50	HA
UCX10045000B06005054	4,5	6	5	54	HB
UCX10045000A04508050	4,5	4,5	8	50	HA
UCX10050000A05014050	5	5	14	50	HA
UCX10050000A05016051	5	5	16	51	HA
UCX10050000B06006054	5	6	6	54	HB
UCX10050000A05010050	5	5	10	50	HA
UCX10050000A05025075	5	5	25	75	HA
UCX10055000A05516050	5,5	5,5	16	50	HA
UCX10055000A05510057	5,5	5,5	10	57	HA
UCX10060000A06016050	6	6	16	50	HA
UCX10060000A06019064	6	6	19	64	HA
UCX10060000B06007054	6	6	7	54	HB
UCX10060000A06010057	6	6	10	57	HA
UCX10060000A06030075	6	6	30	75	HA
UCX10065000A06513060	6,5	6,5	13	60	HA
UCX10070000A07020060	7	7	20	60	HA
UCX10070000B08008058	7	8	8	58	HB
UCX10070000A07013060	7	7	13	60	HA
UCX10075000A07516063	7,5	7,5	16	63	HA
UCX10080000A08020060	8	8	20	60	HA
UCX10080000A08021064	8	8	21	64	HA
UCX10080000B08009058	8	8	9	58	HB
UCX10080000A08016063	8	8	16	63	HA
UCX10080000A08030075	8	8	30	75	HA
UCX10085000A08516067	8,5	8,5	16	67	HA
UCX10090000A09020060	9	9	20	60	HA
UCX10090000B10010066	9	10	10	66	HB
UCX10090000A09016067	9	9	16	67	HA

UCX10

SQUARE TYPE WALCOWO-CZOŁOWE
2-Flute 2-ostrzowe

			HSM Vmax	F	M	30°	A						max	min		AIR
													○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●				○	○	○	○	○	○		○	○



D code new Nowy kod	D	d1	l1	L	Shank Uchwyt
UCX10095000A09519072	9,5	9,5	19	72	HA
UCX10100000A10022070	10	10	22	70	HA
UCX10100000A10022070	10	10	22	70	HA
UCX10100000B10011066	10	10	11	66	HB
UCX10100000A10019072	10	10	19	72	HA
UCX10100000A10040100	10	10	40	100	HA
UCX10110000A11022083	11	11	22	83	HA
UCX10120000A12022070	12	12	22	70	HA
UCX10120000A12025076	12	12	25	76	HA
UCX10120000B12012073	12	12	12	73	HB
UCX10120000A12022083	12	12	22	83	HA
UCX10120000A12045100	12	12	45	100	HA
UCX10130000A13022083	13	13	22	83	HA
UCX10140000A14025075	14	14	25	75	HA
UCX10140000B14014075	14	14	14	75	HB
UCX10140000A14022083	14	14	22	83	HA
UCX10140000A14045100	14	14	45	100	HA
UCX10150000A15026092	15	15	26	92	HA
UCX10160000A16025075	16	16	25	75	HA
UCX10160000A16032089	16	16	32	89	HA
UCX10160000B16016082	16	16	16	82	HB
UCX10160000A16026092	16	16	26	92	HA
UCX10160000A16045100	16	16	45	100	HA
UCX10180000B18018084	18	18	18	84	HB
UCX10180000A18026092	18	18	26	92	HA
UCX10180000A18045100	18	18	45	100	HA
UCX10200000A20032100	20	20	32	100	HA
UCX10200000A20038102	20	20	38	102	HA
UCX10200000B20020092	20	20	20	92	HB
UCX10200000A20032104	20	20	32	104	HA
UCX10200000A20045100	20	20	45	100	HA

UCX10

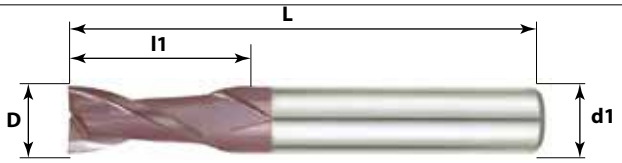
NEW

SQUARE TYPE WALCOWO-CZOŁOWE

2-Flute 2-ostrzowe

HSM Vmax	F	M	30°	A					max	min		AIR
									○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●				○	○	○	○	○	○		○	○

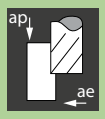


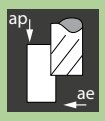
D code new Nowy kod	D	d1	L	l1	Chamfer Size Rozmiar Fazki	Z	Shank Uchwyt
UCX1003000CA03012032	3.0	3	32	12	0.1	2	HA
UCX1004000CA04012040	4.0	4	40	12	0.1	2	HA
UCX1005000CA05014050	5.0	5	50	14	0.1	2	HA
UCX1006000CA06016050	6.0	6	50	16	0.1	2	HA
UCX1008000CA08020060	8.0	8	60	20	0.13	2	HA
UCX1010000CA1002207	10.0	10	70	22	0.13	2	HA
UCX1012000CA12022070	12.0	12	70	22	0.18	2	HA
UCX1014000CA14025075	14.0	14	75	25	0.18	2	HA
UCX1016000CA16025075	16.0	16	75	25	0.18	2	HA
UCX1020000CA20032100	20.0	20	100	32	0.23	2	HA
UCX1003000CHB06007057	3.0	6	57	7	0.1	2	HB
UCX1004000CHB06008057	4.0	6	57	8	0.1	2	HB
UCX1005000CHB06010057	5.0	6	57	10	0.1	2	HB
UCX1006000CHB06010057	6.0	6	57	10	0.1	2	HB
UCX1008000CHB08016063	8.0	8	63	16	0.13	2	HB
UCX1010000CHB10019072	10.0	10	72	19	0.13	2	HB
UCX1012000CHB12022083	12.0	12	83	22	0.18	2	HB
UCX1014000CHB14022083	14.0	14	83	22	0.18	2	HB
UCX1016000CHB16026092	16.0	16	92	26	0.18	2	HB
UCX1020000CHB20032104	20.0	20	104	32	0.23	2	HB

Added Chamfer Edges 45°
Dodana Faza Krawędzi 45°

UCX10

Cutting Conditions Parametry skrawania

			Alloy steel, Tool steel Stal stopowa, Stal narzędziowa		Alloy steel, Heat resistant steels Stal stopowa, Stal stopowa żaroodporna		Stainless steels Stal nierdzewna	
			30 HRC		30~45 HRC			
d1	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min
1.0	1	0.5	14300	105	8500	65	7150	50
1.5	1.5	0.75	9350	150	5550	85	5600	80
2.0	2	1	7850	160	5150	100	4300	80
3.0	3	1.5	6100	180	3800	120	3150	100
4.0	4	0.8	5150	255	3150	155	2650	130
5.0	5	1	4300	270	2550	160	2150	135
6.0	6	1.2	3800	300	2300	190	1950	155
8.0	8	1.6	2850	325	1700	170	1450	155
10.0	10	2	2200	280	1350	135	1150	135
12.0	12	2.4	1850	240	1150	110	950	110
14.0	14	2.8	1700	215	1050	100	850	100
16.0	16	3.2	1500	185	950	95	700	95
20.0	20	4	1150	145	700	70	550	70

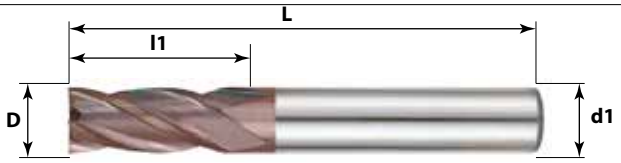
			Caston Iron Żeliwo		Aluminium alloys Stopy aluminium		Copper Brass, Non-Ferrous Metals Miedź, Brąz, Metale nie żelazne	
d1	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min
1.0	1	1	18700	205	44000	330	24700	200
1.5	1.5	1.5	12100	205	27500	385	20300	300
2.0	2	2	9350	220	22000	460	16500	340
3.0	3	3	6050	220	15400	460	11000	340
4.0	4	4	4600	220	11000	460	8800	340
5.0	5	5	3650	220	9150	460	6800	340
6.0	6	6	2950	255	7600	485	5700	375
8.0	8	8	2200	275	5700	485	4400	375
10.0	10	10	1850	285	4600	485	3400	375
12.0	12	12	1450	295	3750	485	2850	375
14.0	14	14	1300	310	3300	485	2400	375
16.0	16	16	1100	320	2850	485	2200	375
20.0	20	20	900	340	2200	485	1700	375

UCX11

SQUARE TYPE WALCOWO-CZOŁOWE
4-Flute 4-ostrzowe

HSM Vmax	F	M	30°	A					max	min		AIR
									○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●				○	○	○	○	○	○		○	○



D code new Nowy kod	D	d1	l1	L	Shank Uchwyt
UCX11010000A04003040	1	4	3	40	HA
UCX11010000A03003039	1	3	3	39	HA
UCX11015000A04005040	1,5	4	4,5	40	HA
UCX11015000A03005039	1,5	3	5	39	HA
UCX11020000A02008032	2	2	8	32	HA
UCX11020000A03007039	2	3	7	39	HA
UCX11020000B06004050	2	6	4	50	HB
UCX11020000A03007038	2	3	7	38	HA
UCX11025000A02508032	2,5	2,5	8	32	HA
UCX11025000A03007039	2,5	3	7	39	HA
UCX11025000B06004050	2,5	6	4	50	HB
UCX11030000A03012032	3	3	12	32	HA
UCX11030000A03009039	3	3	10	39	HA
UCX11030000B06005050	3	6	5	50	HB
UCX11030000B06008057	3	6	8	57	HB
UCX11030000A03020060	3	3	20	60	HA
UCX11035000A03512032	3,5	3,5	12	32	HA
UCX11035000B06006050	3,5	6	6	50	HB
UCX11035000A03510050	3,5	3,5	10	50	HA
UCX11035000B06010057	3,5	6	10	57	HB
UCX11040000A04012040	4	4	12	40	HA
UCX11040000A04014051	4	4	14	51	HA
UCX11040000B06008054	4	6	8	54	HB
UCX11040000A04011050	4	4	11	50	HA
UCX11040000B06011057	4	6	11	57	HB
UCX11040000A04020060	4	4	20	60	HA
UCX11045000A04514050	4,5	4,5	14	50	HA
UCX11045000B06008054	4,5	6	8	54	HB
UCX11045000A04511050	4,5	4,5	11	50	HA
UCX11045000B06011057	4,5	6	11	57	HB
UCX11050000A05014050	5	5	14	50	HA
UCX11050000A05016051	5	5	16	51	HA
UCX11050000B06009054	5	6	9	54	HB
UCX11050000A05013050	5	5	13	50	HA
UCX11050000B06013057	5	6	13	57	HB
UCX11050000A05025075	5	5	25	75	HA
UCX11055000A05516050	5,5	5,5	16	50	HA
UCX11055000A05513057	5,5	5,5	13	57	HA
UCX11060000A06016050	6	6	16	50	HA
UCX11060000A06019064	6	6	19	64	HA
UCX11060000B06010054	6	6	10	54	HB
UCX11060000A06013057	6	6	13	57	HA
UCX11060000B06013057	6	6	13	57	HB
UCX11060000A06030075	6	6	30	75	HA
UCX11065000A06516060	6,5	6,5	16	60	HA
UCX11070000A07020060	7	7	20	60	HA
UCX11070000B08011058	7	8	11	58	HB
UCX11070000A07016060	7	7	16	60	HA
UCX11070000B08016063	7	8	16	63	HB

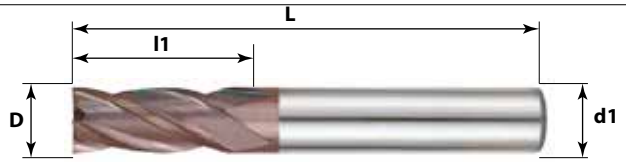
UCX11

SQUARE TYPE WALCOWO-CZOŁOWE

4-Flute 4-ostrzowe

			HSM Vmax	F	M	30°	A					max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●				○	○	○	○	○	○		○	○



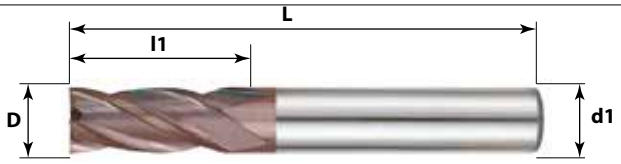
D code new Nowy kod	D	d1	l1	L	Shank Uchwyt
UCX11075000A07519063	7,5	7,5	19	63	HA
UCX11080000A08020060	8	8	20	60	HA
UCX11080000A08021064	8	8	21	64	HA
UCX11080000B08012058	8	8	12	58	HB
UCX11080000A08019063	8	8	19	63	HA
UCX11080000B08019063	8	8	19	63	HB
UCX11080000A08030075	8	8	30	75	HA
UCX11085000A08519067	8,5	8,5	19	67	HA
UCX11090000A09020060	9	9	20	60	HA
UCX11090000B10013066	9	10	13	66	HB
UCX11090000A09019067	9	9	19	67	HA
UCX11090000B10019072	9	10	19	72	HB
UCX11095000A09522072	9,5	9,5	22	72	HA
UCX1110000A10022070	10	10	22	70	HA
UCX11100000A10022070	10	10	22	70	HA
UCX11100000B10014066	10	10	14	66	HB
UCX11100000A10022072	10	10	22	72	HA
UCX11100000B10022072	10	10	22	72	HB
UCX11100000A10040100	10	10	40	100	HA
UCX11110000A11026083	11	11	26	83	HA
UCX11120000A12022070	12	12	22	70	HA
UCX11120000A12025076	12	12	25	76	HA
UCX11120000B12016073	12	12	16	73	HB
UCX11120000A12026083	12	12	26	83	HA
UCX11120000B12026083	12	12	26	83	HB
UCX11120000A12045100	12	12	45	100	HA
UCX11130000A13026083	13	13	26	83	HA
UCX11140000A14025075	14	14	25	75	HA
UCX11140000B14018075	14	14	18	75	HB
UCX11140000A14026083	14	14	26	83	HA
UCX11140000B14026083	14	14	26	83	HB
UCX11140000A14045100	14	14	45	100	HA
UCX11150000A15032092	15	15	32	92	HA
UCX11160000A16025075	16	16	25	75	HA
UCX11160000A16032089	16	16	32	89	HA
UCX11160000B16022082	16	16	22	82	HB
UCX11160000A16032092	16	16	32	92	HA
UCX11160000B16032092	16	16	32	92	HB
UCX11160000A16045100	16	16	45	100	HA
UCX11180000B18024084	18	18	24	84	HB
UCX11180000A18032092	18	18	32	92	HA
UCX11180000B18032092	18	18	32	92	HB
UCX11180000A18045100	18	18	45	100	HA
UCX11200000A20032100	20	20	32	100	HA
UCX11200000A20038102	20	20	38	102	HA
UCX11200000B20026092	20	20	26	92	HB
UCX11200000A20038104	20	20	38	104	HA
UCX11200000B20038104	20	20	38	104	HB
UCX11200000A20045100	20	20	45	100	HA

UCX11

SQUARE TYPE WALCOWO-CZOŁOWE
4-Flute 4-ostrzowe

HSM Vmax	F	M	30°	A						max	min		AIR
										○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●				○	○	○	○	○	○		○	○

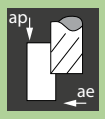


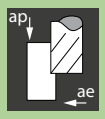
D code new Nowy kod	D	d1	L	l1	Chamfer Size Rozmiar Fazki	Z	Shank Uchwyt
UCX1103000CA03012032	3.0	3	32	12	0.1	4	HA
UCX1104000CA04012040	4.0	4	40	12	0.1	4	HA
UCX1105000CA05014050	5.0	5	50	14	0.1	4	HA
UCX1106000CA06016050	6.0	6	50	16	0.1	4	HA
UCX1108000CA08020060	8.0	8	60	20	0.13	4	HA
UCX111000CA10022070	10.0	10	70	22	0.13	4	HA
UCX1112000CA12022070	12.0	12	70	22	0.18	4	HA
UCX1114000CA14025075	14.0	14	75	25	0.18	4	HA
UCX1116000CA16025075	16.0	16	75	25	0.18	4	HA
UCX1120000CA20032100	20.0	20	100	32	0.23	4	HA
UCX1103000CHB06008057	3.0	6	57	8	0.1	4	HB
UCX1104000CHB06011057	4.0	6	57	11	0.1	4	HB
UCX1105000CHB06013057	5.0	6	57	13	0.1	4	HB
UCX1106000CHB06013057	6.0	6	57	13	0.1	4	HB
UCX1108000CHB08019063	8.0	8	63	19	0.13	4	HB
UCX1110000CHB10022072	10.0	10	72	22	0.13	4	HB
UCX1112000CHB12026083	12.0	12	83	26	0.18	4	HB
UCX1114000CHB14026083	14.0	14	83	26	0.18	4	HB
UCX1116000CHB16032092	16.0	16	92	32	0.18	4	HB
UCX1120000CHB20038104	20.0	20	104	38	0.23	4	HB
UCX1114000CA14025075	14.0	14	75	25	0.18	4	HA
UCX1116000CA16025075	16.0	16	75	25	0.18	4	HA
UCX1120000CA20032100	20.0	20	100	32	0.23	4	HA

Added Chamfer Edges 45°
Dodana Faza Krawędzi 45°

UCX11

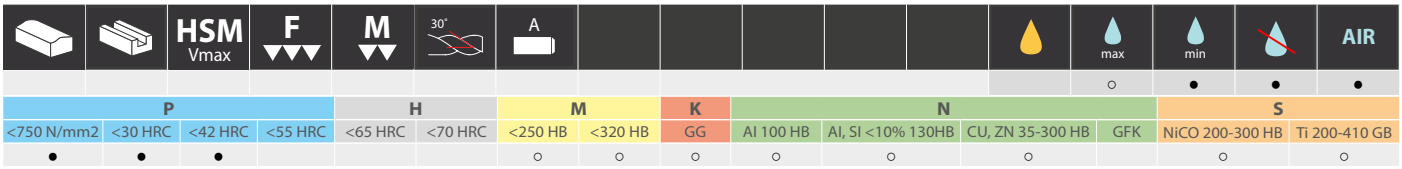
Cutting Conditions Parametry skrawania

			Alloy steel, Tool steel Stal stopowa, Stal narzędziowa		Alloy steel, Heat resistant steels Stal stopowa, Stal stopowa żaroodporna		Stainless steels Stal nierdzwena	
			30 HRC		30~45 HRC			
d1	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min
1.0	0.1	1	17600	110	10250	65	8650	55
1.5	0.15	1.5	11800	160	7050	85	7050	90
2.0	0.2	2	9850	180	6450	120	5350	100
3.0	0.3	3	7600	205	4750	130	3950	105
4.0	0.4	4	6450	365	3950	220	3300	180
5.0	0.5	5	5350	385	3200	230	2700	195
6.0	0.6	6	4750	425	2850	265	2400	215
8.0	0.8	8	3550	450	2150	245	1800	225
10.0	1	10	2750	390	1700	195	1450	195
12.0	1.2	12	2350	330	1450	160	1150	155
14.0	1.4	14	2100	465	1300	145	1050	140
16.0	1.6	16	1850	265	1150	130	900	130
20.0	2	20	1450	205	900	100	700	100

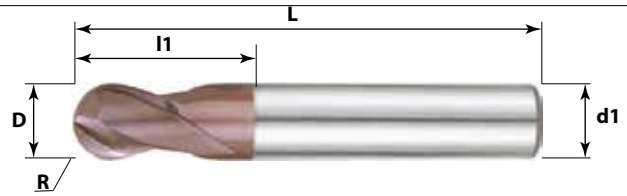
			Caston Iron Żeliwo		Aluminium alloys Stopy aluminium		Copper Brass, Non-Ferrous Metals Miedź, Brąz, Metale nie żelazne	
d1	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min
1.0	0.1	1.5	18700	460	44000	750	24700	450
1.5	0.15	2.25	12100	460	27500	860	20300	675
2.0	0.2	3	9350	475	22000	1035	16500	770
3.0	0.3	4.5	6050	475	15400	990	11000	760
4.0	0.4	6	4600	485	11000	1035	8800	770
5.0	0.5	7.5	3650	485	9150	1010	6800	760
6.0	0.6	9	2950	570	7600	1100	5700	825
8.0	0.8	12	2200	615	5700	1100	4400	825
10.0	1	15	1850	640	4600	1100	3400	825
12.0	1.2	18	1450	670	3750	1100	2850	825
14.0	1.4	21	1300	705	3300	1100	2400	825
16.0	1.6	24	1100	725	2850	1100	2200	825
20.0	2	30	900	770	2200	1100	1700	825

UCX13

BALL TYPE KULISTE
2-Flute 2-ostrzowe



P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●				○	○	○	○	○	○		○	○



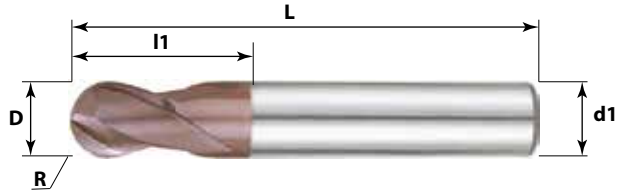
D code new Nowy kod						Shank Uchwyt
UCX13010005A03003039	R 0,5	1	3	3	39	HA
UCX13015008A03005039	R 0,75	1,5	3	5	39	HA
UCX13020010A03007039	R 1,0	2	3	7	39	HA
UCX13020010B06003050	R 1,0	2	6	3	50	HB
UCX13020010A03006038	R 1,0	2	3	6	38	HA
UCX13025013A03007039	R 1,25	2,5	3	8	39	HA
UCX13030015A03009039	R 1,5	3	3	9	39	HA
UCX13030015B06004050	R 1,5	3	6	4	50	HB
UCX13030015B06007057	R 1,5	3	6	7	57	HB
UCX13030015A03005075	R 1,5	3	3	5	75	HA
UCX13030015A03020060	R 1,5	3	3	20	60	HA
UCX13040020A04014051	R 2,0	4	4	14	51	HA
UCX13040020B06005054	R 2,0	4	6	5	54	HB
UCX13040020B06008057	R 2,0	4	6	8	57	HB
UCX13040020A04008075	R 2,0	4	4	8	75	HA
UCX13040020A04020060	R 2,0	4	4	20	60	HA
UCX13050025A05016051	R 2,5	5	5	16	51	HA
UCX13050025B06006054	R 2,5	5	6	6	54	HB
UCX13050025B06010057	R 2,5	5	6	10	57	HB
UCX13050025A05009075	R 2,5	5	5	9	75	HA
UCX13050025A05025075	R 2,5	5	5	25	75	HA
UCX13060030A06019064	R 3,0	6	6	19	64	HA
UCX13060030B06007054	R 3,0	6	6	7	54	HB
UCX13060030B06010057	R 3,0	6	6	10	57	HB
UCX13060030A06010100	R 3,0	6	6	10	100	HA
UCX13060030A06030075	R 3,0	6	6	30	75	HA
UCX13080040A08021064	R 4,0	8	8	21	64	HA
UCX13080040B08009058	R 4,0	8	8	9	58	HB
UCX13080040B08016063	R 4,0	8	8	16	63	HB
UCX13080040A08012100	R 4,0	8	8	12	100	HA
UCX13080040A08030075	R 4,0	8	8	30	75	HA
UCX13100050A10022070	R 5,0	10	10	22	70	HA
UCX13100050B10011066	R 5,0	10	10	11	66	HB
UCX13100050B10019072	R 5,0	10	10	19	72	HB
UCX13100050A10014100	R 5,0	10	10	14	100	HA
UCX13100050A10040100	R 5,0	10	10	40	100	HA
UCX13110055A11025070	R 5,5	11	11	25	70	HA
UCX13120060A12025076	R 6,0	12	12	25	76	HA
UCX13120060B12012073	R 6,0	12	12	12	73	HB
UCX13120060B12022083	R 6,0	12	12	22	83	HB
UCX13120060A12016100	R 6,0	12	12	16	100	HA
UCX13120060A12045100	R 6,0	12	12	45	100	HA
UCX13140070B14014075	R 7,0	14	14	14	75	HB
UCX13140070B14022083	R 7,0	14	14	22	83	HB
UCX13140070A14018100	R 7,0	14	14	18	100	HA
UCX13140070A14045100	R 7,0	14	14	45	100	HA

UCX13

BALL TYPE KULISTE
2-Flute 2-ostrzowe

HSM Vmax	F	M	30°	A						max	min		AIR
										○	●	●	●

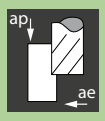
P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●				○	○	○	○	○	○		○	○

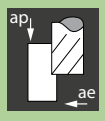


D code new Nowy kod						Shank Uchwyt
UCX13160080A16032089	R 8,0	16	16	32	89	HA
UCX13160080B16026092	R 8,0	16	16	26	92	HB
UCX13160080A16022150	R 8,0	16	16	22	150	HA
UCX13160080A16045100	R 8,0	16	16	45	100	HA
UCX13180090B18018084	R 9,0	18	18	18	84	HB
UCX13180090B18026092	R 9,0	18	18	26	92	HB
UCX13180090A18045100	R 9,0	18	18	45	100	HA
UCX13200100A20038102	R 10,0	20	20	38	102	HA
UCX13200100B20020092	R 10,0	20	20	20	92	HB
UCX13200100B20032104	R 10,0	20	20	32	104	HB
UCX13200100A20026150	R 10,0	20	20	26	150	HA
UCX13200100A20045100	R 10,0	20	20	45	100	HA

UCX13

Cutting Conditions Parametry skrawania

			Alloy steel, Tool steel Stal stopowa, Stal narzędziowa		Alloy steel, Heat resistant steels Stal stopowa, Stal stopowa żaroodporna		Stainless steels Stal nierdzewna	
			30 HRC		30~45 HRC			
d1	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min
1.0	0.2	0.2	17600	150	10250	85	8650	75
1.5	0.3	0.2	11800	215	7050	115	7050	120
2.0	0.4	0.2	9850	240	6450	145	5350	120
3.0	0.6	0.2	7600	270	4750	170	3950	145
4.0	0.8	0.2	6450	485	3950	300	3300	240
5.0	1	0.2	5350	510	3200	305	2700	255
6.0	1.2	0.2	4750	560	2850	350	2400	280
8.0	1.6	0.3	3550	605	2150	325	1800	300
10.0	2	0.3	2750	520	1700	255	1450	255
12.0	2.4	0.3	2350	440	1450	215	1150	205
14.0	2.8	0.3	2100	395	1300	195	1050	190
16.0	3.2	0.3	1850	350	1150	170	950	170
20.0	4	0.3	1450	270	900	135	700	130

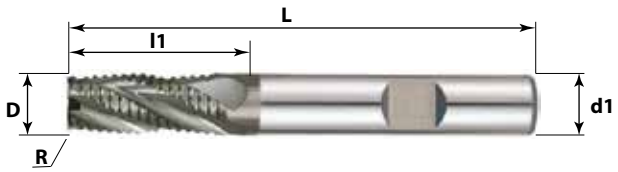
			Caston Iron Żeliwo		Aluminium alloys Stopy aluminium		Copper Brass, Non-Ferrous Metals Miedź, Brąz, Metale nie żelazne	
d1	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min
1.0	0.7	0.3	18700	620	44000	1050	24700	605
1.5	1.05	0.45	12100	620	27500	1160	20300	910
2.0	1.4	0.6	9350	640	22000	1320	16500	1035
3.0	2.1	0.9	6050	640	15400	1320	11000	1035
4.0	2.8	1.2	4600	640	11000	1320	8800	1035
5.0	3.5	1.5	3650	640	9150	1320	6800	1035
6.0	4.2	1.8	2950	770	7600	1430	5700	1100
8.0	5.6	2.4	2200	815	5700	1430	4400	1100
10.0	7	3	1850	860	4600	1430	3400	1100
12.0	8.4	3.6	1450	900	3750	1430	2850	1100
14.0	9.8	4.2	1300	945	3300	1430	2400	1100
16.0	11.2	4.8	1100	970	2850	1430	2200	1100
20.0	14	6	900	1035	2200	1430	1700	1100

UCX14

SQUARE TYPE WALCOWO-CZOŁOWE
3-5-Flute 3-5-ostrzowe

HSM Vmax	M	R	30°	A						max	min		AIR
										○	●	●	●

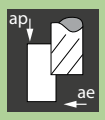
P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●				○	○	○	○	○	○		○	○

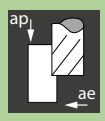


D code new Nowy kod						Shank Uchwyt
UCX14060000B06016057	6	6	16	57	3	HB
UCX14080000B08016063	8	8	16	63	3	HB
UCX14100000B10022072	10	10	22	72	4	HB
UCX14120000B12026083	12	12	26	83	4	HB
UCX14140000B14026083	14	14	26	83	4	HB
UCX14160000B16032092	16	16	32	92	4	HB
UCX14180000B18032092	18	18	32	92	4	HB
UCX14200000B20038104	20	20	38	104	4	HB
UCX14250000B25045121	25	25	45	121	5	HB

UCX14

Cutting Conditions Parametry skrawania

			**Alloy steel, Tool steel Stal stopowa, Stal narzędziowa**		**Alloy steel, Heat resistant steels Stal stopowa, Stal stopowa żaroodporna**	
			30 HRC		**30~45 HRC**	
d1	ae	ap	RPM	mm/min	RPM	mm/min
6.0	1.8	9	13250	1970	10550	710
8.0	2.4	12	9850	1970	7800	710
10.0	3	15	7800	1970	6450	710
12.0	3.6	18	6800	2040	5100	680
14.0	4.2	21	5800	2040	4400	710
16.0	4.8	24	5100	2040	4100	650
18.0	5.4	27	4400	1970	3750	610
20.0	6	30	4100	1840	3050	480
25.0	7.5	37.5	3650	1830	2700	530

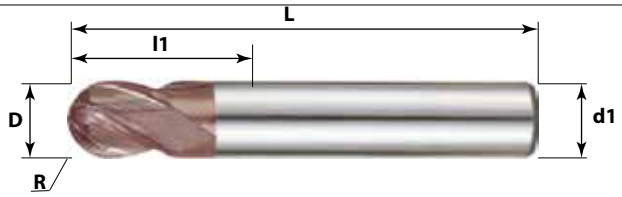
			**Stainless steels Stal nierdzwena**		**Inconel Inconel**	
d1	ae	ap	RPM	mm/min	RPM	mm/min
6	0,3	6	7150	480	2050	160
8	0,4	8	5350	480	1550	150
10	0,5	10	4350	480	1100	160
12	0,6	12	3550	480	1000	160
14	0,7	14	3050	480	750	110
16	0,8	16	2800	430	700	90
18	0,9	18	2300	360	600	90
20	1	20	2050	310	550	90
25	1,25	25	1850	350	500	90

UCX15

BALL TYPE KULISTE
4-Flute 4-ostrzowe

		HSM Vmax	F	M	30°	A						max	min		AIR
												○	●	●	●

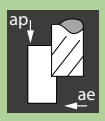
P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, SI <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●				○	○	○	○	○	○		○	○

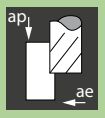


D code new Nowy kod						Shank Uchwyt
UCX15020010A06004048	R 1,0	2	6	4	48	HA
UCX15030015A06004048	R 1,5	3	6	4	48	HA
UCX15040020A06006050	R 2,0	4	6	6	50	HA
UCX15050025A06007051	R 2,5	5	6	7	51	HA
UCX15060030A06007051	R 3,0	6	6	7	51	HA
UCX15080040A08009059	R 4,0	8	8	9	59	HA
UCX15100050A10010060	R 5,0	10	10	10	60	HA
UCX15120060A12014071	R 6,0	12	12	14	71	HA
UCX15140070A14014071	R 7,0	14	14	14	71	HA
UCX15160080A16016076	R 8,0	16	16	16	76	HA
UCX15180090A18018076	R 9,0	18	18	18	76	HA
UCX15200100A20020082	R 10,0	20	20	20	82	HA

UCX15

Cutting Conditions Parametry skrawania

			Alloy steel, Tool steel Stal stopowa, Stal narzędziowa		Alloy steel, Heat resistant steels Stal stopowa, Stal stopowa żaroodporna		Stainless steels Stal nierdzwena	
			30 HRC		30~45 HRC			
d1	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min
R1.0 X 2.0	0.6	3	13300	680	10000	405	4100	135
R1.5 X 3.0	0.9	4.5	11500	870	8550	585	3850	190
R2.0 X 4.0	1.2	6	8950	950	7150	680	3600	230
R2.5 X 5.0	1.5	7.5	7800	1045	6200	745	3100	230
R3.0 X 6.0	1.8	9	7250	1330	5900	1090	2700	235
R4.0 X 8.0	2.4	12	6100	1660	4900	1185	2100	285
R5.0 X 10.0	3	15	5450	1950	4350	1330	1750	290
R6.0 X 12.0	3.6	18	4985	2230	4000	1425	1500	320
R7.0 X 14.0	4.2	21	4500	2230	3600	1425	1300	320
R8.0 X 16.0	4.8	24	4085	2230	3200	1380	1100	320
R9.0 X 18.0	5.4	27	3800	2135	3000	1330	1050	320
R10.0X 20.0	6	30	3550	2135	2800	1330	950	320

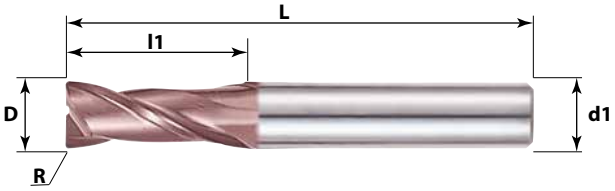
			Caston Iron Żeliwo		Aluminium alloys Stopy aluminium	
d1	ae	ap	RPM	mm/min	RPM	mm/min
R1.0 x 2.0	0.1	2	10500	330	30800	605
R1.5 X 3.0	0.15	3	7050	340	20500	605
R2.0 X 4.0	0.2	4	5150	430	15400	605
R2.5 X 5.0	0.25	5	4150	495	12100	715
R3.0 X 6.0	0.3	6	3400	540	10300	715
R4.0 X 8.0	0.4	8	2500	680	7900	820
R5.0 X 10.0	0.5	10	2050	680	6150	820
R6.0 X 12.0	0.6	12	1750	680	5150	945
R7.0 X 14.0	0.7	14	1400	700	4300	945
R8.0 X 16.0	0.8	16	1300	700	3850	820
R9.0 X 18.0	0.9	18	1100	700	3400	820
R10.0X 20.0	1	20	1050	630	2950	820

UCX18

SQUARE TYPE WALCOWO-CZOŁOWE
4-Flute 4-ostrzowe

			HSM Vmax	F	M	30°	A					max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, SI <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●				○	○	○	○	○	○			



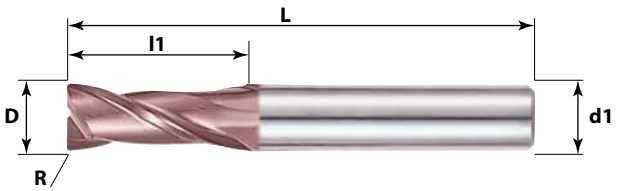
D code new Nowy kod	R	D	d1	l1	L	Shank Uchwyt
UCX18020002A04004050	R0.2	2.0	4	4	50	HA
UCX18020003A04004050	R0.3	2.0	4	4	50	HA
UCX18020005A04004050	R0.5	2.0	4	4	50	HA
UCX18025002A04005050	R0.2	2.5	4	5	50	HA
UCX18025003A04005050	R0.3	2.5	4	5	50	HA
UCX18025005A04005050	R0.5	2.5	4	5	50	HA
UCX18030002A04006050	R0.2	3.0	4	6	50	HA
UCX18030003A04006050	R0.3	3.0	4	6	50	HA
UCX18030005A04006050	R0.5	3.0	4	6	50	HA
UCX18030010A04006050	R1.0	3.0	4	6	50	HA
UCX18040002A04008050	R0.2	4.0	4	8	50	HA
UCX18040003A04008050	R0.3	4.0	4	8	50	HA
UCX18040005A04008050	R0.5	4.0	4	8	50	HA
UCX18040010A04008050	R1.0	4.0	4	8	50	HA
UCX18050002A06010050	R0.2	5.0	6	10	50	HA
UCX18050003A06010050	R0.3	5.0	6	10	50	HA
UCX18050005A06010050	R0.5	5.0	6	10	50	HA
UCX18050010A06010050	R1.0	5.0	6	10	50	HA
UCX18060002A06012050	R0.2	6.0	6	12	50	HA
UCX18060003A06012050	R0.3	6.0	6	12	50	HA
UCX18060005A06012050	R0.5	6.0	6	12	50	HA
UCX18060010A06012050	R1.0	6.0	6	12	50	HA
UCX18080005A08016060	R0.5	8.0	8	16	60	HA
UCX18080010A08016060	R1.0	8.0	8	16	60	HA
UCX18080015A08016060	R1.5	8.0	8	16	60	HA
UCX18080020A08016060	R2.0	8.0	8	16	60	HA
UCX18080025A08016060	R2.5	8.0	8	16	60	HA
UCX18100005A10020075	R0.5	10.0	10	20	75	HA
UCX18100010A10020075	R1.0	10.0	10	20	75	HA
UCX18100015A10020075	R1.5	10.0	10	20	75	HA
UCX18100020A10020075	R2.0	10.0	10	20	75	HA
UCX18100025A10020075	R2.5	10.0	10	20	75	HA
UCX18120005A12024075	R0.5	12.0	12	24	75	HA
UCX18120010A12024075	R1.0	12.0	12	24	75	HA
UCX18120015A12024075	R1.5	12.0	12	24	75	HA
UCX18120020A12024075	R2.0	12.0	12	24	75	HA
UCX18120025A12024075	R2.5	12.0	12	24	75	HA
UCX18030005A04006075	R0.5	3.0	4	6	75	HA
UCX18030010A04006075	R1.0	3.0	4	6	75	HA
UCX18040005A04008075	R0.5	4.0	4	8	75	HA
UCX18040010A04008075	R1.0	4.0	4	8	75	HA
UCX18050005A06010075	R0.5	5.0	6	10	75	HA
UCX18050010A06010075	R1.0	5.0	6	10	75	HA
UCX18060005A06012075	R0.5	6.0	6	12	75	HA
UCX18060010A06012075	R1.0	6.0	6	12	75	HA

UCX18

SQUARE TYPE WALCOWO-CZOŁOWE
4-Flute 4-ostrzowe

			HSM Vmax	F	M	30°	A						max	min		AIR
													○	●	●	●

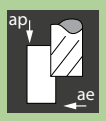
P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●				○	○	○	○	○	○			

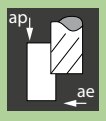


D code new Nowy kod	R	D	d1	l1	L	Shank Uchwyt
UCX18080005A08016100	R0.5	8.0	8	16	100	HA
UCX18080010A08016100	R1.0	8.0	8	16	100	HA
UCX18080015A08016100	R1.5	8.0	8	16	100	HA
UCX18080020A08016100	R2.0	8.0	8	16	100	HA
UCX18080025A08016100	R2.5	8.0	8	16	100	HA
UCX18100005A10020100	R0.5	10.0	10	20	100	HA
UCX18100010A10020100	R1.0	10.0	10	20	100	HA
UCX18100015A10020100	R1.5	10.0	10	20	100	HA
UCX18100020A10020100	R2.0	10.0	10	20	100	HA
UCX18100025A10020100	R2.5	10.0	10	20	100	HA
UCX18120005A12024100	R0.5	12.0	12	24	100	HA
UCX18120010A12024100	R1.0	12.0	12	24	100	HA
UCX18120015A12024100	R1.5	12.0	12	24	100	HA
UCX18120020A12024100	R2.0	12.0	12	24	100	HA
UCX18120025A12024100	R2.5	12.0	12	24	100	HA

UCX18

Cutting Conditions Parametry skrawania

			Alloy steel, Tool steel Stal stopowa, Stal narzędziowa		Alloy steel, Heat resistant steels Stal stopowa, Stal stopowa żaroodporna		Stainless steels Stal nierdzwena	
			30 HRC		30~45 HRC			
d1	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min
2.0	2	1	7850	160	5150	100	4300	80
3.0	3	1.5	6100	180	3800	120	3150	100
4.0	4	0.8	5150	255	3150	155	2650	130
5.0	5	1	4300	270	2550	160	2150	135
6.0	6	1.2	3800	300	2300	190	1950	155
8.0	8	1.6	2850	325	1700	170	1450	155
10.0	10	2	2200	280	1350	135	1150	135
12.0	12	2.4	1850	240	1150	110	950	110

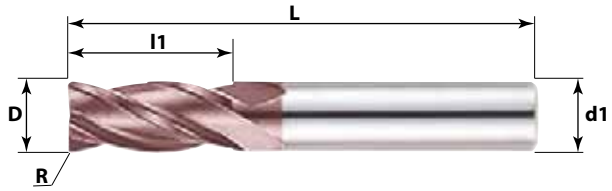
			Caston Iron Żeliwo		Aluminium alloys Stopy aluminium		Copper Brass, Non-Ferrous Metals Miedź, Brąz, Metale nie żelazne	
d1	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min
2.0	2	2	9350	220	22000	460	16500	340
3.0	3	3	6050	220	15400	460	11000	340
4.0	4	4	4600	220	11000	460	8800	340
5.0	5	5	3650	220	9150	460	6800	340
6.0	6	6	2950	255	7600	485	5700	375
8.0	8	8	2200	275	5700	485	4400	375
10.0	10	10	1850	285	4600	485	3400	375
12.0	12	12	1450	295	3750	485	2850	375

UCX19

SQUARE TYPE WALCOWO-CZOŁOWE
4-Flute 4-ostrzowe

HSM Vmax	F	M	30°	A	max	min	AIR
					○	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●				○	○	○	○	○	○			



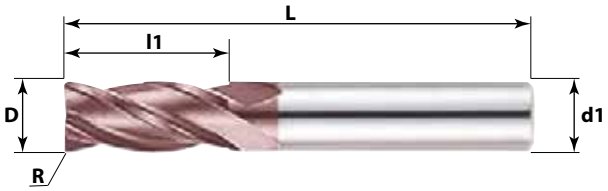
D code new Nowy kod	R	D	d1	l1	L	Z	Shank Uchwyt
UCX19020002A04004050	R0.2	2.0	4	4	50	4	HA
UCX19020003A04004050	R0.3	2.0	4	4	50	4	HA
UCX19020005A04004050	R0.5	2.0	4	4	50	4	HA
UCX19025002A04005050	R0.2	2.5	4	5	50	4	HA
UCX19025003A04005050	R0.3	2.5	4	5	50	4	HA
UCX19025005A04005050	R0.5	2.5	4	5	50	4	HA
UCX19030002A04006050	R0.2	3.0	4	6	50	4	HA
UCX19030003A04006050	R0.3	3.0	4	6	50	4	HA
UCX19030005A04006050	R0.5	3.0	4	6	50	4	HA
UCX19030010A04006050	R1.0	3.0	4	6	50	4	HA
UCX19040002A04008050	R0.2	4.0	4	8	50	4	HA
UCX19040003A04008050	R0.3	4.0	4	8	50	4	HA
UCX19040005A04008050	R0.5	4.0	4	8	50	4	HA
UCX19040010A04008050	R1.0	4.0	4	8	50	4	HA
UCX19050002A06010050	R0.2	5.0	6	10	50	4	HA
UCX19050003A06010050	R0.3	5.0	6	10	50	4	HA
UCX19050005A06010050	R0.5	5.0	6	10	50	4	HA
UCX19050010A06010050	R1.0	5.0	6	10	50	4	HA
UCX19060002A06012050	R0.2	6.0	6	12	50	4	HA
UCX19060003A06012050	R0.3	6.0	6	12	50	4	HA
UCX19060005A06012050	R0.5	6.0	6	12	50	4	HA
UCX19060010A06012050	R1.0	6.0	6	12	50	4	HA
UCX19080005A08016060	R0.5	8.0	8	16	60	4	HA
UCX19080010A08016060	R1.0	8.0	8	16	60	4	HA
UCX19080015A08016060	R1.5	8.0	8	16	60	4	HA
UCX19080020A08016060	R2.0	8.0	8	16	60	4	HA
UCX19080025A08016060	R2.5	8.0	8	16	60	4	HA
UCX19100005A10020075	R0.5	10.0	10	20	75	4	HA
UCX19100010A10020075	R1.0	10.0	10	20	75	4	HA
UCX19100015A10020075	R1.5	10.0	10	20	75	4	HA
UCX19100020A10020075	R2.0	10.0	10	20	75	4	HA
UCX19100025A10020075	R2.5	10.0	10	20	75	4	HA
UCX19120005A12024075	R0.5	12.0	12	24	75	4	HA
UCX19120010A12024075	R1.0	12.0	12	24	75	4	HA
UCX19120015A12024075	R1.5	12.0	12	24	75	4	HA
UCX19120020A12024075	R2.0	12.0	12	24	75	4	HA
UCX19120025A12024075	R2.5	12.0	12	24	75	4	HA

UCX19

SQUARE TYPE WALCOWO-CZOŁOWE
4-Flute 4-ostrzowe

HSM Vmax	F	M	30°	A	max	min	AIR
					○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●				○	○	○	○	○	○			



D code new Nowy kod	R	D	d1	l1	L	Z	Shank Uchwyt
UCX19030005A04006075	R0.5	3.0	4	6	75	4	HA
UCX19030010A04006075	R1.0	3.0	4	6	75	4	HA
UCX19040005A04008075	R0.5	4.0	4	8	75	4	HA
UCX19040010A04008075	R1.0	4.0	4	8	75	4	HA
UCX19050005A06010075	R0.5	5.0	6	10	75	4	HA
UCX19050010A06010075	R1.0	5.0	6	10	75	4	HA
UCX19060005A06012075	R0.5	6.0	6	12	75	4	HA
UCX19060010A06012075	R1.0	6.0	6	12	75	4	HA
UCX19080005A08016100	R0.5	8.0	8	16	100	4	HA
UCX19080010A08016100	R1.0	8.0	8	16	100	4	HA
UCX19080015A08016100	R1.5	8.0	8	16	100	4	HA
UCX19080020A08016100	R2.0	8.0	8	16	100	4	HA
UCX19080025A08016100	R2.5	8.0	8	16	100	4	HA
UCX19100005A10020100	R0.5	10.0	10	20	100	4	HA
UCX19100010A10020100	R1.0	10.0	10	20	100	4	HA
UCX19100015A10020100	R1.5	10.0	10	20	100	4	HA
UCX19100020A10020100	R2.0	10.0	10	20	100	4	HA
UCX19100025A10020100	R2.5	10.0	10	20	100	4	HA
UCX19120005A12024100	R0.5	12.0	12	24	100	4	HA
UCX19120010A12024100	R1.0	12.0	12	24	100	4	HA
UCX19120015A12024100	R1.5	12.0	12	24	100	4	HA
UCX19120020A12024100	R2.0	12.0	12	24	100	4	HA
UCX19120025A12024100	R2.5	12.0	12	24	100	4	HA

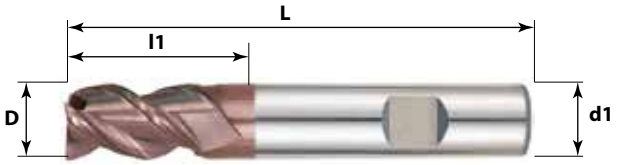
UCX19

SQUARE TYPE WALCOWO-CZOŁOWE

4-Flute 4-ostrzowe

			HSM Vmax	F	M	30°	A					max	min		AIR
												○	●	●	●

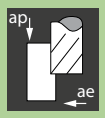
P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●				○	○	○	○	○	○			



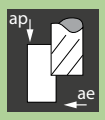
D code new Nowy kod	R	D	d1	l1	Shank Uchwyt
UCX96030000B06007057	3	6	7	57	HB
UCX96035000B06007057	3,5	6	7	57	HB
UCX96040000B06008057	4	6	8	57	HB
UCX96045000B06008057	4,5	6	8	57	HB
UCX96050000B06010057	5	6	10	57	HB
UCX96060000B06010057	6	6	10	57	HB
UCX96070000B08013063	7	8	13	63	HB
UCX96080000B08016063	8	8	16	63	HB
UCX96090000B10016072	9	10	16	72	HB
UCX96100000B10019072	10	10	19	72	HB
UCX96120000B12022083	12	12	22	83	HB
UCX96140000B14022083	14	14	22	83	HB
UCX96160000B16026092	16	16	26	92	HB
UCX96180000B18026092	18	18	26	92	HB
UCX96200000B20032104	20	20	32	104	HB

Cutting Conditions Parametry skrawania

UCX19



			Alloy steel, Tool steel Stal stopowa, Stal narzędziowa		Alloy steel, Heat resistant steels Stal stopowa, Stal stopowa żaroodporna		Stainless steels Stal nierdzwena	
			30 HRC		30~45 HRC			
d1	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min
1.0	0.1	1	17600	150	10250	85	8650	75
1.5	0.15	1.5	11800	215	7050	115	7050	120
2.0	0.2	2	9850	240	6450	145	5350	120
3.0	0.3	3	7600	270	4750	170	3950	145
4.0	0.4	4	6450	485	3950	300	3300	240
5.0	0.5	5	5350	510	3200	305	2700	255
6.0	0.6	6	4750	560	2850	350	2400	280
8.0	0.8	8	3550	605	2150	325	1800	300
10.0	1	10	2750	520	1700	255	1450	255
12.0	1.2	12	2350	440	1450	215	1150	205



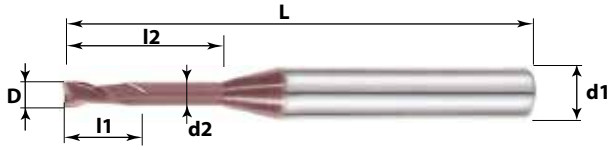
			Caston Iron Żeliwo		Aluminium alloys Stopy aluminium		Copper Brass, Non-Ferrous Metals Miedź, Brąz, Metale nie żelazne	
d1	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min
1.0	0.1	1.5	18700	620	44000	1050	24700	605
1.5	0.15	2.25	12100	620	27500	1160	20300	910
2.0	0.2	3	9350	640	22000	1320	16500	1035
3.0	0.3	4.5	6050	640	15400	1320	11000	1035
4.0	0.4	6	4600	640	11000	1320	8800	1035
5.0	0.5	7.5	3650	640	9150	1320	6800	1035
6.0	0.6	9	2950	770	7600	1430	5700	1100
8.0	0.8	12	2200	815	5700	1430	4400	1100
10.0	1	15	1850	860	4600	1430	3400	1100
12.0	1.2	18	1450	900	3750	1430	2850	1100

UCX83

SQUARE TYPE WALCOWO-CZOŁOWE
2-Flute 2-ostrzowe

			HSM Vmax	F	M	30°	A					max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●				○	○	○	○	○	○			



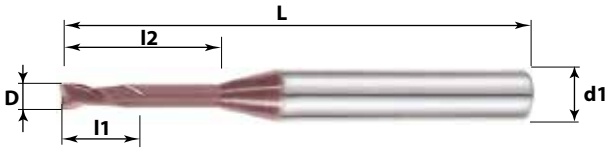
D code new Nowy kod	D	d1	l1	l2	L	d2	Shank Uchwyt
UCX83004000A04002050	0,4	4	0,7	2	50	0,37	HA
UCX83004000A04004050	0,4	4	0,7	4	50	0,37	HA
UCX83005000A04002050	0,5	4	0,75	2	50	0,45	HA
UCX83005000A04004050	0,5	4	0,75	4	50	0,45	HA
UCX83005000A04006050	0,5	4	0,75	6	50	0,45	HA
UCX83006000A04002050	0,6	4	0,9	2	50	0,55	HA
UCX83006000A04004050	0,6	4	0,9	4	50	0,55	HA
UCX83006000A04006050	0,6	4	0,9	6	50	0,55	HA
UCX83007000A04004050	0,7	4	1,1	4	50	0,65	HA
UCX83007000A04006050	0,7	4	1,1	6	50	0,65	HA
UCX83008000A04004050	0,8	4	1,2	4	50	0,75	HA
UCX83008000A04006050	0,8	4	1,2	6	50	0,75	HA
UCX83008000A04008050	0,8	4	1,2	8	50	0,75	HA
UCX83009000A04006050	0,9	4	1,4	6	50	0,85	HA
UCX83009000A04008050	0,9	4	1,4	8	50	0,85	HA
UCX83009000A04010050	0,9	4	1,4	10	50	0,85	HA
UCX83010000A04006050	1	4	1,5	6	50	0,95	HA
UCX83010000A04008050	1	4	1,5	8	50	0,95	HA
UCX83010000A04010050	1	4	1,5	10	50	0,95	HA
UCX83010000A04012050	1	4	1,5	12	50	0,95	HA
UCX83012000A04006050	1,2	4	1,8	6	50	1,15	HA
UCX83012000A04008050	1,2	4	1,8	8	50	1,15	HA
UCX83012000A04010050	1,2	4	1,8	10	50	1,15	HA
UCX83012000A04012050	1,2	4	1,8	12	50	1,15	HA
UCX83015000A04006050	1,5	4	2,3	6	50	1,45	HA
UCX83015000A04008050	1,5	4	2,3	8	50	1,45	HA
UCX83015000A04010050	1,5	4	2,3	10	50	1,45	HA
UCX83015000A04012050	1,5	4	2,3	12	50	1,45	HA
UCX83015000A04014050	1,5	4	2,3	14	50	1,45	HA
UCX83015000A04016050	1,5	4	2,3	16	50	1,45	HA
UCX83015000A04018050	1,5	4	2,3	18	50	1,45	HA
UCX83015000A04020050	1,5	4	2,3	20	50	1,45	HA
UCX83020000A04006050	2	4	3	6	50	1,95	HA
UCX83020000A04008050	2	4	3	8	50	1,95	HA
UCX83020000A04010050	2	4	3	10	50	1,95	HA
UCX83020000A04012050	2	4	3	12	50	1,95	HA
UCX83020000A04014050	2	4	3	14	50	1,95	HA
UCX83020000A04016050	2	4	3	16	50	1,95	HA
UCX83020000A04018050	2	4	3	18	50	1,95	HA
UCX83020000A04020050	2	4	3	20	50	1,95	HA
UCX83025000A04008050	2,5	4	3,7	8	50	2,4	HA
UCX83025000A04012050	2,5	4	3,7	12	50	2,4	HA
UCX83025000A04016050	2,5	4	3,7	16	50	2,4	HA
UCX83025000A04020050	2,5	4	3,7	20	50	2,4	HA
UCX83030000A06008050	3	6	4,5	8	50	2,85	HA
UCX83030000A06012050	3	6	4,5	12	50	2,85	HA
UCX83030000A06016060	3	6	4,5	16	60	2,85	HA
UCX83030000A06020060	3	6	4,5	20	60	2,85	HA
UCX83030000A06025075	3	6	4,5	25	75	2,85	HA

UCX83

SQUARE TYPE WALCOWO-CZOŁOWE
2-Flute 2-ostrzowe

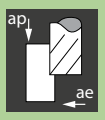
			HSM Vmax	F	M	30°	A						max	min		AIR
													○	●	●	●

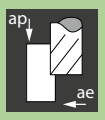
P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●				○	○	○	○	○	○			



D code new Nowy kod	D	d1	l1	l2	L	d2	Shank Uchwyt
UCX83040000A06012050	4	6	6	12	50	3,85	HA
UCX83040000A06016060	4	6	6	16	60	3,85	HA
UCX83040000A06020075	4	6	6	20	75	3,85	HA
UCX83040000A06025075	4	6	6	25	75	3,85	HA
UCX83040000A06030075	4	6	6	30	75	3,85	HA
UCX83040000A06035075	4	6	6	35	75	3,85	HA

UCX83

		Alloy steel, Tool steel Stal stopowa, Stal narzędziowa	
		30 HRC	
d1	ap	RPM	mm/min
0.4	0.007~0.018	26500~34000	170~370
0.5	0.009~0.022	26500~34000	170~370
0.6	0.011~0.026	26500~34000	210~485
0.7	0.012~0.031	26500~34000	210~485
0.8	0.014~0.035	23000~30000	240~535
0.9	0.030~0.060	21500~27000	240~610
1.0	0.045~0.090	19000~24000	240~690
1.2	0.055~0.100	15500~19000	240~765
1.4	0.062~0.125	13600~17000	240~765
1.5	0.070~0.135	12500~15500	240~765
1.6	0.075~0.145	12000~15000	240~765
1.8	0.080~0.160	11000~14000	240~765
2.0	0.090~0.180	10000~12500	240~765
2.5	0.112~0.235	8000~10000	240~765
3.0	0.135~0.270	6800~8500	240~765
4.0	0.180~0.360	5100~6500	240~765

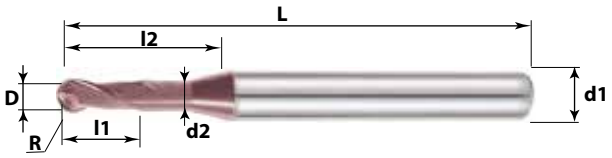
		Alloy steel, Heat resistant steels Stal stopowa, Stal stopowa żaroodporna	
		30~45 HRC	
d1	ap	RPM	mm/min
0.4	0.007-0.018	19000-24000	72-290
0.5	0.009-0.022	19000-24000	72-290
0.6	0.011-0.026	19000-24000	95-365
0.7	0.012-0.031	19000-24000	95-365
0.8	0.014-0.035	16500-21000	100-410
0.9	0.030-0.060	15000-19000	135-460
1.0	0.045-0.090	13500-17000	160-510
1.2	0.055-0.100	11000-14000	160-510
1.4	0.062-0.125	9800-12000	160-510
1.5	0.070-0.135	8950-11500	160-510
1.6	0.075-0.145	8700-10900	160-510
1.8	0.080-0.160	7800-9800	160-510
2.0	0.090-0.180	7000-8950	160-510
2.5	0.112-0.235	5700-7200	160-510
3.0	0.135-0.270	4700-6000	160-510
4.0	0.180-0.360	3500-4500	160-510

UCX86

BALL TYPE KULISTE
2-Flute 2-ostrzowe

		HSM Vmax	F	M	30°	A						max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●					○	○	○	○	○	○			



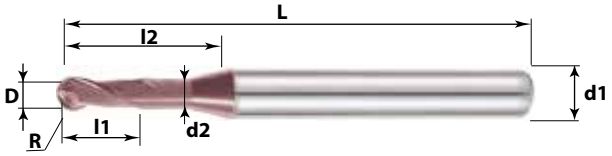
D code new Nowy kod								Shank Uchwyt
UCX86004002A04002050	R0,2	0,4	4	0,7	2	50	0,37	HA
UCX86005003A04002050	R0,25	0,5	4	0,75	2	50	0,45	HA
UCX86005003A04004050	R0,25	0,5	4	0,75	4	50	0,45	HA
UCX86005003A04006050	R0,25	0,5	4	0,75	6	50	0,45	HA
UCX86006003A04002050	R0,3	0,6	4	0,9	2	50	0,55	HA
UCX86006003A04004050	R0,3	0,6	4	0,9	4	50	0,55	HA
UCX86006003A04006050	R0,3	0,6	4	0,9	6	50	0,55	HA
UCX86008004A04004050	R0,4	0,8	4	1,2	4	50	0,75	HA
UCX86008004A04006050	R0,4	0,8	4	1,2	6	50	0,75	HA
UCX86008004A04008050	R0,4	0,8	4	1,2	8	50	0,75	HA
UCX86010005A04006050	R0,5	1	4	1,5	6	50	0,95	HA
UCX86010005A04008050	R0,5	1	4	1,5	8	50	0,95	HA
UCX86010005A04010050	R0,5	1	4	1,5	10	50	0,95	HA
UCX86010005A04012050	R0,5	1	4	1,5	12	50	0,95	HA
UCX86012006A04008050	R0,6	1,2	4	1,8	8	50	1,15	HA
UCX86012006A04012050	R0,6	1,2	4	1,8	12	50	1,15	HA
UCX86014007A04016050	R0,7	1,4	4	2,1	16	50	1,35	HA
UCX86015008A04006050	R0,75	1,5	4	2,3	6	50	1,45	HA
UCX86015008A04008050	R0,75	1,5	4	2,3	8	50	1,45	HA
UCX86015008A04010050	R0,75	1,5	4	2,3	10	50	1,45	HA
UCX86015008A04012050	R0,75	1,5	4	2,3	12	50	1,45	HA
UCX86015008A04016050	R0,75	1,5	4	2,3	16	50	1,45	HA
UCX86015008A04020050	R0,75	1,5	4	2,3	20	50	1,45	HA
UCX86016008A04008050	R0,8	1,6	4	2,4	8	50	1,55	HA
UCX86016008A04012050	R0,8	1,6	4	2,4	12	50	1,55	HA
UCX86016008A04016050	R0,8	1,6	4	2,4	16	50	1,55	HA
UCX86016008A04020050	R0,8	1,6	4	2,4	20	50	1,55	HA
UCX86020010A04008050	R1,0	2	4	3	8	50	1,95	HA
UCX86020010A04010050	R1,0	2	4	3	10	50	1,95	HA
UCX86020010A04012050	R1,0	2	4	3	12	50	1,95	HA
UCX86020010A04014050	R1,0	2	4	3	14	50	1,95	HA
UCX86020010A04016050	R1,0	2	4	3	16	50	1,95	HA
UCX86020010A04020050	R1,0	2	4	3	20	50	1,95	HA
UCX86030015A06010050	R1,5	3	6	4,5	10	50	2,85	HA
UCX86030015A06012050	R1,5	3	6	4,5	12	50	2,85	HA
UCX86030015A06016060	R1,5	3	6	4,5	16	60	2,85	HA
UCX86030015A06020060	R1,5	3	6	4,5	20	60	2,85	HA
UCX86030015A06025075	R1,5	3	6	4,5	25	75	2,85	HA
UCX86040020A06012050	R2,0	4	6	6	12	50	3,85	HA
UCX86040020A06016060	R2,0	4	6	6	16	60	3,85	HA
UCX86040020A06020075	R2,0	4	6	6	20	75	3,85	HA
UCX86040020A06025075	R2,0	4	6	6	25	75	3,85	HA
UCX86040020A06030075	R2,0	4	6	6	30	75	3,85	HA

UCX86

BALL TYPE KULISTE
2-Flute 2-ostrzowe

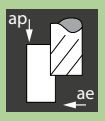
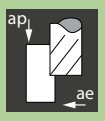
HSM Vmax	F	M	30°	A	max	min		AIR
					○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●					○	○	○	○	○	○			



D code new Nowy kod								Shank Uchwyt
UCX86004002A04002050	R0,2	0,4	4	0,7	2	50	0,37	HA
UCX86005003A04002050	R0,25	0,5	4	0,75	2	50	0,45	HA
UCX86005003A04004050	R0,25	0,5	4	0,75	4	50	0,45	HA
UCX86005003A04006050	R0,25	0,5	4	0,75	6	50	0,45	HA
UCX86006003A04002050	R0,3	0,6	4	0,9	2	50	0,55	HA
UCX86006003A04004050	R0,3	0,6	4	0,9	4	50	0,55	HA
UCX86006003A04006050	R0,3	0,6	4	0,9	6	50	0,55	HA
UCX86008004A04004050	R0,4	0,8	4	1,2	4	50	0,75	HA
UCX86008004A04006050	R0,4	0,8	4	1,2	6	50	0,75	HA
UCX86008004A04008050	R0,4	0,8	4	1,2	8	50	0,75	HA
UCX86010005A04006050	R0,5	1	4	1,5	6	50	0,95	HA
UCX86010005A04008050	R0,5	1	4	1,5	8	50	0,95	HA
UCX86010005A04010050	R0,5	1	4	1,5	10	50	0,95	HA
UCX86010005A04012050	R0,5	1	4	1,5	12	50	0,95	HA
UCX86012006A04008050	R0,6	1,2	4	1,8	8	50	1,15	HA
UCX86012006A04012050	R0,6	1,2	4	1,8	12	50	1,15	HA
UCX86014007A04016050	R0,7	1,4	4	2,1	16	50	1,35	HA
UCX86015008A04006050	R0,75	1,5	4	2,3	6	50	1,45	HA
UCX86015008A04008050	R0,75	1,5	4	2,3	8	50	1,45	HA
UCX86015008A04010050	R0,75	1,5	4	2,3	10	50	1,45	HA
UCX86015008A04012050	R0,75	1,5	4	2,3	12	50	1,45	HA
UCX86015008A04016050	R0,75	1,5	4	2,3	16	50	1,45	HA
UCX86015008A04020050	R0,75	1,5	4	2,3	20	50	1,45	HA
UCX86016008A04008050	R0,8	1,6	4	2,4	8	50	1,55	HA
UCX86016008A04012050	R0,8	1,6	4	2,4	12	50	1,55	HA
UCX86016008A04016050	R0,8	1,6	4	2,4	16	50	1,55	HA
UCX86016008A04020050	R0,8	1,6	4	2,4	20	50	1,55	HA
UCX86020010A04008050	R1,0	2	4	3	8	50	1,95	HA
UCX86020010A04010050	R1,0	2	4	3	10	50	1,95	HA
UCX86020010A04012050	R1,0	2	4	3	12	50	1,95	HA
UCX86020010A04014050	R1,0	2	4	3	14	50	1,95	HA
UCX86020010A04016050	R1,0	2	4	3	16	50	1,95	HA
UCX86020010A04020050	R1,0	2	4	3	20	50	1,95	HA
UCX86030015A06010050	R1,5	3	6	4,5	10	50	2,85	HA
UCX86030015A06012050	R1,5	3	6	4,5	12	50	2,85	HA
UCX86030015A06016060	R1,5	3	6	4,5	16	60	2,85	HA
UCX86030015A06020060	R1,5	3	6	4,5	20	60	2,85	HA
UCX86030015A06025075	R1,5	3	6	4,5	25	75	2,85	HA
UCX86040020A06012050	R2,0	4	6	6	12	50	3,85	HA
UCX86040020A06016060	R2,0	4	6	6	16	60	3,85	HA
UCX86040020A06020075	R2,0	4	6	6	20	75	3,85	HA
UCX86040020A06025075	R2,0	4	6	6	25	75	3,85	HA
UCX86040020A06030075	R2,0	4	6	6	30	75	3,85	HA

UCX86

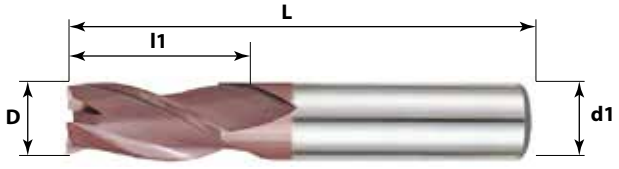
		Alloy steel, Tool steel Stal stopowa, Stal narzędziowa				Alloy steel, Heat resistant steels Stal stopowa, Stal stopowa żaroodporna	
		30 HRC				30~45 HRC	
d1	ap	RPM	mm/min	d1	ap	RPM	mm/min
0.4	0.018~0.036	26350~34000	150~415	0.4	0.018-0.036	19100-24200	75-230
0.5	0.023~0.045	26350~34000	150~415	0.5	0.023-0.045	19100-24200	75-230
0.6	0.027~0.054	26350~34000	190~535	0.6	0.027-0.054	19100-24200	95-300
0.8	0.036~0.072	26350~34000	190~535	0.8	0.036-0.072	19100-24200	95-300
1.0	0.045~0.090	24650~31000	210~595	1.0	0.045-0.090	17400-22100	105-330
1.2	0.055~0.100	20500~26000	210~665	1.2	0.055-0.100	14500-18300	105-330
1.4	0.062~0.125	18000~22000	210~665	1.4	0.062-0.125	12800-15300	105-330
1.5	0.070~0.135	16000~20500	210~665	1.5	0.070-0.135	11500-14900	105-330
1.6	0.075~0.145	15500~20000	210~665	1.6	0.075-0.145	11200-14000	105-330
1.8	0.080~0.160	14500~18200	210~665	1.8	0.080-0.160	10200-12800	105-330
2.0	0.090~0.180	13000~16000	210~665	2.0	0.090-0.180	9400-11500	105-330
3.0	0.135~0.270	9000~11000	210~665	3.0	0.135-0.270	6000-11500	105-330
4.0	0.180~0.360	7200~9350	210~665	4.0	0.180-0.360	5000-6600	105-330

UCX95

SQUARE TYPE WALCOWO-CZOŁOWE
3-Flute 3-ostrzowe

HSM Vmax	F	M	30°	A					max	min		AIR
									○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●				○	○	○	○	○	○		○	○



D code new Nowy kod	D	d1	l1	L	Shank Uchwyt
UCX95005000A03002038	0,5	3	1,5	38	HA
UCX95006000A03002038	0,6	3	1,5	38	HA
UCX95008000A03002038	0,8	3	2	38	HA
UCX95010000A03002038	1	3	2	38	HA
UCX95010000A04003040	1	4	3	40	HA
UCX95012000A03002038	1,2	3	2	38	HA
UCX95015000A03002038	1,5	3	2	38	HA
UCX95015000A04005040	1,5	4	4,5	40	HA
UCX95018000A03002038	1,8	3	2	38	HA
UCX95020000B06004035	2	6	4	35	HB
UCX95020000A02008032	2	2	8	32	HA
UCX95020000B06003050	2	6	3	50	HB
UCX95025000B06005036	2,5	6	5	36	HB
UCX95025000A02508032	2,5	2,5	8	32	HA
UCX95030000B06005036	3	6	5	36	HB
UCX95030000A03012032	3	3	12	32	HA
UCX95030000B06004050	3	6	4	50	HB
UCX95030000B06007057	3	6	7	57	HB
UCX95035000B06006037	3,5	6	6	37	HB
UCX95035000A03512032	3,5	3,5	12	32	HA
UCX95035000B06004050	3,5	6	4	50	HB
UCX95035000A03507050	3,5	3,5	7	50	HA
UCX95040000B06007038	4	6	7	38	HB
UCX95040000A04012040	4	4	12	40	HA
UCX95040000B06005054	4	6	5	54	HB
UCX95040000A04008050	4	4	8	50	HA
UCX95040000B06008057	4	6	8	57	HB
UCX95045000B06008038	4,5	6	8	38	HB
UCX95045000A04514050	4,5	4,5	14	50	HA
UCX95045000B06005054	4,5	6	5	54	HB
UCX95045000A04508050	4,5	4,5	8	50	HA
UCX95050000B06008039	5	6	8	39	HB
UCX95050000A05014050	5	5	14	50	HA
UCX95050000B06006054	5	6	6	54	HB
UCX95050000A05010050	5	5	10	50	HA
UCX95050000B06010057	5	6	10	57	HB
UCX95055000B06008039	5,5	6	8	39	HB
UCX95055000A05516050	5,5	5,5	16	50	HA
UCX95055000A05510057	5,5	5,5	10	57	HA
UCX95058000B06008039	5,75	6	8	39	HB
UCX95060000B06008039	6	6	8	39	HB
UCX95060000A06016050	6	6	16	50	HA
UCX95060000B06007054	6	6	7	54	HB
UCX95060000A06010057	6	6	10	57	HA
UCX95060000B06010057	6	6	10	57	HB
UCX95065000A06513060	6,5	6,5	13	60	HA
UCX95068000B08010042	6,75	8	10	42	HB
UCX95070000B08010042	7	8	10	42	HB
UCX95070000A07020060	7	7	20	60	HA
UCX95070000B08008058	7	8	8	58	HB

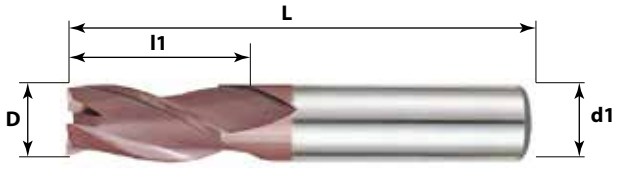
UCX95

SQUARE TYPE WALCOWO-CZOŁOWE

3-Flute 3-ostrzowe

HSM Vmax	F	M	30°	A						max	min		AIR
										○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●				○	○	○	○	○	○		○	○



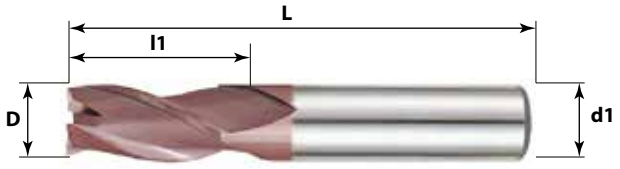
D code new Nowy kod	D	d1	l1	L	Shank Uchwyt
UCX95070000A07013060	7	7	13	60	HA
UCX95075000A07516063	7,5	7,5	16	63	HA
UCX95078000B08010042	7,75	8	10	42	HB
UCX95080000B08011043	8	8	11	43	HB
UCX95080000A08020060	8	8	20	60	HA
UCX95080000B08009058	8	8	9	58	HB
UCX95080000A08016063	8	8	16	63	HA
UCX95080000B08016063	8	8	16	63	HB
UCX95085000A08516067	8,5	8,5	16	67	HA
UCX95087000B10011048	8,7	10	11	48	HB
UCX95090000B10011048	9	10	11	48	HB
UCX95090000A09020060	9	9	20	60	HA
UCX95090000B10010066	9	10	10	66	HB
UCX95090000A09016067	9	9	16	67	HA
UCX95090000B10016072	9	10	16	72	HB
UCX95095000A09519072	9,5	9,5	19	72	HA
UCX95097000B10011048	9,7	10	11	48	HB
UCX95100000B10013050	10	10	13	50	HB
UCX95100000A10022070	10	10	22	70	HA
UCX95100000B10011066	10	10	11	66	HB
UCX95100000A10019072	10	10	19	72	HA
UCX95100000B10019072	10	10	19	72	HB
UCX95110000A11022083	11	11	22	83	HA
UCX95120000B12015055	12	12	15	55	HB
UCX95120000A12022070	12	12	22	70	HA
UCX95120000B12012073	12	12	12	73	HB
UCX95120000A12022083	12	12	22	83	HA
UCX95120000B12022083	12	12	22	83	HB
UCX95130000A13022083	13	13	22	83	HA
UCX95140000B14015058	14	14	15	58	HB
UCX95140000A14025075	14	14	25	75	HA
UCX95140000B14014075	14	14	14	75	HB
UCX95140000A14022083	14	14	22	83	HA
UCX95140000B14022083	14	14	22	83	HB
UCX95150000A15026092	15	15	26	92	HA
UCX95160000B16018062	16	16	18	62	HB
UCX95160000A16025075	16	16	25	75	HA
UCX95160000B16016082	16	16	16	82	HB
UCX95160000A16026092	16	16	26	92	HA
UCX95160000B16026092	16	16	26	92	HB
UCX95180000B18020070	18	18	20	70	HB
UCX95180000B18018084	18	18	18	84	HB
UCX95180000A18026092	18	18	26	92	HA
UCX95180000B18026092	18	18	26	92	HB
UCX95200000B20022075	20	20	22	75	HB
UCX95200000A20032100	20	20	32	100	HA
UCX95200000B20020092	20	20	20	92	HB
UCX95200000A20032104	20	20	32	104	HA
UCX95200000B20032104	20	20	32	104	HB

UCX95

SQUARE TYPE WALCOWO-CZOŁOWE
3-Flute 3-ostrzowe

HSM Vmax	F	M	30°	A	max	min	AIR
					○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●	●				○	○	○	○	○	○		○	○

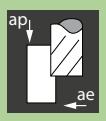


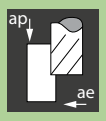
D code new Nowy kod	D	d1	L	l1	Chamfer Size Rozmiar Fazki	Z	Shank Uchwyt
UCX9503000CB06005036	3.0	6	36	5	0.1	3	B
UCX9504000CB06007038	4.0	6	38	7	0.1	3	B
UCX9505000CB06008039	5.0	6	39	8	0.1	3	B
UCX9506000CB06008039	6.0	6	39	8	0.1	3	B
UCX9508000CB08011043	8.0	8	43	11	0.13	3	B
UCX9510000CB10013050	10.0	10	50	13	0.13	3	B
UCX9512000CB12015055	12.0	12	55	15	0.18	3	B
UCX9514000CB14015058	14.0	14	58	15	0.18	3	B
UCX9516000CB16018062	16.0	16	62	18	0.18	3	B
UCX9520000CB20022075	20.0	20	75	22	0.23	3	B
UCX9503000CA03012032	3.0	3	32	12	0.1	3	A
UCX9504000CA04012040	4.0	4	40	12	0.1	3	A
UCX9505000CA05014050	5.0	5	50	14	0.1	3	A
UCX9506000CA06016050	6.0	6	50	16	0.1	3	A
UCX9508000CA08020060	8.0	8	60	20	0.13	3	A
UCX9510000CA10022070	10.0	10	70	22	0.13	3	A
UCX9512000CA12022070	12.0	12	70	22	0.18	3	A
UCX9514000CA14025075	14.0	14	75	25	0.18	3	A
UCX9516000CA16025075	16.0	16	75	25	0.18	3	A
UCX9520000CA20032100	20.0	20	100	32	0.23	3	A
UCX9503000CB06007057	3.0	6	57	7	0.1	3	B
UCX9504000CB06008057	4.0	6	57	8	0.1	3	B
UCX9505000CB06010057	5.0	6	57	10	0.1	3	B
UCX9506000CB06010057	6.0	6	57	10	0.1	3	B
UCX9508000CB08016063	8.0	8	63	16	0.13	3	B
UCX9510000CB10019072	10.0	10	72	19	0.13	3	B
UCX9512000CB12022083	12.0	12	83	22	0.18	3	B
UCX9514000CB14022083	14.0	14	83	22	0.18	3	B
UCX9516000CB16026092	16.0	16	92	26	0.18	3	B
UCX9520000CB20032104	20.0	20	104	32	0.23	3	B

Added Chamfer Edges 45°
Dodana Faza Krawędzi 45°

UCX95

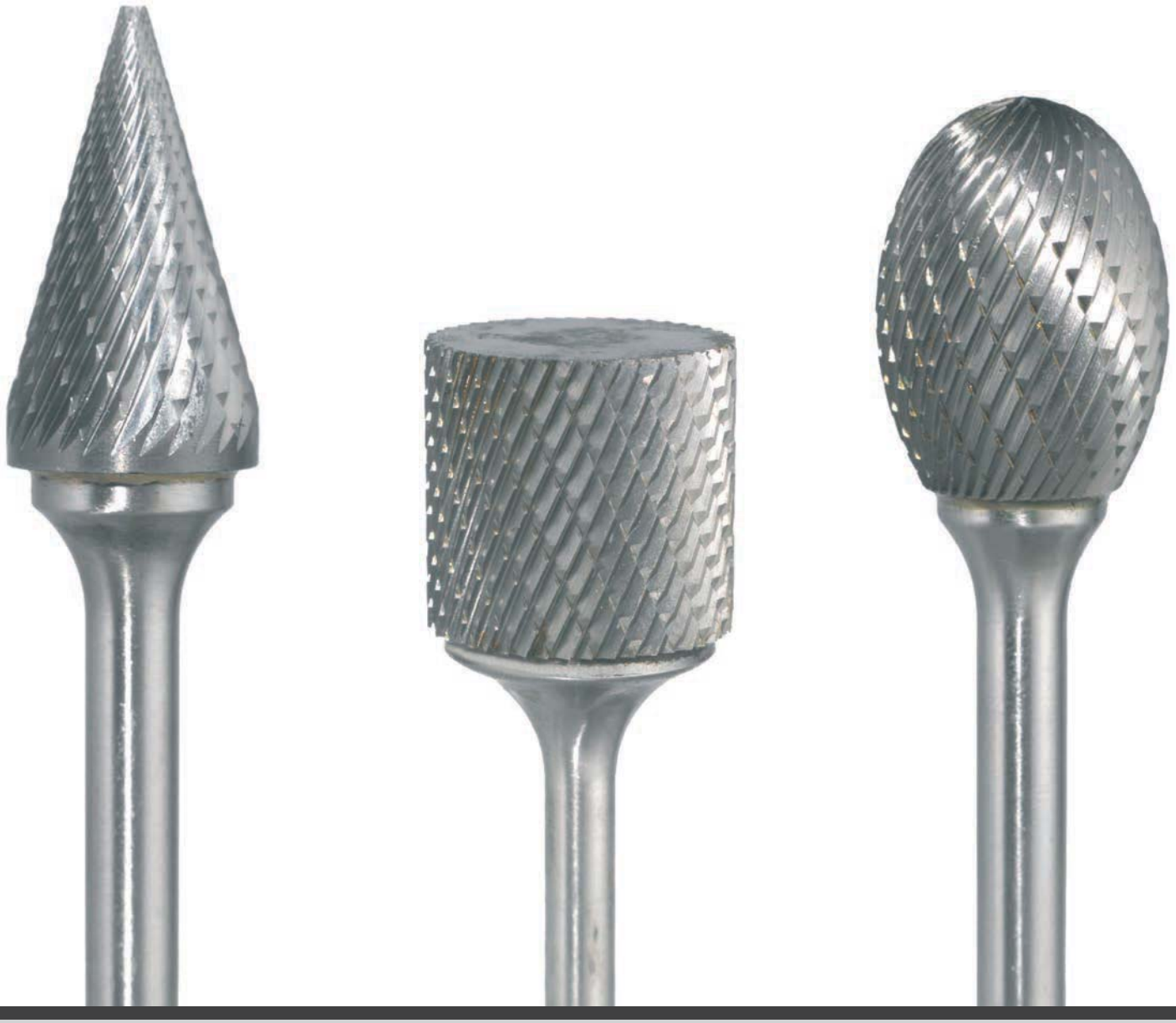
Cutting Conditions Parametry skrawania

			Alloy steel, Tool steel Stal stopowa, Stal narzędziowa		Alloy steel, Heat resistant steels Stal stopowa, Stal stopowa żaroodporna		Stainless steels Stal nierdzewna	
			30 HRC		30~45 HRC			
d1	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min
1.0	1	0.5	14300	75	8500	45	7150	35
1.5	1.5	0.75	12750	105	5550	60	5600	55
2.0	2	1	7850	110	5150	70	4300	55
3.0	3	1.5	6100	125	3800	85	3150	70
4.0	4	0.8	5150	180	3150	110	2650	90
5.0	5	1	4300	190	2550	110	2150	95
6.0	6	1.2	3800	210	2300	135	1950	110
8.0	8	1.6	2850	230	1700	120	1450	110
10.0	10	2	2200	195	1350	95	1150	95
12.0	12	2.4	1850	170	1150	75	950	75
14.0	14	2.8	1700	150	1050	70	850	70
16.0	16	3.2	1500	130	950	65	700	65
20.0	20	4	1150	100	700	50	550	50

			Caston Iron Żeliwo		Aluminium alloys Stopy aluminium		Copper Brass, Non-Ferrous Metals Miedź, Brąz, Metale nie żelazne	
d1	ae	ap	RPM	mm/min	RPM	mm/min	RPM	mm/min
1.0	1	1	18700	185	44000	300	24700	180
1.5	1.5	1.5	12100	185	27500	345	20300	270
2.0	2	2	9350	200	22000	420	16500	310
3.0	3	3	6050	200	15400	430	11000	310
4.0	4	4	4600	185	11000	420	8800	310
5.0	5	5	3650	200	9150	420	6800	310
6.0	6	6	2950	230	7600	440	5700	340
8.0	8	8	2200	240	5700	440	4400	330
10.0	10	10	1850	255	4600	440	3400	330
12.0	12	12	1450	275	3750	430	2850	330
14.0	14	14	1300	285	3300	430	2400	330
16.0	16	16	1100	285	2850	430	2200	330
20.0	20	20	900	310	2200	430	1700	330

RB

ROTARY BURRS
FREZY ROTACYJNE

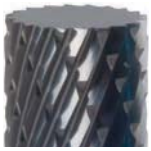
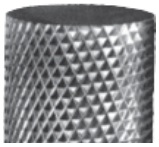


Rotary burrs with chip breaker and standard cutting edge are used in fast machining welds, burrs, plane smoothing, chamfering and other similar operations relatet with metal machining.

Frezy rotacyjne o nacięciu standardowym i łamaczem wióra znajdują zastosowanie w szybkim usuwaniu nadmiaru spoin spawalniczych, usuwaniu zadziorów, wyrównywaniu płaszczyzn, fazowaniu i innych podobnych operacji związanych z obróbką metali.

TIZ IMPLEMENTS

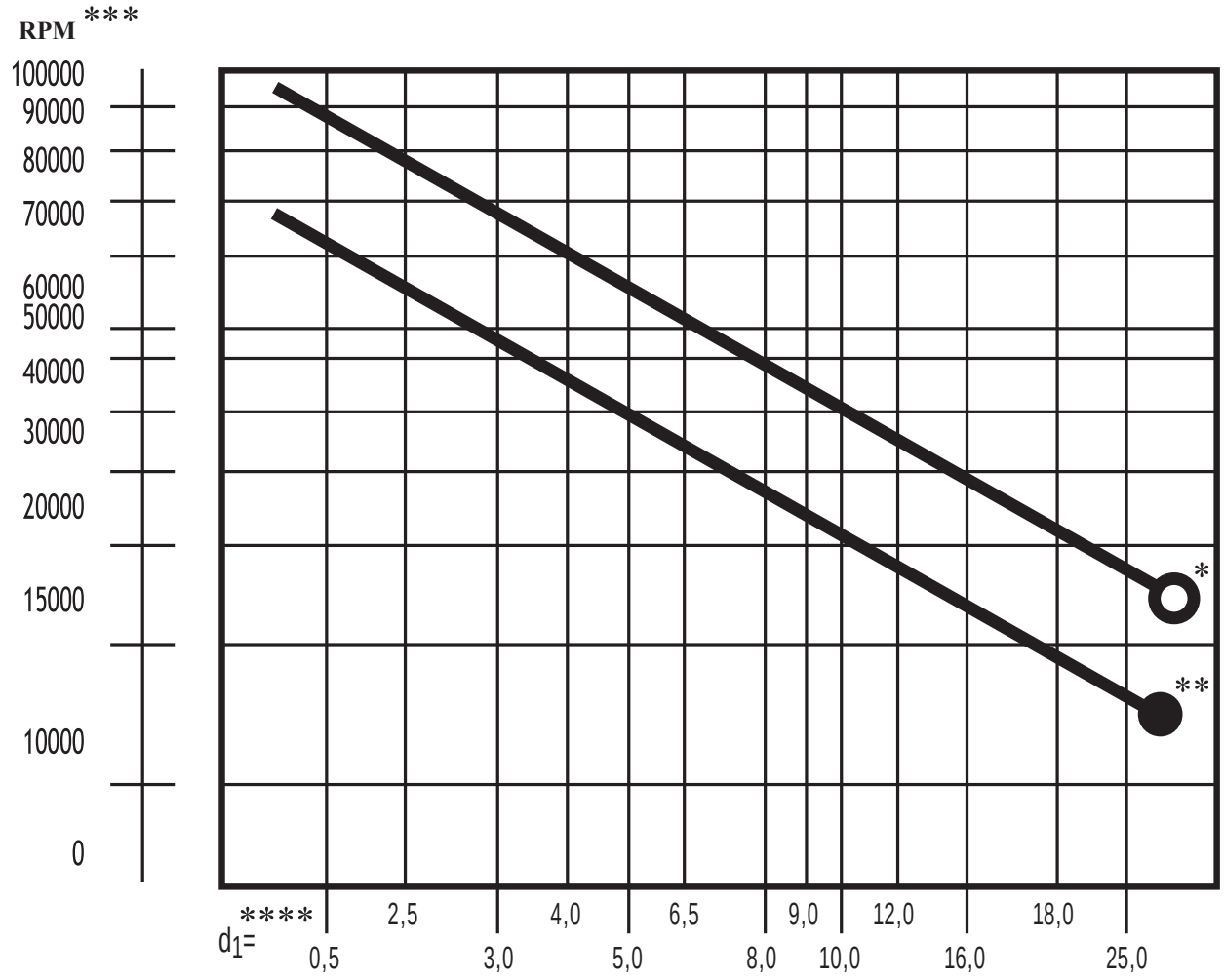
EDP No.			Pag. / Str.
SA		**CYLINDER SHAPE** WALCOWE BEZ OSTRZY NA CZOLE	5
SB		**CYLINDER SHAPE WITH END CUT** WALCOWE Z OSTRZAMI NA CZOLE	6
SC		**CYLINDER SHAPE WITH RADIUS CUT** WALCOWE ZAOKRĄGLONE	7
SD		**BALL SHAPE** KULISTE	8
SE		**OVAL SHAPE** OWALNE	9
SF		**TREE SHAPE WITH RADIUS END** OSTROŁUKOWE ZAOKRĄGLONE	10
SG		**TREE SHAPE WITH POINTED END** OSTROŁUKOWE	11
SH		**FLAME SHAPE** O ZARYSIE PŁOMIENIA	12
SJ		**60° CONE SHAPE** POGŁĘBIACZE 60°	13
SK		**90° CONE SHAPE** POGŁĘBIACZE 90°	13
SL		**TAPER WITH RADIUS END** STOŻKOWE ZAOKRĄGLONE	14
SM		**CONE SHAPE** STOŻKOWE	15
SN		**INVERTED CONE SHAPE** STOŻKOWE ODWRÓCONE	16

Materials Materiały	**TYPE OF CUT** TYP OSTRZY „NACIĘĆ”			
				
	MP	**M**	**MF**	**MD**
Designed Zastosowanie	**The general use of „Plain Cut” is on steel, alloy steel, cast iron, copper and brass** Pilniki ze „zwykłymi nacięciami” mają zastosowanie do ogólnego użytku dla obróbki stali, stali stopowych, żeliwa, miedzi i mosiądzu	**The double cut burr allows rapid stock removal in the hardened materials, designed for creating a small chip and excellent workpiece finishes, the small chip helps to eliminate loading of the flutes, exceedingly convenient application by user** Pilniki z podwójnymi nacięciami pozwalają na szybkie usuwanie naddatku w utwardzonych materiałach, zaprojektowane do tworzenia małego wióra i doskonałego wykończenia powierzchni, małe wióra pomagają wyeliminować obciążenie ostrzy, wyjątkowo łatwy w użyciu	**Designed to be wider chip space with relief angle, more suitable application to nonferrous metals** Zaprojektowany w celu uzyskania większej przestrzeni wiórowej wzdłuż kąta przyłożenia, najlepiej nadaje się do obróbki metali nieżelaznych	**Designed for creating extremaly small chips as powder-like chip, excellent operator control on heat treated and tough alloy steels, excellent finishes** Zaprojektowany w celu uzyskania wyjątkowo małych wiórów proszkowych, doskonały do obróbki stali utwardzonych i stopowych, doskonała jakość powierzchni po obróbce
ALUMINIUM ALUMINIUM			x	
BRASS, BRONZE, COPPER MOSIĄDZ, BRĄZ, MIEDŹ	x	x		
FIBER GLASS WŁÓKNA SZKLANE				x
CAST IRON ŻELIWO	x	x		
PLASTICS TWORZYWA SZTUCZNE			x	
STEEL, HRC 40-55 STAL, HRC 40-55	x	x		x
STEEL, HRC 55-60 STAL, HRC 55-60	x	x		x
STEEL, CARBON STAL WĘGLOWA	x	x		
STEEL, NICKEL CHROME STAL STOPOWA, Ni - Cr	x	x		x
STEEL, WELDMENTS STAL, SPAWY	x	x		
TITANIUM TYTAN	x	x		
ZINC CYNK			x	

WHEN ORDER PROVIDE ITEM NR. AND CUTS TYPE= M / MP / MF /MD
W ZAMÓWIENIU PODAĆ KOD I TYP OSTRZY-X = M / MP / MF / MD

ROTARY BURRS PILNIKI OBROTOWE

BURRS SPEED RECOMENDATION
ZALECANE PRĘDKOŚCI DLA PILNIKÓW

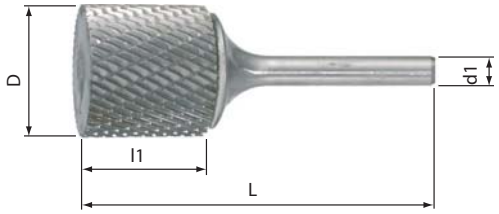


* Stainless Stal Nierdzewna
** Other Common Materials Inne Materiały
*** Rotate Per Minute Obroty Na Minutę
**** Size Rozmiar

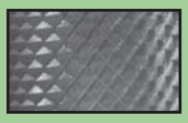
SA

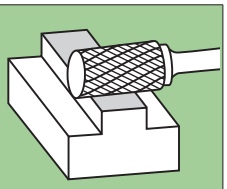
CYLINDER SHAPE WALCOWE BEZ OSTRZY NA CZOLE

UF







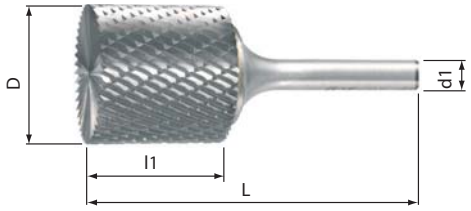


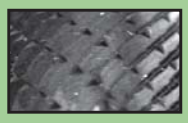
DOUBLE CUT TYP OSTRZA - M		**PLAIN CUT** TYP OSTRZA - P		**DIAMOND CUT** TYP OSTRZA - MD		**ALUMA CUT** TYP OSTRZA - MF		**SIZE** ROZMIAR			
								D	**d1**	**L**	**l1**
SA-41M		SA-41MP		SA-41MD		–		1,5	3	38	6,0
SA-41ML2		SA-41ML2P		SA-41ML2D		–		1,5	3	50	6,0
SA-41ML3		SA-41ML3P		SA-41ML3D		–		1,5	3	75	6,0
SA-42M		SA-42MP		SA-42MD		–		2,5	3	38	11,0
SA-42ML2		SA-42ML2P		SA-42ML2D		–		2,5	3	50	11,0
SA-42ML3		SA-42ML3P		SA-42ML3D		–		2,5	3	75	11,0
SA-43M		SA-43MP		SA-43MD		–		3,0	3	38	14,0
SA-43ML2		SA-43ML2P		SA-43ML2D		–		3,0	3	50	14,0
SA-43ML3		SA-43ML3P		SA-43ML3D		–		3,0	3	75	14,0
SA-11M		SA-11MP		SA-11MD		–		3,0	6	56	12,0
SA-12M		SA-12MP		SA-12MD		–		3,0	6	60	12,7
SA-52M		SA-52MP		SA-52MD		–		4,0	3	38	12,7
SA-13M		SA-13MP		SA-13MD		–		4,0	6	50	16,0
SA-53M		SA-53MP		SA-53MD		–		5,0	3	38	12,7
SA-14M		SA-14MP		SA-14MD		–		5,0	6	50	16,0
SA-1ML		SA-1MLP		SA-1MLD		–		6,0	6	50	25,0
SA-1M		SA-1MP		SA-1MD		SA-1MNF		6,0	6	50	16,0
SA-51M		SA-51MP		SA-51MD		–		6,3	3	50	12,7
SA-2M		SA-2MP		SA-2MD		–		8,0	6	63	19,0
SA-3M		SA-3MP		SA-3MD		SA-3MNF		9,5	6	63	19,0
SA-3ML		SA-3MLP		SA-3MLD		–		9,5	6	69	25,0
SA-4M		SA-4MP		SA-4MD		–		11,0	6	69	25,0
SA-5M		SA-5MP		SA-5MD		SA-5MNF		12,7	6	69	25,0
SA-6M		SA-6MP		SA-6MD		SA-6MNF		16,0	6	69	25,0
SA-7M		SA-7MP		SA-7MD		SA-7MNF		19,0	6	69	25,0
SA-9M		SA-9MP		SA-9MD		–		25,0	6	69	25,0

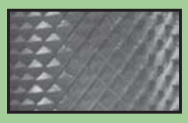
SB

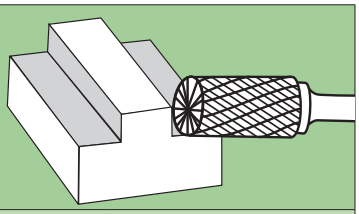
CYLINDER SHAPE WITH END CUT WALCOWE Z OSTRZAMI NA CZOLE

UF







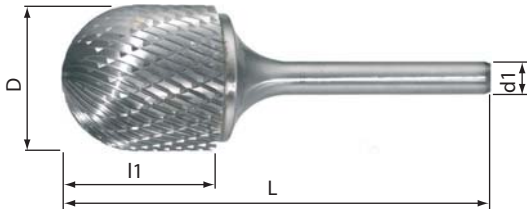


DOUBLE CUT TYP OSTRZA - M		**PLAIN CUT** TYP OSTRZA - P		**DIAMOND CUT** TYP OSTRZA - MD		**ALUMA CUT** TYP OSTRZA - MF		**SIZE** ROZMIAR			
								D	**d1**	**L**	**l1**
SB-41M		SB-41MP		SB-41MD		–		1,5	3	38	6
SB-41ML2		SB-41ML2P		SB-41ML2D		–		1,5	3	50	6
SB-41ML3		SB-41ML3P		SB-41ML3D		–		1,5	3	75	6
SB-42M		SB-42MP		SB-42MD		–		2,5	3	38	11
SB-42ML2		SB-42ML2P		SB-42ML2D		–		2,5	3	50	11
SB-42ML3		SB-42ML3P		SB-42ML3D		–		2,5	3	75	11
SB-ECOM		SB-ECOMP		SB-ECOMD		–		3	3	38	-
SB-43M		SB-43MP		SB-43MD		–		3	3	38	14
SB-11M		SB-11MP		SB-11MD		–		3	6	56	12
SB-12M		SB-12MP		SB-12MD		–		3	6	60	12,7
SB-13M		SB-13MP		SB-13MD		–		4	6	50	16
SB-14M		SB-14MP		SB-14MD		–		5	6	50	16
SB-1M		SB-1MP		SB-1MD		SB-1MNF		6	6	50	16
SB-1ML		SB-1MLP		SB-1MLD		–		6	6	50	25
SB-51M		SB-51MP		SB-51MD		–		6,3	3	43	4,7
SB-2M		SB-2MP		SB-2MD		–		8	6	63	19
SB-3M		SB-3MP		SB-3MD		SB-3MNF		9,5	6	63	19
SB-3ML		SB-3MLP		SB-3MLD		–		9,5	6	69	25
SB-4M		SB-4MP		SB-4MD		–		11	6	69	25
SB-5M		SB-5MP		SB-5MD		SB-5MNF		12,7	6	69	25
SB-6M		SB-6MP		SB-6MD		SB-6MNF		16	6	69	25
SB-7M		SB-7MP		SB-7MD		SB-7MNF		19	6	69	25
SB-9M		SB-9MP		SB-9MD		–		25	6	69	25

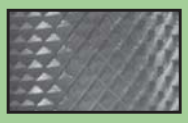
SC

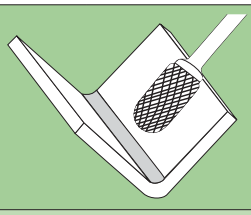
CYLINDER SHAPE WITH RADIUS CUT WALCOWE ZAOKRĄGLONE

UF







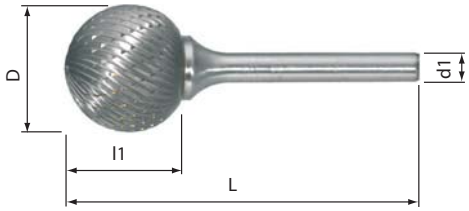


DOUBLE CUT TYP OSTRZA - M		**PLAIN CUT** TYP OSTRZA - P		**DIAMOND CUT** TYP OSTRZA - MD		**ALUMA CUT** TYP OSTRZA - MF		**SIZE** ROZMIAR			
								D	**d1**	**L**	**l1**
SC-41M		SC-41MP		SC-41MD		–		2,5	3	38	11
SC-42M		SC-42MP		SC-42MD		–		3	3	38	14
SC-42ML2		SC-42ML2P		SC-42ML2D		–		3	3	50	14
SC-42ML3		SC-42ML3P		SC-42ML3D		–		3	3	75	14
SC-11M		SC-11MP		SC-11MD		–		3	6	56	12
SC-12M		SC-12MP		SC-12MD		–		3	6	60	16
SC-52M		SC-52MP		SC-52MD		–		4	3	38	12,7
SC-13M		SC-13MP		SC-13MD		–		4	6	50	16
SC-53M		SC-53MP		SC-53MD		–		5	3	38	12,7
SC-14M		SC-14MP		SC-14MD		–		5	6	50	16
SC-1M		SC-1MP		SC-1MD		SC-1MNF		6	6	50	16
SC-1ML		SC-1MLP		SC-1MLD		–		6	6	50	25
SC-51M		SC-51MP		SC-51MD		–		6,3	3	50	12,7
SC-2M		SC-2MP		SC-2MD		–		8	6	63	19
SC-3M		SC-3MP		SC-3MD		SC-3MNF		9,5	6	63	19
SC-3ML		SC-3MLP		SC-3MLD		–		9,5	6	69	25
SC-4M		SC-4MP		SC-4MD		–		11	6	69	25
SC-5M		SC-5MP		SC-5MD		SC-5MNF		12,7	6	69	25
SC-6M		SC-6MP		SC-6MD		–		16	6	69	25
SC-7M		SC-7MP		SC-7MD		SC-7MNF		19	6	69	25
SC-9M		SC-9MP		SC-9MD		–		25	6	69	25

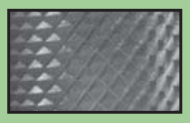
SD

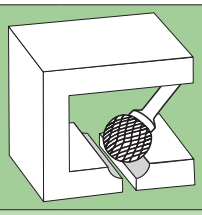
BALL SHAPE KULISTE

UF









DOUBLE CUT TYP OSTRZA - M		**PLAIN CUT** TYP OSTRZA - P		**DIAMOND CUT** TYP OSTRZA - MD		**ALUMA CUT** TYP OSTRZA - MF		**SIZE** ROZMIAR			
								D	**d1**	**L**	**l1**
SD-41M		SD-41MP		SD-41MD		–		2,5	3	38	2,3
SD-42M		SD-42MP		SD-42MD		–		3	3	38	2,8
SD-42ML2		SD-42ML2P		SD-42ML2D		–		3	3	50	2,8
SD-42ML3		SD-42ML3P		SD-42ML3D		–		3	3	75	2,8
SD-11M		SD-11MP		SD-11MD		–		3	6	50	2,8
SD-53M		SD-53MP		SD-53MD		–		5	3	38	4
SD-14M		SD-14MP		SD-14MD		–		5	6	50	4
SD-1M		SD-1MP		SD-1MD		SD-1MNF		6	6	50	5
SD-51M		SD-51MP		SD-51MD		–		6,3	3	44	5
SD-2M		SD-2MP		SD-2MD		–		8	6	50	6,4
SD-3M		SD-3MP		SD-3MD		SD-3MNF		9,5	6	52	8
SD-4M		SD-4MP		SD-4MD		–		11	6	54	9,5
SD-5M		SD-5MP		SD-5MD		SD-5MNF		12,7	6	55	11
SD-6M		SD-6MP		SD-6MD		SD-6MNF		16	6	58	14
SD-7M		SD-7MP		SD-7MD		SD-7MNF		19	6	62	16
SD-9M		SD-9MP		SD-9MD		–		25	6	68	23

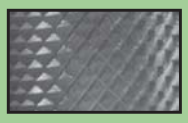
SE

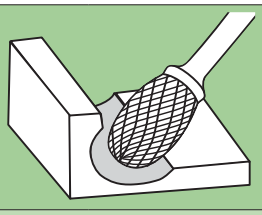
OVAL SHAPE OWALNE

UF







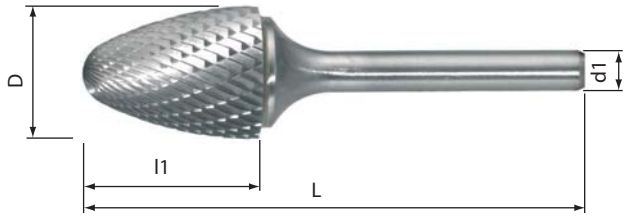


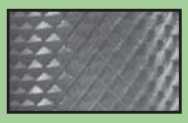
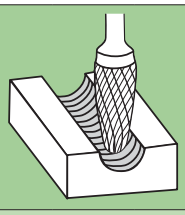
DOUBLE CUT TYP OSTRZA - M		PLAIN CUT TYP OSTRZA - P		DIAMOND CUT TYP OSTRZA - MD		ALUMA CUT TYP OSTRZA - MF		SIZE ROZMIAR			
								D	**d1**	**L**	**l1**
SE-41M		SE-41MP		SE-41MD		–		3	3	38	5,5
SE-41ML2		SE-41ML2P		SE-41ML2D		–		3	3	50	5,5
SE-41ML3		SE-41ML3P		SE-41ML3D		–		3	3	75	5,5
SE-53M		SE-53MP		SE-53MD		–		5	3	38	7,1
SE-1M		SE-1MP		SE-1MD		–		6	6	50	9,5
SE-51M		SE-51MP		SE-51MD		–		6,3	3	47	9,5
SE-3M		SE-3MP		SE-3MD		SE-3MNF		9,5	6	60	16
SE-5M		SE-5MP		SE-5MD		SE-5MNF		12,7	6	66	22
SE-6M		SE-6MP		SE-6MD		SE-6MNF		16	6	69	25
SE-7M		SE-7MP		SE-7MD		SE-7MNF		19	6	69	25

SF

TREE SHAPE WITH RADIUS END OSTROŁUKOWE ZAOKRĄGLONE

UF

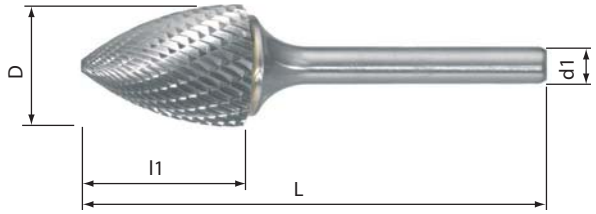


											
DOUBLE CUT TYP OSTRZA - M		**PLAIN CUT** TYP OSTRZA - P		**DIAMOND CUT** TYP OSTRZA - MD		**ALUMA CUT** TYP OSTRZA - MF		**SIZE** ROZMIAR			
								D	**d1**	**L**	**l1**
SF-41M		SF-41MP		SF-41MD		–		3	3	38	6
SF-42M		SF-42MP		SF-42MD		–		3	3	38	12,7
SF-11M		SF-11MP		SF-11MD		–		3	6	56	12,7
SF-42ML2		SF-42ML2P		SF-42ML2D		–		3	3	50	12,7
SF-42ML3		SF-42ML3P		SF-42ML3D		–		3	3	75	12,7
SF-53M		SF-53MP		SF-53MD		–		5	3	38	12,7
SF-1M		SF-1MP		SF-1MD		SF-1MNF		6	6	50	16
SF-51M		SF-51MP		SF-51MD		–		6,3	3	50	12,7
SF-3M		SF-3MP		SF-3MD		SF-3MNF		9,5	6	63	19
SF-4M		SF-4MP		SF-4MD		–		11	6	69	25
SF-13M		SF-13MP		SF-13MD		–		12,7	6	63	19
SF-5M		SF-5MP		SF-5MD		SF-5MNF		12,7	6	69	25
SF-6M		SF-6MP		SF-6MD		SF-6MNF		16	6	69	25
SF-7M		SF-7MP		SF-7MD		–		19	6	69	25
SF-14M		SF-14MP		SF-14MD		SF-14MNF		19	6	76	32
SF-15M		SF-15MP		SF-15MD		–		19	6	82	38

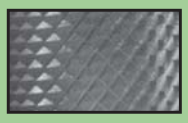
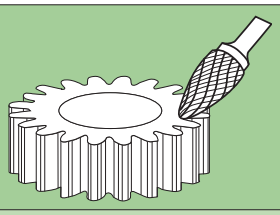
SG

TREE SHAPE WITH POINTED END OSTROŁUKOWE

UF





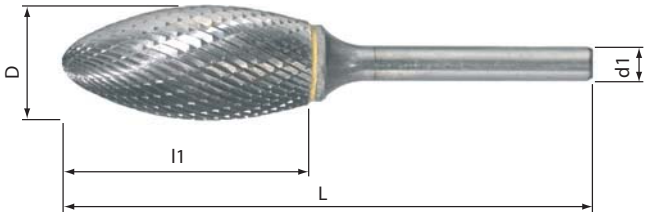



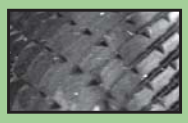
DOUBLE CUT TYP OSTRZA - M		PLAIN CUT TYP OSTRZA - P		DIAMOND CUT TYP OSTRZA - MD		SIZE ROZMIAR			
						D	d1	L	l1
SG-41M		SG-41MP		SG-41MD		3	3	38	6
SG-43M		SG-43MP		SG-43MD		3	3	38	9,5
SG-44M		SG-44MP		SG-44MD		3	3	38	12,7
SG-44ML2		SG-44ML2P		SG-44ML2D		3	3	50	12,7
SG-44ML3		SG-44ML3P		SG-44ML3D		3	3	75	12,7
SG-53M		SG-53MP		SG-53MD		5	3	38	12,7
SG-1M		SG-1MP		SG-1MD		6	6	50	16
SG-51M		SG-51MP		SG-51MD		6,3	3	50	12,7
SG-2M		SG-2MP		SG-2MD		8	6	63	19
SG-3M		SG-3MP		SG-3MD		9,5	6	63	19
SG-13M		SG-13MP		SG-13MD		12,7	6	63	19
SG-5M		SG-5MP		SG-5MD		12,7	6	69	25
SG-6M		SG-6MP		SG-6MD		16	6	69	25
SG-7M		SG-7MP		SG-7MD		19	6	69	25
SG-15M		SG-15MP		SG-15MD		19	6	82	38

SH

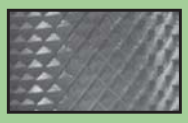
FLAME SHAPE O ZARYSIE PŁOMIENIA

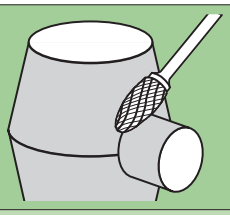
UF









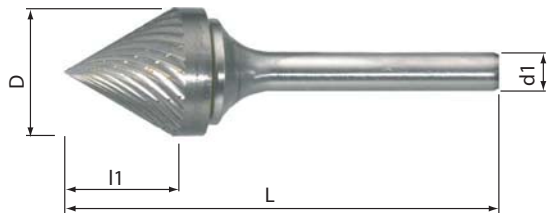


DOUBLE CUT TYP OSTRZA - M		**PLAIN CUT** TYP OSTRZA - P		**DIAMOND CUT** TYP OSTRZA - MD		**SIZE** ROZMIAR			
						D	**d1**	**L**	**l1**
SH-41M		SH-41MP		SH-41MD		3	3	38	6,3
SH-41ML2		SH-41ML2P		SH-41ML2D		3	3	50	6,3
SH-41ML3		SH-41ML3P		SH-41ML3D		3	3	75	6,3
SH-53M		SH-53MP		SH-53MD		5	3	38	9,5
SH-2M		SH-2MP		SH-2MD		8	6	63	19
SH-5M		SH-5MP		SH-5MD		12,7	6	76	32
SH-6M		SH-6MP		SH-6MD		16	6	80	36
SH-7M		SH-7MP		SH-7MD		19	6	85	41

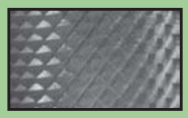
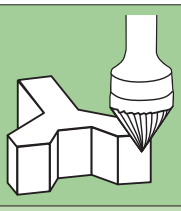
SJ

60° CONE SHAPE POGŁĘBIACZE 60°

UF





DOUBLE CUT TYP OSTRZA - M		PLAIN CUT TYP OSTRZA - P		DIAMOND CUT TYP OSTRZA - MD		SIZE ROZMIAR			
						D	d1	L	l1
SJ-42M		SJ-42MP		SJ-42MD		3	3	38	2,5
SJ-1M		SJ-1MP		SJ-1MD		6	6	50	4
SJ-3M		SJ-3MP		SJ-3MD		9,5	6	55	8
SJ-5M		SJ-5MP		SJ-5MD		12,7	6	58	11
SJ-6M		SJ-6MP		SJ-6MD		16	6	61	14,5
SJ-7M		SJ-7MP		SJ-7MD		19	6	65	17,5
SJ-9M		SJ-9MP		SJ-9MD		25	6	68	24,5

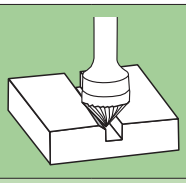
SK

90° CONE SHAPE POGŁĘBIACZE 90°

UF





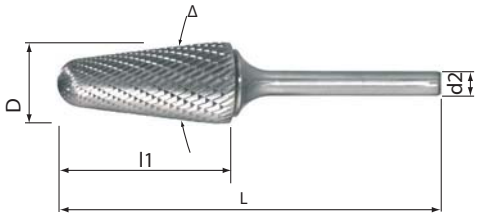



DOUBLE CUT TYP OSTRZA - M		PLAIN CUT TYP OSTRZA - P		DIAMOND CUT TYP OSTRZA - MD		SIZE ROZMIAR			
						d1	d2	l1	l2
SK-42M		SK-42MP		SK-42MD		3	3	38	1,5
SK-1M		SK-1MP		SK-1MD		6	6	50	3
SK-3M		SK-3MP		SK-3MD		9,5	6	52	4,7
SK-5M		SK-5MP		SK-5MD		12,7	6	54	6,3
SK-7M		SK-7MP		SK-7MD		19	6	58	9,5
SK-9M		SK-9MP		SK-9MD		25	6	60	12,7

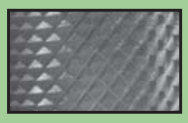
SL

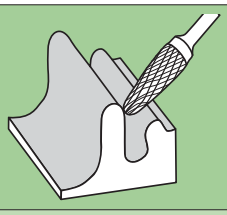
TAPER WITH RADIUS END STOŻKOWE ZAOKRĄGLONE

UF







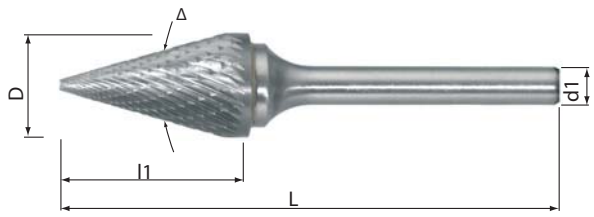


DOUBLE CUT TYP OSTRZA - M		**PLAIN CUT** TYP OSTRZA - P		**DIAMOND CUT** TYP OSTRZA - MD		**ALUMA CUT** TYP OSTRZA - MF		**SIZE** ROZMIAR				
								D	**d1**	**L**	**l1**	**Δ°**
SL-41M		SL-41MP		SL-41MD		–		3	3	38	9,5	8
SL-42M		SL-42MP		SL-42MD		–		3	3	38	12,7	8
SL-42ML2		SL-42ML2P		SL-42ML2D		–		3	3	50	12,7	8
SL-42ML3		SL-42ML3P		SL-42ML3D		–		3	3	75	12,7	8
SL-53M		SL-53MP		SL-53MD		–		5	3	38	12,7	14
SL-1M		SL-1MP		SL-1MD		–		6	6	50	16	14
SL-2M		SL-2MP		SL-2MD		–		8	6	69	22	14
SL-3M		SL-3MP		SL-3MD		SL-3MNF		9,5	6	74	27	14
SL-4M		SL-4MP		SL-4MD		SL-4MNF		12,7	6	76	28	14
SL-5M		SL-5MP		SL-5MD		SL-5MNF		16	6	77	30	14
SL-7M		SL-7MP		SL-7MD		SL-7MNF		19	6	85	38	14

SM

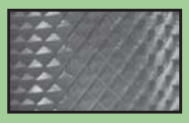
CONE SHAPE STOŻKOWE

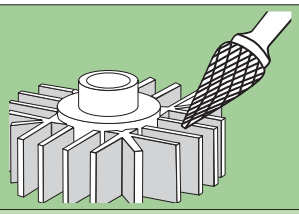
UF









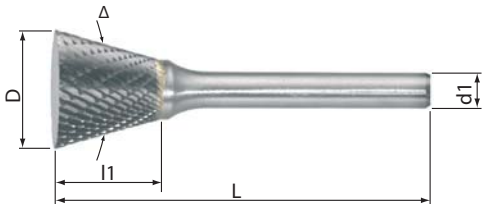


DOUBLE CUT TYP OSTRZA - M		PLAIN CUT TYP OSTRZA - P		DIAMOND CUT TYP OSTRZA - MD		SIZE ROZMIAR				
						D	d1	L	l1	Δ°
SM-41M		SM-41MP		SM-41MD		3	3	38	8,9	12
SM-42M		SM-42MP		SM-42MD		3	3	38	11	12
SM-42ML2		SM-42ML2P		SM-42ML2D		3	3	50	11	14
SM-42ML3		SM-42ML3P		SM-42ML3D		3	3	75	11	14
SM-43M		SM-43MP		SM-43MD		3	3	38	16	14
SM-53M		SM-53MP		SM-53MD		5	3	38	12,7	7
SM-1M		SM-1MP		SM-1MD		6	6	50	12,7	16
SM-2M		SM-2MP		SM-2MD		6	6	50	19	22
SM-3M		SM-3MP		SM-3MD		6	6	50	25	14
SM-51M		SM-51MP		SM-51MD		6,3	3	53	12,7	10
SM-4M		SM-4MP		SM-4MD		9,5	6	63	16	22
SM-5M		SM-5MP		SM-5MD		12,7	6	69	22	28
SM-6M		SM-6MP		SM-6MD		16	6	73	25	28

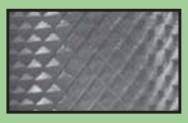
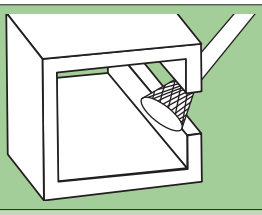
SN

INVERTED CONE SHAPE STOŻKOWE ODWRÓCONE

UF





DOUBLE CUT TYP OSTRZA - M		PLAIN CUT TYP OSTRZA - P		DIAMOND CUT TYP OSTRZA - MD		SIZE ROZMIAR				
						D	**d1**	**L**	**l1**	**Δ°**
SN-41M		SN-41MP		SN-41MD		2,5	3	38	3	10
SN-42M		SN-42MP		SN-42MD		3	3	38	4	10
SN-53M		SN-53MP		SN-53MD		5	3	38	6,3	10
SN-1M		SN-1MP		SN-1MD		6	6	50	8	10
SN-51M		SN-51MP		SN-51MD		6,3	3	44	6	10
SN-2M		SN-2MP		SN-2MD		9,5	6	53	9,5	13
SN-4M		SN-4MP		SN-4MD		12,7	6	57	12,7	28
SN-6M		SN-6MP		SN-6MD		16	6	63	19	18
SN-7M		SN-7MP		SN-7MD		19	6	60	16	30

CBN

CUBIC BORON NITRIDE
FREZY Z AZOTKIEM BORU



CUBIC BORON NITRIDE CBN machining high hardened steels up to 70 HRC

FREZY Z AZTOKIEM BORU CBN przeznaczone są do wysokowydajnej obróbki materiałów >70 HRC

TIZ IMPLEMENTS

P K N

DSCRIPTION - CBN OPIS -CBN

CUBIC BORON NITRIDE CBN machining high hardened steels up to 70 HRC

FREZY Z AZTOKIEM BORU CBN do wysokowydajnej obróbki materiałów do 70 HRC

- Achieve stable machining and higher accuracy for the duration.
- Save the setting time and cost due to reducing of frequent tool change.
- Improve repeatability in performance.
- Special designed geometry improves tool rigidity at High Speed Cutting.
- Tighter Radius Tolerance ±0.005mm higher accuracy and longer tool life.
- .Osiąganie stabilniejszej i bardziej dokładnej obróbki.
- Oszczędność czasu oraz kosztów poprzez zredukowanie częstotliwości zmiany narzędzia.
- Doskonała wydajność.
- Specjalnie zaprojektowany kształt narzędzia zwiększa sztywność przy obróbce szybkościowej.
- Zawężona tolerancja promienia równa ±0.005mm zwiększa dokładność i trwałość narzędzia.

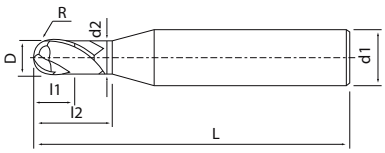
EDP No.		Z	Angle Kąt	Materials Materiały	D / R	Pag. / Str.
CBN01		2		P K N	R 0,2 - 1,5	3 - 4
CBN02		2		P K N	D 0,5 - 2	5 - 6

CBN01

BALL NOSE KULISTE
2-Flute, Bal Nose 2-ostrzowe, kuliste

		HSM Vmax	F	A								max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
				●	●						○			

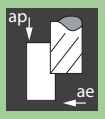


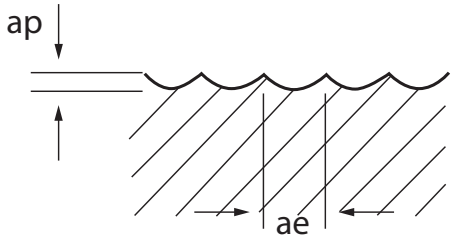


D code new Nowy kod	R	D	d1	d2	L	l1	l2	Z	Shank Uchwyt
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CBN01005003A04000002	0,25	0,5	4	0,46	50	0,4	1,5	2	A
CBN01006003A04001002	0,3	0,6	4	0,56	50	0,5	1,5	2	A
CBN01008004A04001002	0,4	0,8	4	0,76	50	0,6	2	2	A
CBN01010005A04001003	0,5	1	4	0,95	50	0,6	2,5	2	A
CBN01010005A04001004	0,5	1	4	0,95	50	0,6	4	2	A
CBN01010005A04001006	0,5	1	4	0,95	50	0,6	6	2	A
CBN01012006A04001003	0,6	1,2	4	1,15	50	0,8	3	2	A
CBN01015008A04001003	0,75	1,5	4	1,45	50	0,95	3	2	A
CBN01015008A04001004	0,75	1,5	4	1,45	50	0,95	4	2	A
CBN01015008A04001006	0,75	1,5	4	1,45	50	0,95	6	2	A
CBN01020010A04001005	1	2	4	1,95	50	1,2	5	2	A
CBN01020010A04001006	1	2	4	1,95	50	1,2	6	2	A
CBN01030015A04002006	1,5	3	4	2,85	50	1,8	6	2	A

CBN01

Cutting Conditions Parametry skrawania

			**Hardened steels** Stale hartowane		**High hardened steels** Wysoko hartowane stale	
			50 - 60 HRC		**60 - 70 HRC**	
d1	**ae**	**ap**	**RPM**	**mm/min**	**RPM**	**mm/min**
0,4	0,005	0,005	50,000	1,200	50,000	1,200
0,5	0,005	0,005	50,000	1,500	50,000	1,500
0,6	0,005	0,005	50,000	2,000	50,000	2,000
0,8	0,005	0,005	50,000	2,000	50,000	2,000
1,0	0,01	0,01	50,000	3,000	50,000	3,000
1,2	0,01	0,01	50,000	3,000	50,000	3,000
1,5	0,01	0,01	50,000	3,000	50,000	3,000
2,0	0,01	0,01	40,000	3,200	32,000	2,500
3,0	0,01	0,01	26,500	2,100	21,500	1,700

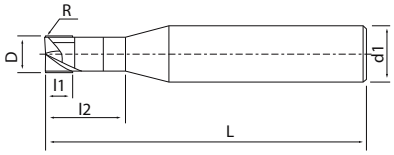


CBN02

TOROIDAL TOROIDALNE
2-Flute 2-ostrzowe

		HSM Vmax	F	30°	A							max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
				●	●						○			

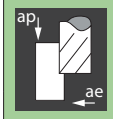


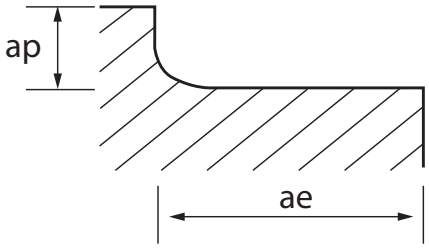


D code new Nowy kod	R	D	d1	d2	L	l1	l2	Z	Shank Uchwyt
CBN02005001A04000002	0,05	0,5	4	0,46	50	0,3	2	2	A
CBN02005001A04000003	0,05	0,5	4	0,46	50	0,3	3	2	A
CBN02010001A04001003	0,05	1	4	0,95	50	0,7	3	2	A
CBN02010001A04001005	0,05	1	4	0,95	50	0,7	5	2	A
CBN02010001A04001003	0,1	1	4	0,95	50	0,7	3	2	A
CBN02010001A04001005	0,1	1	4	0,95	50	0,7	5	2	A
CBN02015001A04001005	0,1	1,5	4	1,45	50	1	5	2	A
CBN02015001A04001008	0,1	1,5	4	1,45	50	1	8	2	A
CBN02015002A04001005	0,2	1,5	4	1,45	50	1	5	2	A
CBN02015002A04001008	0,2	1,5	4	1,45	50	1	8	2	A
CBN02020001A04001006	0,1	2	4	1,95	50	1,2	6	2	A
CBN02020001A04001010	0,1	2	4	1,95	50	1,2	10	2	A
CBN02020002A04001006	0,2	2	4	1,95	50	1,2	6	2	A
CBN02020002A04001010	0,2	2	4	1,95	50	1,2	10	2	A

CBN02

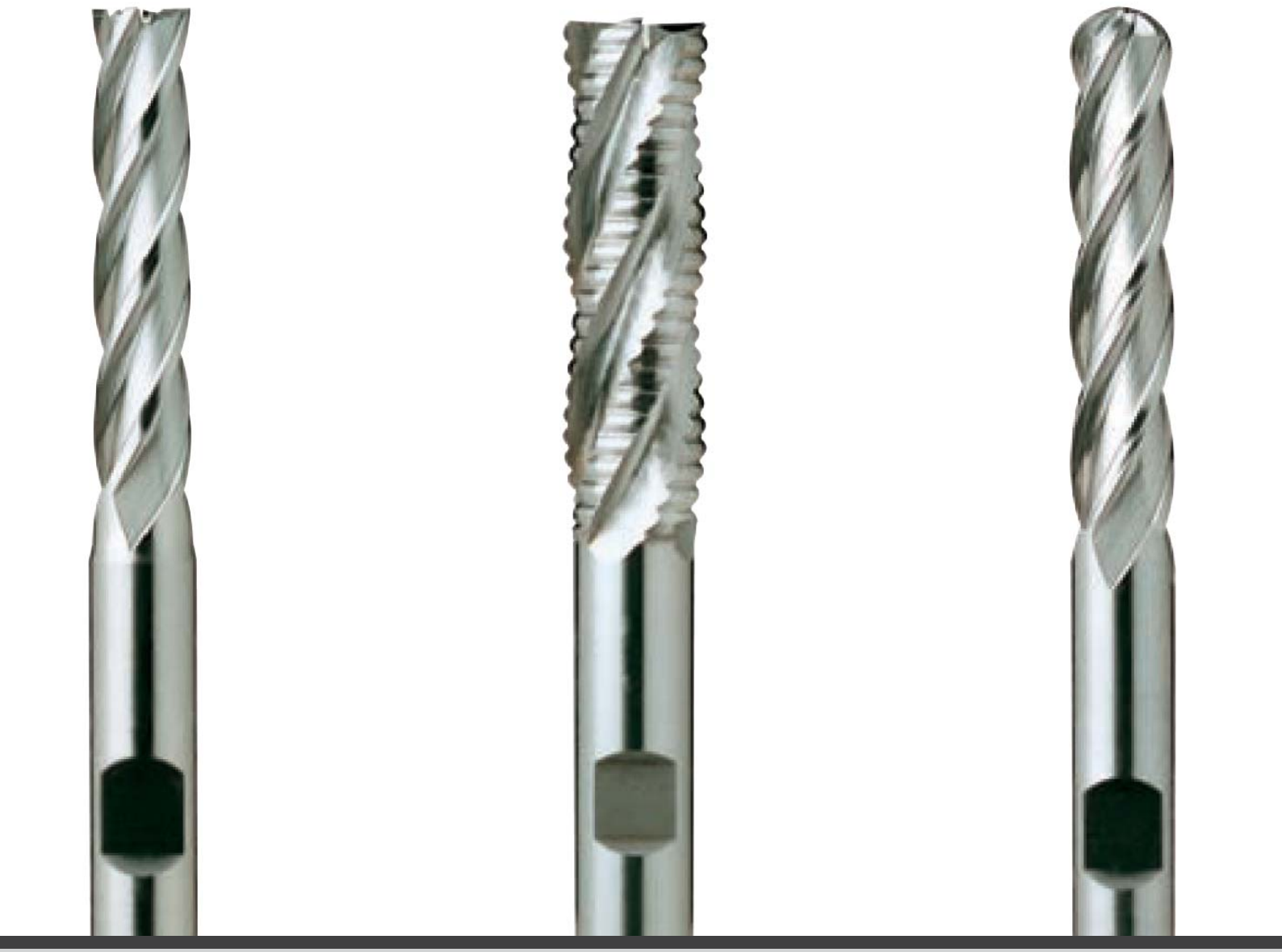
Cutting Conditions Parametry skrawania

	**Hardened steels** Stale hartowane				**High hardened steels** Wysoko hartowane stale			
	50 - 60 HRC				**60 - 70 HRC**			
d1	**ae**	**ap**	**RPM**	**mm/min**	**ae**	**ap**	**RPM**	**mm/min**
0,5	0.10	0.01	50,000	700	0.06	0.005	50,000	550
1,0	0.20	0.01	43,000	1,000	0.10	0.10	30,000	700
1,5	0.40	0.02	30,000	1,000	0.20	0.20	19,000	700
2,0	0.60	0.03	22,000	900	0.30	0.30	14,000	800



HSS

HSSCo8 END MILLS
FREZY HSSCo8

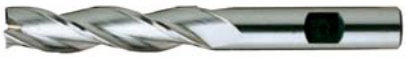


General purpose HSSCo8 End Mills with TiAlN coating or non-coated

Frezy HSSCo8 do zastosowania ogólnego z pokryciem TiAlN lub bez pokrycia

TIZ IMPLEMENTS

P N

EDP No.		Z	Angle Kąt	Materials Materiały	D / R	Pag. / Str.
HM070 HMF70		2	30°	P N	D 1,0 - 40	5 - 7
HM071 HMF71		2	30°	P N	D 1,5 - 40	8 - 9
HM010 HMF10		2	30°	P N	D 2,5 - 40	10 - 11
HM064		2	30°	P N	D 1,0 - 32	12 - 13
HM009		2	30°	P N	D 2,0 - 20	13 - 14
HM612		2	30°	P N	D 0,6 - 4	16
HM623		2	30°	P N	D 0,5 - 6	17
HM072 HMF72		3	30°	P N	D 1,5 - 32	18 - 22
HM073 HMF73		3	30°	P N	D 1,0 - 40	23 - 27
HM016 HMF16		3	30°	P N	D 2,0 - 40	28 - 32
HM053 HMF53		3	30°	P N	D 1,0 - 20	33 - 37
HM054 HMF54		3	30°	P N	D 1,5 - 10	38 - 42
HM051 HMF51		3	30°	P N	D 1,0 - 10	43 - 47
HM052 HMF52		3	30°	P N	D 1,5 - 10	48 - 52
HM074 HMF74 HM075 HMF75		4-6	30°	P N	D 2,0 - 40	53 - 54
HM076 HMF76 HM077 HMF77		4-6	30°	P N	D 2,0 - 40	55 - 56
HM095 HMF95 HM096 HMF96		4-6	30°	P N	D 2,0 - 40	57 - 58
HM097 HMF97 HM098 HMF98		4-6	30°	P N	D 2,0 - 40	59 - 60
HM061 HMF61 HM062 HMF62 HMF63 HMF63		Multi Wiele	50°	P N	D 2,0 - 30	61 - 62
HM035 HMF35		2	30°	P N	R 1,0 - 16	63 - 64
HM092 HMF92		2	30°	P N	R 1,0 - 15	65 - 66

HM0A0 HMFA0		4-6	30°	P N	R 3,0 - 12,5	67 - 68
HM029 HMF29		4-6	30°	P N	R 5,0 - 12,5	69 - 70
HM012 HMF12		3	30°	P N	R 1,0 - 3	71 - 72
HM0A1 HMFA1		Multi Wiele	30°	P N	D 6,0 - 50	73 - 74
HM0A2 HMFA2		Multi Wiele	30°	P N	D 6,0 - 40	75 - 76
HM0B4 HMFB4		3	30°	P N	D 10,0 - 40	77 - 78
HM065 HMF65		3	30°	P N	D 10,0 - 40	79 - 80
HM0A5		3		P N	D 6,0 - 30	81 - 82
HM056		3		P N	D 10,0 - 30	83 - 84
HM057 HMF57		3-4	30°	P N	R 3,0 - 20	85 - 86
HM0B1 HMFB1		Multi Wiele	30°	P N	D 6,0 - 25	87 - 88
HM024 HMF24		3-4	30°	P N	D 6,0 - 20	89 - 90
HM046 HMF46		3-4	30°	P N	R 3,0 - 20	91 - 92
HM0A3 HMFA3		3-6	30°	P N	D 6,0 - 40	93 - 94
HM0B2 HMFB2		3-6	30°	P N	D 6,0 - 40	95 - 96
HM0A4 HMFA4		3-6	30°	P N	D 6,0 - 40	97 - 98
HM068 HMF68		3-6	30°	P N	D 6,0 - 45	99 - 100
HM015 HMF15		3	30°	P N	D 6,0 - 40	101 - 102
HM049 HMF49		3	30°	P N	D 6,0 - 40	103 - 104
HM0A6		-	30°	P N	D 14,0 - 50	105 - 106
HM0A7 HMFA7		4-6	30°	P N	D 14,0 - 50	107 - 108
HM078 HMF78		4-6	30°	P N	D 16,0 - 50	109 - 110
HM079 HMF79		4-6	30°	P N	D 16,0 - 50	111 - 112
HM0C0 HMFC0		2	30°	P N	D 2,0 - 30	113- 114
HM0C4 HMFC4 HM0C5 HMFC5		4-6	30°	P N	D 2,0 - 30	115 - 116

HM0C6 **HMFC6**		3-4		P N	D 14,0 - 50	107 - 108
HM0P1 **HMFP1**		2		P N	D 2,0 - 25	119 - 120
HM059 **HMF59**		4-6		P N	D 6,0 - 30	121 - 122

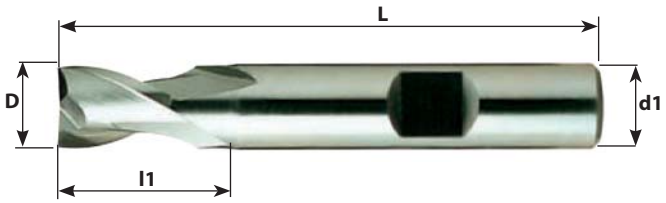
HM070 HMF70

SQUARE TYPE WALCOWO-CZOŁOWE

2 Flute, Short Length 2-ostrzowe, krótkie



P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, SI <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●								○	○				



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM070010000B06003047	HMF70010000B06003047	1.0	6	47	2.5	2	B
HM070015000B06003047	HMF70015000B06003047	1.5	6	47	3	2	B
HM070020000B06004048	HMF70020000B06004048	2.0	6	48	4	2	B
HM070025000B06005049	HMF70025000B06005049	2.5	6	49	5	2	B
HM070028000B06005049	HMF70028000B06005049	2.8	6	49	5	2	B
HM070030000B06005049	HMF70030000B06005049	3.0	6	49	5	2	B
HM070035000B06006050	HMF70035000B06006050	3.5	6	50	6	2	B
HM070038000B06007051	HMF70038000B06007051	3.8	6	51	7	2	B
HM070040000B06007051	HMF70040000B06007051	4.0	6	51	7	2	B
HM070045000B06007051	HMF70045000B06007051	4.5	6	51	7	2	B
HM070048000B06008052	HMF70048000B06008052	4.8	6	52	8	2	B
HM070050000B06008052	HMF70050000B06008052	5.0	6	52	8	2	B
HM070055000B06008052	HMF70055000B06008052	5.5	6	52	8	2	B
HM070058000B06008052	HMF70058000B06008052	5.75	6	52	8	2	B
HM070060000B06008052	HMF70060000B06008052	6.0	6	52	8	2	B
HM070065000B10010060	HMF70065000B10010060	6.5	10	60	10	2	B
HM070068000B10010060	HMF70068000B10010060	6.75	10	60	10	2	B
HM070070000B10010060	HMF70070000B10010060	7.0	10	60	10	2	B
HM070075000B10010060	HMF70075000B10010060	7.5	10	60	10	2	B
HM070078000B10011061	HMF70078000B10011061	7.75	10	61	11	2	B
HM070080000B10011061	HMF70080000B10011061	8.0	10	61	11	2	B
HM070085000B10011061	HMF70085000B10011061	8.5	10	61	11	2	B
HM070087000B10011061	HMF70087000B10011061	8.7	10	61	11	2	B
HM070090000B10011061	HMF70090000B10011061	9.0	10	61	11	2	B
HM070095000B10011061	HMF70095000B10011061	9.5	10	61	11	2	B
HM070097000B10013063	HMF70097000B10013063	9.7	10	63	13	2	B
HM070100000B10013063	HMF70100000B10013063	10.0	10	63	13	2	B
HM070105000B12013070	HMF70105000B12013070	10.5	12	70	13	2	B
HM070107000B12013070	HMF70107000B12013070	10.7	12	70	13	2	B
HM070110000B12013070	HMF70110000B12013070	11.0	12	70	13	2	B
HM070115000B12013070	HMF70115000B12013070	11.5	12	70	13	2	B
HM070117000B12016073	HMF70117000B12016073	11.7	12	73	16	2	B
HM070120000B12016073	HMF70120000B12016073	12.0	12	73	16	2	B
HM070125000B12016073	HMF70125000B12016073	12.5	12	73	16	2	B
HM070127000B12016073	HMF70127000B12016073	12.7	12	73	16	2	B
HM070130000B12016073	HMF70130000B12016073	13.0	12	73	16	2	B
HM070135000B12016073	HMF70135000B12016073	13.5	12	73	16	2	B
HM070137000B12016073	HMF70137000B12016073	13.7	12	73	16	2	B
HM070140000B12016073	HMF70140000B12016073	14.0	12	73	16	2	B
HM070147000B12016073	HMF70147000B12016073	14.7	12	73	16	2	B
HM070150000B12016073	HMF70150000B12016073	15.0	12	73	16	2	B
HM070157000B16019079	HMF70157000B16019079	15.7	16	79	19	2	B
HM070160000B16019079	HMF70160000B16019079	16.0	16	79	19	2	B
HM070167000B16019079	HMF70167000B16019079	16.7	16	79	19	2	B
HM070170000B16019079	HMF70170000B16019079	17.0	16	79	19	2	B
HM070177000B16019079	HMF70177000B16019079	17.7	16	79	19	2	B
HM070180000B16019079	HMF70180000B16019079	18.0	16	79	19	2	B
HM070190000B16019079	HMF70190000B16019079	19.0	16	79	19	2	B
HM070197000B20022088	HMF70197000B20022088	19.7	20	88	22	2	B

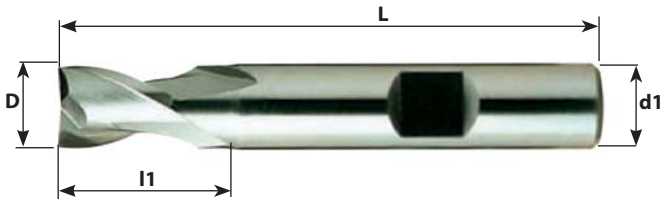
HM070 HMF70

SQUARE TYPE WALCOWO-CZOŁOWE

2 Flute, Short Length 2-ostrzowe, krótkie

					HSS Co 8%	30°	B					max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●								○	○				



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM070200000B16022082	HMF70200000B16022082	20.0	16	82	22	2	B
HM070200000B20022088	HMF70200000B20022088	20.0	20	88	22	2	B
HM070210000B20022088	HMF70210000B20022088	21.0	20	88	22	2	B
HM070220000B20022088	HMF70220000B20022088	22.0	20	88	22	2	B
HM070220000B25022098	HMF70220000B25022098	22.0	25	98	22	2	B
HM070240000B25026102	HMF70240000B25026102	24.0	25	102	26	2	B
HM070250000B25026102	HMF70250000B25026102	25.0	25	102	26	2	B
HM070260000B25026102	HMF70260000B25026102	26.0	25	102	26	2	B
HM070270000B25026102	HMF70270000B25026102	27.0	25	102	26	2	B
HM070280000B25026102	HMF70280000B25026102	28.0	25	102	26	2	B
HM070290000B25026102	HMF70290000B25026102	29.0	25	102	26	2	B
HM070300000B25026102	HMF70300000B25026102	30.0	25	102	26	2	B
HM070320000B32032112	HMF70320000B32032112	32.0	32	112	32	2	B
HM070340000B32032112	HMF70340000B32032112	34.0	32	112	32	2	B
HM070350000B32032112	HMF70350000B32032112	35.0	32	112	32	2	B
HM070360000B32032112	HMF70360000B32032112	36.0	32	112	32	2	B
HM070380000B32038118	HMF70380000B32038118	38.0	32	118	38	2	B
HM070380000B40038130	HMF70380000B40038130	38.0	40	130	38	2	B
HM070400000B32038118	HMF70400000B32038118	40.0	32	118	38	2	B
HM070400000B40038130	HMF70400000B40038130	40.0	40	130	38	2	B

HM070 HMF70

Cutting Conditions Parametry skrawania

Uncoated Bez pokrycia

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2.0	2	1	5600	40	4500	30	4000	30	2200	15	12000	160
3.0	3	1,5	3500	55	3200	45	2500	40	1600	20	11000	250
4.0	4	2	2800	70	2200	55	1800	45	1100	30	8000	290
5.0	5	2,5	2200	90	1800	70	1600	60	900	35	6300	310
6.0	6	3	1800	90	1600	80	1200	60	800	40	5600	310
8.0	8	4	1400	100	1100	90	900	70	560	45	4000	390
10.0	10	5	1100	100	900	90	800	80	450	45	3100	400
12.0	12	6	900	110	800	100	630	80	400	50	2500	380
14.0	14	7	800	110	700	90	560	80	350	50	2200	350
16.0	16	8	700	110	560	90	450	70	280	45	2000	350
18.0	18	9	630	100	500	90	400	70	250	45	1800	350
20.0	20	10	560	100	450	90	400	70	220	45	1600	320
22.0	22	11	500	100	450	90	350	70	220	45	1400	300
25.0	25	12,5	450	90	400	80	310	60	180	35	1200	280
28.0	28	14	400	80	350	70	280	55	160	30	1100	270
30.0	30	15	350	70	310	60	250	50	160	30	1100	270
32.0	32	16	350	70	280	55	220	45	140	30	1000	240
36.0	36	18	310	60	250	50	200	40	120	25	900	220
40.0	40	20	280	60	220	50	180	40	110	25	800	200

Coated TiAlN Pokryte TiAlN

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2.0	2	1	7850	55	6300	40	5600	40	3100	20	16800	225
3.0	3	1,5	4900	75	4500	65	3500	55	2250	30	15400	350
4.0	4	2	3900	100	3100	75	2500	65	1550	40	11200	405
5.0	5	2,5	3100	125	2500	100	2250	85	1250	50	8800	435
6.0	6	3	2500	125	2250	110	1700	85	1100	55	7850	435
8.0	8	4	1950	140	1550	125	1250	100	800	65	5600	545
10.0	10	5	1550	140	1250	125	1100	110	650	65	4350	560
12.0	12	6	1250	155	1100	140	900	110	550	70	3500	530
14.0	14	7	1100	155	1000	125	800	110	500	70	3100	490
16.0	16	8	1000	155	800	125	650	100	400	65	2800	490
18.0	18	9	900	140	700	125	550	100	350	65	2500	490
20.0	20	10	800	140	650	125	550	100	300	65	2250	450
22.0	22	11	700	140	650	125	500	100	300	65	1950	420
25.0	25	12,5	650	125	550	110	450	85	250	50	1700	390
28.0	28	14	550	110	500	100	400	75	200	40	1550	380
30.0	30	15	500	100	450	85	350	70	200	40	1550	380
32.0	32	16	500	100	400	75	300	65	200	40	1400	335
36.0	36	18	450	85	350	70	300	55	150	35	1250	310
40.0	40	20	400	85	300	70	250	55	150	35	1100	280

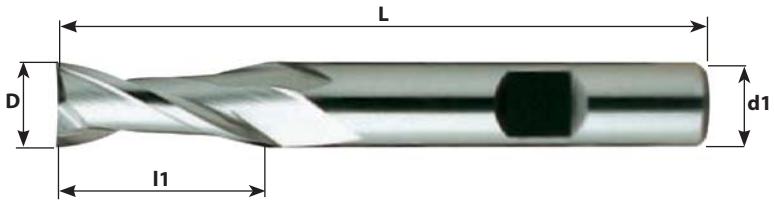
HM071 HMF71

SQUARE TYPE WALCOWO-CZOŁOWE

2 Flute, Long Length 2-ostrzowe, długie

HSS Co 8%	30°	B	max	min	AIR
			○	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●								○	○				



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM071015000B06007051	HMF71015000B06007051	1.5	6	51	7	2	B
HM071020000B06007051	HMF71020000B06007051	2.0	6	51	7	2	B
HM071025000B06008052	HMF71025000B06008052	2.5	6	52	8	2	B
HM071030000B06008052	HMF71030000B06008052	3.0	6	52	8	2	B
HM071035000B06010054	HMF71035000B06010054	3.5	6	54	10	2	B
HM071040000B06011055	HMF71040000B06011055	4.0	6	55	11	2	B
HM071045000B06011055	HMF71045000B06011055	4.5	6	55	11	2	B
HM071050000B06013057	HMF71050000B06013057	5.0	6	57	13	2	B
HM071055000B06013057	HMF71055000B06013057	5.5	6	57	13	2	B
HM071060000B06013057	HMF71060000B06013057	6.0	6	57	13	2	B
HM071065000B10016066	HMF71065000B10016066	6.5	10	66	16	2	B
HM071070000B10016066	HMF71070000B10016066	7.0	10	66	16	2	B
HM071075000B10016066	HMF71075000B10016066	7.5	10	66	16	2	B
HM071080000B10019069	HMF71080000B10019069	8.0	10	69	19	2	B
HM071085000B10019069	HMF71085000B10019069	8.5	10	69	19	2	B
HM071090000B10019069	HMF71090000B10019069	9.0	10	69	19	2	B
HM071095000B10019069	HMF71095000B10019069	9.5	10	69	19	2	B
HM071100000B10022072	HMF71100000B10022072	10.0	10	72	22	2	B
HM071110000B12022079	HMF71110000B12022079	11.0	12	79	22	2	B
HM071120000B12026083	HMF71120000B12026083	12.0	12	83	26	2	B
HM071130000B12026083	HMF71130000B12026083	13.0	12	83	26	2	B
HM071140000B12026083	HMF71140000B12026083	14.0	12	83	26	2	B
HM071150000B12026083	HMF71150000B12026083	15.0	12	83	26	2	B
HM071160000B16032092	HMF71160000B16032092	16.0	16	92	32	2	B
HM071180000B16032092	HMF71180000B16032092	18.0	16	92	32	2	B
HM071200000B20038104	HMF71200000B20038104	20.0	20	104	38	2	B
HM071220000B20038104	HMF71220000B20038104	22.0	20	104	38	2	B
HM071240000B25045121	HMF71240000B25045121	24.0	25	121	45	2	B
HM071250000B25045121	HMF71250000B25045121	25.0	25	121	45	2	B
HM071260000B25045121	HMF71260000B25045121	26.0	25	121	45	2	B
HM071270000B25045121	HMF71270000B25045121	27.0	25	121	45	2	B
HM071280000B25045121	HMF71280000B25045121	28.0	25	121	45	2	B
HM071300000B25045121	HMF71300000B25045121	30.0	25	121	45	2	B
HM071320000B32053133	HMF71320000B32053133	32.0	32	133	53	2	B
HM071400000B40063155	HMF71400000B40063155	40.0	40	155	63	2	B

HM071 HMF71

Cutting Conditions Parametry skrawania

Uncoated Bez pokrycia

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2.0	2	1	5600	40	4500	30	4000	30	2200	15	12000	160
3.0	3	1,5	3500	55	3200	45	2500	40	1600	20	11000	250
4.0	4	2	2800	70	2200	55	1800	45	1100	30	8000	290
5.0	5	2,5	2200	90	1800	70	1600	60	900	35	6300	310
6.0	6	3	1800	90	1600	80	1200	60	800	40	5600	310
8.0	8	4	1400	100	1100	90	900	70	560	45	4000	390
10.0	10	5	1100	100	900	90	800	80	450	45	3100	400
12.0	12	6	900	110	800	100	630	80	400	50	2500	380
14.0	14	7	800	110	700	90	560	80	350	50	2200	350
16.0	16	8	700	110	560	90	450	70	280	45	2000	350
18.0	18	9	630	100	500	90	400	70	250	45	1800	350
20.0	20	10	560	100	450	90	400	70	220	45	1600	320
22.0	22	11	500	100	450	90	350	70	220	45	1400	300
25.0	25	12,5	450	90	400	80	310	60	180	35	1200	280
28.0	28	14	400	80	350	70	280	55	160	30	1100	270
30.0	30	15	350	70	310	60	250	50	160	30	1100	270
32.0	32	16	350	70	280	55	220	45	140	30	1000	240
36.0	36	18	310	60	250	50	200	40	120	25	900	220
40.0	40	20	280	60	220	50	180	40	110	25	800	200

Coated TiAlN Pokryte TiAlN

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2.0	2	1	7850	55	6300	40	5600	40	3100	20	16800	225
3.0	3	1,5	4900	75	4500	65	3500	55	2250	30	15400	350
4.0	4	2	3900	100	3100	75	2500	65	1550	40	11200	405
5.0	5	2,5	3100	125	2500	100	2250	85	1250	50	8800	435
6.0	6	3	2500	125	2250	110	1700	85	1100	55	7850	435
8.0	8	4	1950	140	1550	125	1250	100	800	65	5600	545
10.0	10	5	1550	140	1250	125	1100	110	650	65	4350	560
12.0	12	6	1250	155	1100	140	900	110	550	70	3500	530
14.0	14	7	1100	155	1000	125	800	110	500	70	3100	490
16.0	16	8	1000	155	800	125	650	100	400	65	2800	490
18.0	18	9	900	140	700	125	550	100	350	65	2500	490
20.0	20	10	800	140	650	125	550	100	300	65	2250	450
22.0	22	11	700	140	650	125	500	100	300	65	1950	420
25.0	25	12,5	650	125	550	110	450	85	250	50	1700	390
28.0	28	14	550	110	500	100	400	75	200	40	1550	380
30.0	30	15	500	100	450	85	350	70	200	40	1550	380
32.0	32	16	500	100	400	75	300	65	200	40	1400	335
36.0	36	18	450	85	350	70	300	55	150	35	1250	310
40.0	40	20	400	85	300	70	250	55	150	35	1100	280

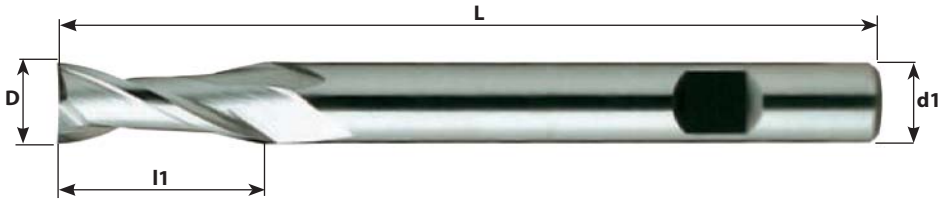
HM010 HMF10

SQUARE TYPE WALCOWO-CZOŁOWE

2 Flute, Extra Long Length 2-ostrzowe, bardzo długie

					HSS Co 8%	30°	B					max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●								○	○				



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM010025000B06008056	HMF10025000B06008056	2.5	6	56	8	2	B
HM010030000B06008056	HMF10030000B06008056	3.0	6	56	8	2	B
HM010035000B06010059	HMF10035000B06010059	3.5	6	59	10	2	B
HM010040000B06011063	HMF10040000B06011063	4.0	6	63	11	2	B
HM010045000B06011063	HMF10045000B06011063	4.5	6	63	11	2	B
HM010050000B06013068	HMF10050000B06013068	5.0	6	68	13	2	B
HM010055000B06013068	HMF10055000B06013068	5.5	6	68	13	2	B
HM010060000B06013068	HMF10060000B06013068	6.0	6	68	13	2	B
HM010065000B10016080	HMF10065000B10016080	6.5	10	80	16	2	B
HM010070000B10016080	HMF10070000B10016080	7.0	10	80	16	2	B
HM010080000B10019088	HMF10080000B10019088	8.0	10	88	19	2	B
HM010085000B10019088	HMF10085000B10019088	8.5	10	88	19	2	B
HM010090000B10019088	HMF10090000B10019088	9.0	10	88	19	2	B
HM010100000B10022095	HMF10100000B10022095	10.0	10	95	22	2	B
HM010120000B12026110	HMF10120000B12026110	12.0	12	110	26	2	B
HM010140000B12026110	HMF10140000B12026110	14.0	12	110	26	2	B
HM010160000B16032123	HMF10160000B16032123	16.0	16	123	32	2	B
HM010180000B16032123	HMF10180000B16032123	18.0	16	123	32	2	B
HM010200000B20038141	HMF10200000B20038141	20.0	20	141	38	2	B
HM010220000B20038141	HMF10220000B20038141	22.0	20	141	38	2	B
HM010240000B25045166	HMF10240000B25045166	24.0	25	166	45	2	B
HM010250000B25045166	HMF10250000B25045166	25.0	25	166	45	2	B
HM010260000B25045166	HMF10260000B25045166	26.0	25	166	45	2	B
HM010280000B25045166	HMF10280000B25045166	28.0	25	166	45	2	B
HM010300000B25045166	HMF10300000B25045166	30.0	25	166	45	2	B
HM010320000B32053186	HMF10320000B32053186	32.0	32	186	53	2	B
HM010360000B32053186	HMF10360000B32053186	36.0	32	186	53	2	B
HM010400000B32063207	HMF10400000B32063207	40.0	32	207	63	2	B
HM010400000B40063217	HMF10400000B40063217	40.0	40	217	63	2	B

HM010 HMF10

Cutting Conditions Parametry skrawania

Uncoated Bez pokrycia

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa , Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa , Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa , Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa , Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2.0	2	1	5600	40	4500	30	4000	30	2200	15	12000	160
3.0	3	1,5	3500	55	3200	45	2500	40	1600	20	11000	250
4.0	4	2	2800	70	2200	55	1800	45	1100	30	8000	290
5.0	5	2,5	2200	90	1800	70	1600	60	900	35	6300	310
6.0	6	3	1800	90	1600	80	1200	60	800	40	5600	310
8.0	8	4	1400	100	1100	90	900	70	560	45	4000	390
10.0	10	5	1100	100	900	90	800	80	450	45	3100	400
12.0	12	6	900	110	800	100	630	80	400	50	2500	380
14.0	14	7	800	110	700	90	560	80	350	50	2200	350
16.0	16	8	700	110	560	90	450	70	280	45	2000	350
18.0	18	9	630	100	500	90	400	70	250	45	1800	350
20.0	20	10	560	100	450	90	400	70	220	45	1600	320
22.0	22	11	500	100	450	90	350	70	220	45	1400	300
25.0	25	12,5	450	90	400	80	310	60	180	35	1200	280
28.0	28	14	400	80	350	70	280	55	160	30	1100	270
30.0	30	15	350	70	310	60	250	50	160	30	1100	270
32.0	32	16	350	70	280	55	220	45	140	30	1000	240
36.0	36	18	310	60	250	50	200	40	120	25	900	220
40.0	40	20	280	60	220	50	180	40	110	25	800	200

Coated TiAlN Pokryte TiAlN

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2.0	2	1	7850	55	6300	40	5600	40	3100	20	16800	225
3.0	3	1,5	4900	75	4500	65	3500	55	2250	30	15400	350
4.0	4	2	3900	100	3100	75	2500	65	1550	40	11200	405
5.0	5	2,5	3100	125	2500	100	2250	85	1250	50	8800	435
6.0	6	3	2500	125	2250	110	1700	85	1100	55	7850	435
8.0	8	4	1950	140	1550	125	1250	100	800	65	5600	545
10.0	10	5	1550	140	1250	125	1100	110	650	65	4350	560
12.0	12	6	1250	155	1100	140	900	110	550	70	3500	530
14.0	14	7	1100	155	1000	125	800	110	500	70	3100	490
16.0	16	8	1000	155	800	125	650	100	400	65	2800	490
18.0	18	9	900	140	700	125	550	100	350	65	2500	490
20.0	20	10	800	140	650	125	550	100	300	65	2250	450
22.0	22	11	700	140	650	125	500	100	300	65	1950	420
25.0	25	12,5	650	125	550	110	450	85	250	50	1700	390
28.0	28	14	550	110	500	100	400	75	200	40	1550	380
30.0	30	15	500	100	450	85	350	70	200	40	1550	380
32.0	32	16	500	100	400	75	300	65	200	40	1400	335
36.0	36	18	450	85	350	70	300	55	150	35	1250	310
40.0	40	20	400	85	300	70	250	55	150	35	1100	280

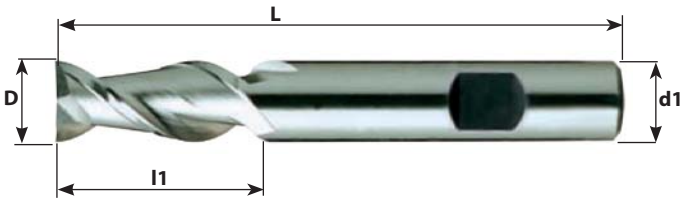
HM064

SQUARE TYPE WALCOWO-CZOŁOWE

2 Flute, Short Length 2-ostrzowe, krótkie



P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○									●	●				



D code Uncoated Kod bez pokrycia	D	d1	L	l1	Z	Shank Uchwyt
HM064010000B06003049	1.0	6	49	3	2	B
HM064015000B06005049	1.5	6	49	5	2	B
HM064020000B06007051	2.0	6	51	7	2	B
HM064025000B06008052	2.5	6	52	8	2	B
HM064030000B06008052	3.0	6	52	8	2	B
HM064035000B06010054	3.5	6	54	10	2	B
HM064040000B06011055	4.0	6	55	11	2	B
HM064045000B06011055	4.5	6	55	11	2	B
HM064050000B06013057	5.0	6	57	13	2	B
HM064055000B06013057	5.5	6	57	13	2	B
HM064060000B06013057	6.0	6	57	13	2	B
HM064065000B10016066	6.5	10	66	16	2	B
HM064070000B10016066	7.0	10	66	16	2	B
HM064075000B10016066	7.5	10	66	16	2	B
HM064080000B10019069	8.0	10	69	19	2	B
HM064085000B10019069	8.5	10	69	19	2	B
HM064090000B10019069	9.0	10	69	19	2	B
HM064100000B10022072	10.0	10	72	22	2	B
HM064110000B12022079	11.0	12	79	22	2	B
HM064120000B12026083	12.0	12	83	26	2	B
HM064130000B12026083	13.0	12	83	26	2	B
HM064140000B12026083	14.0	12	83	26	2	B
HM064150000B12026083	15.0	12	83	26	2	B
HM064160000B16032092	16.0	16	92	32	2	B
HM064170000B16032092	17.0	16	92	32	2	B
HM064180000B16032092	18.0	16	92	32	2	B
HM064190000B16032092	19.0	16	92	32	2	B
HM064200000B20038104	20.0	20	104	38	2	B
HM064210000B20038104	21.0	20	104	38	2	B
HM064220000B20038104	22.0	20	104	38	2	B
HM064230000B20038104	23.0	20	104	38	2	B
HM064240000B25045121	24.0	25	121	45	2	B
HM064250000B25045121	25.0	25	121	45	2	B
HM064260000B25045121	26.0	25	121	45	2	B
HM064280000B25045121	28.0	25	121	45	2	B
HM064300000B25045121	30.0	25	121	45	2	B
HM064320000B32053133	32.0	32	133	53	2	B

HM064

Cutting Conditions Parametry skrawania

Uncoated - Slotting Bez pokrycia - Rowkowanie

Material Materiał			Aluminium Nonferrous Metals Aluminium, Metale nieżelazne	
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED
3.0	3	1,5	8000	560
6.0	6	3	7000	700
8.0	8	4	6000	850
10.0	10	5	5000	1200
12.0	12	6	5000	1200
14.0	14	7	3500	1240
16.0	16	8	3500	1240
18.0	18	9	2300	1300
20.0	20	10	2300	1300

Uncoated - Side Cutting Bez pokrycia - Frezowanie boku

Material Materiał			Aluminium Nonferrous Metals Aluminium, Metale nieżelazne	
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED
3.0	0,75	3	8000	730
6.0	1,5	6	7000	900
8.0	2	8	6000	1100
10.0	2,5	10	5000	1500
12.0	6	12	5000	1500
14.0	7	14	3500	1600
16.0	8	16	3500	1600
18.0	9	18	2300	1700
20.0	10	20	2300	1700

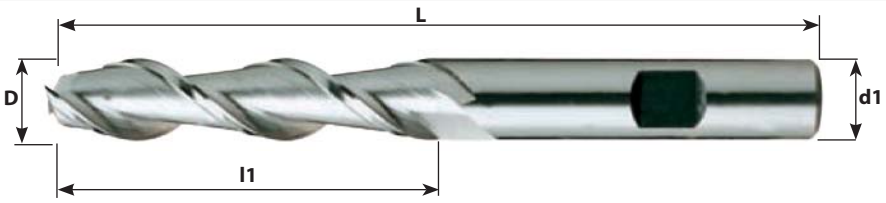
HM009

SQUARE TYPE WALCOWO-CZOŁOWE

2 Flute, Long Length 2-ostrzowe, długie

					HSS Co 8%	30°	B					max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○									●	●				



D code Uncoated Kod bez pokrycia	D	d1	L	l1	Z	Shank Uchwyt
HM009020000B06010054	2.0	6	54	10	2	B
HM009030000B06012056	3.0	6	56	12	2	B
HM009040000B06019063	4.0	6	63	19	2	B
HM009050000B06024068	5.0	6	68	24	2	B
HM009060000B06024068	6.0	6	68	24	2	B
HM009070000B10030080	7.0	10	80	30	2	B
HM009080000B10038088	8.0	10	88	38	2	B
HM009090000B10038088	9.0	10	88	38	2	B
HM009100000B10045095	10.0	10	95	45	2	B
HM009110000B12045102	11.0	12	102	45	2	B
HM009120000B12053110	12.0	12	110	53	2	B
HM009130000B12053110	13.0	12	110	53	2	B
HM009140000B12053110	14.0	12	110	53	2	B
HM009150000B12053110	15.0	12	110	53	2	B
HM009160000B16063123	16.0	16	123	63	2	B
HM009180000B16063123	18.0	16	123	63	2	B
HM009200000B20075141	20.0	20	141	75	2	B

HM009

Cutting Conditions Parametry skrawania

Uncoated - Slotting Bez pokrycia - Rowkowanie

Material Materiał			Aluminium Nonferrous Metals Aluminium, Metale nieżelazne	
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED
3.0	3	1,5	8000	560
6.0	6	3	7000	700
8.0	8	4	6000	850
10.0	10	5	5000	1200
12.0	12	6	5000	1200
14.0	14	7	3500	1240
16.0	16	8	3500	1240
18.0	18	9	2300	1300
20.0	20	10	2300	1300

Uncoated - Side Cutting Bez pokrycia - Frezowanie boku

Material Materiał			Aluminium Nonferrous Metals Aluminium, Metale nieżelazne	
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED
3.0	0,75	3	8000	730
6.0	1,5	6	7000	900
8.0	2	8	6000	1100
10.0	2,5	10	5000	1500
12.0	6	12	5000	1500
14.0	7	14	3500	1600
16.0	8	16	3500	1600
18.0	9	18	2300	1700
20.0	10	20	2300	1700

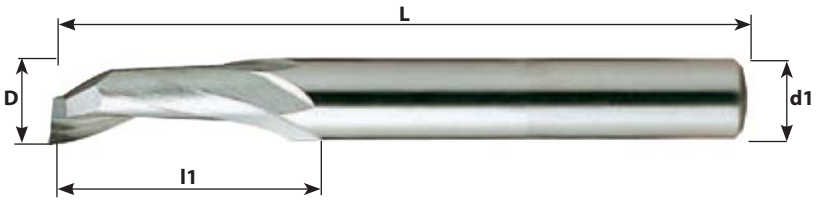
HM612

SQUARE TYPE WALCOWO-CZOŁOWE

1 Flute, 1-ostrzowe

HSS Co 8%	30°	B	max	min		AIR
			○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
○									●	●				



D code Uncoated Kod bez pokrycia	D	d1	d2	L	l1	Z	Shank Uchwyt
HM612030000A08012060	3.0	8	-	60	12	1	A
HM612040000A08012060	4.0	8	-	60	12	1	A
HM612050000A08014060	5.0	8	-	60	14	1	A
HM612060000A08014060	6.0	8	-	60	14	1	A
HM612070000A08014060	7.0	8	-	60	14	1	A
HM612080000A08014080	8.0	8	-	80	14	1	A
HM612090000A08014080	9.0	8	-	80	14	1	A
HM612100000A08014080	10.0	8	-	80	14	1	A
HM612050000A08035080	5.0	8	4.8	80	18	1	A
HM612050000A08040100	5.0	8	—	100	40	1	A
HM612080000A08068120	8.0	8	7.5	120	14	1	A

Cutting Conditions Parametry skrawania

Uncoated Bez pokrycia

Material Materiał			Aluminium Nonferrous Metals Aluminium, Metale nieżelazne	
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED
3.0	3	1,5	20000	1100
4.0	4	2	18000	950
5.0	5	2,5	14000	750
6.0	6	3	11000	600
7.0	7	3,5	10000	550
8.0	8	4	8500	450
10.0	10	5	7000	380

µm	d1 ≤ 3,0	0 — -6	d1 ≤18	0 — -11		
	d1 ≤ 6,0	0 — -8	d1 ≤30	0 — -13		
	d1 ≤ 10	0 — -9	d1 ≤50	0 — -16		

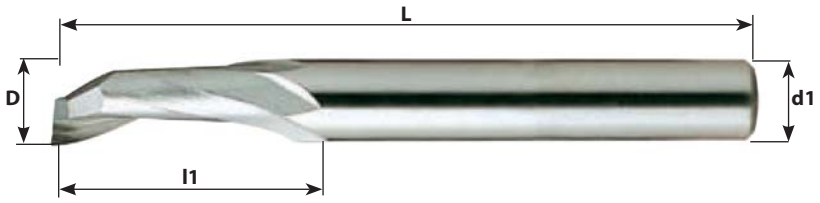
HM623

SQUARE TYPE WALCOWO-CZOŁOWE

1 Flute, 1-ostrzowe

					HSS Co 8%	30°	B					max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●								○	○				



D code Uncoated Kod bez pokrycia	D	d1	L	l1	Z	Shank Uchwyt
HM623030000A08012060	3.0	8	60	12	1	A
HM623040000A08012060	4.0	8	60	12	1	A
HM623050000A08012060	5.0	8	60	12	1	A
HM623060000A08014060	6.0	8	60	14	1	A
HM623070000A08014060	7.0	8	60	14	1	A
HM623080000A08014080	8.0	8	80	14	1	A
HM623090000A08014080	9.0	8	80	14	1	A
HM623100000A08014080	10.0	8	80	14	1	A

Cutting Conditions Parametry skrawania

Uncoated Bez pokrycia

Material Materiał			Aluminium Nonferrous Metals Aluminium, Metale nieżelazne	
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED
3.0	3	1,5	20000	1100
4.0	4	2	18000	950
5.0	5	2,5	14000	750
6.0	6	3	11000	600
7.0	7	3,5	10000	550
8.0	8	4	8500	450
10.0	10	5	7000	380

µm	d1 ≤ 3,0	0 — -6	d1 ≤18	0 — -11	
	d1 ≤ 6,0	0 — -8	d1 ≤30	0 — -13	
	d1 ≤ 10	0 — -9	d1 ≤50	0 — -16	

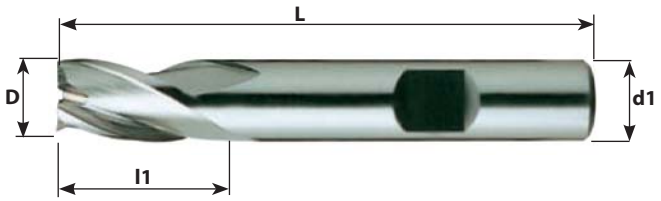
HM072 HMF72

SQUARE TYPE WALCOWO-CZOŁOWE

3 Flute, Long Length 3-ostrzowe, długie

					HSS Co 8%	30°	B					max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●								○	○				



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM072015000B06003047	HMF72015000B06003047	1.5	6	47	3	3	B
HM072020000B06004048	HMF72020000B06004048	2.0	6	48	4	3	B
HM072025000B06005049	HMF72025000B06005049	2.5	6	49	5	3	B
HM072030000B06005049	HMF72030000B06005049	3.0	6	49	5	3	B
HM072035000B06006050	HMF72035000B06006050	3.5	6	50	6	3	B
HM072040000B06007051	HMF72040000B06007051	4.0	6	51	7	3	B
HM072045000B06007051	HMF72045000B06007051	4.5	6	51	7	3	B
HM072050000B06008052	HMF72050000B06008052	5.0	6	52	8	3	B
HM072055000B06008052	HMF72055000B06008052	5.5	6	52	8	3	B
HM072060000B06008052	HMF72060000B06008052	6.0	6	52	8	3	B
HM072065000B10010060	HMF72065000B10010060	6.5	10	60	10	3	B
HM072070000B10010060	HMF72070000B10010060	7.0	10	60	10	3	B
HM072075000B10010060	HMF72075000B10010060	7.5	10	60	10	3	B
HM072080000B10011061	HMF72080000B10011061	8.0	10	61	11	3	B
HM072085000B10011061	HMF72085000B10011061	8.5	10	61	11	3	B
HM072100000B10013063	HMF72100000B10013063	10.0	10	63	13	3	B
HM072120000B12016073	HMF72120000B12016073	12.0	12	73	16	3	B
HM072140000B12016073	HMF72140000B12016073	14.0	12	73	16	3	B
HM072150000B12016073	HMF72150000B12016073	15.0	12	73	16	3	B
HM072160000B16019079	HMF72160000B16019079	16.0	16	79	19	3	B
HM072180000B16019079	HMF72180000B16019079	18.0	16	79	19	3	B
HM072200000B20022088	HMF72200000B20022088	20.0	20	88	22	3	B
HM072220000B20022088	HMF72220000B20022088	22.0	20	88	22	3	B
HM072240000B25026102	HMF72240000B25026102	24.0	25	102	26	3	B
HM072250000B25026102	HMF72250000B25026102	25.0	25	102	26	3	B
HM072260000B25026102	HMF72260000B25026102	26.0	25	102	26	3	B
HM072280000B25026102	HMF72280000B25026102	28.0	25	102	26	3	B
HM072300000B25026102	HMF72300000B25026102	30.0	25	102	26	3	B
HM072320000B32032112	HMF72320000B32032112	32.0	32	112	32	3	B

µm						
	d1 ≤ 3,0	0 — -6	d1 ≤18	0 — -11		
	d1 ≤ 6,0	0 — -8	d1 ≤30	0 — -13		
	d1 ≤ 10	0 — -9	d1 ≤50	0 — -16		

HM072 HMF72

Cutting Conditions Parametry skrawania

Uncoated - Slotting Bez pokrycia - Rowkowanie

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	0,2	3	5600	60	4500	40	4000	35	2200	15	12000	180
3	0,3	4,5	3500	80	3200	60	2500	45	1600	20	11000	280
4	0,4	6	2800	105	2200	75	1800	50	1100	30	8000	330
5	0,5	7,5	2200	135	1800	95	1600	65	900	35	6300	350
6	0,6	9	1800	135	1600	110	1200	65	800	45	5600	350
8	0,8	12	1400	150	1100	120	900	80	560	50	4000	440
10	1	15	1100	150	900	120	800	90	450	50	3100	450
12	1,2	18	900	165	800	135	630	90	400	55	2500	430
14	1,4	21	800	165	700	120	560	90	350	55	2200	400
16	1,6	24	700	165	560	120	450	80	280	50	2000	400
18	1,8	27	630	150	500	120	400	80	250	50	1800	400
20	2	30	560	150	450	120	400	80	220	50	1600	360
22	2,2	33	500	150	450	120	350	80	220	50	1400	340
25	2,5	37,5	450	135	400	110	310	65	180	35	1200	320
28	2,8	42	400	120	350	95	280	60	160	30	1100	300
30	3	45	350	105	310	80	250	55	160	30	1100	300
32	3,2	48	350	105	280	75	220	50	140	30	1000	270
35	3,5	52,5	320	95	260	65	210	45	130	25	950	260
36	3,6	54	310	90	250	65	200	45	120	25	900	250
40	4	60	280	90	220	65	180	45	110	25	800	220

HM072 HMF72

Cutting Conditions Parametry skrawania

Coated TiAlN - Slotting Pokryte TiAlN - Rowkowanie

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2.0	2	1	7900	50	6300	35	5600	30	3100	15	16800	150
3.0	3	1,5	4900	70	4500	50	3500	35	2200	20	15400	240
4.0	4	2	3900	85	3100	60	2500	40	1500	30	11200	280
5.0	5	2,5	3100	110	2500	75	2200	55	1300	30	8800	290
6.0	6	3	2500	110	2200	90	1700	55	1100	35	7800	290
8.0	8	4	2000	125	1500	100	1300	70	780	40	5600	360
10.0	10	5	1500	125	1300	110	1100	75	630	40	4300	380
12.0	12	6	1300	140	1100	110	880	75	560	50	3500	360
14.0	14	7	1100	140	980	100	780	75	490	50	3100	340
16.0	16	8	980	140	780	100	630	70	390	40	2800	340
18.0	18	9	880	125	700	100	560	70	350	40	2500	340
20.0	20	10	780	125	630	100	560	70	310	40	2200	310
22.0	22	11	700	125	630	100	490	70	310	40	1950	280
25.0	25	12,5	630	110	560	90	430	55	250	30	1700	270
28.0	28	14	560	100	490	75	390	50	220	30	1500	250
30.0	30	15	490	85	430	70	350	40	220	30	1500	250
32.0	32	16	490	85	390	65	310	40	200	30	1400	225
35.0	35	17,5	450	80	360	60	290	35	180	25	1300	215
36.0	36	18	430	75	350	55	280	35	170	20	1250	210
40.0	40	20	390	75	310	55	250	35	150	20	1100	180

HM072 HMF72

Cutting Conditions Parametry skrawania

Uncoated - Side Cutting Bez pokrycia - Frezowanie boku

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	0,2	3	5600	60	4500	40	4000	35	2200	15	12000	180
3	0,3	4,5	3500	80	3200	60	2500	45	1600	20	11000	280
4	0,4	6	2800	105	2200	75	1800	50	1100	30	8000	330
5	0,5	7,5	2200	135	1800	95	1600	65	900	35	6300	350
6	0,6	9	1800	135	1600	110	1200	65	800	45	5600	350
8	0,8	12	1400	150	1100	120	900	80	560	50	4000	440
10	1	15	1100	150	900	120	800	90	450	50	3100	450
12	1,2	18	900	165	800	135	630	90	400	55	2500	430
14	1,4	21	800	165	700	120	560	90	350	55	2200	400
16	1,6	24	700	165	560	120	450	80	280	50	2000	400
18	1,8	27	630	150	500	120	400	80	250	50	1800	400
20	2	30	560	150	450	120	400	80	220	50	1600	360
22	2,2	33	500	150	450	120	350	80	220	50	1400	340
25	2,5	37,5	450	135	400	110	310	65	180	35	1200	320
28	2,8	42	400	120	350	95	280	60	160	30	1100	300
30	3	45	350	105	310	80	250	55	160	30	1100	300
32	3,2	48	350	105	280	75	220	50	140	30	1000	270
35	3,5	52,5	320	95	260	65	210	45	130	25	950	260
36	3,6	54	310	90	250	65	200	45	120	25	900	250
40	4	60	280	90	220	65	180	45	110	25	800	220

HM072 HMF72

Coated TiAlN - Side Cutiing Pokryte TiAlN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	0,2	3	7900	85	6300	55	5600	50	3100	20	16800	250
3	0,3	4,5	4900	110	4500	85	3500	60	2200	30	15400	390
4	0,4	6	3900	145	3100	105	2500	70	1500	40	11200	460
5	0,5	7,5	3100	190	2500	130	2200	90	1300	50	8800	490
6	0,6	9	2500	190	2200	155	1700	90	1100	60	7800	490
8	0,8	12	2000	210	1500	170	1300	110	780	70	5600	620
10	1	15	1500	210	1300	170	1100	125	630	70	4300	630
12	1,2	18	1300	230	1100	190	880	125	560	75	3500	600
14	1,4	21	1100	230	980	170	780	125	490	75	3100	560
16	1,6	24	980	230	780	170	630	110	390	70	2800	560
18	1,8	27	880	210	700	170	560	110	350	70	2500	560
20	2	30	780	210	630	170	560	110	310	70	2200	500
22	2,2	33	700	210	630	170	490	110	310	70	1950	480
25	2,5	37,5	630	190	560	155	430	90	250	50	1700	450
28	2,8	42	560	170	490	130	390	85	220	40	1500	420
30	3	45	490	145	430	110	350	75	220	40	1500	420
32	3,2	48	490	145	390	105	310	70	200	40	1400	380
35	3,5	52,5	450	130	360	95	290	65	180	35	1300	360
36	3,6	54	430	125	350	90	280	65	170	35	1250	350
40	4	60	390	125	310	90	250	65	150	35	1100	310

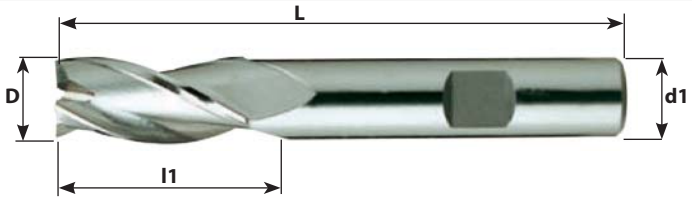
HM073 HMF73

SQUARE TYPE WALCOWO-CZOŁOWE

3 Flute, Short Length 3-ostrzowe, krótkie

					HSS Co 8%	30°	B					max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●								○	○				



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM073010000B06003047	HMF73010000B06003047	1.0	6	47	3	3	B
HM073015000B06007051	HMF73015000B06007051	1.5	6	51	7	3	B
HM073020000B06007051	HMF73020000B06007051	2.0	6	51	7	3	B
HM073025000B06008052	HMF73025000B06008052	2.5	6	52	8	3	B
HM073030000B06008052	HMF73030000B06008052	3.0	6	52	8	3	B
HM073035000B06010054	HMF73035000B06010054	3.5	6	54	10	3	B
HM073040000B06011055	HMF73040000B06011055	4.0	6	55	11	3	B
HM073045000B06011055	HMF73045000B06011055	4.5	6	55	11	3	B
HM073050000B06013057	HMF73050000B06013057	5.0	6	57	13	3	B
HM073055000B06013057	HMF73055000B06013057	5.5	6	57	13	3	B
HM073060000B06013057	HMF73060000B06013057	6.0	6	57	13	3	B
HM073065000B10016066	HMF73065000B10016066	6.5	10	66	16	3	B
HM073070000B10016066	HMF73070000B10016066	7.0	10	66	16	3	B
HM073075000B10016066	HMF73075000B10016066	7.5	10	66	16	3	B
HM073080000B10019069	HMF73080000B10019069	8.0	10	69	19	3	B
HM073085000B10019069	HMF73085000B10019069	8.5	10	69	19	3	B
HM073090000B10019069	HMF73090000B10019069	9.0	10	69	19	3	B
HM073095000B10019069	HMF73095000B10019069	9.5	10	69	19	3	B
HM073100000B10022072	HMF73100000B10022072	10.0	10	72	22	3	B
HM073120000B12026083	HMF73120000B12026083	12.0	12	83	26	3	B
HM073140000B12026083	HMF73140000B12026083	14.0	12	83	26	3	B
HM073150000B12026083	HMF73150000B12026083	15.0	12	83	26	3	B
HM073160000B16032092	HMF73160000B16032092	16.0	16	92	32	3	B
HM073180000B16032092	HMF73180000B16032092	18.0	16	92	32	3	B
HM073200000B20038104	HMF73200000B20038104	20.0	20	104	38	3	B
HM073220000B20038104	HMF73220000B20038104	22.0	20	104	38	3	B
HM073240000B25045121	HMF73240000B25045121	24.0	25	121	45	3	B
HM073250000B25045121	HMF73250000B25045121	25.0	25	121	45	3	B
HM073260000B25045121	HMF73260000B25045121	26.0	25	121	45	3	B
HM073280000B25045121	HMF73280000B25045121	28.0	25	121	45	3	B
HM073300000B25045121	HMF73300000B25045121	30.0	25	121	45	3	B
HM073320000B32053133	HMF73320000B32053133	32.0	32	133	53	3	B
HM073400000B40063155	HMF73400000B40063155	40.0	40	155	63	3	B

HM073 HMF73

Cutting Conditions Parametry skrawania

Uncoated - Slotting Bez pokrycia - Rowkowanie

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	0,2	3	5600	60	4500	40	4000	35	2200	15	12000	180
3	0,3	4,5	3500	80	3200	60	2500	45	1600	20	11000	280
4	0,4	6	2800	105	2200	75	1800	50	1100	30	8000	330
5	0,5	7,5	2200	135	1800	95	1600	65	900	35	6300	350
6	0,6	9	1800	135	1600	110	1200	65	800	45	5600	350
8	0,8	12	1400	150	1100	120	900	80	560	50	4000	440
10	1	15	1100	150	900	120	800	90	450	50	3100	450
12	1,2	18	900	165	800	135	630	90	400	55	2500	430
14	1,4	21	800	165	700	120	560	90	350	55	2200	400
16	1,6	24	700	165	560	120	450	80	280	50	2000	400
18	1,8	27	630	150	500	120	400	80	250	50	1800	400
20	2	30	560	150	450	120	400	80	220	50	1600	360
22	2,2	33	500	150	450	120	350	80	220	50	1400	340
25	2,5	37,5	450	135	400	110	310	65	180	35	1200	320
28	2,8	42	400	120	350	95	280	60	160	30	1100	300
30	3	45	350	105	310	80	250	55	160	30	1100	300
32	3,2	48	350	105	280	75	220	50	140	30	1000	270
35	3,5	52,5	320	95	260	65	210	45	130	25	950	260
36	3,6	54	310	90	250	65	200	45	120	25	900	250
40	4	60	280	90	220	65	180	45	110	25	800	220

HM073 HMF73

Cutting Conditions Parametry skrawania

Coated TiAlN - Slotting Pokryte TiAlN - Rowkowanie

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2.0	2	1	7900	50	6300	35	5600	30	3100	15	16800	150
3.0	3	1,5	4900	70	4500	50	3500	35	2200	20	15400	240
4.0	4	2	3900	85	3100	60	2500	40	1500	30	11200	280
5.0	5	2,5	3100	110	2500	75	2200	55	1300	30	8800	290
6.0	6	3	2500	110	2200	90	1700	55	1100	35	7800	290
8.0	8	4	2000	125	1500	100	1300	70	780	40	5600	360
10.0	10	5	1500	125	1300	110	1100	75	630	40	4300	380
12.0	12	6	1300	140	1100	110	880	75	560	50	3500	360
14.0	14	7	1100	140	980	100	780	75	490	50	3100	340
16.0	16	8	980	140	780	100	630	70	390	40	2800	340
18.0	18	9	880	125	700	100	560	70	350	40	2500	340
20.0	20	10	780	125	630	100	560	70	310	40	2200	310
22.0	22	11	700	125	630	100	490	70	310	40	1950	280
25.0	25	12,5	630	110	560	90	430	55	250	30	1700	270
28.0	28	14	560	100	490	75	390	50	220	30	1500	250
30.0	30	15	490	85	430	70	350	40	220	30	1500	250
32.0	32	16	490	85	390	65	310	40	200	30	1400	225
35.0	35	17,5	450	80	360	60	290	35	180	25	1300	215
36.0	36	18	430	75	350	55	280	35	170	20	1250	210
40.0	40	20	390	75	310	55	250	35	150	20	1100	180

HM073 HMF73

Cutting Conditions Parametry skrawania

Uncoated - Side Cutiing Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	0,2	3	5600	60	4500	40	4000	35	2200	15	12000	180
3	0,3	4,5	3500	80	3200	60	2500	45	1600	20	11000	280
4	0,4	6	2800	105	2200	75	1800	50	1100	30	8000	330
5	0,5	7,5	2200	135	1800	95	1600	65	900	35	6300	350
6	0,6	9	1800	135	1600	110	1200	65	800	45	5600	350
8	0,8	12	1400	150	1100	120	900	80	560	50	4000	440
10	1	15	1100	150	900	120	800	90	450	50	3100	450
12	1,2	18	900	165	800	135	630	90	400	55	2500	430
14	1,4	21	800	165	700	120	560	90	350	55	2200	400
16	1,6	24	700	165	560	120	450	80	280	50	2000	400
18	1,8	27	630	150	500	120	400	80	250	50	1800	400
20	2	30	560	150	450	120	400	80	220	50	1600	360
22	2,2	33	500	150	450	120	350	80	220	50	1400	340
25	2,5	37,5	450	135	400	110	310	65	180	35	1200	320
28	2,8	42	400	120	350	95	280	60	160	30	1100	300
30	3	45	350	105	310	80	250	55	160	30	1100	300
32	3,2	48	350	105	280	75	220	50	140	30	1000	270
35	3,5	52,5	320	95	260	65	210	45	130	25	950	260
36	3,6	54	310	90	250	65	200	45	120	25	900	250
40	4	60	280	90	220	65	180	45	110	25	800	220

HM073 HMF73

Coated TiAIN - Side Cutiing Pokryte TiAIN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	0,2	3	7900	85	6300	55	5600	50	3100	20	16800	250
3	0,3	4,5	4900	110	4500	85	3500	60	2200	30	15400	390
4	0,4	6	3900	145	3100	105	2500	70	1500	40	11200	460
5	0,5	7,5	3100	190	2500	130	2200	90	1300	50	8800	490
6	0,6	9	2500	190	2200	155	1700	90	1100	60	7800	490
8	0,8	12	2000	210	1500	170	1300	110	780	70	5600	620
10	1	15	1500	210	1300	170	1100	125	630	70	4300	630
12	1,2	18	1300	230	1100	190	880	125	560	75	3500	600
14	1,4	21	1100	230	980	170	780	125	490	75	3100	560
16	1,6	24	980	230	780	170	630	110	390	70	2800	560
18	1,8	27	880	210	700	170	560	110	350	70	2500	560
20	2	30	780	210	630	170	560	110	310	70	2200	500
22	2,2	33	700	210	630	170	490	110	310	70	1950	480
25	2,5	37,5	630	190	560	155	430	90	250	50	1700	450
28	2,8	42	560	170	490	130	390	85	220	40	1500	420
30	3	45	490	145	430	110	350	75	220	40	1500	420
32	3,2	48	490	145	390	105	310	70	200	40	1400	380
35	3,5	52,5	450	130	360	95	290	65	180	35	1300	360
36	3,6	54	430	125	350	90	280	65	170	35	1250	350
40	4	60	390	125	310	90	250	65	150	35	1100	310

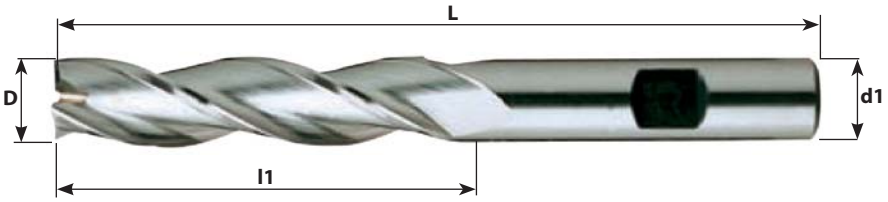
HM016 HMF16

SQUARE TYPE WALCOWO-CZOŁOWE

3 Flute, Long Length 3-ostrzowe, długie

HSS Co 8%	30°	B	max	min	AIR
			○	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, SI <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●								○	○				



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM016020000B06010054	HMF16020000B06010054	2.0	6	54	10	3	B
HM016025000B06012056	HMF16025000B06012056	2.5	6	56	12	3	B
HM016030000B06012056	HMF16030000B06012056	3.0	6	56	12	3	B
HM016035000B06015059	HMF16035000B06015059	3.5	6	59	15	3	B
HM016040000B06019063	HMF16040000B06019063	4.0	6	63	19	3	B
HM016045000B06019063	HMF16045000B06019063	4.5	6	63	19	3	B
HM016050000B06024068	HMF16050000B06024068	5.0	6	68	24	3	B
HM016055000B06024068	HMF16055000B06024068	5.5	6	68	24	3	B
HM016060000B06024068	HMF16060000B06024068	6.0	6	68	24	3	B
HM016070000B10030080	HMF16070000B10030080	7.0	10	80	30	3	B
HM016075000B10030080	HMF16075000B10030080	7.5	10	80	30	3	B
HM016080000B10038088	HMF16080000B10038088	8.0	10	88	38	3	B
HM016090000B10038088	HMF16090000B10038088	9.0	10	88	38	3	B
HM016100000B10045095	HMF16100000B10045095	10.0	10	95	45	3	B
HM016110000B12045102	HMF16110000B12045102	11.0	12	102	45	3	B
HM016120000B12053110	HMF16120000B12053110	12.0	12	110	53	3	B
HM016130000B12053110	HMF16130000B12053110	13.0	12	110	53	3	B
HM016140000B12053110	HMF16140000B12053110	14.0	12	110	53	3	B
HM016150000B12053110	HMF16150000B12053110	15.0	12	110	53	3	B
HM016160000B16063123	HMF16160000B16063123	16.0	16	123	63	3	B
HM016170000B16063123	HMF16170000B16063123	17.0	16	123	63	3	B
HM016180000B16063123	HMF16180000B16063123	18.0	16	123	63	3	B
HM016190000B16063123	HMF16190000B16063123	19.0	16	123	63	3	B
HM016200000B16075135	HMF16200000B16075135	20.0	16	135	75	3	B
HM016200000B20075141	HMF16200000B20075141	20.0	20	141	75	3	B
HM016220000B20075141	HMF16220000B20075141	22.0	20	141	75	3	B
HM016240000B25090166	HMF16240000B25090166	24.0	25	166	90	3	B
HM016250000B25090166	HMF16250000B25090166	25.0	25	166	90	3	B
HM016260000B25090166	HMF16260000B25090166	26.0	25	166	90	3	B
HM016280000B25090166	HMF16280000B25090166	28.0	25	166	90	3	B
HM016300000B25090166	HMF16300000B25090166	30.0	25	166	90	3	B
HM01632000B320106186	HMF1632000B320106186	32.0	32	186	106	3	B
HM01635000B320106186	HMF1635000B320106186	35.0	32	186	106	3	B
HM01636000B320106186	HMF1636000B320106186	36.0	32	186	106	3	B
HM01640000B400125217	HMF1640000B400125217	40.0	40	217	125	3	B

HM016 HMF16

Cutting Conditions Parametry skrawania

Uncoated - Slotting Bez pokrycia - Rowkowanie

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	0,2	3	5600	60	4500	40	4000	35	2200	15	12000	180
3	0,3	4,5	3500	80	3200	60	2500	45	1600	20	11000	280
4	0,4	6	2800	105	2200	75	1800	50	1100	30	8000	330
5	0,5	7,5	2200	135	1800	95	1600	65	900	35	6300	350
6	0,6	9	1800	135	1600	110	1200	65	800	45	5600	350
8	0,8	12	1400	150	1100	120	900	80	560	50	4000	440
10	1	15	1100	150	900	120	800	90	450	50	3100	450
12	1,2	18	900	165	800	135	630	90	400	55	2500	430
14	1,4	21	800	165	700	120	560	90	350	55	2200	400
16	1,6	24	700	165	560	120	450	80	280	50	2000	400
18	1,8	27	630	150	500	120	400	80	250	50	1800	400
20	2	30	560	150	450	120	400	80	220	50	1600	360
22	2,2	33	500	150	450	120	350	80	220	50	1400	340
25	2,5	37,5	450	135	400	110	310	65	180	35	1200	320
28	2,8	42	400	120	350	95	280	60	160	30	1100	300
30	3	45	350	105	310	80	250	55	160	30	1100	300
32	3,2	48	350	105	280	75	220	50	140	30	1000	270
35	3,5	52,5	320	95	260	65	210	45	130	25	950	260
36	3,6	54	310	90	250	65	200	45	120	25	900	250
40	4	60	280	90	220	65	180	45	110	25	800	220

HM016 HMF16

Coated TiAlN - Slotting Pokryte TiAlN - Rowkowanie

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2.0	2	1	7900	50	6300	35	5600	30	3100	15	16800	150
3.0	3	1,5	4900	70	4500	50	3500	35	2200	20	15400	240
4.0	4	2	3900	85	3100	60	2500	40	1500	30	11200	280
5.0	5	2,5	3100	110	2500	75	2200	55	1300	30	8800	290
6.0	6	3	2500	110	2200	90	1700	55	1100	35	7800	290
8.0	8	4	2000	125	1500	100	1300	70	780	40	5600	360
10.0	10	5	1500	125	1300	110	1100	75	630	40	4300	380
12.0	12	6	1300	140	1100	110	880	75	560	50	3500	360
14.0	14	7	1100	140	980	100	780	75	490	50	3100	340
16.0	16	8	980	140	780	100	630	70	390	40	2800	340
18.0	18	9	880	125	700	100	560	70	350	40	2500	340
20.0	20	10	780	125	630	100	560	70	310	40	2200	310
22.0	22	11	700	125	630	100	490	70	310	40	1950	280
25.0	25	12,5	630	110	560	90	430	55	250	30	1700	270
28.0	28	14	560	100	490	75	390	50	220	30	1500	250
30.0	30	15	490	85	430	70	350	40	220	30	1500	250
32.0	32	16	490	85	390	65	310	40	200	30	1400	225
35.0	35	17,5	450	80	360	60	290	35	180	25	1300	215
36.0	36	18	430	75	350	55	280	35	170	20	1250	210
40.0	40	20	390	75	310	55	250	35	150	20	1100	180

HM016 HMF16

Cutting Conditions Parametry skrawania

Uncoated - Side Cutiing Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Alumi-nium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	0,2	3	5600	60	4500	40	4000	35	2200	15	12000	180
3	0,3	4,5	3500	80	3200	60	2500	45	1600	20	11000	280
4	0,4	6	2800	105	2200	75	1800	50	1100	30	8000	330
5	0,5	7,5	2200	135	1800	95	1600	65	900	35	6300	350
6	0,6	9	1800	135	1600	110	1200	65	800	45	5600	350
8	0,8	12	1400	150	1100	120	900	80	560	50	4000	440
10	1	15	1100	150	900	120	800	90	450	50	3100	450
12	1,2	18	900	165	800	135	630	90	400	55	2500	430
14	1,4	21	800	165	700	120	560	90	350	55	2200	400
16	1,6	24	700	165	560	120	450	80	280	50	2000	400
18	1,8	27	630	150	500	120	400	80	250	50	1800	400
20	2	30	560	150	450	120	400	80	220	50	1600	360
22	2,2	33	500	150	450	120	350	80	220	50	1400	340
25	2,5	37,5	450	135	400	110	310	65	180	35	1200	320
28	2,8	42	400	120	350	95	280	60	160	30	1100	300
30	3	45	350	105	310	80	250	55	160	30	1100	300
32	3,2	48	350	105	280	75	220	50	140	30	1000	270
35	3,5	52,5	320	95	260	65	210	45	130	25	950	260
36	3,6	54	310	90	250	65	200	45	120	25	900	250
40	4	60	280	90	220	65	180	45	110	25	800	220

HM016 HMF16

Coated TiAIN - Side Cutiing Pokryte TiAIN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	0,2	3	7900	85	6300	55	5600	50	3100	20	16800	250
3	0,3	4,5	4900	110	4500	85	3500	60	2200	30	15400	390
4	0,4	6	3900	145	3100	105	2500	70	1500	40	11200	460
5	0,5	7,5	3100	190	2500	130	2200	90	1300	50	8800	490
6	0,6	9	2500	190	2200	155	1700	90	1100	60	7800	490
8	0,8	12	2000	210	1500	170	1300	110	780	70	5600	620
10	1	15	1500	210	1300	170	1100	125	630	70	4300	630
12	1,2	18	1300	230	1100	190	880	125	560	75	3500	600
14	1,4	21	1100	230	980	170	780	125	490	75	3100	560
16	1,6	24	980	230	780	170	630	110	390	70	2800	560
18	1,8	27	880	210	700	170	560	110	350	70	2500	560
20	2	30	780	210	630	170	560	110	310	70	2200	500
22	2,2	33	700	210	630	170	490	110	310	70	1950	480
25	2,5	37,5	630	190	560	155	430	90	250	50	1700	450
28	2,8	42	560	170	490	130	390	85	220	40	1500	420
30	3	45	490	145	430	110	350	75	220	40	1500	420
32	3,2	48	490	145	390	105	310	70	200	40	1400	380
35	3,5	52,5	450	130	360	95	290	65	180	35	1300	360
36	3,6	54	430	125	350	90	280	65	170	35	1250	350
40	4	60	390	125	310	90	250	65	150	35	1100	310

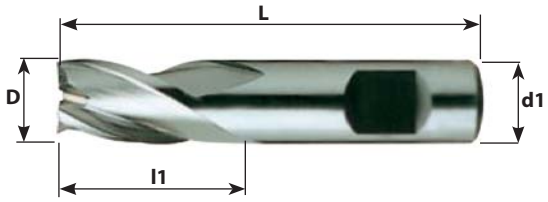
HM053 HMF53

SQUARE TYPE WALCOWO-CZOŁOWE

3 Flute, Short Length 3-ostrzowe, krótkie

HSS Co 8%	30°	B	max	min	AIR
			○	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●								○	○				



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM053010000B06002034	HMF53010000B06002034	1.0	6	34	2	3	B
HM053013000B06003034	HMF53013000B06003034	1.3	6	34	3	3	B
HM053015000B06003034	HMF53015000B06003034	1.5	6	34	3	3	B
HM053018000B06003034	HMF53018000B06003034	1.8	6	34	3	3	B
HM053020000B06004035	HMF53020000B06004035	2.0	6	35	4	3	B
HM053023000B06004035	HMF53023000B06004035	2.3	6	35	4	3	B
HM053025000B06005036	HMF53025000B06005036	2.5	6	36	5	3	B
HM053028000B06005036	HMF53028000B06005036	2.8	6	36	5	3	B
HM053030000B06005036	HMF53030000B06005036	3.0	6	36	5	3	B
HM053033000B06006037	HMF53033000B06006037	3.3	6	37	6	3	B
HM053035000B06006037	HMF53035000B06006037	3.5	6	37	6	3	B
HM053038000B06007038	HMF53038000B06007038	3.8	6	38	7	3	B
HM053040000B06007038	HMF53040000B06007038	4.0	6	38	7	3	B
HM053043000B06007038	HMF53043000B06007038	4.3	6	38	7	3	B
HM053045000B06007038	HMF53045000B06007038	4.5	6	38	7	3	B
HM053048000B06008039	HMF53048000B06008039	4.8	6	39	8	3	B
HM053050000B06008039	HMF53050000B06008039	5.0	6	39	8	3	B
HM053053000B06008039	HMF53053000B06008039	5.3	6	39	8	3	B
HM053055000B06008039	HMF53055000B06008039	5.5	6	39	8	3	B
HM053058000B06008039	HMF53058000B06008039	5.75	6	39	8	3	B
HM053060000B06008039	HMF53060000B06008039	6.0	6	39	8	3	B
HM053065000B08010042	HMF53065000B08010042	6.5	8	42	10	3	B
HM053070000B08010042	HMF53070000B08010042	7.0	8	42	10	3	B
HM053075000B08010042	HMF53075000B08010042	7.5	8	42	10	3	B
HM053080000B08011043	HMF53080000B08011043	8.0	8	43	11	3	B
HM053085000B10011048	HMF53085000B10011048	8.5	10	48	11	3	B
HM053090000B10011048	HMF53090000B10011048	9.0	10	48	11	3	B
HM053095000B10011048	HMF53095000B10011048	9.5	10	48	11	3	B
HM053100000B10013050	HMF53100000B10013050	10.0	10	50	13	3	B
HM053120000B12016058	HMF53120000B12016058	12.0	12	58	16	3	B
HM053160000B16019064	HMF53160000B16019064	16.0	16	64	19	3	B
HM053200000B20022078	HMF53200000B20022078	20.0	20	78	22	3	B

HM053 HMF53

Cutting Conditions Parametry skrawania

Uncoated - Slotting Bez pokrycia - Rowkowanie

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	0,2	3	5600	60	4500	40	4000	35	2200	15	12000	180
3	0,3	4,5	3500	80	3200	60	2500	45	1600	20	11000	280
4	0,4	6	2800	105	2200	75	1800	50	1100	30	8000	330
5	0,5	7,5	2200	135	1800	95	1600	65	900	35	6300	350
6	0,6	9	1800	135	1600	110	1200	65	800	45	5600	350
8	0,8	12	1400	150	1100	120	900	80	560	50	4000	440
10	1	15	1100	150	900	120	800	90	450	50	3100	450
12	1,2	18	900	165	800	135	630	90	400	55	2500	430
14	1,4	21	800	165	700	120	560	90	350	55	2200	400
16	1,6	24	700	165	560	120	450	80	280	50	2000	400
18	1,8	27	630	150	500	120	400	80	250	50	1800	400
20	2	30	560	150	450	120	400	80	220	50	1600	360
22	2,2	33	500	150	450	120	350	80	220	50	1400	340
25	2,5	37,5	450	135	400	110	310	65	180	35	1200	320
28	2,8	42	400	120	350	95	280	60	160	30	1100	300
30	3	45	350	105	310	80	250	55	160	30	1100	300
32	3,2	48	350	105	280	75	220	50	140	30	1000	270
35	3,5	52,5	320	95	260	65	210	45	130	25	950	260
36	3,6	54	310	90	250	65	200	45	120	25	900	250
40	4	60	280	90	220	65	180	45	110	25	800	220

HM053 HMF53

Cutting Conditions Parametry skrawania

Coated TiAlN - Slotting Pokryte TiAlN - Rowkowanie

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2.0	2	1	7900	50	6300	35	5600	30	3100	15	16800	150
3.0	3	1,5	4900	70	4500	50	3500	35	2200	20	15400	240
4.0	4	2	3900	85	3100	60	2500	40	1500	30	11200	280
5.0	5	2,5	3100	110	2500	75	2200	55	1300	30	8800	290
6.0	6	3	2500	110	2200	90	1700	55	1100	35	7800	290
8.0	8	4	2000	125	1500	100	1300	70	780	40	5600	360
10.0	10	5	1500	125	1300	110	1100	75	630	40	4300	380
12.0	12	6	1300	140	1100	110	880	75	560	50	3500	360
14.0	14	7	1100	140	980	100	780	75	490	50	3100	340
16.0	16	8	980	140	780	100	630	70	390	40	2800	340
18.0	18	9	880	125	700	100	560	70	350	40	2500	340
20.0	20	10	780	125	630	100	560	70	310	40	2200	310
22.0	22	11	700	125	630	100	490	70	310	40	1950	280
25.0	25	12,5	630	110	560	90	430	55	250	30	1700	270
28.0	28	14	560	100	490	75	390	50	220	30	1500	250
30.0	30	15	490	85	430	70	350	40	220	30	1500	250
32.0	32	16	490	85	390	65	310	40	200	30	1400	225
35.0	35	17,5	450	80	360	60	290	35	180	25	1300	215
36.0	36	18	430	75	350	55	280	35	170	20	1250	210
40.0	40	20	390	75	310	55	250	35	150	20	1100	180

HM053 HMF53

Cutting Conditions Parametry skrawania

Uncoated - Side Cutiing Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Alumi-nium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	0,2	3	5600	60	4500	40	4000	35	2200	15	12000	180
3	0,3	4,5	3500	80	3200	60	2500	45	1600	20	11000	280
4	0,4	6	2800	105	2200	75	1800	50	1100	30	8000	330
5	0,5	7,5	2200	135	1800	95	1600	65	900	35	6300	350
6	0,6	9	1800	135	1600	110	1200	65	800	45	5600	350
8	0,8	12	1400	150	1100	120	900	80	560	50	4000	440
10	1	15	1100	150	900	120	800	90	450	50	3100	450
12	1,2	18	900	165	800	135	630	90	400	55	2500	430
14	1,4	21	800	165	700	120	560	90	350	55	2200	400
16	1,6	24	700	165	560	120	450	80	280	50	2000	400
18	1,8	27	630	150	500	120	400	80	250	50	1800	400
20	2	30	560	150	450	120	400	80	220	50	1600	360
22	2,2	33	500	150	450	120	350	80	220	50	1400	340
25	2,5	37,5	450	135	400	110	310	65	180	35	1200	320
28	2,8	42	400	120	350	95	280	60	160	30	1100	300
30	3	45	350	105	310	80	250	55	160	30	1100	300
32	3,2	48	350	105	280	75	220	50	140	30	1000	270
35	3,5	52,5	320	95	260	65	210	45	130	25	950	260
36	3,6	54	310	90	250	65	200	45	120	25	900	250
40	4	60	280	90	220	65	180	45	110	25	800	220

HM053 HMF53

Coated TiAlN - Side Cutiing Pokryte TiAlN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	0,2	3	7900	85	6300	55	5600	50	3100	20	16800	250
3	0,3	4,5	4900	110	4500	85	3500	60	2200	30	15400	390
4	0,4	6	3900	145	3100	105	2500	70	1500	40	11200	460
5	0,5	7,5	3100	190	2500	130	2200	90	1300	50	8800	490
6	0,6	9	2500	190	2200	155	1700	90	1100	60	7800	490
8	0,8	12	2000	210	1500	170	1300	110	780	70	5600	620
10	1	15	1500	210	1300	170	1100	125	630	70	4300	630
12	1,2	18	1300	230	1100	190	880	125	560	75	3500	600
14	1,4	21	1100	230	980	170	780	125	490	75	3100	560
16	1,6	24	980	230	780	170	630	110	390	70	2800	560
18	1,8	27	880	210	700	170	560	110	350	70	2500	560
20	2	30	780	210	630	170	560	110	310	70	2200	500
22	2,2	33	700	210	630	170	490	110	310	70	1950	480
25	2,5	37,5	630	190	560	155	430	90	250	50	1700	450
28	2,8	42	560	170	490	130	390	85	220	40	1500	420
30	3	45	490	145	430	110	350	75	220	40	1500	420
32	3,2	48	490	145	390	105	310	70	200	40	1400	380
35	3,5	52,5	450	130	360	95	290	65	180	35	1300	360
36	3,6	54	430	125	350	90	280	65	170	35	1250	350
40	4	60	390	125	310	90	250	65	150	35	1100	310

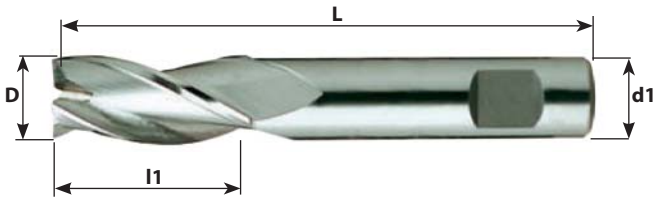
HM054 HMF54

SQUARE TYPE WALCOWO-CZOŁOWE

3 Flute, Short Length 3-ostrzowe, krótkie

					HSS Co 8%	30°	B					max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, SI <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●								○	○				



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM054015000B06004035	HMF54015000B06004035	1.5	6	35	4	3	B
HM054020000B06007038	HMF54020000B06007038	2.0	6	38	7	3	B
HM054025000B06008039	HMF54025000B06008039	2.5	6	39	8	3	B
HM054030000B06008039	HMF54030000B06008039	3.0	6	39	8	3	B
HM054035000B06010041	HMF54035000B06010041	3.5	6	41	10	3	B
HM054040000B06011042	HMF54040000B06011042	4.0	6	42	11	3	B
HM054045000B060X2042	HMF54045000B060X2042	4.5	6	42	11	3	B
HM054050000B06013044	HMF54050000B06013044	5.0	6	44	13	3	B
HM054055000B06013044	HMF54055000B06013044	5.5	6	44	13	3	B
HM054060000B06013044	HMF54060000B06013044	6.0	6	44	13	3	B
HM054065000B08016048	HMF54065000B08016048	6.5	8	48	16	3	B
HM054070000B08016048	HMF54070000B08016048	7.0	8	48	16	3	B
HM054075000B08016048	HMF54075000B08016048	7.5	8	48	16	3	B
HM054080000B08019051	HMF54080000B08019051	8.0	8	51	19	3	B
HM054085000B10019056	HMF54085000B10019056	8.5	10	56	19	3	B
HM054090000B10019056	HMF54090000B10019056	9.0	10	56	19	3	B
HM054095000B10019056	HMF54095000B10019056	9.5	10	56	19	3	B
HM054100000B10022059	HMF54100000B10022059	10.0	10	59	22	3	B

µm	d1 ≤ 3,0	0 — -6	d1 ≤18	0 — -11		
	d1 ≤ 6,0	0 — -8	d1 ≤30	0 — -13		
	d1 ≤ 10	0 — -9	d1 ≤50	0 — -16		

HM054 HMF54

Cutting Conditions Parametry skrawania

Uncoated - Slotting Bez pokrycia - Rowkowanie

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	0,2	3	5600	60	4500	40	4000	35	2200	15	12000	180
3	0,3	4,5	3500	80	3200	60	2500	45	1600	20	11000	280
4	0,4	6	2800	105	2200	75	1800	50	1100	30	8000	330
5	0,5	7,5	2200	135	1800	95	1600	65	900	35	6300	350
6	0,6	9	1800	135	1600	110	1200	65	800	45	5600	350
8	0,8	12	1400	150	1100	120	900	80	560	50	4000	440
10	1	15	1100	150	900	120	800	90	450	50	3100	450
12	1,2	18	900	165	800	135	630	90	400	55	2500	430
14	1,4	21	800	165	700	120	560	90	350	55	2200	400
16	1,6	24	700	165	560	120	450	80	280	50	2000	400
18	1,8	27	630	150	500	120	400	80	250	50	1800	400
20	2	30	560	150	450	120	400	80	220	50	1600	360
22	2,2	33	500	150	450	120	350	80	220	50	1400	340
25	2,5	37,5	450	135	400	110	310	65	180	35	1200	320
28	2,8	42	400	120	350	95	280	60	160	30	1100	300
30	3	45	350	105	310	80	250	55	160	30	1100	300
32	3,2	48	350	105	280	75	220	50	140	30	1000	270
35	3,5	52,5	320	95	260	65	210	45	130	25	950	260
36	3,6	54	310	90	250	65	200	45	120	25	900	250
40	4	60	280	90	220	65	180	45	110	25	800	220

HM054 HMF54

Coated TiAlN - Slotting Pokryte TiAlN - Rowkowanie

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2.0	2	1	7900	50	6300	35	5600	30	3100	15	16800	150
3.0	3	1,5	4900	70	4500	50	3500	35	2200	20	15400	240
4.0	4	2	3900	85	3100	60	2500	40	1500	30	11200	280
5.0	5	2,5	3100	110	2500	75	2200	55	1300	30	8800	290
6.0	6	3	2500	110	2200	90	1700	55	1100	35	7800	290
8.0	8	4	2000	125	1500	100	1300	70	780	40	5600	360
10.0	10	5	1500	125	1300	110	1100	75	630	40	4300	380
12.0	12	6	1300	140	1100	110	880	75	560	50	3500	360
14.0	14	7	1100	140	980	100	780	75	490	50	3100	340
16.0	16	8	980	140	780	100	630	70	390	40	2800	340
18.0	18	9	880	125	700	100	560	70	350	40	2500	340
20.0	20	10	780	125	630	100	560	70	310	40	2200	310
22.0	22	11	700	125	630	100	490	70	310	40	1950	280
25.0	25	12,5	630	110	560	90	430	55	250	30	1700	270
28.0	28	14	560	100	490	75	390	50	220	30	1500	250
30.0	30	15	490	85	430	70	350	40	220	30	1500	250
32.0	32	16	490	85	390	65	310	40	200	30	1400	225
35.0	35	17,5	450	80	360	60	290	35	180	25	1300	215
36.0	36	18	430	75	350	55	280	35	170	20	1250	210
40.0	40	20	390	75	310	55	250	35	150	20	1100	180

HM054 HMF54

Cutting Conditions Parametry skrawania

Uncoated - Side Cutiing Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Alumi-nium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	0,2	3	5600	60	4500	40	4000	35	2200	15	12000	180
3	0,3	4,5	3500	80	3200	60	2500	45	1600	20	11000	280
4	0,4	6	2800	105	2200	75	1800	50	1100	30	8000	330
5	0,5	7,5	2200	135	1800	95	1600	65	900	35	6300	350
6	0,6	9	1800	135	1600	110	1200	65	800	45	5600	350
8	0,8	12	1400	150	1100	120	900	80	560	50	4000	440
10	1	15	1100	150	900	120	800	90	450	50	3100	450
12	1,2	18	900	165	800	135	630	90	400	55	2500	430
14	1,4	21	800	165	700	120	560	90	350	55	2200	400
16	1,6	24	700	165	560	120	450	80	280	50	2000	400
18	1,8	27	630	150	500	120	400	80	250	50	1800	400
20	2	30	560	150	450	120	400	80	220	50	1600	360
22	2,2	33	500	150	450	120	350	80	220	50	1400	340
25	2,5	37,5	450	135	400	110	310	65	180	35	1200	320
28	2,8	42	400	120	350	95	280	60	160	30	1100	300
30	3	45	350	105	310	80	250	55	160	30	1100	300
32	3,2	48	350	105	280	75	220	50	140	30	1000	270
35	3,5	52,5	320	95	260	65	210	45	130	25	950	260
36	3,6	54	310	90	250	65	200	45	120	25	900	250
40	4	60	280	90	220	65	180	45	110	25	800	220

HM054 HMF54

Coated TiAlN - Side Cutiing Pokryte TiAlN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	0,2	3	7900	85	6300	55	5600	50	3100	20	16800	250
3	0,3	4,5	4900	110	4500	85	3500	60	2200	30	15400	390
4	0,4	6	3900	145	3100	105	2500	70	1500	40	11200	460
5	0,5	7,5	3100	190	2500	130	2200	90	1300	50	8800	490
6	0,6	9	2500	190	2200	155	1700	90	1100	60	7800	490
8	0,8	12	2000	210	1500	170	1300	110	780	70	5600	620
10	1	15	1500	210	1300	170	1100	125	630	70	4300	630
12	1,2	18	1300	230	1100	190	880	125	560	75	3500	600
14	1,4	21	1100	230	980	170	780	125	490	75	3100	560
16	1,6	24	980	230	780	170	630	110	390	70	2800	560
18	1,8	27	880	210	700	170	560	110	350	70	2500	560
20	2	30	780	210	630	170	560	110	310	70	2200	500
22	2,2	33	700	210	630	170	490	110	310	70	1950	480
25	2,5	37,5	630	190	560	155	430	90	250	50	1700	450
28	2,8	42	560	170	490	130	390	85	220	40	1500	420
30	3	45	490	145	430	110	350	75	220	40	1500	420
32	3,2	48	490	145	390	105	310	70	200	40	1400	380
35	3,5	52,5	450	130	360	95	290	65	180	35	1300	360
36	3,6	54	430	125	350	90	280	65	170	35	1250	350
40	4	60	390	125	310	90	250	65	150	35	1100	310

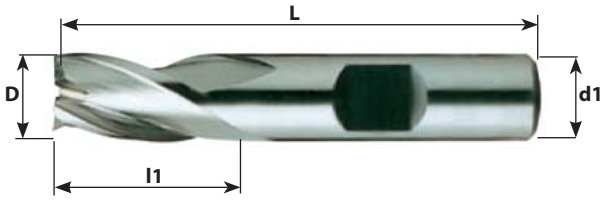
HM051 HMF51

SQUARE TYPE WALCOWO-CZOŁOWE

3 Flute, Short Length 3-ostrzowe, krótkie

HSS Co 8%	30°	B	max	min		AIR
			○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●								○	○				



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM051010000B06002025	HMF51010000B06002025	1.0	6	24.5	2	3	B
HM051015000B06003025	HMF51015000B06003025	1.5	6	24.5	2.5	3	B
HM051020000B06003026	HMF51020000B06003026	2.0	6	25.5	3	3	B
HM051025000B06004026	HMF51025000B06004026	2.5	6	26	4	3	B
HM051028000B06005028	HMF51028000B06005028	2.8	6	28	4.5	3	B
HM051030000B06005028	HMF51030000B06005028	3.0	6	28	4.5	3	B
HM051035000B06006030	HMF51035000B06006030	3.5	6	30	5.5	3	B
HM051038000B06007033	HMF51038000B06007033	3.8	6	32.5	6.5	3	B
HM051040000B06007033	HMF51040000B06007033	4.0	6	32.5	6.5	3	B
HM051045000B06007035	HMF51045000B06007035	4.5	6	34.5	7	3	B
HM051048000B06008036	HMF51048000B06008036	4.8	6	36	7.5	3	B
HM051050000B06008036	HMF51050000B06008036	5.0	6	36	7.5	3	B
HM051055000B06009036	HMF51055000B06009036	5.5	6	36	8.5	3	B
HM051058000B06010036	HMF51058000B06010036	5.75	6	36	9.5	3	B
HM051060000B06010036	HMF51060000B06010036	6.0	6	36	9.5	3	B
HM051075000B10011048	HMF51075000B10011048	7.5	10	47.5	11	3	B
HM051080000B10011048	HMF51080000B10011048	8.0	10	47.5	11	3	B
HM051095000B10013052	HMF51095000B10013052	9.5	10	51.5	13	3	B
HM051100000B10013052	HMF51100000B10013052	10.0	10	51.5	13	3	B

µm						
	d1 ≤ 3,0	0 — -6	d1 ≤18	0 — -11		
	d1 ≤ 6,0	0 — -8	d1 ≤30	0 — -13		
	d1 ≤ 10	0 — -9	d1 ≤50	0 — -16		

HM051 HMF51

Cutting Conditions Parametry skrawania

Uncoated - Slotting Bez pokrycia - Rowkowanie

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	0,2	3	5600	60	4500	40	4000	35	2200	15	12000	180
3	0,3	4,5	3500	80	3200	60	2500	45	1600	20	11000	280
4	0,4	6	2800	105	2200	75	1800	50	1100	30	8000	330
5	0,5	7,5	2200	135	1800	95	1600	65	900	35	6300	350
6	0,6	9	1800	135	1600	110	1200	65	800	45	5600	350
8	0,8	12	1400	150	1100	120	900	80	560	50	4000	440
10	1	15	1100	150	900	120	800	90	450	50	3100	450
12	1,2	18	900	165	800	135	630	90	400	55	2500	430
14	1,4	21	800	165	700	120	560	90	350	55	2200	400
16	1,6	24	700	165	560	120	450	80	280	50	2000	400
18	1,8	27	630	150	500	120	400	80	250	50	1800	400
20	2	30	560	150	450	120	400	80	220	50	1600	360
22	2,2	33	500	150	450	120	350	80	220	50	1400	340
25	2,5	37,5	450	135	400	110	310	65	180	35	1200	320
28	2,8	42	400	120	350	95	280	60	160	30	1100	300
30	3	45	350	105	310	80	250	55	160	30	1100	300
32	3,2	48	350	105	280	75	220	50	140	30	1000	270
35	3,5	52,5	320	95	260	65	210	45	130	25	950	260
36	3,6	54	310	90	250	65	200	45	120	25	900	250
40	4	60	280	90	220	65	180	45	110	25	800	220

HM051 HMF51

Cutting Conditions Parametry skrawania

Coated TiAlN - Slotting Pokryte TiAlN - Rowkowanie

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2.0	2	1	7900	50	6300	35	5600	30	3100	15	16800	150
3.0	3	1,5	4900	70	4500	50	3500	35	2200	20	15400	240
4.0	4	2	3900	85	3100	60	2500	40	1500	30	11200	280
5.0	5	2,5	3100	110	2500	75	2200	55	1300	30	8800	290
6.0	6	3	2500	110	2200	90	1700	55	1100	35	7800	290
8.0	8	4	2000	125	1500	100	1300	70	780	40	5600	360
10.0	10	5	1500	125	1300	110	1100	75	630	40	4300	380
12.0	12	6	1300	140	1100	110	880	75	560	50	3500	360
14.0	14	7	1100	140	980	100	780	75	490	50	3100	340
16.0	16	8	980	140	780	100	630	70	390	40	2800	340
18.0	18	9	880	125	700	100	560	70	350	40	2500	340
20.0	20	10	780	125	630	100	560	70	310	40	2200	310
22.0	22	11	700	125	630	100	490	70	310	40	1950	280
25.0	25	12,5	630	110	560	90	430	55	250	30	1700	270
28.0	28	14	560	100	490	75	390	50	220	30	1500	250
30.0	30	15	490	85	430	70	350	40	220	30	1500	250
32.0	32	16	490	85	390	65	310	40	200	30	1400	225
35.0	35	17,5	450	80	360	60	290	35	180	25	1300	215
36.0	36	18	430	75	350	55	280	35	170	20	1250	210
40.0	40	20	390	75	310	55	250	35	150	20	1100	180

HM051 HMF51

Cutting Conditions Parametry skrawania

Uncoated - Side Cutiing Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Alumi-nium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	0,2	3	5600	60	4500	40	4000	35	2200	15	12000	180
3	0,3	4,5	3500	80	3200	60	2500	45	1600	20	11000	280
4	0,4	6	2800	105	2200	75	1800	50	1100	30	8000	330
5	0,5	7,5	2200	135	1800	95	1600	65	900	35	6300	350
6	0,6	9	1800	135	1600	110	1200	65	800	45	5600	350
8	0,8	12	1400	150	1100	120	900	80	560	50	4000	440
10	1	15	1100	150	900	120	800	90	450	50	3100	450
12	1,2	18	900	165	800	135	630	90	400	55	2500	430
14	1,4	21	800	165	700	120	560	90	350	55	2200	400
16	1,6	24	700	165	560	120	450	80	280	50	2000	400
18	1,8	27	630	150	500	120	400	80	250	50	1800	400
20	2	30	560	150	450	120	400	80	220	50	1600	360
22	2,2	33	500	150	450	120	350	80	220	50	1400	340
25	2,5	37,5	450	135	400	110	310	65	180	35	1200	320
28	2,8	42	400	120	350	95	280	60	160	30	1100	300
30	3	45	350	105	310	80	250	55	160	30	1100	300
32	3,2	48	350	105	280	75	220	50	140	30	1000	270
35	3,5	52,5	320	95	260	65	210	45	130	25	950	260
36	3,6	54	310	90	250	65	200	45	120	25	900	250
40	4	60	280	90	220	65	180	45	110	25	800	220

HM051 HMF51

Coated TiAlN - Side Cutiing Pokryte TiAlN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	0,2	3	7900	85	6300	55	5600	50	3100	20	16800	250
3	0,3	4,5	4900	110	4500	85	3500	60	2200	30	15400	390
4	0,4	6	3900	145	3100	105	2500	70	1500	40	11200	460
5	0,5	7,5	3100	190	2500	130	2200	90	1300	50	8800	490
6	0,6	9	2500	190	2200	155	1700	90	1100	60	7800	490
8	0,8	12	2000	210	1500	170	1300	110	780	70	5600	620
10	1	15	1500	210	1300	170	1100	125	630	70	4300	630
12	1,2	18	1300	230	1100	190	880	125	560	75	3500	600
14	1,4	21	1100	230	980	170	780	125	490	75	3100	560
16	1,6	24	980	230	780	170	630	110	390	70	2800	560
18	1,8	27	880	210	700	170	560	110	350	70	2500	560
20	2	30	780	210	630	170	560	110	310	70	2200	500
22	2,2	33	700	210	630	170	490	110	310	70	1950	480
25	2,5	37,5	630	190	560	155	430	90	250	50	1700	450
28	2,8	42	560	170	490	130	390	85	220	40	1500	420
30	3	45	490	145	430	110	350	75	220	40	1500	420
32	3,2	48	490	145	390	105	310	70	200	40	1400	380
35	3,5	52,5	450	130	360	95	290	65	180	35	1300	360
36	3,6	54	430	125	350	90	280	65	170	35	1250	350
40	4	60	390	125	310	90	250	65	150	35	1100	310

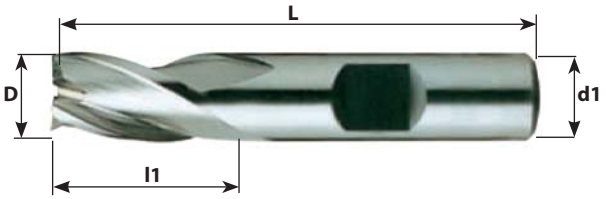
HM052 HMF52

SQUARE TYPE WALCOWO-CZOŁOWE

3 Flute, Long Length 3-ostrzowe, długie

					HSS Co 8%	30°	B					max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●								○	○				



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM052015000B06004028	HMF52015000B06004028	1.5	6	28	4	3	B
HM052020000B06005029	HMF52020000B06005029	2.0	6	29	4.5	3	B
HM052025000B06007032	HMF52025000B06007032	2.5	6	32	6.5	3	B
HM052030000B06008034	HMF52030000B06008034	3.0	6	34	7.5	3	B
HM052035000B06009037	HMF52035000B06009037	3.5	6	36.5	8.5	3	B
HM052040000B06010039	HMF52040000B06010039	4.0	6	39	9.5	3	B
HM052045000B060X1042	HMF52045000B060X1042	4.5	6	42	11	3	B
HM052050000B06013045	HMF52050000B06013045	5.0	6	44.5	12.5	3	B
HM052055000B06015046	HMF52055000B06015046	5.5	6	46	14.5	3	B
HM052060000B06016045	HMF52060000B06016045	6.0	6	44.5	16	3	B
HM052080000B10019056	HMF52080000B10019056	8.0	10	55.5	19	3	B
HM052090000B10023061	HMF52090000B10023061	9.0	10	61	22.5	3	B
HM052100000B10023061	HMF52100000B10023061	10.0	10	61	22.5	3	B

µm	d1 ≤ 3,0	0 — -6	d1 ≤18	0 — -11		
	d1 ≤ 6,0	0 — -8	d1 ≤30	0 — -13		
	d1 ≤ 10	0 — -9	d1 ≤50	0 — -16		

HM052 HMF52

Cutting Conditions Parametry skrawania

Uncoated - Slotting Bez pokrycia - Rowkowanie

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	0,2	3	5600	60	4500	40	4000	35	2200	15	12000	180
3	0,3	4,5	3500	80	3200	60	2500	45	1600	20	11000	280
4	0,4	6	2800	105	2200	75	1800	50	1100	30	8000	330
5	0,5	7,5	2200	135	1800	95	1600	65	900	35	6300	350
6	0,6	9	1800	135	1600	110	1200	65	800	45	5600	350
8	0,8	12	1400	150	1100	120	900	80	560	50	4000	440
10	1	15	1100	150	900	120	800	90	450	50	3100	450
12	1,2	18	900	165	800	135	630	90	400	55	2500	430
14	1,4	21	800	165	700	120	560	90	350	55	2200	400
16	1,6	24	700	165	560	120	450	80	280	50	2000	400
18	1,8	27	630	150	500	120	400	80	250	50	1800	400
20	2	30	560	150	450	120	400	80	220	50	1600	360
22	2,2	33	500	150	450	120	350	80	220	50	1400	340
25	2,5	37,5	450	135	400	110	310	65	180	35	1200	320
28	2,8	42	400	120	350	95	280	60	160	30	1100	300
30	3	45	350	105	310	80	250	55	160	30	1100	300
32	3,2	48	350	105	280	75	220	50	140	30	1000	270
35	3,5	52,5	320	95	260	65	210	45	130	25	950	260
36	3,6	54	310	90	250	65	200	45	120	25	900	250
40	4	60	280	90	220	65	180	45	110	25	800	220

HM052 HMF52

Cutting Conditions Parametry skrawania

Coated TiAlN - Slotting Pokryte TiAlN - RowkowanieC покрытием TiAlN - Обработка канавок

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2.0	2	1	7900	50	6300	35	5600	30	3100	15	16800	150
3.0	3	1,5	4900	70	4500	50	3500	35	2200	20	15400	240
4.0	4	2	3900	85	3100	60	2500	40	1500	30	11200	280
5.0	5	2,5	3100	110	2500	75	2200	55	1300	30	8800	290
6.0	6	3	2500	110	2200	90	1700	55	1100	35	7800	290
8.0	8	4	2000	125	1500	100	1300	70	780	40	5600	360
10.0	10	5	1500	125	1300	110	1100	75	630	40	4300	380
12.0	12	6	1300	140	1100	110	880	75	560	50	3500	360
14.0	14	7	1100	140	980	100	780	75	490	50	3100	340
16.0	16	8	980	140	780	100	630	70	390	40	2800	340
18.0	18	9	880	125	700	100	560	70	350	40	2500	340
20.0	20	10	780	125	630	100	560	70	310	40	2200	310
22.0	22	11	700	125	630	100	490	70	310	40	1950	280
25.0	25	12,5	630	110	560	90	430	55	250	30	1700	270
28.0	28	14	560	100	490	75	390	50	220	30	1500	250
30.0	30	15	490	85	430	70	350	40	220	30	1500	250
32.0	32	16	490	85	390	65	310	40	200	30	1400	225
35.0	35	17,5	450	80	360	60	290	35	180	25	1300	215
36.0	36	18	430	75	350	55	280	35	170	20	1250	210
40.0	40	20	390	75	310	55	250	35	150	20	1100	180

HM052 HMF52

Cutting Conditions Parametry skrawania

Uncoated - Side Cutiing Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Alumi-nium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	0,2	3	5600	60	4500	40	4000	35	2200	15	12000	180
3	0,3	4,5	3500	80	3200	60	2500	45	1600	20	11000	280
4	0,4	6	2800	105	2200	75	1800	50	1100	30	8000	330
5	0,5	7,5	2200	135	1800	95	1600	65	900	35	6300	350
6	0,6	9	1800	135	1600	110	1200	65	800	45	5600	350
8	0,8	12	1400	150	1100	120	900	80	560	50	4000	440
10	1	15	1100	150	900	120	800	90	450	50	3100	450
12	1,2	18	900	165	800	135	630	90	400	55	2500	430
14	1,4	21	800	165	700	120	560	90	350	55	2200	400
16	1,6	24	700	165	560	120	450	80	280	50	2000	400
18	1,8	27	630	150	500	120	400	80	250	50	1800	400
20	2	30	560	150	450	120	400	80	220	50	1600	360
22	2,2	33	500	150	450	120	350	80	220	50	1400	340
25	2,5	37,5	450	135	400	110	310	65	180	35	1200	320
28	2,8	42	400	120	350	95	280	60	160	30	1100	300
30	3	45	350	105	310	80	250	55	160	30	1100	300
32	3,2	48	350	105	280	75	220	50	140	30	1000	270
35	3,5	52,5	320	95	260	65	210	45	130	25	950	260
36	3,6	54	310	90	250	65	200	45	120	25	900	250
40	4	60	280	90	220	65	180	45	110	25	800	220

HM052 HMF52

Cutting Conditions Parametry skrawania

Coated TiAlN - Side Cutiing Pokryte TiAlN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	0,2	3	7900	85	6300	55	5600	50	3100	20	16800	250
3	0,3	4,5	4900	110	4500	85	3500	60	2200	30	15400	390
4	0,4	6	3900	145	3100	105	2500	70	1500	40	11200	460
5	0,5	7,5	3100	190	2500	130	2200	90	1300	50	8800	490
6	0,6	9	2500	190	2200	155	1700	90	1100	60	7800	490
8	0,8	12	2000	210	1500	170	1300	110	780	70	5600	620
10	1	15	1500	210	1300	170	1100	125	630	70	4300	630
12	1,2	18	1300	230	1100	190	880	125	560	75	3500	600
14	1,4	21	1100	230	980	170	780	125	490	75	3100	560
16	1,6	24	980	230	780	170	630	110	390	70	2800	560
18	1,8	27	880	210	700	170	560	110	350	70	2500	560
20	2	30	780	210	630	170	560	110	310	70	2200	500
22	2,2	33	700	210	630	170	490	110	310	70	1950	480
25	2,5	37,5	630	190	560	155	430	90	250	50	1700	450
28	2,8	42	560	170	490	130	390	85	220	40	1500	420
30	3	45	490	145	430	110	350	75	220	40	1500	420
32	3,2	48	490	145	390	105	310	70	200	40	1400	380
35	3,5	52,5	450	130	360	95	290	65	180	35	1300	360
36	3,6	54	430	125	350	90	280	65	170	35	1250	350
40	4	60	390	125	310	90	250	65	150	35	1100	310

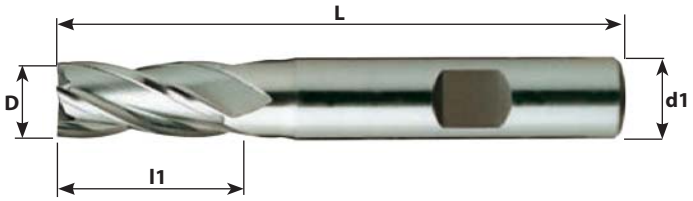
HM074 HMF74 HM075 HMF75

SQUARE TYPE WALCOWO-CZOŁOWE

4-6 Flute, Short Length 4-6-ostrzowe, krótkie

HSS Co 8%	30°	B	max	min	AIR
			○	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●								○	○				



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM074020000B06007051	HMF74020000B06007051	2.0	6	51	7	4	B
HM074025000B06008052	HMF74025000B06008052	2.5	6	52	8	4	B
HM074030000B06008052	HMF74030000B06008052	3.0	6	52	8	4	B
HM074035000B06010054	HMF74035000B06010054	3.5	6	54	10	4	B
HM074040000B06011055	HMF74040000B06011055	4.0	6	55	11	4	B
HM074050000B06013057	HMF74050000B06013057	5.0	6	57	13	4	B
HM074060000B06013057	HMF74060000B06013057	6.0	6	57	13	4	B
HM074070000B10016066	HMF74070000B10016066	7.0	10	66	16	4	B
HM074080000B10019069	HMF74080000B10019069	8.0	10	69	19	4	B
HM074090000B10019069	HMF74090000B10019069	9.0	10	69	19	4	B
HM074100000B10022072	HMF74100000B10022072	10.0	10	72	22	4	B
HM074110000B12022079	HMF74110000B12022079	11.0	12	79	22	4	B
HM074120000B12026083	HMF74120000B12026083	12.0	12	83	26	4	B
HM074130000B12026083	HMF74130000B12026083	13.0	12	83	26	4	B
HM074140000B12026083	HMF74140000B12026083	14.0	12	83	26	4	B
HM074150000B12026083	HMF74150000B12026083	15.0	12	83	26	4	B
HM074160000B16032092	HMF74160000B16032092	16.0	16	92	32	4	B
HM074170000B16032092	HMF74170000B16032092	17.0	16	92	32	4	B
HM074180000B16032092	HMF74180000B16032092	18.0	16	92	32	4	B
HM074190000B16032092	HMF74190000B16032092	19.0	16	92	32	4	B
HM074200000B20038104	HMF74200000B20038104	20.0	20	104	38	4	B
HM075210000B20038104	HMF75210000B20038104	21.0	20	104	38	6	B
HM075220000B20038104	HMF75220000B20038104	22.0	20	104	38	6	B
HM075230000B20038104	HMF75230000B20038104	23.0	20	104	38	6	B
HM075240000B25045121	HMF75240000B25045121	24.0	25	121	45	6	B
HM075250000B25045121	HMF75250000B25045121	25.0	25	121	45	6	B
HM075260000B25045121	HMF75260000B25045121	26.0	25	121	45	6	B
HM075280000B25045121	HMF75280000B25045121	28.0	25	121	45	6	B
HM075300000B25045121	HMF75300000B25045121	30.0	25	121	45	6	B
HM075320000B32053133	HMF75320000B32053133	32.0	32	133	53	6	B
HM075340000B32053133	HMF75340000B32053133	34.0	32	133	53	6	B
HM075350000B32053133	HMF75350000B32053133	35.0	32	133	53	6	B
HM075360000B32053133	HMF75360000B32053133	36.0	32	133	53	6	B
HM075400000B32063143	HMF75400000B32063143	40.0	32	143	63	6	B

µm	d1 h6					
	D 0~+0.04					

HM074 HMF74 HM075 HMF75

Cutting Conditions Parametry skrawania

Uncoated - Side Cutiing Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2.0	0,2	3	5600	80	4500	55	4000	45	2200	20	12000	240
3.0	0,3	4,5	3500	110	3200	80	2500	60	1600	30	11000	380
4.0	0,4	6	2800	140	2200	100	1800	65	1100	45	8000	440
5.0	0,5	7,5	2200	180	1800	125	1600	90	900	50	6300	470
6.0	0,6	9	1800	180	1600	145	1200	90	800	60	5600	470
8.0	0,8	12	1400	200	1100	160	900	105	560	65	4000	580
10.0	1	15	1100	200	900	160	800	120	450	65	3100	600
12.0	1,2	18	900	220	800	180	630	120	400	75	2500	570
14.0	1,4	21	800	220	700	160	560	120	350	75	2200	530
16.0	1,6	24	700	220	560	160	450	105	280	65	2000	530
18.0	1,8	27	630	200	500	160	400	105	250	65	1800	530
20.0	2	30	560	200	450	160	400	105	220	65	1600	480
22.0	2,2	33	500	200	450	160	350	105	220	65	1400	450
25.0	2,5	37,5	450	180	400	145	310	90	180	50	1200	420
28.0	2,8	42	400	160	350	125	280	80	160	45	1100	400
30.0	3	45	350	140	310	110	250	75	160	45	1100	400
32.0	3,2	48	350	140	280	100	220	65	140	45	1000	360
36.0	3,6	54	310	120	250	90	200	60	120	35	900	330
40.0	4	60	280	120	220	90	180	60	110	35	800	300

Coated TiAIN - Side Cutiing Pokryte TiAIN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2.0	0,2	3	7850	110	6300	75	5600	65	3100	30	16800	335
3.0	0,3	4,5	4900	155	4500	110	3500	85	2250	40	15400	530
4.0	0,4	6	3900	195	3100	140	2500	90	1550	65	11200	615
5.0	0,5	7,5	3100	250	2500	175	2250	125	1250	70	8800	660
6.0	0,6	9	2500	250	2250	205	1700	125	1100	85	7850	660
8.0	0,8	12	1950	280	1550	225	1250	145	800	90	5600	810
10.0	1	15	1550	280	1250	225	1100	170	650	90	4350	840
12.0	1,2	18	1250	310	1100	250	900	170	550	105	3500	800
14.0	1,4	21	1100	310	1000	225	800	170	500	105	3100	740
16.0	1,6	24	1000	310	800	225	650	145	400	90	2800	740
18.0	1,8	27	900	280	700	225	550	145	350	90	2500	740
20.0	2	30	800	280	650	225	550	145	300	90	2250	670
22.0	2,2	33	700	280	650	225	500	145	300	90	1950	630
25.0	2,5	37,5	650	250	550	205	450	125	250	70	1700	590
28.0	2,8	42	550	225	500	175	400	110	200	65	1550	560
30.0	3	45	500	195	450	155	350	105	200	65	1550	560
32.0	3,2	48	500	195	400	140	300	90	200	65	1400	505
36.0	3,6	54	450	170	350	125	300	85	150	50	1250	460
40.0	4	60	400	170	300	125	250	85	150	50	1100	420

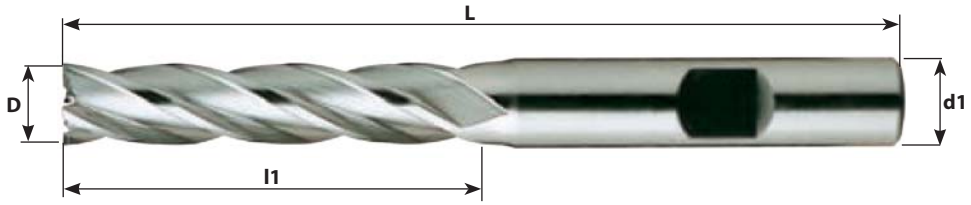
HM076 HMF76 HM077 HMF77

SQUARE TYPE WALCOWO-CZOŁOWE

4-6 Flute, Long Length 4-6-ostrzowe, długie

		HSS Co 8%	30°	B								max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●								○	○				



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM076020000B06010054	HMF76020000B06010054	2.0	6	54	10	4	B
HM076025000B06012056	HMF76025000B06012056	2.5	6	56	12	4	B
HM076030000B06012056	HMF76030000B06012056	3.0	6	56	12	4	B
HM076035000B06015059	HMF76035000B06015059	3.5	6	59	15	4	B
HM076040000B06019063	HMF76040000B06019063	4.0	6	63	19	4	B
HM076045000B06019063	HMF76045000B06019063	4.5	6	63	19	4	B
HM076050000B06024068	HMF76050000B06024068	5.0	6	68	24	4	B
HM076060000B06024068	HMF76060000B06024068	6.0	6	68	24	4	B
HM076070000B10030080	HMF76070000B10030080	7.0	10	80	30	4	B
HM076080000B10038088	HMF76080000B10038088	8.0	10	88	38	4	B
HM076090000B10038088	HMF76090000B10038088	9.0	10	88	38	4	B
HM076100000B10045095	HMF76100000B10045095	10.0	10	95	45	4	B
HM076110000B12045102	HMF76110000B12045102	11.0	12	102	45	4	B
HM076120000B12053110	HMF76120000B12053110	12.0	12	110	53	4	B
HM076130000B12053110	HMF76130000B12053110	13.0	12	110	53	4	B
HM076140000B12053110	HMF76140000B12053110	14.0	12	110	53	4	B
HM076150000B12053110	HMF76150000B12053110	15.0	12	110	53	4	B
HM076160000B16063123	HMF76160000B16063123	16.0	16	123	63	4	B
HM076170000B16063123	HMF76170000B16063123	17.0	16	123	63	4	B
HM076180000B16063123	HMF76180000B16063123	18.0	16	123	63	4	B
HM076190000B16063123	HMF76190000B16063123	19.0	16	123	63	4	B
HM076200000B16075135	HMF76200000B16075135	20.0	16	135	75	4	B
HM076200000B20075141	HMF76200000B20075141	20.0	20	141	75	4	B
HM077220000B20075141	HMF77220000B20075141	22.0	20	141	75	6	B
HM077240000B25090166	HMF77240000B25090166	24.0	25	166	90	6	B
HM077250000B25090166	HMF77250000B25090166	25.0	25	166	90	6	B
HM077260000B25090166	HMF77260000B25090166	26.0	25	166	90	6	B
HM077280000B25090166	HMF77280000B25090166	28.0	25	166	90	6	B
HM077300000B25090166	HMF77300000B25090166	30.0	25	166	90	6	B
HM07732000B320106186	HMF7732000B320106186	32.0	32	186	106	6	B
HM07736000B320106186	HMF7736000B320106186	36.0	32	186	106	6	B
HM07740000B400125217	HMF7740000B400125217	40.0	40	217	125	6	B

µm	d1 h6					
	D≤ 6	0~+0.04				
	D> 6	0~+0.05				

HM076 HMF76 HM077 HMF77

Cutting Conditions Parametry skrawania

Uncoated - Side Cutiing Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2.0	0,2	3	5600	80	4500	55	4000	45	2200	20	12000	240
3.0	0,3	4,5	3500	110	3200	80	2500	60	1600	30	11000	380
4.0	0,4	6	2800	140	2200	100	1800	65	1100	45	8000	440
5.0	0,5	7,5	2200	180	1800	125	1600	90	900	50	6300	470
6.0	0,6	9	1800	180	1600	145	1200	90	800	60	5600	470
8.0	0,8	12	1400	200	1100	160	900	105	560	65	4000	580
10.0	1	15	1100	200	900	160	800	120	450	65	3100	600
12.0	1,2	18	900	220	800	180	630	120	400	75	2500	570
14.0	1,4	21	800	220	700	160	560	120	350	75	2200	530
16.0	1,6	24	700	220	560	160	450	105	280	65	2000	530
18.0	1,8	27	630	200	500	160	400	105	250	65	1800	530
20.0	2	30	560	200	450	160	400	105	220	65	1600	480
22.0	2,2	33	500	200	450	160	350	105	220	65	1400	450
25.0	2,5	37,5	450	180	400	145	310	90	180	50	1200	420
28.0	2,8	42	400	160	350	125	280	80	160	45	1100	400
30.0	3	45	350	140	310	110	250	75	160	45	1100	400
32.0	3,2	48	350	140	280	100	220	65	140	45	1000	360
36.0	3,6	54	310	120	250	90	200	60	120	35	900	330
40.0	4	60	280	120	220	90	180	60	110	35	800	300

Coated TiAIN - Side Cutiing Pokryte TiAIN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2.0	0,2	3	7850	110	6300	75	5600	65	3100	30	16800	335
3.0	0,3	4,5	4900	155	4500	110	3500	85	2250	40	15400	530
4.0	0,4	6	3900	195	3100	140	2500	90	1550	65	11200	615
5.0	0,5	7,5	3100	250	2500	175	2250	125	1250	70	8800	660
6.0	0,6	9	2500	250	2250	205	1700	125	1100	85	7850	660
8.0	0,8	12	1950	280	1550	225	1250	145	800	90	5600	810
10.0	1	15	1550	280	1250	225	1100	170	650	90	4350	840
12.0	1,2	18	1250	310	1100	250	900	170	550	105	3500	800
14.0	1,4	21	1100	310	1000	225	800	170	500	105	3100	740
16.0	1,6	24	1000	310	800	225	650	145	400	90	2800	740
18.0	1,8	27	900	280	700	225	550	145	350	90	2500	740
20.0	2	30	800	280	650	225	550	145	300	90	2250	670
22.0	2,2	33	700	280	650	225	500	145	300	90	1950	630
25.0	2,5	37,5	650	250	550	205	450	125	250	70	1700	590
28.0	2,8	42	550	225	500	175	400	110	200	65	1550	560
30.0	3	45	500	195	450	155	350	105	200	65	1550	560
32.0	3,2	48	500	195	400	140	300	90	200	65	1400	505
36.0	3,6	54	450	170	350	125	300	85	150	50	1250	460
40.0	4	60	400	170	300	125	250	85	150	50	1100	420

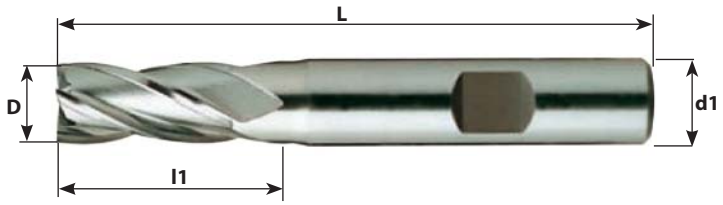
HM095 HMF95 HM096 HMF96

SQUARE TYPE WALCOWO-CZOŁOWE

4-6 Flute, Short Length 4-6-ostrzowe, krótkie

					HSS Co 8%	30°	B					max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●								○	○				



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM095020000B06007051	HMF95020000B06007051	2.0	6	51	7	4	B
HM095030000B06008052	HMF95030000B06008052	3.0	6	52	8	4	B
HM095040000B06011055	HMF95040000B06011055	4.0	6	55	11	4	B
HM095050000B06013057	HMF95050000B06013057	5.0	6	57	13	4	B
HM095060000B06013057	HMF95060000B06013057	6.0	6	57	13	4	B
HM095070000B10016066	HMF95070000B10016066	7.0	10	66	16	4	B
HM095080000B10019069	HMF95080000B10019069	8.0	10	69	19	4	B
HM095090000B10019069	HMF95090000B10019069	9.0	10	69	19	4	B
HM095100000B10022072	HMF95100000B10022072	10.0	10	72	22	4	B
HM095110000B12022079	HMF95110000B12022079	11.0	12	79	22	4	B
HM095120000B12026083	HMF95120000B12026083	12.0	12	83	26	4	B
HM095130000B12026083	HMF95130000B12026083	13.0	12	83	26	4	B
HM095140000B12026083	HMF95140000B12026083	14.0	12	83	26	4	B
HM095150000B12026083	HMF95150000B12026083	15.0	12	83	26	4	B
HM095160000B16032092	HMF95160000B16032092	16.0	16	92	32	4	B
HM095170000B16032092	HMF95170000B16032092	17.0	16	92	32	4	B
HM095180000B16032092	HMF95180000B16032092	18.0	16	92	32	4	B
HM095190000B16032092	HMF95190000B16032092	19.0	16	92	32	4	B
HM095200000B16038098	HMF95200000B16038098	20.0	16	98	38	4	B
HM095200000B20038104	HMF95200000B20038104	20.0	20	104	38	4	B
HM095220000B200X1104	HMF95220000B200X1104	22.0	20	104	38	4	B
HM095250000B250X1121	HMF95250000B250X1121	25.0	25	121	45	4	B
HM096220000B20038104	HMF96220000B200X2104	22.0	20	104	38	6	B
HM096240000B25045121	HMF96240000B25045121	24.0	25	121	45	6	B
HM096250000B25045121	HMF96250000B250X2121	25.0	25	121	45	6	B
HM096260000B25045121	HMF96260000B25045121	26.0	25	121	45	6	B
HM096280000B25045121	HMF96280000B25045121	28.0	25	121	45	6	B
HM096300000B25045121	HMF96300000B25045121	30.0	25	121	45	6	B
HM096320000B32053133	HMF96320000B32053133	32.0	32	133	53	6	B
HM096340000B32053133	HMF96340000B32053133	34.0	32	133	53	6	B
HM096350000B32053133	HMF96350000B32053133	35.0	32	133	53	6	B
HM096360000B32053133	HMF96360000B32053133	36.0	32	133	53	6	B
HM096380000B32063143	HMF96380000B32063143	38.0	32	143	63	6	B
HM096400000B32063143	HMF96400000B32063143	40.0	32	143	63	6	B
HM096400000B40063155	HMF96400000B40063155	40.0	40	155	63	6	B

µm	d1 h6					
	D 0~+0.04					

HM095 HMF95 HM096 HMF96

Cutting Conditions Parametry skrawania

Uncoated - Side Cutiing Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2.0	0,2	3	5600	80	4500	55	4000	45	2200	20	12000	240
3.0	0,3	4,5	3500	110	3200	80	2500	60	1600	30	11000	380
4.0	0,4	6	2800	140	2200	100	1800	65	1100	45	8000	440
5.0	0,5	7,5	2200	180	1800	125	1600	90	900	50	6300	470
6.0	0,6	9	1800	180	1600	145	1200	90	800	60	5600	470
8.0	0,8	12	1400	200	1100	160	900	105	560	65	4000	580
10.0	1	15	1100	200	900	160	800	120	450	65	3100	600
12.0	1,2	18	900	220	800	180	630	120	400	75	2500	570
14.0	1,4	21	800	220	700	160	560	120	350	75	2200	530
16.0	1,6	24	700	220	560	160	450	105	280	65	2000	530
18.0	1,8	27	630	200	500	160	400	105	250	65	1800	530
20.0	2	30	560	200	450	160	400	105	220	65	1600	480
22.0	2,2	33	500	200	450	160	350	105	220	65	1400	450
25.0	2,5	37,5	450	180	400	145	310	90	180	50	1200	420
28.0	2,8	42	400	160	350	125	280	80	160	45	1100	400
30.0	3	45	350	140	310	110	250	75	160	45	1100	400
32.0	3,2	48	350	140	280	100	220	65	140	45	1000	360
36.0	3,6	54	310	120	250	90	200	60	120	35	900	330
40.0	4	60	280	120	220	90	180	60	110	35	800	300

Coated TiAIN - Side Cutiing Pokryte TiAIN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2.0	0,2	3	7850	110	6300	75	5600	65	3100	30	16800	335
3.0	0,3	4,5	4900	155	4500	110	3500	85	2250	40	15400	530
4.0	0,4	6	3900	195	3100	140	2500	90	1550	65	11200	615
5.0	0,5	7,5	3100	250	2500	175	2250	125	1250	70	8800	660
6.0	0,6	9	2500	250	2250	205	1700	125	1100	85	7850	660
8.0	0,8	12	1950	280	1550	225	1250	145	800	90	5600	810
10.0	1	15	1550	280	1250	225	1100	170	650	90	4350	840
12.0	1,2	18	1250	310	1100	250	900	170	550	105	3500	800
14.0	1,4	21	1100	310	1000	225	800	170	500	105	3100	740
16.0	1,6	24	1000	310	800	225	650	145	400	90	2800	740
18.0	1,8	27	900	280	700	225	550	145	350	90	2500	740
20.0	2	30	800	280	650	225	550	145	300	90	2250	670
22.0	2,2	33	700	280	650	225	500	145	300	90	1950	630
25.0	2,5	37,5	650	250	550	205	450	125	250	70	1700	590
28.0	2,8	42	550	225	500	175	400	110	200	65	1550	560
30.0	3	45	500	195	450	155	350	105	200	65	1550	560
32.0	3,2	48	500	195	400	140	300	90	200	65	1400	505
36.0	3,6	54	450	170	350	125	300	85	150	50	1250	460
40.0	4	60	400	170	300	125	250	85	150	50	1100	420

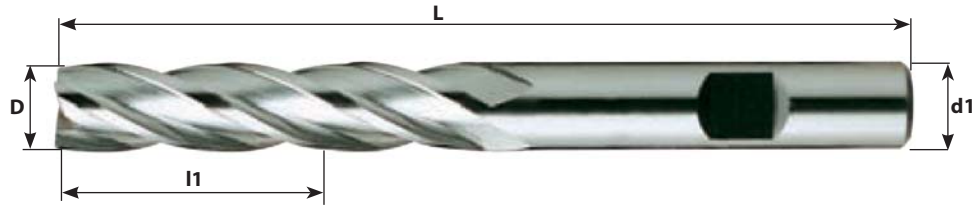
HM097 HMF97 HM098 HMF98

SQUARE TYPE WALCOWO-CZOŁOWE

4-6 Flute, Long Length 4-6-ostrzowe, długie

					HSS Co 8%	30°	B					max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●								○	○				



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM097020000B06010054	HMF97020000B06010054	2.0	6	54	10	4	B
HM097025000B06012056	HMF97025000B06012056	2.5	6	56	12	4	B
HM097030000B06012056	HMF97030000B06012056	3.0	6	56	12	4	B
HM097035000B06015059	HMF97035000B06015059	3.5	6	59	15	4	B
HM097040000B06019063	HMF97040000B06019063	4.0	6	63	19	4	B
HM097045000B06019063	HMF97045000B06019063	4.5	6	63	19	4	B
HM097050000B06024068	HMF97050000B06024068	5.0	6	68	24	4	B
HM097055000B06024068	HMF97055000B06024068	5.5	6	68	24	4	B
HM097060000B06024068	HMF97060000B06024068	6.0	6	68	24	4	B
HM097070000B10030080	HMF97070000B10030080	7.0	10	80	30	4	B
HM097080000B10038088	HMF97080000B10038088	8.0	10	88	38	4	B
HM097090000B10038088	HMF97090000B10038088	9.0	10	88	38	4	B
HM097100000B10045095	HMF97100000B10045095	10.0	10	95	45	4	B
HM097110000B12045102	HMF97110000B12045102	11.0	12	102	45	4	B
HM097120000B12053110	HMF97120000B12053110	12.0	12	110	53	4	B
HM097130000B12053110	HMF97130000B12053110	13.0	12	110	53	4	B
HM097140000B12053110	HMF97140000B12053110	14.0	12	110	53	4	B
HM097150000B12053110	HMF97150000B12053110	15.0	12	110	53	4	B
HM097160000B16063123	HMF97160000B16063123	16.0	16	123	63	4	B
HM097170000B16063123	HMF97170000B16063123	17.0	16	123	63	4	B
HM097180000B16063123	HMF97180000B16063123	18.0	16	123	63	4	B
HM097190000B16063123	HMF97190000B16063123	19.0	16	123	63	4	B
HM097200000B20075141	HMF97200000B20075141	20.0	20	141	75	4	B
HM098220000B20075141	HMF98220000B20075141	22.0	20	141	75	6	B
HM098240000B25090166	HMF98240000B25090166	24.0	25	166	90	6	B
HM098250000B25090166	HMF98250000B25090166	25.0	25	166	90	6	B
HM098260000B25090166	HMF98260000B25090166	26.0	25	166	90	6	B
HM098280000B25090166	HMF98280000B25090166	28.0	25	166	90	6	B
HM098300000B25090166	HMF98300000B25090166	30.0	25	166	90	6	B
HM09832000B320106186	HMF9832000B320106186	32.0	32	186	106	6	B
HM09836000B320106186	HMF9836000B320106186	36.0	32	186	106	6	B
HM09840000B400125217	HMF9840000B400125217	40.0	40	217	125	6	B

µm	d1 h6					
	D≤ 6	0~+0.04				
	D> 6	0~+0.05				

HM097 HMF97 HM098 HMF98

Cutting Conditions Parametry skrawania

Uncoated - Side Cutiing Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2.0	0,2	3	5600	80	4500	55	4000	45	2200	20	12000	240
3.0	0,3	4,5	3500	110	3200	80	2500	60	1600	30	11000	380
4.0	0,4	6	2800	140	2200	100	1800	65	1100	45	8000	440
5.0	0,5	7,5	2200	180	1800	125	1600	90	900	50	6300	470
6.0	0,6	9	1800	180	1600	145	1200	90	800	60	5600	470
8.0	0,8	12	1400	200	1100	160	900	105	560	65	4000	580
10.0	1	15	1100	200	900	160	800	120	450	65	3100	600
12.0	1,2	18	900	220	800	180	630	120	400	75	2500	570
14.0	1,4	21	800	220	700	160	560	120	350	75	2200	530
16.0	1,6	24	700	220	560	160	450	105	280	65	2000	530
18.0	1,8	27	630	200	500	160	400	105	250	65	1800	530
20.0	2	30	560	200	450	160	400	105	220	65	1600	480
22.0	2,2	33	500	200	450	160	350	105	220	65	1400	450
25.0	2,5	37,5	450	180	400	145	310	90	180	50	1200	420
28.0	2,8	42	400	160	350	125	280	80	160	45	1100	400
30.0	3	45	350	140	310	110	250	75	160	45	1100	400
32.0	3,2	48	350	140	280	100	220	65	140	45	1000	360
36.0	3,6	54	310	120	250	90	200	60	120	35	900	330
40.0	4	60	280	120	220	90	180	60	110	35	800	300

Coated TiAIN - Side Cutiing Pokryte TiAIN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2.0	0,2	3	7850	110	6300	75	5600	65	3100	30	16800	335
3.0	0,3	4,5	4900	155	4500	110	3500	85	2250	40	15400	530
4.0	0,4	6	3900	195	3100	140	2500	90	1550	65	11200	615
5.0	0,5	7,5	3100	250	2500	175	2250	125	1250	70	8800	660
6.0	0,6	9	2500	250	2250	205	1700	125	1100	85	7850	660
8.0	0,8	12	1950	280	1550	225	1250	145	800	90	5600	810
10.0	1	15	1550	280	1250	225	1100	170	650	90	4350	840
12.0	1,2	18	1250	310	1100	250	900	170	550	105	3500	800
14.0	1,4	21	1100	310	1000	225	800	170	500	105	3100	740
16.0	1,6	24	1000	310	800	225	650	145	400	90	2800	740
18.0	1,8	27	900	280	700	225	550	145	350	90	2500	740
20.0	2	30	800	280	650	225	550	145	300	90	2250	670
22.0	2,2	33	700	280	650	225	500	145	300	90	1950	630
25.0	2,5	37,5	650	250	550	205	450	125	250	70	1700	590
28.0	2,8	42	550	225	500	175	400	110	200	65	1550	560
30.0	3	45	500	195	450	155	350	105	200	65	1550	560
32.0	3,2	48	500	195	400	140	300	90	200	65	1400	505
36.0	3,6	54	450	170	350	125	300	85	150	50	1250	460
40.0	4	60	400	170	300	125	250	85	150	50	1100	420

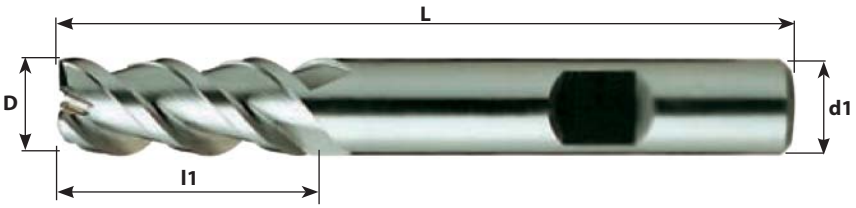
HM061 HMF61 HM062 HMF62 HMF63 HMF63

SQUARE TYPE WALCOWO-CZOŁOWE

Multi Flute, Long Length Wieloostrzowe, długie

HSS Co 8%	50°	B	max	min	AIR
			○	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●								○	○				



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM061020000B06007051	HMF61020000B06007051	2.0	6	51	7	2	B
HM061030000B06008052	HMF61030000B06008052	3.0	6	52	8	2	B
HM061040000B06011055	HMF61040000B06011055	4.0	6	55	11	2	B
HM061050000B06013057	HMF61050000B06013057	5.0	6	57	13	2	B
HM062060000B06013057	HMF62060000B06013057	6.0	6	57	13	3	B
HM062070000B10016066	HMF62070000B10016066	7.0	10	66	16	3	B
HM062080000B10019069	HMF62080000B10019069	8.0	10	69	19	3	B
HM062090000B10019069	HMF62090000B10019069	9.0	10	69	19	3	B
HM062100000B10022072	HMF62100000B10022072	10.0	10	72	22	3	B
HM062110000B12022079	HMF62110000B12022079	11.0	12	79	22	3	B
HM062120000B12026083	HMF62120000B12026083	12.0	12	83	26	3	B
HM062130000B12026083	HMF62130000B12026083	13.0	12	83	26	3	B
HM062140000B12026083	HMF62140000B12026083	14.0	12	83	26	3	B
HM062150000B12026083	HMF62150000B12026083	15.0	12	83	26	3	B
HM062160000B16032092	HMF62160000B16032092	16.0	16	92	32	3	B
HM062180000B16032092	HMF62180000B16032092	18.0	16	92	32	3	B
HM062200000B20038104	HMF62200000B20038104	20.0	20	104	38	3	B
HM062230000B20038104	HMF62230000B20038104	23.0	20	104	38	3	B
HM063220000B25045121	HMF63220000B25045121	22.0	25	121	45	4	B
HM063250000B25045121	HMF63250000B25045121	25.0	25	121	45	4	B
HM063300000B25045121	HMF63300000B25045121	30.0	25	121	45	4	B

µm	d1 h6		D 7 - 10	0~+0.058		
	D ≤ 3	0~+0.04	D 10,5 - 18	0~+0.07		
	D 4 - 6	0~+0.048	D > 3	0~+0.084		

HM061 HMF61 HM062 HMF62 HMF63 HMF63

Cutting Conditions Parametry skrawania

Uncoated - Side Cutiing Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa	
Hardness Twardość			~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40	
			500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2	
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED
2.0	0,6	3	5000	35	4500	25	2500	10
3.0	0,9	4,5	3500	50	2800	35	1800	20
4.0	1,2	6	2500	60	2000	40	1200	25
5.0	1,5	7,5	2000	75	1800	55	1000	30
6.0	1,8	9	1800	85	1300	55	900	35
8.0	2,4	12	1200	95	1000	65	600	40
10.0	3	15	1000	95	900	70	500	40
12.0	3,6	18	900	110	700	70	450	45
14.0	4,2	21	800	95	600	70	400	45
16.0	4,8	24	600	95	500	65	300	40
18.0	5,4	27	550	95	450	65	280	40
20.0	6	30	500	95	450	65	250	40
22.0	6,6	33	500	95	400	65	250	40
25.0	7,5	37,5	450	85	350	55	200	30
28.0	8,4	42	400	75	300	50	180	25
30.0	9	45	350	65	280	45	180	25

Coated TiAlN - Side Cutiing Pokryte TiAlN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa	
Hardness Twardość			~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40	
			500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2	
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED
2.0	0,6	3	7000	50	6300	35	3500	15
3.0	0,9	4,5	4900	70	3920	50	2520	30
4.0	1,2	6	3500	85	2800	55	1680	35
5.0	1,5	7,5	2800	105	2520	75	1400	40
6.0	1,8	9	2520	120	1820	75	1260	50
8.0	2,4	12	1680	135	1400	90	840	55
10.0	3	15	1400	135	1260	100	700	55
12.0	3,6	18	1260	155	980	100	630	65
14.0	4,2	21	1120	135	840	100	560	65
16.0	4,8	24	840	135	700	90	420	55
18.0	5,4	27	770	135	630	90	390	55
20.0	6	30	700	135	630	90	350	55
22.0	6,6	33	700	135	560	90	350	55
25.0	7,5	37,5	630	120	490	75	280	40
28.0	8,4	42	560	105	420	70	250	35
30.0	9	45	490	90	390	65	250	35

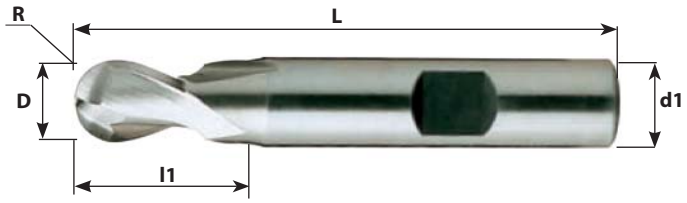
HM035 HMF35

BALLNOSE KULISTE

2 Flute, Short Length 2-ostrzowe, krótkie

HSS Co 8%	30°	B	max	min	AIR
			○	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●								○	○				



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	R	D	d1	L	l1	Z	Shank Uchwyt
HM035020010B06004048	HMF35020010B06004048	1	2.0	6	48	4	2	B
HM035025013B06005049	HMF35025013B06005049	1,25	2.5	6	49	5	2	B
HM035030015B06005049	HMF35030015B06005049	1,5	3.0	6	49	5	2	B
HM035035018B06006050	HMF35035018B06006050	1,75	3.5	6	50	6	2	B
HM035040020B06007051	HMF35040020B06007051	2	4.0	6	51	7	2	B
HM035045023B06007051	HMF35045023B06007051	2,25	4.5	6	51	7	2	B
HM035050025B06008052	HMF35050025B06008052	2,5	5.0	6	52	8	2	B
HM035055028B06008052	HMF35055028B06008052	2,75	5.5	6	52	8	2	B
HM035060030B06008052	HMF35060030B06008052	3	6.0	6	52	8	2	B
HM035070035B10010060	HMF35070035B10010060	3,5	7.0	10	60	10	2	B
HM035080040B10011061	HMF35080040B10011061	4	8.0	10	61	11	2	B
HM035090045B10011061	HMF35090045B10011061	4,5	9.0	10	61	11	2	B
HM035100050B10013063	HMF35100050B10013063	5	10.0	10	63	13	2	B
HM035110055B12013070	HMF35110055B12013070	5,5	11.0	12	70	13	2	B
HM035120060B12016073	HMF35120060B12016073	6	12.0	12	73	16	2	B
HM035130065B12016073	HMF35130065B12016073	6,5	13.0	12	73	16	2	B
HM035140070B12016073	HMF35140070B12016073	7	14.0	12	73	16	2	B
HM035150075B12016073	HMF35150075B12016073	7,5	15.0	12	73	16	2	B
HM035160080B16019079	HMF35160080B16019079	8	16.0	16	79	19	2	B
HM035170085B16019079	HMF35170085B16019079	8,5	17.0	16	79	19	2	B
HM035180090B16019079	HMF35180090B16019079	9	18.0	16	79	19	2	B
HM035190095B16019079	HMF35190095B16019079	9,5	19.0	16	79	19	2	B
HM035200100B16022082	HMF35200100B16022082	10	20.0	16	82	22	2	B
HM035200100B20022088	HMF35200100B20022088	10	20.0	20	88	22	2	B
HM035220110B20022088	HMF35220110B20022088	11	22.0	20	88	22	2	B
HM035220110B25022098	HMF35220110B25022098	11	22.0	25	98	22	2	B
HM035240120B25026102	HMF35240120B25026102	12	24.0	25	102	26	2	B
HM035250125B25026102	HMF35250125B25026102	12,5	25.0	25	102	26	2	B
HM035260130B25026102	HMF35260130B25026102	13	26.0	25	102	26	2	B
HM035280140B25026102	HMF35280140B25026102	14	28.0	25	102	26	2	B
HM035300150B25026102	HMF35300150B25026102	15	30.0	25	102	26	2	B
HM035320160B32032112	HMF35320160B32032112	16	32.0	32	112	32	2	B

µm	d1 h6		± 0,02	
	D 0~-0.03			

HM035 HMF35

Cutting Conditions Parametry skrawania

Uncoated Bez pokrycia

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
R1.5 x 3.0	1,05	0,45	4500	95	3400	70	2000	30	1400	20	11000	230
R2.0 x 4.0	1,4	0,6	3200	115	2400	80	1400	35	1000	25	8000	260
R3.0 x 6.0	2,1	0,9	2200	135	1700	90	1000	45	700	25	5600	280
R4.0 x 8.0	2,8	1,2	1600	160	1200	105	700	50	500	30	4000	350
R5.0 x 10.0	3,5	1,5	1300	180	1000	120	560	60	400	35	3200	360
R6.0 x 12.0	4,2	1,8	1000	170	800	105	450	55	320	35	2500	340
R8.0 x 16.0	5,6	2,4	800	150	600	100	350	55	250	35	2000	300
R10.0 x 20.0	7	3	600	140	500	85	300	50	200	35	1600	280
R12.5 x 25.0	8,75	3,75	500	130	400	70	220	40	160	30	1300	250

Coated TiAlN Pokryte TiAlN

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
R1.5 x 3.0	1,05	0,45	6300	135	4750	100	2800	40	1950	30	15400	320
R2.0 x 4.0	1,4	0,6	4500	160	3350	110	1950	50	1400	35	11200	365
R3.0 x 6.0	2,1	0,9	3100	190	2400	125	1400	65	1000	35	7850	390
R4.0 x 8.0	2,8	1,2	2250	225	1700	145	1000	70	700	40	5600	490
R5.0 x 10.0	3,5	1,5	1800	250	1400	170	800	85	550	50	4500	505
R6.0 x 12.0	4,2	1,8	1400	240	1100	145	650	75	450	50	3500	475
R8.0 x 16.0	5,6	2,4	1100	210	850	140	500	75	350	50	2800	420
R10.0 x 20.0	7	3	850	195	700	120	400	70	300	50	2250	390
R12.5 x 25.0	8,75	3,75	700	180	550	100	300	55	200	40	1800	350

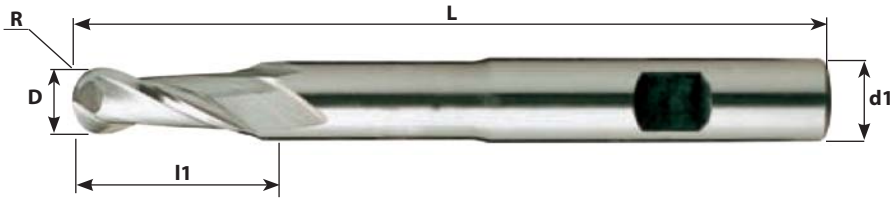
HM092 HMF92

BALLNOSE KULISTE

2 Flute, Long Length 2-ostrzowe, długie

HSS Co 8%	30°	B	max	min	AIR
			○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●								○	○				



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	R	D	d1	L	l1	Z	Shank Uchwyt
HM092020010B06007054	HMF92020010B06007054	1	2.0	6	54	7	2	B
HM092030015B06008056	HMF92030015B06008056	1,5	3.0	6	56	8	2	B
HM092040020B06011063	HMF92040020B06011063	2	4.0	6	63	11	2	B
HM092050025B06013068	HMF92050025B06013068	2,5	5.0	6	68	13	2	B
HM092060030B06013068	HMF92060030B06013068	3	6.0	6	68	13	2	B
HM092070035B10016080	HMF92070035B10016080	3,5	7.0	10	80	16	2	B
HM092080040B10019088	HMF92080040B10019088	4	8.0	10	88	19	2	B
HM092090045B10019088	HMF92090045B10019088	4,5	9.0	10	88	19	2	B
HM092100050B10022095	HMF92100050B10022095	5	10.0	10	95	22	2	B
HM092110055B12022102	HMF92110055B12022102	5,5	11.0	12	102	22	2	B
HM092120060B12026110	HMF92120060B12026110	6	12.0	12	110	26	2	B
HM092130065B12026110	HMF92130065B12026110	6,5	13.0	12	110	26	2	B
HM092140070B12026110	HMF92140070B12026110	7	14.0	12	110	26	2	B
HM092150075B12026110	HMF92150075B12026110	7,5	15.0	12	110	26	2	B
HM092160080B16032123	HMF92160080B16032123	8	16.0	16	123	32	2	B
HM092170085B16032123	HMF92170085B16032123	8,5	17.0	16	123	32	2	B
HM092180090B16032123	HMF92180090B16032123	9	18.0	16	123	32	2	B
HM092190095B16032123	HMF92190095B16032123	9,5	19.0	16	123	32	2	B
HM092200100B20038141	HMF92200100B20038141	10	20.0	20	141	38	2	B
HM092220110B20038141	HMF92220110B20038141	11	22.0	20	141	38	2	B
HM092240120B25045166	HMF92240120B25045166	12	24.0	25	166	45	2	B
HM092250125B25045166	HMF92250125B25045166	12,5	25.0	25	166	45	2	B
HM092260130B25045166	HMF92260130B25045166	13	26.0	25	166	45	2	B
HM092280140B25045166	HMF92280140B25045166	14	28.0	25	166	45	2	B
HM092300150B25045166	HMF92300150B25045166	15	30.0	25	166	45	2	B

µm	d1 h6		R	± 0,02	
	D 0~-0.03				

HM092 HMF92

Cutting Conditions Parametry skrawania

Uncoated Bez pokrycia

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
R1.5 x 3.0	1,05	0,45	4500	95	3400	70	2000	30	1400	20	11000	230
R2.0 x 4.0	1,4	0,6	3200	115	2400	80	1400	35	1000	25	8000	260
R3.0 x 6.0	2,1	0,9	2200	135	1700	90	1000	45	700	25	5600	280
R4.0 x 8.0	2,8	1,2	1600	160	1200	105	700	50	500	30	4000	350
R5.0 x 10.0	3,5	1,5	1300	180	1000	120	560	60	400	35	3200	360
R6.0 x 12.0	4,2	1,8	1000	170	800	105	450	55	320	35	2500	340
R8.0 x 16.0	5,6	2,4	800	150	600	100	350	55	250	35	2000	300
R10.0 x 20.0	7	3	600	140	500	85	300	50	200	35	1600	280
R12.5 x 25.0	8,75	3,75	500	130	400	70	220	40	160	30	1300	250

Coated TiAlN Pokryte TiAlN

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
R1.5 x 3.0	1,05	0,45	6300	135	4750	100	2800	40	1950	30	15400	320
R2.0 x 4.0	1,4	0,6	4500	160	3350	110	1950	50	1400	35	11200	365
R3.0 x 6.0	2,1	0,9	3100	190	2400	125	1400	65	1000	35	7850	390
R4.0 x 8.0	2,8	1,2	2250	225	1700	145	1000	70	700	40	5600	490
R5.0 x 10.0	3,5	1,5	1800	250	1400	170	800	85	550	50	4500	505
R6.0 x 12.0	4,2	1,8	1400	240	1100	145	650	75	450	50	3500	475
R8.0 x 16.0	5,6	2,4	1100	210	850	140	500	75	350	50	2800	420
R10.0 x 20.0	7	3	850	195	700	120	400	70	300	50	2250	390
R12.5 x 25.0	8,75	3,75	700	180	550	100	300	55	200	40	1800	350

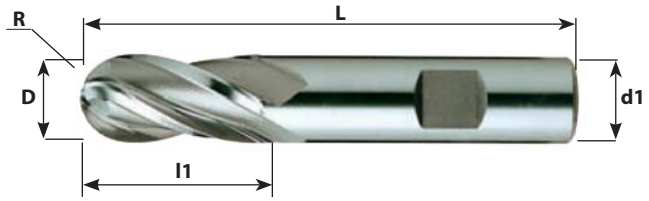
HM0A0 HMFA0

BALLNOSE KULISTE

4-6 Flute, Short Length 4-6-ostrzowe, krótkie

					HSS Co 8%	30°	B					max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●								○	○				



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	R	D	d1	L	l1	Z	Shank Uchwyt
HM0A0060030B06013057	HMFA0060030B06013057	3	6.0	6	57	13	4	B
HM0A0080040B10019069	HMFA0080040B10019069	4	8.0	10	69	19	4	B
HM0A0100050B10022072	HMFA0100050B10022072	5	10.0	10	72	22	4	B
HM0A0120060B12026083	HMFA0120060B12026083	6	12.0	12	83	26	4	B
HM0A0160080B16032092	HMFA0160080B16032092	8	16.0	16	92	32	4	B
HM0A0200100B20038104	HMFA0200100B20038104	10	20.0	20	104	38	4	B
HM0A0250125B25045121	HMFA0250125B25045121	12,5	25.0	25	121	45	6	B

µm	d1 h6		R	± 0,02	
	D 0~-0.03				

HM0A0 HMFA0

Cutting Conditions Parametry skrawania

Uncoated Bez pokrycia

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
R3.0 x 6.0	2,1	0,9	2200	200	1700	135	1000	70	700	40	5600	420
R4.0 x 8.0	2,8	1,2	1600	240	1200	160	700	75	500	45	4000	530
R5.0 x 10.0	3,5	1,5	1300	270	1000	180	560	90	400	50	3200	540
R6.0 x 12.0	4,2	1,8	1000	260	800	160	450	80	320	50	2500	510
R8.0 x 16.0	5,6	2,4	800	230	600	150	350	80	250	50	2000	450
R10.0 x 20.0	7	3	600	210	500	130	300	75	200	50	1600	420
R12.5 x 25.0	8,75	3,75	500	200	400	105	220	60	160	45	1300	380

Coated TiAlN Pokryte TiAlN

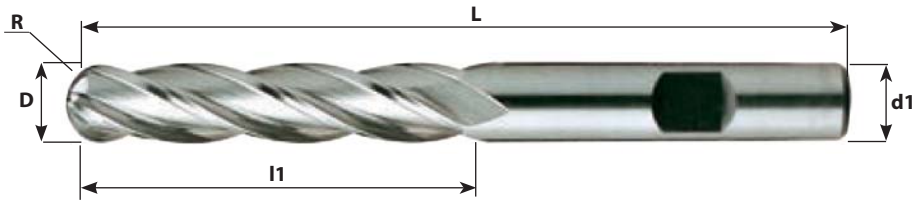
Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
R3.0 x 6.0	2,1	0,9	3100	280	2400	190	1400	100	1000	55	7850	590
R4.0 x 8.0	2,8	1,2	2250	335	1700	225	1000	105	700	65	5600	740
R5.0 x 10.0	3,5	1,5	1800	380	1400	250	800	125	550	70	4500	755
R6.0 x 12.0	4,2	1,8	1400	365	1100	225	650	110	450	70	3500	715
R8.0 x 16.0	5,6	2,4	1100	320	850	210	500	110	350	70	2800	630
R10.0 x 20.0	7	3	850	295	700	180	400	105	300	70	2250	590
R12.5 x 25.0	8,75	3,75	700	280	550	145	300	85	200	65	1800	530

HM029 HMF29

BALLNOSE KULISTE
4-6 Flute, Long Length 4-6-ostrzowe, długie

					HSS Co 8%	30°	B					max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●								○	○				



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	R	D	d1	L	l1	Z	Shank Uchwyt
HM029100050B10045095	HMF29100050B10045095	5	10.0	10	95	45	4	B
HM029120060B12053110	HMF29120060B12053110	6	12.0	12	110	53	4	B
HM029160080B16063123	HMF29160080B16063123	8	16.0	16	123	63	4	B
HM029200100B20075141	HMF29200100B20075141	10	20.0	20	141	75	4	B
HM029250125B25090166	HMF29250125B25090166	12,5	25.0	25	166	90	6	B

µm	d1 h6		R	± 0,02	
	D 0~-0.03				

HM029 HMF29

Cutting Conditions Parametry skrawania

Uncoated Bez pokrycia

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
R3.0 x 6.0	2,1	0,9	2200	200	1700	135	1000	70	700	40	5600	420
R4.0 x 8.0	2,8	1,2	1600	240	1200	160	700	75	500	45	4000	530
R5.0 x 10.0	3,5	1,5	1300	270	1000	180	560	90	400	50	3200	540
R6.0 x 12.0	4,2	1,8	1000	260	800	160	450	80	320	50	2500	510
R8.0 x 16.0	5,6	2,4	800	230	600	150	350	80	250	50	2000	450
R10.0 x 20.0	7	3	600	210	500	130	300	75	200	50	1600	420
R12.5 x 25.0	8,75	3,75	500	200	400	105	220	60	160	45	1300	380

Coated TiAlN Pokryte TiAlN

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
R3.0 x 6.0	2,1	0,9	3100	280	2400	190	1400	100	1000	55	7850	590
R4.0 x 8.0	2,8	1,2	2250	335	1700	225	1000	105	700	65	5600	740
R5.0 x 10.0	3,5	1,5	1800	380	1400	250	800	125	550	70	4500	755
R6.0 x 12.0	4,2	1,8	1400	365	1100	225	650	110	450	70	3500	715
R8.0 x 16.0	5,6	2,4	1100	320	850	210	500	110	350	70	2800	630
R10.0 x 20.0	7	3	850	295	700	180	400	105	300	70	2250	590
R12.5 x 25.0	8,75	3,75	700	280	550	145	300	85	200	65	1800	530

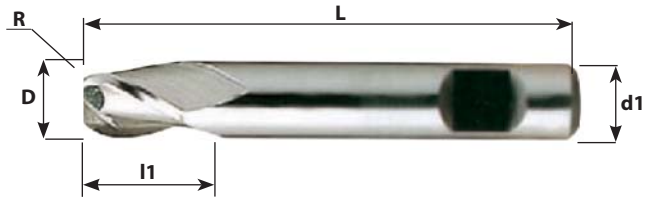
HM012 HMF12

BALLNOSE KULISTE

3 Flute, Short Length 3-ostrzowe, krótkie

HSS Co 8%	30°	B	max	min	AIR
			○	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●								○	○				



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	R	D	d1	L	l1	Z	Shank Uchwyt
HM012020010B06004035	HMF12020010B06004035	1	2.0	6	35	4	3	B
HM012025013B06005036	HMF12025013B06005036	1,25	2.5	6	36	5	3	B
HM012030015B06005036	HMF12030015B06005036	1,5	3.0	6	36	5	3	B
HM012040020B06007038	HMF12040020B06007038	2	4.0	6	38	7	3	B
HM012050025B06008039	HMF12050025B06008039	2,5	5.0	6	39	8	3	B
HM012060030B06008039	HMF12060030B06008039	3	6.0	6	39	8	3	B

µm	d1 h6		R	± 0,02	
	D 0~-0.03				

HM012 HMF12

Cutting Conditions Parametry skrawania

Uncoated Bez pokrycia

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
R3.0 x 6.0	2,1	0,9	2200	200	1700	135	1000	70	700	40	5600	420
R4.0 x 8.0	2,8	1,2	1600	240	1200	160	700	75	500	45	4000	530
R5.0 x 10.0	3,5	1,5	1300	270	1000	180	560	90	400	50	3200	540
R6.0 x 12.0	4,2	1,8	1000	260	800	160	450	80	320	50	2500	510
R8.0 x 16.0	5,6	2,4	800	230	600	150	350	80	250	50	2000	450
R10.0 x 20.0	7	3	600	210	500	130	300	75	200	50	1600	420
R12.5 x 25.0	8,75	3,75	500	200	400	105	220	60	160	45	1300	380

Coated TiAlN Pokryte TiAlN

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
R3.0 x 6.0	2,1	0,9	3100	280	2400	190	1400	100	1000	55	7850	590
R4.0 x 8.0	2,8	1,2	2250	335	1700	225	1000	105	700	65	5600	740
R5.0 x 10.0	3,5	1,5	1800	380	1400	250	800	125	550	70	4500	755
R6.0 x 12.0	4,2	1,8	1400	365	1100	225	650	110	450	70	3500	715
R8.0 x 16.0	5,6	2,4	1100	320	850	210	500	110	350	70	2800	630
R10.0 x 20.0	7	3	850	295	700	180	400	105	300	70	2250	590
R12.5 x 25.0	8,75	3,75	700	280	550	145	300	85	200	65	1800	530

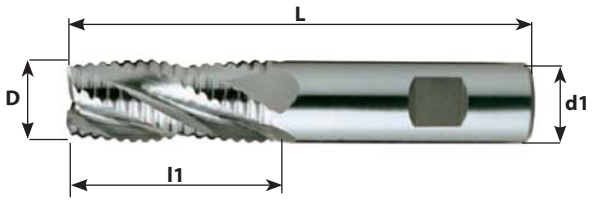
HM0A1 HMFA1

SQUARE TYPE WALCOWO-CZOŁOWE

Multi Flute, Short Length Wieloostrzowe, krótkie

HSS Co 8%	30°	B	max	min	AIR
			○	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●								○	○				



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM0A1060030B06013057	HMFA1060030B06013057	6.0	6	57	13	3	B
HM0A1070030B10016066	HMFA1070030B10016066	7.0	10	66	16	3	B
HM0A1080030B10019069	HMFA1080030B10019069	8.0	10	69	19	3	B
HM0A1090030B10019069	HMFA1090030B10019069	9.0	10	69	19	3	B
HM0A1095030B10019069	HMFA1095030B10019069	9.5	10	69	19	3	B
HM0A1100040B10022072	HMFA1100040B10022072	10.0	10	72	22	4	B
HM0A1110040B12022079	HMFA1110040B12022079	11.0	12	79	22	4	B
HM0A1120040B12026083	HMFA1120040B12026083	12.0	12	83	26	4	B
HM0A1125040B12026083	HMFA1125040B12026083	12.5	12	83	26	4	B
HM0A1130040B12026083	HMFA1130040B12026083	13.0	12	83	26	4	B
HM0A1140040B12026083	HMFA1140040B12026083	14.0	12	83	26	4	B
HM0A1145040B12026083	HMFA1145040B12026083	14.5	12	83	26	4	B
HM0A1150040B12026083	HMFA1150040B12026083	15.0	12	83	26	4	B
HM0A1160040B16032092	HMFA1160040B16032092	16.0	16	92	32	4	B
HM0A1170040B16032092	HMFA1170040B16032092	17.0	16	92	32	4	B
HM0A1180040B16032092	HMFA1180040B16032092	18.0	16	92	32	4	B
HM0A1190040B16032092	HMFA1190040B16032092	19.0	16	92	32	4	B
HM0A1200040B20038104	HMFA1200040B20038104	20.0	20	104	38	4	B
HM0A1200040B16038098	HMFA1200040B16038098	20.0	16	98	38	4	B
HM0A1220050B20038104	HMFA1220050B20038104	22.0	20	104	38	5	B
HM0A1240050B25045121	HMFA1240050B25045121	24.0	25	121	45	5	B
HM0A1250050B25045121	HMFA1250050B25045121	25.0	25	121	45	5	B
HM0A1260060B25045121	HMFA1260060B25045121	26.0	25	121	45	6	B
HM0A1280060B25045121	HMFA1280060B25045121	28.0	25	121	45	6	B
HM0A1300060B25045121	HMFA1300060B25045121	30.0	25	121	45	6	B
HM0A1320060B32053133	HMFA1320060B32053133	32.0	32	133	53	6	B
HM0A1340060B32053133	HMFA1340060B32053133	34.0	32	133	53	6	B
HM0A1350060B32053133	HMFA1350060B32053133	35.0	32	133	53	6	B
HM0A1360060B32053133	HMFA1360060B32053133	36.0	32	133	53	6	B
HM0A1380060B32063155	HMFA1380060B32063155	38.0	32	155	63	6	B
HM0A1380060B40063155	HMFA1380060B40063155	38.0	40	155	63	6	B
HM0A1400060B32063155	HMFA1400060B32063155	40.0	32	155	63	6	B
HM0A1400060B40063155	HMFA1400060B40063155	40.0	40	155	63	6	B
HM0A1450060B32063143	HMFA1450060B32063143	45.0	32	143	63	6	B
HM0A1500060B50075177	HMFA1500060B50075177	50.0	50	177	75	6	B
HM0A1060000B06013057	HMFA1060000B06013057	6.0	6	57	13	3	B
HM0A1080000B10019069	HMFA1080000B10019069	8.0	10	69	19	3	B

µm	d1 ≤ 3,0	0 — -6	d1 ≤18	0 — -11		
	d1 ≤ 6,0	0 — -8	d1 ≤30	0 — -13		
	d1 ≤ 10	0 — -9	d1 ≤50	0 — -16		

HM0A1 HMFA1

Cutting Conditions Parametry skrawania

Uncoated - Side Cutiing Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	1800	80	1600	60	1200	55	800	30	4500	200
8.0	4	12	1400	105	1100	75	900	65	560	35	3100	230
10.0	5	15	1100	150	900	120	800	110	450	60	2500	350
12.0	6	18	900	180	800	140	630	110	400	70	2000	400
14.0	7	21	800	180	700	140	560	110	350	70	1800	420
16.0	8	24	700	180	560	140	450	110	280	70	1600	450
18.0	9	27	630	180	500	140	400	110	250	70	1400	470
20.0	10	30	560	180	450	140	400	110	220	70	1200	500
22.0	11	33	500	220	450	170	350	140	220	85	1100	470
25.0	12,5	37,5	450	220	400	170	310	140	180	85	1000	450
28.0	14	42	400	210	350	160	280	130	160	85	900	510
30.0	15	45	350	210	310	160	250	130	160	85	900	530
32.0	16	48	350	210	280	160	220	130	140	85	800	500
36.0	18	54	310	210	250	160	200	130	120	85	700	470
40.0	20	60	280	200	220	150	180	120	110	80	630	450
50.0	25	75	220	200	180	170	160	140	90	80	500	370

Coated TiAIN - Side Cutiing Pokryte TiAIN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	2500	110	2250	85	1700	75	1100	40	6300	280
8.0	4	12	1950	145	1550	105	1250	90	800	50	4350	320
10.0	5	15	1550	210	1250	170	1100	155	650	85	3500	490
12.0	6	18	1250	250	1100	195	900	155	550	100	2800	560
14.0	7	21	1100	250	1000	195	800	155	500	100	2500	590
16.0	8	24	1000	250	800	195	650	155	400	100	2250	630
18.0	9	27	900	250	700	195	550	155	350	100	1950	660
20.0	10	30	800	250	650	195	550	155	300	100	1700	700
22.0	11	33	700	310	650	240	500	195	300	120	1550	660
25.0	12,5	37,5	650	310	550	240	450	195	250	120	1400	630
28.0	14	42	550	295	500	225	400	180	220	120	1250	715
30.0	15	45	500	295	450	225	350	180	220	120	1250	740
32.0	16	48	500	295	400	225	300	180	200	120	1100	700
36.0	18	54	450	295	350	225	300	180	170	120	1000	660
40.0	20	60	400	280	300	210	250	170	130	110	900	630
50.0	25	75	300	280	250	240	220	195	120	110	700	520

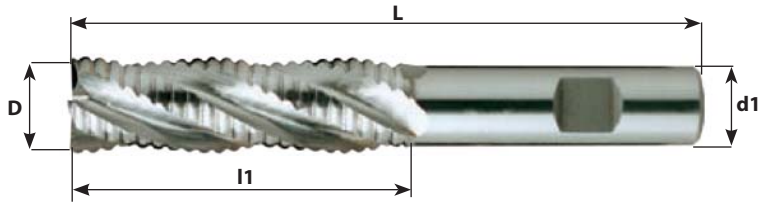
HM0A2 HMFA2

SQUARE TYPE WALCOWO-CZOŁOWE

Multi Flute, Long Length Wieloostrzowe, długie

HSS Co 8%	30°	B										max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●								○	○				



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM0A2060030B06024068	HMFA2060030B06024068	6.0	6	68	24	3	B
HM0A2070030B10030080	HMFA2070030B10030080	7.0	10	80	30	3	B
HM0A2080030B10038088	HMFA2080030B10038088	8.0	10	88	38	3	B
HM0A2090030B10038088	HMFA2090030B10038088	9.0	10	88	38	3	B
HM0A2100040B10045095	HMFA2100040B10045095	10.0	10	95	45	4	B
HM0A2110040B12045102	HMFA2110040B12045102	11.0	12	102	45	4	B
HM0A2120040B12053110	HMFA2120040B12053110	12.0	12	110	53	4	B
HM0A2130040B12053110	HMFA2130040B12053110	13.0	12	110	53	4	B
HM0A2140040B12053110	HMFA2140040B12053110	14.0	12	110	53	4	B
HM0A2150040B12053110	HMFA2150040B12053110	15.0	12	110	53	4	B
HM0A2160040B16063123	HMFA2160040B16063123	16.0	16	123	63	4	B
HM0A2170040B16063123	HMFA2170040B16063123	17.0	16	123	63	4	B
HM0A2180040B16063123	HMFA2180040B16063123	18.0	16	123	63	4	B
HM0A2190040B16063123	HMFA2190040B16063123	19.0	16	123	63	4	B
HM0A2200040B20075141	HMFA2200040B20075141	20.0	20	141	75	4	B
HM0A2200040B16075135	HMFA2200040B16075135	20.0	16	135	75	4	B
HM0A2220050B20075141	HMFA2220050B20075141	22.0	20	141	75	5	B
HM0A2220050B25075151	HMFA2220050B25075151	22.0	25	151	75	5	B
HM0A2240050B25090166	HMFA2240050B25090166	24.0	25	166	90	5	B
HM0A2250050B25090166	HMFA2250050B25090166	25.0	25	166	90	5	B
HM0A2260060B25090166	HMFA2260060B25090166	26.0	25	166	90	6	B
HM0A2280060B25090166	HMFA2280060B25090166	28.0	25	166	90	6	B
HM0A2300060B25090166	HMFA2300060B25090166	30.0	25	166	90	6	B
HM0A232060B320106186	HMFA232060B320106186	32.0	32	186	106	6	B
HM0A235060B320106186	HMFA235060B320106186	35.0	32	186	106	6	B
HM0A236060B320106186	HMFA236060B320106186	36.0	32	186	106	6	B
HM0A238060B320125217	HMFA238060B320125217	38.0	32	217	125	6	B
HM0A238060B400125217	HMFA238060B400125217	38.0	40	217	125	6	B
HM0A240060B320125217	HMFA240060B320125217	40.0	32	217	125	6	B
HM0A240060B400125217	HMFA240060B400125217	40.0	40	217	125	6	B

µm						
	d1 ≤ 3,0	0 — -6	d1 ≤18	0 — -11		
	d1 ≤ 6,0	0 — -8	d1 ≤30	0 — -13		
	d1 ≤ 10	0 — -9	d1 ≤50	0 — -16		

HM0A2 HMFA2

Cutting Conditions Parametry skrawania

Uncoated - Side Cutiing Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	1800	80	1600	60	1200	55	800	30	4500	200
8.0	4	12	1400	105	1100	75	900	65	560	35	3100	230
10.0	5	15	1100	150	900	120	800	110	450	60	2500	350
12.0	6	18	900	180	800	140	630	110	400	70	2000	400
14.0	7	21	800	180	700	140	560	110	350	70	1800	420
16.0	8	24	700	180	560	140	450	110	280	70	1600	450
18.0	9	27	630	180	500	140	400	110	250	70	1400	470
20.0	10	30	560	180	450	140	400	110	220	70	1200	500
22.0	11	33	500	220	450	170	350	140	220	85	1100	470
25.0	12,5	37,5	450	220	400	170	310	140	180	85	1000	450
28.0	14	42	400	210	350	160	280	130	160	85	900	510
30.0	15	45	350	210	310	160	250	130	160	85	900	530
32.0	16	48	350	210	280	160	220	130	140	85	800	500
36.0	18	54	310	210	250	160	200	130	120	85	700	470
40.0	20	60	280	200	220	150	180	120	110	80	630	450
50.0	25	75	220	200	180	170	160	140	90	80	500	370

Coated TiAIN - Side Cutiing Pokryte TiAIN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	2500	110	2250	85	1700	75	1100	40	6300	280
8.0	4	12	1950	145	1550	105	1250	90	800	50	4350	320
10.0	5	15	1550	210	1250	170	1100	155	650	85	3500	490
12.0	6	18	1250	250	1100	195	900	155	550	100	2800	560
14.0	7	21	1100	250	1000	195	800	155	500	100	2500	590
16.0	8	24	1000	250	800	195	650	155	400	100	2250	630
18.0	9	27	900	250	700	195	550	155	350	100	1950	660
20.0	10	30	800	250	650	195	550	155	300	100	1700	700
22.0	11	33	700	310	650	240	500	195	300	120	1550	660
25.0	12,5	37,5	650	310	550	240	450	195	250	120	1400	630
28.0	14	42	550	295	500	225	400	180	220	120	1250	715
30.0	15	45	500	295	450	225	350	180	220	120	1250	740
32.0	16	48	500	295	400	225	300	180	200	120	1100	700
36.0	18	54	450	295	350	225	300	180	170	120	1000	660
40.0	20	60	400	280	300	210	250	170	130	110	900	630
50.0	25	75	300	280	250	240	220	195	120	110	700	520

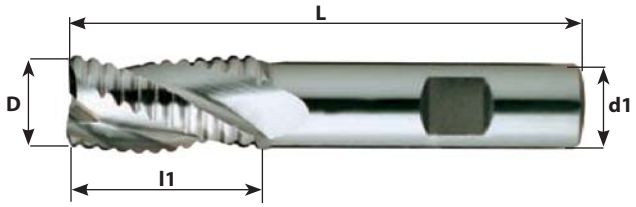
HM0B4 HMFB4

SQUARE TYPE WALCOWO-CZOŁOWE

3 Flute, Short Length 3-ostrzowe, krótkie

					HSS Co 8%	30°	B					max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●								○	○				



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM0B4100000B10022072	HMFB4100000B10022072	10.0	10	72	22	3	B
HM0B4120000B12026083	HMFB4120000B12026083	12.0	12	83	26	3	B
HM0B4140000B12026083	HMFB4140000B12026083	14.0	12	83	26	3	B
HM0B4160000B16032092	HMFB4160000B16032092	16.0	16	92	32	3	B
HM0B4180000B16032092	HMFB4180000B16032092	18.0	16	92	32	3	B
HM0B4200000B20038104	HMFB4200000B20038104	20.0	20	104	38	3	B
HM0B4220000B20038104	HMFB4220000B20038104	22.0	20	104	38	3	B
HM0B4250000B25045121	HMFB4250000B25045121	25.0	25	121	45	3	B
HM0B4280000B25045121	HMFB4280000B25045121	28.0	25	121	45	3	B
HM0B4300000B25045121	HMFB4300000B25045121	30.0	25	121	45	3	B
HM0B4320000B32053133	HMFB4320000B32053133	32.0	32	133	53	3	B
HM0B4360000B32053133	HMFB4360000B32053133	36.0	32	133	53	3	B
HM0B4400000B32063155	HMFB4400000B32063155	40.0	32	155	63	3	B

µm	d1 ≤ 3,0	0 — -6	d1 ≤18	0 — -11		
	d1 ≤ 6,0	0 — -8	d1 ≤30	0 — -13		
	d1 ≤ 10	0 — -9	d1 ≤50	0 — -16		

HM0B4 HMFB4

Cutting Conditions Parametry skrawania

Uncoated - Side Cutiing Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	1800	80	1600	60	1200	55	800	30	4500	200
8.0	4	12	1400	105	1100	75	900	65	560	35	3100	230
10.0	5	15	1100	150	900	120	800	110	450	60	2500	350
12.0	6	18	900	180	800	140	630	110	400	70	2000	400
14.0	7	21	800	180	700	140	560	110	350	70	1800	420
16.0	8	24	700	180	560	140	450	110	280	70	1600	450
18.0	9	27	630	180	500	140	400	110	250	70	1400	470
20.0	10	30	560	180	450	140	400	110	220	70	1200	500
22.0	11	33	500	220	450	170	350	140	220	85	1100	470
25.0	12,5	37,5	450	220	400	170	310	140	180	85	1000	450
28.0	14	42	400	210	350	160	280	130	160	85	900	510
30.0	15	45	350	210	310	160	250	130	160	85	900	530
32.0	16	48	350	210	280	160	220	130	140	85	800	500
36.0	18	54	310	210	250	160	200	130	120	85	700	470
40.0	20	60	280	200	220	150	180	120	110	80	630	450
50.0	25	75	220	200	180	170	160	140	90	80	500	370

Coated TiAlN - Side Cutiing Pokryte TiAlN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	2500	110	2250	85	1700	75	1100	40	6300	280
8.0	4	12	1950	145	1550	105	1250	90	800	50	4350	320
10.0	5	15	1550	210	1250	170	1100	155	650	85	3500	490
12.0	6	18	1250	250	1100	195	900	155	550	100	2800	560
14.0	7	21	1100	250	1000	195	800	155	500	100	2500	590
16.0	8	24	1000	250	800	195	650	155	400	100	2250	630
18.0	9	27	900	250	700	195	550	155	350	100	1950	660
20.0	10	30	800	250	650	195	550	155	300	100	1700	700
22.0	11	33	700	310	650	240	500	195	300	120	1550	660
25.0	12,5	37,5	650	310	550	240	450	195	250	120	1400	630
28.0	14	42	550	295	500	225	400	180	220	120	1250	715
30.0	15	45	500	295	450	225	350	180	220	120	1250	740
32.0	16	48	500	295	400	225	300	180	200	120	1100	700
36.0	18	54	450	295	350	225	300	180	170	120	1000	660
40.0	20	60	400	280	300	210	250	170	130	110	900	630
50.0	25	75	300	280	250	240	220	195	120	110	700	520

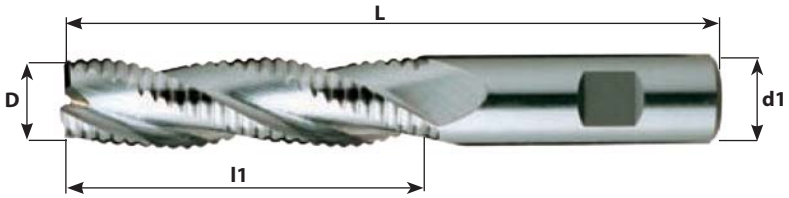
HM065 HMF65

SQUARE TYPE WALCOWO-CZOŁOWE

3 Flute, Long Length 3-ostrzowe, długie

					HSS Co 8%	30°	B					max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●								○	○				



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM065100000B10045095	HMF65100000B10045095	10.0	10	95	45	3	B
HM065120000B12053110	HMF65120000B12053110	12.0	12	110	53	3	B
HM065140000B12053110	HMF65140000B12053110	14.0	12	110	53	3	B
HM065160000B16063123	HMF65160000B16063123	16.0	16	123	63	3	B
HM065180000B16063123	HMF65180000B16063123	18.0	16	123	63	3	B
HM065200000B20075141	HMF65200000B20075141	20.0	20	141	75	3	B
HM065220000B20075141	HMF65220000B20075141	22.0	20	141	75	3	B
HM065250000B25090166	HMF65250000B25090166	25.0	25	166	90	3	B
HM065280000B25090166	HMF65280000B25090166	28.0	25	166	90	3	B
HM065300000B25090166	HMF65300000B25090166	30.0	25	166	90	3	B
HM06536000B320106186	HMF6536000B320106186	36.0	32	186	106	3	B
HM06540000B320125217	HMF6540000B320125217	40.0	32	217	125	3	B

µm	d1 ≤ 3,0	0 — -6	d1 ≤18	0 — -11		
	d1 ≤ 6,0	0 — -8	d1 ≤30	0 — -13		
	d1 ≤ 10	0 — -9	d1 ≤50	0 — -16		

HM065 HMF65

Cutting Conditions Parametry skrawania

Uncoated - Side Cutiing Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	1800	80	1600	60	1200	55	800	30	4500	200
8.0	4	12	1400	105	1100	75	900	65	560	35	3100	230
10.0	5	15	1100	150	900	120	800	110	450	60	2500	350
12.0	6	18	900	180	800	140	630	110	400	70	2000	400
14.0	7	21	800	180	700	140	560	110	350	70	1800	420
16.0	8	24	700	180	560	140	450	110	280	70	1600	450
18.0	9	27	630	180	500	140	400	110	250	70	1400	470
20.0	10	30	560	180	450	140	400	110	220	70	1200	500
22.0	11	33	500	220	450	170	350	140	220	85	1100	470
25.0	12,5	37,5	450	220	400	170	310	140	180	85	1000	450
28.0	14	42	400	210	350	160	280	130	160	85	900	510
30.0	15	45	350	210	310	160	250	130	160	85	900	530
32.0	16	48	350	210	280	160	220	130	140	85	800	500
36.0	18	54	310	210	250	160	200	130	120	85	700	470
40.0	20	60	280	200	220	150	180	120	110	80	630	450
50.0	25	75	220	200	180	170	160	140	90	80	500	370

Coated TiAIN - Side Cutiing Pokryte TiAIN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	2500	110	2250	85	1700	75	1100	40	6300	280
8.0	4	12	1950	145	1550	105	1250	90	800	50	4350	320
10.0	5	15	1550	210	1250	170	1100	155	650	85	3500	490
12.0	6	18	1250	250	1100	195	900	155	550	100	2800	560
14.0	7	21	1100	250	1000	195	800	155	500	100	2500	590
16.0	8	24	1000	250	800	195	650	155	400	100	2250	630
18.0	9	27	900	250	700	195	550	155	350	100	1950	660
20.0	10	30	800	250	650	195	550	155	300	100	1700	700
22.0	11	33	700	310	650	240	500	195	300	120	1550	660
25.0	12,5	37,5	650	310	550	240	450	195	250	120	1400	630
28.0	14	42	550	295	500	225	400	180	220	120	1250	715
30.0	15	45	500	295	450	225	350	180	220	120	1250	740
32.0	16	48	500	295	400	225	300	180	200	120	1100	700
36.0	18	54	450	295	350	225	300	180	170	120	1000	660
40.0	20	60	400	280	300	210	250	170	130	110	900	630
50.0	25	75	300	280	250	240	220	195	120	110	700	520

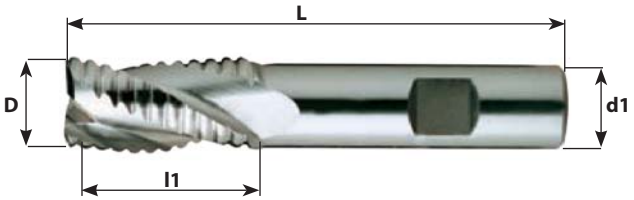
HM0A5

SQUARE TYPE WALCOWO-CZOŁOWE

3 Flute, Short Length 3-ostrzowe, krótkie

					HSS Co 8%		B					max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	○								●	●				



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM0A5060000B06013057	HMFA5060000B06013057	6.0	6	57	13	3	B
HM0A5080000B10019069	HMFA5080000B10019069	8.0	10	69	19	3	B
HM0A5100000B10022072	HMFA5100000B10022072	10.0	10	72	22	3	B
HM0A5120000B12026083	HMFA5120000B12026083	12.0	12	83	26	3	B
HM0A5140000B12026083	HMFA5140000B12026083	14.0	12	83	26	3	B
HM0A5160000B16032092	HMFA5160000B16032092	16.0	16	92	32	3	B
HM0A5180000B16032092	HMFA5180000B16032092	18.0	16	92	32	3	B
HM0A5200000B20038104	HMFA5200000B20038104	20.0	20	104	38	3	B
HM0A5220000B20038104	HMFA5220000B20038104	22.0	20	104	38	3	B
HM0A5250000B25045121	HMFA5250000B25045121	25.0	25	121	45	3	B
HM0A5300000B25045121	HMFA5300000B25045121	30.0	25	121	45	3	B

µm	d1 ≤ 3,0	0 — -6	d1 ≤18	0 — -11		
	d1 ≤ 6,0	0 — -8	d1 ≤30	0 — -13		
	d1 ≤ 10	0 — -9	d1 ≤50	0 — -16		

HM0A5

Cutting Conditions Parametry skrawania

Uncoated - Side Cutiing Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	1800	80	1600	60	1200	55	800	30	4500	200
8.0	4	12	1400	105	1100	75	900	65	560	35	3100	230
10.0	5	15	1100	150	900	120	800	110	450	60	2500	350
12.0	6	18	900	180	800	140	630	110	400	70	2000	400
14.0	7	21	800	180	700	140	560	110	350	70	1800	420
16.0	8	24	700	180	560	140	450	110	280	70	1600	450
18.0	9	27	630	180	500	140	400	110	250	70	1400	470
20.0	10	30	560	180	450	140	400	110	220	70	1200	500
22.0	11	33	500	220	450	170	350	140	220	85	1100	470
25.0	12,5	37,5	450	220	400	170	310	140	180	85	1000	450
30.0	15	45	350	210	310	160	250	130	160	85	900	530

Coated TiAIN - Side Cutiing Pokryte TiAIN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	2500	110	2250	85	1700	75	1100	40	6300	280
8.0	4	12	1950	145	1550	105	1250	90	800	50	4350	320
10.0	5	15	1550	210	1250	170	1100	155	650	85	3500	490
12.0	6	18	1250	250	1100	195	900	155	550	100	2800	560
14.0	7	21	1100	250	1000	195	800	155	500	100	2500	590
16.0	8	24	1000	250	800	195	650	155	400	100	2250	630
18.0	9	27	900	250	700	195	550	155	350	100	1950	660
20.0	10	30	800	250	650	195	550	155	300	100	1700	700
22.0	11	33	700	310	650	240	500	195	300	120	1550	660
25.0	12,5	37,5	650	310	550	240	450	195	250	120	1400	630
30.0	15	45	500	295	450	225	350	180	220	120	1250	740

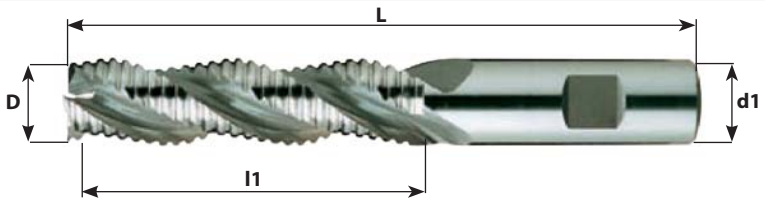
HM056

SQUARE TYPE WALCOWO-CZOŁOWE

3 Flute, Long Length 3-ostrzowe, długie

					HSS Co 8%		B					max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	○								●	●				



D code Uncoated Kod bez pokrycia	D	d1	L	l1	Z	Shank Uchwyt
HM056100000B10045095	10.0	10	95	45	3	B
HM056120000B12053110	12.0	12	110	53	3	B
HM056140000B12053110	14.0	12	110	53	3	B
HM056160000B16063123	16.0	16	123	63	3	B
HM056180000B16063123	18.0	16	123	63	3	B
HM056200000B20075141	20.0	20	141	75	3	B
HM056220000B20075141	22.0	20	141	75	3	B
HM056250000B25090166	25.0	25	166	90	3	B
HM056300000B25090166	30.0	25	166	90	3	B

µm	d1 ≤ 3,0	0 — -6	d1 ≤18	0 — -11		
	d1 ≤ 6,0	0 — -8	d1 ≤30	0 — -13		
	d1 ≤ 10	0 — -9	d1 ≤50	0 — -16		

HM056

Cutting Conditions Parametry skrawania

Uncoated - Side Cutiing Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	1800	80	1600	60	1200	55	800	30	4500	200
8.0	4	12	1400	105	1100	75	900	65	560	35	3100	230
10.0	5	15	1100	150	900	120	800	110	450	60	2500	350
12.0	6	18	900	180	800	140	630	110	400	70	2000	400
14.0	7	21	800	180	700	140	560	110	350	70	1800	420
16.0	8	24	700	180	560	140	450	110	280	70	1600	450
18.0	9	27	630	180	500	140	400	110	250	70	1400	470
20.0	10	30	560	180	450	140	400	110	220	70	1200	500
22.0	11	33	500	220	450	170	350	140	220	85	1100	470
25.0	12,5	37,5	450	220	400	170	310	140	180	85	1000	450
30.0	15	45	350	210	310	160	250	130	160	85	900	530

Coated TiAIN - Side Cutiing Pokryte TiAIN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	2500	110	2250	85	1700	75	1100	40	6300	280
8.0	4	12	1950	145	1550	105	1250	90	800	50	4350	320
10.0	5	15	1550	210	1250	170	1100	155	650	85	3500	490
12.0	6	18	1250	250	1100	195	900	155	550	100	2800	560
14.0	7	21	1100	250	1000	195	800	155	500	100	2500	590
16.0	8	24	1000	250	800	195	650	155	400	100	2250	630
18.0	9	27	900	250	700	195	550	155	350	100	1950	660
20.0	10	30	800	250	650	195	550	155	300	100	1700	700
22.0	11	33	700	310	650	240	500	195	300	120	1550	660
25.0	12,5	37,5	650	310	550	240	450	195	250	120	1400	630
30.0	15	45	500	295	450	225	350	180	220	120	1250	740

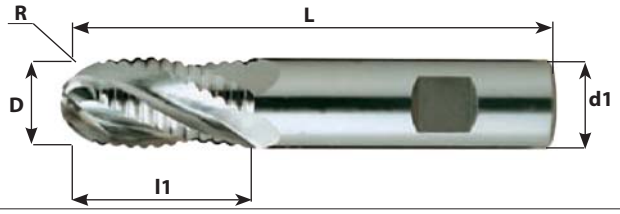
HM057 HMF57

SQUARE TYPE WALCOWO-CZOŁOWE

3-4 Flute, Short Length 3-4-ostrzowe, krótkie

					HSS Co 8%	30°	B					max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●								○	○				



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	R	D	d1	L	l1	Z	Shank Uchwyt
HM057060030B06013057	HMF57060030B06013057	3	6.0	6	57	13	3	B
HM057080040B10019069	HMF57080040B10019069	4	8.0	10	69	19	3	B
HM057100050B10022072	HMF57100050B10022072	5	10.0	10	72	22	3	B
HM057120060B12026083	HMF57120060B12026083	6	12.0	12	83	26	4	B
HM057160080B16032092	HMF57160080B16032092	8	16.0	16	92	32	4	B
HM057200100B20038104	HMF57200100B20038104	10	20.0	20	104	38	4	B
HM057250125B25045121	HMF57250125B25045121	12,5	25.0	25	121	45	4	B
HM057320160B32053133	HMF57320160B32053133	16	32.0	32	133	53	4	B
HM057400200B32063155	HMF57400200B32063155	20	40.0	32	155	63	4	B

µm	d1 ≤ 3,0	0 — -6	d1 ≤18	0 — -11		
	d1 ≤ 6,0	0 — -8	d1 ≤30	0 — -13		
	d1 ≤ 10	0 — -9	d1 ≤50	0 — -16		

HM057 HMF57

Cutting Conditions Parametry skrawania

Uncoated - Side Cutiing Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
R4.0 x 8.0	2	6	1400	105	1100	75	900	65	560	35	3100	230
R5.0 x 10.0	2,5	7,5	1100	150	900	120	800	110	450	60	2500	250
R6.0 x 12.0	3	9	900	180	800	140	630	110	400	70	2000	400
R8.0 x 16.0	4	12	700	180	560	140	450	110	280	70	1600	450
R10.0 x 20.0	5	15	560	180	450	140	400	110	220	70	1200	500
R12.5 x 25.0	6,25	18,75	450	220	400	170	310	140	180	85	1000	450
R16.0 x 32.0	8	24	350	210	280	160	220	130	140	85	800	500
R20.0 x 40.0	10	30	280	200	220	150	180	120	110	80	630	450

Coated TiAlN - Side Cutiing Pokryte TiAlN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
R4.0 x 8.0	2	6	1960	150	1540	105	1260	90	790	50	4340	320
R5.0 x 10.0	2,5	7,5	1540	210	1260	170	1120	155	630	85	3500	350
R6.0 x 12.0	3	9	1260	250	1120	195	880	155	560	100	2800	560
R8.0 x 16.0	4	12	980	250	790	195	630	155	390	100	2240	630
R10.0 x 20.0	5	15	790	250	630	195	560	155	310	100	1680	700
R12.5 x 25.0	6,25	18,75	630	310	560	240	440	195	250	120	1400	630
R16.0 x 32.0	8	24	490	295	390	225	310	180	200	120	1120	700
R20.0 x 40.0	10	30	390	280	310	210	250	170	160	110	880	630

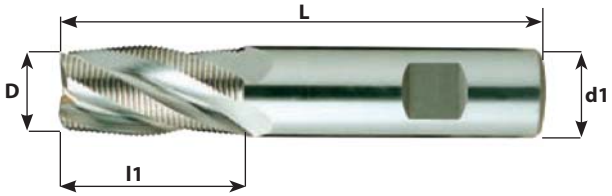
HM0B1 HMFB1

SQUARE TYPE WALCOWO-CZOŁOWE

Multi Flute, Long Length Wieloostrzowe, długie

					HSS Co 8%	30°	B					max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●								○	○				



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM0B1060000B06013057	HMFB1060000B06013057	6.0	6	57	13	3	B
HM0B1070000B10016066	HMFB1070000B10016066	7.0	10	66	16	3	B
HM0B1080000B10019069	HMFB1080000B10019069	8.0	10	69	19	3	B
HM0B1090000B10019069	HMFB1090000B10019069	9.0	10	69	19	3	B
HM0B1100000B10022072	HMFB1100000B10022072	10.0	10	72	22	4	B
HM0B1120000B12026083	HMFB1120000B12026083	12.0	12	83	26	4	B
HM0B1140000B12026083	HMFB1140000B12026083	14.0	12	83	26	4	B
HM0B1160000B16032092	HMFB1160000B16032092	16.0	16	92	32	4	B
HM0B1180000B16032092	HMFB1180000B16032092	18.0	16	92	32	4	B
HM0B1200000B20038104	HMFB1200000B20038104	20.0	20	104	38	4	B
HM0B1220000B20038104	HMFB1220000B20038104	22.0	20	104	38	5	B
HM0B1250000B25045121	HMFB1250000B25045121	25.0	25	121	45	5	B

µm	d1 ≤ 3,0	0 — -6	d1 ≤18	0 — -11		
	d1 ≤ 6,0	0 — -8	d1 ≤30	0 — -13		
	d1 ≤ 10	0 — -9	d1 ≤50	0 — -16		

HM0B1 HMFB1

Cutting Conditions Parametry skrawania

Uncoated - Side Cutiing Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	1800	80	1600	60	1200	55	800	30	4500	200
8.0	4	12	1400	105	1100	75	900	65	560	35	3100	230
10.0	5	15	1100	150	900	120	800	110	450	60	2500	350
12.0	6	18	900	180	800	140	630	110	400	70	2000	400
14.0	7	21	800	180	700	140	560	110	350	70	1800	420
16.0	8	24	700	180	560	140	450	110	280	70	1600	450
18.0	9	27	630	180	500	140	400	110	250	70	1400	470
20.0	10	30	560	180	450	140	400	110	220	70	1200	500
22.0	11	33	500	220	450	170	350	140	220	85	1100	470
25.0	12,5	37,5	450	220	400	170	310	140	180	85	1000	450
28.0	14	42	400	210	350	160	280	130	160	85	900	510
30.0	15	45	350	210	310	160	250	130	160	85	900	530
32.0	16	48	350	210	280	160	220	130	140	85	800	500
36.0	18	54	310	210	250	160	200	130	120	85	700	470
40.0	20	60	280	200	220	150	180	120	110	80	630	450
50.0	25	75	220	200	180	170	160	140	90	80	500	370

Coated TiAlN - Side Cutiing Pokryte TiAlN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	2500	110	2250	85	1700	75	1100	40	6300	280
8.0	4	12	1950	145	1550	105	1250	90	800	50	4350	320
10.0	5	15	1550	210	1250	170	1100	155	650	85	3500	490
12.0	6	18	1250	250	1100	195	900	155	550	100	2800	560
14.0	7	21	1100	250	1000	195	800	155	500	100	2500	590
16.0	8	24	1000	250	800	195	650	155	400	100	2250	630
18.0	9	27	900	250	700	195	550	155	350	100	1950	660
20.0	10	30	800	250	650	195	550	155	300	100	1700	700
22.0	11	33	700	310	650	240	500	195	300	120	1550	660
25.0	12,5	37,5	650	310	550	240	450	195	250	120	1400	630
28.0	14	42	550	295	500	225	400	180	220	120	1250	715
30.0	15	45	500	295	450	225	350	180	220	120	1250	740
32.0	16	48	500	295	400	225	300	180	200	120	1100	700
36.0	18	54	450	295	350	225	300	180	170	120	1000	660
40.0	20	60	400	280	300	210	250	170	130	110	900	630
50.0	25	75	300	280	250	240	220	195	120	110	700	520

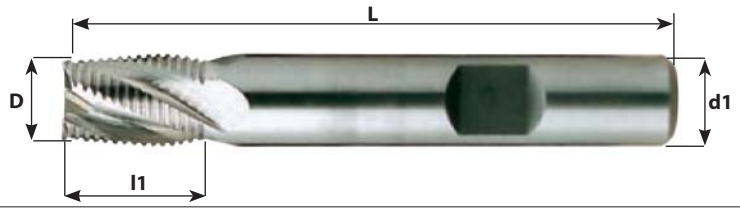
HM024 HMF24

SQUARE TYPE WALCOWO-CZOŁOWE

3-4 Flute, Short Length 3-4-ostrzowe, krótkie

					HSS Co 8%	30°	B					max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●								○	○				



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM024060000B06008052	HMF24060000B06008052	6.0	6	52	8	3	B
HM024080000B10011061	HMF24080000B10011061	8.0	10	61	11	4	B
HM024100000B10013063	HMF24100000B10013063	10.0	10	63	13	4	B
HM024120000B12016073	HMF24120000B12016073	12.0	12	73	16	4	B
HM024140000B12016073	HMF24140000B12016073	14.0	12	73	16	4	B
HM024160000B16019079	HMF24160000B16019079	16.0	16	79	19	4	B
HM024180000B16019079	HMF24180000B16019079	18.0	16	79	19	4	B
HM024200000B20022088	HMF24200000B20022088	20.0	20	88	22	4	B

µm	d1 ≤ 3,0	0 — -6	d1 ≤18	0 — -11		
	d1 ≤ 6,0	0 — -8	d1 ≤30	0 — -13		
	d1 ≤ 10	0 — -9	d1 ≤50	0 — -16		

HM024 HMF24

Cutting Conditions Parametry skrawania

Uncoated - Side Cutiing Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	1800	80	1600	60	1200	55	800	30	4500	200
8.0	4	12	1400	105	1100	75	900	65	560	35	3100	230
10.0	5	15	1100	150	900	120	800	110	450	60	2500	350
12.0	6	18	900	180	800	140	630	110	400	70	2000	400
14.0	7	21	800	180	700	140	560	110	350	70	1800	420
16.0	8	24	700	180	560	140	450	110	280	70	1600	450
18.0	9	27	630	180	500	140	400	110	250	70	1400	470
20.0	10	30	560	180	450	140	400	110	220	70	1200	500

Coated TiAIN - Side Cutiing Pokryte TiAIN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	2500	110	2250	85	1700	75	1100	40	6300	280
8.0	4	12	1950	145	1550	105	1250	90	800	50	4350	320
10.0	5	15	1550	210	1250	170	1100	155	650	85	3500	490
12.0	6	18	1250	250	1100	195	900	155	550	100	2800	560
14.0	7	21	1100	250	1000	195	800	155	500	100	2500	590
16.0	8	24	1000	250	800	195	650	155	400	100	2250	630
18.0	9	27	900	250	700	195	550	155	350	100	1950	660
20.0	10	30	800	250	650	195	550	155	300	100	1700	700

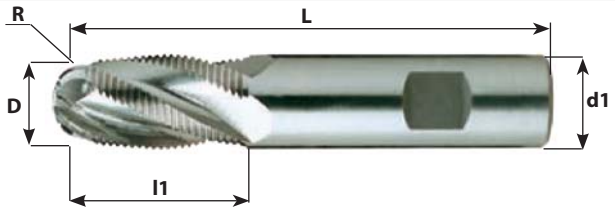
HM046 HMF46

BALLNOSE KULISTE

3-4 Flute, Short Length 3-4-ostrzowe, krótkie

					HSS Co 8%	30°	B					max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●								○	○				



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	R	D	d1	L	l1	Z	Shank Uchwyt
HM046060030B06013057	HMF46060030B06013057	3	6.0	6	57	13	3	B
HM046080040B10019069	HMF46080040B10019069	4	8.0	10	69	19	3	B
HM046100050B10022072	HMF46100050B10022072	5	10.0	10	72	22	3	B
HM046120060B12026083	HMF46120060B12026083	6	12.0	12	83	26	4	B
HM046160080B16032092	HMF46160080B16032092	8	16.0	16	92	32	4	B
HM046200100B20038104	HMF46200100B20038104	10	20.0	20	104	38	4	B
HM046250125B25045121	HMF46250125B25045121	12,5	25.0	25	121	45	4	B
HM046320160B32053133	HMF46320160B32053133	16	32.0	32	133	53	4	B
HM046400200B32063155	HMF46400200B32063155	20	40.0	32	155	63	4	B

µm	d1 ≤ 3,0	0 — -6	d1 ≤18	0 — -11		
	d1 ≤ 6,0	0 — -8	d1 ≤30	0 — -13		
	d1 ≤ 10	0 — -9	d1 ≤50	0 — -16		

HM046 HMF46

Cutting Conditions Parametry skrawania

Uncoated - Side Cutiing Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
R4.0 x 8.0	2	6	1400	105	1100	75	900	65	560	35	3100	230
R5.0 x 10.0	2,5	7,5	1100	150	900	120	800	110	450	60	2500	250
R6.0 x 12.0	3	9	900	180	800	140	630	110	400	70	2000	400
R8.0 x 16.0	4	12	700	180	560	140	450	110	280	70	1600	450
R10.0 x 20.0	5	15	560	180	450	140	400	110	220	70	1200	500
R12.5 x 25.0	6,25	18,75	450	220	400	170	310	140	180	85	1000	450
R16.0 x 32.0	8	24	350	210	280	160	220	130	140	85	800	500
R20.0 x 40.0	10	30	280	200	220	150	180	120	110	80	630	450

Coated TiAlN - Side Cutiing Pokryte TiAlN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
R4.0 x 8.0	2	6	1960	150	1540	105	1260	90	790	50	4340	320
R5.0 x 10.0	2,5	7,5	1540	210	1260	170	1120	155	630	85	3500	350
R6.0 x 12.0	3	9	1260	250	1120	195	880	155	560	100	2800	560
R8.0 x 16.0	4	12	980	250	790	195	630	155	390	100	2240	630
R10.0 x 20.0	5	15	790	250	630	195	560	155	310	100	1680	700
R12.5 x 25.0	6,25	18,75	630	310	560	240	440	195	250	120	1400	630
R16.0 x 32.0	8	24	490	295	390	225	310	180	200	120	1120	700
R20.0 x 40.0	10	30	390	280	310	210	250	170	160	110	880	630

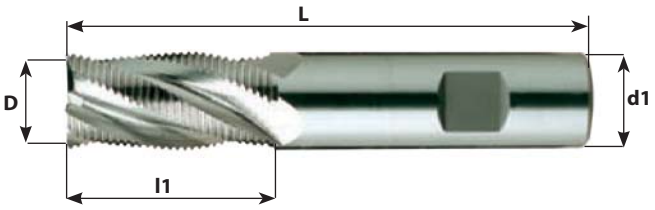
HM0A3 HMFA3

SQUARE TYPE WALCOWO-CZOŁOWE

Multi Flute, Short Length Wieloostrzowe, krótkie

HSS Co 8%	30°	B	max	min	AIR
			○	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●								○	○				



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM0A3060000B06013057	HMFA3060000B06013057	6.0	6	57	13	3	B
HM0A3070000B10016066	HMFA3070000B10016066	7.0	10	66	16	3	B
HM0A3080000B10019069	HMFA3080000B10019069	8.0	10	69	19	3	B
HM0A3090000B10019069	HMFA3090000B10019069	9.0	10	69	19	3	B
HM0A3100000B10022072	HMFA3100000B10022072	10.0	10	72	22	4	B
HM0A3110000B12022079	HMFA3110000B12022079	11.0	12	79	22	4	B
HM0A3120000B12026083	HMFA3120000B12026083	12.0	12	83	26	4	B
HM0A3130000B12026083	HMFA3130000B12026083	13.0	12	83	26	4	B
HM0A3140000B12026083	HMFA3140000B12026083	14.0	12	83	26	4	B
HM0A3150000B12026083	HMFA3150000B12026083	15.0	12	83	26	4	B
HM0A3160000B16032092	HMFA3160000B16032092	16.0	16	92	32	4	B
HM0A3180000B16032092	HMFA3180000B16032092	18.0	16	92	32	4	B
HM0A3200000B20038104	HMFA3200000B20038104	20.0	20	104	38	4	B
HM0A3250000B25045121	HMFA3250000B25045121	25.0	25	121	45	5	B
HM0A3280000B25045121	HMFA3280000B25045121	28.0	25	121	45	6	B
HM0A3300000B25045121	HMFA3300000B25045121	30.0	25	121	45	6	B
HM0A3320000B32053133	HMFA3320000B32053133	32.0	32	133	53	6	B
HM0A3350000B32053133	HMFA3350000B32053133	35.0	32	133	53	6	B
HM0A3400000B32063155	HMFA3400000B32063155	40.0	32	155	63	6	B

µm						
	d1 ≤ 3,0	0 — -6	d1 ≤18	0 — -11		
	d1 ≤ 6,0	0 — -8	d1 ≤30	0 — -13		
	d1 ≤ 10	0 — -9	d1 ≤50	0 — -16		

HM0A3 HMFA3

Cutting Conditions Parametry skrawania

Uncoated - Side Cutiing Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	1800	80	1600	60	1200	55	800	30	4500	200
8.0	4	12	1400	105	1100	75	900	65	560	35	3100	230
10.0	5	15	1100	150	900	120	800	110	450	60	2500	350
12.0	6	18	900	180	800	140	630	110	400	70	2000	400
14.0	7	21	800	180	700	140	560	110	350	70	1800	420
16.0	8	24	700	180	560	140	450	110	280	70	1600	450
18.0	9	27	630	180	500	140	400	110	250	70	1400	470
20.0	10	30	560	180	450	140	400	110	220	70	1200	500
22.0	11	33	500	220	450	170	350	140	220	85	1100	470
25.0	12,5	37,5	450	220	400	170	310	140	180	85	1000	450
28.0	14	42	400	210	350	160	280	130	160	85	900	510
30.0	15	45	350	210	310	160	250	130	160	85	900	530
32.0	16	48	350	210	280	160	220	130	140	85	800	500
36.0	18	54	310	210	250	160	200	130	120	85	700	470
40.0	20	60	280	200	220	150	180	120	110	80	630	450
50.0	25	75	220	200	180	170	160	140	90	80	500	370

Coated TiAIN - Side Cutiing Pokryte TiAIN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	2500	110	2250	85	1700	75	1100	40	6300	280
8.0	4	12	1950	145	1550	105	1250	90	800	50	4350	320
10.0	5	15	1550	210	1250	170	1100	155	650	85	3500	490
12.0	6	18	1250	250	1100	195	900	155	550	100	2800	560
14.0	7	21	1100	250	1000	195	800	155	500	100	2500	590
16.0	8	24	1000	250	800	195	650	155	400	100	2250	630
18.0	9	27	900	250	700	195	550	155	350	100	1950	660
20.0	10	30	800	250	650	195	550	155	300	100	1700	700
22.0	11	33	700	310	650	240	500	195	300	120	1550	660
25.0	12,5	37,5	650	310	550	240	450	195	250	120	1400	630
28.0	14	42	550	295	500	225	400	180	220	120	1250	715
30.0	15	45	500	295	450	225	350	180	220	120	1250	740
32.0	16	48	500	295	400	225	300	180	200	120	1100	700
36.0	18	54	450	295	350	225	300	180	170	120	1000	660
40.0	20	60	400	280	300	210	250	170	130	110	900	630
50.0	25	75	300	280	250	240	220	195	120	110	700	520

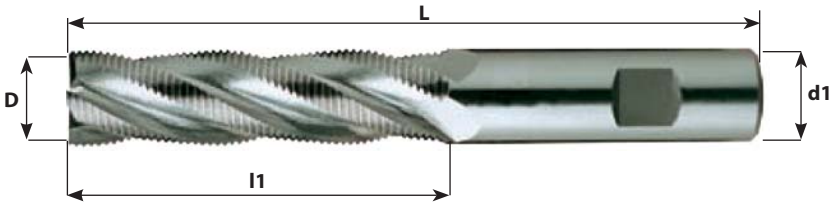
HM0B2 HMFB2

SQUARE TYPE WALCOWO-CZOŁOWE

Multi Flute, Long Length Wieloostrzowe, długie

HSS Co 8%	30°	B										max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●								○	○				



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM0B2060000B06024068	HMFB2060000B06024068	6.0	6	68	24	3	B
HM0B2070000B10030080	HMFB2070000B10030080	7.0	10	80	30	3	B
HM0B2080000B10038088	HMFB2080000B10038088	8.0	10	88	38	3	B
HM0B2090000B10038088	HMFB2090000B10038088	9.0	10	88	38	3	B
HM0B2100000B10045095	HMFB2100000B10045095	10.0	10	95	45	4	B
HM0B2110000B12045102	HMFB2110000B12045102	11.0	12	102	45	4	B
HM0B2120000B12053110	HMFB2120000B12053110	12.0	12	110	53	4	B
HM0B2130000B12053110	HMFB2130000B12053110	13.0	12	110	53	4	B
HM0B2140000B12053110	HMFB2140000B12053110	14.0	12	110	53	4	B
HM0B2150000B12053110	HMFB2150000B12053110	15.0	12	110	53	4	B
HM0B2160000B16063123	HMFB2160000B16063123	16.0	16	123	63	4	B
HM0B2170000B16063123	HMFB2170000B16063123	17.0	16	123	63	4	B
HM0B2180000B16063123	HMFB2180000B16063123	18.0	16	123	63	4	B
HM0B2190000B16063123	HMFB2190000B16063123	19.0	16	123	63	4	B
HM0B2200000B20075141	HMFB2200000B20075141	20.0	20	141	75	4	B
HM0B2220000B20075141	HMFB2220000B20075141	22.0	20	141	75	5	B
HM0B2240000B25090166	HMFB2240000B25090166	24.0	25	166	90	5	B
HM0B2250000B25090166	HMFB2250000B25090166	25.0	25	166	90	5	B
HM0B2260000B25090166	HMFB2260000B25090166	26.0	25	166	90	6	B
HM0B2280000B25090166	HMFB2280000B25090166	28.0	25	166	90	6	B
HM0B2300000B25090166	HMFB2300000B25090166	30.0	25	166	90	6	B
HM0B232000B320106186	HMFB232000B320106186	32.0	32	186	106	6	B
HM0B235000B320106186	HMFB235000B320106186	35.0	32	186	106	6	B
HM0B236000B320106186	HMFB236000B320106186	36.0	32	186	106	6	B
HM0B238000B320125217	HMFB238000B320125217	38.0	32	217	125	6	B
HM0B240000B320125217	HMFB240000B320125217	40.0	32	217	125	6	B
HM0B240000B400125217	HMFB240000B400125217	40.0	40	217	125	6	B

µm	d1 ≤ 3,0	0 — -6	d1 ≤18	0 — -11		
	d1 ≤ 6,0	0 — -8	d1 ≤30	0 — -13		
	d1 ≤ 10	0 — -9	d1 ≤50	0 — -16		

HM0B2 HMFB2

Cutting Conditions Parametry skrawania

Uncoated - Side Cutiing Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	1800	80	1600	60	1200	55	800	30	4500	200
8.0	4	12	1400	105	1100	75	900	65	560	35	3100	230
10.0	5	15	1100	150	900	120	800	110	450	60	2500	350
12.0	6	18	900	180	800	140	630	110	400	70	2000	400
14.0	7	21	800	180	700	140	560	110	350	70	1800	420
16.0	8	24	700	180	560	140	450	110	280	70	1600	450
18.0	9	27	630	180	500	140	400	110	250	70	1400	470
20.0	10	30	560	180	450	140	400	110	220	70	1200	500
22.0	11	33	500	220	450	170	350	140	220	85	1100	470
25.0	12,5	37,5	450	220	400	170	310	140	180	85	1000	450
28.0	14	42	400	210	350	160	280	130	160	85	900	510
30.0	15	45	350	210	310	160	250	130	160	85	900	530
32.0	16	48	350	210	280	160	220	130	140	85	800	500
36.0	18	54	310	210	250	160	200	130	120	85	700	470
40.0	20	60	280	200	220	150	180	120	110	80	630	450
50.0	25	75	220	200	180	170	160	140	90	80	500	370

Coated TiAIN - Side Cutiing Pokryte TiAIN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	2500	110	2250	85	1700	75	1100	40	6300	280
8.0	4	12	1950	145	1550	105	1250	90	800	50	4350	320
10.0	5	15	1550	210	1250	170	1100	155	650	85	3500	490
12.0	6	18	1250	250	1100	195	900	155	550	100	2800	560
14.0	7	21	1100	250	1000	195	800	155	500	100	2500	590
16.0	8	24	1000	250	800	195	650	155	400	100	2250	630
18.0	9	27	900	250	700	195	550	155	350	100	1950	660
20.0	10	30	800	250	650	195	550	155	300	100	1700	700
22.0	11	33	700	310	650	240	500	195	300	120	1550	660
25.0	12,5	37,5	650	310	550	240	450	195	250	120	1400	630
28.0	14	42	550	295	500	225	400	180	220	120	1250	715
30.0	15	45	500	295	450	225	350	180	220	120	1250	740
32.0	16	48	500	295	400	225	300	180	200	120	1100	700
36.0	18	54	450	295	350	225	300	180	170	120	1000	660
40.0	20	60	400	280	300	210	250	170	130	110	900	630
50.0	25	75	300	280	250	240	220	195	120	110	700	520

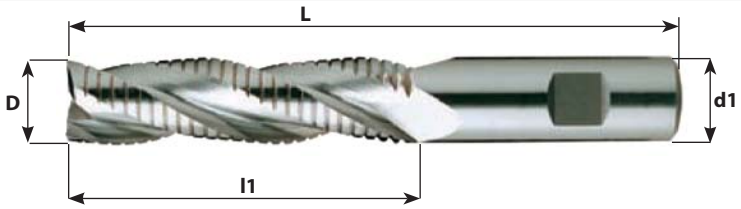
HM0A4 HMFA4

SQUARE TYPE WALCOWO-CZOŁOWE

Multi Flute, Short Length Wieloostrzowe, krótkie

HSS Co 8%	30°	B	max	min	AIR
			○	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●								○	○				



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM0A4060000B06013057	HMFA4060000B06013057	6.0	6	57	13	3	B
HM0A4070000B10016066	HMFA4070000B10016066	7.0	10	66	16	3	B
HM0A4080000B10019069	HMFA4080000B10019069	8.0	10	69	19	4	B
HM0A4090000B10019069	HMFA4090000B10019069	9.0	10	69	19	4	B
HM0A4100000B10022072	HMFA4100000B10022072	10.0	10	72	22	4	B
HM0A4110000B12022079	HMFA4110000B12022079	11.0	12	79	22	4	B
HM0A4120000B12026083	HMFA4120000B12026083	12.0	12	83	26	4	B
HM0A4130000B12026083	HMFA4130000B12026083	13.0	12	83	26	4	B
HM0A4140000B12026083	HMFA4140000B12026083	14.0	12	83	26	4	B
HM0A4150000B12026083	HMFA4150000B12026083	15.0	12	83	26	4	B
HM0A4160000B16032092	HMFA4160000B16032092	16.0	16	92	32	4	B
HM0A4180000B16032092	HMFA4180000B16032092	18.0	16	92	32	4	B
HM0A4200000B20038104	HMFA4200000B20038104	20.0	20	104	38	4	B
HM0A4220000B20038104	HMFA4220000B20038104	22.0	20	104	38	5	B
HM0A4250000B25045121	HMFA4250000B25045121	25.0	25	121	45	5	B
HM0A4280000B25045121	HMFA4280000B25045121	28.0	25	121	45	5	B
HM0A4300000B25045121	HMFA4300000B25045121	30.0	25	121	45	5	B
HM0A4320000B32053133	HMFA4320000B32053133	32.0	32	133	53	5	B
HM0A4360000B32053133	HMFA4360000B32053133	36.0	32	133	53	6	B
HM0A4400000B32063155	HMFA4400000B32063155	40.0	32	155	63	6	B

µm						
	d1 ≤ 3,0	0 — -6	d1 ≤18	0 — -11		
	d1 ≤ 6,0	0 — -8	d1 ≤30	0 — -13		
	d1 ≤ 10	0 — -9	d1 ≤50	0 — -16		

HM0A4 HMFA4

Cutting Conditions Parametry skrawania

Uncoated - Side Cutiing Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	1800	65	1600	50	1200	45	800	25	4500	160
8.0	4	12	1400	85	1100	60	900	50	560	30	3100	185
10.0	5	15	1100	120	900	95	800	90	450	50	2500	280
12.0	6	18	900	145	800	110	630	90	400	55	2000	320
14.0	7	21	800	145	700	110	560	90	350	55	1800	340
16.0	8	24	700	145	560	110	450	90	280	55	1600	360
18.0	9	27	630	145	500	110	400	90	250	55	1400	380
20.0	10	30	560	145	450	110	400	90	220	55	1200	400
22.0	11	33	500	175	450	135	350	110	220	70	1100	380
25.0	12,5	37,5	450	175	400	135	310	110	180	70	1000	360
28.0	14	42	400	170	350	130	280	105	160	70	900	410
30.0	15	45	350	170	310	130	250	105	160	70	900	420
32.0	16	48	350	170	280	130	220	105	140	70	800	400
36.0	18	54	310	170	250	130	200	105	120	70	700	380
40.0	20	60	280	160	220	120	180	95	110	65	630	360

Coated TiAlN - Side Cutiing Pokryte TiAlN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	2500	90	2250	70	1700	65	1100	35	6300	225
8.0	4	12	1950	120	1550	85	1250	70	800	40	4350	260
10.0	5	15	1550	170	1250	135	1100	125	650	70	3500	390
12.0	6	18	1250	205	1100	155	900	125	550	75	2800	450
14.0	7	21	1100	205	1000	155	800	125	500	75	2500	475
16.0	8	24	1000	205	800	155	650	125	400	75	2250	505
18.0	9	27	900	205	700	155	550	125	350	75	1950	530
20.0	10	30	800	205	650	155	550	125	300	75	1700	560
22.0	11	33	700	245	650	190	500	155	300	100	1550	530
25.0	12,5	37,5	650	245	550	190	450	155	250	100	1400	505
28.0	14	42	550	240	500	180	400	145	200	100	1250	575
30.0	15	45	500	240	450	180	350	145	200	100	1250	590
32.0	16	48	500	240	400	180	300	145	170	100	1100	560
36.0	18	54	450	240	350	180	280	145	150	100	1000	530
40.0	20	60	400	225	300	170	250	135	150	90	900	505
50.0	25	75	300	280	250	240	220	195	120	110	700	520

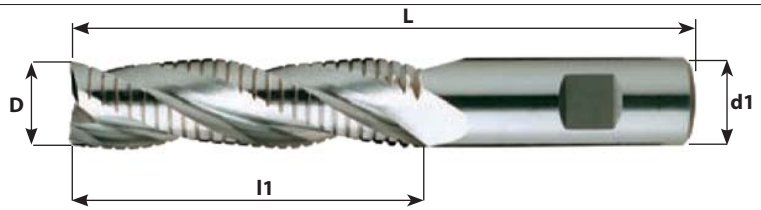
HM068 HMF68

SQUARE TYPE WALCOWO-CZOŁOWE

Multi Flute, Long Length Wieloostrzowe, długie

HSS Co 8%	30°	B										max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●								○	○				



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM068060000B06024068	HMF68060000B06024068	6.0	6	68	24	3	B
HM068080000B10038088	HMF68080000B10038088	8.0	10	88	38	4	B
HM068100000B10045095	HMF68100000B10045095	10.0	10	95	45	4	B
HM068120000B12053110	HMF68120000B12053110	12.0	12	110	53	4	B
HM068140000B12053110	HMF68140000B12053110	14.0	12	110	53	4	B
HM068160000B16063123	HMF68160000B16063123	16.0	16	123	63	4	B
HM068180000B16063123	HMF68180000B16063123	18.0	16	123	63	4	B
HM068200000B20075141	HMF68200000B20075141	20.0	20	141	75	4	B
HM068220000B20075141	HMF68220000B20075141	22.0	20	141	75	5	B
HM068250000B25090166	HMF68250000B25090166	25.0	25	166	90	5	B
HM068300000B25090166	HMF68300000B25090166	30.0	25	166	90	5	B
HM06832000B320106186	HMF6832000B320106186	32.0	32	186	106	5	B
HM06845000B400125217	HMF6845000B400125217	45.0	40	217	125	6	B

µm	d1 ≤ 3,0	0 — -6	d1 ≤18	0 — -11		
	d1 ≤ 6,0	0 — -8	d1 ≤30	0 — -13		
	d1 ≤ 10	0 — -9	d1 ≤50	0 — -16		

HM068 HMF68

Cutting Conditions Parametry skrawania

Uncoated - Side Cutiing Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	1800	65	1600	50	1200	45	800	25	4500	160
8.0	4	12	1400	85	1100	60	900	50	560	30	3100	185
10.0	5	15	1100	120	900	95	800	90	450	50	2500	280
12.0	6	18	900	145	800	110	630	90	400	55	2000	320
14.0	7	21	800	145	700	110	560	90	350	55	1800	340
16.0	8	24	700	145	560	110	450	90	280	55	1600	360
18.0	9	27	630	145	500	110	400	90	250	55	1400	380
20.0	10	30	560	145	450	110	400	90	220	55	1200	400
22.0	11	33	500	175	450	135	350	110	220	70	1100	380
25.0	12,5	37,5	450	175	400	135	310	110	180	70	1000	360
28.0	14	42	400	170	350	130	280	105	160	70	900	410
30.0	15	45	350	170	310	130	250	105	160	70	900	420
32.0	16	48	350	170	280	130	220	105	140	70	800	400
36.0	18	54	310	170	250	130	200	105	120	70	700	380
40.0	20	60	280	160	220	120	180	95	110	65	630	360

Coated TiAIN - Side Cutiing Pokryte TiAIN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	2500	90	2250	70	1700	65	1100	35	6300	225
8.0	4	12	1950	120	1550	85	1250	70	800	40	4350	260
10.0	5	15	1550	170	1250	135	1100	125	650	70	3500	390
12.0	6	18	1250	205	1100	155	900	125	550	75	2800	450
14.0	7	21	1100	205	1000	155	800	125	500	75	2500	475
16.0	8	24	1000	205	800	155	650	125	400	75	2250	505
18.0	9	27	900	205	700	155	550	125	350	75	1950	530
20.0	10	30	800	205	650	155	550	125	300	75	1700	560
22.0	11	33	700	245	650	190	500	155	300	100	1550	530
25.0	12,5	37,5	650	245	550	190	450	155	250	100	1400	505
28.0	14	42	550	240	500	180	400	145	200	100	1250	575
30.0	15	45	500	240	450	180	350	145	200	100	1250	590
32.0	16	48	500	240	400	180	300	145	170	100	1100	560
36.0	18	54	450	240	350	180	280	145	150	100	1000	530
40.0	20	60	400	225	300	170	250	135	150	90	900	505
50.0	25	75	300	280	250	240	220	195	120	110	700	520

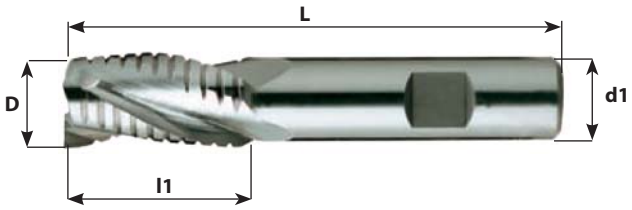
HM015 HMF15

SQUARE TYPE WALCOWO-CZOŁOWE

3 Flute, Short Length 3-ostrzowe, krótkie

					HSS Co 8%	30°	B					max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●								○	○				



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM015060000B06013057	HMF15060000B06013057	6.0	6	57	13	3	B
HM015080000B10019069	HMF15080000B10019069	8.0	10	69	19	3	B
HM015100000B10022072	HMF15100000B10022072	10.0	10	72	22	3	B
HM015120000B12026083	HMF15120000B12026083	12.0	12	83	26	3	B
HM015130000B12026083	HMF15130000B12026083	13.0	12	83	26	3	B
HM015140000B12026083	HMF15140000B12026083	14.0	12	83	26	3	B
HM015160000B16032092	HMF15160000B16032092	16.0	16	92	32	3	B
HM015180000B16032092	HMF15180000B16032092	18.0	16	92	32	3	B
HM015200000B20038104	HMF15200000B20038104	20.0	20	104	38	3	B
HM015220000B20038104	HMF15220000B20038104	22.0	20	104	38	3	B
HM015250000B25045121	HMF15250000B25045121	25.0	25	121	45	3	B
HM015280000B25045121	HMF15280000B25045121	28.0	25	121	45	3	B
HM015300000B25045121	HMF15300000B25045121	30.0	25	121	45	3	B
HM015320000B32053133	HMF15320000B32053133	32.0	32	133	53	3	B
HM015360000B32053133	HMF15360000B32053133	36.0	32	133	53	3	B
HM015400000B32063155	HMF15400000B32063155	40.0	32	155	63	3	B

µm	d1 ≤ 3,0	0 — -6	d1 ≤18	0 — -11		
	d1 ≤ 6,0	0 — -8	d1 ≤30	0 — -13		
	d1 ≤ 10	0 — -9	d1 ≤50	0 — -16		

HM015 HMF15

Cutting Conditions Parametry skrawania

Uncoated - Side Cutiing Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	1800	65	1600	50	1200	45	800	25	4500	160
8.0	4	12	1400	85	1100	60	900	50	560	30	3100	185
10.0	5	15	1100	120	900	95	800	90	450	50	2500	280
12.0	6	18	900	145	800	110	630	90	400	55	2000	320
14.0	7	21	800	145	700	110	560	90	350	55	1800	340
16.0	8	24	700	145	560	110	450	90	280	55	1600	360
18.0	9	27	630	145	500	110	400	90	250	55	1400	380
20.0	10	30	560	145	450	110	400	90	220	55	1200	400
22.0	11	33	500	175	450	135	350	110	220	70	1100	380
25.0	12,5	37,5	450	175	400	135	310	110	180	70	1000	360
28.0	14	42	400	170	350	130	280	105	160	70	900	410
30.0	15	45	350	170	310	130	250	105	160	70	900	420
32.0	16	48	350	170	280	130	220	105	140	70	800	400
36.0	18	54	310	170	250	130	200	105	120	70	700	380
40.0	20	60	280	160	220	120	180	95	110	65	630	360

Coated TiAIN - Side Cutiing Pokryte TiAIN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	2500	90	2250	70	1700	65	1100	35	6300	225
8.0	4	12	1950	120	1550	85	1250	70	800	40	4350	260
10.0	5	15	1550	170	1250	135	1100	125	650	70	3500	390
12.0	6	18	1250	205	1100	155	900	125	550	75	2800	450
14.0	7	21	1100	205	1000	155	800	125	500	75	2500	475
16.0	8	24	1000	205	800	155	650	125	400	75	2250	505
18.0	9	27	900	205	700	155	550	125	350	75	1950	530
20.0	10	30	800	205	650	155	550	125	300	75	1700	560
22.0	11	33	700	245	650	190	500	155	300	100	1550	530
25.0	12,5	37,5	650	245	550	190	450	155	250	100	1400	505
28.0	14	42	550	240	500	180	400	145	200	100	1250	575
30.0	15	45	500	240	450	180	350	145	200	100	1250	590
32.0	16	48	500	240	400	180	300	145	170	100	1100	560
36.0	18	54	450	240	350	180	280	145	150	100	1000	530
40.0	20	60	400	225	300	170	250	135	150	90	900	505
50.0	25	75	300	280	250	240	220	195	120	110	700	520

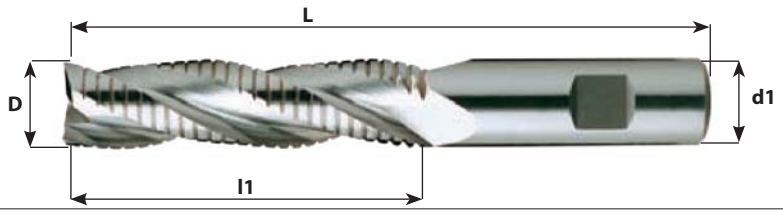
HM049 HMF49

SQUARE TYPE WALCOWO-CZOŁOWE

3 Flute, Long Length 3-ostrzowe, długie

					HSS Co 8%	30°	B					max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●								○	○				



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM049060000B06024068	HMF49060000B06024068	6.0	6	68	24	3	B
HM049080000B10038088	HMF49080000B10038088	8.0	10	88	38	3	B
HM049100000B10045095	HMF49100000B10045095	10.0	10	95	45	3	B
HM049120000B12053110	HMF49120000B12053110	12.0	12	110	53	3	B
HM049140000B12053110	HMF49140000B12053110	14.0	12	110	53	3	B
HM049160000B16063123	HMF49160000B16063123	16.0	16	123	63	3	B
HM049180000B16063123	HMF49180000B16063123	18.0	16	123	63	3	B
HM049200000B20075141	HMF49200000B20075141	20.0	20	141	75	3	B
HM049220000B20075141	HMF49220000B20075141	22.0	20	141	75	3	B
HM049250000B25090166	HMF49250000B25090166	25.0	25	166	90	3	B
HM049280000B25090166	HMF49280000B25090166	28.0	25	166	90	3	B
HM049300000B25090166	HMF49300000B25090166	30.0	25	166	90	3	B
HM04936000B320106186	HMF4936000B320106186	36.0	32	186	106	3	B
HM04940000B320125217	HMF4940000B320125217	40.0	32	217	125	3	B

µm						
	d1 ≤ 3,0	0 — -6	d1 ≤18	0 — -11		
	d1 ≤ 6,0	0 — -8	d1 ≤30	0 — -13		
	d1 ≤ 10	0 — -9	d1 ≤50	0 — -16		

HM049 HMF49

Cutting Conditions Parametry skrawania

Uncoated - Side Cutiing Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	1800	65	1600	50	1200	45	800	25	4500	160
8.0	4	12	1400	85	1100	60	900	50	560	30	3100	185
10.0	5	15	1100	120	900	95	800	90	450	50	2500	280
12.0	6	18	900	145	800	110	630	90	400	55	2000	320
14.0	7	21	800	145	700	110	560	90	350	55	1800	340
16.0	8	24	700	145	560	110	450	90	280	55	1600	360
18.0	9	27	630	145	500	110	400	90	250	55	1400	380
20.0	10	30	560	145	450	110	400	90	220	55	1200	400
22.0	11	33	500	175	450	135	350	110	220	70	1100	380
25.0	12,5	37,5	450	175	400	135	310	110	180	70	1000	360
28.0	14	42	400	170	350	130	280	105	160	70	900	410
30.0	15	45	350	170	310	130	250	105	160	70	900	420
32.0	16	48	350	170	280	130	220	105	140	70	800	400
36.0	18	54	310	170	250	130	200	105	120	70	700	380
40.0	20	60	280	160	220	120	180	95	110	65	630	360

Coated TiAlN - Side Cutiing Pokryte TiAlN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	2500	90	2250	70	1700	65	1100	35	6300	225
8.0	4	12	1950	120	1550	85	1250	70	800	40	4350	260
10.0	5	15	1550	170	1250	135	1100	125	650	70	3500	390
12.0	6	18	1250	205	1100	155	900	125	550	75	2800	450
14.0	7	21	1100	205	1000	155	800	125	500	75	2500	475
16.0	8	24	1000	205	800	155	650	125	400	75	2250	505
18.0	9	27	900	205	700	155	550	125	350	75	1950	530
20.0	10	30	800	205	650	155	550	125	300	75	1700	560
22.0	11	33	700	245	650	190	500	155	300	100	1550	530
25.0	12,5	37,5	650	245	550	190	450	155	250	100	1400	505
28.0	14	42	550	240	500	180	400	145	200	100	1250	575
30.0	15	45	500	240	450	180	350	145	200	100	1250	590
32.0	16	48	500	240	400	180	300	145	170	100	1100	560
36.0	18	54	450	240	350	180	280	145	150	100	1000	530
40.0	20	60	400	225	300	170	250	135	150	90	900	505
50.0	25	75	300	280	250	240	220	195	120	110	700	520

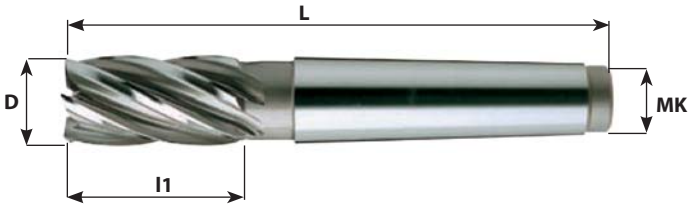
HM0A6

SQUARE TYPE WALCOWO-CZOŁOWE

Multi Flute, Short Length Wieloostrzowe, krótkie

				HSS Co 8%	30°							max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●								○	○				



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	MK	L	l1	Z
HM0A6140000M02026111	HMFA6140000M02026111	14.0	2	111	26	4
HM0A6150000M02026111	HMFA6150000M02026111	15.0	2	111	26	4
HM0A6160000M02032117	HMFA6160000M02032117	16.0	2	117	32	4
HM0A6180000M02032117	HMFA6180000M02032117	18.0	2	117	32	4
HM0A6200000M02038123	HMFA6200000M02038123	20.0	2	123	38	4
HM0A6220000M02038123	HMFA6220000M02038123	22.0	2	123	38	6
HM0A6240000M03045147	HMFA6240000M03045147	24.0	3	147	45	6
HM0A6250000M03045147	HMFA6250000M03045147	25.0	3	147	45	6
HM0A6260000M03045147	HMFA6260000M03045147	26.0	3	147	45	6
HM0A6280000M03045147	HMFA6280000M03045147	28.0	3	147	45	6
HM0A6300000M03045147	HMFA6300000M03045147	30.0	3	147	45	6
HM0A6320000M04053178	HMFA6320000M04053178	32.0	4	178	53	6
HM0A6350000M04053178	HMFA6350000M04053178	35.0	4	178	53	6
HM0A6360000M04053178	HMFA6360000M04053178	36.0	4	178	53	6
HM0A6380000M04063188	HMFA6380000M04063188	38.0	4	188	63	6
HM0A6400000M04063188	HMFA6400000M04063188	40.0	4	188	63	6
HM0A6420000M04063188	HMFA6420000M04063188	42.0	4	188	63	6
HM0A6440000M04063188	HMFA6440000M04063188	44.0	4	188	63	6
HM0A6450000M04063188	HMFA6450000M04063188	45.0	4	188	63	8
HM0A6500000M05075233	HMFA6500000M05075233	50.0	5	233	75	8

HM0A6

Cutting Conditions Parametry skrawania

Uncoated - Side Cutiing Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2.0	0,2	3	5600	80	4500	55	4000	45	2200	20	12000	240
3.0	0,3	4,5	3500	110	3200	80	2500	60	1600	30	11000	380
4.0	0,4	6	2800	140	2200	100	1800	65	1100	45	8000	440
5.0	0,5	7,5	2200	180	1800	125	1600	90	900	50	6300	470
6.0	0,6	9	1800	180	1600	145	1200	90	800	60	5600	470
8.0	0,8	12	1400	200	1100	160	900	105	560	65	4000	580
10.0	1	15	1100	200	900	160	800	120	450	65	3100	600
12.0	1,2	18	900	220	800	180	630	120	400	75	2500	570
14.0	1,4	21	800	220	700	160	560	120	350	75	2200	530
16.0	1,6	24	700	220	560	160	450	105	280	65	2000	530
18.0	1,8	27	630	200	500	160	400	105	250	65	1800	530
20.0	2	30	560	200	450	160	400	105	220	65	1600	480
22.0	2,2	33	500	200	450	160	350	105	220	65	1400	450
25.0	2,5	37,5	450	180	400	145	310	90	180	50	1200	420
28.0	2,8	42	400	160	350	125	280	80	160	45	1100	400
30.0	3	45	350	140	310	110	250	75	160	45	1100	400
32.0	3,2	48	350	140	280	100	220	65	140	45	1000	360
36.0	3,6	54	310	120	250	90	200	60	120	35	900	330
40.0	4	60	280	120	220	90	180	60	110	35	800	300

Coated TiAlN - Side Cutiing Pokryte TiAlN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2.0	0,2	3	7850	110	6300	75	5600	65	3100	30	16800	335
3.0	0,3	4,5	4900	155	4500	110	3500	85	2250	40	15400	530
4.0	0,4	6	3900	195	3100	140	2500	90	1550	65	11200	615
5.0	0,5	7,5	3100	250	2500	175	2250	125	1250	70	8800	660
6.0	0,6	9	2500	250	2250	205	1700	125	1100	85	7850	660
8.0	0,8	12	1950	280	1550	225	1250	145	800	90	5600	810
10.0	1	15	1550	280	1250	225	1100	170	650	90	4350	840
12.0	1,2	18	1250	310	1100	250	900	170	550	105	3500	800
14.0	1,4	21	1100	310	1000	225	800	170	500	105	3100	740
16.0	1,6	24	1000	310	800	225	650	145	400	90	2800	740
18.0	1,8	27	900	280	700	225	550	145	350	90	2500	740
20.0	2	30	800	280	650	225	550	145	300	90	2250	670
22.0	2,2	33	700	280	650	225	500	145	300	90	1950	630
25.0	2,5	37,5	650	250	550	205	450	125	250	70	1700	590
28.0	2,8	42	550	225	500	175	400	110	200	65	1550	560
30.0	3	45	500	195	450	155	350	105	200	65	1550	560
32.0	3,2	48	500	195	400	140	300	90	200	65	1400	505
36.0	3,6	54	450	170	350	125	300	85	150	50	1250	460
40.0	4	60	400	170	300	125	250	85	150	50	1100	420

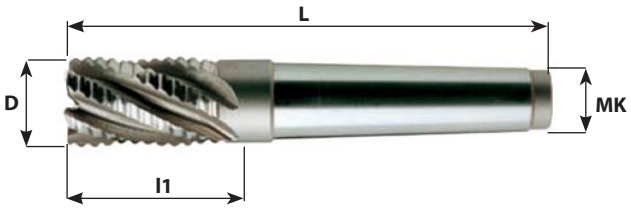
HM0A7 HMFA7

SQUARE TYPE WALCOWO-CZOŁOWE

Multi Flute, Short Length Wieloostrzowe, krótkie

HSS Co 8%	30°											max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●								○	○				



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	l1	MK	L	Z
HM0A7140000M02026111	HMFA7140000M02026111	14.0	26	2	111	4
HM0A7160000M02032117	HMFA7160000M02032117	16.0	32	2	117	4
HM0A7180000M02032117	HMFA7180000M02032117	18.0	32	2	117	4
HM0A7200000M02038123	HMFA7200000M02038123	20.0	38	2	123	4
HM0A7220000M02038123	HMFA7220000M02038123	22.0	38	2	123	5
HM0A7240000M03045147	HMFA7240000M03045147	24.0	45	3	147	5
HM0A7250000M03045147	HMFA7250000M03045147	25.0	45	3	147	5
HM0A7260000M03045147	HMFA7260000M03045147	26.0	45	3	147	5
HM0A7270000M03045147	HMFA7270000M03045147	27.0	45	3	147	6
HM0A7280000M03045147	HMFA7280000M03045147	28.0	45	3	147	6
HM0A7300000M03045147	HMFA7300000M03045147	30.0	45	3	147	6
HM0A7320000M04053178	HMFA7320000M04053178	32.0	53	4	178	6
HM0A7350000M04053178	HMFA7350000M04053178	35.0	53	4	178	6
HM0A7360000M04053178	HMFA7360000M04053178	36.0	53	4	178	6
HM0A7380000M04063188	HMFA7380000M04063188	38.0	63	4	188	6
HM0A7400000M04063188	HMFA7400000M04063188	40.0	63	4	188	6
HM0A7450000M04063188	HMFA7450000M04063188	45.0	63	4	188	6
HM0A7500000M05075233	HMFA7500000M05075233	50.0	75	5	233	6

HM0A7 HMFA7

Cutting Conditions Parametry skrawania

Uncoated - Side Cutiing Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	1800	80	1600	60	1200	55	800	30	4500	200
8.0	4	12	1400	105	1100	75	900	65	560	35	3100	230
10.0	5	15	1100	150	900	120	800	110	450	60	2500	350
12.0	6	18	900	180	800	140	630	110	400	70	2000	400
14.0	7	21	800	180	700	140	560	110	350	70	1800	420
16.0	8	24	700	180	560	140	450	110	280	70	1600	450
18.0	9	27	630	180	500	140	400	110	250	70	1400	470
20.0	10	30	560	180	450	140	400	110	220	70	1200	500
22.0	11	33	500	220	450	170	350	140	220	85	1100	470
25.0	12,5	37,5	450	220	400	170	310	140	180	85	1000	450
28.0	14	42	400	210	350	160	280	130	160	85	900	510
30.0	15	45	350	210	310	160	250	130	160	85	900	530
32.0	16	48	350	210	280	160	220	130	140	85	800	500
36.0	18	54	310	210	250	160	200	130	120	85	700	470
40.0	20	60	280	200	220	150	180	120	110	80	630	450
50.0	25	75	220	200	180	170	160	140	90	80	500	370

Coated TiAIN - Side Cutiing Pokryte TiAIN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	2500	110	2250	85	1700	75	1100	40	6300	280
8.0	4	12	1950	145	1550	105	1250	90	800	50	4350	320
10.0	5	15	1550	210	1250	170	1100	155	650	85	3500	490
12.0	6	18	1250	250	1100	195	900	155	550	100	2800	560
14.0	7	21	1100	250	1000	195	800	155	500	100	2500	590
16.0	8	24	1000	250	800	195	650	155	400	100	2250	630
18.0	9	27	900	250	700	195	550	155	350	100	1950	660
20.0	10	30	800	250	650	195	550	155	300	100	1700	700
22.0	11	33	700	310	650	240	500	195	300	120	1550	660
25.0	12,5	37,5	650	310	550	240	450	195	250	120	1400	630
28.0	14	42	550	295	500	225	400	180	220	120	1250	715
30.0	15	45	500	295	450	225	350	180	220	120	1250	740
32.0	16	48	500	295	400	225	300	180	200	120	1100	700
36.0	18	54	450	295	350	225	300	180	170	120	1000	660
40.0	20	60	400	280	300	210	250	170	130	110	900	630
50.0	25	75	300	280	250	240	220	195	120	110	700	520

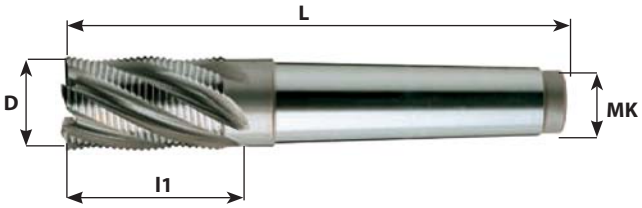
HM078 HMF78

SQUARE TYPE WALCOWO-CZOŁOWE

Multi Flute, Short Length Wieloostrzowe, krótkie

HSS Co 8%	30°											max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●								○	○				



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	l1	MK	L	Z
HM078160000M02032117	HMF78160000M02032117	16.0	32	2	117	4
HM078180000M02032117	HMF78180000M02032117	18.0	32	2	117	4
HM078200000M02038123	HMF78200000M02038123	20.0	38	2	123	4
HM078220000M02038123	HMF78220000M02038123	22.0	38	2	123	5
HM078240000M03045147	HMF78240000M03045147	24.0	45	3	147	5
HM078250000M03045147	HMF78250000M03045147	25.0	45	3	147	5
HM078260000M03045147	HMF78260000M03045147	26.0	45	3	147	5
HM078280000M03045147	HMF78280000M03045147	28.0	45	3	147	6
HM078300000M03045147	HMF78300000M03045147	30.0	45	3	147	6
HM078320000M04053178	HMF78320000M04053178	32.0	53	4	178	6
HM078350000M04053178	HMF78350000M04053178	35.0	53	4	178	6
HM078360000M04053178	HMF78360000M04053178	36.0	53	4	178	6
HM078380000M04063188	HMF78380000M04063188	38.0	63	4	188	6
HM078400000M04063188	HMF78400000M04063188	40.0	63	4	188	6
HM078450000M04063188	HMF78450000M04063188	45.0	63	4	188	6
HM078500000M05075233	HMF78500000M05075233	50.0	75	5	233	6

HM078 HMF78

Cutting Conditions Parametry skrawania

Uncoated - Side Cutiing Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	1800	80	1600	60	1200	55	800	30	4500	200
8.0	4	12	1400	105	1100	75	900	65	560	35	3100	230
10.0	5	15	1100	150	900	120	800	110	450	60	2500	350
12.0	6	18	900	180	800	140	630	110	400	70	2000	400
14.0	7	21	800	180	700	140	560	110	350	70	1800	420
16.0	8	24	700	180	560	140	450	110	280	70	1600	450
18.0	9	27	630	180	500	140	400	110	250	70	1400	470
20.0	10	30	560	180	450	140	400	110	220	70	1200	500
22.0	11	33	500	220	450	170	350	140	220	85	1100	470
25.0	12,5	37,5	450	220	400	170	310	140	180	85	1000	450
28.0	14	42	400	210	350	160	280	130	160	85	900	510
30.0	15	45	350	210	310	160	250	130	160	85	900	530
32.0	16	48	350	210	280	160	220	130	140	85	800	500
36.0	18	54	310	210	250	160	200	130	120	85	700	470
40.0	20	60	280	200	220	150	180	120	110	80	630	450
50.0	25	75	220	200	180	170	160	140	90	80	500	370

Coated TiAlN - Side Cutiing Pokryte TiAlN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	2500	110	2250	85	1700	75	1100	40	6300	280
8.0	4	12	1950	145	1550	105	1250	90	800	50	4350	320
10.0	5	15	1550	210	1250	170	1100	155	650	85	3500	490
12.0	6	18	1250	250	1100	195	900	155	550	100	2800	560
14.0	7	21	1100	250	1000	195	800	155	500	100	2500	590
16.0	8	24	1000	250	800	195	650	155	400	100	2250	630
18.0	9	27	900	250	700	195	550	155	350	100	1950	660
20.0	10	30	800	250	650	195	550	155	300	100	1700	700
22.0	11	33	700	310	650	240	500	195	300	120	1550	660
25.0	12,5	37,5	650	310	550	240	450	195	250	120	1400	630
28.0	14	42	550	295	500	225	400	180	220	120	1250	715
30.0	15	45	500	295	450	225	350	180	220	120	1250	740
32.0	16	48	500	295	400	225	300	180	200	120	1100	700
36.0	18	54	450	295	350	225	300	180	170	120	1000	660
40.0	20	60	400	280	300	210	250	170	130	110	900	630
50.0	25	75	300	280	250	240	220	195	120	110	700	520

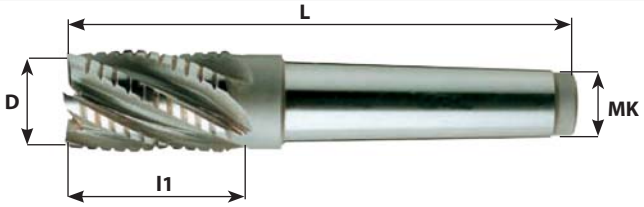
HM079 HMF79

SQUARE TYPE WALCOWO-CZOŁOWE

Multi Flute, Short Length Wieloostrzowe, krótkie

HSS Co 8%	30°											max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●								○	○				



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	l1	MK	L	Z
HM079160000M02032117	HMF79160000M02032117	16.0	32	2	117	4
HM079180000M02032117	HMF79180000M02032117	18.0	32	2	117	4
HM079200000M02038123	HMF79200000M02038123	20.0	38	2	123	4
HM079220000M02038123	HMF79220000M02038123	22.0	38	2	123	5
HM079240000M03045147	HMF79240000M03045147	24.0	45	3	147	5
HM079250000M03045147	HMF79250000M03045147	25.0	45	3	147	5
HM079260000M03045147	HMF79260000M03045147	26.0	45	3	147	5
HM079280000M03045147	HMF79280000M03045147	28.0	45	3	147	6
HM079300000M03045147	HMF79300000M03045147	30.0	45	3	147	6
HM079320000M04053178	HMF79320000M04053178	32.0	53	4	178	6
HM079350000M04053178	HMF79350000M04053178	35.0	53	4	178	6
HM079360000M04053178	HMF79360000M04053178	36.0	53	4	178	6
HM079380000M04063188	HMF79380000M04063188	38.0	63	4	188	6
HM079400000M04063188	HMF79400000M04063188	40.0	63	4	188	6
HM079450000M04063188	HMF79450000M04063188	45.0	63	4	188	6
HM079500000M05075233	HMF79500000M05075233	50.0	75	5	233	6

HM079 HMF79

Cutting Conditions Parametry skrawania

Uncoated - Side Cutiing Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
16.0	8	24	700	145	560	110	450	90	280	55	1600	360
18.0	9	27	630	145	500	110	400	90	250	55	1400	380
20.0	10	30	560	145	450	110	400	90	220	55	1200	400
22.0	11	33	500	175	450	135	350	110	220	70	1100	380
25.0	12,5	37,5	450	175	400	135	310	110	180	70	1000	360
28.0	14	42	400	170	350	130	280	105	160	70	900	410
30.0	15	45	350	170	310	130	250	105	160	70	900	420
32.0	16	48	350	170	280	130	220	105	140	70	800	400
36.0	18	54	310	170	250	130	200	105	120	70	700	380
40.0	20	60	280	160	220	120	180	95	110	65	630	360
45.0	22,5	67,5	250	150	210	125	180	95	100	60	560	330
50.0	25	75	220	145	190	120	160	90	90	55	500	330

Coated TiAIN - Side Cutiing Pokryte TiAIN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
Hardness Twardość					~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
16.0	8	24	1000	205	800	155	650	125	400	75	2250	505
18.0	9	27	900	205	700	155	550	125	350	75	1950	530
20.0	10	30	800	205	650	155	550	125	300	75	1700	560
22.0	11	33	700	245	650	190	500	155	300	100	1550	530
25.0	12,5	37,5	650	245	550	190	450	155	250	100	1400	505
28.0	14	42	550	240	500	180	400	145	200	100	1250	575
30.0	15	45	500	240	450	180	350	145	200	100	1250	590
32.0	16	48	500	240	400	180	300	145	170	100	1100	560
36.0	18	54	450	240	350	180	280	145	150	100	1000	530
40.0	20	60	400	225	300	170	250	135	150	90	900	505
45.0	22,5	67,5	350	205	280	170	210	115	140	85	810	485
50.0	25	75	310	190	250	165	190	110	120	75	730	460

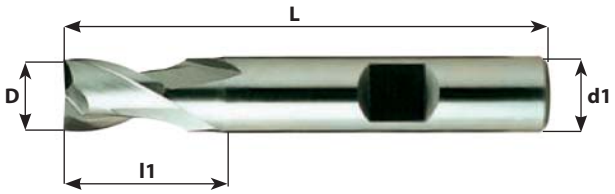
HM0xxx

SQUARE TYPE WALCOWO-CZOŁOWE

2 Flute, Short Length 2-ostrzowe, krótkie



P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●								○	○				



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM0C0020000B06004048	HMFC0020000B06004048	2.0	6	48	4	2	B
HM0C0025000B06005049	HMFC0025000B06005049	2.5	6	49	5	2	B
HM0C0030000B06005049	HMFC0030000B06005049	3.0	6	49	5	2	B
HM0C0040000B06007051	HMFC0040000B06007051	4.0	6	51	7	2	B
HM0C0050000B06008052	HMFC0050000B06008052	5.0	6	52	8	2	B
HM0C0060000B06008052	HMFC0060000B06008052	6.0	6	52	8	2	B
HM0C0070000B10010060	HMFC0070000B10010060	7.0	10	60	10	2	B
HM0C0080000B10011061	HMFC0080000B10011061	8.0	10	61	11	2	B
HM0C0090000B10011061	HMFC0090000B10011061	9.0	10	61	11	2	B
HM0C0100000B10013063	HMFC0100000B10013063	10.0	10	63	13	2	B
HM0C0110000B12013070	HMFC0110000B12013070	11.0	12	70	13	2	B
HM0C0120000B12016073	HMFC0120000B12016073	12.0	12	73	16	2	B
HM0C0130000B12016073	HMFC0130000B12016073	13.0	12	73	16	2	B
HM0C0140000B12016073	HMFC0140000B12016073	14.0	12	73	16	2	B
HM0C0150000B12016073	HMFC0150000B12016073	15.0	12	73	16	2	B
HM0C0160000B16019079	HMFC0160000B16019079	16.0	16	79	19	2	B
HM0C0170000B16019079	HMFC0170000B16019079	17.0	16	79	19	2	B
HM0C0180000B16019079	HMFC0180000B16019079	18.0	16	79	19	2	B
HM0C0190000B16019079	HMFC0190000B16019079	19.0	16	79	19	2	B
HM0C0200000B20022088	HMFC0200000B20022088	20.0	20	88	22	2	B
HM0C0220000B20022088	HMFC0220000B20022088	22.0	20	88	22	2	B
HM0C0240000B25026102	HMFC0240000B25026102	24.0	25	102	26	2	B
HM0C0250000B25026102	HMFC0250000B25026102	25.0	25	102	26	2	B
HM0C0280000B25026102	HMFC0280000B25026102	28.0	25	102	26	2	B
HM0C0300000B25026102	HMFC0300000B25026102	30.0	25	102	26	2	B

HM0xxx

Cutting Conditions Parametry skrawania

Uncoated - Sloting Bez pokrycia - Rowkowanie

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa	
Hardness Twardość			~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40	
			500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2	
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED
2.0	2	1	5000	35	4500	35	2400	15
3.0	3	1,5	3500	50	2800	45	1800	20
4.0	4	2	2500	60	2000	50	1200	35
5.0	5	2,5	2000	75	1800	65	1000	40
6.0	6	3	1800	90	1300	65	900	45
8.0	8	4	1200	100	1000	75	600	50
10.0	10	5	1000	100	900	90	500	50
12.0	12	6	900	110	700	90	450	55
14.0	14	7	800	100	600	90	400	55
16.0	16	8	600	100	500	75	300	50
18.0	18	9	550	100	450	75	280	50
20.0	20	10	500	100	450	75	250	50
22.0	22	11	500	100	400	75	250	50
25.0	25	12,5	450	90	350	65	200	40

Coated TiAlN - Sloting Pokryte TiAlN - Rowkowanie

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa	
Hardness Twardość			~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40	
			500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2	
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED
16.0	8	24	800	155	650	125	400	75
18.0	9	27	700	155	550	125	350	75
20.0	10	30	650	155	550	125	300	75
22.0	11	33	650	190	500	155	300	100
25.0	12,5	37,5	550	190	450	155	250	100
28.0	14	42	500	180	400	145	200	100
30.0	15	45	450	180	350	145	200	100
32.0	16	48	400	180	300	145	170	100
36.0	18	54	350	180	280	145	150	100
40.0	20	60	300	170	250	135	150	90
45.0	22,5	67,5	280	170	210	115	140	85
50.0	25	75	250	165	190	110	120	75

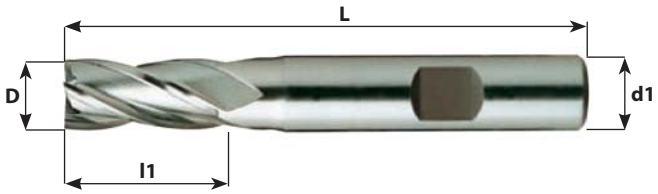
HM0C4 HMFC4 HM0C5 HMFC5

SQUARE TYPE WALCOWO-CZOŁOWE

3-4 Flute, Short Length 3-4-ostrzowe, krótkie

		30°	B									max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●								○	○				



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM0C4020000B06007051	HMFC4020000B06007051	2.0	6	51	7	4	B
HM0C4030000B06008052	HMFC4030000B06008052	3.0	6	52	8	4	B
HM0C4040000B06011055	HMFC4040000B06011055	4.0	6	55	11	4	B
HM0C4050000B06013057	HMFC4050000B06013057	5.0	6	57	13	4	B
HM0C4060000B06013057	HMFC4060000B06013057	6.0	6	57	13	4	B
HM0C4070000B10016066	HMFC4070000B10016066	7.0	10	66	16	4	B
HM0C4080000B10019069	HMFC4080000B10019069	8.0	10	69	19	4	B
HM0C4090000B10019069	HMFC4090000B10019069	9.0	10	69	19	4	B
HM0C4100000B10022072	HMFC4100000B10022072	10.0	10	72	22	4	B
HM0C4120000B12026083	HMFC4120000B12026083	12.0	12	83	26	4	B
HM0C4140000B12026083	HMFC4140000B12026083	14.0	12	83	26	4	B
HM0C4160000B16032092	HMFC4160000B16032092	16.0	16	92	32	4	B
HM0C4180000B16032092	HMFC4180000B16032092	18.0	16	92	32	4	B
HM0C4200000B20038104	HMFC4200000B20038104	20.0	20	104	38	4	B
HM0C5220000B20038104	HMFC5220000B20038104	22.0	20	104	38	6	B
HM0C5240000B25045121	HMFC5240000B25045121	24.0	25	121	45	6	B
HM0C5250000B25045121	HMFC5250000B25045121	25.0	25	121	45	6	B
HM0C5280000B25045121	HMFC5280000B25045121	28.0	25	121	45	6	B
HM0C5300000B25045121	HMFC5300000B25045121	30.0	25	121	45	6	B

µm	d1 h6					
	D + 0.04 - 0					

HM0C4 HMFC4 HM0C5 HMFC5

Cutting Conditions Parametry skrawania

Uncoated - Side Cutiing Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa	
Hardness Twardość			~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40	
			500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2	
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED
2.0	0,2	3	5000	60	4500	50	2400	20
3.0	0,3	4,5	3500	90	2800	65	1800	35
4.0	0,4	6	2500	110	2000	70	1200	50
5.0	0,5	7,5	2000	140	1800	100	1000	55
6.0	0,6	9	1800	160	1300	100	900	65
8.0	0,8	12	1200	180	1000	115	600	70
10.0	1	15	1000	180	900	130	500	70
12.0	1,2	18	900	200	700	130	450	80
14.0	1,4	21	800	180	600	130	400	80
16.0	1,6	24	600	180	500	115	300	70
18.0	1,8	27	550	180	450	115	280	70
20.0	2	30	500	180	450	115	250	70
22.0	2,2	33	500	180	400	115	250	70
25.0	2,5	37,5	450	160	350	100	200	55

Coated TiAIN - Side Cutiing Pokryte TiAIN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa	
Hardness Twardość			~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40	
			500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2	
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED
2.0	0,2	3	7000	85	6300	70	3350	30
3.0	0,3	4,5	4900	125	3900	90	2500	50
4.0	0,4	6	3500	155	2800	100	1700	70
5.0	0,5	7,5	2800	195	2500	140	1400	75
6.0	0,6	9	2500	225	1800	140	1250	90
8.0	0,8	12	1700	250	1400	160	250	100
10.0	1	15	1400	250	1260	180	700	100
12.0	1,2	18	1250	280	980	180	600	110
14.0	1,4	21	1100	250	840	180	550	110
16.0	1,6	24	850	250	700	160	400	95
18.0	1,8	27	750	250	630	160	390	95
20.0	2	30	700	250	630	160	350	95
22.0	2,2	33	700	250	560	160	350	95
25.0	2,5	37,5	630	225	490	140	280	75

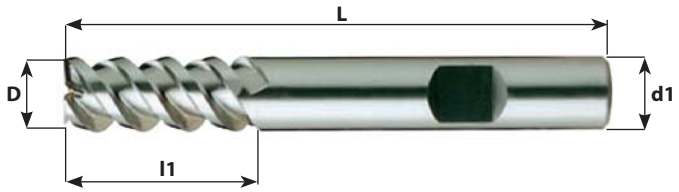
HM0C6 HMFC6

SQUARE TYPE WALCOWO-CZOŁOWE

3-4 Flute, Short Length 3-4-ostrzowe, krótkie

						60°	B						max	min		AIR
													○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●								○	○				



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM0C6060000B06013057	HMFC6060000B06013057	6.0	6	57	13	3	B
HM0C6070000B10016066	HMFC6070000B10016066	7.0	10	66	16	3	B
HM0C6080000B10019069	HMFC6080000B10019069	8.0	10	69	19	3	B
HM0C6090000B10019069	HMFC6090000B10019069	9.0	10	69	19	3	B
HM0C6100000B10022072	HMFC6100000B10022072	10.0	10	72	22	3	B
HM0C6120000B12026083	HMFC6120000B12026083	12.0	12	83	26	3	B
HM0C6140000B12026083	HMFC6140000B12026083	14.0	12	83	26	3	B
HM0C6150000B12026083	HMFC6150000B12026083	15.0	12	83	26	3	B
HM0C6160000B16032092	HMFC6160000B16032092	16.0	16	92	32	3	B
HM0C6180000B16032092	HMFC6180000B16032092	18.0	16	92	32	3	B
HM0C6200000B20038104	HMFC6200000B20038104	20.0	20	104	38	3	B
HM0C6250000B25045121	HMFC6250000B25045121	25.0	25	121	45	4	B
HM0C6300000B25045121	HMFC6300000B25045121	30.0	25	121	45	4	B

HM0C6 HMFC6

Cutting Conditions Parametry skrawania

Uncoated - Side Cutiing Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa	
Hardness Twardość			~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40	
			500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2	
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED
6.0	1,8	9	2000	100	1600	65	1200	45
8.0	2,4	12	1500	100	1300	80	1000	45
10.0	3	15	1300	110	1000	80	800	50
12.0	3,6	18	1000	120	800	80	600	50
14.0	4,2	21	800	130	650	80	500	55
16.0	4,8	24	660	140	520	110	400	70
18.0	5,4	27	500	180	400	140	310	100
20.0	6	30	400	190	330	160	250	100

Coated TiAIN - Side Cutiing Pokryte TiAIN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa	
Hardness Twardość			~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40	
			500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2	
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED
6.0	1,8	9	2800	140	2240	90	1680	60
8.0	2,4	12	2100	140	1820	110	1400	60
10.0	3	15	1800	155	1400	110	1120	70
12.0	3,6	18	1400	170	1120	110	840	70
14.0	4,2	21	1100	180	910	110	700	75
16.0	4,8	24	920	195	730	155	560	100
18.0	5,4	27	700	250	560	195	430	140
20.0	6	30	560	265	460	225	350	140

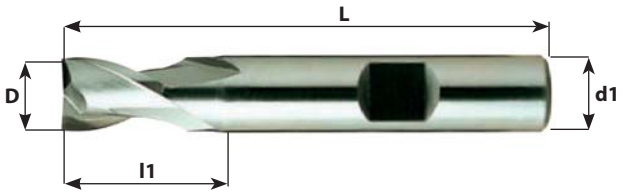
HM0P1 HMFP1

SQUARE TYPE WALCOWO-CZOŁOWE

2 Flute, Short Length 2-ostrzowe, krótkie



P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●								○	○				



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM0P1020000B06004048	HMFP1020000B06004048	2.0	6	48	4	2	B
HM0P1030000B06005049	HMFP1030000B06005049	3.0	6	49	5	2	B
HM0P1040000B06007051	HMFP1040000B06007051	4.0	6	51	7	2	B
HM0P1050000B06008052	HMFP1050000B06008052	5.0	6	52	8	2	B
HM0P1060000B06008052	HMFP1060000B06008052	6.0	6	52	8	2	B
HM0P1080000B10011061	HMFP1080000B10011061	8.0	10	61	11	2	B
HM0P1100000B10013063	HMFP1100000B10013063	10.0	10	63	13	2	B
HM0P1120000B12016073	HMFP1120000B12016073	12.0	12	73	16	2	B
HM0P1140000B12016073	HMFP1140000B12016073	14.0	12	73	16	2	B
HM0P1160000B16019079	HMFP1160000B16019079	16.0	16	79	19	2	B
HM0P1180000B16019079	HMFP1180000B16019079	18.0	16	79	19	2	B
HM0P1200000B20022088	HMFP1200000B20022088	20.0	20	88	22	2	B
HM0P1220000B20022088	HMFP1220000B20022088	22.0	20	88	22	2	B
HM0P1250000B25026102	HMFP1250000B25026102	25.0	25	102	26	2	B

µm	d1 ≤ 3,0	0 — -6	d1 ≤18	0 — -11		
	d1 ≤ 6,0	0 — -8	d1 ≤30	0 — -13		
	d1 ≤ 10	0 — -9	d1 ≤50	0 — -16		

HM0P1 HMFP1

Cutting Conditions Parametry skrawania

Uncoated - Sloting Bez pokrycia - Rowkowanie

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa	
Hardness Twardość			~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40	
			500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2	
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED
2.0	2	1	5600	35	5000	35	2800	20
3.0	3	1,5	4000	55	3000	50	2000	25
4.0	4	2	2800	70	2200	55	1400	35
5.0	5	2,5	2200	85	2000	75	1100	45
6.0	6	3	2000	100	1500	75	1000	50
8.0	8	4	1400	110	1100	85	700	55
10.0	10	5	1100	110	1000	100	560	55
12.0	12	6	1000	125	800	100	500	60
14.0	14	7	900	110	700	100	450	60
16.0	16	8	700	110	560	85	350	55
18.0	18	9	600	110	500	85	300	55
20.0	20	10	560	110	500	85	280	55
22.0	22	11	560	110	450	85	280	55
25.0	25	12,5	500	100	400	75	230	45

Coated TiAlN - Sloting Pokryte TiAlN - Rowkowanie

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa	
Hardness Twardość			~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40	
			500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2	
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED
2.0	2	1	7840	50	7000	50	3900	30
3.0	3	1,5	5600	80	4200	70	2800	35
4.0	4	2	3900	100	3100	75	1950	50
5.0	5	2,5	3100	120	2800	105	1540	60
6.0	6	3	2800	140	2100	105	1400	70
8.0	8	4	1950	155	1540	120	1000	75
10.0	10	5	1550	155	1400	150	800	75
12.0	12	6	1400	175	1100	150	700	85
14.0	14	7	1250	155	1000	150	600	85
16.0	16	8	1000	155	800	120	500	75
18.0	18	9	840	155	700	120	390	75
20.0	20	10	780	155	700	120	390	75
22.0	22	11	780	155	600	120	390	75
25.0	25	12,5	700	140	550	105	320	65

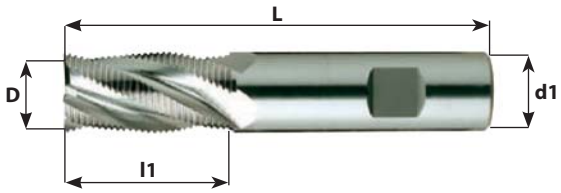
HM059 HMF59

SQUARE TYPE WALCOWO-CZOŁOWE

Multi Flute, Short Length Wieloostrzowe, krótkie

		30°	B									max	min		AIR
												○	●	●	●

P				H		M		K	N				S	
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB
●	●								○	○				



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM059060000B06013057	HMF59060000B06013057	6.0	6	57	13	4	B
HM059070000B10016066	HMF59070000B10016066	7.0	10	66	16	4	B
HM059080000B10019069	HMF59080000B10019069	8.0	10	69	19	4	B
HM059090000B10019069	HMF59090000B10019069	9.0	10	69	19	5	B
HM059100000B10022072	HMF59100000B10022072	10.0	10	72	22	5	B
HM059110000B12022079	HMF59110000B12022079	11.0	12	79	22	5	B
HM059120000B12026083	HMF59120000B12026083	12.0	12	83	26	5	B
HM059130000B12026083	HMF59130000B12026083	13.0	12	83	26	5	B
HM059140000B12026083	HMF59140000B12026083	14.0	12	83	26	5	B
HM059150000B12026083	HMF59150000B12026083	15.0	12	83	26	5	B
HM059160000B16032092	HMF59160000B16032092	16.0	16	92	32	5	B
HM059180000B16032092	HMF59180000B16032092	18.0	16	92	32	5	B
HM059200000B20038104	HMF59200000B20038104	20.0	20	104	38	5	B
HM059220000B20038104	HMF59220000B20038104	22.0	20	104	38	5	B
HM059250000B25045121	HMF59250000B25045121	25.0	25	121	45	6	B
HM059300000B25045121	HMF59300000B25045121	30.0	25	121	45	6	B

µm	d1 ≤ 3,0	0 — -6	d1 ≤18	0 — -11		
	d1 ≤ 6,0	0 — -8	d1 ≤30	0 — -13		
	d1 ≤ 10	0 — -9	d1 ≤50	0 — -16		

HM059 HMF59

Cutting Conditions Parametry skrawania

Uncoated - Side Cutiing Bez pokrycia - Frezowanie boczne

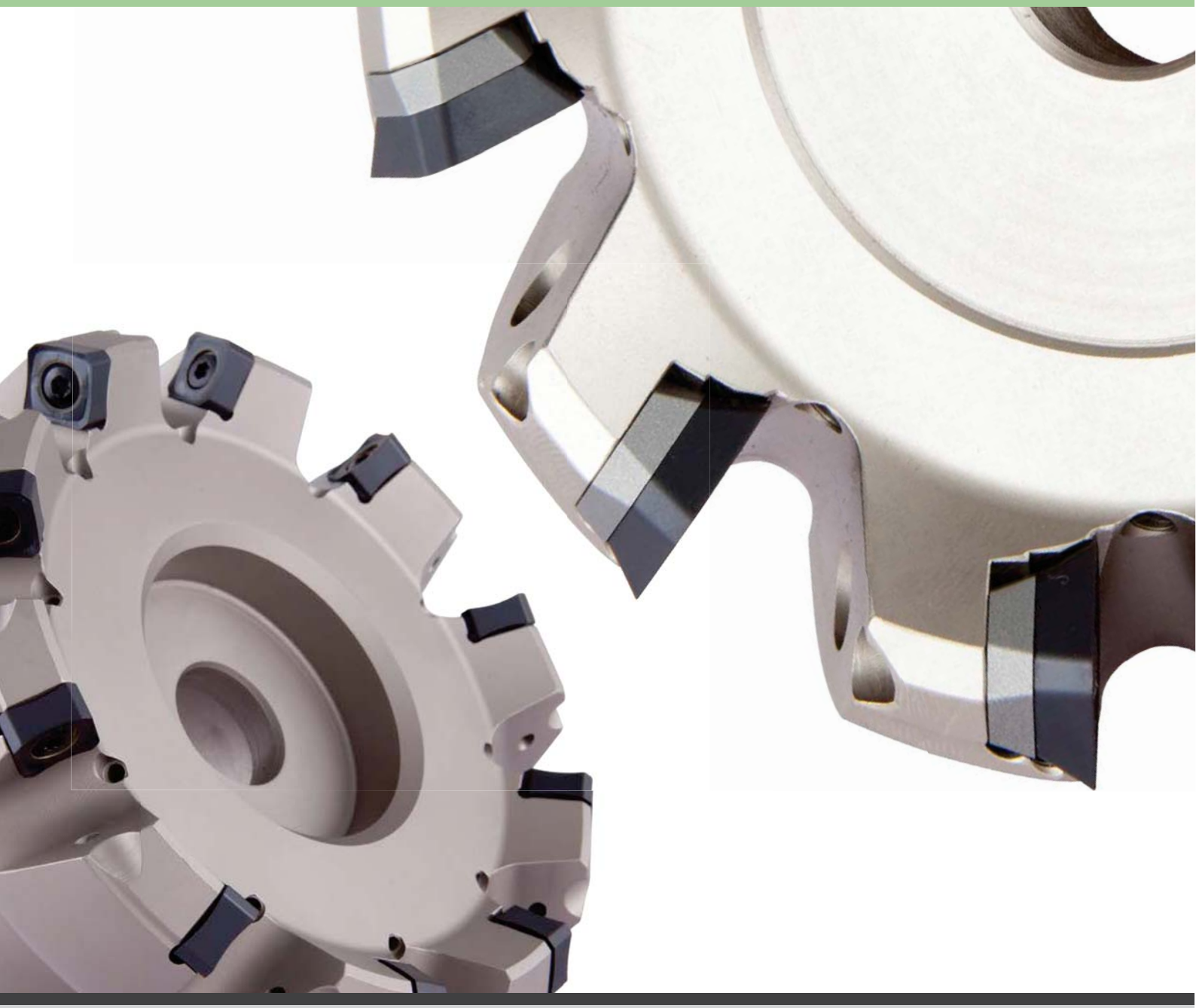
Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa	
Hardness Twardość			~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40		HRc30 ~HRc40	
			500 ~ 800N/mm2		800 ~ 900N/mm2		900 ~ 1100N/mm2		1100 ~ 1300N/mm2	
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	2300	100	2000	75	1500	70	1000	35
8.0	4	12	1800	130	1400	95	1100	80	700	45
10.0	5	15	1400	190	1100	150	1000	140	560	75
12.0	6	18	1100	230	1000	180	800	140	500	85
14.0	7	21	1000	230	900	180	700	140	450	85
16.0	8	24	900	230	700	180	560	140	350	85
18.0	9	27	800	230	600	180	500	140	300	85
20.0	10	30	700	230	560	180	500	140	300	85
22.0	11	33	600	280	560	210	450	180	300	105
25.0	12,5	37,5	560	280	500	210	400	180	230	105
28.0	14	42	500	260	450	200	350	160	200	105
30.0	15	45	450	260	400	200	300	160	200	105

Coated TiAIN - Side Cutiing Pokryte TiAIN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa	
Hardness Twardość			~ HRc20		HRc20 ~HRc30		HRc30 ~HRc40		HRc30 ~HRc40	
			500 ~ 800N/mm2		800 ~ 900N/mm2		900 ~ 1100N/mm2		1100 ~ 1300N/mm2	
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	3220	140	2800	105	2100	95	1400	50
8.0	4	12	2520	180	1960	135	1540	110	980	60
10.0	5	15	1960	265	1540	210	1400	195	780	105
12.0	6	18	1540	320	1400	250	1120	195	700	120
14.0	7	21	1400	320	1260	250	980	195	630	120
16.0	8	24	1260	320	980	250	780	195	490	120
18.0	9	27	1120	320	840	250	700	195	420	120
20.0	10	30	980	320	780	250	700	195	420	120
22.0	11	33	840	390	780	295	630	250	420	145
25.0	12,5	37,5	780	390	700	295	560	250	320	145
28.0	14	42	700	365	630	280	490	225	280	145
30.0	15	45	630	365	560	280	420	225	280	145

ICT

INDEXABLE MILLING TOOLS
FREZY SKŁADANE



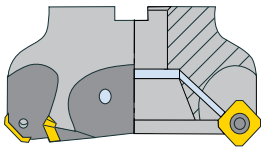
Indexable milling tools gives a wide range of milling cutters and holders. Sets new standards in case of precision and performance for modular milling systems.

Oferta frezów składanych obejmuje szeroką gamę płytek i oprawek do frezowania. Ustanawiając nowe standardy w zakresie precyzyjnej i wydajnej obróbki, z wykorzystaniem modułowych systemów frezowania.

TIZ IMPLEMENTS

SELECTION GUIDE SPIS TREŚCI

M770 | Z=4-16 | 11 - 12

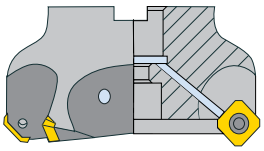




SDKT 1204

FACE MILLING CUTTERS
NARZĘDZIA DO OBRÓBKI PŁASZCZYZN

M700 | Z=3-16 | 13 - 14

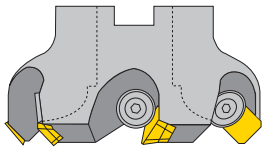




SEKT 1204

FACE MILLING CUTTERS
NARZĘDZIA DO OBRÓBKI PŁASZCZYZN

M440 | Z=4-8 | 15 - 20

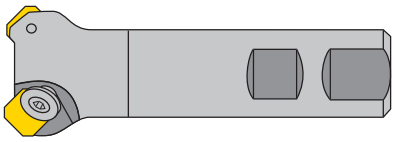




SEKN 1203
SEKR

FACE MILLING CUTTERS
NARZĘDZIA DO OBRÓBKI PŁASZCZYZN

M440 | Z=2-4 | 16 - 20

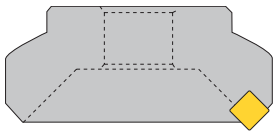




SEKN 1203
SEKR

FACE MILLING CUTTERS
NARZĘDZIA DO OBRÓBKI PŁASZCZYZN

M441 | Z=4-26 | 17-20

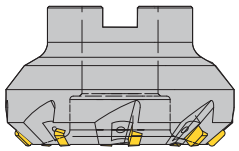




SEKN 1203
1504

FACE MILLING CUTTERS
NARZĘDZIA DO OBRÓBKI PŁASZCZYZN

M164 | Z=4-15 | 21 - 22

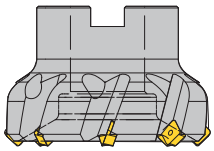




SEEN 1203
SEER 1504

FACE MILLING CUTTERS
NARZĘDZIA DO OBRÓBKI PŁASZCZYZN

M162 M163 | Z=4-18 | 23 - 24

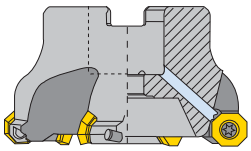




SEKT 12T3

FACE MILLING CUTTERS
NARZĘDZIA DO OBRÓBKI PŁASZCZYZN

M460 | Z=3-12 | 24 - 27

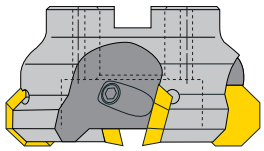




ODMX 060508
ODMW 060508

FACE MILLING CUTTERS
NARZĘDZIA DO OBRÓBKI PŁASZCZYZN

M980 | Z=4-10 | 28 - 29

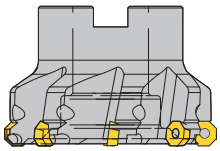




OFER 070405

FACE MILLING CUTTERS
NARZĘDZIA DO OBRÓBKI PŁASZCZYZN

M165 | Z=4-10 | 30 - 31

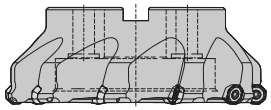




OFMT 05T3

FACE MILLING CUTTERS
NARZĘDZIA DO OBRÓBKI PŁASZCZYZN

M166 | Z=8-20 | 32 - 33

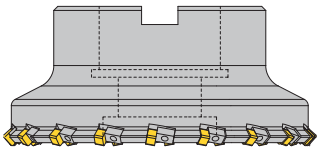




OFMR 0704

FACE MILLING CUTTERS
NARZĘDZIA DO OBRÓBKI PŁASZCZYZN

M168 | Z=8-32 | 34 - 35

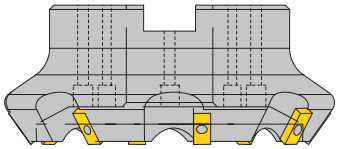


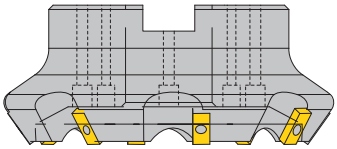


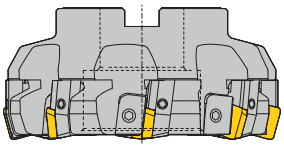
HNMN 090512

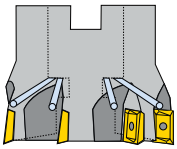
FACE MILLING CUTTERS
NARZĘDZIA DO OBRÓBKI PŁASZCZYZN

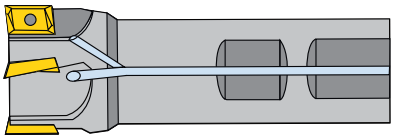
SELECTION GUIDE SPIS TREŚCI

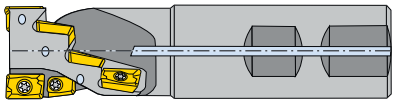
M170	**Z=5-16**	**36 - 37**
		
	**LNMT** 2007 2510	
FACE MILLING CUTTERS NARZĘDZIA DO OBRÓBKI PŁASZCZYZN		

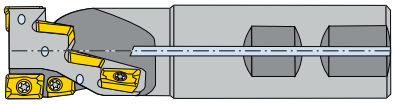
M174	**Z=6-16**	**38 - 39**
		
	**LNMT** 1506	
FACE MILLING CUTTERS NARZĘDZIA DO OBRÓBKI PŁASZCZYZN		

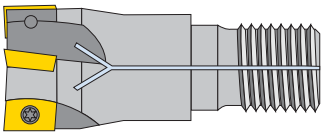
M850	**Z=4-20**	**40 - 41**
		
	**SPKN** 1203 1503 **SPKR** 1203 1503	
FACE MILLING CUTTERS NARZĘDZIA DO OBRÓBKI PŁASZCZYZN		

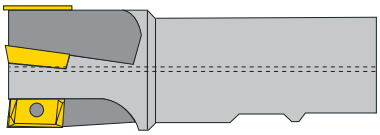
M305	**Z=6-8**	**42 - 46**
		
	**JDMX** 1003	
FACE MILLING CUTTERS NARZĘDZIA DO OBRÓBKI PŁASZCZYZN		

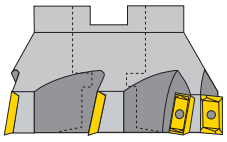
M305	**Z=1-5**	**43 - 46**
		
	**JDMX** 1003	
FACE MILLING CUTTERS NARZĘDZIA DO OBRÓBKI PŁASZCZYZN		

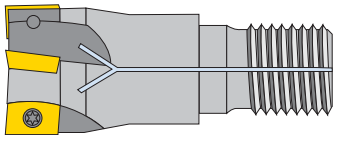
M600	**Z=4-14**	**44 - 46**
		
	**JDMX** 1003	
FACE MILLING CUTTERS NARZĘDZIA DO OBRÓBKI PŁASZCZYZN		

M600	**Z=4-14**	**44 - 46**
		
	**JDMX** 1003	
FACE MILLING CUTTERS NARZĘDZIA DO OBRÓBKI PŁASZCZYZN		

M930	**Z=2-6**	**45 - 46**
		
	**JDMX**1003	
FACE MILLING CUTTERS NARZĘDZIA DO OBRÓBKI PŁASZCZYZN		

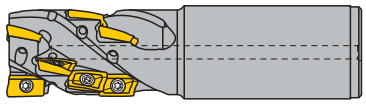
M330	**Z=2-6**	**47 - 52**
		
	**JDMX** 1705	
FACE MILLING CUTTERS NARZĘDZIA DO OBRÓBKI PŁASZCZYZN		

M330	**Z=4-10**	**47 - 52**
		
	**JDMX** 1705	
FACE MILLING CUTTERS NARZĘDZIA DO OBRÓBKI PŁASZCZYZN		

M330	**Z=2-4**	**47 - 52**
		
	**JDMX** 1705	
FACE MILLING CUTTERS NARZĘDZIA DO OBRÓBKI PŁASZCZYZN		

SELECTION GUIDE SPIS TREŚCI

M330 | Z=2-4 | 47 - 52

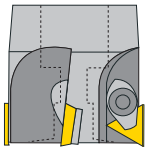




JDMX 1705

FACE MILLING CUTTERS
NARZĘDZIA DO OBRÓBKI PŁASZCZYZN

M320 | Z=4-5 | 53 - 56

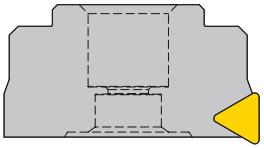




TPUN TPKN 1603

FACE MILLING CUTTERS
NARZĘDZIA DO OBRÓBKI PŁASZCZYZN

M175 | Z=4-20 | 54 - 56

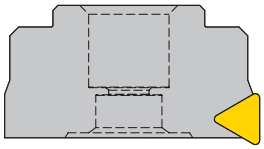




TPKN 2204

FACE MILLING CUTTERS
NARZĘDZIA DO OBRÓBKI PŁASZCZYZN

M321 | Z=5-20 | 57 - 58

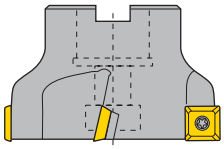




TPKX 2204

FACE MILLING CUTTERS
NARZĘDZIA DO OBRÓBKI PŁASZCZYZN

M176 | Z=5-24 | 59 - 60

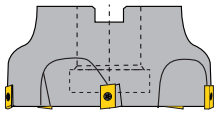




SEMT 09T308 120308

FACE MILLING CUTTERS
NARZĘDZIA DO OBRÓBKI PŁASZCZYZN

M177 | Z=5-16 | 61 - 62





1506 LNMT 2007 2510

FACE MILLING CUTTERS
NARZĘDZIA DO OBRÓBKI PŁASZCZYZN

M178 | Z=2-3 | 63 - 65

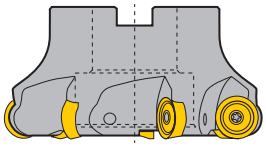




RCMT 10T3 1204

FACE MILLING CUTTERS
NARZĘDZIA DO OBRÓBKI PŁASZCZYZN

M178 | Z=4-10 | 64 - 65





RCMT 10T3 1204

FACE MILLING CUTTERS
NARZĘDZIA DO OBRÓBKI PŁASZCZYZN

M179 | Z=2-4 | 66 - 68

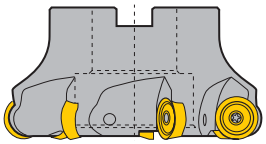




0702 0803 RDMW 1003 10T3 1204 12T3

FACE MILLING CUTTERS
NARZĘDZIA DO OBRÓBKI PŁASZCZYZN

M179 | Z=3-9 | 67 - 68

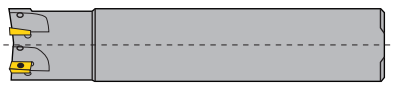




1003 1203 RDMW 12T3 1604 1605 2006

FACE MILLING CUTTERS
NARZĘDZIA DO OBRÓBKI PŁASZCZYZN

M180 | Z=1-6 | 69 - 73

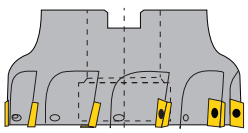




APLT 11T3 1604

SHOULDER MILLING CUTTERS
NARZĘDZIA WALCOWO-CZOŁOWE

M180 | Z=5-12 | 71 - 73



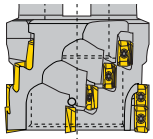


APLT 11T3 1604

SHOULDER MILLING CUTTERS
NARZĘDZIA WALCOWO-CZOŁOWE

SELECTION GUIDE SPIS TREŚCI

M182	**Z=16-24**	**74 - 97**

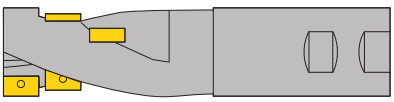




APLT 11T3 1604

SHOULDER MILLING CUTTERS
NARZĘDZIA WALCOWO-CZOŁOWE

M182	**Z=3-14**	**75 - 97**

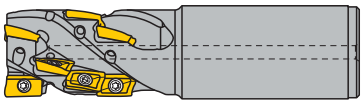




APLT 11T3 1604

SHOULDER MILLING CUTTERS
NARZĘDZIA WALCOWO-CZOŁOWE

M330	**Z=2-4**	**47 - 52**

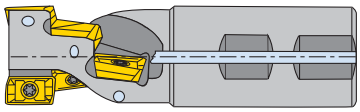




JDMX 1705

FACE MILLING CUTTERS
NARZĘDZIA DO OBRÓBKI PŁASZCZYZN

M650	**Z=2-8**	**77 - 82**

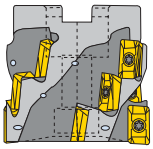




APKT 1604
APGT

SHOULDER MILLING CUTTERS
NARZĘDZIA WALCOWO-CZOŁOWE

M650	**Z=6-12**	**78 - 82**

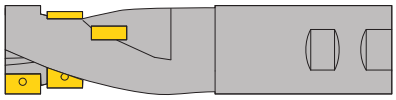




APKT 1604
APGT

SHOULDER MILLING CUTTERS
NARZĘDZIA WALCOWO-CZOŁOWE

M344	**Z=3**	**79 - 82**

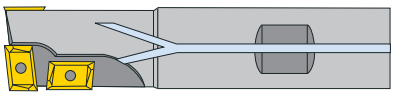




JDMX 1003 1604
APGT 1003 1604

SHOULDER MILLING CUTTERS
NARZĘDZIA WALCOWO-CZOŁOWE

M183	**Z=1-4**	**83 - 84**

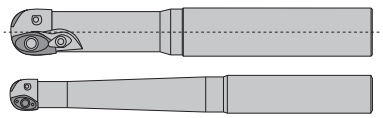




APMT 1135 1604

SHOULDER MILLING CUTTERS
NARZĘDZIA WALCOWO-CZOŁOWE

M500	**Z=2**	**85 - 90**

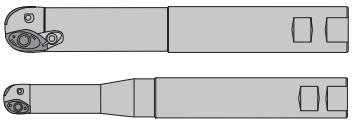




BPMT

PROFIL MILLING TOOLS
FREZY DO OBRÓBKI PROFILU

M500	**Z=2**	**86 - 90**

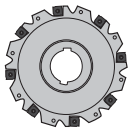




BPMT

PROFIL MILLING TOOLS
FREZY DO OBRÓBKI PROFILU

M541	**Z=10-24**	**91 - 93**

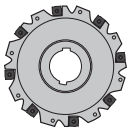




SNEQ 12T3 1202 1203 1204

SIDE AND FACE MILLING
FREZY DO OBRÓBKI BRZEGU ORAZ PROFILU

M541	**Z=10-24**	**92-93**

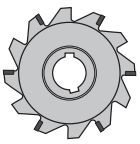




SNEQ 12T3 1202 1203 1204

SIDE AND FACE MILLING
FREZY DO OBRÓBKI BRZEGU ORAZ PROFILU

M542	**Z=10-18**	**94 - 96**



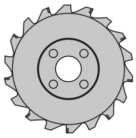


MPMT 0603 0803 1204

SIDE AND FACE MILLING
FREZY DO OBRÓBKI BRZEGU ORAZ PROFILU

SELECTION GUIDE SPIS TREŚCI

M543	Z=10-18	95 - 96

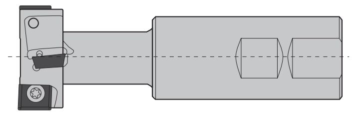




MPMT 0603 0803 1204

SIDE AND FACE MILLING
FREZY DO OBRÓBKI BRZEGU ORAZ PROFILU

M110	Z=2-6	97 - 98

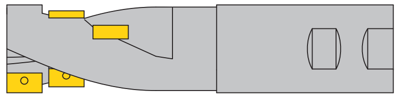


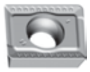


MPMT 0603 0803 1204

T-SLOT MILLING TOOLS
FREZY DO ROWKÓW TYPU T

M111	Z=2-4	99 - 102

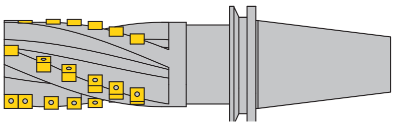


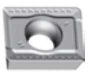


APLT 150412
SPMT 120408

HELLICAL END MILL
FREZY JEŻOWE

M112	Z=4	100 - 102

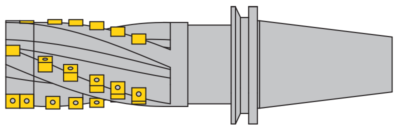




APLT 150412
SPMT 120408

HELLICAL END MILL
FREZY JEŻOWE

M113	Z=4	101 - 102

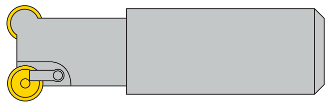




APLT 150412
SPMT 120408

HELLICAL END MILL
FREZY JEŻOWE

M120	Z=2-3	103 - 104

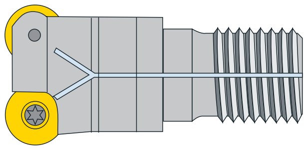




RDMX 0803 10T3 1204

MOULD MILLING CUTTERS
NARZĘDZIA DO DO OBRÓBKI FORM

M910	Z=2-5	105 - 106





RDMX 10T3

MOULD MILLING CUTTERS
NARZĘDZIA DO DO OBRÓBKI FORM

M390/M391/ M392	Z=1-3	107 - 110

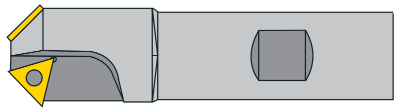




SPMT 1204

CHAMFERING MILLING CUTTERS
FREZY DO FAZOWANIA

M400	Z=2	111 - 118

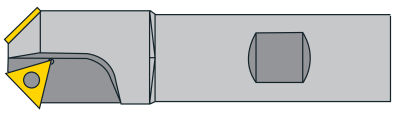




TCMT 1102 16T3

CHAMFERING MILLING CUTTERS
FREZY DO FAZOWANIA

M401	Z=1-3	112 - 118

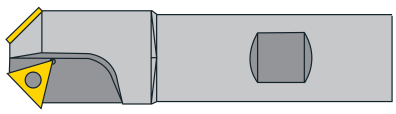




TCMT 1102 16T3

CHAMFERING MILLING CUTTERS
FREZY DO FAZOWANIA

M402	Z=1-3	113 - 118

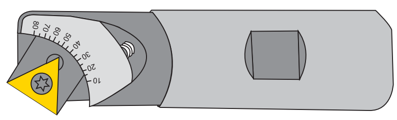




TCMT 1102 16T3

CHAMFERING MILLING CUTTERS
FREZY DO FAZOWANIA

M710		114 - 118



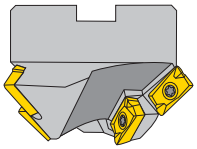


TCMT 1102 16T3

CHAMFERING MILLING CUTTERS
FREZY DO FAZOWANIA

SELECTION GUIDE SPIS TREŚCI

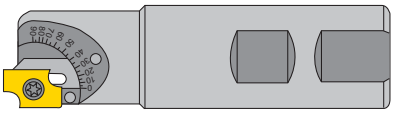
M135	**Z=6**	**119 - 124**




APKT 1604

CHAMFERING MILLING CUTTERS
FREZY DO FAZOWANIA

M741	**Z=6, 12**	**120 - 124**




XDCW 1503

CHAMFERING MILLING CUTTERS
FREZY DO FAZOWANIA

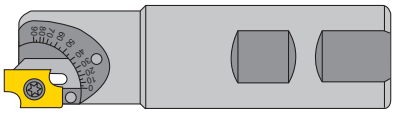
M810	**Z=2**	**121 - 124**




XDCW 1503
XPCW 2004

CHAMFERING MILLING CUTTERS
FREZY DO FAZOWANIA

M742		**122 - C124**




XDCW 1503

CHAMFERING MILLING CUTTERS
FREZY DO FAZOWANIA

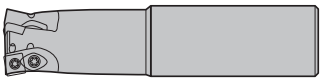
M820	**Z=2**	**123 - 124**




XDCW 1503
XPCW 2004

CHAMFERING MILLING CUTTERS
FREZY DO FAZOWANIA

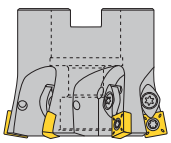
M550	**Z=2-3**	**125 - 126**




SDMT 09T3 1204

HIGH FEED MILLING CUTERS
FREZY DO OBRÓBKI SZYBKOŚCIOWEJ

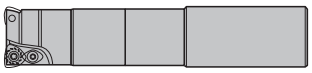
M550	**Z=4-6**	**125 - 126**




SDMT 09T3 1204

HIGH FEED MILLING CUTERS
FREZY DO OBRÓBKI SZYBKOŚCIOWEJ

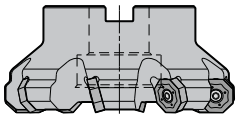
M551	**Z=2-3**	**127 - 128**




WPGT 0503 0604 0806 0907

HIGH FEED MILLING CUTERS
FREZY DO OBRÓBKI SZYBKOŚCIOWEJ

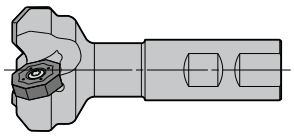
M173	**Z=5-17**	**129-131**




OSWX 0604 08T5

FACE MILLING CUTERS
FREZY DO OBRÓBKI PŁASZCZYZN

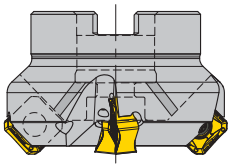
M173	**Z=2-4**	**130-131**




OSWX 0604 08T5

FACE MILLING CUTERS
FREZY DO OBRÓBKI PŁASZCZYZN

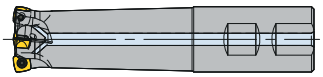
M184	**Z=4-16**	**132-134**




SWGX 1206

HIGH FEED MILLING CUTERS
FREZY DO OBRÓBKI SZYBKOŚCIOWEJ

M191	**Z=2-5**	**136-137**

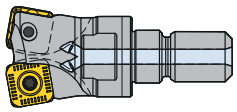



SEKW 08T3
SEKT

HIGH FEED MILLING CUTERS
FREZY DO OBRÓBKI SZYBKOŚCIOWEJ

SELECTION GUIDE SPIS TREŚCI

M192	Z=2-5	138-141

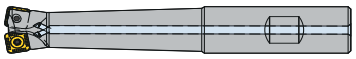




SPEW0803

FACE MILLING CUTERS
FREZY DO OBRÓBKI PŁASZCZYZN

M192	Z=2-4	139-141

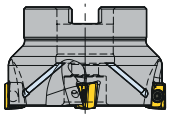




SPEW0803

HIGH FEED MILLING CUTERS
FREZY DO OBRÓBKI SZYBKOŚCIOWEJ

M186	Z=2-5	142-144

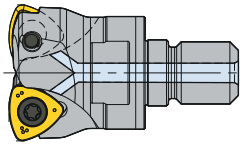




APKX0803

HIGH FEED MILLING CUTERS
FREZY DO OBRÓBKI SZYBKOŚCIOWEJ

M252	Z=2-5	140-141





WN..1207

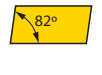
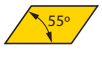
FACE MILLING CUTERS
FREZY DO OBRÓBKI PŁASZCZYZN

ISO MILLING INSERTS DESIGNATION OZNACZENIE PYTEK DO FREZOWANIA WEDŁUG ISO

ISO milling inserts designation / Oznaczenie pytek do frezowania według ISO

C	N	M	G	12	04	08	C1	P200
1	2	3	4	5	6	7	8	9

1 Shapes
Kształty

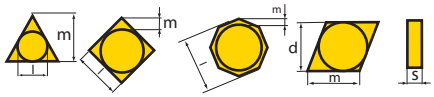
			
H	O	P	R
			
S	T	C	D
			
E	M	V	W
			
L	A	B	K

2 Reliefe angle
Kąt przyłożenia

	
A	B
	
C	D
	
E	F
	
G	N
	
P	

3 Tolerance
Tolerancje (mm)

Classe Klasa	m (±)	s (±)	d = l (±)
E	0,025	0,025	0,025
G	0,08	0,13	0,05
K	0,013	0,025	0,05
L	0,013	0,025	0,05
M	0,08	0,13	0,05
U	0,13	0,13	0,05



4 Type
Wykonanie

	
N	R
	
F	A
	
M	G, P
	
W	T
	Special Special
Q	X

5 Cutting edge lenght
Długość ostrza (mm))

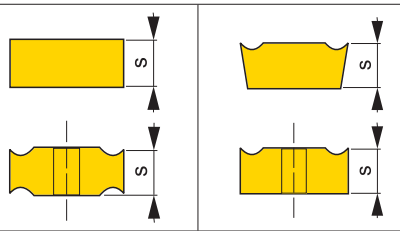
D=l(mm)	A	C	D	K	O	R	S	T	V	W
										
4,76										
5										
5,56					05					
6						06				
6,35		06	07					11		
6,7	10									
7,94					07					05
8						08				
9,525	15	09	11	16			09	16	16	06
10						10				
12						12				
12,7		12	15				12	22		08
15,87	16	16					15	27		
19,05		19					19			
25,4		25					25			

ISO MILLING INSERTS DESIGNATION OZNACZENIE PYTEK DO FREZOWANIA WEDŁUG ISO

ISO milling inserts designation / Oznaczenie pytek do frezowania według ISO

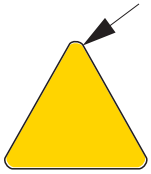
C	N	M	G	12	04	08	C1	P200
1	2	3	4	5	6	7	8	9

6 Thickness
Grubość (mm)



Specification Oznaczenie	S (mm)
01	1,59
T1	1,98
02	2,38
03	3,18
T3	3,97
04	4,76
05	5,56
06	6,35
07	7,94

7 Corner radius
Promień naroża (mm)



Specification Oznaczenie	r (mm)
00	0
02	0,2
04	0,4
08	0,8
12	1,2
16	1,6
24	2,4
32	3,2

8 Chip breaker
Łamacz wióra

See description on pages .....
Zobacz opis na stronach .....

9 Grade
Gatunek

See description on pages .....
Zobacz opis na stronach .....

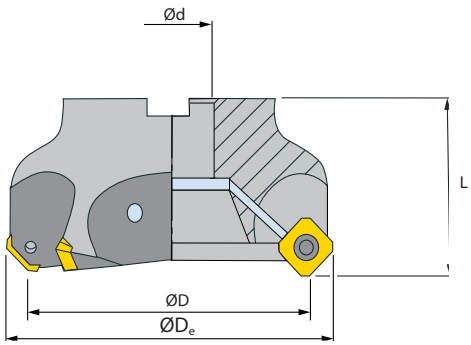
FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

M770

Face Milling Cutters With Corner Angle 45°
Frezy do obróbki płaszczyzn o kącie przystawienia 45°



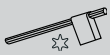




Tools / Narzędzia

EDP Nr. new nowy	**EDP Nr.**	**Dimensions** Wymiary (mm)						**Insert** Płytka
		ØD	**Ød**	**ØDe**	**L**	**Z**	**ap**	
M770A05004022048SD12	M770HW0500	50	22	63	48	4	0,5-6	SDKT1204
M770A06305022048SD12	M770HW0630	63	22	76	48	5		
M770A08006027050SD12	M770HW0800	80	27	93	50	6		
M770A10006032050SD12	M770HW1000	100	32	113	50	6		
M770A12507040063SD12	M770HW1250	125	40	138	63	7		
M770A16008040063SD12	M770HW1600	160	40	173	63	8		
M770A20012060063SD12	M770HW2000	200	60	213	63	12		
M770A25016060063SD12	M770HW2500	250	60	263	63	16		

Accessories / Akcesoria

Tool Narzędzie	**ØD**	Insert Screw	Wrench
			
M770	Ø50 - Ø250	SR088	W011

FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

Milling Inserts Płytki do frezowania

SDKT

Insert Shape Kształt płytki	Type Typ	P Steel / Stal	H Hardened Steel Stal hartowana	M Stainless Steel Stal nierdzewna	K Cast iron Żeliwo	N Non-ferrous materials Materiały nieżelazne	S Heat-resistant steel Stal żaroodporna
	SDKT120408 C57 P100	●	●	●	●		●

Cutting Conditions / Parametry skrawania SDKT120408

Material Group Grupa materiałowa	Group № N° Grupy	Material Examples Przykłady materiałów	Hardness Twardość HB	d.o.c. a_p (mm) min	d.o.c. a_p (mm) max	feed (mm/tooth) f (mm/ząb) min	feed (mm/tooth) f (mm/ząb) max	V_c (m/min) min	V_c (m/min) max
Low Carbon Steel Stal niskowęglowa	1	Ck15 9SMnPb28	150 180 210	0.50	6.00	0.18	0.48	190	350 300 260
Alloy Steel Stal stopowa	2	42 CrMo 4 100 Cr 6 32 NiCrMo 14.5	180 230 280 320	0.50	6.00	0.15	0.45 0.40	150 130	240 210 190 170
High Alloy Steel Stal wysokostopowa	3	X38 CrMoV 5 X210 CrW 12 X90 CrMoV 8	220 280 320 350	0.50	5.00	0.12	0.42 0.38	90 60	150 130 110 90
Austenitic Stainless Steel Stal nierdzewna austenityczna	4	303 / 304 304 L	210 - 250	0.50	6.00	0.18	0.35	170	250
	5	316 / 316L	230 - 270		5.00	0.15	0.32	160	210
	6	316 Ti 630 (F16PH)	.....		4.00	0.12	0.28	70	150
Ferritic Stainless Steel Stal nierdzewna ferrytyczna	7	430 / 439 / 444	Annealed Wyżarzona	0.50	6.00	0.18	0.35	150	210
Martensitic Stainless Steel Stal nierdzewna martenzytyczna	8	410 / 420	Annealed Wyżarzona	0.50	6.00	0.15	0.35	150	230
			Treated Ulepszona				0.28	90	170
Cast Iron Żeliwo szare	9	EN - GJL 200 EN - GJL 250 EN - GJL 300	140 - 230	0.50	6.00	0.18	0.48	170	300 250 210
Nodular Cast Iron Żeliwo sferoidalne	10	EN - GJS 400 EN - GJS 600 EN - GJS 800	210 260 310	0.50	6.00	0.15	0.42	120	210 170 150
Nickel Based Alloys Stopy niklu	11	Inconel 625 Inconel 718 Hastelloy C	.....	0.50	4.00	0.15	0.28	25 28 40	35 40 60
Ti Alloy Stop Ti	12	TiAl 6V4 T40	.....	0.50	4.00	0.18	0.32 0.28	35 28	60 40

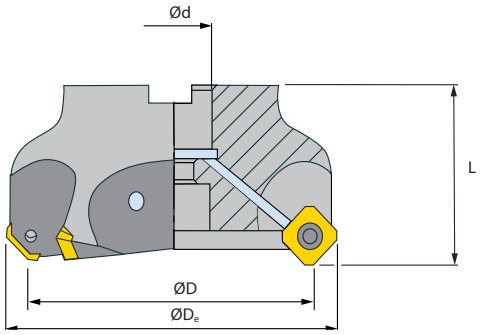
FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

M700

Face Milling Cutters With Corner Angle 45°
Frezy do obróbki płaszczyzn o kącie przystawienia 45°



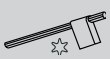




Tools / Narzędzia

EDP Nr. new nowy	**EDP Nr.**	**Dimensions** Wymiary (mm)						**Insert** Płytka
		ØD	**Ød**	**ØDe**	**L**	**Z**	**ap**	
M700A04003016053SE12	M700HW0400	40	16	53	40	3	0,5-6	SEKT 1204
M700A05004022063SE12	M700HW0500	50	22	63	45	4		
M700A06305022076SE12	M700HW0630	63	22	76	45	5		
M700A08006027093SE12	M700HW0800	80	27	93	50	6		
M700A10006032113SE12	M700HW1000	100	32	113	50	6		
M700A12507040138SE12	M700HW1250	125	40	138	60	7		
M700A16008040173SE12	M700HW1600	160	40	173	63	8		
M700A20012060213SE12	M700HW2000	200	60	213	63	12		
M700A25016060263SE12	M700HW2500	250	60	263	63	16		

Accessories / Akcesoria

Tool Narzędzie	**ØD**	Insert screw	Wrench
			
M700	Ø40 - Ø250	SR101	W011

FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

Milling Inserts Płytki do frezowania

SEKT

Insert Shape Kształt płytki	Type Typ	P	H	M	K	N	S
		Steel Stal	**Hardened Steel** Stal hartowana	**Stainless Steel** Stal nierdzewna	**Cast iron** Żeliwo	**Non-ferrous materials** Materiały nieżelazne	**Heat-resistant steel** Stal żaroodporna
	SEKT120408 C57 P100	●	●	●	●		●

Cutting Conditions / Parametry skrawania SEKT120408

Material Group Grupa materiałowa	Group № N° Grupy	Material Examples Przykłady materiałów	Hardness Twardość HB	d.o.c. a_p (mm)		feed (mm/tooth) f (mm/ząb)		V_c (m/min)	
				min	max	min	max	min	max
Low Carbon Steel Stal niskowęglowa	1	Ck15 9SMnPb28	150	0.50	7.00	0.20	0.48	190	350
			180						300
			210						260
Alloy Steel Stal stopowa	2	42 CrMo 4 100 Cr 6 32 NiCrMo 14.5	180	0.50	7.00	0.18	0.45	150	240
			230						210
			280				0.40	130	190
			320						170
High Alloy Steel Stal wysokostopowa	3	X40 CrMoV 51 40 NiMo 6 S 2-10-1-8 H13 / D2 HSS / M42	220	0.50	7.00	0.16	0.42	90	150
			280						130
			320				0.38	60	110
			350						90
Hardened Steel Stal hartowana			400	0.30	5	0.14	0.35	40	80
			480		3		0.32		70
			550		1.5		0.28		60
Austenitic Stainless Steel Stal nierdzewna austenityczna	4	303 / 304 304 L	210 - 250	0.50	6.00	0.18	0.35	170	250
	5	316 / 316L	230 - 270		5.00	0.15	0.32	160	210
	6	316 Ti 630 (F16PH)	.....		4.00	0.12	0.28	70	150
Ferritic Stainless Steel Stal nierdzewna ferrytyczna	7	430 / 439 / 444	Annealed Wyżarzona	0.50	6.00	0.18	0.35	150	210
Martensitic Stainless Steel Stal nierdzewna martenzytyczna	8	410 / 420	Annealed Wyżarzona	0.50	6.00	0.15	0.35	150	230
			Treated Ulepszona				0.28	90	170
Cast Iron Żeliwo szare	9	EN - GJL 200	140 - 230	0.50	6.00	0.18	0.48	170	300
		EN - GJL 250							250
		EN - GJL 300							210
Nodular Cast Iron Żeliwo sferoidalne	10	EN - GJS 400	210	0.50	6.00	0.15	0.42	120	210
		EN - GJS 600	260						170
		EN - GJS 800	310						150
White Cast Iron Żeliwo białe	11	G-X260NiCr42	400	0.3	3.00	0.14	0.32	30	60
Nickel Based Alloys Stopy niklu	12	Inconel 625	.....	0.50	4.00	0.15	0.28	25	35
		Inconel 718						28	40
		Hastelloy C						40	60
Ti Alloy Stop Ti	13	TiAl 6V4	.....	0.50	4.00	0.18	0.32	35	60
		T40					0.28	28	40

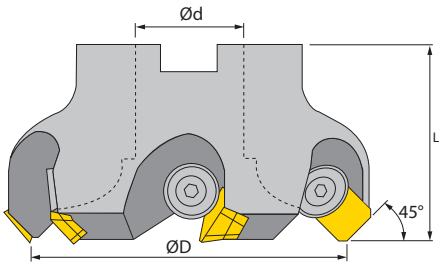
FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

M440

Face Milling Cutters With Corner Angle 45°
Frezy do obróbki płaszczyzn o kącie przystawienia 45°



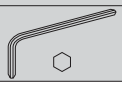




Tools / Narzędzia

EDP Nr. new nowy	**EDP Nr.**	**Dimensions** Wymiary (mm)					**Insert** Płytka
		ØD	**Ød**	**L**	**Z**	**ap**	
M440A05004022063SE12	M440H00630	50	22	63	4	0,5-7,5	SEKN1203 SEKR1203
M440A06305022076SE12	M440H00800	63	22	76	5		
M440A08006027093SE12	M440H01000	80	27	93	6		
M440A10006032113SE12	M440H01250	100	32	113	6		
M440A12507040138SE12	M440H01600	125	40	138	7		

Accessories / Akcesoria

Tool Narzędzie	**ØD**				
M440	Ø50 - Ø160	SR105	SR100	SH102	W015

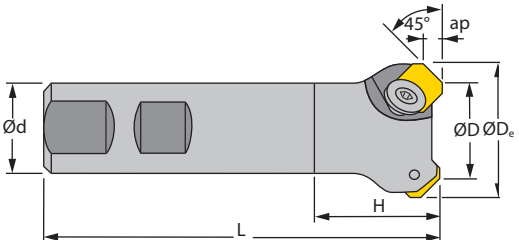
FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

Face Milling Cutters With Corner Angle 45°
Frezy do obróbki płaszczyzn o kącie przystawienia 45°

M440



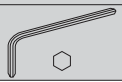
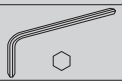




Tools / Narzędzia

EDP Nr. new nowy	**EDP Nr.**	**Dimensions** Wymiary (mm)							**Insert** Płytka
		ØD	**Ød**	**ØDe**	**L**	**H**	**Z**	**ap**	
M440A04002W25053SE12	M750W00250	25	25	38	100	35	2	0,5-7	SEKN1203 SEKR1203
M440A05003W32063SE12	M750W00320	32	25	45	110	44	3		
M440A06304W40076SE12	M750W00400	40	32	53	115	45	4		

Accessories / Akcesoria

Tool Narzędzie	**ØD**	Support	Insert Screw	Screw Support	Wrench	Wrench
						
M440	Ø25 - Ø40	SH100	SR102	SR103	W102	W101

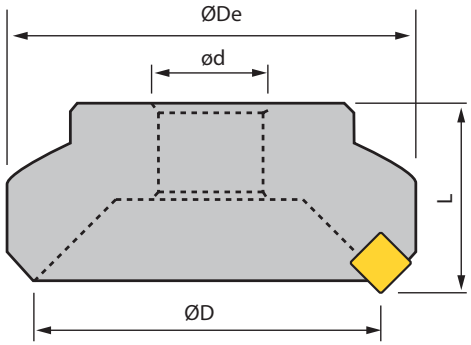
FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

M441

Face Milling Cutters With Corner Angle 45°
Frezy do obróbki płaszczyzn o kącie przystawienia 45°







Tools / Narzędzia

EDP Nr. new nowy	**EDP Nr.**	**Dimensions** Wymiary (mm)						**Insert** Płytka
		ØD	**Ød**	**ØDe**	**L**	**Z**	**ap**	
M441A06304027050SE12		63	27	83	50	4		SEKN1203
M441A08004027050SE12		80	27	98	50	4		
M441A10005032055SE12		100	32	120	55	5		
M441A12506040055SE12		125	40	148	55	6		
M441A16008040060SE12		160	40	180	60	8		
M441A20010060060SE12		200	60	220	60	10		
M441A25012060065SE12		250	60	274	65	12		
M441A30514060065SE12		305	60	325	65	14		
M441A35616060065SE12		356	60	376	65	16		
M441A08006027050SE12		80	27	98	50	6		
M441A10007032055SE12		100	32	120	55	7		
M441A12509040055SE12		125	40	148	55	9		
M441A16011040060SE12		160	40	180	60	11		
M441A20014060060SE12		200	60	220	60	14		
M441A25018060065SE12		250	60	274	65	18		
M441A30522060065SE12		305	60	325	65	22		
M441A35626060065SE12		350	60	356	65	26		
M441A08004027050SE15		80	27	98	50	4		SEKN1504
M441A10005032055SE15		100	32	120	55	5		
M441A12506040055SE15		125	40	148	55	6		
M441A16008040060SE15		160	40	180	60	8		
M441A20010060060SE15		200	60	220	60	10		
M441A25012060065SE15		250	60	274	65	12		
M441A30514060065SE15		305	60	325	65	14		
M441A35616060065SE15		356	60	376	65	16		
M441A10007032055SE15		100	32	120	55	7		
M441A12509040055SE15		125	40	148	55	9		
M441A16011040060SE15		160	40	180	60	11		
M441A20014060060SE15		200	60	220	60	14		
M441A25018060065SE15		250	60	274	65	18		
M441A30522060065SE15		305	60	325	65	22		
M441A35026060065SE15		350	60	356	65	26		

Accessories / Akcesoria

Tool Narzędzie	**ØD**	**Locator**	**Wedge** Klin	**Locator clamp**	**Clamp Screw** Śruba zacisku	**Wrench** Klucz	Washer
M441	Ø63 - Ø350	K101	WG101	LC100	CS106	W103	WA100

FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

Milling Inserts Płytki do frezowania

SEKN SEKR

Insert Shape Kształt płytki	Type Typ	P	H	M	K	N	S
		Steel Stal	**Hardened Steel** Stal hartowana	**Stainless Steel** Stal nierdzewna	**Cast iron** Żeliwo	**Non-ferrous materials** Materiały nieżelazne	**Heat-resistant steel** Stal żaroodporna
	SEKN120305 C57 P100	●	●	●	●		●
	SEKN1504 C57 P100	●	●	●	●		●
	SEKR120305 C57 P100	●	●	●	●		●

Cutting Conditions / Parametry skrawania SEKN120305

Material Group Grupa materiałowa	Group № N° Grupy	Material Examples Przykłady materiałów	Hardness Twardość HB	d.o.c. a_p (mm)		feed (mm/tooth) f (mm/ząb)		V_c (m/min)	
				min	max	min	max	min	max
Low Carbon Steel Stal niskowęglowa	1	Ck15 9SMnPb28	150	0.50	7.00	0.15	0.32	190	350
			180						300
			210						260
Alloy Steel Stal stopowa	2	42 CrMo 4 100 Cr 6 32 NiCrMo 14.5	180	0.50	7.00	0.15	0.30	150	240
			230						210
			280					130	190
			320						170
High Alloy Steel Stal wysokostopowa	3	X40 CrMoV 51 40 NiMo 6 S 2-10-1-8 H13 / D2 HSS / M42	220	0.50	7.00	0.12	0.25	90	150
			280						130
			320					60	110
			350						90
Hardened Steel Stal hartowana			400	0.50	5	0.12	0.24	40	80
			480		3		0.22		70
			550		1.5		0.2		60
Austenitic Stainless Steel Stal nierdzewna austenityczna	4	303 / 304 304 L	Annealed Wyżarzona	0.50	5.00	0.12	0.32	170	250
	5	316 / 316L	Annealed Wyżarzona			0.12	0.28	170	210
	6	316 Ti 630 (F16PH)	Annealed Wyżarzona			0.12	0.25	80	130
Ferritic Stainless Steel Stal nierdzewna ferrytyczna	7	430 / 439 / 444	Annealed Wyżarzona	0.50	7.00	0.12	0.32	150	210
Martensitic Stainless Steel Stal nierdzewna martenzytyczna	8	410 / 420	Annealed Wyżarzona	0.50	7.00	0.12	0.32	150	230
			Treated Ulepszona					90	170
Cast Iron Żeliwo szare	9	EN - GJL 200	140 - 230	0.50	7.00	0.15	0.40	170	300
		EN - GJL 250							250
		EN - GJL 300							210
Nodular Cast Iron Żeliwo sferoidalne	10	EN - GJS 400	210	0.50	7.00	0.12	0.32	120	210
		EN - GJS 600	260						170
		EN - GJS 800	310						150
Nickel Based Alloys Stopy niklu	11	Inconel 625	.....	0.50	5.00	0.12	0.28	25	35
		Inconel 718							40
		Hastelloy C							65
Ti Alloy Stop Ti	12	TiAl 6V4	.....	0.50	5.00	0.12	0.28	35	60
		T40						28	40

FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

SEKN SEKR

Milling Inserts Płytki do frezowania

Cutting Conditions / Parametry skrawania SEKN1504

Material Group Grupa materiałowa	Group № N° Grupy	Material Examples Przykłady materiałów	Hardness Twardość HB	d.o.c. a_p (mm)		feed (mm/tooth) f (mm/ząb)		V_c (m/min)	
				min	max	min	max	min	max
Low Carbon Steel Stal niskowęglowa	1	Ck15 9SMnPb28	150	0.50	9	0,2	0,52	190	350
			180						300
			210						260
Alloy Steel Stal stopowa	2	42 CrMo 4 100 Cr 6 32 NiCrMo 14.5	180	0.50	9	0,2	0,48	150	240
			230						210
			280				0,45	130	190
			320						170
High Alloy Steel Stal wysokostopowa	3	X40 CrMoV 51 40 NiMo 6 S 2-10-1-8 H13 / D2 HSS / M42	220	0.50	9	0,15	0,42	90	150
			280						130
			320				0,38	60	110
			350						90
Hardened Steel Stal hartowana			400	0.50	5	0,12	0,32	40	80
			480		3		0,28		70
			550		1,5		0,26		60
Austenitic Stainless Steel Stal nierdzewna austenityczna	4	303 / 304 304 L	Annealed Wyżarzona	0.50	5.00	0.12	0.32	170	250
	5	316 / 316L	Annealed Wyżarzona			0.12	0.28	170	210
	6	316 Ti 630 (F16PH)	Annealed Wyżarzona			0.12	0.25	80	130
Ferritic Stainless Steel Stal nierdzewna ferrytyczna	7	430 / 439 / 444	Annealed Wyżarzona	0.50	7.00	0.12	0.32	150	210
Martensitic Stainless Steel Stal nierdzewna martenzytyczna	8	410 / 420	Annealed Wyżarzona	0.50	7.00	0.12	0.32	150	230
			Treated Ulepszona					90	170
Cast Iron Żeliwo szare	9	EN - GJL 200	140 - 230	0.50	7.00	0.15	0.40	170	300
		EN - GJL 250							250
		EN - GJL 300							210
Nodular Cast Iron Żeliwo sferoidalne	10	EN - GJS 400	210	0.50	7.00	0.12	0.32	120	210
		EN - GJS 600	260						170
		EN - GJS 800	310						150
Nickel Based Alloys Stopy niklu	11	Inconel 625	.....	0.50	5.00	0.12	0.28	25	35
		Inconel 718							40
		Hastelloy C							65
Ti Alloy Stop Ti	12	TiAl 6V4	.....	0.50	5.00	0.12	0.28	35	60
		T40						28	40

FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

Milling Inserts Płytki do frezowania

SEKN SEKR

Cutting Conditions / Parametry skrawania SEKR120305

Material Group Grupa materiałowa	Group № N° Grupy	Material Examples Przykłady materiałów	Hardness Twardość HB	d.o.c. a_p (mm)		feed (mm/tooth) f (mm/ząb)		V_c (m/min)	
				min	max	min	max	min	max
Low Carbon Steel Stal niskowęglowa	1	Ck15 9SMnPb28	150	0.50	6.00	0.18	0.32	190	350
			180						300
			210						260
Alloy Steel Stal stopowa	2	42 CrMo 4 100 Cr 6 32 NiCrMo 14.5	180	0.50	6.00	0.15	0.30	150	240
			230						210
			280					130	190
			320						170
High Alloy Steel Stal wysokostopowa	3	X38 CrMoV 5 X210 CrW 12 X90 CrMoV 8	220	0.50	5.00	0.12	0.25	90	150
			280						130
			320					60	110
			350						90
Austenitic Stainless Steel Stal nierdzewna austenityczna	4	303 / 304 304 L	210 - 250	0.50	6.00	0.18	0.32	170	250
	5	316 / 316L	230 - 270		5.00	0.15	0.28	160	210
	6	316 Ti 630 (F16PH)	.....		4.00	0.12	0.25	70	150
Ferritic Stainless Steel Stal nierdzewna ferrytyczna	7	430 / 439 / 444	Annealed Wyżarzona	0.50	6.00	0.18	0.32	170	250
Martensitic Stainless Steel Stal nierdzewna martenzytyczna	8	410 / 420	Annealed Wyżarzona	0.50	6.00	0.12	0.32	150	230
			Treated Ulepszona				0.23	90	170
Cast Iron Żeliwo szare	9	EN - GJL 200	140 - 230	0.50	6.00	0.15	0.32	170	300
		EN - GJL 250							250
		EN - GJL 300							210
Nodular Cast Iron Żeliwo sferoidalne	10	EN - GJS 400	210	0.50	6.00	0.12	0.28	120	210
		EN - GJS 600	260						170
		EN - GJS 800	310						150
Nickel Based Alloys Stopy niklu	11	Inconel 625	.....	0.50	4.00	0.12	0.23	25	35
		Inconel 718						28	40
		Hastelloy C						40	60
Ti Alloy Stop Ti	12	TiAl 6V4	.....	0.50	4.00	0.12	0.28	35	60
		T40						28	40

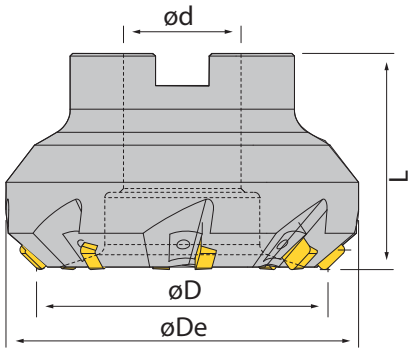
FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

M164

Face Milling Cutters With Corner Angle 45°
Frezy do obróbki płaszczyzn o kącie przystawienia 45°







Tools / Narzędzia

EDP Nr. new nowy	**EDP No.**	**Dimensions** Wymiary (mm)						**Insert** Płytka
		ØD	**Ød**	**ØDe**	**L**	**Z**	**apmax**	
M164B08004027050SE12		80	27	103	50	4		
M164B10005032050SE12		100	32	122	50	5		
M164B12506040063SE12		125	40	147	63	6		
M164B16008040063SE12		160	40	181	63	8	5,5	SEEN1203
M164B20010060063SE12		200	60	221	63	10		
M164B25012060063SE12		250	60	270	63	12		
M164B31515060063SE12		315	60	353	63	15		
M164B0800427050SE15		80	27	103	50	4		
M164B1000532050SE15		100	32	122	50	5		
M164B1250640063SE15		125	40	147	63	6		
M164B1600840063SE15		160	40	181	63	8	7,5	SEEN1504
M164B2001060063SE15		200	60	221	63	10		
M164B2501260063SE15		250	60	270	63	12		
M164B3151560063SE15		315	60	353	63	15		

Accessories / Akcesoria

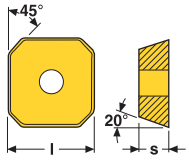
Tool Narzędzie	**Diameter** Średnica ØD	**Inserts** Płytki	**Locator**	**Wedge** Klin	**Screw** Śruba	**Locator Screw** Śruba	**Wrench** Klucz
M164	Ø80- Ø315	SE12	K105	W01RLZ	CS111	LS102	W020 W114
	Ø80- Ø315	SE15	K106	W01RLZ	CS111	LS102	W020 W114

FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

Milling Inserts Płytki do frezowania

SEEN SEKR

● - stable machining/obróbka stabilna
● - general machining/obróbka ogólna
✱ - interrupted cut/obróbka przerywana
obróbka przerywana



P	Steel / Stal	●	✱	●	✱		●	●		●	●	✱		●	●	●	✱			
M	Stainless Steel Stal nierdzewna	●	✱	●	✱			●		●	●	✱		●	●	●	✱			
K	Cast Iron Żeliwo szare					●	✱	●	●				●	●				●		✱
N	Non-ferrous materials Materiały nieżelazne																		●	✱
S	Heat-resistant steel Stal żaroodporna							●	●	●	●									

Insert Shape	Type	Basic Dimensions (mm)			CVD Coating						PVD Coating							Cermet		Cemented carbide			
		l	l.C	s	P127	P128	P228	P102	P203	P204	P100	P225	P216	P246	P226	P251	P143	P230	P231	P139	P234	P224	P235
	SEEN1203 C170	12.7	12.7	3.18																			
	SEEN1203 C171	12.7	12.7	3.18																			
	SEEN1203 C172	12.7	12.7	3.18	●															○		●	
	SEEN1203 C170	12.7	12.7	3.18	●		●											●		●			●
	SEER1203 C172	12.7	12.7	3.18	●	○							●										
	SEEN1504 C172	15.875	15.875	4.76	○																	○	○
	SEEN1504 C170	15.875	15.875	4.76	●	●	●													●			
	SEER1504 C172	15.875	15.875	4.76																			

Cutting Conditions / Parametry skrawania

Material Group Grupa materiałowa	Hardness Twardość HB	Insert grade Gatunek płytki	V(m/min)	f(mm/z)
Low Carbon Steel Stal niskowęglowa	≤180	P230	430 (340-500)	0.2 (0.1-0.4)
		P228 P127	270 (220-350)	0.2 (0.1-0.4)
		P102	220 (180-300)	0.25 (0.15-0.3)
		P216	270 (200-360)	0.2 (0.1-0.3)
		P139	140 (100-220)	0.27 (0.1-0.4)
High-carbon steel **Alloy steel** Stal wysokowęglowa Stopy stali	180-280	P230	400 (320-480)	0.2 (0.1-0.4)
		P228 P127	240 (200-320)	0.2 (0.1-0.4)
		P102	200 (160-280)	0.25 (0.15-0.3)
		P216	240 (180-350)	0.2 (0.1-0.3)
		P139	120 (80-200)	0.27 (0.1-0.4)
Alloy tool steel Stopy stali narzędziowej	280-350	P230	350 (300-450)	0.2 (0.1-0.4)
		P228 P127	220 (180-300)	0.2 (0.1-0.4)
		P102	180 (150-250)	0.25 (0.15-0.3)
		P216	220 (170-340)	0.2 (0.1-0.3)
		P139	100 (60-180)	0.27 (0.1-0.4)
Stainless steel Stal nierdzewna	≤270	P230	220 (160-280)	0.2 (0.1-0.4)
		P228	130 (100-220)	0.2 (0.1-0.4)
		P102	140 (100-240)	0.25 (0.15-0.3)
		P216	140 (100-250)	0.2 (0.1-0.3)
Cast iron Żeliwo	180-250	P225	210 (120-300)	0.2 (0.1-0.3)
		P204	200 (150-250)	0.2 (0.1-0.4)
		P235	100 (80-160)	0.25 (0.1-0.4)

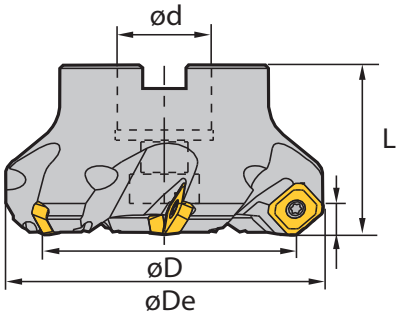
FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

M162
M163

45°

Face Milling Cutters With Corner Angle 45°
Frezy do obróbki płaszczyzn o kącie przystawienia 45°





Tools / Narzędzia

EDP Nr. new nowy	**EDP No.**	**Dimensions** Wymiary (mm)						**Insert** Płytka
		ØD	**Ød**	**ØDe**	**L**	**Z**	**apmax**	
M162B05004022040SE12		50	22	61	40	4	6	SEKT12T3
M162A0500422040SE12		50	22	61	40	4		
M162B06305022040SE12		63	22	74	40	5		
M162A06305022040SE12		63	22	74	40	5		
M162B08006027050SE12		80	27	91	50	6		
M162A08006027050SE12		80	27	91	50	6		
M162B10007032050SE12		100	32	107	50	7		
M162A10007032050SE12		100	32	107	50	7		
M162A12508040063SE12		125	40	136	63	8		
M162B16010040063SE12		125	40	136	63	8		
M162A16010040063SE12		160	40	170	63	10		
M162B20012060063SE12		200	60	210	63	12		
M162B25014060063SE12		250	60	260	63	14		
M162B31518060070SE12		315	60	325	70	18		
M163B05003022040SE12		50	22	61	40	3		
M163B06304022040SE12		63	22	74	40	4		
M163B08004027050SE12		80	27	91	50	4		
M163B10005032050SE12		100	32	107	50	5		
M163B12506040063SE12		125	40	131	63	6		

Accessories / Akcesoria

Tool Narzędzie	**Diameter** Średnica ØD	**Insert screw** Śrubka do płytki	**Shim** Podkładka	**Shim Screw** Śrubka do podkładki	**Wrench** Klucz	**Wrench** Klucz
M162	Ø50- Ø100	SR067	–	–	W116	–
	Ø125- Ø315	SR068	SH104	SR086		W115
M163	Ø50- Ø125	SR067	–	–	W116	–

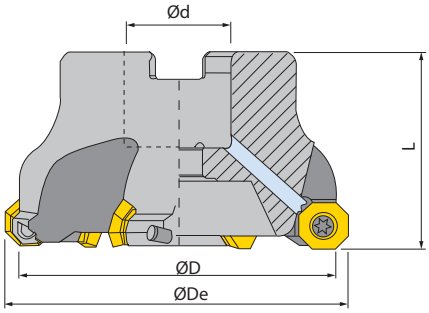
FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

M460

43°

Face Milling Cutters With Corner Angle 43°
Frezy do obróbki płaszczyzn o kącie przystawienia 43°

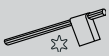




Tools / Narzędzia

EDP Nr. new nowy	**EDP Nr.**	**Dimensions** Wymiary (mm)						**Insert** Płytka
		ØD	**Ød**	**ØDe**	**L**	**Z**	**apmax**	
M460A04003016040OD06	M460HW0400	40	16	47	40	3	0,5-4	ODMX0605 ODMW0605
M460A05004022040OD06	M460HW0500	50	22	57	40	4		
M460A06305022040OD06	M460HW0630	63	22	70	40	5		
M460A08006027050OD06	M460HW0800	80	27	87	50	6		
M460A10007032050OD06	M460HW1000	100	32	107	50	7		
M460A12508040063OD06	M460HW1250	125	40	132	63	8		
M460A20012060063OD06	M460HW2000	200	60	206,5	63	12		

Accessories / Akcesoria

Tool Narzędzie	**ØD**	Insert Screw	Wrench
			
M460	Ø40 - Ø80	SR106	W017

FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

Milling Inserts Płytki do frezowania

ODMX ODMW

Insert Shape Kształt płytki	Type Typ	P	H	M	K	N	S
		Steel / Stal	Hardened Steel Stal hartowana	Stainless Steel Stal nierdzewna	Cast iron Żeliwo	Non-ferrous materials Materiały nieżelazne	Heat-resistant steel Stal żaroodporna
	ODMX0605 C53 P100	●	●	●	●		●
	ODMW0605 C53 P100	●	●		●		

FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

Cutting Conditions / Parametry skrawania ODMX0605

Material Group Grupa materiałowa	Group № N° Grupy	Material Examples Przykłady materiałów	Hardness Twardość HB	d.o.c. a_p (mm)		feed (mm/tooth) f (mm/ząb)		V_c (m/min)	
				min	max	min	max	min	max
Low Carbon Steel Stal niskowęglowa	1	Ck15 Ck45 1020 1045	150	0,5	4	0,23	0,52	190	350
			180		4		0,52		300
			210		4		0,52		260
Alloy Steel Stal stopowa	2	42 CrMo 4 St 50-2 Ck60 /1060 /4140	180	0,5	4	0,20	0,48	150	240
			230		4		0,48		210
			280	0,5	4	0,20	0,45	130	190
			320		4		0,45		170
High Alloy Steel Stal wysokostopowa	3	X40 CrMoV 51 40 NiMo 6 S 2-10-1-8 H13 / D2 HSS / M42	220	0,5	4	0,15	0,42	90	150
			280		4		0,42		130
			320	0,5	4	0,15	0,38	60	110
			350		4		0,38		90
Hardened Steel Stal hartowana			400	0,5	3	0,14	0,25	40	80
			480		2		0,22		70
			550		1		0,20		60
Austenitic Stainless Steel Stal nierdzewna austenityczna	4	X5 CrNi 18 9 304	210 to 250	0,5	4	0,18	0,35	190	250
	5	X2 CrNiMo 17 2 2 316	230 to 270	0,5	4	0,18	0,32	160	210
	6	X6 CrNiMoTi 17 12 2 316 Ti Duplex / Nitronic	----------	0,5	4	0,15	0,28	70	150
Ferritic Stainless Steel Stal nierdzewna ferrytyczna	7	X8 Cr 7 430	Annealed Wyżarzona	0,5	4	0,21	0,38	150	210
Martensitic Stainless Steel Stal nierdzewna martenzytyczna	8	X15 Cr 13 410	Annealed Wyżarzona	0,5	4	0,21	0,38	150	230
			Treated Ulepszona	0,5	4	0,21	0,32	90	170
Cast Iron Żeliwo szare	9	GG 20	140 to 230	0,5	4	0,22	0,50	170	300
		GG 25							250
		GG 30							210
Nodular Cast Iron Żeliwo sferoidalne	10	GGG 40	210	0,5	4	0,18	0,45	120	210
		GGG 50	260						170
		GGG 70	310						150
White Cast Iron Żeliwo białe	11	G-X260NiCr42	400	0,5	3	0,14	0,25	30	60
Nickel Based Alloys Stopy niklu	12	Inconel 625	----------	0,5	4	0,16	0,32	25	35
		Inconel 718						28	38
		Hastelloy C						40	65
Ti Alloy Stop Ti	13	TiAl 6 V4	----------	0,5	4	0,18	0,32	35	60
		T40					0,28	28	40

FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

Cutting Conditions / Parametry skrawania ODMW0605

Material Group Grupa materiałowa	Group № N° Grupy	Material Examples Przykłady materiałów	Hardness Twardość HB	d.o.c. a_p (mm)		feed (mm/tooth) f (mm/ząb)		V_c (m/min)	
				min	max	min	max	min	max
Low Carbon Steel Stal niskowęglowa	1	Ck15 Ck45 1020 1045	150	0,5	4	0,28	0,52	190	350
			180		4		0,52		300
			210		4		0,52		260
Alloy Steel Stal stopowa	2	42 CrMo 4 St 50-2 Ck60 /1060 /4140	180	0,5	4	0,25	0,48	150	240
			230		4		0,48		210
			280	0,5	4	0,25	0,42	130	190
			320		4		0,42		170
High Alloy Steel Stal wysokostopowa	3	X40 CrMoV 51 40 NiMo 6 S 2-10-1-8 H13 / D2 HSS / M42	220	0,5	4	0,23	0,38	90	150
			280		4		0,38		130
			320	0,5	4	0,23	0,32	60	110
			350		4		0,32		90
Hardened Steel Stal hartowana			400	0,5	3	0,14	0,25	40	80
			480		2		0,22		70
			550		1		0,20		60
Cast Iron Żeliwo szare	9	GG 20	140 to 230	0,5	4	0,25	0,50	170	300
		GG 25							250
		GG 30							210
Nodular Cast Iron Żeliwo sferoidalne	10	GGG 40	210	0,5	4	0,23	0,45	120	210
		GGG 50	260						170
		GGG 70	310						150
White Cast Iron Żeliwo białe	11	G-X260NiCr42	400	0,5	3	0,14	0,25	30	60

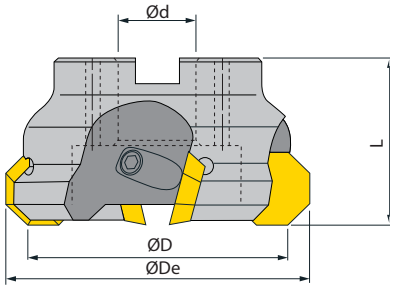
FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

M980

Face Milling Cutters With Corner Angle 43°
Frezy do obróbki płaszczyzn o kącie przystawienia 43°



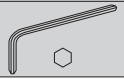




Tools / Narzędzia

EDP Nr. new nowy	**EDP Nr.**	**Dimensions** Wymiary (mm)						**Insert** Płytka
		ØD	**Ød**	**ØDe**	**L**	**Z**	**apmax**	
M980A06304022040OF07	M980H00630	63	22	73	40	4	0,5-5	OFER070405
M980A08006027050OF07	M980H00800	80	27	90	50	6		
M980A10006032050OF07	M980H01000	100	32	110	50	6		
M980A12508040063OF07	M980H01250	125	40	135	63	8		
M980A16010040063OF07	M980H01600	160	40	170	63	10		

Accessories / Akcesoria

Tool Narzędzie	**ØD**	Insert Screw	Support	Wrench
				
M980	63	CS100	SR045	W012
	80	CS101		
	100	CS102		
	125	CS103		
	160	CS104		

FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

Milling Inserts Płytki do frezowania

OFER

Insert Shape Kształt płytki	Type Typ	P	H	M	K	N	S
		Steel / Stal	Hardened Steel Stal hartowana	Stainless Steel Stal nierdzewna	Cast iron Żeliwo	Non-ferrous materials Materiały nieżelazne	Heat-resistant steel Stal żaroodporna
	OFER070405 C53 P100	●	●	●	●		●

Cutting Conditions / Parametry skrawania OFER070405

Material Group Grupa materiałowa	Group № Nº Grupy	Material Examples Przykłady materiałów	Hardness Twardość HB	d.o.c. a_p (mm)		feed (mm/tooth) f (mm/ząb)		V_c (m/min)	
				min	max	min	max	min	max
Low Carbon Steel Stal niskowęglowa	1	Ck15 9SMnPb28	150	0.50	5.00	0.15	0.32	190	350
			180						300
			210						260
Alloy Steel Stal stopowa	2	42 CrMo 4 100 Cr 6 32 NiCrMo 14.5	180	0.50	5.00	0.15	0.30	150	240
			230						210
			280					130	190
			320						170
High Alloy Steel Stal wysokostopowa	3	X38 CrMoV 5 X210 CrW 12 X90 CrMoV 8	220	0.50	5.00	0.12	0.25	90	150
			280						130
			320					60	110
			350						90
Austenitic Stainless Steel Stal nierdzewna austenityczna	4	303 / 304 304 L	210-250	0.50	5.0	0.18	0.32	170	250
	5	316 / 316L	230-270		5.0	0.15	0.28	160	210
	6	316 Ti 630 (F16PH)	...		3.5	0.12	0.25	70	150
Ferritic Stainless Steel Stal nierdzewna ferrytyczna	7	430 / 439 / 444	Annealed Wyżarzona	0.50	5.00	0.12	0.32	150	210
Martensitic Stainless Steel Stal nierdzewna martenzytyczna	8	410 / 420	Annealed Wyżarzona	0.50	5.00	0.12	0.32	150	230
			Treated Ulepszona				0.25	90	170
Cast Iron Żeliwo szare	9	EN - GJL 200	140 - 230	0.50	5.00	0.15	0.40	170	300
		EN - GJL 250							250
		EN - GJL 300							210
Nodular Cast Iron Żeliwo sferoidalne	10	EN - GJS 400	210	0.50	5.00	0.12	0.32	120	210
		EN - GJS 600	260						170
		EN - GJS 800	310						150
Nickel Based Alloys Stopy niklu	11	Inconel 625	...	0.50	3.50	0.12	0.28	25	35
		Inconel 718						28	40
		Hastelloy C						40	65
Ti Alloy Stop Ti	12	TiAl 6V4	...	0.50	3.50	0.12	0.28	35	60
		T40						28	40

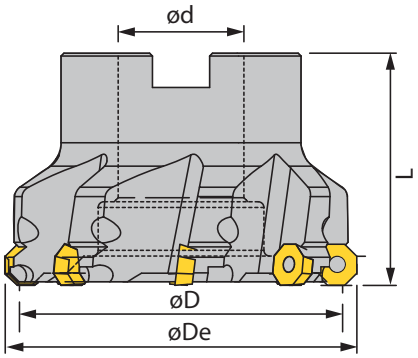
FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

M165

Face Milling Cutters With Corner Angle 45°
Frezy do obróbki płaszczyzn o kącie przystawienia 45°







Tools / Narzędzia

EDP Nr. new nowy	**EDP No.**	**Dimensions** Wymiary (mm)						**Insert** Płytka
		ØD	**ØDe**	**Ød**	**L**	**Z**	**apmax**	
M165B0500422040OF05		50	22	56	40	4	0,5-3,5	OFMT05T3
M165A0500522040OF05		50	22	56	40	5		
M165B0500522040OF05		50	22	56	40	5		
M165A0630522040OF05		63	22	69	40	5		
M165B0630522040OF05		63	22	69	40	5		
M165A0800627050OF05		80	27	86	50	6		
M165B0800627050OF05		80	27	86	50	6		
M165A1000732050OF05		100	32	106	50	7		
M165B1000732050OF05		100	32	106	50	7		
M165A1250840063OF05		125	40	130	63	8		
M165B1250840063OF05		125	40	130	63	8		
M165A1601040063OF05		160	40	165	63	10		
M165B1601040063OF05		160	40	165	63	10		

Accessories / Akcesoria

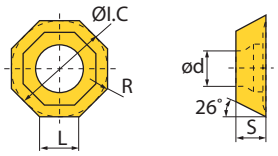
Tool Narzędzie	**Diameter** Średnica ØD	**Insert screw** Śrubka do płytki	**Wrench** Klucz
M165	Ø50- Ø63	SR116	W116
	Ø80- Ø160	SR117	

FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

Milling Inserts Płytki do frezowania

OFMT

● - stable machining/obróbka stabilna
● - general machining/obróbka ogólna
✱ - interrupted cut/obróbka przerywana



P	Steel / Stal	● ✱ ● ✱ ○ ● ○ ● ● ✱ ○ ● ● ● ✱ ○ ○ ○
M	Stainless Steel Stal nierdzewna	● ✱ ● ✱ ○ ○ ○ ● ● ✱ ○ ● ● ● ✱ ○ ○ ○
K	Cast Iron Żeliwo szare	○ ○ ○ ○ ● ✱ ● ○ ○ ○ ● ● ○ ○ ○ ● ○ ✱
N	Non-ferrous materials Materiały nieżelazne	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ● ✱
S	Heat-resistant steel Stal żaroodporna	○ ○ ○ ○ ○ ○ ● ● ● ○ ○ ○ ○ ○ ○ ○ ○ ○

Insert Shape	Type	Basic Dimensions (mm)			CVD Coating												Cermet		Cemented carbide			
		l	s	r	P127	P128	P228	P102	P203	P204	P225	P216	P246	P226	P251	P143	P230	P231	P139	P234	P224	P235
	OFMT05T3 C40	5.26	3.97	0.5			○	○			●	●		●								
	OFMT05T3 C41	5.26	3.97	0.5							●	●		●								
	OFMT05T3 C39	5.26	3.97	0.5																	●	

Cutting Conditions / Parametry skrawania

Material Group Grupa materiałowa	Hardness Twardość HB	Insert grade Gatunek płytki	V(m/min)	f(mm/z)	
				-C40	-C41
Low Carbon Steel Stal niskowęglowa	≤180	P228	270 (220-350)	0.2 (0.1-0.3)	0.25 (0.1-0.4)
		P216 P246	270 (200-360)	0.2 (0.1-0.3)	0.25 (0.1-0.4)
		P102	220 (180-300)	0.2 (0.1-0.3)	0.25 (0.1-0.4)
		P226	230 (170-350)	0.2 (0.1-0.3)	0.25 (0.1-0.4)
High-carbon steel **Alloy steel** Stal wysokowęglowaStopy stali	180-280	P228	240 (200-320)	0.15 (0.1-0.3)	0.2 (0.1-0.4)
		P216 P246	240 (180-350)	0.15 (0.1-0.3)	0.2 (0.1-0.4)
		P102	200 (160-280)	0.2 (0.1-0.3)	0.25 (0.1-0.4)
		P226	220 (150-330)	0.2 (0.1-0.3)	0.25 (0.1-0.4)
Alloy tool steel Stopy stali narzędziowej	280-350	P228	220 (180-300)	0.15 (0.1-0.3)	0.2 (0.1-0.4)
		P216 P246	220 (170-340)	0.15 (0.1-0.3)	0.2 (0.1-0.4)
		P102	180 (150-250)	0.2 (0.1-0.3)	0.25 (0.1-0.4)
		P226	190 (130-300)	0.2 (0.1-0.3)	0.25 (0.1-0.4)
Stainless steel Stal nierdzewna	≤270	P216 P246	160 (110-270)	0.15 (0.1-0.3)	0.2 (0.1-0.4)
		P226	140 (100-250)	0.15 (0.1-0.3)	0.2 (0.1-0.4)
		P228	150 (120-250)	0.15 (0.1-0.3)	0.2 (0.1-0.4)
Cast iron Żeliwo	180-250	P225	210 (120-300)	0.2 (0.1-0.3)	0.25 (0.1-0.4)
Al alloy Stopy aluminium				-C39	
	-	P224	300-	0.15 (0.05-0.3)	

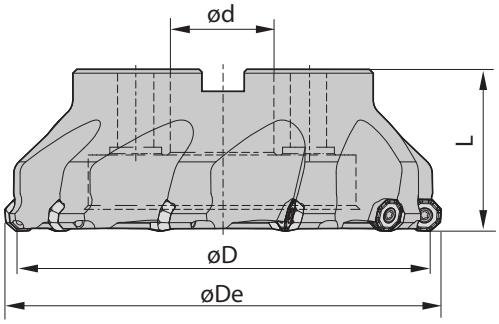
FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

M166

Face Milling Cutters With Corner Angle 45°
Frezy do obróbki płaszczyzn o kącie przystawienia 45°







Tools / Narzędzia

EDP Nr. new nowy	**EDP No.**	**Dimensions** Wymiary (mm)						**Insert** Płytka
		ØD	**Ød**	**ØDe**	**L**	**Z**	**apmax**	
M166B12508H40063OF07		125	40	136	63	8	0,5-5	OFMR0704
M166B16010H40063OF07		160	40	171	63	10		
M166B20012H60063OF07		200	60	211	63	12		
M166B25016H60063OF07		250	60	261	63	16		
M166B31520H60063OF07		315	60	321	63	20		

Accessories / Akcesoria

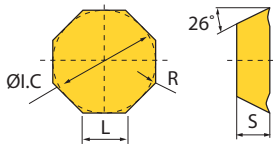
Tool Narzędzie	**Diameter** Średnica ØD	**Locator**	**Wedge** Klin	**Screw** Śruba	**Locator Screw** Śruba	**Wrench** Klucz
M166	Ø125- Ø315	K107	WG107	CS111	LS102	W113 W114

FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

Milling Inserts Płytki do frezowania

OFMR

● - stable machining/obróbka stabilna
◕ - general machining/obróbka ogólna
✱ - interrupted cut/obróbka przerywana



P	Steel / Stal	◕	✱	◕	✱		◕		◕	◕	✱		◕	◕	◕	✱			
M	Stainless Steel Stal nierdzewna	◕	✱	◕	✱				◕	◕	✱		◕	◕	◕	✱			
K	Cast Iron Żeliwo szare					◕	✱	●				◕	◕				●		✱
N	Non-ferrous materials Materiały nieżelazne																	◕	✱
S	Heat-resistant steel Stal żaroodporna							●	◕	◕									

Insert Shape	Type	Basic Dimensions (mm)			CVD Coating											Cermet		Cemented carbide			
		l	s	r	P127	P128	P228	P102	P203	P204	P225	P216	P246	P226	P251	P143	P230	P231	P139	P234	P224	P235
	OFMR0704 C40	7.45	4.76	0.8	●	●	●	●	●	●	●	●										
	OFMR0704 C41	7.45	4.76	0.8	●					●			●									

Cutting Conditions / Parametry skrawania

Material Group Grupa materiałowa	Hardness Twardość HB	Insert grade Gatunek płytki	V(m/min)	f(mm/z)	
				-C40	-C41
Low Carbon Steel Stal niskowęglowa	≤180	P228 P127	270 (220-350)	0.2 (0.1-0.3)	0.25 (0.1-0.4)
		P216	270 (200-360)	0.2 (0.1-0.3)	0.25 (0.1-0.4)
		P102	220 (180-300)	0.2 (0.1-0.3)	0.25 (0.1-0.4)
		P226	230 (170-350)	0.2 (0.1-0.3)	0.25 (0.1-0.4)
High-carbon steel **Alloy steel** Stal wysokowęglowaStopy stali	180-280	P228 P127	240 (200-320)	0.15 (0.1-0.3)	0.2 (0.1-0.4)
		P216	240 (180-350)	0.15 (0.1-0.3)	0.2 (0.1-0.4)
		P102	200 (160-280)	0.2 (0.1-0.3)	0.25 (0.1-0.4)
		P226	220 (150-330)	0.2 (0.1-0.3)	0.25 (0.1-0.4)
Alloy tool steel Stopy stali narzędziowej	280-350	P228 P127	220 (180-300)	0.15 (0.1-0.3)	0.2 (0.1-0.4)
		P216	220 (170-340)	0.15 (0.1-0.3)	0.2 (0.1-0.4)
		P102	180 (150-250)	0.2 (0.1-0.3)	0.25 (0.1-0.4)
		P226	190 (130-300)	0.2 (0.1-0.3)	0.25 (0.1-0.4)
Stainless steel Stal nierdzewna	≤270	P216 P246	160 (110-270)	0.15 (0.1-0.3)	0.2 (0.1-0.4)
		P226	140 (100-250)	0.15 (0.1-0.3)	0.2 (0.1-0.4)
		P228	150 (120-250)	0.15 (0.1-0.3)	0.2 (0.1-0.4)
Cast iron Żeliwo	180-250	P225	210 (120-300)	0.2 (0.1-0.3)	0.25 (0.1-0.4)
		P204	200 (150-250)	0.2 (0.1-0.3)	0.25 (0.1-0.4)

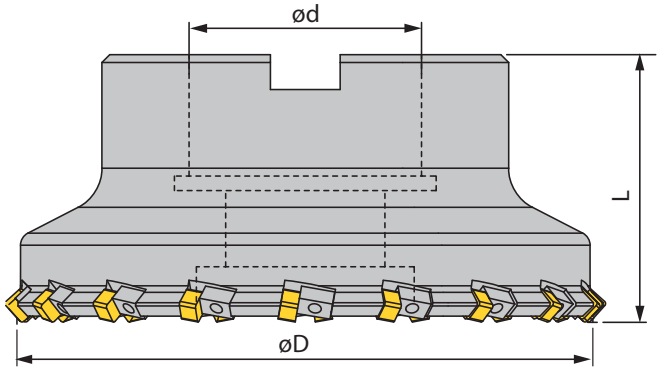
FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

M168

Face Milling Cutters With Corner Angle 45°
Frezy do obróbki płaszczyzn o kącie przystawienia 45°







Tools / Narzędzia

EDP Nr. new nowy	**EDP No.**	**Dimensions** Wymiary (mm)					**Insert** Płytka
		ØD	**Ød**	**L**	**Z**	**apmax**	
M168B08008027050HN09		80	27	50	8	0,5-6	HNMN0905
M168B10010032063HN09		100	32	63	10		
M168B12514040070HN09		125	40	70	14		
M168B16018040063HN09		160	40	63	18		
M168B20022060063HN09		200	60	63	22		
M168B25028060063HN09		250	60	63	28		
M168B31532060063HN09		315	60	63	32		

Accessories / Akcesoria

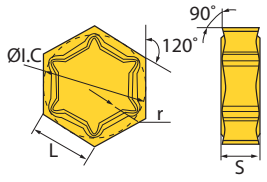
Tool Narzędzie	**Diameter** Średnica ØD	**Wedge** Klin	**Screw** Śruba	**Wrench** Klucz
M168	Ø80- Ø315	W018Z	SC500	W117

FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

Milling Inserts Płytki do frezowania

HNMN

● - stable machining/obróbka stabilna
◕ - general machining/obróbka ogólna
✱ - interrupted cut/obróbka przerywana



P	Steel / Stal	◕	✱	◕	✱		◕		◕	◕	✱		●	●	●	✱		
M	Stainless Steel Stal nierdzewna	◕	✱	◕	✱				◕	◕	✱		●	●	●	✱		
K	Cast Iron Żeliwo szare					◕	✱	●				◕	●				●	✱
N	Non-ferrous materials Materiały nieżelazne																◕	✱
S	Heat-resistant steel Stal żaroodporna							●	◕	◕								

Insert Shape	Type	Basic Dimensions (mm)			CVD Coating											Cermet		Cemented carbide			
		l	s	r	P127	P128	P228	P102	P203	P204	P225	P216	P246	P226	P251	P143	P230	P231	P139	P234	P224	P235
	HNMN090512 C40	9.16	5.56	1.2					•	•												
	HNMN090512 C41	9.16	5.56	1.2					•	•												
	HNMN090512 C07	9.16	5.56	1.2					•	•												

Cutting Conditions / Parametry skrawania

Material Group Grupa materiałowa	Hardness Twardość HB	Insert grade Gatunek płytki	V(m/min)	f(mm/z)		
				-C40	-C41	-C07
Cast iron Żeliwo	180-250	P203	180 (110-250)	0.15 (0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.5)
		P204	130 (110-200)	0.2 (0.1-0.2)	0.25 (0.1-0.3)	0.3 (0.2-0.5)

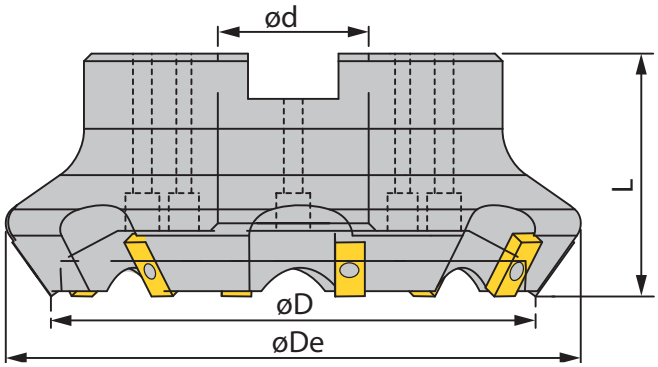
FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

M170

Face Milling Cutters With Corner Angle60°
Frezy do obróbki płaszczyzn o kącie przystawienia60°







Tools / Narzędzia

EDP Nr. new nowy	**EDP No.**	**Dimensions** Wymiary (mm)						**Insert** Płytka
		ØD	**Ød**	**ØDe**	**L**	**Z**	**apmax**	
M170B12506040063LN20		125	40	153	63	6	12	LNMT2007
M170B16908040063LN20		169	40	187	63	8		
M170B20010060070LN20		200	60	227	70	10		
M170B25012060070LN20		250	60	278	70	12		
M170B31515060080LN20		315	60	339	80	15		
M170B12505040063LN25		125	40	154	63	5	17	LNMT2510
M170B16006040063LN25		160	40	189	63	6		
M170B20008060070LN25		200	60	229	70	8		
M170B25010060070LN25		250	60	278	70	10		
M170B31512060080LN25		315	60	346	80	12		
M170B40016060080LN25		400	60	427	80	16		

Accessories / Akcesoria

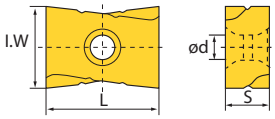
Tool Narzędzie	**Insert** Płytka	**Insert screw** Śrubka do płytki	**Shim** Podkładka	**Shim Screw** Śrubka do podkładki	**Wrench** Klucz	**Wrench** Klucz
M170	LN20	SR317	SH105	SR120	W116	W121
	LN25	SR119	SH106	SR136	W126	W116

FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

Milling Inserts Płytki do frezowania

LNMT

● - stable machining/obróbka stabilna
◕ - general machining/obróbka ogólna
✱ - interrupted cut/obróbka przerywana



P	Steel / Stal	◕	✱	◕	✱		◕		◕	◕	✱		◕	◕	◕	✱			
M	Stainless Steel Stal nierdzewna	◕	✱	◕	✱				◕	◕	✱		◕	◕	◕	✱			
K	Cast Iron Żeliwo szare					◕	✱	●				◕	◕				●		✱
N	Non-ferrous materials Materiały nieżelazne																	◕	✱
S	Heat-resistant steel Stal żaroodporna							●	◕	◕									

Insert Shape	Type	Basic Dimensions (mm)			CVD Coating											Cermet		Cemented carbide			
		l	s	d	P127	P128	P228	P102	P203	P204	P225	P216	P246	P226	P251	P143	P230	P231	P139	P234	P224	P235
	LNMT2007 C151	20	6.35	4.6				•		•				•								
	LNMT2510 C145	25	9.525	5.5				•		•				•								

Cutting Conditions / Parametry skrawania

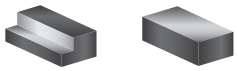
Material Group Grupa materiałowa	Hardness Twardość HB	Insert grade Gatunek płytki	V(m/min)	f(mm/z)
Low Carbon Steel Stal niskowęglowa	≤180	P226	180 (150-300)	0.5 (0.2-0.8)
		P102	180 (150-300)	0.5 (0.2-0.8)
High-carbon steel **Alloy steel** Stal wysokowęglowa Stopy stali	180-280	P226	150 (120-280)	0.5 (0.2-0.8)
		P102	140 (120-280)	0.5 (0.2-0.8)
Alloy tool steel Stopy stali narzędziowej	280-350	P226	120 (80-250)	0.45 (0.2-0.6)
		P102	100 (80-250)	0.45 (0.2-0.6)
Stainless steel Stal nierdzewna	≤270	P226	120 (80-200)	0.45 (0.2-0.6)
		P102	100 (80-200)	0.45 (0.2-0.6)

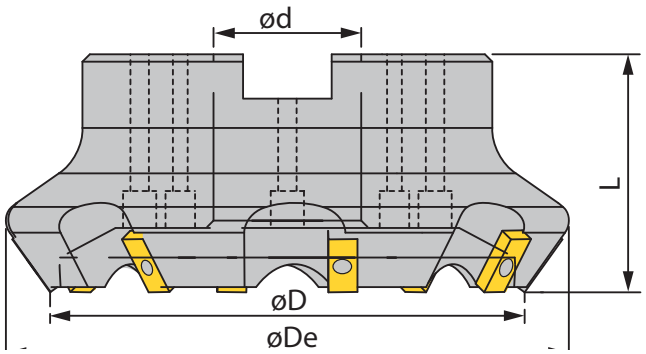
FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

M174

Face Milling Cutters With Corner Angle 75°
Frezy do obróbki płaszczyzn o kącie przystawienia 75°







Tools / Narzędzia

EDP Nr. new nowy	**EDP No.**	**Dimensions** Wymiary (mm)						**Insert** Płytka
		ØD	**Ød**	**ØDe**	**L**	**Z**	**apmax**	
M174B12506040063LN15		125	40	137	63	6	0,5-8	LNMT1506
M174B16008040063LN15		160	40	170	63	8		
M174B20010060070LN15		200	60	208	70	10		
M174B25012060070LN15		250	60	257	70	12		
M174B31516060080LN15		315	60	328	80	16		

Accessories / Akcesoria

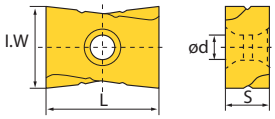
Tool Narzędzie	**Diameter** Średnica ØD	**Shim** Podkładka	**Shim Screw** Śrubka do podkładki	**Screw** Śruba	**Wrench** Klucz
M174	Ø80- Ø315	SH107	SR137	SR603	W116 W121

FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

Milling Inserts Płytki do frezowania

LNMT

● - stable machining/obróbka stabilna
◕ - general machining/obróbka ogólna
✱ - interrupted cut/obróbka przerywana



P	Steel / Stal	◕	✱	◕	✱		◕		◕	◕	✱		◕	◕	◕	✱			
M	Stainless Steel Stal nierdzewna	◕	✱	◕	✱				◕	◕	✱		◕	◕	◕	✱			
K	Cast Iron Żeliwo szare					◕	✱	●				◕	◕				●		✱
N	Non-ferrous materials Materiały nieżelazne																	◕	✱
S	Heat-resistant steel Stal żaroodporna							●	◕	◕									

Insert Shape	Type	Basic Dimensions (mm)			CVD Coating											Cermet		Cemented carbide			
		l	s	d	P127	P128	P228	P102	P203	P204	P225	P216	P246	P226	P251	P143	P230	P231	P139	P234	P224	P235
	LNMT1506-C145	15.875	6.35	4.6	•		•	•	•	•				•								

Cutting Conditions / Parametry skrawania

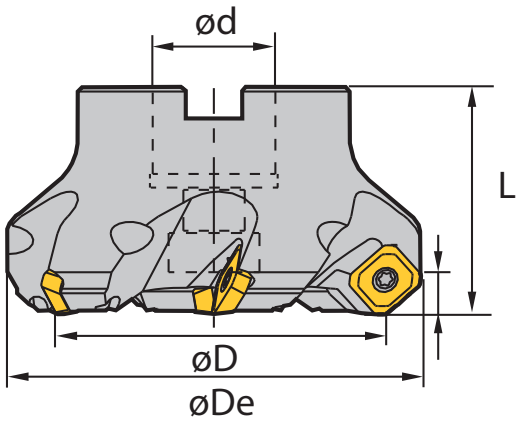
Material Group Grupa materiałowa	Hardness Twardość HB	Insert grade Gatunek płytki	V(m/min)	f(mm/z)
Low Carbon Steel Stal niskowęglowa	≤180	P226	180 (150-300)	0.5 (0.2-0.8)
		P102	180 (150-300)	0.5 (0.2-0.8)
High-carbon steel **Alloy steel** Stal wysokowęglowaStopy stali	180-280	P226	150 (120-280)	0.5 (0.2-0.8)
		P102	140 (120-280)	0.5 (0.2-0.8)
Alloy tool steel Stopy stali narzędziowej	280-350	P226	120 (80-250)	0.45 (0.2-0.6)
		P102	100 (80-250)	0.45 (0.2-0.6)
Stainless steel Stal nierdzewna	≤270	P226	120 (80-200)	0.45 (0.2-0.6)
		P102	100 (80-200)	0.45 (0.2-0.6)

FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

M850

Face Milling Cutters With Corner Angle 75°
Frezy do obróbki płaszczyzn o kącie przystawienia 75°







Tools / Narzędzia

EDP Nr. new nowy	**EDP Nr.**	**Dimensions** Wymiary (mm)						**Insert** Płytka
		ØD	**Ød**	**ØDe**	**L**	**Z**	**apmax**	
M850B08004027050SP12		80	27	84	50	4	6	SPKN1203 SPKR1203
M850B10006032050SP12		100	32	104	50	6		
M850B12508040063SP12		125	40	129	63	8		
M850B16010040063SP12		160	40	164	63	10		
M850B20012060063SP12		200	60	203	63	12		
M850B25016060063SP12		250	60	253	63	16		
M850B31520060070SP12		315	60	318	70	20		
M850B08004027050SP15		80	27	84	50	4	8	SPKN1503 SPKR1503
M850B10006027050SP15		100	27	104	50	6		
M850B12508040063SP15		125	40	129	63	8		
M850B16010040063SP15		160	40	164	63	10		
M850B20012060063SP15		200	60	204	63	12		
M850B25016060063SP15		250	60	253	63	16		
M850B31520060070SP15		315	60	318	70	20		

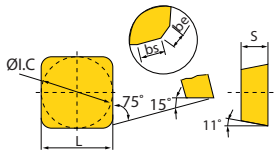
Accessories / Akcesoria

Tool Narzędzie	**Diameter** Średnica ØD	**Inserts** Płytki	**Cassette** Kaseta	**Wedge** Klin	**Screw** Śruba	**Locator Screw** Śruba	**Wrench** Klucz
M850	Ø80- Ø100	SP12	K109R	WG109	CS113	LS102	W113 W123
	Ø125- Ø315				CS114		
	Ø80- Ø315	SP15	K109		CS114		

FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

Milling Inserts Płytki do frezowania

● - stable machining/obróbka stabilna
● - general machining/obróbka ogólna
✱ - interrupted cut/obróbka przerywana



P	Steel / Stal	●	✱	●	✱		●	●		●	●	✱		●	●	●	✱			
M	Stainless Steel Stal nierdzewna	●	✱	●	✱			●		●	●	✱		●	●	●	✱			
K	Cast Iron Żeliwo szare					●	✱	●	●				●	●				●		✱
N	Non-ferrous materials Materiały nieżelazne																		●	✱
S	Heat-resistant steel Stal żaroodporna							●	●	●	●									

Insert Shape	Type	Basic Dimensions (mm)			CVD Coating						PVD Coating							Cermet		Cemented carbide			
		l	s	be	P127	P128	P228	P102	P203	P204	P100	P225	P216	P246	P226	P251	P143	P230	P231	P139	P234	P224	P235
	SPKN1203 C130R	12.7	3.18	1.4																			
	SPKN1203 C131L	12.7	3.18	1.4																			
	SPKN1203 C132R	12.7	3.18	1.4																		○	●
	SPKN1203 C133L	12.7	3.18	1.4																			●
	SPKN1203 C134R	12.7	3.18	1.4	●							●	●		●					●			
	SPKN1203 C135L	12.7	3.18	1.4									●							●			
	SPKN1203 C136R	12.7	3.18	1.4																			
	SPKN1203 C137L	12.7	3.18	1.4																			
	SPKN1203 C177R	12.7	3.18	1.4									○										
	SPKN1203 C177L	12.7	3.18	1.4																			
	SPKN1203 C140R	12.7	3.18	1.4																			○
	SPKN1203 C141L	12.7	3.18	1.4	●	●														○			
	SPKN120312 C83	12.7	3.18	1.4																			○
	SPKN1504 C130R	15.875	4.76	1.4																			
	SPKN1504 C131L	15.875	4.76	1.4																			
	SPKN1504 C132R	15.875	4.76	1.4																			●
	SPKN1504 C133L	15.875	4.76	1.4																			●
	SPKN1504 C134R	15.875	4.76	1.4	●								●							●			
	SPKN1504 C135L	15.875	4.76	1.4																●			
	SPKN1504 C136R	15.875	4.76	1.4								●											
	SPKN1504 C137L	15.875	4.76	1.4																			
	SPKN1504 C138R	15.875	4.76	1.4									●										
	SPKN1504 C139L	15.875	4.76	1.4																			
	SPKN1504 C140R	15.875	4.76	1.4	●																		
	SPKN1504 C141L	15.875	4.76	1.4																			
	SPKR1504 C142R	15.875	4.76	1.4																			
	SPKR1504 C142L	15.875	4.76	1.4																			
	SPKN1203 C55	12	3.18								●												
	SPKN1204 C55	12	4.76								●												
	SPKN1504 C55	15	4.76								●												

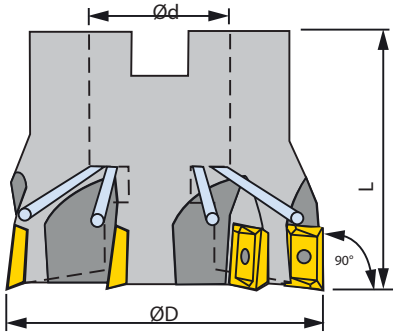
FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

M305

Cutters with Corner Angle 90° Frezy kątowe o kącie przystawienia 90°



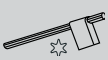




Tools / Narzędzia

EDP Nr. new nowy	EDP No.	Dimensions Wymiary (mm)					Insert Płytka
		ØD	Ød	L	Z	apmax	
M305A04006022040JD10	M308H00400	40	22	40	6	0,5 - 9	JDMX1003 JDGT1003
M305A05007022040JD11	M308H00500	50	22	40	7		
M305A06308022040JD12	M308H00630	63	22	40	8		

Accessories / Akcesoria

Tool Narzędzie	ØD	Spare Parts / Części zamienne	
			
M305	Ø40 - Ø63	SR070	W116

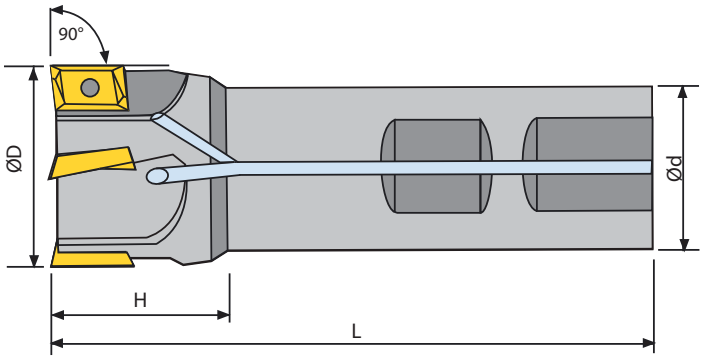
FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

Cutters with Corner Angle 90° Frezy kątowe o kącie przystawienia 90°

M305





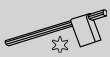


Tools / Narzędzia

EDP Nr. new nowy	**EDP No.**	**Dimensions** Wymiary (mm)						**Insert** Płytka
		ØD	**Ød**	**L**	**H**	**Z**	**apmax**	
M305A01001T16080JD10	M305WW0100	10	16	80	24	1	0,5-9	JDMX1003 JDGT1003
M305A01201T16080JD10	M305WW0120	12	16	80	24	1		
M305A01401T16080JD10	M305WW0140	14	16	80	24	1		
M305A01602T16085JD10	M305WW0160	16	16	85	24	2		
M305A01802T16090JD10	M305WW0180	18	16	90	25	2		
M305A02003T20090JD10	M305WW0200	20	20	90	25	3		
M305A02203T20090JD10	M305WW0220	22	20	90	25	3		
M305A02504T25095JD10	M305WW0250	25	25	95	25	4		
M305A02503T25095JD10	M305WW0251	25	25	95	25	3		
M305A02804T25095JD10	M305WW0280	28	25	95	25	4		
M305A03004T25095JD10	M305WW0300	30	25	95	26	4		
M305A03205T25095JD10	M305WW0320	32	25	95	26	5		
M305A01001T16150JD10	M306WW0100	10	16	150	24	1	0,5-9	JDMX1003 JDGT1003
M305A01201T16150JD10	M306WW0120	12	16	150	24	1		
M305A01401T16150JD10	M306WW0140	14	16	150	24	1		
M305A01602T16150JD10	M306WW0160	16	16	150	24	2		
M305A01802T16150JD10	M306WW0180	18	16	150	25	2		
M305A02003T20150JD10	M306WW0200	20	20	150	25	3		
M305A02203T20150JD10	M306WW0220	22	20	150	25	3		
M305A02504T20150JD10	M306WW0250	25	20	150	25	4		
M305A02503T25150JD10	M306WW0251	25	25	150	24	3		
M305A02503T20150JD10	M306WW0252	25	20	150	24	3		
M305A03004T25150JD10	M306WW0300	30	25	150	26	4		
M305A03205T25150JD10	M306WW0320	32	25	150	26	5		

Also available wledon shank -change T on W in code Dostępne również uchwyty weldon - zmiana w kodzie T na W

Accessories / Akcesoria

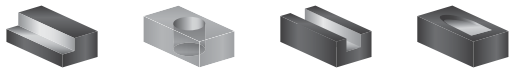
Tool Narzędzie	**ØD**	**Spare Parts** / Części zamienne	
			
M305	Ø10 - Ø32	SR070	W116

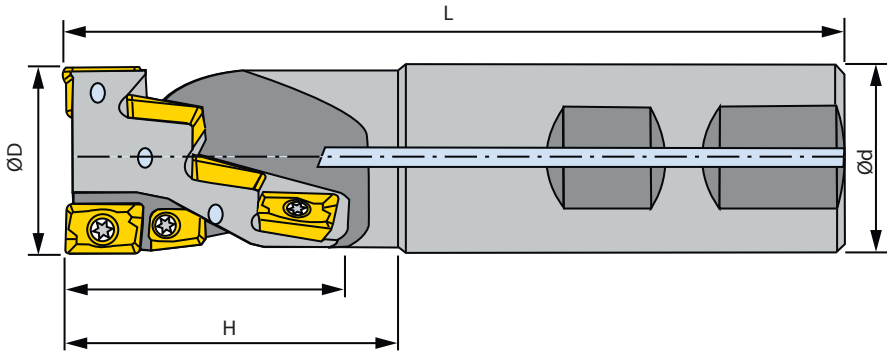
FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

M600

Cutters with Corner Angle 90° Frezy kątowe o kącie przystawienia 90°



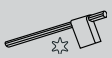




Tools / Narzędzia

EDP Nr. new nowy	EDP No.	Dimensions Wymiary (mm)						Insert Płytka
		ØD	Ød	L	H	Z	apmax	
M600A02004W20086JD10	M600WW0200	20	20	86	28	4		JDMX1003 JDGT1003
M600A02508W25100JD10	M600WW0250	25	25	100	36	8		
M600A03212W32120JD10	M600WW0320	32	32	120	45	12		
M600A04014W32130JD10	M600WW0400	40	32	130	54	14		

Accessories / Akcesoria

Tool Narzędzie	ØD	Spare Parts / Części zamienne	
			
M600	Ø20 - Ø40	SR070	W116

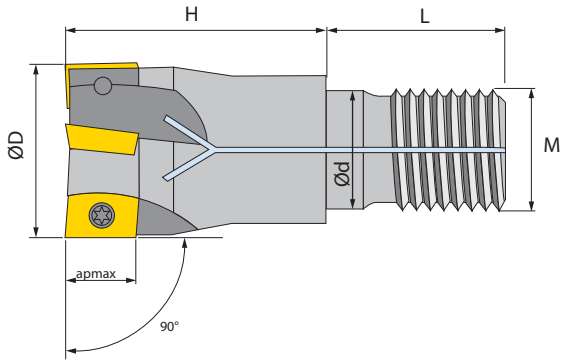
FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

Screw-on Roughing Cutters Głowice wkręcane do obróbki zgrubnej

M930



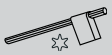




Tools / Narzędzia

EDP Nr. new nowy	**EDP No.**	**Dimensions** Wymiary (mm)							**Insert** Płytka
		ØD	**Ød**	**M**	**L**	**H**	**Z**	**apmax**	
M930A01602M08025JD10	M930CW0160	16	8,5	8	25	17,5	2	9	JDMX1003 JDGT1003
M930A02003M10030JD11	M930CW0200	20	10,5	10	30	20	3	9	
M930A02503M12035JD12	M930CW0250	25	12,5	12	35	22	3	9	
M930A02504M12035JD13	M930CW0251	25	12,5	12	35	22	4	9	
M930A03205M17043JD14	M930CW0320	32	17	16	43	24	5	9	

Accessories / Akcesoria

Tool Narzędzie	**ØD**	**Spare Parts** / Części zamienne	
			
M930	Ø16 - Ø40	SR070	W016

Milling Inserts Płytki do frezowania

Insert Shape Kształt płytki	**Type** Typ	P	H	M	K	N	S
		Steel / Stal	**Hardened Steel** Stal hartowana	Stainless Steel Stal nierdzewna	Cast Iron Żeliwo szare	Non-ferrous materials Materiały nieżelazne	Heat-resistant steel Stal żaroodporna
	JDMX100305 C82 P100	●	●	●	●		●
	JDMX100308 C82 P100	●	●	●	●		●
	JDMX100332 C82 P100	●	●	●	●		●
	JDMX100340 C82 P100	●	●	●	●		●
	JDGT1003 C63 P402					●	

FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

Cutting Conditions / Parametry skrawania JDMX1003

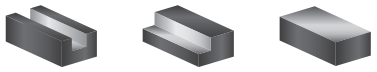
Material Group Grupa materiałowa	Group № N° Grupy	Material Examples Przykłady materiałów	Hardness Twardość HB	d.o.c. a_p (mm)		feed (mm/tooth) f (mm/ząb)		V_c (m/min)	
				min	max	min	max	min	max
Low Carbon Steel Stal niskowęglowa	1	Ck15 Ck45 1020 1045	150	0,5	9	0,10	0,38	180	300
			180		9		0,25		260
			210		9		0,23		220
Alloy Steel Stal stopowa	2	42 CrMo 4 St 50-2 Ck60 /1060 /4140	180	0,5	9	0,08	0,22	130	200
			230		9		0,22		180
			280	0,5	9	0,08	0,18	100	160
			320		9		0,18		140
High Alloy Steel Stal wysokostopowa	3	X40 CrMoV 51 40 NiMo 6 S 2-10-1-8 H13 / D2 HSS / M42	220	0,5	7	0,08	0,18	90	130
			280		7		0,18		110
			320	0,5	7	0,08	0,16	60	100
			350		7		0,16		90
Hardened Steel Stal hartowana			400	0,5	4	0,10	0,16	40	80
			480		2		0,15		70
			550		1		0,14		60
Austenitic Stainless Steel Stal nierdzewna austenityczna	4	X5 CrNi 18 9 304	210 to 250	0,5	9	0,10	0,22	190	250
	5	X2 CrNiMo 17 2 2 316	230 to 270	0,5	9	0,10	0,2	160	210
	6	X6 CrNiMoTi 17 12 2 316 Ti Duplex / Nitronic	----------	0,5	9	0,08	0,18	70	120
Ferritic Stainless Steel Stal nierdzewna ferrytyczna	7	X8 Cr 7 430	Annealed Wyżarzona	0,5	9	0,08	0,2	150	230
Martensitic Stainless Steel Stal nierdzewna martenzytyczna	8	X15 Cr 13 410	Annealed Wyżarzona	0,5	9	0,08	0,2	130	210
			Treated Ulepszona	0,5	9	0,08	0,2	90	150
Cast Iron Żeliwo szare	9	GG 20	140 to 230	0,5	9	0,10	0,25	150	240
		GG 25							220
		GG 30							190
Nodular Cast Iron Żeliwo sferoidalne	10	GGG 40	210	0,5	9	0,10	0,22	100	200
		GGG 50	260						160
		GGG 70	310						130
White Cast Iron Żeliwo białe	11	G-X260NiCr42	400	0,5	3	0,10	0,14	30	60
Nickel Based Alloys Stopy niklu	12	Inconel 625	----------	0,5	5	0,08	0,15	25	35
		Inconel 718						28	38
		Hastelloy C						40	65
Ti Alloy Stop Ti	13	TiAl 6 V4	----------	0,5	5	0,08	0,18	35	60
		T40					0,15	28	40

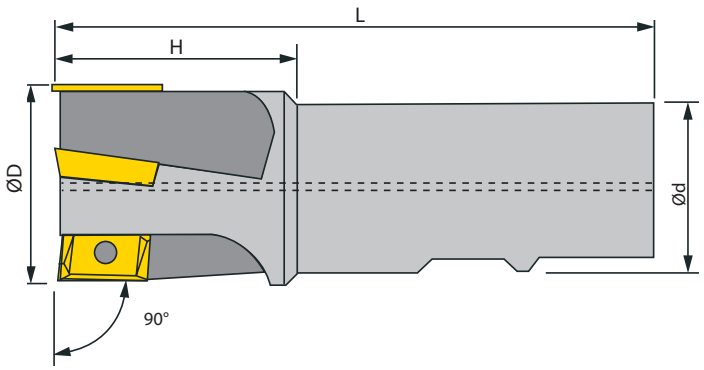
FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

Cutters with Corner Angle 90° Frezy kątowe o kącie przystawienia 90°

M330





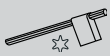


Tools / Narzędzia

EDP Nr. new nowy	**EDP No.**	**Dimensions** Wymiary (mm)						**Insert** Płytka
		ØD	**Ød**	**L**	**H**	**Z**	**apmax**	
M330A02502T25115JD17		25	25	115	35	2	0,5-15	JDMX1705
M330A03202T32125JD17		32	32	125	45	2		
M330A03203T32125JD17		32	32	125	45	3		
M330A04003T32125JD17		40	32	125	45	3		
M330A04004T32125JD17		40	32	125	45	4		
M330A05004T32125JD17		50	32	125	45	4		
M330A05005T32125JD17		50	32	125	45	5		
M330A06304T32125JD17		63	32	125	45	4		
M330A06306T32125JD17		63	32	125	45	6		
M330A02502T25170JD17		25	25	170	35	2		
M330A02802T25170JD17		28	25	170	35	2		
M330A03202T32190JD17		32	32	190	45	2		
M330A03203T32190JD17		32	32	190	45	3		
M330A03502T32190JD17		35	32	190	45	2		
M330A03503T32190JD17		35	32	190	45	3		
M330A04002T32190JD17		40	32	190	45	2		
M330A04003T32190JD17		40	32	190	45	3		
M330A04004T32190JD17		40	32	190	45	4		
M330A02502T25220JD17		25	25	220	80	2		
M330A02802T25220JD17		28	25	220	35	2		
M330A03202T32260JD17		32	32	260	100	2		
M330A03203T32260JD17		32	32	260	100	3		
M330A03502T32260JD17		35	32	260	45	2		
M330A03503T32260JD17		35	32	260	45	3		
M330A04002T32260JD17		40	32	260	45	2		
M330A04003T32260JD17		40	32	260	45	3		
M330A04004T32260JD17		40	32	260	45	4		

Also available wledon shank -change T on W in code Dostępne również uchwyty weldon - zmiana w kodzie T na W

Accessories / Akcesoria

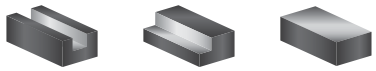
Tool Narzędzie	**ØD**	**Spare Parts** / Części zamienne	
			
M330	Ø25 - Ø63	CS109	W105

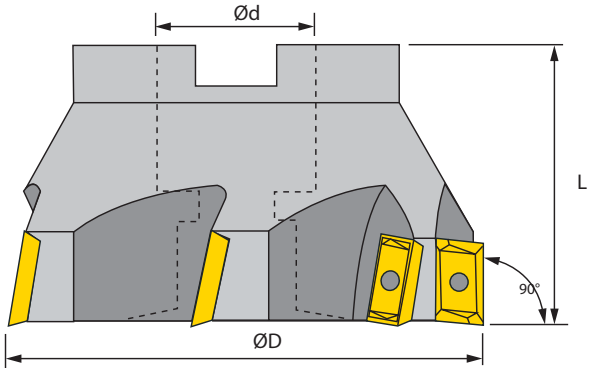
FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

M330

Cutters with Corner Angle 90° Frezy kątowe o kącie przystawienia 90°



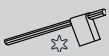




Tools / Narzędzia

EDP Nr. new nowy	**EDP No.**	**Dimensions** Wymiary (mm)					**Insert** Płytka
		ØD	**Ød**	**L**	**Z**	**apmax**	
M330A04004016040JD17		40	16	40	4	0,5-15	JDMX1705
M330A05005022040JD17		50	22	40	5		
M330A06306022040JD17		63	22	40	6		
M330A08007027050JD17		80	27	50	7		
M330A10008032050JD17		100	32	50	8		
M330A12509040063JD17		125	40	63	9		
M330A16010040063JD17		160	40	63	10		

Accessories / Akcesoria

Tool Narzędzie	**ØD**	**Spare Parts** / Części zamienne	
			
M330	Ø40 - Ø160	CS109	W105

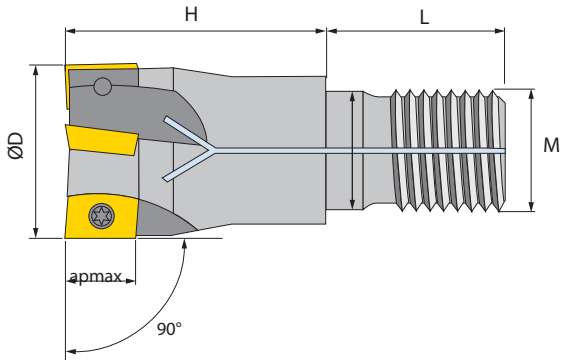
FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

Cutters with Corner Angle 90° Frezy kątowe o kącie przystawienia 90°

M330







Tools / Narzędzia

EDP Nr. new nowy	**EDP No.**	**Dimensions** Wymiary (mm)						**Insert** Płytka
		ØD	**Ød**	**L**	**H**	**Z**	**apmax**	
M330A02502M12057JD12		25	12.5	57	35	2	0,5-15	JDMX1705
M330A02802M12057JD12		28	12.5	57	35	2		
M330A03202M17063JD12		32	17	63	40	2		
M330A03203M17063JD12		32	17	63	40	3		
M330A03502M17063JD12		35	17	63	40	2		
M330A03503M17063JD12		35	17	63	40	3		
M330A04003M17063JD12		40	17	63	40	3		
M330A04004M17063JD12		40	17	63	40	4		

Accessories / Akcesoria

Tool Narzędzie	**ØD**	**Spare Parts** / Części zamienne	
			
M330	Ø25 - Ø40	CS109	W105

Milling Inserts Płytki do frezowania

JDMX

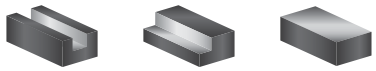
Insert Shape Kształt płytki	**Type** Typ	P	H	M	K	N	S
		Steel / Stal	**Hardened Steel** Stal hartowana	Stainless Steel Stal nierdzewna	Cast Iron Żeliwo szare	Non-ferrous materials Materiały nieżelazne	Heat-resistant steel Stal żaroodporna
	JDMX1705 C50 P100	●	●	●	●		●

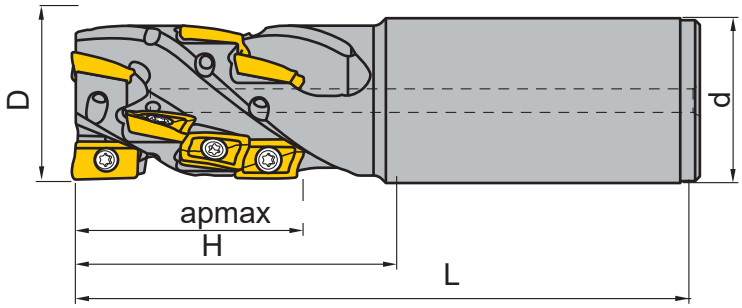
FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

M330

Cutters with Corner Angle 90º Frezy kątowe o kącie przystawienia 90º



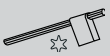




Tools / Narzędzia

EDP Nr. new nowy	**EDP No.**	**Dimensions** Wymiary (mm)					**Insert** Płytka
		ØD	**Ød**	**L**	**Z**	**apmax**	
M330A04008T42160JD17		40	42	160	8	56	JDMX1705
M330A04012T42160JD17		40	42	160	12	56	
M330A05012W51160JD17		50	50,8	160	12	56	
M330A05018W51190JD17		50	50,8	190	18	84	

Accessories / Akcesoria

Tool Narzędzie	**ØD**	**Spare Parts /** Części zamienne	
			
M330	Ø40 - Ø160	CS109	W105

FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

Cutting Conditions Parametry skrawania JDMX1705 - side boczne

Material Group Grupa materiałowa	Hardness Twardość	V_c (m/min)	ae (mm)	ap (mm)	fz (mm/tooth)		
					40 Length of cut 56mm 50 Length of cut 42mm	50 Length of cut 56mm 63 Length of cut 56mm	50 Length of cut 84mm
Low Carbon Steel Stal niskowęglowa	<180HB	200 (160 -250)	-0.15D1	20	0,23	0,23	0,19
				50	0,19	0,19	0,15
				80	-	-	0,1
		160 (120-200)	-0.3D1	20	0,23	0,23	0,19
				50	0,19	0,19	0,15
				80	-	-	0,1
Carbon Steel Alloy Stee Stal węglowa- Stal stopowa	180-350HB	160 (120-200)	-0.15D1	20	0,23	0,23	0,19
				50	0,19	0,19	0,15
				80	-	-	0,1
		(100-140)	-0.3D1	20	0,23	0,23	0,19
				50	0,19	0,19	0,15
				80	-	-	0,1
Stainless Steel Stal nierdzewna	<270HB	160 (120-200)	-0.15D1	10	0,23	0,23	0,19
				50	0,19	0,19	0,15
				80	-	-	0,1
		120 (100-140)	-0.3D1	10	0,23	0,23	0,19
				50	0,19	0,19	0,15
				80	-	-	0,1
Cast Iron Żeliwo szare	Tensile Strength <350MPa	230 (180-280)	-0.15D1	10	0,28	0,28	0,24
				50	0,24	0,24	0,19
				80	-	-	0,13
		190 (140-240)	-0.3D1	10	0,28	0,28	0,24
				50	0,24	0,24	0,19
				80	-	-	0,13
Nodular Cast Iron Żeliwo sferoidalne	Tensile Strength <800MPa	190 (140-220)	-0.15D1	10	0,28	0,28	0,24
				50	0,24	0,24	0,19
				80	-	-	0,13
		170 (120-220)	-0.3D1	10	0,19	0,19	0,14
				50	0,14	0,14	0,1
				80	-	-	0,07
Ti Alloy Stop Ti	<350HB	40 (30- 60)	-0.15D1	20	0,1	0,1	-
				50	0,1	0,1	-
Heat Resistant Alloy Odporne na ciepło	-	30 (20- 40)	-0.15D1	10	0,07	0,07	-

FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

Cutting Conditions Parametry skrawania JDMX1705 - sloting rowkowanie

Material Group Grupa materiałowa	Hardness Twardość	V_c (m/min)	ae (mm)	ap (mm)	fz (mm/tooth)		
					40 Length of cut 56mm 50 Length of cut 42mm	50 Length of cut 56mm 63 Length of cut 56mm	50 Length of cut 84mm
Low Carbon Steel Stal niskowęglowa	<180HB	140 (120-160)	D1	20	0,19	0,19	0,15
				50	0,14	0,14	-
Carbon Steel Alloy Stee Stal węglowa- Stal stopowa	180-350HB	100 (80-120)	D1	20	0,14	0,14	0,1
				50	0,1	0,1	-
Stainless Steel Stal nierdzewna	<270HB	190 (140-240)	D1	10	0,1	0,1	0,07
Cast Iron Żeliwo szare	Tensile Strength <350MPa	190 (140-240)	D1	10	0,24	0,24	0,2
				50	0,2	0,2	0,15
Nodular Cast Iron Żeliwo sferoidalne Ч	Tensile Strength <800MPa	170 (120-220)	D1	10	0,14	0,14	0,1
				50	0,1	0,1	-
Ti Alloy Stop Ti	<350HB	40 (30-60)	D1	50	0,07	0,07	-
Heat Resistant Alloy Odporne na ciepło	-	30 (20-40)	D1	20	0,05	0,05	

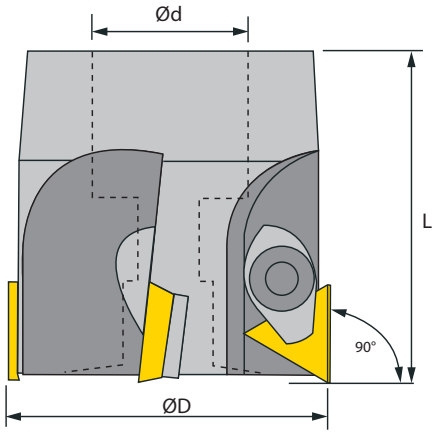
FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

Cutters with Corner Angle 90° Frezy kątowe o kącie przystawienia 90°

M320







Tools / Narzędzia

EDP Nr. new nowy	**EDP No.**	**Dimensions** Wymiary (mm)					**Insert** Płytka
		ØD	**Ød**	**L**	**Z**	**apmax**	
M320A05004050050TP16	M320H00500	50	22	50	4	0,5 - 12	TPUN1603 TPKN1603
M320A06304063050TP16	M320H00630	63	27	50	4		
M320A08005080050TP16	M320H00800	80	32	50	5		

Accessories / Akcesoria

Tool Narzędzie	**ØD**	Insert Screw	Insert Clamp	Shim	Wrench
					
M320	Ø50 - Ø80	SR108	WG103	SH103	SR017

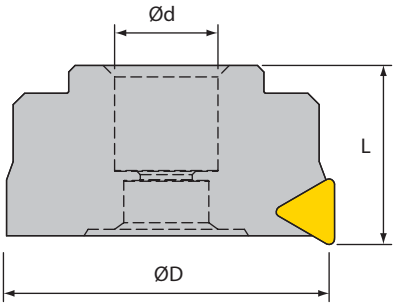
FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

M175

Face Milling Cutters With Corner Angle 90°
Frezy do obróbki płaszczyzn o kącie przystawienia 90°







Tools / Narzędzia

EDP Nr. new nowy	**EDP Nr.**	**Dimensions** Wymiary (mm)					**Insert** Płytka
		ØD	**Ød**	**L**	**Z**	**apmax**	
M175B08004027050TP22		80	27	50	4	0,5-18	TPKN2204
M175B10006032050TP22		100	32	50	6		
M175B12508040063TP22		125	40	63	8		
M175B16010040063TP22		160	40	63	10		
M175B20012060063TP22		200	60	63	12		
M175B25016060063TP22		250	60	63	16		
M175B31520060070TP22		315	60	70	20		

Accessories / Akcesoria

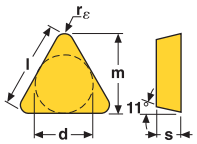
Tool Narzędzie	**Diameter** Średnica ØD	**Cassette** Kaseta	**Wedge** Klin	**Screw** Śruba	**Locator Screw** Śruba	**Wrench** Klucz
M175	Ø80- Ø100	K110	WG109	CS113	LS102	W113
	Ø125 Ø315	K111	WG109	CS114		W123

FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

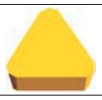
Milling Inserts Płytki do frezowania

TPKN

● - stable machining/obróbka stabilna
● - general machining/obróbka ogólna
✱ - interrupted cut/obróbka przerywana



P	Steel / Stal	●	✱	●	✱		●		●	●	✱		●	●	●	✱			
M	Stainless Steel Stal nierdzewna	●	✱	●	✱				●	●	✱		●	●	●	✱			
K	Cast Iron Żeliwo szare					●	✱	●				●	●				●		✱
N	Non-ferrous materials Materiały nieżelazne																	●	✱
S	Heat-resistant steel Stal żaroodporna							●	●	●									

Insert Shape	Type	Basic Dimensions (mm)			CVD Coating											Cermet		Cemented carbide			
		l	s	r	P127	P128	P228	P102	P203	P204	P225	P216	P246	P226	P251	P143	P230	P231	P139	P234	P224	P235
	TPUN160308 C82	9,525	3,18	0,8																	
	TPKN160312 C82	8,525	3,18	1,2																	
	TPKN220412 C82	12,70	4,7	1,2																	
	TPKN2204 C165	22	4.76		☒														☒		
	TPKN2204 C166	22	4.76		☒							☒							☒		

Cutting Conditions / Parametry skrawania TPUN160308

Material Group Grupa materiałowa	Group № N° Grupy	Material Examples Przykłady materiałów	Hardness Twardość HB	d.o.c. a_p (mm)		feed (mm/tooth) f (mm/ząb) (мм / зуб)		V_c (m/min)	
				min	max	min	max	min	max
Low Carbon Steel Stal niskowęglowa	1	Ck15 9SMnPb28	150 180 210	0.50	12.00	0.12	0.32	190	300 260 220
Alloy Steel Stal stopowa	2	42 CrMo 4 100 Cr 6 32 NiCrMo 14.5	180 230 280 320	0.50	7.00	0.12	0.18	130 100	200 180 160 140
Cast Iron Żeliwo szare	9	EN - GJL 200 EN - GJL 250 EN - GJL 300	140 - 230	0.50	12.00	0.12	0.22	150	240 220 190
Nodular Cast Iron Żeliwo sferoidalne	10	EN - GJS 400 EN - GJS 600 EN - GJS 800	210 260 310	0.50	12.00	0.12	0.18	100	200 160 130

FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

Cutting Conditions / Parametry skrawania TPKN160312

Material Group Grupa materiałowa	Group № N° Grupy	Material Examples Przykłady materiałów	Hardness Twardość HB	d.o.c. a_p (mm)		feed (mm/tooth) f (mm/ząb) (мм / зуб)		V_c (m/min)	
				min	max	min	max	min	max
Low Carbon Steel Stal niskowęglowa	1	Ck15 9SMnPb28	150	0.50	12.00	0.15	0.25	180	300
			180						260
			210						220
Alloy Steel Stal stopowa	2	42 CrMo 4 100 Cr 6 32 NiCrMo 14.5	180	0.50	7.00	0.12	0.23	130	200
			230						180
			280				0.22	100	160
			320						140
High Alloy Steel Stal wysokostopowa	3	X38 CrMoV 5 X210 CrW 12 X90 CrMoV 8	220	0.50	7.00	0.12	0.18	90	130
			280						110
Cast Iron Żeliwo szare	9	EN - GJL 200	140 - 230	0.50	12.00	0.15	0.25	150	240
		EN - GJL 250							220
		EN - GJL 300							190
Nodular Cast Iron Żeliwo sferoidalne	10	EN - GJS 400	210	0.50	12.00	0.12	0.21	100	200
		EN - GJS 600	260						160
		EN - GJS 800	310						130

Cutting Conditions / Parametry skrawania TPKN220412

Material Group Grupa materiałowa	Group № N° Grupy	Material Examples Przykłady materiałów	Hardness Twardość HB	d.o.c. a_p (mm)		feed (mm/tooth) f (mm/ząb) (мм / зуб)		V_c (m/min)	
				min	max	min	max	min	max
Low Carbon Steel Stal niskowęglowa	1	Ck15 9SMnPb28	150	0.50	18.00	0.18	0.28	180	300
			180						260
			210						220
Alloy Steel Stal stopowa	2	42 CrMo 4 100 Cr 6 32 NiCrMo 14.5	180	0.50	18.00	0.15	0.23	130	200
			230						180
			280		14.00			100	160
			320						140
High Alloy Steel Stal wysokostopowa	3	X38 CrMoV 5 X210 CrW 12 X90 CrMoV 8	220	0.50	12.00	0.12	0.18	90	130
			280						110
			320					90	95
			350						80
Cast Iron Żeliwo szare	9	EN - GJL 200	140 - 230	0.50	18.00	0.18	0.28	150	240
		EN - GJL 250							220
		EN - GJL 300							190
Nodular Cast Iron Żeliwo sferoidalne	10	EN - GJS 400	210	0.50	14.00	0.15	0.23	100	200
		EN - GJS 600							160
		EN - GJS 800							130

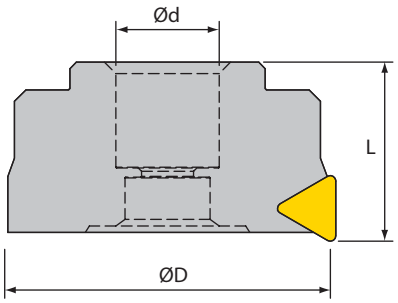
FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

Face Milling Cutters With Corner Angle 90°
Frezy do obróbki płaszczyzn o kącie przystawienia 90°

M321







Tools / Narzędzia

EDP Nr. new nowy	**EDP Nr.**	**Dimensions** Wymiary (mm)					**Insert** Płytka
		ØD	**Ød**	**L**	**Z**	**apmax**	
M321B08005027050TP22	M321H04080	80	27	50	5	0,5-18	TPKX2205
M321B10006032055TP22	M321H04100	100	32	55	6		
M321B12508040055TP22	M321H04125	125	40	55	8		
M321B16010040060TP22	M321H04160	160	40	60	10		
M321B20014060060TP22	M321H04200	200	60	60	14		
M321B25016060065TP22	M321H04250	250	60	65	16		
M321B31518060065TP22	M321H04315	315	60	65	18		
M321B35420060065TP22	M321H04360	354	60	65	20		

Accessories / Akcesoria

Tool Narzędzie	**ØD**	Locator	Insert Clamp	Locator Clamp	Clamp Screw	Wrench
						
M321	Ø80 - Ø354	K112	WG101	LS100	CS106	W103

FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

TPKX

Milling Inserts Płytki do frezowania

Insert Shape Kształt płytki	Type Typ	P Steel / Stal	H Hardened Steel Stal hartowana	M Stainless Steel Stal nierdzewna	K Cast Iron Żeliwo szare	N Non-ferrous materials Materiały nieżelazne	S Heat-resistant steel Stal żaroodporna
	TPKX2205 C51 P100	●	●		●		

Cutting Conditions / Parametry skrawania TPKX2205

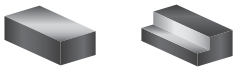
Material Group Grupa materiałowa	Group № N° Grupy	Material Examples Przykłady materiałów	Hardness Twardość HB	d.o.c. a_p (mm) min	d.o.c. a_p (mm) max	feed (mm/tooth) f (mm/ząb) min	feed (mm/tooth) f (mm/ząb) max	V_c (m/min) min	V_c (m/min) max
Low Carbon Steel Stal niskowęglowa	1	Ck15 Ck45 1020 1045	150	0,5	18	0,18	0,28	180	300
			180		18		0,28		260
			210		18		0,28		220
Alloy Steel Stal stopowa	2	42 CrMo 4 St 50-2 Ck60 /1060 /4140	180	0,5	18	0,15	0,23	130	200
			230		18		0,23		180
			280	0,5	14	0,15	0,23	100	160
			320		14		0,23		140
High Alloy Steel Stal wysokostopowa	3	X40 CrMoV 51 40 NiMo 6 S 2-10-1-8 H13 / D2 HSS / M42	220	0,5	12	0,12	0,18	90	130
			280		12		0,18		110
			320	0,5	12	0,12	0,18	60	95
			350		12		0,18		80
Hardened Steel Stal hartowana			400	0,5	5	0,10	0,18	40	80
			480		3		0,16		70
			550		1,5				60
Cast Iron Żeliwo szare	9	GG 20	140 to 230	0,5	18	0,18	0,28	150	240
		GG 25							220
		GG 30							190
Nodular Cast Iron Żeliwo sferoidalne	10	GGG 40	210	0,5	14	0,15	0,23	100	200
		GGG 50	260						160
		GGG 70	310						130
White Cast Iron Żeliwo białe	11	G-X260NiCr42	400	0,5	3	0,10	0,18	30	60

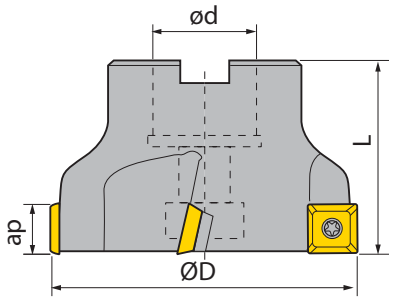
FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

Face Milling Tools Frezy do obróbki płaszczyzn

M176







Tools / Narzędzia

EDP Nr. new nowy	**EDP No.**	**Dimensions** Wymiary (mm)					**Insert** Płytka
		ØD	**Ød**	**L**	**Z**	**apmax**	
M176B05005022040SE09	M181HW00500	50	22	40	5	6.7	SEMT09T3
M176B06306022040SE09	M181HW00630	63	22	40	6	6.7	
M176B08008027050SE09	M181HW00800	80	27	50	8	6.7	
M176B10008032050SE09	M181HW01000	100	32	50	8	6.7	
M176B10010032050SE09	M181HW01001	100	32	50	10	6.7	
M176B12512040063SE09	M181HW01250	125	40	63	12	6.7	
M176B05003022040SE12	M182HW00500	50	22	40	3	10,8	SEMT1203
M176B06304022040SE12	M182HW00630	63	22	40	4	10,8	
M176B08004027050SE12	M182HW00800	80	27	50	4	10,8	
M176B10005032050SE12	M182HW01000	100	32	50	5	10,8	
M176B12506040063SE12	M182HW01250	125	40	63	6	10,8	
M176B16008040063SE12	M182HW01600	160	40	63	8	10,8	
M176B25012060063SE12	M182HW02500	250	60	63	12	10,8	
M176B05004022040SE12	M183HW00500	50	22	40	4	10,8	
M176B06305022040SE12	M183HW00630	63	22	40	5	10,8	
M176B08006027050SE12	M183HW00800	80	27	50	6	10,8	
M176B10007032050SE12	M183HW01000	100	32	50	7	10,8	
M176B12508040063SE12	M183HW01250	125	40	63	8	10,8	
M176B16012040063SE12	M183HW01600	160	40	63	12	10,8	
M176B05005022040SE12	M184HW00500	50	22	40	5	10,8	
M176B06306022040SE12	M184HW00630	63	22	40	6	10,8	
M176B08008027050SE12	M184HW00800	80	27	50	8	10,8	
M176B10010032050SE12	M184HW01000	100	32	50	10	10,8	
M176B12512040063SE12	M184HW01250	125	40	63	12	10,8	
M176B20016060063SE12	M184HW02000	200	60	63	16	10,8	
M176B25018060063SE12	M184HW02500	250	60	63	18	10,8	
M176B31524060063SE12	M184HW03150	315	60	63	24	10,8	

Accessories / Akcesoria

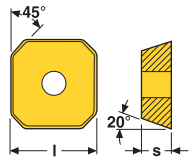
Tool Narzędzie	**Diameter** Średnica ØD	**Insert** Płytka	**Shim** Podkładka	**Screw** Śruba	**Shim Screw** Śrubka do podkładki	**Wrench** Klucz	**Wrench** Klucz
M176	Ø50- Ø125	SE09	–	SR137	–	W124	–
	Ø50	SE12	–	SR067	–	W125	–
	Ø63- Ø315		SH108	SR068	SR138		W115

FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

SEMT

Milling Inserts Płytki do frezowania

● - stable machining/obróbka stabilna
● - general machining/obróbka ogólna
✱ - interrupted cut/obróbka przerywana



P	Steel / Stal	●	✱	●	✱		●		●	●	✱		●	●	●	✱			
M	Stainless Steel Stal nierdzewna	●	✱	●	✱				●	●	✱		●	●	●	✱			
K	Cast Iron Żeliwo szare					●	✱	●				●	●				●		✱
N	Non-ferrous materials Materiały nieżelazne																	●	✱
S	Heat-resistant steel Stal żaroodporna							●	●	●									

Insert Shape	Type	Basic Dimensions (mm)			CVD Coating												Cermet		Cemented carbide			
		l	s	r	P127	P128	P228	P102	P203	P204	P225	P216	P246	P226	P251	P143	P230	P231	P139	P234	P224	P235
	SEMT09T308PER-C167	9.525	4.01	0.8								●										
	SEMT09T308PER C168	9.525	4.01	0.8								●										
	SEMT09T308PER-C169	9.525	4.01	0.8					●													
	SEMT120308PER-C167	13.308	4.04	0.8	●			●				●										
	SEMT120308PER C168	13.308	4.04	0.8			●	●	●	●	●	●		●								
	SEMT120308PER-169	13.308	4.04	0.8			●	●		●	○	○										

Cutting Conditions / Parametry skrawania

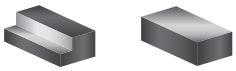
Material Group Grupa materiałowa	Hardness Twardość HB	Insert grade Gatunek płytki	V(m/min)	f(mm/z)		
				-C61	-C06	-C62
Low Carbon Steel Stal niskowęglowa	<180	P228	270(220-350)	0.15 (0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
		P216	270(200-360)	0.15 (0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
		P226	230 (170-350)	0.15 (0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
High-carbon steel **Alloy steel** Stal wysokowęglowa Stopy stali	180-280	P228	240 (200-320)	0.15 (0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
		P216	240 (180-350)	0.15 (0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
		P226	220 (150-330)	0.15 (0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
Alloy tool steel Stopy stali narzędziowej	280-350	P228	220 (180-300)	0.1 (0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
		P216	220 (170-340)	0.1 (0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
		P226	190 (130-300)	0.15 (0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
Stainless steel Stal nierdzewna	<270	P228	150 (120-240)	0.1 (0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
		P216	160 (110-270)	0.1(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
		P226	140 (100-250)	0.15 (0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
Cast iron Żeliwo	180-250	P225	210 (120-300)	0.15 (0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
		P216	160 (120-200)	0.15 (0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
		P204	200 (150-250)	0.15 (0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)

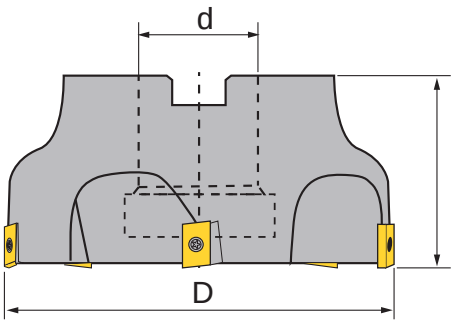
FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

Face Milling Cutters With Corner Angle 90°
Frezy do obróbki płaszczyzn o kącie przystawienia 90°

M177







Tools / Narzędzia

EDP Nr. new nowy	**EDP No.**	**Dimensions** Wymiary (mm)						**Insert** Płytka
		ØD	**Ød**	**ØDe**	**L**	**Z**	**apmax**	
M177B12506040063LN15		125	40		63	6	6.7	
M177B16008040063LN15		160	40		63	8	6.7	
M177B20010060070LN15		200	60		70	10	6.7	LNMT1506
M177B25012060070LN15		250	60		70	12	6.7	
M177B31516060080LN15		315	60		80	16	6.7	
M177B12506040063LN20		125	40		63	6	6.7	
M177B16008040063LN20		160	40		63	8	10,8	
M177B20010060070LN20		200	60		70	10	10,8	LNMT2007
M177B25012060070LN20		250	60		70	12	10,8	
M177B31515060080LN20		315	60		80	15	10,8	
M177B12505040063LN25		125	40		63	5	10,8	
M177B16006040063LN25		160	40		63	6	10,8	
M177B20008060070LN25		200	60		70	8	10,8	LNMT2510
M177B25010060070LN25		250	60		70	10	10,8	
M177B31512060080LN25		315	60		80	12	10,8	

Accessories / Akcesoria

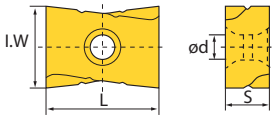
Tool Narzędzie	**Diameter** Średnica ØD	**Insert** Płytka	**Shim** Podkładka	**Shim Screw** Śrubka do podkładki	**Screw** Śruba	**Wrench** Klucz	**Wrench** Klucz
M177	Ø125- Ø315	LN15	SH107	SR137	SR603	W116	W121
	Ø125- Ø315	LN20	SH105	SR137	SR120	W116	W121
	Ø125- Ø315	LN25	SH106	SR136	SR119	W126	W116

FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

LNMT

Milling Inserts Płytki do frezowania

● - stable machining/obróbka stabilna
● - general machining/obróbka ogólna
✱ - interrupted cut/obróbka przerywana



P	Steel / Stal	●	✱	●	✱		●		●	●	✱		●	●	●	✱			
M	Stainless Steel Stal nierdzewna	●	✱	●	✱				●	●	✱		●	●	●	✱			
K	Cast Iron Żeliwo szare					●	✱	●				●	●				●		✱
N	Non-ferrous materials Materiały nieżelazne																	●	✱
S	Heat-resistant steel Stal żaroodporna							●	●	●									

Insert Shape	Type	Basic Dimensions (mm)			CVD Coating											Cermet		Cemented carbide			
		l	s	d	P127	P128	P228	P102	P203	P204	P225	P216	P246	P226	P251	P143	P230	P231	P139	P234	P224	P235
	LNMT1506-C145	15.875	6.35	4.6	•		•	•	•	•				•								
	LNMT2007 C151	20	7.94	4.6				•		•				•								
	LNMT2510 C152	25	9.525	5.5				•		•				•								

Cutting Conditions / Parametry skrawania

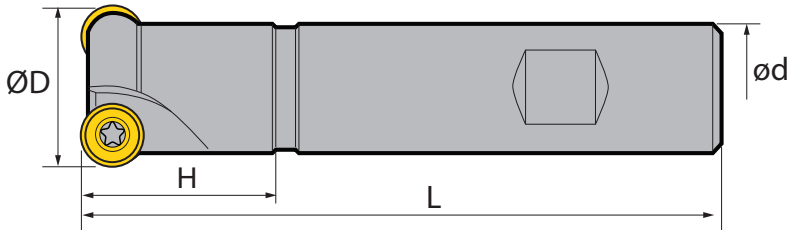
Material Group Grupa materiałowa	Hardness Twardość HB	Insert grade Gatunek płytki	V(m/min)	f(mm/z)
Low Carbon Steel Stal niskowęglowa	≤180	P226	180 (150-300)	0.5 (0.2-0.8)
		P102	180 (150-300)	0.5 (0.2-0.8)
High-carbon steel **Alloy steel** Stal wysokowęglowa Stopy stali	180-280	P226	150 (120-280)	0.5 (0.2-0.8)
		P102	140 (120-280)	0.5 (0.2-0.8)
Alloy tool steel Stopy stali narzędziowej	280-350	P226	120 (80-250)	0.45 (0.2-0.6)
		P102	100 (80-250)	0.45 (0.2-0.6)
Stainless steel Stal nierdzewna	≤270	P226	120 (80-200)	0.45 (0.2-0.6)
		P102	100 (80-200)	0.45 (0.2-0.6)

FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

Face Milling Tools Frezy do obróbki płaszczyzn

M178





Tools / Narzędzia

EDP Nr. new nowy	**EDP No.**	**Dimensions** Wymiary (mm)						**Insert** Płytka
		ØD	**Ød**	**L**	**H**	**Z**	**apmax**	
M178B02502W20100RC10		25	20	100	30	2	0,5-5	RCMT10T3
M178B03202W25120RC10		32	25	120	35	2		
M178B04003W32120RC12		40	32	120	40	3	0,5-6	RCMT1204
M178B05003W32120RC12		50	32	120	40	3		

Accessories / Akcesoria

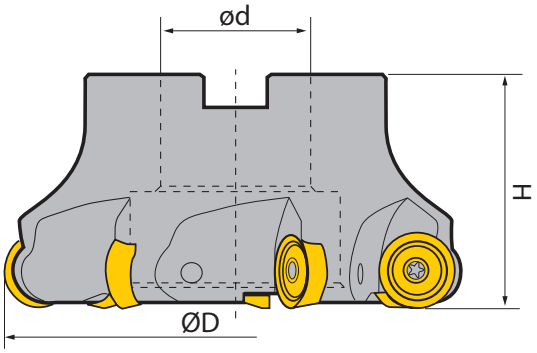
Tool Narzędzie	**Diameter** Średnica ØD	**Insert screw** Śrubka do płytki	**Wrench** Klucz
M178	Ø25- Ø32	SR116	W125
	Ø40- Ø50	SR067	W125

FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

M178

Face Milling Tools Frezy do obróbki płaszczyzn





Tools / Narzędzia

EDP Nr. new nowy	**EDP No.**	**Dimensions** Wymiary (mm)					**Insert** Płytka
		ØD	**Ød**	**L**	**Z**	**apmax**	
M178A06304022050RC12		63	22	50	4	6	RCMT1204
M178B06304022050RC12		63	22	50	4		
M178B06306022050RC12		63	22	50	6		
M178B06304022050RC16		63	22	50	4	8	RCMT1606
M178A08005027050RC16		80	27	50	5		
M178B08005027050RC16		80	27	50	5		
M178B10006032063RC16		100	32	63	6		
M178B08004027050RC20		80	27	50	4	10	RCMT1606
M178B10005032063RC20		100	32	63	5		
M178B10006032063RC20		100	32	63	6		
M178B12506040063RC20		125	40	63	6		
M178B12507040063RC20		125	40	63	7		
M178B16008040063RC20		160	40	63	8		
M178B25010040063RC20		250	40	63	10		

Accessories / Akcesoria

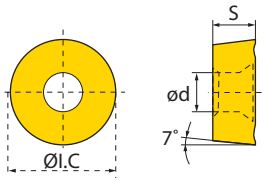
Tool Narzędzie	**Diameter** Średnica ØD	**Insert screw** Śrubka do płytki	**Wrench** Klucz	**Wrench** Klucz
M178	Ø63	SR067	W116	-
	Ø80- Ø100	SR123	-	W126
	Ø125- Ø160	SR124	-	W127

FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

Milling Inserts Płytki do frezowania

RCMT

● - stable machining/obróbka stabilna
● - general machining/obróbka ogólna
✱ - interrupted cut/obróbka przerywana



P	Steel / Stal	● ✱ ● ✱ ● ✱ ● ● ✱ ● ● ● ✱
M	Stainless Steel Stal nierdzewna	● ✱ ● ✱ ● ● ✱ ● ✱ ● ● ✱
K	Cast Iron Żeliwo szare	● ✱ ● ● ✱ ● ● ● ✱
N	Non-ferrous materials Materiały nieżelazne	● ✱
S	Heat-resistant steel Stal żaroodporna	● ● ●

Insert Shape	Type	Basic Dimensions (mm)				CVD Coating											Cermet		Cemented carbide			
		R	I.C	s	d	P127	P128	P228	P102	P203	P204	P225	P216	P246	P226	P251	P143	P230	P231	P139	P234	P224	P235
	RCMT10T3MOC41	5	10.0	3.97	4.4	•	•								○								
	RCMT1204MOC41	6	12.0	4.76	4.0	•	•	•	•				○										
	RCMT1204MOC07	6	12.0	4.76	4.0	•	•	•	•														
	RCMT1606MOC41	8	16.0	6.35	5.56	•	•	○							○								
	RCMT1606MOC07	8	16.0	6.35	5.56	•	•		•		•												
	RCMT2006MOC41	10	20.0	6.35	6.55	•	•																
	RCMT2006MOC07	10	20.0	6.35	6.55	•	•		•		•												

Cutting Conditions / Parametry skrawania

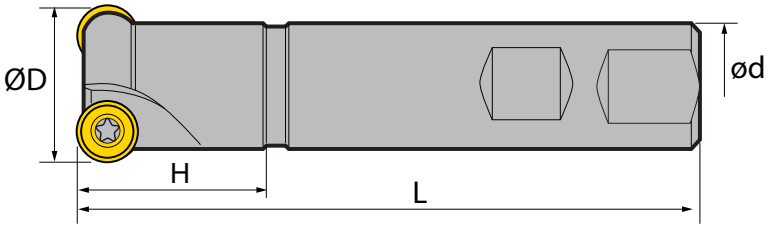
Material Group Grupa materiałowa	Hardness Twardość HB	Insert grade Gatunek płytki	V(m/min)	f(mm/z)	
				-C41	-C07
Low Carbon Steel Stal niskowęglowa	≤180	P127 P228	270 (220-350)	0.2 (0.1-0.5)	0.3 (0.2-0.8)
		P226 P102	220 (180-300)	0.25 (0.1-0.5)	0.3 (0.2-0.8)
		P216	270 (200-360)	0.2 (0.1-0.5)	0.3 (0.2-0.8)
High-carbon steel **Alloy steel** Stal wysokowęglowa Stopy stali	180-280	P127 P228	240 (200-320)	0.2 (0.1-0.5)	0.3 (0.2-0.8)
		P226 P102	200 (160-280)	0.25 (0.1-0.5)	0.3 (0.2-0.8)
		P216	240 (180-350)	0.2 (0.1-0.5)	0.3 (0.2-0.8)
Alloy tool steel Stopy stali narzędziowej	280-350	P127 P228	220 (180-300)	0.2 (0.1-0.4)	0.3 (0.2-0.6)
		P226 P102	180 (150-250)	0.2 (0.1-0.5)	0.3 (0.2-0.8)
		P216	220 (170-340)	0.2 (0.1-0.4)	0.3 (0.2-0.6)
Stainless steel Stal nierdzewna	≤270	P228	160 (110-270)	0.15 (0.1-0.3)	0.3 (0.2-0.6)
		P102	140 (100-250)	0.15 (0.1-0.3)	0.3 (0.2-0.6)
		P216	150 (120-250)	0.15 (0.1-0.3)	0.3 (0.2-0.6)
Cast iron Żeliwo	180-250	P226	210 (120-300)	0.2 (0.1-0.3)	0.3 (0.2-0.8))

FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

M179

Face Milling Tools Frezy do obróbki płaszczyzn





Tools / Narzędzia

EDP Nr. new nowy	**EDP No.**	**Dimensions** Wymiary (mm)						**Insert** Płytka
		ØD	**Ød**	**L**	**H**	**Z**	**apmax**	
M179B01602W16100RD08		16	16	100	25	2	4	RDMW0803
M179B02502W25100RD08		25	25	100	30	2	4	
M179B03202W32120RD10		32	32	120	40	2	5	RDMW1003 RDMW10T3
M179B04003W32120RD12		40	32	120	40	3	6	RDMW1204 RDMW12T3
M179B05004W32120RD12		50	32	120	40	4	6	
M179B01502W16088RD07		15	16	88	40	2	4	RDMW0702 RDMW1003
M179B01502W16108RD07		15	16	108	60	2	4	
M179B01502W20130RD07		15	20	130	80	2	5	
M179B01502W20150RD07		15	20	150	100	2	6	
M179B01502W25120RD07		15	25	120	176	2	6	
M179B02002W20090RD10		20	20	90	40	2	5	
M179B02002W20110RD10		20	20	110	60	2	5	
M179B02002W25136RD10		20	25	136	80	2	5	
M179B02002W25156RD10		20	25	156	10	2	5	
M179B02002W25176RD10		20	25	176	120	2	5	

Accessories / Akcesoria

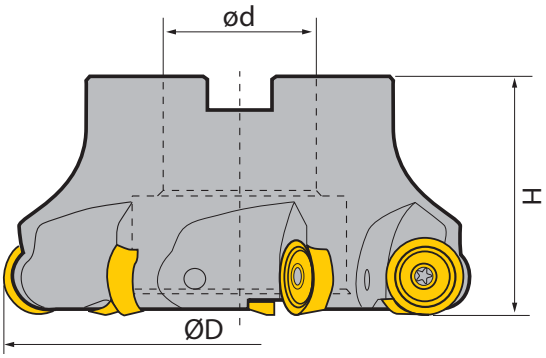
Tool Narzędzie	**Diameter** Średnica ØD	**Insert** Płytka	**Insert screw** Śrubka do płytki	**Wrench** Klucz
M179	Ø25		SR137	W128
	Ø32- Ø50		SR117	W042
		RDMW0702	SR125	W129
		RDMW1003	SR126	W130

FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

Face Milling Tools Frezy do obróbki płaszczyzn

M179





Tools / Narzędzia

EDP Nr. new nowy	**EDP No.**	**Dimensions** Wymiary (mm)					**Insert** Płytka
		ØD	**Ød**	**L**	**Z**	**apmax**	
M179B05003022040RD12		50	22	40	3	6	RDMW1203
M179B06304022050RD12		63	22	50	4	6	
M179B08005027050RD16		80	27	50	5	8	RDMW1605
M179B10006032050RD16		100	32	50	6	8	
M179B12506040063RD20		125	40	63	6	10	RDMW2006
M179B16007040063RD20		160	40	63	7	10	
M179B04206016044RD10		42	16	44	6	5	RDMW1003
M179B05207022050RD10		52	22	50	7	5	
M179B04205016042RD12		42	16	42	5	6	RDMW12T3
M179B05205022050RD12		52	22	50	5	6	
M179B06606027050RD12		66	27	50	6	6	
M179B08007027050RD12		80	27	50	7	6	
M179B05204022050RD16		52	22	50	4	8	RDMW1604
M179B05205022050RD16		52	22	50	5	8	
M179B06605027050RD16		66	27	50	5	8	
M179B08006027052RD16		80	27	52	6	8	
M179B10007032052RD16		100	32	52	7	8	
M179B12508040052RD16		125	40	52	8	8	
M179B16009040052RD16		160	40	52	9	8	

Accessories / Akcesoria

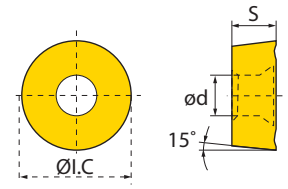
Tool Narzędzie	**Screw** ВинтŚrubka	**Clamp** Zacisk	**Clamp Screw** Śruba zacisku	**Wrench** Klucz	**Insert** Płytka
M179	SR101	-		W042	RDMW1003
	SR101	-	SR117	W126	RDMW12T3
	SR102	WG112		W127	RDMW1604

FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

RDMW

Milling Inserts Płytki do frezowania

● - stable machining/obróbka stabilna
● - general machining/obróbka ogólna
✱ - interrupted cut/obróbka przerywana



P	Steel / Stal	●	✱	●	✱		●		●	●	✱		●	●	●	✱			
M	Stainless Steel Stal nierdzewna	●	✱	●	✱				●	●	✱		●	●	●	✱			
K	Cast Iron Żeliwo szare					●	✱	●				●	●				●		✱
N	Non-ferrous materials Materiały nieżelazne																	●	✱
S	Heat-resistant steel Stal żaroodporna							●	●	●									

Insert Shape	Type	Basic Dimensions (mm)			CVD Coating											Cermet		Cemented carbide			
		R	s	d	P127	P128	P228	P102	P203	P204	P225	P216	P246	P226	P251	P143	P230	P231	P139	P234	P224	P235
	RDMW0702MO	3.5	2.38	2.7				●			●	●										
	RDMW0803MO	4	3.18	3.4				●				●										
	RDMW1003MO	5	3.18	3.9			●	●			●	●										
	RDMW10T3MO	5	3.97	4.4	○			●			●	●										
	RDMW1204MO	6	4.76	4.4			○	●			●	●										
	RDMW12T3MO	6	3.97	3.9		○	●	●			●	●										
	RDMW1604MO	8	4.76	5.2				●			●	●										
	RDMW1605MO	8	5.56	5.5				●			●	●	○									
	RDMW2006MO	10	6.35	6.5				●		○												

Cutting Conditions / Parametry skrawania

Material Group Grupa materiałowa	Hardness Twardość HB	Insert grade Gatunek płytki	V(m/min)	f(mm/z)
Low Carbon Steel Stal niskowęglowa	≤180	P127 P228	270 (220-350)	0.2 (0.08-0.45)
		P226 P102	220 (180-300)	0.25 (0.15-0.45)
		P216	270 (200-360)	0.2 (0.1-0.45)
High-carbon steel **Alloy steel** Stal wysokowęglowa Stopy stali	180-280	P127 P228	240 (200-320)	0.2 (0.08-0.45)
		P226 P102	200 (160-280)	0.25 (0.15-0.45)
		P216	240 (180-350)	0.2 (0.1-05.5)
Alloy tool steel Stopy stali narzędziowej	280-350	P127 P228	220 (180-300)	0.2 (0.08-0.45)
		P226 P102	180 (150-250)	0.25 (0.15-0.45)
		P216	220 (170-340)	0.2 (0.1-0.45)
Stainless steel Stal nierdzewna	≤270	P228	150 (120-240)	0.2 (0.1-0.45)
		P102	150 (100-220)	0.25 (0.1-0.45)
		P216	160 (110-270)	0.2 (0.1-0.45)
Cast iron Żeliwo	180-250	P226	210 (120-300)	0.2 (0.1-0.45)

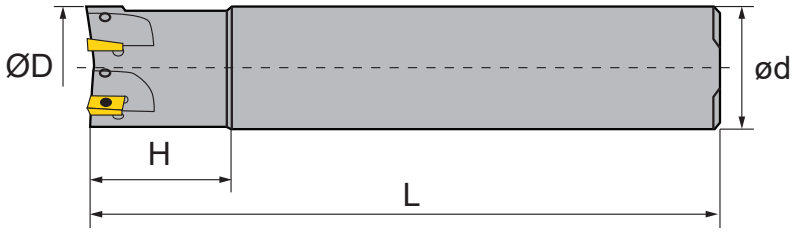
SHOULDER MILLING CUTTERS FREZY WALCOWO-CZOŁOWE

Cutters with Corner Angle 90° Frezy kątowe o kącie przystawienia 90°

M180







Tools / Narzędzia

EDP Nr. new nowy	**EDP No.**	**Dimensions** Wymiary (mm)						**Insert** Płytka
		ØD	**Ød**	**L**	**H**	**Z**	**apmax**	
M180B01201T16085AP11		12	16	85	25	1	10.5	APLT11T3
M180B01602T16090AP11		16	16	90	25	2		
M180B02002T20100AP11		20	20	100	30	2		
M180B02003T20100AP11		20	20	100	30	3		
M180A02503T25115AP11		25	25	115	35	3		
M180B02503T25115AP11		25	25	115	35	3		
M180B02504T25115AP11		25	25	115	35	4		
M180A03204T32125AP11		32	32	125	40	4		
M180B03204T32125AP11		32	32	125	40	4		
M180A02502T25115AP16		25	25	115	35	2	15.5	APLT1604
M180B02502T25115AP16		25	25	115	35	2		
M180A03203T32125AP16		32	32	125	40	3		
M180B03203T32125AP16		32	32	125	40	3		
M180B04003T32130AP16		40	32	130	42	3		
M180A04004T32130AP16		40	32	130	42	4		
M180B04004T32130AP16		40	32	130	42	4		
M180A05005T32135AP16		50	32	135	45	5		
M180B05005T32135AP16		50	32	135	45	5		
M180A06306T32135AP16		63	32	135	45	6		
M180B06306T32135AP16		63	32	135	45	6		

Accessories / Akcesoria

Tool Narzędzie	**Diameter** Średnica ØD	**Insert** Płytka	**Screw** Śrubka Винт	**Wrench** Klucz	
M180	Ø12 - Ø32	AP11	SR127	W077	
	Ø25 - Ø63	AP16	SR116		W116

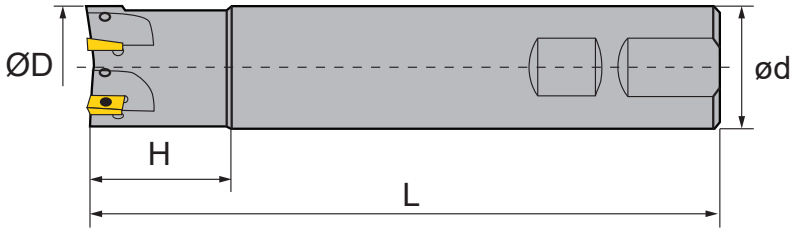
SHOULDER MILLING CUTTERS FREZY WALCOWO-CZOŁOWE

M180

Cutters with Corner Angle 90° Frezy kątowe o kącie przystawienia 90°







Tools / Narzędzia

EDP Nr. new nowy	**EDP No.**	**Dimensions** Wymiary (mm)						**Insert** Płytka
		ØD	**Ød**	**L**	**H**	**Z**	**apmax**	
M180B01201W16085AP11		12	16	85	25	1	10.5	APLT11T3
M180B01602W16090AP11		16	16	90	25	2		
M180B02002W20100AP11		20	20	100	30	2		
M180B02003W20100AP11		20	20	100	30	3		
M180B02503W25115AP11		25	25	115	35	3		
M180B02503W25115AP11		25	25	115	35	3		
M180B03204W32125AP11		32	32	125	40	4		
M180B02502W25115AP16		25	25	115	35	2	15.5	APLT1604
M180B03203W32125AP16		32	32	125	40	3		
M180B04004W32130AP16		40	32	130	42	4		
M180B05005W32135AP16		50	32	135	45	5		
M180B06306W32135AP16		63	32	135	45	6		

Accessories / Akcesoria

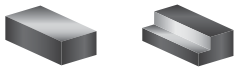
Tool Narzędzie	**Diameter** Średnica ØD	**Insert** Płytka	**Screw** Śrubka	**Wrench** Klucz	
M180	Ø12 - Ø32	APKT11	SR127	W077	
	Ø25 - Ø63	APKT16	SR116		W116

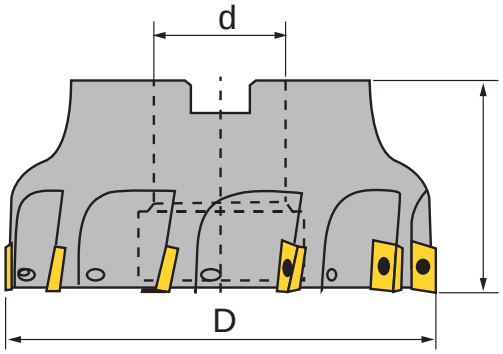
SHOULDER MILLING CUTTERS FREZY WALCOWO-CZOŁOWE

Cutters with Corner Angle 90° Frezy kątowe o kącie przystawienia 90°

M180







Tools / Narzędzia

EDP Nr. new nowy	**EDP No.**	**Dimensions** Wymiary (mm)					**Insert** Płytka
		ØD	**Ød**	**L**	**Z**	**apmax**	
M180A05006022040AP11		50	22	40	6	11	APLT11T3
M180B05006022040AP11		50	22	40	6		
M180A06308022040AP11		63	22	40	8		
M180B06308022040AP11		63	22	40	8		
M180B08008027050AP11		80	27	50	8		
M180A08008027050AP11		80	27	50	8		
M180B10010032050AP11		100	32	50	10		
M180A05005022040AP16		50	22	40	5	15.5	APLT1604
M180B05005022040AP16		50	22	40	5		
M180A06306022040AP16		63	22	40	6		
M180B06306022040AP16		63	22	40	6		
M180A08007027050AP16		80	27	50	7		
M180B08007027050AP16		80	27	50	7		
M180B10008032050AP16		100	32	50	8		
M180B12510040063AP16		125	40	63	10		
M180B16010040063AP16		160	40	63	10		
M180B20012060063AP16		200	60	63	12		
M180B20012060063AP16		200	60	63	12		

Accessories / Akcesoria

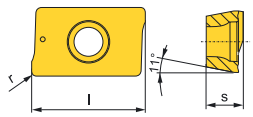
Tool Narzędzie	**Diameter** Średnica ØD	**Insert** Płytka	**Screw** Śrubka	**Wrench** Klucz
M180	Ø50 - Ø100	APKT11	SR127	W131
	Ø50 - Ø100	APKT16	SR117	W116

SHOULDER MILLING CUTTERS FREZY WALCOWO-CZOŁOWE

APLT

Milling Inserts Płytki do frezowania

● - stable machining/obróbka stabilna
● - general machining/obróbka ogólna
✱ - interrupted cut/obróbka przerywana



		P127	P128	P228	P102	P203	P204	P225	P216	P246	P226	P251	P143	P230	P231	P139	P234	P224	P235
P	Steel / Stal	●	✱	●	✱		●		●	●	✱		●	●	●	✱			
M	Stainless Steel Stal nierdzewna	●	✱	●	✱				●	●	✱		●	●	●	✱			
K	Cast Iron Żeliwo szare					●	✱	●				●	●				●		✱
N	Non-ferrous materials Materiały nieżelazne																	●	✱
S	Heat-resistant steel Stal żaroodporna							●	●	●									

Insert Shape	Type	Basic Dimensions (mm)			CVD Coating										Cermet		Cemented carbide			
		L	s	r	P127	P128	P228	P102	P203	P204	P225	P216	P246	P226	P251	P143	P230	P231	P139	P234	P224	P235
	APLT11T304-C61	12.24	3.6	0.4	○		●	●				●		●								
	APLT11T308-C61	12.24	3.6	0.8			●					●										
	APLT11T312-C61	12.24	3.6	1.2								○										
	APLT11T316-C61	12.24	3.6	1.6								●										
	APLT160408-C61	17.877	5.76	0.8	●		●	●				●		●								
	APLT11T304-C06	12.24	3.6	0.4	●	●	●	●			●	●		●								
	APLT11T308-C06	12.24	3.6	0.8	●		●	●	●		●	●		●								
	APLT11T312-C06	12.24	3.6	1.2			●					●										
	APLT11T316-C06	12.24	3.6	1.6			●					●										
	APLT160408-C06	17.877	5.76	0.8	●	●	●	●	●	●	●	●	●	●								
	APLT11T304-C62	12.24	3.6	0.4		●		●						●								
	APLT11T304-C39	12.24	3.6	0.4																	●	●
	APLT11T308-C39	12.24	3.6	0.8																	●	●
	APLT160408-C39	17.877	5.76	0.8																	●	●

Cutting Conditions / Parametry skrawania Square shoulder miling - frezowanie walcowo-czołowe

Material Group Grupa materiałowa	Hardness Twardość HB	Insert grade Gatunek płytki	V(m/min)	f(mm/z)			ae (mm)
				-C61	-CC06	-C62	
Low Carbon Steel Stal niskowęglowa	≤180	P228 P127	320 (240-400)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)	≤0.5D
		P102	260 (180-380)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)	≤0.5D
		P216 P246	320 (200-400)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)	≤0.5D
		P226	280 (180-400)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)	≤0.5D
High-carbon steel **Alloy steel** Stal wysokowęglowa Stopy stali	180-280	P228 P127	280 (210-380)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.3)	≤0.5D
		P102	240 (160-320)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)	≤0.5D
		P216 P246	280 (180-350)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.3)	≤0.5D
		P226	260 (150-380)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)	≤0.5D
Alloy tool steel Stopy stali narzędziowej	280-350	P228 P127	260 (180-350)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.3)	≤0.5D
		P102	220 (150-280)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)	≤0.5D
		P216 P246	260 (160-330)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.3)	≤0.5D
		P226	240 (120-350)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)	≤0.5D
Stainless steel Stal nierdzewna	≤270	P228	200 (120-270)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.3)	≤0.5D
		P102	180 (150-300)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.3)	≤0.5D
		P216 P246	200 (110-300)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.3)	≤0.5D
		P226	170 (100-280)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.3)	≤0.5D
Cast iron Żeliwo	180-250	P225	220 (120-250)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	-	≤0.5D
		P204	200 (120-320)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	-	≤0.5D
Al alloy Stopy aluminium				-C39			
	-	P224	300-	0.2 (0.08-0.4)			≤0.5D
		P235	300-				

SHOULDER MILLING CUTTERS FREZY WALCOWO-CZOŁOWE

Cutting Conditions / Parametry skrawania Slot milling frezowanie rowków

Material Group Grupa materiałowa	Hardness Twardość HB	Insert grade Gatunek płytki	V(m/min)	f(mm/z)			ae (mm)
				-C61	-CC06	-C62	
Low Carbon Steel Stal niskowęglowa	≤180	P228 P127	190 (170-250)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2(0.2-0.3)	D
		P102	150 (130-210)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2(0.2-0.35	D
		P216 P246	190 (140-250)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2(0.2-0.3)	D
		P226	170 (130-250)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2(0.2-0.3)	D
High-carbon steel Alloy steel Stal wysokowęglowa Stopy stali	180-280	P228 P127	170 (150-220)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2(0.2-0.3)	D
		P102	140 (110-200)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2(0.2-0.3)	D
		P216 P246	170 (130-250)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2(0.2-0.3)	D
		P226	150 (110-230)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2(0.2-0.3)	D
Alloy tool steel Stopy stali narzędziowej	280-350	P228 P127	150 (130-210)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2(0.2-0.3)	D
		P102	130 (100-180)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2(0.2-0.3)	D
		P216 P246	150 (110-240)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2(0.2-0.3)	D
		P226	140 (80-210)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2(0.2-0.3)	D
Stainless steel Stal nierdzewna	≤270	P228	110 (80-190)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2(0.2-0.3)	D
		P102	100 (80-170)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2(0.2-0.3)	D
		P216 P246	120 (80-190)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2(0.2-0.3)	D
		P226	100 (70-180)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.2(0.2-0.3)	D
Cast iron Żeliwo	180-250	P225	130 (80-180)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	-	D
		P204	120 (80-210)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	-	D
Al alloy Stopy aluminium				-C39			
	-	P224	300-	0.2 (0.08-0.4)			D
		P235	300-				

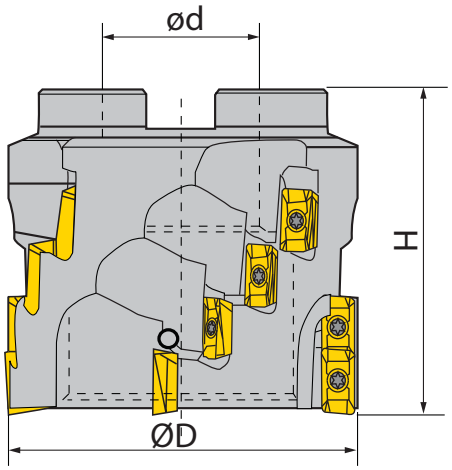
SHOULDER MILLING CUTTERS FREZY WALCOWO-CZOŁOWE

M182

Cutters with Corner Angle 90º Frezy kątowe o kącie przystawienia 90º







Tools / Narzędzia

EDP Nr. new nowy	**EDP No.**	**Dimensions** Wymiary (mm)					**Insert** Płytka
		ØD	**Ød**	**L**	**Z**	**apmax**	
M182B05016022058AP11		50	22	58	16		APLT11T3
M182B06316027058AP11		63	27	58	16		
M182B08020032063AP11		80	32	63	20		
M182B10024040063AP11		100	40	63	24		

Accessories / Akcesoria

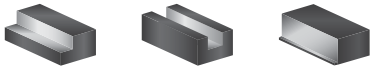
Tool Narzędzie	**Diameter** Średnica ØD	**Screw** Śrubka	**Wrench** Klucz
M182	Ø50 - Ø100	SR127	W131

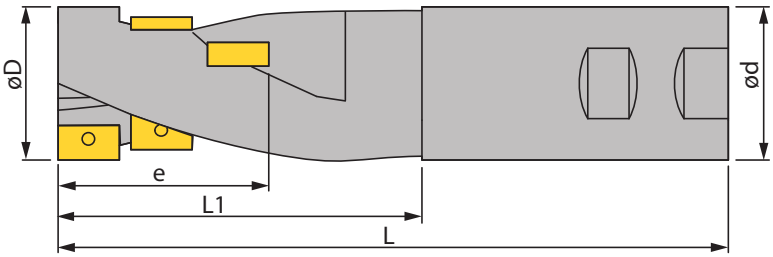
SHOULDER MILLING CUTTERS FREZY WALCOWO-CZOŁOWE

Cutters with Corner Angle 90° Frezy kątowe o kącie przystawienia 90°

M182







Tools / Narzędzia

EDP Nr. new nowy	**EDP No.**	**Dimensions** Wymiary (mm)						**Insert** Płytka
		ØD	**Ød**	**L**	**H**	**Z**	**apmax**	
M182B02003W20120AP11		20	20	120	45	3		APLT11T3
M182B02508W25130AP11		25	25	130	55	8		
M182B03210W32140AP11		32	32	140	65	10		
M182B04014W40150AP11		40	40	150	75	14		

Accessories / Akcesoria

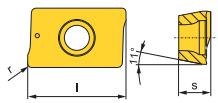
Tool Narzędzie	**Diameter** Średnica ØD	**Screw** Śrubka	**Wrench** Klucz
M182	Ø20 - Ø40	SR127	W131

SHOULDER MILLING CUTTERS FREZY WALCOWO-CZOŁOWE

APLT

Milling Inserts Płytki do frezowania

● - stable machining/obróbka stabilna
● - general machining/obróbka ogólna
✱ - interrupted cut/obróbka przerywana



P	Steel / Stal	●	✱	●	✱		●		●	●	✱		●	●	●	✱			
M	Stainless Steel Stal nierdzewna	●	✱	●	✱				●	●	✱		●	●	●	✱			
K	Cast Iron Żeliwo szare					●	✱	●				●	●				●		✱
N	Non-ferrous materials Materiały nieżelazne																	●	✱
S	Heat-resistant steel Stal żaroodporna							●	●	●									

Insert Shape	Type	Basic Dimensions (mm)			CVD Coating											Cermet		Cemented carbide			
		L	s	r	P127	P128	P228	P102	P203	P204	P225	P216	P246	P226	P251	P143	P230	P231	P139	P234	P224	P235
	APLT11T304-C61	12.24	3.6	0.4	○		●	●				●		●								
	APLT11T308-C61	12.24	3.6	0.8			●					●										
	APLT11T312-C61	12.24	3.6	1.2								○										
	APLT11T316-C61	12.24	3.6	1.6								●										
	APLT160408-C61	17.877	5.76	0.8	●		●	●				●		●								
	APLT11T304-C06	12.24	3.6	0.4	●	●	●	●			●	●		●								
	APLT11T308-C06	12.24	3.6	0.8	●		●	●	●		●	●		●								
	APLT11T312-C06	12.24	3.6	1.2			●					●										
	APLT11T316-C06	12.24	3.6	1.6			●					●										
	APLT160408-C06	17.877	5.76	0.8	●	●	●	●	●	●	●	●	●	●								
	APLT11T304-C62	12.24	3.6	0.4		●		●						●								
	APLT11T304-C39	12.24	3.6	0.4																	●	●
	APLT11T308-C39	12.24	3.6	0.8																	●	●
	APLT160408-C39	17.877	5.76	0.8																	●	●

Cutting Conditions / Parametry skrawania Square shoulder miling - frezowanie walcowo-czołowe

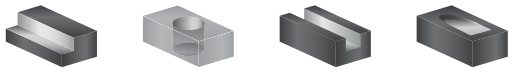
Material Group Grupa materiałowa	Hardness Twardość HB	Insert grade Gatunek płytki	V(m/min)	f(mm/z)			ae (mm)
				-C61	-CC06	-C62	
Low Carbon Steel Stal niskowęglowa	≤180	P228 P127	320 (240-400)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)	≤0.5D
		P102	260 (180-380)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)	≤0.5D
		P216 P246	320 (200-400)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)	≤0.5D
		P226	280 (180-400)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)	≤0.5D
High-carbon steel **Alloy steel** Stal wysokowęglowa Stopy stali	180-280	P228 P127	280 (210-380)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.3)	≤0.5D
		P102	240 (160-320)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)	≤0.5D
		P216 P246	280 (180-350)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.3)	≤0.5D
		P226	260 (150-380)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)	≤0.5D
Alloy tool steel Stopy stali narzędziowej	280-350	P228 P127	260 (180-350)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.3)	≤0.5D
		P102	220 (150-280)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)	≤0.5D
		P216 P246	260 (160-330)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.3)	≤0.5D
		P226	240 (120-350)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.35)	≤0.5D
Stainless steel Stal nierdzewna	≤270	P228	200 (120-270)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.3)	≤0.5D
		P102	180 (150-300)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.3)	≤0.5D
		P216 P246	200 (110-300)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.3)	≤0.5D
		P226	170 (100-280)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.25(0.2-0.3)	≤0.5D
Cast iron Żeliwo	180-250	P225	220 (120-250)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	-	≤0.5D
		P204	200 (120-320)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	-	≤0.5D
Al alloy Stopy aluminium				-C39			
	-	P224	300-	0.2 (0.08-0.4)			≤0.5D
		P235	300-				

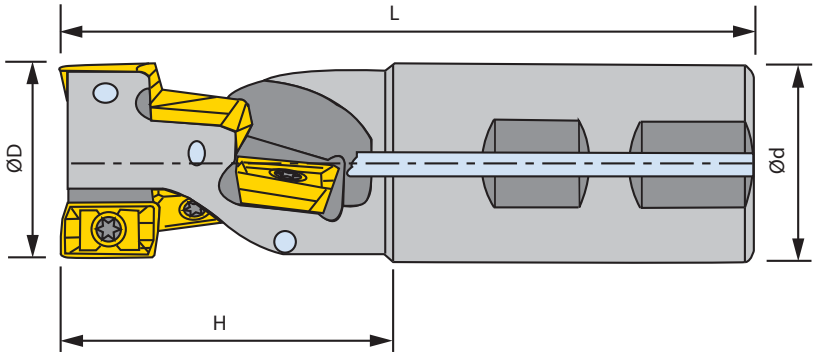
SHOULDER MILLING CUTTERS FREZY WALCOWO-CZOŁOWE

M650

Cutters with Corner Angle 90º Frezy kątowe o kącie przystawienia 90º



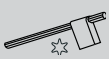




Tools / Narzędzia

EDP Nr. new nowy	**EDP No.**	**Dimensions** Wymiary (mm)						**Insert** Płytka
		ØD	**Ød**	**L**	**H**	**Z**	**apmax**	
M650A02502W25105AP16	M650WW0250	25	25	48	105	2	0,5 - 15	APKT1604 APGT1604
M650A03206W32115AP16	M650WW0320	32	32	55	115	6		
M650A04008W32130AP16	M650WW0400	40	32	65	130	8		

Accessories / Akcesoria

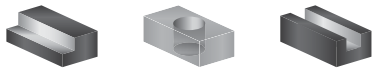
Tool Narzędzie	**ØD**	**Spare Parts /** Części zamienne	
			
M650	Ø25 - Ø40	SR106	W017

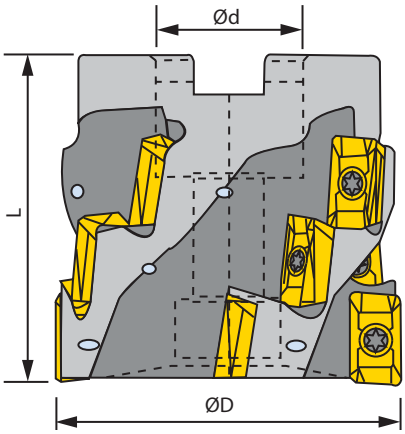
SHOULDER MILLING CUTTERS FREZY WALCOWO-CZOŁOWE

Cutters with Corner Angle 90° Frezy kątowe o kącie przystawienia 90°

M650



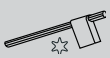




Tools / Narzędzia

EDP Nr. new nowy	**EDP No.**	**Dimensions** Wymiary (mm)					**Insert** Płytka
		ØD	**Ød**	**L**	**Z**	**apmax**	
M650A05006027050AP16	M326H00400	50	27	50	6	0,5 - 15	APKT1604 APGT1604
M650A06312027060AP16	M326H00500	63	27	60	12		

Accessories / Akcesoria

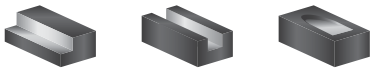
Tool Narzędzie	**ØD**	**Spare Parts** / Części zamienne	
			
M650	Ø50 - Ø63	SR106	W017

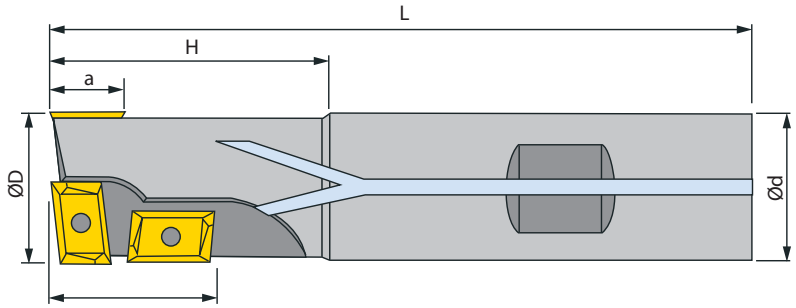
SHOULDER MILLING CUTTERS FREZY WALCOWO-CZOŁOWE

M344

Drilling End Mills Frezy walcowo-czołowe wiercące







Normal / Zwykłe

EDP Nr. new nowy	**EDP No.**	**Dimensions** Wymiary (mm)						**Insert** Płytka
		ØD	**Ød**	**L**	**H**	**Z**	**apmax**	
M344A02003W20090AP10	M344WW0200	20	20	90	35	3		JDMX1003, APGT1003
M344A03203W32130AP16	M344WW0320	32	32	130	50	3		APKT1604, APGT1604

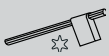
Long / Długie

EDP Nr. new nowy	**EDP No.**	**Dimensions** Wymiary (mm)						**Insert** Płytka
		ØD	**Ød**	**L**	**H**	**Z**	**apmax**	
M344A02003W20150AP10	M345WW0200	20	20	150	30	3		JDMX, APGT

Extra long / Bardzo długie

EDP Nr. new nowy	**EDP No.**	**Dimensions** Wymiary (mm)						**Insert** Płytka
		ØD	**Ød**	**L**	**H**	**Z**	**apmax**	
M344A02003W20180AP10	M346A00200	20	20	180	30	3		JDMX, APGT
M344A03203W25220AP16	M346A00320	32	25	220	50	3		APKT, APGT

Accessories / Akcesoria

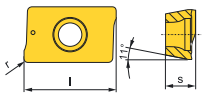
Tool Narzędzie	**ØD**	**Spare Parts** / Części zamienne	
			
M344	Ø20	SR070	W016
	Ø32	SR106	W017

SHOULDER MILLING CUTTERS FREZY WALCOWO-CZOŁOWE

Milling Inserts Płytki do frezowania

APLT

● - stable machining/obróbka stabilna
● - general machining/obróbka ogólna
✱ - interrupted cut/obróbka przerywana



P	Steel / Stal	●	✱	●	✱		●	●		●	●	✱		●	●	●	✱			
M	Stainless Steel Stal nierdzewna	●	✱	●	✱			●		●	●	✱		●	●	●	✱			
K	Cast Iron Żeliwo szare					●	✱	●	●				●	●				●		✱
N	Non-ferrous materials Materiały nieżelazne																		●	✱
S	Heat-resistant steel Stal żaroodporna							●		●	●									

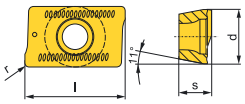
Insert Shape	Type	Basic Dimensions (mm)			CVD Coating						PVD Coating							Cermet		Cemented carbide			
		l	s	r	P127	P128	P228	P102	P203	P204	P100	P225	P216	P246	P226	P251	P143	P230	P231	P139	P234	P224	P235
	APKT160408 C82	16	4.76	0.8							•												
	APKT160424 C82	16	4.76	2.4							•												

SHOULDER MILLING CUTTERS FREZY WALCOWO-CZOŁOWE

APGT

Milling Inserts Płytki do frezowania

● - stable machining/obróbka stabilna
● - general machining/obróbka ogólna
✱ - interrupted cut/obróbka przerywana



P	Steel / Stal	●	●	✱				●	✱		●	●	●	✱			
M	Stainless Steel Stal nierdzewna	●	●	✱				●	✱		●	●	●	✱			
K	Cast Iron Żeliwo szare	●			●	✱	●			●	●				●		✱
N	Non-ferrous materials Materiały nieżelazne	●														●	✱
S	Heat-resistant steel Stal żaroodporna	●					●	●									

Insert Shape Kształt płytki	Type Typ	Dimensions Wymiary (mm)			CVD Coating					PVD Coating					Cermet		Cemented carbide			
		l	s	r	P300	P228	P101	P203	P204	P225	P216	P226	P251	P142	P230	P231	P138	P234	P224	P235
	APGT100306 C63	6,7	3,45	0,6	•															
	APGT160410 C63	9,45	4,76	1,0	•															

Cutting Conditions / Parametry skrawania APGT100306

Aluminium	Group No Nr Grupy	Material Examples Przykładowy materiał	Hardness Twardość HB	d.o.c [mm]		feed [mm/tooth]		Vc [m/min]	
				min	max	min	max	min	max
Si<4%	13	AlMgSi 1	----	0.3	9.0	0.12	0.20	400	1200
4%<Si<8%	13	AlSi 6 Cu 4	----			0.10	0.18	250	600

Cutting Conditions / Parametry skrawania APGT160410

Aluminium	Group No Nr Grupy	Material Examples Przykładowy materiał	Hardness Twardość HB	d.o.c [mm]		feed [mm/tooth]		Vc [m/min]	
				min	max	min	max	min	max
Si<4%	13	AlMgSi 1	----	0.5	15.5	0.15	0.32	400	1200
4%<Si<8%	13	AlSi 6 Cu 4	----			0.12	0.25	250	600

SHOULDER MILLING CUTTERS FREZY WALCOWO-CZOŁOWE

Cutting Conditions / Parametry skrawania

Material Group Grupa materiałowa	Group № N° Grupy	Material Examples Przykłady materiałów	Hardness Twardość HB	d.o.c. a_p (mm)		feed (mm/tooth) f (mm/ząb)		V_c (m/min)	
				min	max	min	max	min	max
Low Carbon Steel Stal niskowęglowa	1	Ck15 9SMnPb28	150	0.50	15.00	0.18	0.32	180	300
			180						260
			210						220
Alloy Steel Stal stopowa	2	42 CrMo 4 100 Cr 6 32 NiCrMo 14.5	180	0.50	15.00	0.15	0.25	130	200
			230						180
			280				0.22	100	160
			320						140
High Alloy Steel Stal wysokostopowa	3	X38 CrMoV 5 X210 CrW 12 X90 CrMoV 8	220	0.50	12.00	0.12	0.22	90	130
			280						110
			320				0.18	60	95
			350						80
Austenitic Stainless Steel Stal nierdzewna austenityczna	4	303 / 304 304 L	210 - 250	0.50	15.00	0.15	0.25	170	270
	5	316 / 316L	230 - 270			0.12	0.22	120	210
	6	316 Ti 630 (F16PH)	.....		12.00	0.12	0.18	70	120
Ferritic Stainless Steel Stal nierdzewna ferrytyczna	7	430 / 439 / 444	Annealed Wyżarzona	0.50	15.00	0.15	0.25	150	230
Martensitic Stainless Steel Stal nierdzewna martenzytyczna	8	410 / 420	Annealed Wyżarzona	0.50	15.00	0.15	0.25	130	210
			Treated Ulepszona				0.20	90	150
Cast Iron Żeliwo szare	9	EN - GJL 200	140 - 230	0.50	15.00	0.18	0.32	150	240
		EN - GJL 250							220
		EN - GJL 300							190
Nodular Cast Iron Żeliwo sferoidalne	10	EN - GJS 400	210	0.50	15.00	0.15	0.28	100	200
		EN - GJS 600	260						160
		EN - GJS 800	310						130
Nickel Based Alloys Stopy niklu	11	Inconel 625	.....	0.50	12.00	0.12	0.18	25	35
		Inconel 718						28	38
		Hastelloy C						40	65
Ti Alloy Stop Ti	12	TiAl 6V4	.....	0.50	12.00	0.12	0.20	35	60
		T40					0.18	28	40

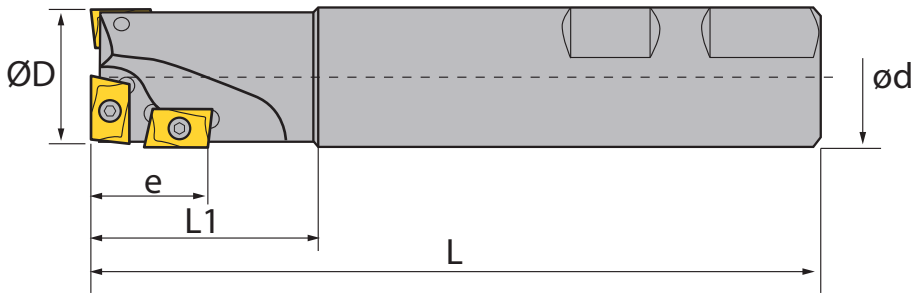
SHOULDER MILLING CUTTERS FREZY WALCOWO-CZOŁOWE

M183

Drilling End Mills Frezy walcowo-czołowe wiercące



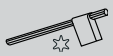




Tools / Narzędzia

EDP Nr. new nowy	**EDP No.**	**Dimensions** Wymiary (mm)					**Insert** Płytka	
		ØD	**Ød**	**L**	**H**	**Z**	APMT1135	APMT1604
M183B02502W25130APXX		25	25	130	40	3	3	-
M183B02502W25200APXX		25	25	200	40	3	3	-
M183B03202W32140APXX		32	32	140	50	1-2	1	2
M183B03202W32225APXX		32	32	225	50	1-2	1	2
M183B04002W32150APXX		40	32	150	60	4	-	4

Accessories / Akcesoria

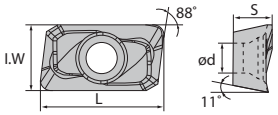
Tool Narzędzie	**ØD**	**Spare Parts** / Części zamienne		
		Insert Płytka		
M183	Ø25-40	APMT1135	SR127	W077
		APMT1604	SR117	W042

SHOULDER MILLING CUTTERS FREZY WALCOWO-CZOŁOWE

Milling Inserts Płytki do frezowania

APMT

● - stable machining/obróbka stabilna
● - general machining/obróbka ogólna
✱ - interrupted cut/obróbka przerywana



P	Steel / Stal	●	✱	●	✱		●		●	●	✱		●	●	●	✱			
M	Stainless Steel Stal nierdzewna	●	✱	●	✱				●	●	✱		●	●	●	✱			
K	Cast Iron Żeliwo szare					●	✱	●				●	●				●		
N	Non-ferrous materials Materiały nieżelazne																	●	✱
S	Heat-resistant steel Stal żaroodporna				✱			●	●	●									

Insert Shape	Type	Basic Dimensions (mm)			CVD Coating											Cermet		Cemented carbide			
		l	s	r	P127	P128	P228	P101	P203	P204	P225	P216	P246	P226	P251	P143	P230	P231	P139	P234	P224	P235
	APMT1135 C82	11.25	3.5	0.8			○				○	○	●									
	APMT160408 C82	17.25	4.76	0.8			○	○				○	●									
	APMT160408 C82	17.25	4.76	3.2				○				●										

Cutting Conditions / Parametry skrawania Driling-Wiercenie

Material Group Grupa materiałowa	Hardness Twardość HB	Insert grade Gatunek płytki	V(m/min)	f(mm/z)
Low Carbon Steel Stal niskowęglowa	≤180	P216 P246	180(150-220)	0.2 (0.08-0.45)
High-carbon steel **Alloy steel** Stal wysokowęglowaStopy stali	180-280	P216 P246	160(130-200)	0.15 (0.08-0.2)
Alloy tool steel Stopy stali narzędziowej	280-350	P216 P246	140(120-180)	0.12 (0.05-0.2)
Stainless steel Stal nierdzewna	≤270	P216 P246	80(50-150)	0.08 (0.03-0.15)
Cast iron Żeliwo	180-250	P216 P246	150 (100-220)	0.15 (0.08-0.2)

Cutting Conditions / Parametry skrawania Milling-Frezowanie

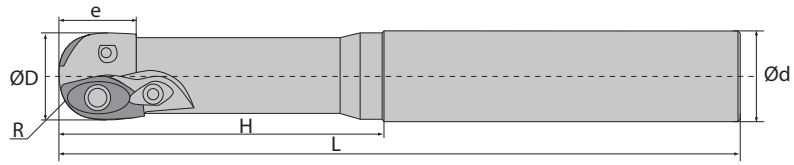
Material Group Grupa materiałowa	Hardness Twardość HB	Insert grade Gatunek płytki	V(m/min)	f(mm/z)
Low Carbon Steel Stal niskowęglowa	≤180	P216 P246	190 (140-250)	0.08 (0.04-0.15)
High-carbon steel **Alloy steel** Stal wysokowęglowaStopy stali	180-280	P216 P246	170 (130-250)	0.08 (0.04-0.15)
Alloy tool steel Stopy stali narzędziowej	280-350	P216 P246	150 (110-240)	0.08 (0.04-0.15)
Stainless steel Stal nierdzewna	≤270	P216 P246	120 (80-190)	0.08 (0.04-0.15)
Cast iron Żeliwo	180-250	P216 P246	120 (80-210)	0.08 (0.04-0.15)

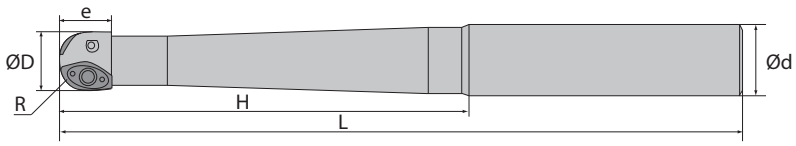
PROFIL MILLING TOOLS FREZY DO OBRÓBKI PROFILU

M500

Profil Milling Tools Frezy do obróbki profilu







Tools / Narzędzia

EDP Nr. new nowy	**EDP No.**	**Dimensions** Wymiary (mm)						
		R	**ØD**	**Ød**	**L**	**H**	**e**	**Z**
M500B01602T20150BP16	M500A00160	8	16	20	150	70	16	2
M500B01602T20180BP16	M500A00161	8	16	20	180	80	16	2
M500B02002T25180BP20	M500A00200	10	20	25	180	80	20	2
M500B02002T25200BP20	M500A00201	10	20	25	200	100	20	2
M500B02002T25250BP20	M500A00202	10	20	25	250	150	20	2
M500B02002T25300BP20	M500A00203	10	20	25	300	110	20	2
M500B02502T25180BP25	M500A00250	12.5	25	25	180	80	25	2
M500B02502T25200BP25	M500A00251	12.5	25	25	200	100	25	2
M500B02502T25250BP25	M500A00252	12.5	25	25	250	110	25	2
M500B02502T25300BP25	M500A00253	12.5	25	25	300	120	25	2
M500B03002T32200BP30	M500A00300	15	30	32	200	120	30	2
M500B03002T32250BP30	M500A00301	15	30	32	250	150	30	2
M500B03002T32300BP30	M500A00302	15	30	32	300	200	30	2
M500B03002T32350BP30	M500A00303	15	30	32	350	200	30	2
M500B03202T32200BP32	M500A00320	16	32	32	200	120	32	2
M500B03202T32250BP32	M500A00321	16	32	32	250	150	32	2
M500B03202T32300BP32	M500A00322	16	32	32	300	200	32	2
M500B03202T32350BP32	M500A00323	16	32	32	350	200	32	2
M500B04002T40200BP40	M500A00400	20	40	40	200	120	40	2
M500B04002T40250BP40	M500A00401	20	40	40	250	150	40	2
M500B04002T40300BP40	M500A00402	20	40	40	300	200	40	2
M500B04002T40350BP40	M500A00403	20	40	40	350	200	40	2

Accessories / Akcesoria

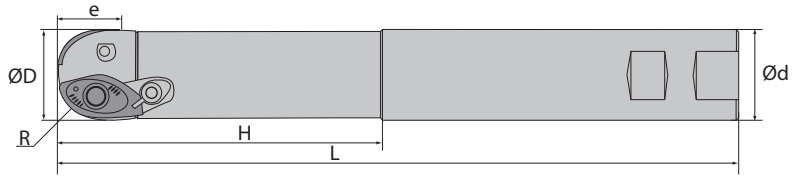
Tool Narzędzie	**Diameter** Średnica ØD	**Clamp** Zacisk	**Screw** Śruba	**Wrench** Klucz	**Wrench** Klucz
M500	Ø16	–	SR064	–	W129
	Ø20	–	SR128	–	SPAN10IP
	Ø25	–	SR117	–	W125
	Ø30	DOC208	SR123	W126	–
	Ø32	DOC208	SR123		–
	Ø40	WG111	SR124	W127	–
	Ø50	WG111	SR129 SR124	W127 W132	–

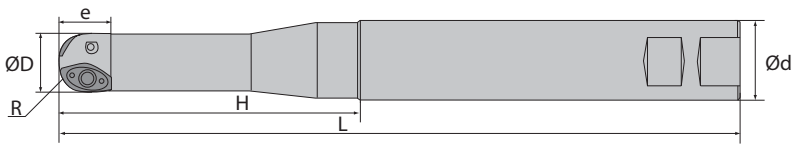
PROFIL MILLING TOOLS FREZY DO OBRÓBKI PROFILU

Profil Milling Tools Frezy do obróbki profilu

M500







Tools / Narzędzia

EDP Nr. new nowy	**EDP No.**	**Dimensions** Wymiary (mm)						
		R	**ØD**	**Ød**	**L**	**H**	**e**	**Z**
M499B01602W20111BP16	M500W00161	8	16	20	111	60	16	2
M499B02002W25127BP20	M500W00201	10	20	25	127	70	20	2
M499B02002W25150BP20	M500W00202	10	20	25	150	80	20	2
M499B02502W25137BP25	M500W00251	12.5	25	25	137	80	25	2
M499B02502W25200BP25	M500W00252	12.5	25	25	200	100	25	2
M499B03002W32161BP30	M500W00301	15	30	32	161	100	30	2
M499B03002W32250BP30	M500W00302	15	30	32	250	150	30	2
M499B03202W32161BP32	M500W00321	16	32	32	161	100	32	2
M499B03202W32250BP32	M500W00322	16	32	32	250	120	32	2
M499B04002W40175BP40	M500W00401	20	40	40	175	100	40	2
M499B04002W40250BP40	M500W00402	20	40	40	250	120	40	2
M499B05002W50200BP50	M500W00501	25	50	50	200	100	50	2
M499B05002W50250BP50	M500W00502	25	50	50	250	150	50	2

Accessories / Akcesoria

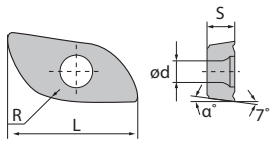
Tool Narzędzie	**Diameter** Średnica **ØD**	**Clamp** Zacisk	**Screw** Śruba	**Wrench** Klucz	**Wrench** Klucz
M500	Ø16	–	SR064	–	W129
	Ø20	–	SR128	–	SPAN10IP
	Ø25	–	SR117	–	W125
	Ø30	DOC208	SR123	W126	–
	Ø32	DOC208	SR123		–
	Ø40	WG111	SR124	W127	–
	Ø50	WG111	SR129 SR124	W127 W132	–

PROFIL MILLING TOOLS FREZY DO OBRÓBKI PROFILU

BPMT

Milling Inserts Płytki do frezowania

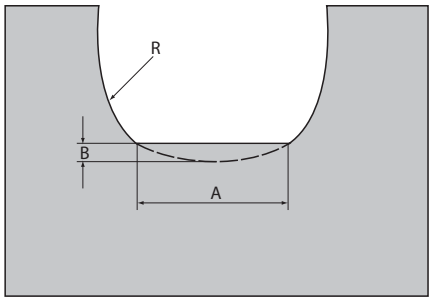
● - stable machining/obróbka stabilna
● - general machining/obróbka ogólna
✱ - interrupted cut/obróbka przerywana



		P127	P128	P228	P102	P203	P204	P225	P216	P246	P226	P251	P143	P230	P231	P139	P234	P224	P235
P	Steel / Stal	●	✱	●	✱		●		●	●	✱		●	●	●	✱			
M	Stainless Steel Stal nierdzewna	●	✱	●	✱				●	●	✱		●	●	●	✱			
K	Cast Iron Żeliwo szare					●	✱	●				●	●				●		✱
N	Non-ferrous materials Materiały nieżelazne																	●	✱
S	Heat-resistant steel Stal żaroodporna							●	●	●									

Insert Shape	Type	Basic Dimensions (mm)			CVD Coating									Cermet		Cemented carbide			
		l	s	r	P127	P128	P228	P102	P203	P204	P225	P216	P246	P226	P251	P143	P230	P231	P139	P234	P224	P235
	BPMT16R0803-C95	16	3.18	8										•								
	BPMT20R10T3-C95	20	3.97	10										•								
	BPMT25R1204-C95	25	4.76	12.5										•								
	BPMT30R1506-C95	30	6.35	15										•								
	BPMT32R1606-C95	32	6.35	16										•								
	BPMT40R2007-C95	40	7.94	20										•								
	BPMT50R2507-C95	50	7.94	25										•								

Slot shape after machining
Rowek po obróbce

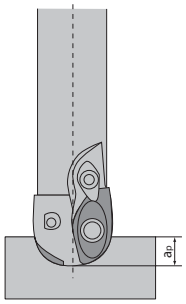


R	A	B
08	1.7	0.09
10	2.2	0.12
12.5	3.0	0.18
15	3.9	0.20
16	3.5	0.22
20	3.6	0.24
25	3.8	0.26

PROFIL MILLING TOOLS FREZY DO OBRÓBKI PROFILU

Cutting Conditions
Parametry skrawania

Slotting
Rowkowanie

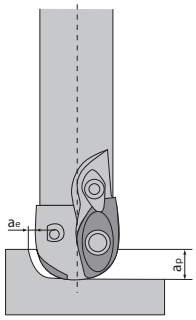


Material Group Grupa materiałowa	Cutting parameters Parametry skrawania	Ø16	Ø20	Ø25	Ø30 Ø32	Ø40	Ø50	Insert grade Gatunek płytki
Medium carbon steel Stal węglowa 150~250HB	V(m/min)	150~220						P226
	Fz(mm/z)	0.1~0.4						
	ap(mm)	4	5	6	10	12	15	
	ae(mm)							
Alloy Steel Stal stopowa 150~280HB	V(m/min)	100~150						
	Fz(mm/z)	0.1~0.4						
	ap(mm)	4	5	6	10	12	15	
	ae(mm)							
Tool steel Stopy stali narzędziowej 150~255HB	V(m/min)	80~120						
	Fz(mm/z)	0.1~0.3						
	ap(mm)	4	5	6	10	12	15	
	ae(mm)							
Hardened Steel Stal hartowana 40~50HRC	V(m/min)	80~100						
	Fz(mm/z)	0.08~0.15						
	ap(mm)	4	5	6	10	12	15	
	ae(mm)							
Cast Iron Żeliwo szare 160~260HB	V(m/min)	250~300						
	Fz(mm/z)	0.08~0.15						
	ap(mm)	4	5	6	10	12	15	
	ae(mm)							
Nodular Cast Iron Żeliwo sferoidalne Ч 170~300HB	V(m/min)	200~250						
	Fz(mm/z)	0.08~0.15						
	ap(mm)	4	5	6	10	12	15	
	ae(mm)							

PROFIL MILLING TOOLS FREZY DO OBRÓBKI PROFILU

Cutting Conditions
Parametry skrawania

Side milling (slight)
Frezowanie obwodowe (drobne)

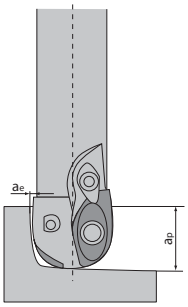


Material Group Grupa materiałowa	Cutting parameters Parametry skrawania	Ø16	Ø20	Ø25	Ø30 Ø32	Ø40	Ø50	Insert grade Gatunek płytki
Medium carbon steel 150~250HB	V(m/min)	150~220						P226
	Fz(mm/z)	0.1~0.4						
	ap(mm)	4 - 8	5 - 10	6 - 12.5	10 - 16	10 - 20	10 - 25	
	ae(mm)	3 - 4	4 - 5	5 - 6.5	6 - 9	8 - 12	10 -15	
Alloy Steel Stal stopowa 150~280HB	V(m/min)	100~150						
	Fz(mm/z)	0.1~0.4						
	ap(mm)	4 - 8	5 - 10	6 - 12.5	10 - 16	10 - 20	10 - 25	
	ae(mm)	3 - 4	4 - 5	5 - 6.5	6 - 9	8 - 12	10 -15	
Tool steel Stopy stali narzędziowej 150~255HB	V(m/min)	80~120						
	Fz(mm/z)	0.1~0.3						
	ap(mm)	4 - 8	5 - 10	6 - 12.5	10 - 16	10 - 20	10 - 25	
	ae(mm)	3 - 4	4 - 5	5 - 6.5	6 - 9	8 - 12	10 -15	
Hardened Steel Stal hartowana 40~50HRC	V(m/min)	80~100						
	Fz(mm/z)	0.08~0.15						
	ap(mm)	4 - 8	5 - 10	6 - 12.5	10 - 16	10 - 20	10 - 25	
	ae(mm)	2 - 3	4 - 5	5 - 6.5	6 - 9	8 - 12	10 -15	
Cast Iron Żeliwo szare 160~260HB	V(m/min)	250~300						
	Fz(mm/z)	0.08~0.15						
	ap(mm)	4 - 8	5 - 10	6 - 12.5	10 - 16	10 - 20	10 - 25	
	ae(mm)	3 - 4	4 - 5	5 - 6.5	6 - 9	8 - 12	10 -15	
Nodular Cast Iron Żeliwo sferoidalne Ч 170~300HB	V(m/min)	200~250						
	Fz(mm/z)	0.08~0.15						
	ap(mm)	4 - 8	5 - 10	6 - 12.5	10 - 16	10 - 20	10 - 25	
	ae(mm)	3 - 4	4 - 5	5 - 6.5	6 - 9	8 - 12	10 -15	

PROFIL MILLING TOOLS FREZY DO OBRÓBKI PROFILU

Cutting Conditions
Parametry skrawania

Side milling (deep)
Frezowanie obwodowe (głębokie)



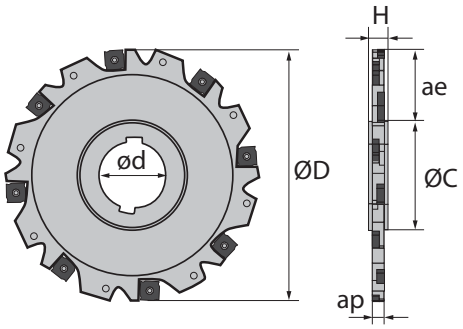
Material Group Grupa materiałowa	**Cutting parameters** Parametry skrawania	**Ø16**	**Ø20**	**Ø25**	**Ø30 Ø32**	**Ø40**	**Ø50**	**Insert grade** Gatunek płytki
Medium carbon steel Stal węglowa 150~250HB	V(m/min)	150~220						P226
	Fz(mm/z)	0.1~0.4						
	ap(mm)	16	20	25	28	35	40	
	ae(mm)	1.5	2	3	6	8	10	
Alloy Steel Stal stopowa 150~280HB	V(m/min)	100~150						
	Fz(mm/z)	0.1~0.4						
	ap(mm)	16	20	25	28	35	40	
	ae(mm)	1.5	2	3	6	8	10	
Tool steel Stopy stali narzędziowej 150~255HB	V(m/min)	80~120						
	Fz(mm/z)	0.1~0.3						
	ap(mm)	16	20	25	28	35	40	
	ae(mm)	1.5	2	3	6	8	10	
Hardened Steel Stal hartowana- 40~50HRC	V(m/min)	80~100						
	Fz(mm/z)	0.08~0.15						
	ap(mm)	-	-	-	-	-	-	
	ae(mm)	-	-	-	-	-	-	
Cast Iron Żeliwo szare 160~260HB	V(m/min)	250~300						
	Fz(mm/z)	0.08~0.15						
	ap(mm)	16	20	25	28	35	40	
	ae(mm)	1.5	2	3	6	8	10	
Nodular Cast Iron Żeliwo sferoidalne Ч 170~300HB	V(m/min)	200~250						
	Fz(mm/z)	0.08~0.15						
	ap(mm)	16	20	25	28	35	40	
	ae(mm)	1.5	2	3	6	8	10	

SIDE AND FACE MILLING FREZY DO OBRÓBKI BRZEGU ORAZ PROFILU

M541

Side And Face Milling Frezy Do Obróbki Brzegu Oraz Profilu





Tools / Narzędzia

EDP Nr. new nowy	**EDP No.**	**Dimensions** Wymiary (mm)							**Insert** Płytka
		ØD	**Ød**	**Øc**	**H**	**Z**	**ap**	**ae max**	
M541B10004027012XS12		100	27	40.7	12	10	4	25	SNEQ1202
M541B12504040012XS12		125	40	50.5	12	12	4	32	
M541B16004040012XS12		160	40	66.7	12	16	4	44	
M541B10005027012XS12		100	27	45	12	10	5	25	SNEQ1203
M541B12505040012XS12		125	40	58	12	12	5	31	
M541B16005040012XS12		160	40	68	12	16	5	44	
M541B10006027012XS12		100	27	45	12	10	6	25	SNEQ12T3
M541B12506040012XS12		125	40	58	12	12	6	31	
M541B16006040012XS12		160	40	68	12	16	6	44	
M541B20006050012XS12		200	50	67.7	12	18	6	62	
M541B25006050012XS12		250	50	72	12	24	6	87	
M541B10007027012XS12		100	27	45	12	10	7	25	SNEQ1204
M541B12507040012XS12		125	40	58	12	12	7	31	
M541B16007040012XS12		160	40	68	12	16	7	44	
M541B20007050012XS12		200	50	72	12	18	7	62	
M541B25007050012XS12		250	50	72	12	24	7	87	
M541B10008027012XS12		100	27	45	12	10	8	25	SNEQ12T4
M541B12508040012XS12		125	40	58	12	12	8	31	
M541B16008040012XS12		160	40	68	12	16	8	44	
M541B20008050012XS12		200	50	72	12	18	8	62	
M541B25008050012XS12		250	50	72	12	24	8	87	

Accessories / Akcesoria

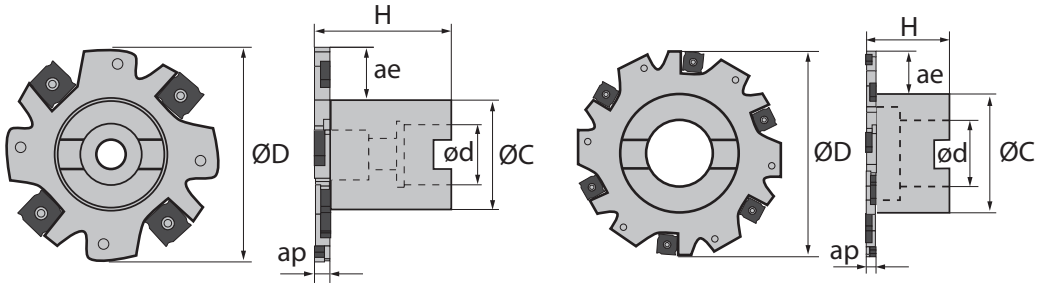
Tool Narzędzie	**Diameter** Średnica ØD	**Cutting width ap**	**Screw** Śruba	**Wrench** Klucz
M541	Ø63– Ø160	4	SC507	SPAN
	Ø63– Ø160	5	SC508	
	Ø63– Ø250	6	SC509	
	Ø63– Ø250	7	SC510	
	Ø63– Ø250	8	SC511	

SIDE AND FACE MILLING FREZY DO OBRÓBKI BRZEGU ORAZ PROFILU

Side And Face Milling Frezy Do Obróbki Brzegu Oraz Profilu

M541





Tools / Narzędzia

EDP Nr. new nowy	EDP No.	Dimensions Wymiary (mm)							Insert Płytka
		ØD	Ød	Øc	H	Z	ap	ae max	
M541B06304022050XS12		63	22	40	50	6	4	10	SNEQ1202
M541B08004022050XS12		80	22	40	50	8	4	18	
M541B10004027050XS12		100	27	48	50	10	4	23	
M541B06305022050XS12		63	22	40	50	6	5	10	SNEQ1203
M541B08005022050XS12		80	22	40	50	8	5	18	
M541B10005027050XS12		100	27	48	50	10	5	23	
M541B06306022050XS12		63	22	40	50	6	6	10	SNEQ12T3
M541B08006022050XS12		80	22	40	50	8	6	18	
M541B10006027050XS12		100	27	48	50	10	6	23	
M541B12506040050XS12		125	40	70	50	12	6	24	
M541B16006040050XS12		160	40	70	50	16	6	41	
M541B06307022050XS12		63	22	40	50	6	7	10	SNEQ1204
M541B08007022050XS12		80	22	40	50	8	7	18	
M541B10007027050XS12		100	27	48	50	10	7	23	
M541B12507040050XS12		125	40	70	50	12	7	24	
M541B16007040050XS12		160	40	70	50	16	7	41	
M541B06308022050XS12		63	22	40	50	6	8	10	SNEQ12T4
M541B08008022050XS12		80	22	40	50	8	8	18	
M541B10008027050XS12		100	27	48	50	10	8	23	
M541B12508040050XS12		125	40	70	50	12	8	24	
M541B16008040050XS12		160	40	70	50	16	8	41	

Accessories / Akcesoria

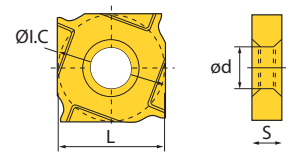
Tool Narzędzie	Diameter Średnica ØD	Cutting width ap	Screw Śruba	Wrench Klucz
M541	Ø63– Ø160	4	SC507	SPAN
	Ø63– Ø160	5	SC508	
	Ø63– Ø250	6	SC509	
	Ø63– Ø250	7	SC510	
	Ø63– Ø250	8	SC511	

SIDE AND FACE MILLING FREZY DO OBRÓBKI BRZEGU ORAZ PROFILU

SNEQ

Milling Inserts Płytki do frezowania

● - stable machining/obróbka stabilna
● - general machining/obróbka ogólna
✱ - interrupted cut/obróbka przerywana



P	Steel / Stal	●	✱	●	✱		●		●	●	✱		●	●	●	✱			
M	Stainless Steel Stal nierdzewna	●	✱	●	✱				●	●	✱		●	●	●	✱			
K	Cast Iron Żeliwo szare					●	✱	●				●	●				●		✱
N	Non-ferrous materials Materiały nieżelazne																	●	✱
S	Heat-resistant steel Stal żaroodporna							●	●	●									

Insert Shape	Type	Basic Dimensions (mm)			CVD Coating											Cermet		Cemented carbide			
		l	s	d	P127	P128	P228	P102	P203	P204	P225	P216	P246	P226	P251	P143	P230	P231	P139	P234	P224	P235
	SNEQ1202	12.7	2.6	5.0												•						
	SNEQ1203	12.7	2.6	5.0												•						
	SNEQ12T3	12.7	2.6	5.0												•						
	SNEQ1204	12.7	2.6	5.0												•						
	SNEQ12T4	12.7	2.6	5.0												•						

Cutting Conditions / Parametry skrawania

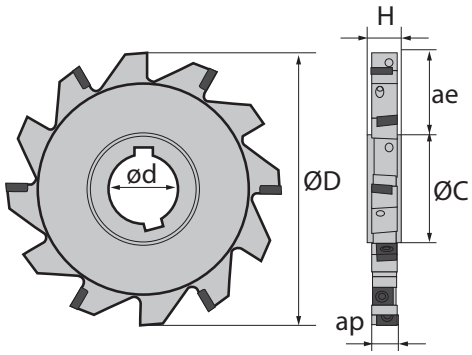
Material Group Grupa materiałowa	Hardness Twardość HB	Insert grade Gatunek płytki	V(m/min)	f(mm/z)
Low Carbon Steel Stal niskowęglowa	≤180	P216	180 (100-250)	0.1(0.08-0.25)
		P226	150 (100-200)	0.15(0.1-0.3)
High-carbon steel **Alloy steel** Stal wysokowęglowaStopy stali	180-280	P216	150 (80-250)	0.1(0.08-0.25)
		P226	120 (80-250)	0.15(0.1-0.3)
Alloy tool steel Stopy stali narzędziowej	280-350	P216	120 (80-250)	0.1(0.08-0.25)
		P226	100 (80-200)	0.15(0.1-0.3)
Stainless steel Stal nierdzewna	≤270	P216	120 (80-250)	0.1(0.05-0.15)
		P226	100 (80-200)	0.08(0.05-0.15)
Cast iron Żeliwo	180-250	P251	120 (80-250)	0.1(0.05-0.15)
		P226	150 (100-250)	0.08(0.05-0.15)

SIDE AND FACE MILLING FREZY DO OBRÓBKI BRZEGU ORAZ PROFILU

Side And Face Milling Frezy do obróbki brzegu oraz profilu

M542





Tools / Narzędzia

EDP Nr. new nowy	**EDP No.**	**Dimensions** Wymiary (mm)							**Insert** Płytka
		ØD	**Ød**	**Øc**	**H**	**Z**	**apmax**	**ae max**	
M542B08010041017MP06	M543H008008	80	27	41	17	10	8	12	MPMT060304
M542B10014047025MP06	M543H010008	100	32	47	25	14	8	12	
M542B10014047025MP06	M543H010010	100	32	47	25	14	10	14	
M542B12516055034MP06	M543H012510	125	40	55	34	16	10	14	
M542B12512055034MP08	M543H012512	125	40	55	34	12	12	16	MPMT080305
M542B16014062047MP08	M543H016012	160	40	62	47	14	12	16	
M542B16012062049MP12	M543H016016	160	40	62	49	12	16	20	MPMT120408
M542B16012062049MP12	M543H016018	160	40	62	49	12	18	24	
M542B16012062049MP12	M543H016020	160	40	62	49	12	18	26	
M542B20014072062MP12	M543H020016	200	50	72	62	14	16	20	
M542B20014072062MP12	M543H020018	200	50	72	62	14	18	24	
M542B20014072063MP12	M543H020020	200	50	72	63	14	20	26	

Accessories / Akcesoria

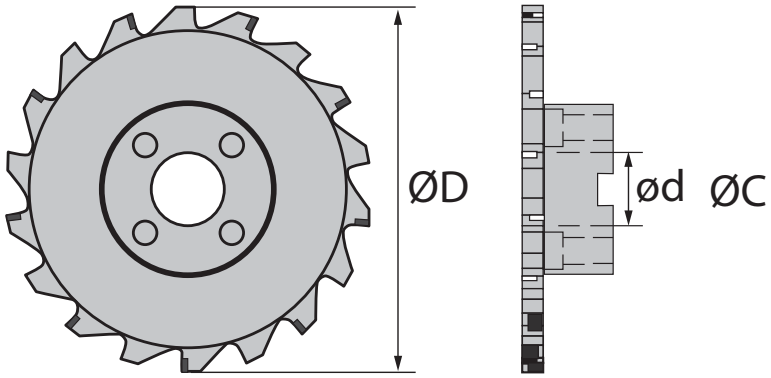
Tool Narzędzie	**Diameter** Średnica ØD	**Insert** Płytka	**Screw** Śruba	**Wrench** Klucz	**Wrench** Klucz
M542	Ø80– Ø125	MP06	SR064	W073	–
	Ø125– Ø160	MP08	SR137	W128	–
	Ø160– Ø200	MP12	SR123	–	W120

SIDE AND FACE MILLING FREZY DO OBRÓBKI BRZEGU ORAZ PROFILU

M543

Side And Face Milling Frezy do obróbki brzegu oraz profilu





Tools / Narzędzia

EDP Nr. new nowy	**EDP No.**	**Dimensions** Wymiary (mm)							**Insert** Płytka
		ØD	**Ød**	**Øc**	**H**	**Z**	**ap**	**ae max**	
M543B08010045040MP06	M544H008008	80	22	45	21	10	8	40	MPMT060304
M543B10014055040MP06	M544H010008	100	27	55	24	14	8	40	
M543B10014055040MP06	M544H010010	100	27	55	24	14	10	40	
M543B12516065045MP06	M544H012510	125	32	65	33	16	10	45	
M543B12512065045MP08	M544H012512	125	32	65	33	12	12	45	MPMT080305
M543B16014080050MP08	M544H016012	160	40	80	45	14	12	50	
M543B20018092050MP08	M544H020012	200	40	92	53	18	12	50	
M543B12510065050MP12	M544H012516	125	32	65	30	10	16	50	MPMT120408
M543B16012080060MP12	M544H016016	160	40	80	45	12	16	60	
M543B16012080060MP12	M544H016018	160	40	80	45	12	18	60	
M543B20014092050MP12	M544H020016	200	40	92	53	14	16	50	
M543B20014092050MP12	M544H020018	200	40	92	53	14	18	50	
M543B20014092050MP12	M544H020020	200	40	92	53	14	20	50	

Accessories / Akcesoria

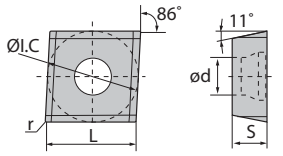
Tool Narzędzie	**Diameter** Średnica ØD	**Insert** Płytka	**Screw** Śruba	**Wrench** Klucz	**Wrench** Klucz
M543	Ø80– Ø125	MP06	SR064	W073	–
	Ø125– Ø160	MP08	SR137	W128	–
	Ø160– Ø200	MP12	SR123	–	W120

SIDE AND FACE MILLING FREZY DO OBRÓBKI BRZEGU ORAZ PROFILU

Milling Inserts Płytki do frezowania

MPMT

● - stable machining/obróbka stabilna
● - general machining/obróbka ogólna
✱ - interrupted cut/obróbka przerywana



P	Steel / Stal	●	✱	●	✱		●		●	●	✱		●	●	●	✱				
M	Stainless Steel Stal nierdzewna	●	✱	●	✱				●	●	✱		●	●	●	✱				
K	Cast Iron Żeliwo szare					●	✱	●				●	●				●			✱
N	Non-ferrous materials Materiały nieżelazne																		●	✱
S	Heat-resistant steel Stal żaroodporna							●	●	●										

Insert Shape	Type	Basic Dimensions (mm)			CVD Coating												Cermet		Cemented carbide			
		l	s	r	P127	P128	P228	P102	P203	P204	P225	P216	P246	P226	P251	P143	P230	P231	P139	P234	P224	P235
	MPMT060304 C41	6.35	3.18	0.4			•							•								
	MPMT080305 C41	8.3	3.18	0.5			•							○								
	MPMT120408 C41	12.7	4.76	0.8			•							•								

Cutting Conditions / Parametry skrawania

Material Group Grupa materiałowa	Hardness Twardość HB	Insert grade Gatunek płytki	V(m/min)	f(mm/z)
Low Carbon Steel Stal niskowęglowa	≤180	P216	180 (100-250)	0.1(0.08-0.25)
		P226	150 (100-200)	0.15(0.1-0.3)
High-carbon steel **Alloy steel** Stal wysokowęglowaStopy stali	180-280	P216	150 (80-250)	0.1(0.08-0.25)
		P226	120 (80-250)	0.15(0.1-0.3)
Alloy tool steel Stopy stali narzędziowej	280-350	P216	120 (80-250)	0.1(0.08-0.25)
		P226	100 (80-200)	0.15(0.1-0.3)
Stainless steel Stal nierdzewna	≤270	P216	120 (80-250)	0.1(0.05-0.15)
		P226	100 (80-200)	0.08(0.05-0.15)
Cast iron Żeliwo	180-250	P251	120 (80-250)	0.1(0.05-0.15)
		P226	150 (100-250)	0.08(0.05-0.15)

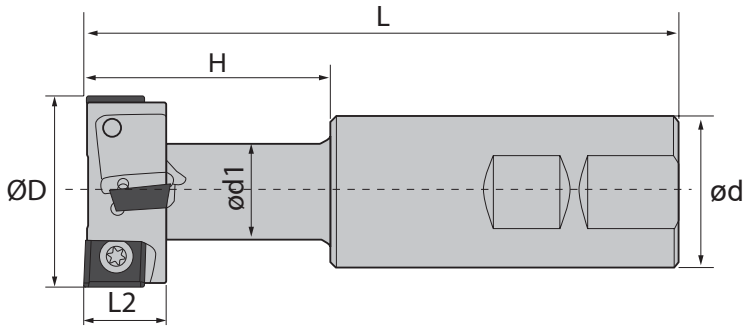
T-SLOT MILLING TOOLS FREZY DO ROWKÓW TYPU T

M110

Side And Face Milling Frezy do obróbki brzegu oraz profilu







Tools / Narzędzia

EDP Nr. new nowy	**EDP No.**	**Dimensions** Wymiary (mm)						**Z**	**Number of inserts** Ilość płytek	**Insert** Płytka
		ØD	**Ød**	**Ød1**	**L**	**L2**	**H**			
M110B02101W25100MP06		21	25	10	100	9	32	1	2	MPMT060304
M110B02501W25100MP06		25	25	12	100	11	35	1	2	
M110B03202W32110MP08		32	32	15	110	14	45	2	4	MPMT080305
M110B04002W32125MP12		40	32	19	125	18	55	2	4	MPMT120408
M110B05002W40140MP12		50	40	25	140	22	65	2	4	
M110B06002W50160MP12		60	50	32	160	28	80	2	6	

Accessories / Akcesoria

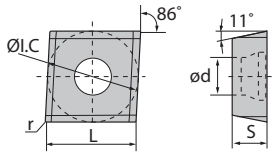
Tool Narzędzie	**Tool Type** Typ narzędzia	**Screw** Śruba	**Wrench** Klucz	**Wrench** Klucz
M110	M110AD021Z01W025L032MP06A	SR130	W073	–
	M110AD025Z01W025L035MP06A	SR130	W073	–
	M110AD032Z02W032L045MP08A	SR137	SPAN10IP	–
	M110AD040Z02W032L055MP12A	SR083M	–	W126
	M110AD050Z02W040L065MP12A	SR083M	–	W126
	M110AD060Z02W050L080MP12A	SR083M	–	W126

T-SLOT MILLING TOOLS FREZY DO ROWKÓW TYPU T

Milling Inserts Płytki do frezowania

MPMT

● - stable machining/obróbka stabilna
● - general machining/obróbka ogólna
✱ - interrupted cut/obróbka przerywana



P	Steel / Stal	●	✱	●	✱		●		●	●	✱		●	●	●	✱			
M	Stainless Steel Stal nierdzewna	●	✱	●	✱				●	●	✱		●	●	●	✱			
K	Cast Iron Żeliwo szare					●	✱	●				●	●				●		✱
N	Non-ferrous materials Materiały nieżelazne																	●	✱
S	Heat-resistant steel Stal żaroodporna							●	●	●									

Insert Shape	Type	Basic Dimensions (mm)			CVD Coating											Cermet		Cemented carbide			
		l	s	r	P127	P128	P228	P102	P203	P204	P225	P216	P246	P226	P251	P143	P230	P231	P139	P234	P224	P235
	MPMT060304 C41	6.35	3.18	0.4			•							•								
	MPMT080305 C41	8.3	3.18	0.5			•							○								
	MPMT120408 C41	12.7	4.76	0.8			•							•								

Cutting Conditions / Parametry skrawania

Workpiece material Materiał obrabiany	Hardness Twardość HB	Insert grade Gatunek płytki	V(m/min)	f(mm/z)
Cast iron Żeliwo	180-250	P226	80~160	0.05~0.2

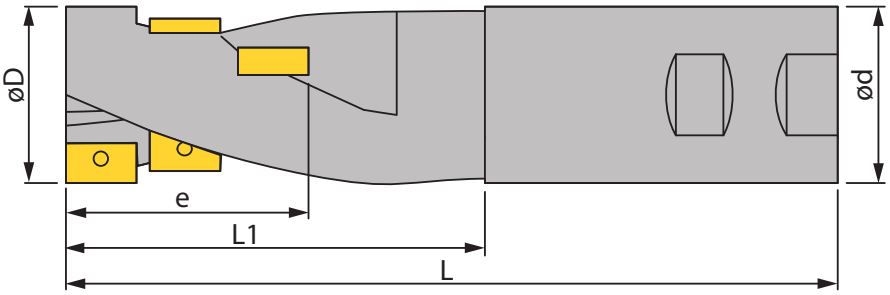
HELLICAL END MILL FREZY JEŻOWE

M111

Hellical End Mill Frezy spiralne







Tools / Narzędzia

EDP Nr. new nowy	EDP No.	Dimensions Wymiary (mm)						Number of insert Ilość płytek	
		ØD	Ød	L	L2	H	Z	APLT 1504	SPMT1204
M111B04001W40095AP15		40	40	175	55	95	2	1	5
M111B05010W40095SP12		50	40	175	55	95	4	2	10

Accessories / Akcesoria

Tool Narzędzie	Diameter Średnica ØD	Screw Śruba	Wrench Klucz
M111	Ø40	SR131	W120
	Ø50	SR123	W120

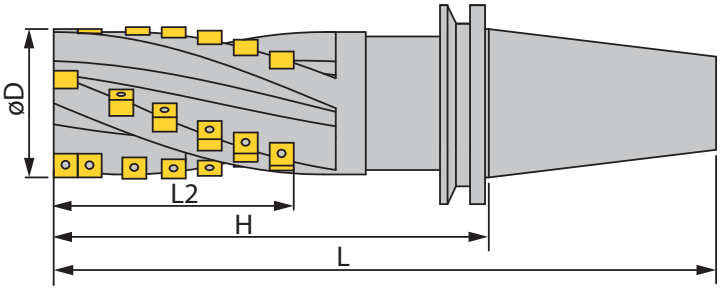
HELLICAL END MILL FREZY JEŻOWE

Hellical End Mill Frezy spiralne

M112







Tools / Narzędzia

EDP Nr. new nowy	EDP No.	Dimensions Wymiary (mm)				Z	Number of insert Ilość płytek		Shank type Typ chwytu
		ØD	L	L2	H		APLT 1504	SPMT 1204	
M112B050040S50145AP15	M107JT500500	50	246.75	84	145	4	2	16	SK50
M112B063040S50135AP15	M107JT5M0630	63	236.75	74	135	4	2	14	SK50
M112B063040S50165AP15	M107JT5L0630	63	266.75	104	165	4	2	20	SK50
M112B063040S50195AP15	M107JT5XL0630	63	296.75	134	195	4	2	26	SK50
M112B080040S50165AP15	M107JT5L0800	80	266.75	104	165	4	2	20	SK50
M112B080040S50205AP15	M107JT5XL0800	80	306.75	144	205	4	2	28	SK50
M112B050040B50145AP15	M107BT500500	50	246.8	84	145	4	2	16	BT50
M112B063040B50135AP15	M107BT5M0630	63	236.8	74	135	4	2	14	BT50
M112B063040B50165AP15	M107BT5L0630	63	266.8	104	165	4	2	20	BT50
M112B063040B50195AP15	M107BT5XL0630	63	296.8	134	195	4	2	26	BT50
M112B080040B50165AP15	M107BT5L0800	80	266.8	104	165	4	2	20	BT50
M112B080040B50205AP15	M107BT5XL0800	80	306.8	144	205	4	2	28	BT50

Accessories / Akcesoria

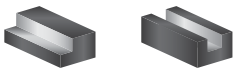
Tool Narzędzie	Diameter Średnica ØD	Insert screw Śrubka do płytki	Screw of inter-changeable head Śrubka do wymien-nej głowicy	Wrench of insert screw Klucz do śrubki od płytki	Wrench of inter-changeable head Klucz do wymiennej głoicy	Interchangeable head Wymienna głowica
M112	Ø50	SR123	–	W120	–	–
	Ø63		–		–	–
	Ø80		–		–	–

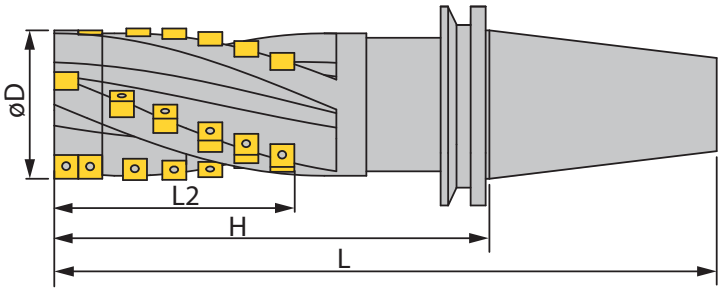
HELLICAL END MILL FREZY JEŻOWE

M113

Hellical End Mill Frezy spiralne







Tools / Narzędzia

EDP Nr. new nowy	EDP No.	Dimensions Wymiary (mm)				Z	Number of insert Ilość płytek		Shank type Typ chwytu
		ØD	L	L2	H		APLT 1504	SPMT 1204	
M113B050040S50145AP15	M108JT500500	50	246.75	84	145	4	2	16	SK50
M113B063040S50135AP15	M108JT5M0630	63	236.75	74	135	4	2	14	SK50
M113B063040S50165AP15	M108JT5L0630	63	266.75	104	165	4	2	20	SK50
M113B063040S50195AP15	M108JT5XL0630	63	296.75	134	195	4	2	26	SK50
M113B080040S50165AP15	M108JT5L0800	80	266.75	104	165	4	2	20	SK50
M113B080040S50205AP15	M108JT5XL0800	80	306.75	144	205	4	2	28	SK50
M113B050040B50145AP15	M108BT500500	50	246.8	84	145	4	2	16	BT50
M113B063040B50135AP15	M108BT5M0630	63	236.8	74	135	4	2	14	BT50
M113B063040B50165AP15	M108BT5L0630	63	266.8	104	165	4	2	20	BT50
M113B063040B50195AP15	M108BT5XL0630	63	296.8	134	195	4	2	26	BT50
M113B080040B50165AP15	M108BT5L0800	80	266.8	104	165	4	2	20	BT50
M113B080040B50205AP15	M108BT5XL0800	80	306.8	144	205	4	2	28	BT50

Accessories / Akcesoria

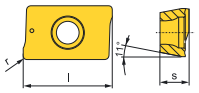
Tool Narzędzie	Diameter Średnica ØD	Insert screw Śrubka do płytki	Screw of head Śrubka do wymiennej głowicy	Wrench of insert screw Klucz do śrubki od płytki	Wrench of head Klucz do wymiennej głoicy	Interchangeable head Wymienna głowica
M113	Ø50	SR123	SR132	W120	W134	IH101
	Ø63					IH102
	Ø80		SR133		W135	IH103

HELLICAL END MILL FREZY JEŻOWE

Milling Inserts Płytki do frezowania

APLT SPMT

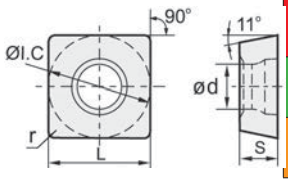
- stable machining/obróbka stabilna
- general machining/obróbka ogólna
- interrupted cut/obróbka przerywana



		P127	P128	P228	P102	P203	P204	P225	P216	P246	P226	P251	P143	P230	P231	P139	P234	P224	P235
P	Steel / Stal	●	✱	●	✱		●		●	●	✱		●	●	●	✱			
M	Stainless Steel Stal nierdzewna	●	✱	●	✱				●	●	✱		●	●	●	✱			
K	Cast Iron Żeliwo szare					●	✱	●				●	●				●		✱
N	Non-ferrous materials Materiały nieżelazne																	●	✱
S	Heat-resistant steel Stal żaroodporna				✱			●	●	●									

Insert Shape Kształt płytki	Type Typ	Dimensions Wymiary (mm) L	I.W	S	d	r	CVD Coating P127	P128	P228	P102	P203	P204	PVD Coating P225	P216	P246	P226	P251	P143	Cermet P230	P231	Cemented carbide P139	P234	P224	P235
	APLT150412 C06	16.33	12.7	4.76	5.4	1.2										●	○							
	APLT150412 C93	16.33	12.7	4.76	5.4	1.2										○	●							
	APLT160408 C76																							
	APLT160424 C76																							

- stable machining/obróbka stabilna
- general machining/obróbka ogólna
- interrupted cut/obróbka przerywana



		P127	P128	P228	P102	P203	P204	P225	P216	P246	P226	P251	P143	P230	P231	P139	P234	P224	P235
P	Steel / Stal	●	✱	●	✱		●		●	●	✱		●	●	●	✱			
M	Stainless Steel Stal nierdzewna	●	✱	●	✱				●	●	✱		●	●	●	✱			
K	Cast Iron Żeliwo szare					●	✱	●				●	●				●		✱
N	Non-ferrous materials Materiały nieżelazne																	●	✱
S	Heat-resistant steel Stal żaroodporna				✱			●	●	●									

Insert Shape Kształt płytki	Type Typ	Dimensions Wymiary (mm) L	I.W	S	d	r	CVD Coating P127	P128	P228	P102	P203	P204	PVD Coating P225	P216	P246	P226	P251	P143	Cermet P230	P231	Cemented carbide P139	P234	P224	P235
	SPMT120408 C06	12.7	12.7	4.76	5.5	0.8										●	○							
	SPMT120408 C93	12.7	12.7	4.76	5.5	0.8										○	●							

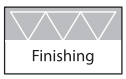
Cutting Conditions / Parametry skrawania

Material Group Grupa materiałowa	Hardness Twardość HB	Insert grade Gatunek płytki	V(m/min)	f(mm/z)
Low Carbon Steel Stal niskowęglowa	≤180	P226	80 (60-90)	0.25(0.1-0.35)
			90 (70-120)	0.3(0.15-0.4)
			90 (70-120)	0.3 (0.15-0.4)
High-carbon steel **Alloy steel** Stal wysokowęglowaStopy stali	180-280	P226	70 (60-100)	0.2 (0.1-0.35)
			80 (60-120)	0.25 (0.15-0.35)
			90 (70-120)	0.25 (0.15-0.35)
Alloy tool steel Stopy stali narzędziowej	280-350	P226	50 (40-80)	0.15(0.08-0.25)
			60 (50-100)	0.2 (0.1-0.35)
			70 (50-100)	0.2(0.1-0.35)
Cast iron Żeliwo	180-250	P226 P251	70 (50-100)	0.2 (0.1-0.35)
			80 (60-120)	0.25 (0.15-0.35)
			90 (80-120)	0.25 (0.15-0.35)

MOULD MILLING CUTTERS FREZY DO OBRÓBKI FORM

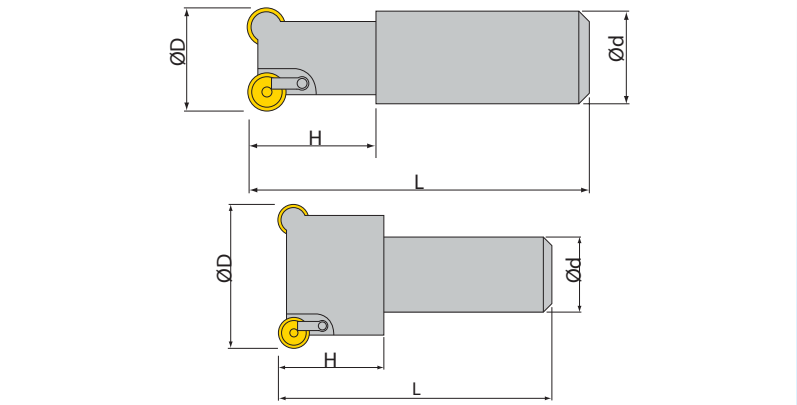
M120

Copying End Mills Frezy do kopiowania









Tools / Narzędzia

EDP Nr. new nowy	**EDP No.**	**Dimensions** Wymiary (mm)						**Insert** Płytka
		ØD	**Ød**	**L**	**H**	**Z**	**apmax**	
M120A02002T20130RD08	M120A00200	20	20	130	50	2	≤ 4	RDMX0803 RDMX10T3 RDMX1204
M120A02503T20140RD08	M120A00250	25	20	140	60	3		
M120A02502T20140RD08	M130A00250	25	20	140	60	2	≤ 5	
M120A03203T32150RD08	M130A00320	32	32	150	70	3		
M120A03202T32150RD08	M140A00320	32	32	150	70	2	≤ 6	
M120A04003T32150RD08	M140A00400	40	32	150	50	3		

FEATURES
WŁAŚCIWOŚCI

More precise; Tolerance Dia D: 0/-0,2
For semi-finishing and rough machining
Wear resistant (Nickel plated body)
Recommended to use toolholders SMC, SMA
or FMA and TIZ Vises, which guarantee lowest vibration
and stability machining

Bardziej dokładne; Tolerancja ØD: 0/-0,2
Do obróbki półwykańczającej i zgrubnej
Odporne na ścieranie (Niklowany korpus)
Zalecane stosowanie oprawek SMC, SMA lub FMA
minimalizujących drgania oraz stosowanie sztywnych
i stabilnych imadeł firmy TIZ Implements

Accessories / Akcesoria

Tool Narzędzie	**ØD**	**Spare Parts** / Części zamienne		
				
M120	Ø20 - Ø25	SR001	CL002	W045
	Ø25 - Ø32	SR021	CL002	W017
	Ø32 - Ø40	SR021	CL003	W017

MOULD MILLING CUTTERS FREZY DO OBRÓBKI FORM

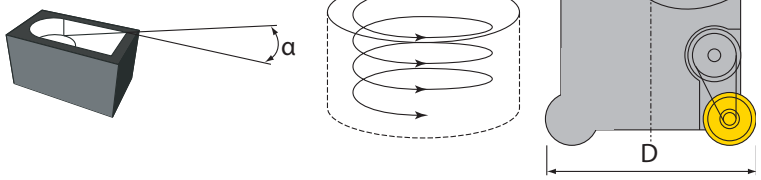
Cutting Conditions / Parametry skrawania

Material Group Grupa materiałowa	Range of cutting conditions Zakres parametrów		Ø20 RDMX 0803				Ø25 RDMX 0803				Ø25 RDMX 10T3			
	Vc [m/min]	Fz [mm/ząb]	Vc [m/min]	Fz [mm/ząb]	ap [mm]	ae [mm]	Vc [m/min]	Fz [mm/ząb]	ap [mm]	ae [mm]	Vc [m/min]	Fz [mm/ząb]	ap [mm]	ae [mm]
Low Carbon Steel Stal niskowęglowa <200HB	150 - 250	0,3 - 0,8	250	0,4	1,5	6	250	0,4	1,5	7,5	250	0,4	1,5	7,5
Alloy Steel Stal stopowa <30HRC	120 - 230	0,3 - 0,8	200	0,4	1,5	6	200	0,4	1,5	7,5	200	0,4	1,5	7,5
Alloy Steel Stal stopowa 30-40 HRC	100 - 200	0,2 - 0,6	150	0,2	1,5	6	150	0,2	1,5	7,5	150	0,2	1,5	7,5
Alloy Steel Stal stopowa 40-45 HRC	60 - 150	0,15 - 0,3	100	0,15	1	6	100	0,15	1	7,5	100	0,15	1	7,5
Alloy Steel Stal stopowa 45-50 HRC	60 - 100	0,15 - 0,3	80	0,15	1	6	80	0,15	1	7,5	80	0,15	1	7,5
Alloy Steel Stal stopowa 50-60 HRC	50 - 100	0,05 - 0,2	70	0,1	1	6	70	0,1	1	7,5	70	0,1	1	7,5
Stainless steel Stal nierdzewna	150 - 240	0,2 - 0,8	200	0,25	1,5	6	200	0,25	1,5	7,5	200	0,25	1,5	7,5
Cast iron Żeliwo	100 - 220	0,3 - 1	180	0,4	1,5	6	180	0,4	1,5	7,5	180	0,4	1,5	7,5

Cutting Conditions / Parametry skrawania

Material Group Grupa materiałowa	Range of cutting conditions Zakres parametrów		Optimal cutting conditions / Optymalne parametry skrawania											
			Ø32 RDMX 10T3				Ø32 RDMX 1204				Ø40 RDMX 1204			
	Vc [m/min]	Fz [mm/ząb]	Vc [m/min]	Fz [mm/ząb]	ap [mm]	ae [mm]	Vc [m/min]	Fz [mm/ząb]	ap [mm]	ae [mm]	Vc [m/min]	Fz [mm/ząb]	ap [mm]	ae [mm]
Low Carbon Steel Stal niskowęglowa <200HB	150 - 250	0,3 - 0,8	250	0,4	1,5	9,6	250	0,5	2	9,6	250	0,5	2	12
Alloy Steel Stal stopowa <30HRC	120 - 230	0,3 - 0,8	200	0,4	1,5	9,6	200	0,4	2	9,6	200	0,4	2	12
Alloy Steel Stal stopowa 30-40 HRC	100 - 200	0,2 - 0,6	150	0,2	1,5	9,6	150	0,2	2	9,6	150	0,2	2	12
Alloy Steel Stal stopowa 40-45 HRC	60 - 150	0,15 - 0,3	100	0,15	1	9,6	100	0,15	1,5	9,6	100	0,15	1,5	12
Alloy Steel Stal stopowa 45-50 HRC	60 - 100	0,15 - 0,3	80	0,15	1	9,6	80	0,15	1	9,6	80	0,15	1	12
Alloy Steel Stal stopowa 50-60 HRC	50 - 100	0,05 - 0,2	70	0,1	1	9,6	70	0,1	1	9,6	70	0,1	1	12
Stainless steel Stal nierdzewna	150 - 240	0,2 - 0,8	200	0,25	1,5	9,6	200	0,3	2	9,6	200	0,3	2	12
Cast iron Żeliwo	100 - 220	0,3 - 1	180	0,4	1,5	9,6	180	0,5	2	9,6	180	0,5	2	12

D	α	Dh
Ø25	3	35-39
Ø32	3	49-63
Ø40	3	61-79
Ø50	3	76-99
Ø63	3	102-123
Ø80	3	136-159



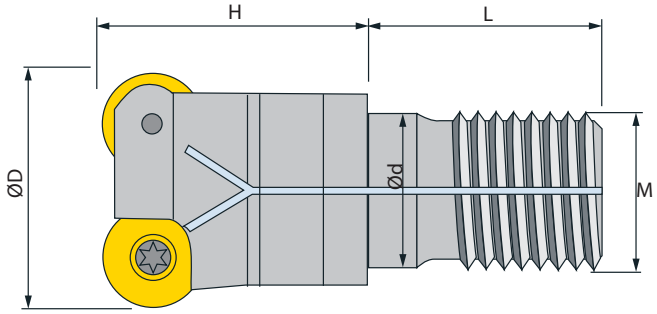
MOULD MILLING CUTTERS FREZY DO OBRÓBKI FORM

M910

Screw-on Roughing Cutters Głowice wkręcane do obróbki zgrubnej



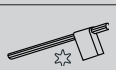




Tools / Narzędzia

EDP Nr. new nowy	**EDP No.**	**Dimensions** Wymiary (mm)							**Insert** Płytka
		ØD	**Ød**	**M**	**L**	**H**	**Z**	**apmax**	
M910A02002M13030RD10	M910CW0200	20	12,5	12	30	20	2	≤ 5	RDMX10T3
M910A02502M13035RD11	M910CW0250	25	12,5	12	35	22	2		
M910A02503M13035RD12	M910CW0251	25	12,5	12	35	22	3		
M910A03004M17043RD13	M910CW0300	30	17	16	43	24	4		
M910A03204M17043RD14	M910CW0320	32	17	16	43	24	4		
M910A03504M17043RD15	M910CW0350	35	17	16	43	24	4		
M910A04005M17043RD16	M910CW0400	40	17	16	43	24	5		
M910A04205M17043RD17	M912CW0420	42	17	16	43	24	5		
M910A03004M13035RD18	M912CW0300	30	12,5	12	35	22	4		
M910A03204M13035RD19	M912CW0320	32	12,5	12	35	22	4		

Accessories / Akcesoria

Tool Narzędzie	**ØD**	**Spare Parts** / Części zamienne	
			
M910	Ø20 - Ø40	SR145	W107
	Ø32 - Ø42	SR145	W107

MOULD MILLING CUTTERS FREZY DO OBRÓBKI FORM

Milling Inserts Płytki do frezowania

RDMX

Insert Shape Kształt płytki	Type Typ	P	H	M	K	N	S
		Steel / Stal	Hardened Steel Stal hartowana	Stainless Steel Stal nierdzewna	Cast Iron Żeliwo szare	Non-ferrous materials Materiały nieżelazne	Heat-resistant steel Stal żaroodporna
	RDMX060230 C60 P100	●	●		●		
	RDMX080340 C60 P100						
	RDMX10T350 C60 P100						

Cutting Conditions / Parametry skrawania

Material Group Grupa materiałowa	Range of cutting conditions Zakres parametrów		Ø20 RDMX 0803				Ø25 RDMX 0803				Ø25 RDMX 10T3			
	Vc [m/min]	Fz [mm/ząb]	Vc [m/min]	Fz [mm/ząb]	ap [mm]	ae [mm]	Vc [m/min]	Fz [mm/ząb]	ap [mm]	ae [mm]	Vc [m/min]	Fz [mm/ząb]	ap [mm]	ae [mm]
Low Carbon Steel Stal niskowęglowa <200HB	150 - 250	0,3 - 0,8	250	0,4	1,5	6	250	0,4	1,5	7,5	250	0,4	1,5	7,5
Alloy Steel Stal stopowa / <30HRC	120 - 230	0,3 - 0,8	200	0,4	1,5	6	200	0,4	1,5	7,5	200	0,4	1,5	7,5
Alloy Steel Stal stopowa / 30-40 HRC	100 - 200	0,2 - 0,6	150	0,2	1,5	6	150	0,2	1,5	7,5	150	0,2	1,5	7,5
Alloy Steel Stal stopowa / 40-45 HRC	60 - 150	0,15 - 0,3	100	0,15	1	6	100	0,15	1	7,5	100	0,15	1	7,5
Alloy Steel Stal stopowa / 45-50 HRC	60 - 100	0,15 - 0,3	80	0,15	1	6	80	0,15	1	7,5	80	0,15	1	7,5
Alloy Steel Stal stopowa / 50-60 HRC	50 - 100	0,05 - 0,2	70	0,1	1	6	70	0,1	1	7,5	70	0,1	1	7,5
Stainless steel Stal nierdzewna	150 - 240	0,2 - 0,8	200	0,25	1,5	6	200	0,25	1,5	7,5	200	0,25	1,5	7,5
Cast iron Żeliwo	100 - 220	0,3 - 1	180	0,4	1,5	6	180	0,4	1,5	7,5	180	0,4	1,5	7,5

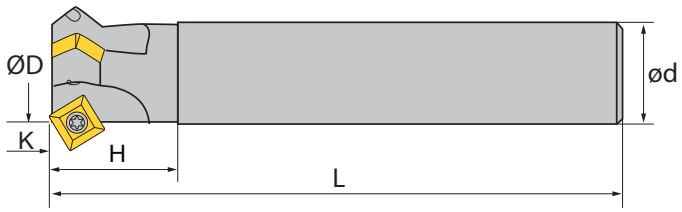
CHAMFERING MILLING CUTTERS FREZY DO FAZOWANIA

M390

Chamfering Milling Cutters With Chamfer Angle 30°
Frezy do fazowania o kącie fazki 30°







Tools / Narzędzia

EDP Nr. new nowy	**EDP No.**	**Dimensions** Wymiary (mm)						**Insert** Płytka
		ØD	**Ød**	**K**	**L**	**H**	**Z**	
M390B01201T20040SP12		12	20	30	180	40	1	SPMT1204
M390B02502T25040SP12		25	25	30	180	40	2	
M390B03203T32040SP12		32	32	30	180	40	3	
M390B01201W20040SP12		12	20	30	100	40	1	
M390B02502W25040SP12		25	25	30	100	40	2	
M390B03203W32040SP12		32	32	30	100	40	3	

Accessories / Akcesoria

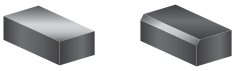
Tool Narzędzie	**Diameter** Średnica ØD	**Screw** Śruba	**Wrench** Klucz
M390	Ø12- Ø32	SR134	W120

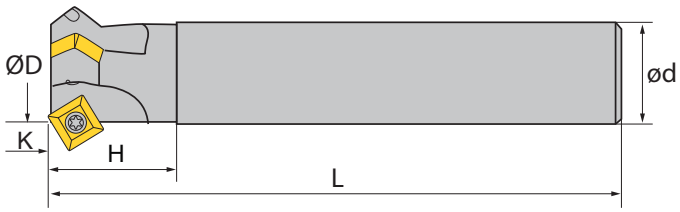
CHAMFERING MILLING CUTTERS FREZY DO FAZOWANIA

Chamfering Milling Cutters With Chamfer Angle 45°
Frezy do fazowania o kącie fazki 45°

M391







Tools / Narzędzia

EDP Nr. new nowy	**EDP No.**	**Dimensions** Wymiary (mm)						**Insert** Płytka
		ØD	**Ød**	**K**	**L**	**H**	**Z**	
M391B01201T20040SP12		12	20	45	100	40	1	SPMT1204
M391B02502T25040SP12		25	25	45	120	40	2	
M391B03203T32040SP12		32	32	45	180	40	3	
M391B01201W20040SP12		12	20	45	100	40	1	
M391B02502W25040SP12		25	25	45	120	40	2	
M391B03203W32040SP12		32	32	45	180	40	3	

Accessories / Akcesoria

Tool Narzędzie	**Diameter** Średnica ØD	**Screw** Śruba	**Wrench** Klucz
M391	Ø12- Ø32	SR134	W120

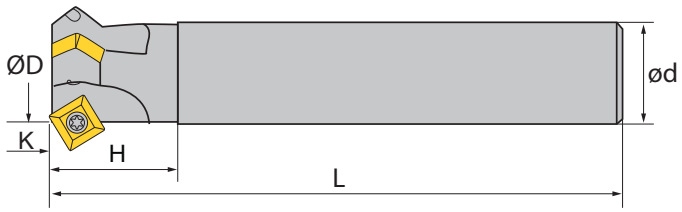
CHAMFERING MILLING CUTTERS FREZY DO FAZOWANIA

M392

Chamfering Milling Cutters With Chamfer Angle 60°
Frezy do fazowania o kącie fazki 60°







Tools / Narzędzia

EDP Nr. new nowy	**EDP No.**	**Dimensions** Wymiary (mm)						**Insert** Płytka
		ØD	**Ød**	**K**	**L**	**H**	**Z**	
M392B01201T20040SP12		12	20	60	100	40	1	SPMT1204
M392B02502T25040SP12		25	25	60	120	40	2	
M392B03603T32040SP12		36	32	60	180	40	3	
M392B01201W20040SP12		12	20	60	100	40	1	
M392B02502W25040SP12		25	25	60	120	40	2	
M392B03603W32040SP12		36	32	60	180	40	3	

Accessories / Akcesoria

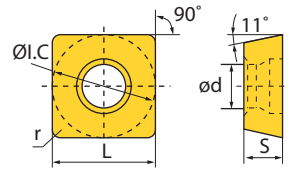
Tool Narzędzie	**Diameter** Średnica ØD	**Screw** Śruba	**Wrench** Klucz
M392	Ø12- Ø32	SR134	W120

CHAMFERING MILLING CUTTERS FREZY DO FAZOWANIA

Milling Inserts Płytki do frezowania

SPMT

● - stable machining/obróbka stabilna
● - general machining/obróbka ogólna
✱ - interrupted cut/obróbka przerywana



P	Steel / Stal	●	✱	●	✱		●		●	●	✱		●	●	●	✱			
M	Stainless Steel Stal nierdzewna	●	✱	●	✱				●	●	✱		●	●	●	✱			
K	Cast Iron Żeliwo szare					●	✱	●				●	●				●		✱
N	Non-ferrous materials Materiały nieżelazne																	●	✱
S	Heat-resistant steel Stal żaroodporna							●	●	●									

Insert Shape	Type Typ	Basic Dimensions (mm)			CVD Coating											Cermet		Cemented carbide			
		L	s	r	P127	P128	P228	P102	P203	P204	P225	P216	P246	P226	P251	P143	P230	P231	P139	P234	P224	P235
	SPMT120408	12.7	4.76	0.8	•	•	•															

Cutting Conditions / Parametry skrawania

Material Group Grupa materiałowa	Hardness Twardość HB	Insert grade Gatunek płytki	V(m/min)	f(mm/z)
Low Carbon Steel Stal niskowęglowa	≤180	P127 P228	180(100—250)	0.25 (0.1-0.4)
		P226 P102	150(100—200)	0.3 (0.1-0.5)
		P139	120(80—150)	0.4 (0.1-0.5)
High-carbon steel **Alloy steel** Stal wysokowęglowaStopy stali	180-280	P127 P228	160(100—220)	0.3 (0.1-0.4)
		P226 P102	130(100—180)	0.3 (0.1-0.5)
		P139	100(60—150)	0.4 (0.1-0.5)
Alloy tool steel Stopy stali narzędziowej	280-350	P127 P228	120(80—180)	0.3 (0.1-0.4)
		P226 P102	100(80—150)	0.3 (0.1-0.5)
		P139	80(60—120)	0.4 (0.1-0.5)
Stainless steel Stal nierdzewna	≤270	P127 P228	120(80—180)	0.3 (0.1-0.4)
		P226 P102	100(80—150)	0.3 (0.1-0.5)
		P139	80(60—120)	0.4 (0.1-0.5)
Cast iron Żeliwo	180-250	P226	130(100—180)	0.4 (0.1-0.5)

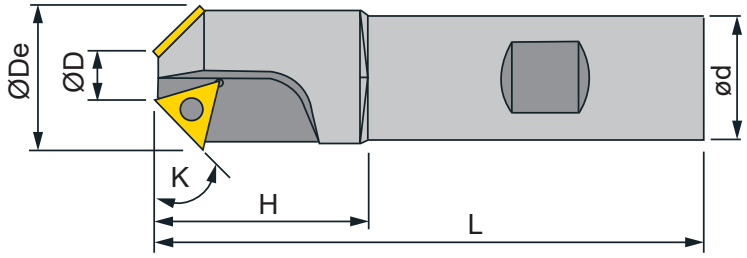
CHAMFERING MILLING CUTTERS FREZY DO FAZOWANIA

M400

Chamfering Milling Cutters With Chamfer Angle 30°
Frezy do fazowania o kącie fazki 30°



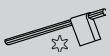




Tools / Narzędzia

EDP Nr. new nowy	**EDP No.**	**Dimensions** Wymiary (mm)								**Insert** Płytka
		ØD	**Ød**	**ØDe**	**K**	**L**	**H**	**Z**	**apmax**	
M400A00602W20095TC11	M415W00320	6	20	32	30	95	39	2	8	TCMT16T3

Accessories / Akcesoria

Tool Narzędzie	**ØD**	**Spare Parts** / Części zamienne	
			
M400	Ø6	SR106	W017

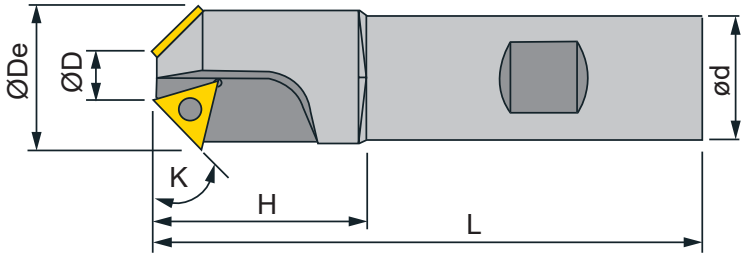
CHAMFERING MILLING CUTTERS FREZY DO FAZOWANIA

M401

Chamfering Milling Cutters With Chamfer Angle 45°
Frezy do fazowania o kącie fazki 45°



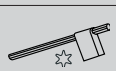




Tools / Narzędzia

EDP Nr. new nowy	**EDP No.**	**Dimensions** Wymiary (mm)								**Insert** Płytka
		ØD	**Ød**	**ØDe**	**K**	**L**	**H**	**Z**	**apmax**	
M401A00103W12070TC11	M400W00160	1,2	12	16	45	70	20	1	8	TCMT1102
M401A00601W20090TC11	M400W00210	6,2	20	21	45	90	35	2		
M401A01002W25095TC11	M400W03250	10,4	25	32,5	45	95	39	2	11	TCMT16T3

Accessories / Akcesoria

Tool Narzędzie	**ØD**	**Spare Parts** / Części zamienne	
			
M401	Ø1,2 - Ø6,2	SR070	W016
	Ø10,4	SR106	W017

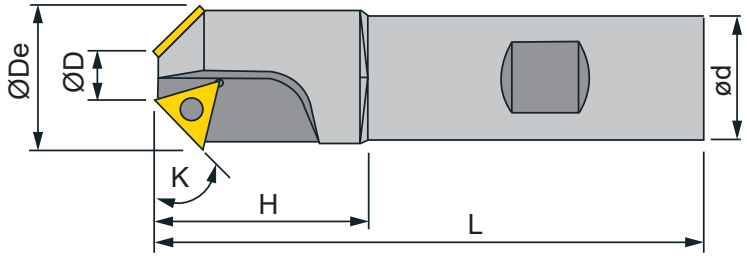
CHAMFERING MILLING CUTTERS FREZY DO FAZOWANIA

M402

Chamfering Milling Cutters With Chamfer Angle 60°
Frezy do fazowania o kącie fazki 60°



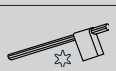




Tools / Narzędzia

EDP Nr. new nowy	**EDP No.**	**Dimensions** Wymiary (mm)								**Insert** Płytka
		ØD	**Ød**	**ØDe**	**K**	**L**	**H**	**Z**	**apmax**	
M402A00503W12070TC11	M400W00160	5,4	12	16	60	70	20	1	8	TCMT1102
M402A01601W20090TC11	M400W00260	15,8	20	26	60	90	35	2		
M402A02002W25095TC11	M400W03250	20	25	35	60	95	39	2	11	TCMT16T3

Accessories / Akcesoria

Tool Narzędzie	**ØD**	**Spare Parts** / Części zamienne	
			
M402	Ø5,4- Ø15,8	SR070	W016
	Ø20	SR106	W017

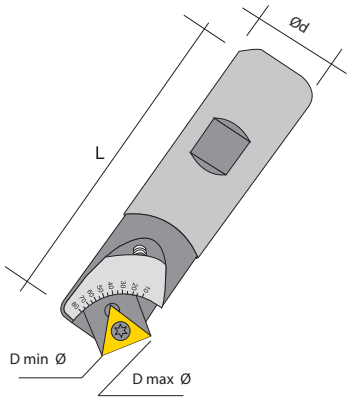
CHAMFERING MILLING CUTTERS FREZY DO FAZOWANIA

Chamfering Milling Cutters With Chamfer Angle 10°-80°
Frezy do fazowania o kącie fazki 10°-80°

M710







Tools / Narzędzia

EDP Nr. new nowy	**EDP No.**	**Dimensions** Wymiary (mm)					**Insert** Płytka
		ØDmax	**ØDmin**	**Ød**	**K**	**L**	
M710A02700W20100TC11	M710W00270	27	5	20	80	100	TCMT1102
M710A02700W20150TC11	M710W00271	27	5	20	80	150	
M710A02700W16100TC11	M710W00272	27	5	16	80	100	
M710A03400W25100TC11	M720W00340	34	5	25	80	100	TCMT16T3
M710A03400W25150TC11	M720W00341	34	5	25	80	150	
M710A03400W25200TC11	M720W00342	34	5	25	80	200	
M710A03400W20100TC11	M720W00343	34	5	20	80	100	
M710A03400W20150TC11	M720W00344	34	5	20	80	150	

Accessories / Akcesoria

Tool Narzędzie	**Spare Parts** / Części zamienne				
					**Insert** Płytka
M710	DH100	SR070	SR109	W016	TCMT1102
	DH101	SR106	SR108	W017	TCMT16T3

CHAMFERING MILLING CUTTERS FREZY DO FAZOWANIA

Cutting Conditions / Parametry skrawania

Material Group Grupa materiałowa	Group No Nr Grupy	Material Examples Przykłady materiałów	Hardness Twardość HB	d.o.c. a_p (mm)		feed (mm/rev) f (mm/obr)		A max (mm²)	V_c (m/min)		Optimal cutting conditions Optymalne warunki skrawania	
				min	max	min	max		min	max	d.o.c a_p	feed f
Low Carbon Steel Stal niskowęglowa	1	Ck15 9SMnPb28	150	0.10	2.00	0.08	0.20	0.36	180	350	0.2 - 1	0.18
			180		2.00		0.18	0.29		280		
			210		2.00		0.16	0.29		250		
Alloy Steel Stal stopowa	2	42 CrMo 4 100 Cr 6 32 NiCrMo 14.5	180	0.10	2.00	0.08	0.18	0.29	120	280	0.2 - 1	0.15
			230		2.00		0.18	0.24		250		
			280		1.50	0.09	0.16	0.24		210		
			320		1.50		0.14	0.19		180		
High Alloy Steel Stal wysokostopowa	3	X38 CrMoV 5 X210 CrW 12 X90 CrMoV 8	220	0.10	2.00	0.08	0.16	0.24	70	190	0.2 - 1	0.12
			280		1.50		0.14	0.24		150		
			320		1.50		0.13	0.17		130		
			350		1.50		0.13	0.14		100		
Austenitic Stainless Steel Stal nierdzewna austenityczna	4	303 / 304 304 L	210 - 250	0.10	2.00	0.08	0.16	0.22	170	270	0.2 - 1	0.15
	5	316 / 316L	230 - 270		1.80	0.08	0.14	0.17	120	210	0.2 - 1	0.12
	6	316 Ti 630 (F16PH)	...		1.50	0.08	0.13	0.14	70	120	0.2 - 1	0.12
Ferritic Stainless Steel Stal nierdzewna ferrytyczna	7	430 / 439 / 444	Annealed Wyżarzona	0.10	2.00	0.08	0.16	0.20	170	250	0.2 - 1	0.15
Martensitic Stainless Steel Stal nierdzewna martenzytyczna	8	410 / 420	Annealed Wyżarzona	0.10	2.00	0.08	0.16	0.20	170	250	0.2 - 1	0.15
			Treated Ulepszona						120	210		
Cast Iron Żeliwo szare	9	EN - GJL 200	140 - 230	0.10	2.00	0.06	0.18	0.38	170	280	0.2 - 1	0.18
		EN - GJL 250						0.36		250		
		EN - GJL 300						0.36		230		
Nodular Cast Iron Żeliwo sferoidalne	10	EN - GJS 400	210	0.10	2.00	0.06	0.16	0.29	120	230	0.2 - 1	0.15
		EN - GJS 600						0.24		190		
		EN - GJS 800						0.24		150		
Nickel Based Alloys Stopy niklu	11	Inconel 625	...	0.10	1.50	0.08	0.14	0.14	25	35	0.2 - 1	0.12
		Inconel 718						0.14	28	40		
		Hastelloy C						0.17	40	65		
Ti Alloy Stop Ti	12	TiAl 6V4	...	0.10	1.50	0.08	0.14	0.17	35	60	0.2 - 1	0.14
		T40					0.13	0.14	28	40		0.12

CHAMFERING MILLING CUTTERS FREZY DO FAZOWANIA

Cutting Conditions / Parametry skrawania

Material Group Grupa materiałowa	Group № N° Grupy	Material Examples Przykłady materiałów	Hardness Twardość HB	d.o.c. a_p (mm)		feed (mm/rev) f (mm/obr)		A max (mm^2)	V_c (m/min)		Optimal cutting conditions Optymalne warunki skrawania	
				min	max	min	max		min	max	d.o.c a_p	feed f
Low Carbon Steel Stal niskowęglowa	1	Ck15 9SMnPb28	150	0.20	2.00	0.15	0.45	0.43	180	350	0.2 - 1	0.24
			180		2.00		0.40	0.35		280		
			210		2.00		0.40	0.35		250		
Alloy Steel Stal stopowa	2	42 CrMo 4 100 Cr 6 32 NiCrMo 14.5	180	0.20	2.00	0.12	0.40	0.35	120	280	0.2 - 1	0.22
			230		2.00		0.40	0.29		250		
			280		1.50	0.12	0.38	0.29		210		
			320		1.50		0.35	0.23		180		
High Alloy Steel Stal wysokostopowa	3	X38 CrMoV 5 X210 CrW 12 X90 CrMoV 8	220	0.20	2.00	0.12	0.40	0.29	70	190	0.2 - 1	0.18
			280		1.50		0.38	0.29		150		
			320		1.50		0.35	0.20		130		
			350		1.50		0.32	0.17		100		
Austenitic Stainless Steel Stal nierdzewna austenityczna	4	303 / 304 304 L	210 - 250	0.20	2.00	0.15	0.38	0.31	170	270	0.2 - 1	0.24
	5	316 / 316L	230 - 270		1.80	0.12	0.35	0.24	120	210	0.2 - 1	0.22
	6	316 Ti 630 (F16PH)	...		1.50	0.12	0.32	0.20	70	120	0.2 - 1	0.24
Ferritic Stainless Steel Stal nierdzewna ferrytyczna	7	430 / 439 / 444	Annealed Wyżarzona	0.20	2.00	0.15	0.38	0.27	170	250	0.2 - 1	0.24
Martensitic Stainless Steel Stal nierdzewna martenzytyczna	8	410 / 420	Annealed Wyżarzona	0.20	2.00	0.15	0.35	0.27	170	250	0.2 - 1	0.24
			Treated Ulepszona						120	210		
Cast Iron Żeliwo szare	9	EN - GJL 200	140 - 230	0.20	2.00	0.15	0.40	0.46	170	280	0.2 - 1	0.24
		EN - GJL 250						0.43		250		
		EN - GJL 300						0.43		230		
Nodular Cast Iron Żeliwo sferoidalne	10	EN - GJS 400	210	0.20	2.00	0.15	0.40	0.35	120	230	0.2 - 1	0.22
		EN - GJS 600	260					0.29		190		
		EN - GJS 800	310					0.29		150		
Nickel Based Alloys Stopy niklu	11	Inconel 625	...	0.20	1.50	0.15	0.32	0.17	25	35	0.2 - 1	0.22
		Inconel 718						0.17	28	40		
		Hastelloy C						0.20	40	65		
Ti Alloy Stop Ti	12	TiAl 6V4	...	0.20	1.50	0.12	0.35	0.20	35	60	0.2 - 1	0.22
		T40					0.35	0.17	28	40	0.2 - 1	0.22

CHAMFERING MILLING CUTTERS FREZY DO FAZOWANIA

Cutting Conditions / Parametry skrawania

Material Group Grupa materiałowa	Group № N° Grupy	Material Examples Przykłady materiałów	Hardness Twardość HB	d.o.c. a_p (mm)		feed (mm/rev) f (mm/obr)		A max (mm²)	V_c (m/min)		Optimal cutting conditions Optymalne warunki skrawania	
				min	max	min	max		min	max	d.o.c a_p	feed f
Low Carbon Steel Stal niskowęglowa	1	Ck15 9SMnPb28	150	0.20	3.00	0.11	0.23	0.60	180	350	0.5 - 2.0	0.18
			180		2.50		0.20	0.48		280		
			210		2.50		0.18	0.48		250		
Alloy Steel Stal stopowa	2	42 CrMo 4 100 Cr 6 32 NiCrMo 14.5	180	0.20	2.50	0.11	0.20	0.48	120	280	0.5 - 1.5	0.15
			230		2.50		0.20	0.40		250		
			280		2.00	0.09	0.18	0.40		210		
			320		2.00		0.18	0.32		180		
High Alloy Steel Stal wysokostopowa	3	X38 CrMoV 5 X210 CrW 12 X90 CrMoV 8	220	0.20	2.50	0.09	0.18	0.40	70	190	0.5 - 1.5	0.12
			280		2.50		0.16	0.40		150		
			320		2.00		0.14	0.28		130		
			350		2.00		0.14	0.24		100		
Austenitic Stainless Steel Stal nierdzewna austenityczna	4	303 / 304 304 L	210 - 250	0.20	2.50	0.10	0.18	0.32	170	270	0.5 - 2.0	0.15
	5	316 / 316L	230 - 270		2.00	0.09	0.16	0.24	120	210	0.5 - 1.5	0.12
	6	316 Ti 630 (F16PH)	...		2.00	0.09	0.14	0.20	70	120	0.5 - 1.5	0.12
Ferritic Stainless Steel Stal nierdzewna ferrytyczna	7	430 / 439 / 444	Annealed Wyżarzona	0.20	2.00	0.11	0.18	0.28	170	250	0.5 - 1.5	0.15
Martensitic Stainless Steel Stal nierdzewna martenzytyczna	8	410 / 420	Annealed Wyżarzona	0.20	2.00	0.11	0.18	0.28	170	250	0.5 - 1.5	0.15
			Treated Ulepszona						120	210		
Cast Iron Żeliwo szare	9	EN - GJL 200	140 - 230	0.20	3.00	0.08	0.20	0.64	170	280	0.5 - 2.0	0.18
		EN - GJL 250						0.60		250		
		EN - GJL 300						0.60		230		
Nodular Cast Iron Żeliwo sferoidalne	10	EN - GJS 400	210	0.20	2.50	0.08	0.18	0.48	120	230	0.5 - 1.5	0.15
		EN - GJS 600	260					0.40		190		
		EN - GJS 800	310					0.40		150		
Nickel Based Alloys Stopy niklu	11	Inconel 625	...	0.20	2.00	0.10	0.16	0.24	25	35	0.5 - 1.5	0.12
		Inconel 718						0.24	28	40		
		Hastelloy C						0.28	40	65		
Ti Alloy Stop Ti	12	TiAl 6V4	...	0.20	2.00	0.09	0.16	0.28	35	60	0.5 - 1.5	0.14
		T40					0.14	0.24	28	40		0.12

CHAMFERING MILLING CUTTERS FREZY DO FAZOWANIA

Cutting Conditions / Parametry skrawania

Material Group Grupa materiałowa	Group № Nº Grupy	Material Examples Przykłady materiałów	Hardness Twardość HB	d.o.c. a_p (mm)		feed (mm/rev) f (mm/obr)		A max (mm²)	V_c (m/min)		Optimal cutting conditions Optymalne warunki skrawania	
				min	max	min	max		min	max	d.o.c a_p	feed f
Low Carbon Steel Stal niskowęglowa	1	Ck15 9SMnPb28	150	0.50	5.00	0.21	0.45	1.30	180	350	1 - 2.5	0.32
			180		4.00		0.40	1.00		280		
			210		4.00		0.35	0.80		250		
Alloy Steel Stal stopowa	2	42 CrMo 4 100 Cr 6 32 NiCrMo 14.5	180	0.50	4.00	0.21	0.40	1.00	120	280	1 - 2.5	0.30
			230		4.00		0.40	0.80		250		
			280		3.00	0.18	0.35	0.60		210		
			320		3.00		0.32	0.50		180		
High Alloy Steel Stal wysokostopowa	3	X38 CrMoV 5 X210 CrW 12 X90 CrMoV 8	220	0.50	4.00	0.18	0.35	0.80	70	190	1 - 2.5	0.28
			280		4.00		0.32	0.60		150		
			320		3.00		0.28	0.50		130		
			350		3.00		0.28	0.40		100		
Austenitic Stainless Steel Stal nierdzewna austenityczna	4	303 / 304 304 L	210 - 250	0.50	4.00	0.20	0.35	0.80	170	270	1 - 2.5	0.28
	5	316 / 316L	230 - 270		3.00	0.18	0.32	0.60	170	210	1 - 2.5	0.25
	6	316 Ti 630 (F16PH)	...		3.00	0.18	0.28	0.50	70	120	1 - 2.5	0.23
Ferritic Stainless Steel Stal nierdzewna ferrytyczna	7	430 / 439 / 444	Annealed Wyżarzona	0.50	3.00	0.22	0.35	0.70	170	250	1 - 2.5	0.28
Martensitic Stainless Steel Stal nierdzewna martenzytyczna	8	410 / 420	Annealed Wyżarzona	0.50	3.00	0.22	0.35	0.70	170	250	1 - 2.5	0.28
			Treated Ulepszona						120	210		
Cast Iron Żeliwo szare	9	EN - GJL 200	140 - 230	0.50	5.00	0.15	0.40	1.20	170	280	1 - 3.0	0.32
		EN - GJL 250						1.10		250		
		EN - GJL 300						1.00		230		
Nodular Cast Iron Żeliwo sferoidalne	10	EN - GJS 400	210	0.50	4.00	0.15	0.35	1.00	120	230	1 - 2.5	0.28
		EN - GJS 600	260					0.90		190		
		EN - GJS 800	310					0.80		150		
Nickel Based Alloys Stopy niklu	11	Inconel 625	...	0.50	3.00	0.20	0.32	0.60	25	35	1 - 2.5	0.25
		Inconel 718						0.60	28	40		
		Hastelloy C						0.70	40	65		
Ti Alloy Stop Ti	12	TiAl 6V4	...	0.50	3.00	0.18	0.32	0.70	35	60	1 - 2.5	0.25
		T40					0.28	0.60	28	40	1 - 2.5	0.22

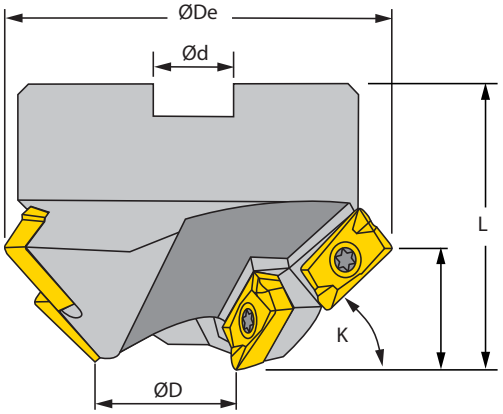
CHAMFERING MILLING CUTTERS FREZY DO FAZOWANIA

M135

Chamfering Milling Cutters With Chamfer Angle 15° 30° 45° 60 ° 75°
Frezy do fazowania o kącie fazki 15° 30° 45° 60 ° 75°



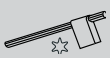




Tools / Narzędzia

EDP Nr. new nowy	**EDP No.**	**Dimensions** Wymiary (mm)							**Insert** Płytka
		ØD	**Ød**	**ØDe**	**K**	**L**	**Z**	**apmax**	
M135A07506027050AP16	M135H00750	35	27	75	45	50	6	21,5	APKT1604
M135A06206027050AP16	M135H00620	35	27	62	60	50	6	26,5	
M135A08506027050AP16	M135H00850	35	27	85	30	50	6	15,0	
M135A09006027050AP16	M135H00900	35	27	90	15	50	6	8,0	
M135A04506022060AP16	M135H00450	35	22	45	75	60	6	29,5	

Accessories / Akcesoria

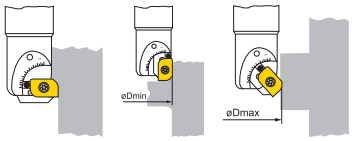
Tool Narzędzie	**ØD**	**Spare Parts** / Części zamienne	
			
M135	Ø45 - Ø75	SR101	W009

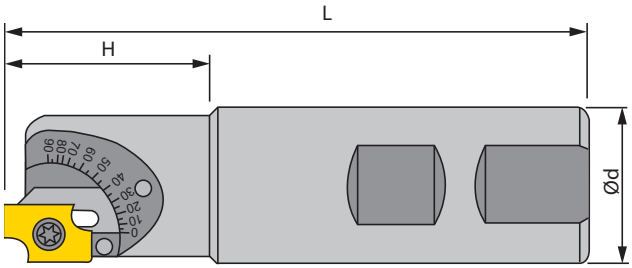
CHAMFERING MILLING CUTTERS FREZY DO FAZOWANIA

Milling Cutters for Concave Radius: Adjustable From 0° to 90° And Fixed
Frezy do obrbki wklęsłych promieni: Nastawienie 0°-90° stały kąt przystawienia

M741



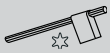




Tools / Narzędzia

EDP Nr. new nowy	**EDP No.**			**Dimensions** Wymiary (mm)					**Insert** Płytka
		ØDmin	**ØDmax**	**Ød**	**K**	**L**	**H**	**R**	
M741A03400W25100XC15	M741W00341	26,5	34	25	90	100	37	1-1.5, 2-2.5, 3-3.5, 4	XDCW1503 C72
M741A03400W20100XC15	M741W00340	26,5	34	20	90	100	37		
M741A03400W25150XC15	M741W00342	26,5	34	25	90	150	37		
M741A03400W20150XC15	M741W00343	26,5	34	20	90	150	37		
M741A03400W25200XC15	M741W00344	26,5	34	25	90	200	37		

Accessories / Akcesoria

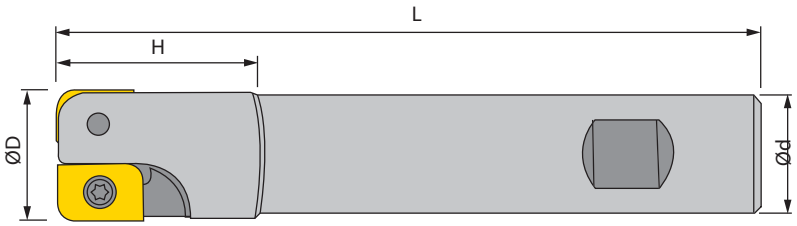
Tool Narzędzie	**Spare Parts** / Części zamienne		
			
M741	DH102	SR108 SR111 SR110	W017

CHAMFERING MILLING CUTTERS FREZY DO FAZOWANIA

M810

Milling Cutters for Concave Radius: Adjustable From 0° to 90° And Fixed
Frezy do obrbki wklęsłych promieni: Nastawienie 0°-90° stały kąt przystawienia

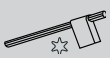




Tools / Narzędzia

EDP Nr. new nowy	**EDP No.**	**Dimensions** Wymiary (mm)						**Insert** Płytka
		ØD	**Ød**	**K**	**L**	**H**	**Z**	
M810A02202W20120XC15	M810W00220	22	20	90	120	35	2	XDCW1503
M810A02200W20180XC15	M810W00221	22	20	90	180	35		
M810A03202W25120XP20	M810W00320	32	25	90	120	40	2	XPCW2004
M810A03200W25180XP20	M810W00321	32	25	90	180	40		

Accessories / Akcesoria

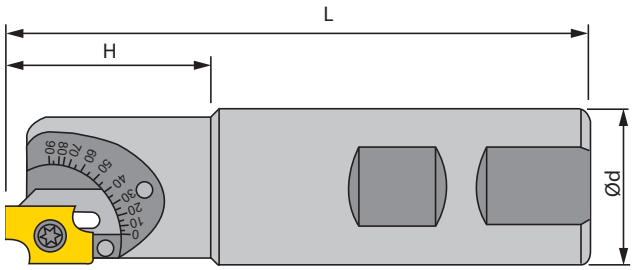
Tool Narzędzie	**ØD**	**Spare Parts** / Części zamienne	
			
M810	Ø22	SR111	W017
	Ø32	SR109	W018

CHAMFERING MILLING CUTTERS FREZY DO FAZOWANIA

Milling Cutters for Concave Radius: Adjustable From 0° to 90° And Fixed
Frezy do obrbki wklęsłych promieni: Nastawienie 0°-90° stały kąt przystawienia

M742

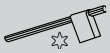




Tools / Narzędzia

EDP Nr. new nowy	**EDP No.**	**Dimensions** Wymiary (mm)					**Insert** Płytka
		ØDmax	**ØDmin**	**Ød**	**K**	**L**	
M742A03300W25100XC15	M742W00331	33	26	25	90	100	XDCW1503
M742A03300W20100XC15	M742W00330	33	26	20	90	100	
M742A03300W25150XC15	M742W00332	33	26	25	90	150	
M742A03300W20150XC15	M742W00333	33	26	20	90	150	
M742A03300W25200XC15	M742W00334	33	26	25	90	200	

Accessories / Akcesoria

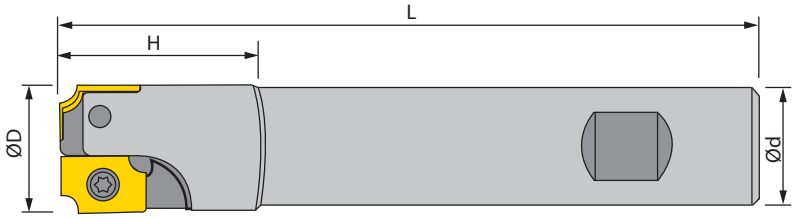
Tool Narzędzie	**Spare Parts /** Części zamienne		
			
M742	H003	SR108 SR111 SR080	W017

CHAMFERING MILLING CUTTERS FREZY DO FAZOWANIA

M820

Milling Cutters for Concave Radius: Adjustable From 0° to 90° And Fixed
Frezy do obrbki wklęsłych promieni: Nastawienie 0°-90° stały kąt przystawienia

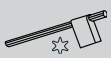




Tools / Narzędzia

EDP Nr. new nowy	**EDP No.**	**Dimensions** Wymiary (mm)						**Insert** Płytka
		ØD	**Ød**	**K**	**L**	**H**	**Z**	
M820A02202W20120XC15	M820W00220	22	20	90	120	35	2	XDCW1503
M820A02200W20180XC15	M820W00221	22	20	90	180	35		
M820A03200W25120XP20	M820W00320	32	25	90	120	40		XPCW2004
M820A03200W25180XP20	M820W00321	32	25	90	180	40		

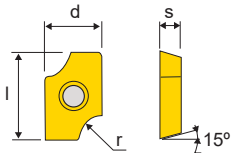
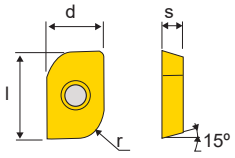
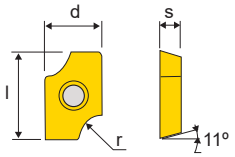
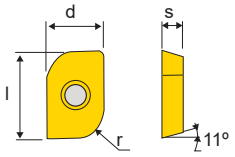
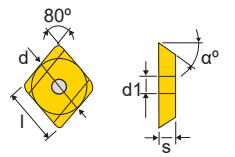
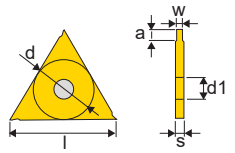
Accessories / Akcesoria

Tool Narzędzie	**ØD**	**Spare Parts** / Części zamienne	
			
M820	Ø22	SR111	W017
	Ø32	SR109	W018

CHAMFERING MILLING CUTTERS FREZY DO FAZOWANIA

Milling Inserts Płytki do frezowania

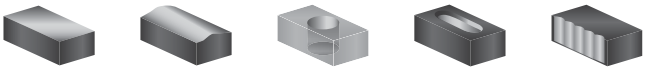
SPECIAL

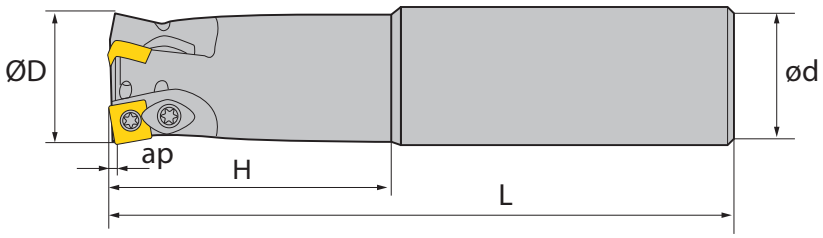
Insert Płytka	Grades / Gatunki									(mm)						Drawing Schemat
	P140	P141								l	s	r	d	D1	a°	w	
XDCW150310 C72	•									15	3,18	1,0	9,5				
XDCW150315 C72	•									15	3,18	1,5	9,5				
XDCW150320 C72	•									15	3,18	2,0	9,5				
XDCW150325 C72	•									15	3,18	2,5	9,5				
XDCW150330 C72	•									15	3,18	3,0	9,5				
XDCW150335 C72	•									15	3,18	3,5	9,5				
XDCW150340 C72	•									15	3,18	4,0	9,5				
XDCW150310 C73	•									15	3,18	1,0	9,5				
XDCW150315 C73	•									15	3,18	1,5	9,5				
XDCW150320 C73	•									15	3,18	2,0	9,5				
XDCW150325 C73	•									15	3,18	2,5	9,5				
XDCW150330 C73	•									15	3,18	3,0	9,5				
XDCW150335 C73	•									15	3,18	3,5	9,5				
XDCW150340 C73	•									15	3,18	4,0	9,5				
XPCW200445 C72	•									20	4,76	4,5	12,75				
XPCW200450 C72	•									20	4,76	5,0	12,75				
XPCW200455 C72	•									20	4,76	5,5	12,75				
XPCW200460 C72	•									20	4,76	6,0	12,75				
XPCW200465 C72	•									20	4,76	6,5	12,75				
XPCW200470 C72	•									20	4,76	7,0	12,75				
XPCW200445 C73	•									20	4,76	4,5	12,75				
XPCW200450 C73	•									20	4,76	5,0	12,75				
XPCW200455 C73	•									20	4,76	5,5	12,75				
XPCW200460 C73	•									20	4,76	6,0	12,75				
XPCW200465 C73	•									20	4,76	6,5	12,75				
XPCW200470 C73	•									20	4,76	7,0	12,75				
CGXX0622	•									6,35	2,2		6,35	2,8	35		
CGXX0932	•									9,52	3,2		9,52	4,9	35		
CGXX1242	•									12,7	4,2		12,7	5,5	35		
CGXX0622		•								6,35	2,2		6,35	2,8	35		
CGXX0932		•								9,52	3,2		9,52	4,9	35		
CGXX1242		•								12,7	4,2		12,7	5,5	35		
540.16.110	•									16	2,5		9,52	4,5	1,2	1,10	
540.16.130	•									16	2,5		9,52	4,5	1,5	1,30	
540.16.160	•									16	2,5		9,52	4,5	1,8	1,60	
540.16.185	•									16	2,5		9,52	4,5	3,0	1,85	
540.16.215	•									16	2,8		9,52	4,5	3,0	2,15	
540.16.265	•									16	3,3		9,52	4,5	3,0	2,65	
540.16.315	•									16	3,8		9,52	4,5	3,0	3,15	
540.16.415	•									16	4,5		9,52	4,5	3,0	4,15	

HIGH FEED MILLING CUTTER FREZY DO OBRÓBKI SZYBKOŚCIOWEJ

M550

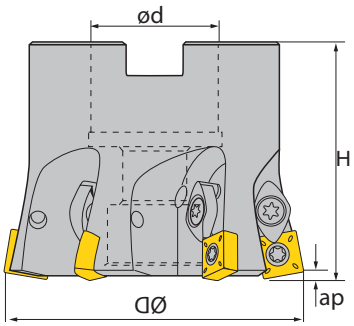
High Feed Milling Cuters Frezy do obróbki szybkościowej





Tools / Narzędzia

EDP Nr. new nowy	**EDP No.**	**Dimensions** Wymiary (mm)						**Insert** Płytka
		ØD	**Ød**	**L**	**H**	**Z**	**apmax**	
M550A02502T25060SD09	M550A00250	25	25	140	60	2	1.4	SDMT09T3
M550A03203T32070SD09	M550A00320	32	32	150	70	3	1.4	
M550A03503T32070SD09	M550A00350	35	32	150	70	3	1.4	
M550A03202T32070SD12	M551A00320	32	32	150	70	2	1.8	SDMT1204
M550A04003T40070SD12	M551A00400	40	40	150	70	3	1.8	



Tools / Narzędzia

EDP Nr. new nowy	**EDP No.**	**Dimensions** Wymiary (mm)					**Insert** Płytka
		ØD	**Ød**	**L**	**Z**	**apmax**	
M550A05004022040SD09	M550HW00500	50	22	40	4	1.4	SDMT09T3
M550A06306022040SD09	M550HW00630	63	22	40	6	1.4	
M550A06306027050SD09	M550HW00631	63	27	50	6	1.4	
M550A06305022040SD12	M550HW00630	63	22	40	5	1.8	SDMT1204
M550A06305027050SD12	M551HW00631	63	27	50	5	1.8	
M550A08005027063SD12	M551HW00800	80	27	63	5	1.8	
M550A10006032050SD12	M551HW01000	100	32	50	6	1.8	

Accessories / Akcesoria

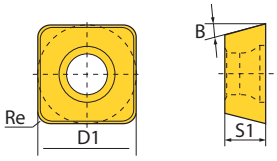
Tool Narzędzie	**Insert** Płytka	**Screw** Śruba	**Clamp Screw** Śruba zacisku	**Clamp** Zacisk	**Wrench** Klucz	
M550	SDMT09	SR128	SR116	DOC204	SPAN10IP	W042
	SDMT12	SR116			W042	

HIGH FEED MILLING CUTERS FREZY DO OBRÓBKI SZYBKOŚCIOWEJ

Milling Inserts Płytki do frezowania

SDMT

● - stable machining/obróbka stabilna
◕ - general machining/obróbka ogólna
✱ - interrupted cut/obróbka przerywana



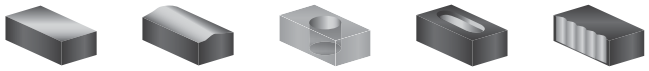
P	Steel / Stal	◕ ✱ ◕ ✱ ● ◕ ● ◕ ◕ ✱ ● ◕ ◕ ◕ ✱ ● ● ●
M	Stainless Steel Stal nierdzewna	◕ ✱ ◕ ✱ ● ● ◕ ◕ ✱ ● ◕ ◕ ◕ ✱ ● ● ●
K	Cast Iron Żeliwo szare	● ✱ ● ● ◕ ● ● ◕ ● ● ● ● ● ● ● ● ✱
N	Non-ferrous materials Materiały nieżelazne	● ✱
S	Heat-resistant steel Stal żaroodporna	● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●

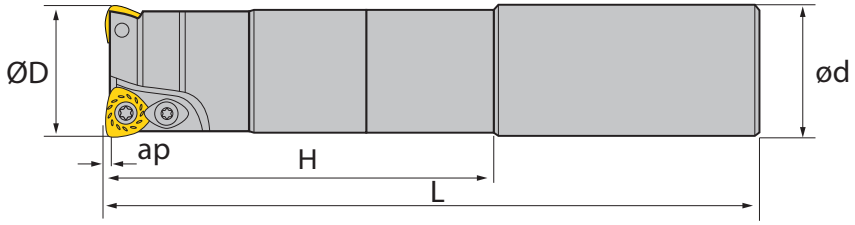
Insert Shape	Type	Basic Dimensions (mm)			CVD Coating												Cermet		Cemented carbide			
		R	s	d	P127	P128	P228	P102	P203	P204	P225	P216	P246	P226	P251	P143	P230	P231	P139	P234	P224	P235
	SDMT09T312-C41	1.2	3.97	9.525				•		•		•		•								
	SDMT120412-C41	2.0	4.76	12.7				•		•		•		•								

HIGH FEED MILLING CUTERS FREZY DO OBRÓBKI SZYBKOŚCIOWEJ

M551

High Feed Milling Cuters Frezy do obróbki szybkościowej





Tools / Narzędzia

EDP Nr. new nowy	**EDP No.**	**Dimensions** Wymiary (mm)						**Insert** Płytka
		ØD	**Ød**	**L**	**H**	**Z**	**apmax**	
M551A02002T20050WP05		20	20	130	50	2	1.5	WPGT0503
M551A02002T20100WP05		20	20	180	100	2	1.5	
M551A02002T20130WP05		20	20	250	130	2	1.5	
M551A02502T25060WP06		25	25	140	60	2	1.5	WPGT0604
M551A02502T25120WP06		25	25	200	120	2	1.5	
M551A02502T25180WP06		25	25	300	180	2	1.5	
M551A03203T32070WP06		32	32	150	70	3	1.5	
M551A03203T32120WP06		32	32	200	120	3	1.5	
M551A03203T32180WP06		32	32	300	180	3	1.5	
M551A04003T32050WP06		40	32	150	50	3	1.5	
M551A04003T32050WP06		40	32	250	50	3	1.5	
M551A04003T32050WP08		40	32	300	50	3	1.5	WPGT0806
M551A04002T32050WP08		40	32	150	50	2	1.5	
M551A04002T32050WP08		40	32	250	50	2	1.5	
M551A04002T32050WP09		40	32	300	50	2	1.5	WPGT0907
M551A05002T32050WP09		50	32	150	50	2	3.0	
M551A05002T32050WP09		50	32	250	50	2	3.0	

Accessories / Akcesoria

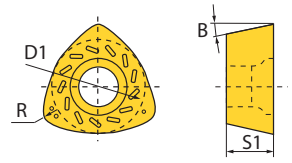
Tool Narzędzie	**Insert** Płytka	**Screw** Śruba	**Clamp Screw** Śruba zacisku	**Clamp** Zacisk	**Wrench** Klucz	
M551	WP05	SR128		-	W139	-
	WP06	SR116		-	W130	-
	WP08	SR123		DOC208	-	W126
	WP09				-	

HIGH FEED MILLING CUTERS FREZY DO OBRÓBKI SZYBKOŚCIOWEJ

Milling Inserts Płytki do frezowania

WPGT

● - stable machining/obróbka stabilna
● - general machining/obróbka ogólna
✱ - interrupted cut/obróbka przerywana



P	Steel / Steel	● ✱ ● ✱ ● ✱ ● ● ✱ ● ● ● ✱
M	Stainless Steel Stal nierdzewna	● ✱ ● ✱ ● ● ✱ ● ● ✱
K	Cast Iron Żeliwo szare	● ✱ ● ● ● ✱
N	Non-ferrous materials Materiały nieżelazne	● ✱
S	Heat-resistant steel Stal żaroodporna	● ● ●

Insert Shape	Type	Basic Dimensions (mm)			CVD Coating											Cermet		Cemented carbide			
		R	s	d	P127	P128	P228	P102	P203	P204	P225	P216	P246	P226	P251	P143	P230	P231	P139	P234	P224	P235
	WPGT050315-C148	1.5	3.5	7.94					•													
	WPGT060415-C148	1.5	4.2	9.525					•													
	WPGT080614-C148	1.5	6.35	12.85					•						•							
	WPGT090725-C148	2.5	7.0	15.0					•													

Cutting Conditions / Parametry skrawania

Material Group Grupa materiałowa	Hardness Twardość HB	Insert grade Gatunek płytki	V (m/min)	Ø25		Ø30 Ø32 Ø35	
				Axial cutting depth	Feed rate per tooth	Axial cutting depth	Feed rate per tooth
Low Carbon Steel Stal niskowęglowa	≤180	P102	170 (120-220) 150 (100-200)	0.6~1.0	0.8~1.2	0.8~1.2	1.0~1.4
High-carbon steel **Alloy steel** Stal wysokowęglowaStopy stali	180-280	P102	130 (80-180)	0.4~0.8	0.8~1.2	0.6~1.0	1.0~1.4
Alloy tool steel Stopy stali narzędziowej	280-350	P102	120 (80-160)	0.4~0.8	0.6~1.0	0.6~1.0	0.8~1.2
Stainless steel Stal nierdzewna	≤270	P102	120 (80-160)	0.6~1.0	0.6~1.0	0.8~1.2	0.8~1.2
Cast iron Żeliwo	180-250	P226	150 (100-200)	0.6~1.0	1.0~1.4	0.8~1.2	1.2~1.6
			120 (80-160)	0.4~0.8	0.8~1.2	0.6~1.0	1.0~1.4

Cutting Conditions / Parametry skrawania

Material Group Grupa materiałowa	Hardness Twardość HB	Insert grade Gatunek płytki	V (m/min)	Ø40		Ø50 Ø63		Ø80 Ø100	
				Axial cutting depth	Feed rate per tooth	Axial cutting depth	Feed rate per tooth	Axial cutting depth	Feed rate per tooth
Low Carbon Steel Stal niskowęglowa	≤180	P102	170 (120-220) 150 (100-200)	0.8~1.2	1.0~1.4	1.1~1.5	1.1~1.5	1.0~1.5	1.0~1.5
High-carbon steel **Alloy steel** Stal wysokowęglowaStopy stali	180-280	P102	130 (80-180)	0.6~1.0	1.0~1.4	0.9~1.3	1.1~1.5	0.8~1.3	1.0~1.5
Alloy tool steel Stopy stali narzędziowej	280-350	P102	120 (80-160)	0.6~1.0	0.8~1.2	0.9~1.3	0.9~1.3	0.8~1.3	0.8~1.3
Stainless steel Stal nierdzewna	≤270	P102	120 (80-160)	0.8~1.2	0.8~1.2	1.1~1.5	0.9~1.3	1.0~1.5	0.8~1.3
Cast iron Żeliwo	180-250	P226	150 (100-200)	0.8~1.2	1.2~1.6	1.1~1.5	1.3~1.7	1.0~1.5	1.2~1.7
			120 (80-160)	0.6~1.0	1.0~1.4	0.9~1.3	1.1~1.5	0.8~1.3	1.0~1.5

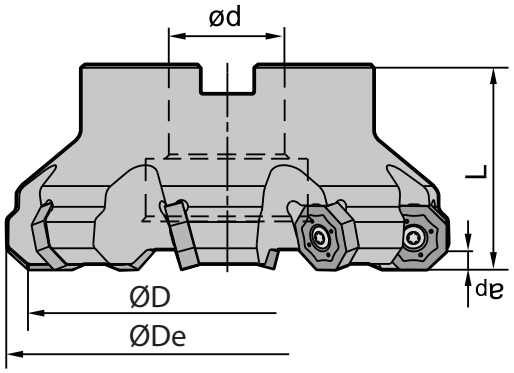
FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

M173

Face Milling Cutters With Corner Angle 45°
Frezy do obróbki płaszczyzn o kącie przystawienia 45°







Tools / Narzędzia

EDP Nr. new nowy	**EDP No.**	**Dimensions** Wymiary (mm)						**Insert** Płytka
		ØD	**Ød**	**ØDe**	**L**	**Z**	**apmax**	
M173B05005022040OS06		50	22	62	40	5	4	OSWX0604
M173B06306022040OS06		63	22	75	40	6	4	OSWX0604
M173B08007027050OS06		80	27	92	50	7	4	OSWX0604
M173B10008032063OS06		100	32	112	63	8	4	OSWX0604
M173B12509040063OS06		125	40	137	63	9	4	OSWX0604
M173B16011040063OS06		160	40	172	63	11	4	OSWX0604
M173B20013060063OS06		200	60	212	63	13	4	OSWX0604
M173B25015060063OS06		250	60	262	63	15	4	OSWX0604
M173B31517060080OS06		315	60	327	80	17	4	OSWX0604
M173B06305022040OS08		63	22	78	40	5	5	OSWX08T5
M173B08006027050OS08		80	27	95	50	6	5	OSWX08T5
M173B10007032063OS08		100	32	115	63	7	5	OSWX08T5
M173B12508040063OS08		125	40	140	63	8	5	OSWX08T5
M173B16010040063OS08		160	40	175	63	10	5	OSWX08T5
M173B20012060063OS08		200	60	215	63	12	5	OSWX08T5
M173B25014060063OS08		250	60	265	63	14	5	OSWX08T5
M173B31516060080OS08		315	60	330	80	16	5	OSWX08T5

Accessories / Akcesoria

Tool Narzędzie	**Diameter** Średnica ØD	**Screw** Śruba	**Wrench** Klucz	**Wrench** Klucz
M173	Ø25 -Ø40	SR117	-	W116
	Ø32 -Ø50	SR123	W126	-

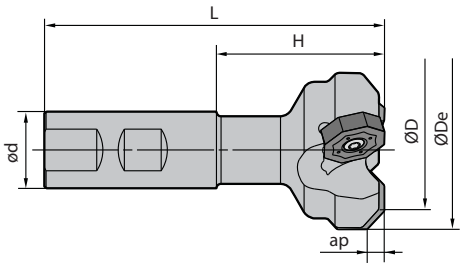
FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

Face Milling Cutters With Corner Angle 45°
Frezy do obróbki płaszczyzn o kącie przystawienia 45°

M173







Tools / Narzędzia

EDP Nr. new nowy	**EDP Nr.**	**Dimensions** Wymiary (mm)							**Insert** Płytka
		ØD	**Ød**	**ØDe**	**L**	**H**	**Z**	**ap**	
M173B02502W20095OS06		25	20	37	95	45	2	4	OSWX0604
M173B04003W25106OS06		40	25	52	106	50	3	4	OSWX0604
M173B04003W25111OS08		32	25	47	111	55	2	5	OSWX0604
M173B03202W25111OS08		40	25	55	111	55	3	5	OSWX08T5
M173B05004W25111OS08		50	25	65	111	55	4	5	OSWX08T5

Accessories / Akcesoria

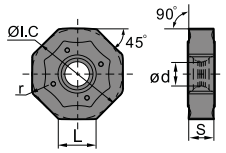
Tool Narzędzie	**Diameter** Średnica ØD	**Screw** Śruba	**Wrench** Klucz	**Wrench** Klucz
M173	Ø25 -Ø40	SR117	-	W116
	Ø32 -Ø50	SR123	W126	-

FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

Milling Inserts Płytki do frezowania

OSWX

● - stable machining/obróbka stabilna
● - general machining/obróbka ogólna
✱ - interrupted cut/obróbka przerywana



P	Steel / Stal	●	●	●	✱		●		●	●	✱			●	●	✱			
M	Stainless Steel Stal nierdzewna	●	●	●	✱				●	●	✱			●	●	✱			
K	Cast Iron Żeliwo szare					●	✱	●				●		●				✱	
N	Non-ferrous materials Materiały nieżelazne																●	✱	
S	Heat-resistant steel Stal żaroodporna				✱			●	●	●									

Insert Shape	Type	Basic Dimensions (mm)				CVD Coating						PCD Coating						Cermet		Cemented carbide			
		l	l.C	s	r	P127	P228	P236	P101	P203	P204	P225	P216	P246	P226	P251		PC31	PC33	P139	P224	P235	
	OSWX060408-C061	6,58	15,875	4,76	0,83					●			●										
	OSWX060408-C006	6,58	15,875	4,76	0,83			●	●	●													
	OSWX08T508-C061	8,39	20,2	5,79	0,83					●			●										
	OSWX08T508-C006	8,39	20,2	5,79	0,83			●	●	●													
	OSWX08T508-C182	6,9	20,5	6,00	0,80					●													
										●		○											

Cutting Conditions / Parametry skrawania

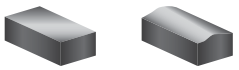
Material Group Grupa materiałowa	Hardness Twardość HB	Insert grade Gatunek płytki	V(m/min)	f(mm/z)	ae(mm)	
					OSWX06-C006	OSWX08-C006
Low Carbon Steel Stal niskowęglowa	≤180	P216 P263 P101	270 (220-350)	0.2 (0.1-0.4)	4	5
High-carbon steel **Alloy steel** Stal wysokowęglowa Stopy stali	180-280	P216	240 (180-300)	0.2 (0.1-0.4)	4	5
		P263	260 (200-320)	0.2 (0.1-0.4)		
		P101	200 (180-300)	0.2 (0.1-0.4)		
Alloy tool steel Stopy stali narzędziowej	280-350	P263	240 (180-300)	0.2 (0.1-0.4)	4	5
		P101	180 (150-250)	0.2 (0.1-0.4)		
Stainless steel Stal nierdzewna	≤270	P263	230(180-300)	0.2(0.1-0.3)	4	5
Cast iron Żeliwo	180-250	P203	270 (150-300)	0.4 (0.1-0.5)	4	5

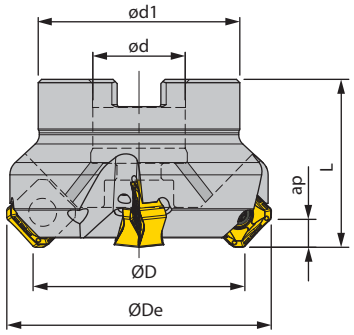
FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

Face Milling Cutters With Corner Angle 45°
Frezy do obróbki płaszczyzn o kącie przystawienia 45°

M184







Tools / Narzędzia

EDP Nr. new nowy	**EDP Nr.**	**Dimensions** Wymiary (mm)						**Insert** Płytka
		ØD	**Ød**	**ØDe**	**L**	**Z**	**ap**	
M184A05004022040SW12		50	22	63	40	4	6	SWGX1206
M184A05006022040SW12		50	22	63	40	6	6	SWGX1206
M184A06306022040SW12		63	22	76	40	6	6	SWGX1206
M184A06308022040SW12		63	22	76	40	8	6	SWGX1206
M184A08007027050SW12		80	27	93	50	7	6	SWGX1206
M184A08010027050SW12		80	27	93	50	10	6	SWGX1206
M184A10008032050SW12		100	32	113	50	8	6	SWGX1206
M184A10012032050SW12		100	32	113	50	12	6	SWGX1206
M184A12510040063SW12		125	40	138	63	10	6	SWGX1206
M184A16012040063SW12		160	40	173	63	12	6	SWGX1206
M184A20014060063SW12		200	60	213	63	14	6	SWGX1206
M184A25016060063SW12		250	60	263	63	16	6	SWGX1206

Accessories / Akcesoria

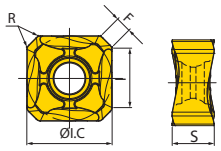
Tool Narzędzie	**Diameter** Średnica ØD	**Insert Screw** Śruba	**Screw** Śruba	**Wrench** Klucz	**Wrench** Klucz
M184	Ø50-Ø60	SC099	-	-	W041
	Ø80	SC099	SC100	W250	W041
	Ø100	SC099	SC101	W251	W225
	Ø125	SC099	SC102	W252	W225
	Ø160-Ø125	SC099	-	-	W225

FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

Milling Inserts Płytki do frezowania

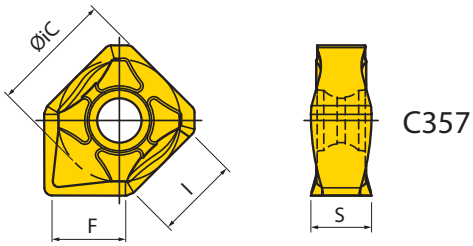
SWGX

● - stable machining/obróbka stabilna
● - general machining/obróbka ogólna
✱ - interrupted cut/obróbka przerywana



P	Steel / Stal	●	●	●	✱		●												
M	Stainless Steel Stal nierdzewna	●	●	●	✱														
K	Cast Iron Żeliwo szare	●	✱	●															
N	Non-ferrous materials Materiały nieżelazne																		
S	Heat-resistant steel Stal żaroodporna	●	●	●															

Insert Shape	Type	Basic Dimensions (mm)					P354	P334	P348	P347	P336	P335	P349	P352	P351	P353	P356							
		l	l.C	s	r	f																		
	SWGX1206-C353	9,3	12,7	6,35	0,8	2	○	●	●	○	○	○												
	SWGX1206-C354	9,3	12,7	6,35	0,8	2	●	●	●		○	○												
	SWGX1206-C355	9,3	12,7	6,35	0,8	2	●	●																
	SWGX1206-C356	9,3	12,7	6,35	0,8	2																		
	SWGX1206-C357	9,3	12,7	6,35	0,4	7,6	●	●																



C357

FACE MILLING CUTTERS FREZY DO OBRÓBKI PŁASZCZYZN

Cutting Conditions / Parametry skrawania

Material Group Grupa materiałowa	Hardness Twardość HB	Insert grade Gatunek płytki	V(m/min)	f(mm/z)
Low Carbon Steel Stal niskowęglowa	220-280	P355	250-320	0,10-0,35
		P354	170-210	
		P334	160-200	
		P348	155-170	
High-carbon steel **Alloy steel** Stal wysokowęglowaStopy stali	280-380	P355	250-300	0,10-0,35
		P354	160-200	
		P334	140-190	
		P348	135-150	
Alloy tool steel Stopy stali narzędziowej	125-220	P355	300-350	0,10-0,35
		P354	180-230	
		P334	170-210	
		P348	165-180	
Stainless steel Stal nierdzewna	200-330	P334	125-190	0,10-0,35
		P348	105-170	
		P347	95-150	
Cast iron Żeliwo	130-150	P354	90-260	0,10-0,40
		P334	80-250	
		P348	100-240	
		P347	125-210	
Non-ferrous materials Materiały nieżelazne	30-130	P352	265-945	0,10-0,40
		P353	525-1890	
Heat-resistant steel Stal żaroodporna	200-320	P354	30-90	0,10-0,40
		P334	20-90	
		P336	25-70	

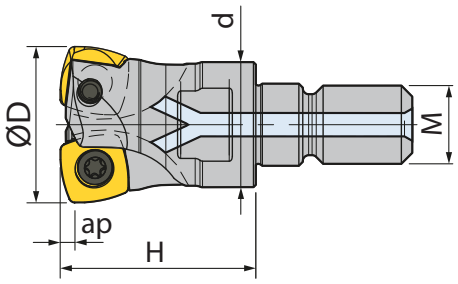
HIGH FEED MILLING CUTTER FREZY DO OBRÓBKI SZYBKOŚCIOWEJ

M191

Screw-on Roughing Cutters Głowice wkręcane do obróbki zgrubnej



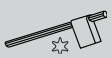




Tools / Narzędzia

EDP Nr. new nowy	**EDP No.**	**Dimensions** Wymiary (mm)							**Insert** Płytka
		ØD	**Ød**	**M**	**L**	**H**	**Z**	**apmax**	
M191A02002M010025SE08		20	16	M10		25	2	1,2	SE08
M191A02503M012028SE08		25	21	M12		28	3		
M191A03204M016035SE08		32	29	M16		35	4		
M191A03504M016035SE08		35	29	M16		35	4		
M191A04205M016035SE08		42	29	M16		35	5		

Accessories / Akcesoria

Tool Narzędzie	**ØD**	**Spare Parts** / Części zamienne	
			
M191	Ø20-Ø32	SR115	W112
	Ø20-Ø42	SR115	W112

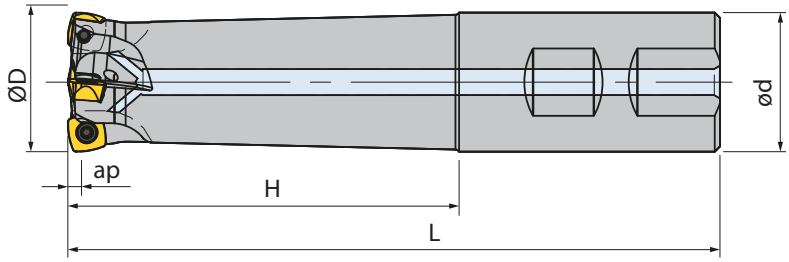
HIGH FEED MILLING CUTTER FREZY DO OBRÓBKI SZYBKOŚCIOWEJ

Cutters with Corner Angle 90° Frezy kątowe o kącie przystawienia 90°

M191



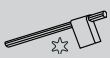




Tools / Narzędzia

EDP Nr. new nowy	**EDP No.**	**Dimensions** Wymiary (mm)						**Insert** Płytka
		ØD	**Ød**	**L**	**H**	**Z**	**apmax**	
M191A02002W020130SE08		20	20	130	75	2	1,2	SE08
M191A02002W020190SE08		20	20	190	110	2		
M191A02503W025140SE08		25	25	140	80	3		
M191A02503W025200SE08		25	25	200	130	3		
M191A03204W032150SE08		32	32	150	90	4		
M191A03204W032200SE08		32	32	200	130	4		

Accessories / Akcesoria

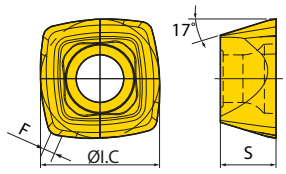
Tool Narzędzie	**ØD**	**Spare Parts** / Części zamienne	
			
M191	Ø20-Ø32	SR115	W112
	Ø20-Ø42	SR115	W112

HIGH FEED MILLING CUTTER FREZY DO OBRÓBKI SZYBKOŚCIOWEJ

Milling Inserts Płytki do frezowania

SEKW SEKT

● - stable machining/obróbka stabilna
● - general machining/obróbka ogólna
✱ - interrupted cut/obróbka przerywana



P	Steel / Steel	●	●				●																								
M	Stainless Steel Stal nierdzewna	●	●																												
K	Cast Iron Żeliwo szare	●	✱																												
N	Non-ferrous materials Materiały nieżelazne																														
S	Heat-resistant steel Stal żaroodporna	●	●																												

Insert Shape	Type	Basic Dimensions (mm)					P354	P334	P348	P347	P336	P335	P349	P352	P351	P353	P356							
		l	I.C	s	r	f																		
	SEKW08T308 C338	-	8,50	3,97	-	-	○	●			○													
	SEKW08T308 C362	-	8,50	3,97	-	-	○	●			○	○												
	SEKT08T308 C338	-	8,50	3,97	-	-	○	●			○	○												

Cutting Conditions / Parametry skrawania

Material Group Grupa materiałowa	Hardness Twardość HB	Insert grade Gatunek płytki	V(m/min)	f(mm/z)
Low Carbon Steel Stal niskowęglowa	220-280	P355	250-320	0,30-1,5
		P354	170-210	
		P334	160-200	
		P348	155-170	
High-carbon steel **Alloy steel** Stal wysokowęglowa Stopy stali	280-380	P355	250-300	0,30-1,5
		P354	160-200	
		P334	140-190	
		P348	135-150	
Alloy tool steel Stopy stali narzędziowej	125-220	P355	300-350	0,30-1,5
		P354	180-230	
		P334	170-210	
		P348	165-180	
Stainless steel Stal nierdzewna	200-330	P334	125-190	0,30-1,5
		P348	105-170	
		P347	95-150	
Cast iron Żeliwo	130-150	P354	90-260	0,30-1,5
		P334	80-250	
		P348	100-240	
		P347	125-210	
Heat-resistant steel Stal żaroodporna	200-320	P354	30-90	0,30-1,0
		P334	20-90	
		P336	25-70	

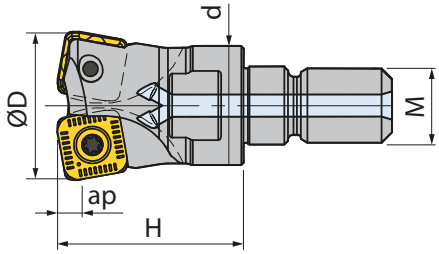
HIGH FEED MILLING CUTTER FREZY DO OBRÓBKI SZYBKOŚCIOWEJ

Cutters with Corner Angle 10° Frezy kątowe o kącie przystawienia 10°

M192



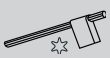




Tools / Narzędzia

EDP Nr. new nowy	**EDP No.**	**Dimensions** Wymiary (mm)							**Insert** Płytka
		ØD	**Ød**	**M**	**L**	**H**	**Z**	**apmax**	
M192A02002M010025SP08		20	16	M10		25	2	1	SP08
M192A02503M012028SP08		25	21	M12		28	3		
M192A03204M016035SP08		32	29	M16		35	4		
M192A03504M016035SP08		35	29	M16		35	4		
M192A04205M016035SP08		42	29	M16		35	5		

Accessories / Akcesoria

Tool Narzędzie	**ØD**	**Spare Parts** / Części zamienne	
			
M192	Ø20-Ø32	SR115	W112
	Ø20-Ø42	SR115	W112

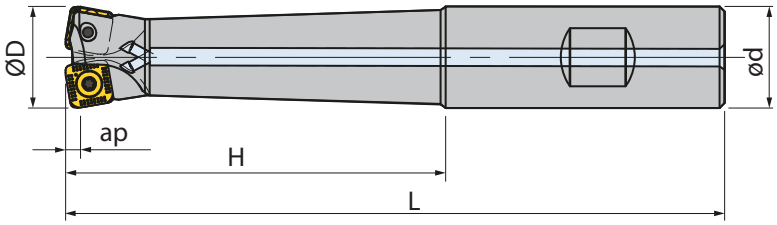
HIGH FEED MILLING CUTTER FREZY DO OBRÓBKI SZYBKOŚCIOWEJ

M192

Cutters with Corner Angle 10° Frezy kątowe o kącie przystawienia 10°



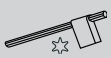




Tools / Narzędzia

EDP Nr. new nowy	**EDP No.**	**Dimensions** Wymiary (mm)						**Insert** Płytka
		ØD	**Ød**	**L**	**H**	**Z**	**apmax**	
M192A02002W020130SP08		20	20	130	75	2	1	SP08
M192A02002W020190SP08		20	20	190	110	2		
M192A02503W025140SP08		25	25	140	80	3		
M192A02503W025200SP08		25	25	200	130	3		
M192A03204W032150SP08		32	32	150	90	4		
M192A03204W032200SP08		32	32	200	130	4		

Accessories / Akcesoria

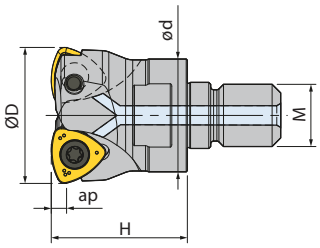
Tool Narzędzie	**ØD**	**Spare Parts** / Części zamienne	
			
M192	Ø20-Ø32	SR115	W112
	Ø20-Ø42	SR115	W112

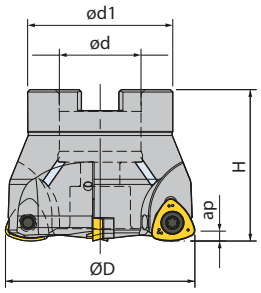
HIGH FEED MILLING CUTTER FREZY DO OBRÓBKI SZYBKOŚCIOWEJ

M252





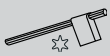




Tools / Narzędzia

EDP Nr. new nowy	**EDP No.**	**Dimensions** Wymiary (mm)						**Insert** Płytka
		ØD	**Ød/M**	**Ød1**	**H**	**Z**	**apmax**	
M252A03502M16035WN12		35	M16	29	35	2	1,8	WN... 1207
M252A05203022045WN12		52	22	40	45	3		
M252A06304027050WN12		63	27	48	50	4		
M252A06604027050WN12		66	27	48	50	4		
M252A06605027050WN12		66	27	48	50	5		
M252A08005027050WN12		80	27	60	50	5		

Accessories / Akcesoria

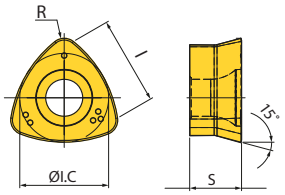
Tool Narzędzie	**ØD**	**Spare Parts** / Części zamienne	
			
M252	35-80	SR052	W042

HIGH FEED MILLING CUTTER FREZY DO OBRÓBKI SZYBKOŚCIOWEJ

Milling Inserts Płytki do frezowania

WNVW

● - stable machining/obróbka stabilna
● - general machining/obróbka ogólna
✱ - interrupted cut/obróbka przerywana



P	Steel / Stal	●	●			●	●																
M	Stainless Steel Stal nierdzewna		●																				
K	Cast Iron Żeliwo szare	●	✱																				
N	Non-ferrous materials Materiały nieżelazne																						
S	Heat-resistant steel Stal żaroodporna	●	●			●																	

Insert Shape	Type	Basic Dimensions (mm)					P354	P334	P348	P347	P336	P335	P349	P352	P351	P353	P356							
		l	l.C	s	r	f																		
	WNVW1207 C388	11,9	12,0	7,00	2,00		●	●			○	○												

Cutting Conditions / Parametry skrawania

Material Group Grupa materiałowa	Hardness Twardość HB	Insert grade Gatunek płytki	V(m/min)	f(mm/z)
Low Carbon Steel Stal niskowęglowa	220-280	P355	250-320	0,10-1,0
		P354	170-210	
		P334	160-200	
		P348	155-170	
High-carbon steel **Alloy steel** Stal wysokowęglowa Stopy stali	280-380	P355	250-300	0,10-1,0
		P354	160-200	
		P334	140-190	
		P348	135-150	
Alloy tool steel Stopy stali narzędziowej	125-220	P355	300-350	0,10-1,0
		P354	180-230	
		P334	170-210	
		P348	165-180	
Stainless steel Stal nierdzewna	200-330	P334	125-190	0,10-1,0
		P348	105-170	
		P347	95-150	
Cast iron Żeliwo	130-150	P354	90-260	0,10-1,0
		P334	80-250	
		P348	100-240	
		P347	125-210	
Heat-resistant steel Stal żaroodporna	200-320	P354	30-90	0,10-0,80
		P334	20-90	
		P336	25-70	

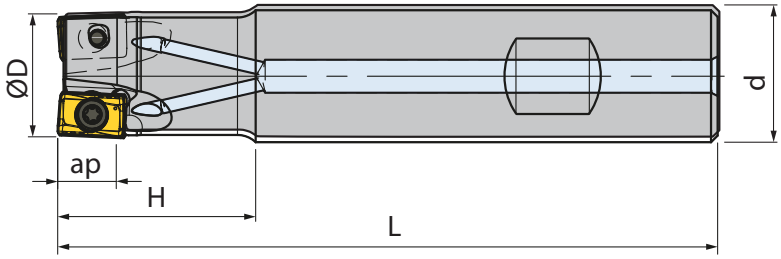
POCKET MILLING CUTERS FREZY DO OBRÓBKI KIESZENI

Cutters with Corner Angle 90° Frezy kątowe o kącie przystawienia 90°

M186



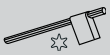




Tools / Narzędzia

EDP Nr. new nowy	**EDP No.**	**Dimensions** Wymiary (mm)						**Insert** Płytka
		ØD	**Ød**	**L**	**H**	**Z**	**apmax**	
M186B02502W25100AN11		25	25	100	32	2	11,2	AN11
M186B03203W32115AN11		32	32	115	40	3		
M186B04004W32125AN11		40	32	125	40	4		
M186B03202W32125AN15		32	32	125	40	2		
M186B04003W32125AN15		32	40	125	40	3		

Accessories / Akcesoria

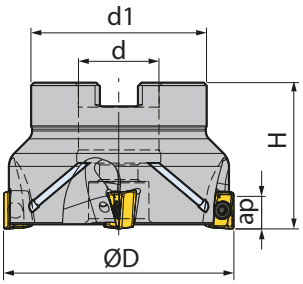
Tool Narzędzie	**ØD**	**Spare Parts /** Części zamienne			
					
M186	Ø25-Ø 40	SR115	W124	-	-
	Ø32-Ø40	SR603	W116	-	-

POCKET MILLING CUTERS FREZY DO OBRÓBKI KIESZENI

M186

Cutters with Corner Angle 90° Frezy kątowe o kącie przystawienia 90°

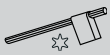




Tools / Narzędzia

EDP Nr. new nowy	EDP No.	Dimensions Wymiary (mm)						Insert Płytka
		ØD	Ød	Ød1	H	Z	apmax	
M186B0500422040AN15		50	22		40	4	14.5	AN15
M186B0630522040AN15		63	22		40	5		
M186B08009022040AN15		80	27		50	6		
M186A1000832050AN15		100	32		50	8		
M186B1000832050AN15		100	32		50	8		
M186A1251040063AN15		125	40		63	10		
M186B1251040063AN15		125	40		63	10		
M186B1601240063AN15		160	40		63	12		

Accessories / Akcesoria

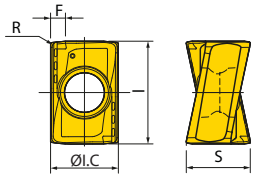
Tool Narzędzie	ØD	Spare Parts / Części zamienne			
					
M186	Ø25-Ø 40	SR115	W124	-	-
	Ø32-Ø40	SR603	W116	-	-

POCKET MILLING CUTERS FREZY DO OBRÓBKI KIESZENI

Milling Inserts Płytki do frezowania

APKX

● - stable machining/obróbka stabilna
● - general machining/obróbka ogólna
✱ interrupted cut/obróbka przerywana
obróbka przerywana



P	Steel / Stal	●	●	●		●	●																								
M	Stainless Steel Stal nierdzewna	●	●	●																											
K	Cast Iron Żeliwo szare	●	✱	●		●	●																								
N	Non-ferrous materials Materiały nieżelazne																														
S	Heat-resistant steel Stal żaroodporna																														

Insert Shape	Type	Basic Dimensions (mm)					P354	P334	P348	P347	P336	P203	P349	P352	P351	P353	P356							
		l	I.C	s	r	f																		
	ANGT150608 C729									●		●												
	ANGT150616 C729									●		●												
	ANGT150620 C729									●														

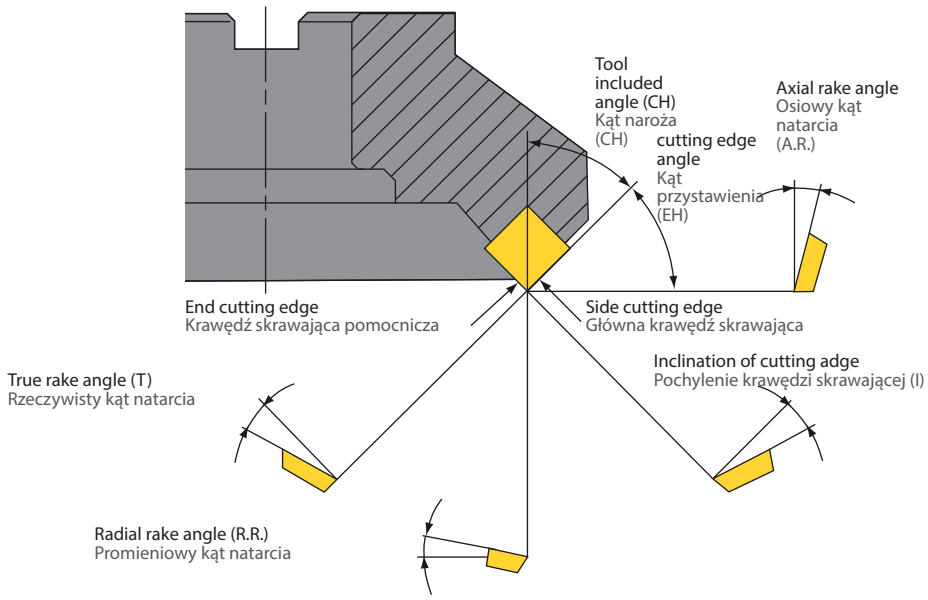
C358 - Ligh cutiing condition for steel Obróbka lekka dla stali

Cutting Conditions / Parametry skrawania

Material Group Grupa materiałowa	Hardness Twardość HB	Insert grade Gatunek płytki	V(m/min)	f(mm/z)
Low Carbon Steel Stal niskowęglowa	220-280	P355	250-320	0,10-0,20
		P354	170-210	
		P334	160-200	
		P348	155-170	
High-carbon steel **Alloy steel** Stal wysokowęglowa Stopy stali	280-380	P355	250-300	0,10-0,20
		P354	160-200	
		P334	140-190	
		P348	135-150	
Alloy tool steel Stopy stali narzędziowej	125-220	P355	300-350	0,10-0,20
		P354	180-230	
		P334	170-210	
		P348	165-180	
Stainless steel Stal nierdzewna	200-330	P334	125-190	0,10-0,20
		P348	105-170	
		P347	95-150	
Cast iron Żeliwo	130-150	P354	90-260	0,10-0,22
		P334	80-250	
		P348	100-240	
		P347	125-210	

TECHNICAL INFO INFORMACJA TECHNICZNA

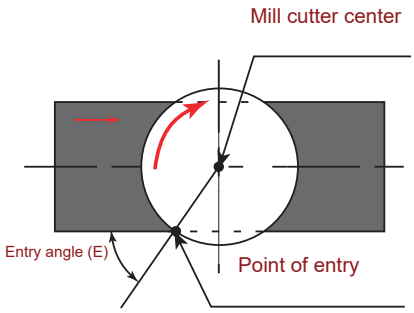
RELATIONSHIP BETWEEN EFFICIENCY AND RAKE ANGLE
ZALEŻNOŚĆ WYDAJNOŚCI OD KĄTA NATARCIA АТАКИ



T	**Cutting edge sharpness** Ostrość krawędzi	**Cutting power** Moc tnąca	**Cutting edge strength** Wytrzymałość krawędzi skrawającej	**Heating** Nagrzewanie	**Chip evacuation** Odprowadzanie wióra	**Welding resistance** Odporność na zgrzewanie
Positive (big) Dodatni (duży)	Good Dobra	Low Mała	Weak Słaba	Low Niskie	Bad. Chip can accumulate on the cutting edge Złe. Wiór może gromadzić się na ostrzu	Good Dobra
Negative (small) Ujemny (mały)	Bad Zła	High Duża	Tough Mocna	High Wysokie	Good. Evacuated out of the tool Dobre. Odprowadzany poza narzędzie	Bad Zła

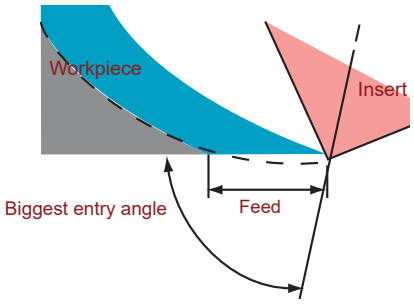
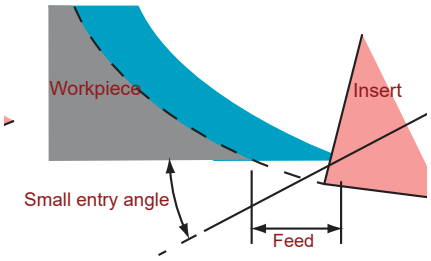
Angle type Rodzaj kąta	**Letter symbol** Symbol literowy	**Function** Funkcja	**Influence** Wpływ
Axial rake angle Osiowy kąt natarcia	A.R.	Decides of chip evacuation direction Decyduje o kierunku odprowadzania wióra.	Positive: Excellent machinability Dodatni: Doskonała skrawność.
Radial rake angle (R.R.) Promieniowy kąt natarcia	R.R.	Decides of cutting edge sharpness Decyduje o ostrości krawędzi skrawającej.	Negative: Excellent chip evacuation Ujemny : Doskonałe odprowadzanie wióra.
Tool included angle (CH)	CH	Decides of chip thickness Decyduje o grubości wióra.	Big: Thin chip and weak impact Duży: Cienki wiór i słabe uderzenia. .
True rake angle (T) Rzeczywisty kąt natarcia	T	Decides of true sharpness of cutting edge Decyduje o rzeczywistej ostrości krawędzi skrawającej.	Positive (big): Excellent machinability. Minimum build-up Negative (large): Poor machinability. Strong cutting edge. Dodatni (duży): Doskonała skrawność. Minimalne narosty. Ujemny (duży): Słaba skrawność. Silna krawędź skrawająca.
Inclination of cutting adge Pochyl-enie krawędzi skrawającej	I	Decids of chip evacuation direction Decyduje o kierunku odprowadzania wióra.	Positive (large): Excellent chip evacuation. Low cutting edge strength. Dodatni (duży):Doskonałe odprowadzanie wióra. Niska wytrzymałość krawędzi skrawającej.

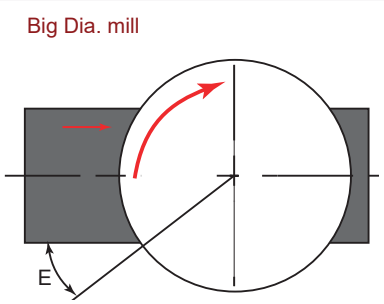
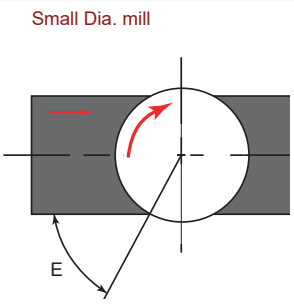
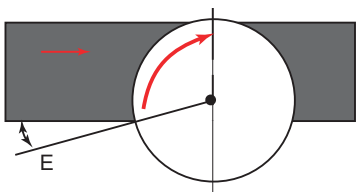
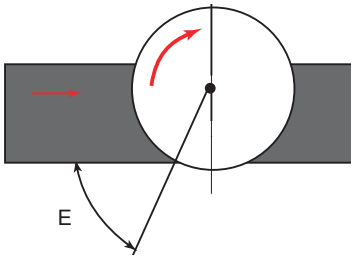
RELATION BETWEEN EFFICIENCY AND ENTRY AND EXIT MILL CUTTER ANGLE
WYDAJNOŚĆ W ZALEŻNOŚCI OD KĄTA WEJŚCIA I WYJŚCIA FREZA



Insert entry angle vs. chip thickness.
Chips with too small section are not able to evacuate a proper amount of heat and it causes the flow of the heat into insert and premature wear of cutting edge.

Kąt wejścia płytki a grubość wióra.
Wióry o zbyt małym przekroju nie są zdolne do odprowadzania odpowiedniej ilości ciepła, co powoduje przepływ ciepła do płytki i przedwczesne zużycie się krawędzi skrawającej.

The biggest entry angle. First contact of the tool with material proceed near to the insert vertex (less favorable way) **Największy kąt wejścia.** Pierwszy kontakt narzędzia z materiałem następuje blisko wierzchołka płytki (tryb mniej korzystny).	**Small entry angle.** First contact of the tool with material proceed on the part of edge located far from sensitive vertex (more favorable way) **Mały kąt wejścia.** Pierwszy kontakt płytki z materiałem następuje na części krawędzi położonej z dala od wrażliwego wierzchołka (tryb bardziej korzystny).
	

	Small / Mały < Entry angle / Kąt wejścia > Big / Duży Long / Duża < Tool life / Żywotność narzędzia > Short / Mała	
Tool diameter, entry angle Średnica narzędzia, kąt wejścia		
Tool position, entry angle Położenie narzędzia, kąt wejścia		

Diameter and position of mill cutter- cautions.
Optimal milling head diameter for face milling is equal to 120%-150% of the workpiece width. When making several cuts the cutting depth <1/4 of total cutting depth is recommended for each cut.

Średnica i położenie freza - Ostrzeżenia
Dla frezowania czołowego optymalna średnica głowicy wynosi 120% – 150% szerokości przedmiotu obrabianego.
Dla wykonania kilku przejść zaleca się skrawać na <1/4 głębokości na raz.

TECHNICAL INFO INFORMACJA TECHNICZNA

SELECTION OF CUTTING EDGE ANGLE ITS EFFECT ON MACHINING PROCESS
WYBÓR KĄTA PRZYSTAWIENIA I JEGO WPŁYW NA PROCES OBRÓBKI

Factor/Czynnik wydajności	Big / Duży < Cutting edge / Kąt przystawiania > Small / Mały				**For round inserts** Na płytki okrągłe
	90°	**75°**	**45°**	**10°**	**0-90°**
Comparison of chip thickness Porównanie grubości wióra	1 (=fz)	0,97	0,71	0,18	**depends on depth of cut** zależy od głębokości skrawania
Advantages Zalety	It can be a solution in the case of difficulties with thin wall workpiece (low axial forces, high radial forces) Może być rozwiązaniem w przypadku trudności z cienkimi ściankami elementów obrabianych (niskie siły osiowe, duże - promieniowe).	For milling in general applications and relatively stable work conditions. Favorable relationship between insert size and maximum depta of cut. Less probability of vibration occurrence by entering of insert into material. Do frezowania w zastosowaniach ogólnych i względnie stabilnych warunkach pracy. Korzystna relacja pomiędzy wielkością płytki a maksymalną głębokością skrawania Mniejsze prawdopodobieństwo wystąpienia drgań przy wchodzeniu płytki w materiał.	Good balancing of axial and radial cutting resistances. Less chippings on workpiece corners and fillets. Minimization of vibration by entering of insert into material. Less radial force directed to spindle bearings. Higher feed possible Dobre równoważenie się osiowych i promieniowych oporów skrawania. Mniej wyszczerbień w narożach przedmiotów obrabianych. Minimalizacja drgań przy wejściu płytki w materiał. Mniejsza siła promieniowa skierowana do łożyska wrzeciona. Możliwe wyższe posuwy.	Thinnest chip and low radial cutting forces. Najcieńszy wiór i niskie siły promieniowe skrawania	
Disadvantages Wady	Vibration during entering material. Increased probability for creation of burrs on the workpiece at the exit of the insert from material. Drgania przy wchodzeniu w materiał Zwiększone prawdopodobieństwo powstania gratu na części obrabianej po stronie wyjścia płytki z materiału.	Higher radial forces may cause problems in the case of low stability of "machine tool-fixture-workpiece-tool" system. Większe siły promieniowe mogą wywołać problemy w przypadku małej stabilności układu OUPN	Lowered maximum cutting depth due to cutting edge angle. Using tool with greater diameter may be a reason for arising backlash in tool holding. Zmniejszona maksymalna głębokość skrawania z powodu kąta przystawienia Stosowanie narzędzi o większej średnicy może być przyczyną powstawania luzów w mocowaniu narzędzia		
Application Zastosowanie	Thin wall and weakly clamped components. When 90° angle is required. Detale ciękościenne i słabo zamocowane Kiedy kąt 90° jest wymagany		The best for general purpose milling Najlepszy do frezowania ogólnego	For machining on high feed speed. In mill cutters for cavities. Do obróbki na wysokich posuwach We frezach do wgłębień	The best for general purpose milling. Thinner chip facilitates machining of heat-resistant alloys and titanium. Najlepszy do frezowania ogólnego Cieńszy wiór ułatwia obróbkę stopów żaroodpornych i tytanu

MILLING - TROUBLESHOOTING
FREZOWANIE - ELIMINOWANIE PROBLEMÓW

		Insert material selection Dobór materiału płytki		**Cutting parameters** Parametry skrawania							**Shape and design of the tool** Kształt i konstrukcja narzędzia			**Machine tool, tool holding** Obrabiarka, zamocowanie narzędzia						
		Coated tool Narzędzie powlekane	**Choose another grade: More tough (T)** Wybierz inny gatunek: bardziej ciągliwy (T), bardziej twardy (A)	**Cutting speed** Prędkość skrawania	**Feed** Posuw	**Depth of cut** Głębokość skrawania	**Climb milling / up milling** Frezowanie współbieżne (W)/ przeciwbieżne(P)	**Coolant** Chłodziwo: **Increase coolant amount** Zwiększyć ilość chłodziwa	**Coolant** Chłodziwo: **Do not use water soluble coolant** Nie używać chłodziwa wodorozcieńczalnego	**Coolant** Chłodziwo: **Determine if dry or wet machining should be used** Ustalić, czy stosować obróbkę na sucho, czy na mokro	**Flute inclination angle** Kąt pochylenia rowka wiórowego	**Quantity of inserts** Liczba płytek	**Mill dia.** Średnica freza	**Short the tool outreach** Skrócić wysięg narzędzia	**Precision of tool clamping** Dokładność zamocowania narzędzia	**Spindle and collet run-out** Bicie tulei zaciskowej i wrzeciona	**Inspection and replacement of collet** Przegląd i wymiana tulei zaciskowej	**Increase the self-centering holder camping force** Zwiększyć siłę zamocowania uchwytu samocentrującego	**Stability, rigidity of machine tool** Stabilność, sztywność obrabiarki
		Increase ↑ Zwiększyć ↑ **Decrease ↑** Zmniejszyć ↓									**Increase ↑** Zwiększyć ↑ **Decrease ↑** Zmniejszyć ↓									
Cutting edge damage Uszkodzenie krawędzi skrawającej	Premature abrasive wear of cutting edge Przyspieszone zużycie ścierne krawędzi skrawającej	•	A	• ↓	• ↑		W		•				• ↑							
	Chippings Wykruszenia		T	• ↓	• ↓	• ↓	W			• Without cooling bez chłodzenia				•		•	•			•
	Build up Tworzenie się narostu	•							•	• Wet Na mokro	• ↑									
Tolerance Tolerancja	Bad surface finish after machining Zła jakość powierzchni po obróbce			• ↑	• ↓	• ↓			•	• Wet Na mokro					•					
	Surface wavy finish Falistość powierzchni				• ↓	• ↓					• ↓	• ↑	• ↑		•		•			
	Non-perpendicularity Nieprostopadłość				• ↓	• ↓	P		•		• ↑	• ↑	• ↑	•						
	Burrs, chipping on the workpiece surface Zadziory, wykruszenia na powierzchni przedmiotu obrabianego				• ↓	• ↓					• ↓									
	chattered chip Wiór karbowany			• ↓	• ↑						• ↑	• ↓	• ↑		•		•	•		•
Chip forming control Kontrola formowania wióra	Bad chip evacuation Złe odprowadzanie wióra				• ↓	• ↓		•				• ↓								

ICT

T-SLOT MILLING CUTERS
FREZY T-OWE



T-Slot milling cutters can easily cut accurate keyways, T-slots and similar applications in the material.

Frezy T-owe w łatwy sposób mogą wykonywać dokładne rowki prowadzące, rowki T-owe oraz inne podobne operacje w materiale.

TIZ IMPLEMENTS

T-SLOT MILLING CUTERS FREZY T-OWE

M712		9-16
		
LNKX		
CIRCULAR SAW BLADES FREZ TARCZOWY		

M725		19
		
LNKX		
T-SLOT MILLING CUTERS FREZY T-OWE		

M725		20
		
LNKX		
T-SLOT MILLING CUTERS FREZY T-OWE		

M725		21
		
LNKX		
T-SLOT MILLING CUTERS FREZY T-OWE		

M725		22
		
LNKX		
T-SLOT MILLING CUTERS FREZY T-OWE		

M725		24
		
LNKX		
T-SLOT MILLING CUTERS FREZY T-OWE		

M748		29
		
LNKX		
T-SLOT MILLING CUTERS FREZY T-OWE		

M749		30
		
SNEX		
T-SLOT MILLING CUTERS FREZY T-OWE		

M747		31
		
SNHT		
T-SLOT MILLING CUTERS FREZY T-OWE		

M750		31
		
RDNW RDKT RPKT		
T-SLOT MILLING CUTERS FREZY T-OWE		

M715		33-34
		
LNKX		
T-SLOT MILLING CUTERS FREZY T-OWE		

M718		49
		
SNEX		
T-SLOT MILLING CUTERS FREZY T-OWE		

T-SLOT MILLING CUTERS FREZY T-OWE

M745 52



SNEX

T-SLOT MILLING CUTERS
FREZY T-OWE

M743 61



LNGX

DISC MILLING CUTTERS
FREZY TARCZOWE

M744 62



LNGX

T-SLOT TRANSFORMER SERIES
FREZY T-OWE SERIA Z CONVERTEREM

M730 67



SNEX

DISC MILLING CUTTERS
FREZY TARCZOWE

M732 69



SNEX

T-SLOT MILLING CUTERS
FREZY T-OWE

M734 70



SNEX

T-SLOT MILLING CUTERS
FREZY T-OWE

M739 72



LNGX

DISC MILLING CUTTERS
FREZY TARCZOWE

M740 73-74



LNGX

T-SLOT MILLING CUTERS
FREZY T-OWE

M746 76



LNGX

T-SLOT MILLING CUTERS
FREZY T-OWE

M753 77



LNGX

T-SLOT MILLING CUTERS
FREZY T-OWE

M754 77



LNGX

T-SLOT MILLING CUTERS
FREZY T-OWE

TLC 82



TRTF

T-SLOT MILLING CUTERS
FREZY T-OWE

PRODUCT INTRODUCTION WPROWADZENIE DO PRODUKTU

New developed indexable prescision saw blades.
Nowo opracowane piły tarczowe z wymiennymi płytkami.

NEW
Nowe rozwiązanie

1. Machining (cutting} speed increases 3000Al - 500%
1. Prędkość obróbki wzrasta 300%-500%
2. Extending insert life with TIALN coating
2. Wydłużowa żywotność płytki pokrytej powłoką TiALN
3. Cut down the cost of cutting tools
3. Obniżenie kosztow narzędzi skrawających



OLD
Stare rozwiązanie

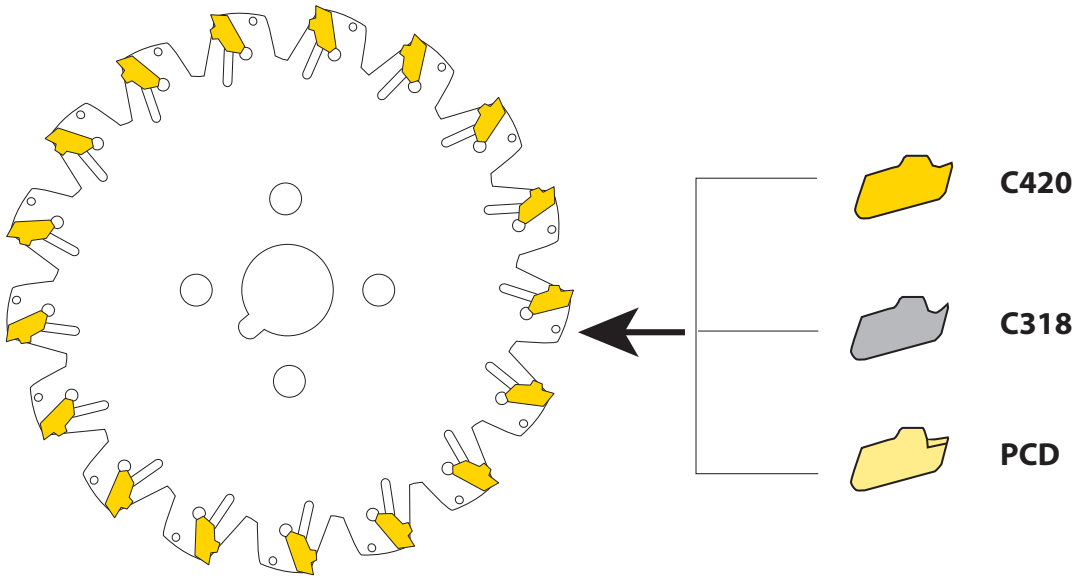
Other brands' saw blades in different raw material and insert assembly

1. HSS saw blades: process speed will slow down. if speed up. the blade will be damaged easily.
1. Piły tarczowe HSS: niska prędkość skrawania. Przy zwiekszeniu, żywotność piły znacznie zmniejsza się.
2.TCT saw blades : insert welded by high temperature, the raw material carbide will be damaged easily.
2. Piły tarczowe z ostrzami węglikowymi: wlutowane ostrza węglikowe pod wpływem wysokej temperatury można łatwo uszkodzić.



INSERT GEOMETRIES GEOMETRIA PŁYTKI

Multipurpose saw blades applications
Piły tarczowe do uniwersalnego zastosowania



For metal
Do metalu



x LNKX 3030 C325
x LNKX 3030 C326

For aluminium & woodworking
Do aluminium i drewna



x LNGT-3030 C432
x LNGT-3030 C433

For plastic & woodworking
Do plastiku i drewna



x LNGT-3032 C432
x LNGT-3032 C433
xx PCD

Attenion Uwaga
x Insert material: solid carbide
Materiał płytki: węglik
xx Insert material: PCD
Materiał płytki: PCD

TECHNICAL INFO INFORMACJA TECHNICZNA

Change the insert
Zmiana płytki

Insert fit-on
Zakładanie płytki



Insert fit-off
Zdejmowanie płytki

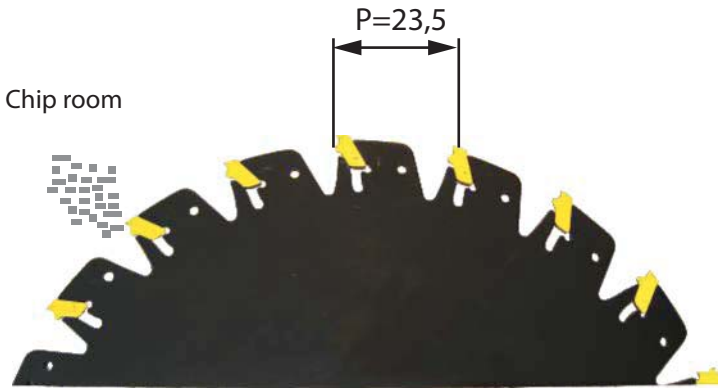


Each slot can load/unload insert for up to 300 times
Każde gniazdo może zamontować i wymontować płytke do 300 razy



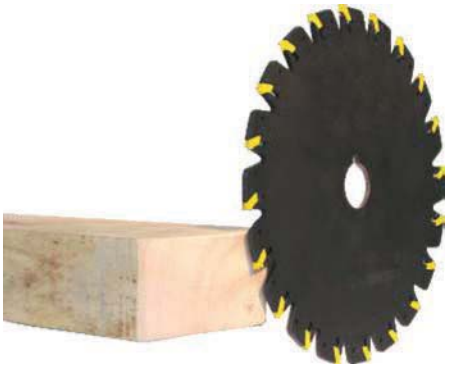
TECHNICAL INFO INFORMACJA TECHNICZNA

Application of the close pitch saw blade
Zastosowanie pił tarczowych z ciasną podziałką





Thickness under 5mm thin stainless pipe cutting
Rury nierdzewne o grubości ścianki poniżej 5mm



The log transverse cutting
Cięcie w poprzek słojów



Thickness under 5mm thin alumiaum pipe cutting
Rury aluminiowe o grubości ścianki poniżej 5mm



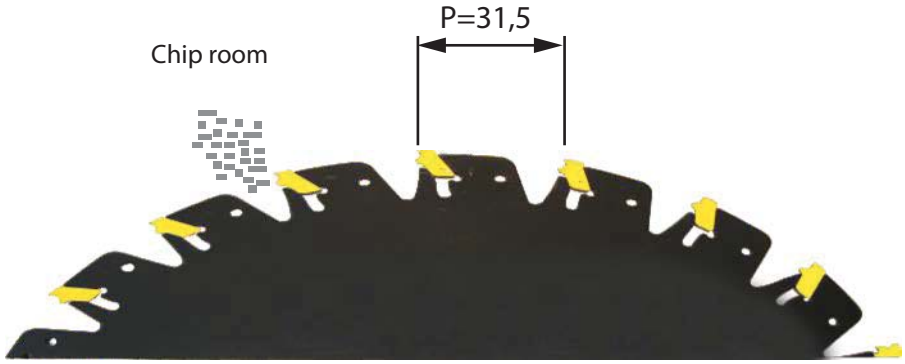
The solid material cutting with supporting point
Cięcie pełnego materiału z podparciem



The forming aluminium parts which thickness under 5mm
Profilie aluminiowe o grubości ścianki poniżej 5mm

TECHNICAL INFO INFORMACJA TECHNICZNA

Application of the close pitch saw blade
Zastosowanie pił tarczowych z grubą podziałką





The log lengthwise cutting
Cięcie wzdłuż słojów



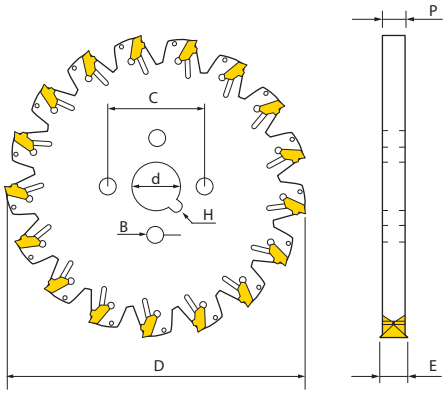


The saw blade can be used to cut large diameter material such aa aluminum, steel and log cuttiug applications
Cięcie dużych bloków materiału takich jak aluminium, stal, słojowe materiały

CIRCULAR SAW BLADES FREZ TARCZOWY

M712



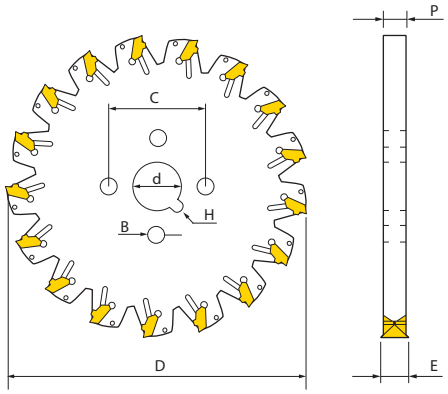


EDP No	D	E	P	d	C	B	Z	H	KG	MAX RPM	**Insert** Płytka	**Wrench** Klucz
M712B0500413009LN10	50	1.0-1.1	0.85	13	-	-	4	-	0.1	12000	LNKX 1010-1011	W220
M712B0630616009LN10	63	1.0-1.1	0.85	16	-	-	6	-	0.1	11000	LNKX 1010-1011	W220
M712B0800822009LN10	80	1.0-1.1	0.85	22	-	-	8	-	0.15	8000	LNKX 1010-1011	W220
M712B1001022009LN10	100	1.0-1.1	0.85	22	-	-	10	6.35	0.15	6300	LNKX 1010-1011	W220
M712B1251222009LN10	125	1.0-1.1	0.85	22	-	-	12	6.35	0.2	5000	LNKX 1010-1011	W220
M712B0500413010LN12	50	1.2-1.3	1	13	-	-	4	6.35	0.1	12000	LNKX 1212-1213	W220
M712B0630616010LN12	63	1.2-1.3	1	16	-	-	6	6.35	0.1	11000	LNKX 1212-1213	W220
M712B0800822010LN12	80	1.2-1.3	1	22	-	-	8	6.35	0.15	8000	LNKX 1212-1213	W220
M712B1001022010LN12	100	1.2-1.3	1	22	-	-	10	6.35	0.15	6300	LNKX 1212-1213	W220
M712B1251222010LN12	125	1.2-1.3	1	22	-	-	12	6.35	0.2	5000	LNKX 1212-1213	W220
M712B0500413012LN14	50	1.4-1.5	1.2	13	-	-	4	-	0.1	12000	LNKX 1414-1415	W220
M712B0630616012LN14	63	1.4-1.5	1.2	16	-	-	6	-	0.1	11000	LNKX 1414-1415	W220
M712B0800822012LN14	80	1.4-1.5	1.2	22	-	-	8	6.35	0.15	8000	LNKX 1414-1415	W220
M712B1001022012LN14	100	1.4-1.5	1.2	22	-	-	10	6.35	0.15	6300	LNKX 1414-1415	W220
M712B1251222012LN14	125	1.4-1.5	1.2	22	-	-	12	6.35	0.2	5000	LNKX 1414-1415	W220
M712B0500413014LN16	50	1.6	1.4	13	-	-	4	-	0.1	12000	LNKX 1616	W220
M712B0630616014LN16	63	1.6	1.4	16	-	-	6	-	0.1	11000	LNKX 1616	W220
M712B0800822014LN16	80	1.6	1.4	22	-	-	8	6.35	0.15	8000	LNKX 1616	W220
M712B1001022014LN16	100	1.6	1.4	22	-	-	10	6.35	0.15	6300	LNKX 1616	W220
M712B1251222014LN16	125	1.6	1.4	22	-	-	12	6.35	0.2	5000	LNKX 1616	W220
M712B1601222014LN16	160	1.6	1.4	22	-	-	12	6.35	0.25	5000	LNKX 1616	W220
M712B1601632014LN16	160	1.6	1.4	32	63	11	16	8	0.25	4000	LNKX 1616	W220
M712B0500413016LN18	50	1.8	1.6	13	-	-	4	-	0.1	12000	LNKX 1818	W220
M712B0630616016LN18	63	1.8	1.6	16	-	-	6	-	0.1	11000	LNKX 1818	W220
M712B0800822016LN18	80	1.8	1.6	22	-	-	8	6.35	0.15	8000	LNKX 1818	W220
M712B1001022016LN18	100	1.8	1.6	22	-	-	10	6.35	0.15	6300	LNKX 1818	W220

CIRCULAR SAW BLADES FREZ TARCZOWY

M712



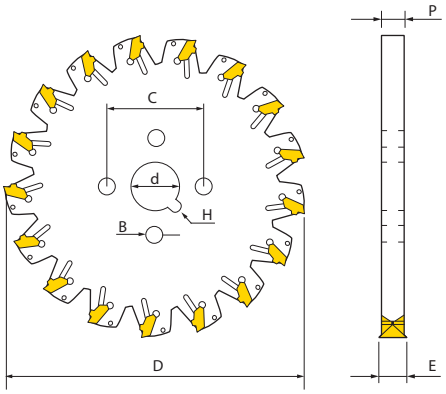


EDP No	D	E	P	d	C	B	Z	H	KG	MAX RPM	**Insert** Płytka	**Wrench** Klucz
M712B0500413009LN10	50	1.0-1.1	0.85	13	-	-	4	-	0.1	12000	LNKX 1010-1011	W220
M712B0630616009LN10	63	1.0-1.1	0.85	16	-	-	6	-	0.1	11000	LNKX 1010-1011	W220
M712B0800822009LN10	80	1.0-1.1	0.85	22	-	-	8	-	0.15	8000	LNKX 1010-1011	W220
M712B1001022009LN10	100	1.0-1.1	0.85	22	-	-	10	6.35	0.15	6300	LNKX 1010-1011	W220
M712B1251222009LN10	125	1.0-1.1	0.85	22	-	-	12	6.35	0.2	5000	LNKX 1010-1011	W220
M712B0500413010LN12	50	1.2-1.3	1	13	-	-	4	6.35	0.1	12000	LNKX 1212-1213	W220
M712B0630616010LN12	63	1.2-1.3	1	16	-	-	6	6.35	0.1	11000	LNKX 1212-1213	W220
M712B0800822010LN12	80	1.2-1.3	1	22	-	-	8	6.35	0.15	8000	LNKX 1212-1213	W220
M712B1001022010LN12	100	1.2-1.3	1	22	-	-	10	6.35	0.15	6300	LNKX 1212-1213	W220
M712B1251222010LN12	125	1.2-1.3	1	22	-	-	12	6.35	0.2	5000	LNKX 1212-1213	W220
M712B0500413012LN14	50	1.4-1.5	1.2	13	-	-	4	-	0.1	12000	LNKX 1414-1415	W220
M712B0630616012LN14	63	1.4-1.5	1.2	16	-	-	6	-	0.1	11000	LNKX 1414-1415	W220
M712B0800822012LN14	80	1.4-1.5	1.2	22	-	-	8	6.35	0.15	8000	LNKX 1414-1415	W220
M712B1001022012LN14	100	1.4-1.5	1.2	22	-	-	10	6.35	0.15	6300	LNKX 1414-1415	W220
M712B1251222012LN14	125	1.4-1.5	1.2	22	-	-	12	6.35	0.2	5000	LNKX 1414-1415	W220
M712B0500413014LN16	50	1.6	1.4	13	-	-	4	-	0.1	12000	LNKX 1616	W220
M712B0630616014LN16	63	1.6	1.4	16	-	-	6	-	0.1	11000	LNKX 1616	W220
M712B0800822014LN16	80	1.6	1.4	22	-	-	8	6.35	0.15	8000	LNKX 1616	W220
M712B1001022014LN16	100	1.6	1.4	22	-	-	10	6.35	0.15	6300	LNKX 1616	W220
M712B1251222014LN16	125	1.6	1.4	22	-	-	12	6.35	0.2	5000	LNKX 1616	W220
M712B1601222014LN16	160	1.6	1.4	22	-	-	12	6.35	0.25	5000	LNKX 1616	W220
M712B1601632014LN16	160	1.6	1.4	32	63	11	16	8	0.25	4000	LNKX 1616	W220
M712B0500413016LN18	50	1.8	1.6	13	-	-	4	-	0.1	12000	LNKX 1818	W220
M712B0630616016LN18	63	1.8	1.6	16	-	-	6	-	0.1	11000	LNKX 1818	W220
M712B0800822016LN18	80	1.8	1.6	22	-	-	8	6.35	0.15	8000	LNKX 1818	W220
M712B1001022016LN18	100	1.8	1.6	22	-	-	10	6.35	0.15	6300	LNKX 1818	W220
M712B1251222016LN18	125	1.8	1.6	22	-	-	12	6.35	0.2	5000	LNKX 1818	W220
M712B1601632016LN18	160	1.8	1.6	32	63	11	16	8	0.25	4000	LNKX 1818	W220
M712B1801820016LN18	180	1.8	1.6	20	-	-	18	-	0.25	3600	LNKX 1818	W220

CIRCULAR SAW BLADES FREZ TARCZOWY

M712



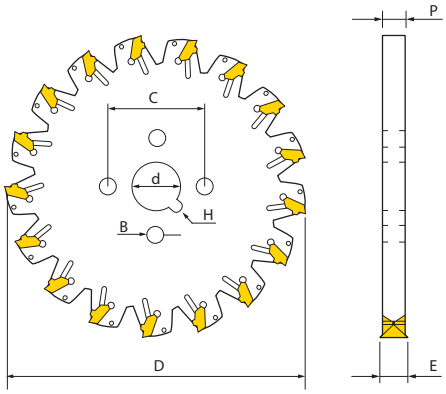


EDP No	D	E	P	d	C	B	Z	H	KG	MAX RPM	**Insert** Płytka	**Wrench** Klucz
M712B0500413009LN10	50	1.0-1.1	0.85	13	-	-	4	-	0.1	12000	LNKX 1010-1011	W220
M712B0630616009LN10	63	1.0-1.1	0.85	16	-	-	6	-	0.1	11000	LNKX 1010-1011	W220
M712B0800822009LN10	80	1.0-1.1	0.85	22	-	-	8	-	0.15	8000	LNKX 1010-1011	W220
M712B1001022009LN10	100	1.0-1.1	0.85	22	-	-	10	6.35	0.15	6300	LNKX 1010-1011	W220
M712B1251222009LN10	125	1.0-1.1	0.85	22	-	-	12	6.35	0.2	5000	LNKX 1010-1011	W220
M712B0500413010LN12	50	1.2-1.3	1	13	-	-	4	6.35	0.1	12000	LNKX 1212-1213	W220
M712B0630616010LN12	63	1.2-1.3	1	16	-	-	6	6.35	0.1	11000	LNKX 1212-1213	W220
M712B0800822010LN12	80	1.2-1.3	1	22	-	-	8	6.35	0.15	8000	LNKX 1212-1213	W220
M712B1001022010LN12	100	1.2-1.3	1	22	-	-	10	6.35	0.15	6300	LNKX 1212-1213	W220
M712B1251222010LN12	125	1.2-1.3	1	22	-	-	12	6.35	0.2	5000	LNKX 1212-1213	W220
M712B0500413012LN14	50	1.4-1.5	1.2	13	-	-	4	-	0.1	12000	LNKX 1414-1415	W220
M712B0630616012LN14	63	1.4-1.5	1.2	16	-	-	6	-	0.1	11000	LNKX 1414-1415	W220
M712B0800822012LN14	80	1.4-1.5	1.2	22	-	-	8	6.35	0.15	8000	LNKX 1414-1415	W220
M712B1001022012LN14	100	1.4-1.5	1.2	22	-	-	10	6.35	0.15	6300	LNKX 1414-1415	W220
M712B1251222012LN14	125	1.4-1.5	1.2	22	-	-	12	6.35	0.2	5000	LNKX 1414-1415	W220
M712B0500413014LN16	50	1.6	1.4	13	-	-	4	-	0.1	12000	LNKX 1616	W220
M712B0630616014LN16	63	1.6	1.4	16	-	-	6	-	0.1	11000	LNKX 1616	W220
M712B0800822014LN16	80	1.6	1.4	22	-	-	8	6.35	0.15	8000	LNKX 1616	W220
M712B1001022014LN16	100	1.6	1.4	22	-	-	10	6.35	0.15	6300	LNKX 1616	W220
M712B1251222014LN16	125	1.6	1.4	22	-	-	12	6.35	0.2	5000	LNKX 1616	W220
M712B1601222014LN16	160	1.6	1.4	22	-	-	12	6.35	0.25	5000	LNKX 1616	W220
M712B1601632014LN16	160	1.6	1.4	32	63	11	16	8	0.25	4000	LNKX 1616	W220
M712B0500413016LN18	50	1.8	1.6	13	-	-	4	-	0.1	12000	LNKX 1818	W220
M712B0630616016LN18	63	1.8	1.6	16	-	-	6	-	0.1	11000	LNKX 1818	W220
M712B0800822016LN18	80	1.8	1.6	22	-	-	8	6.35	0.15	8000	LNKX 1818	W220
M712B1001022016LN18	100	1.8	1.6	22	-	-	10	6.35	0.15	6300	LNKX 1818	W220

CIRCULAR SAW BLADES FREZ TARCZOWY

M712



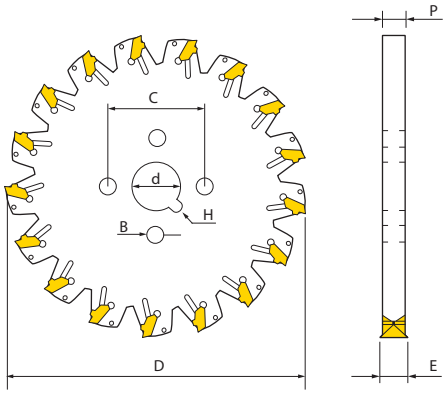


EDP No	D	E	P	d	C	B	Z	H	KG	MAX RPM	**Insert** Płytka	**Wrench** Klucz
M712B0500413009LN10	50	1.0-1.1	0.85	13	-	-	4	-	0.1	12000	LNKX 1010-1011	W220
M712B0630616009LN10	63	1.0-1.1	0.85	16	-	-	6	-	0.1	11000	LNKX 1010-1011	W220
M712B0800822009LN10	80	1.0-1.1	0.85	22	-	-	8	-	0.15	8000	LNKX 1010-1011	W220
M712B1001022009LN10	100	1.0-1.1	0.85	22	-	-	10	6.35	0.15	6300	LNKX 1010-1011	W220
M712B1251222009LN10	125	1.0-1.1	0.85	22	-	-	12	6.35	0.2	5000	LNKX 1010-1011	W220
M712B0500413010LN12	50	1.2-1.3	1	13	-	-	4	6.35	0.1	12000	LNKX 1212-1213	W220
M712B0630616010LN12	63	1.2-1.3	1	16	-	-	6	6.35	0.1	11000	LNKX 1212-1213	W220
M712B0800822010LN12	80	1.2-1.3	1	22	-	-	8	6.35	0.15	8000	LNKX 1212-1213	W220
M712B1001022010LN12	100	1.2-1.3	1	22	-	-	10	6.35	0.15	6300	LNKX 1212-1213	W220
M712B1251222010LN12	125	1.2-1.3	1	22	-	-	12	6.35	0.2	5000	LNKX 1212-1213	W220
M712B0500413012LN14	50	1.4-1.5	1.2	13	-	-	4	-	0.1	12000	LNKX 1414-1415	W220
M712B0630616012LN14	63	1.4-1.5	1.2	16	-	-	6	-	0.1	11000	LNKX 1414-1415	W220
M712B0800822012LN14	80	1.4-1.5	1.2	22	-	-	8	6.35	0.15	8000	LNKX 1414-1415	W220
M712B1001022012LN14	100	1.4-1.5	1.2	22	-	-	10	6.35	0.15	6300	LNKX 1414-1415	W220
M712B1251222012LN14	125	1.4-1.5	1.2	22	-	-	12	6.35	0.2	5000	LNKX 1414-1415	W220
M712B0500413014LN16	50	1.6	1.4	13	-	-	4	-	0.1	12000	LNKX 1616	W220
M712B0630616014LN16	63	1.6	1.4	16	-	-	6	-	0.1	11000	LNKX 1616	W220
M712B0800822014LN16	80	1.6	1.4	22	-	-	8	6.35	0.15	8000	LNKX 1616	W220
M712B1001022014LN16	100	1.6	1.4	22	-	-	10	6.35	0.15	6300	LNKX 1616	W220
M712B1251222014LN16	125	1.6	1.4	22	-	-	12	6.35	0.2	5000	LNKX 1616	W220
M712B1601222014LN16	160	1.6	1.4	22	-	-	12	6.35	0.25	5000	LNKX 1616	W220
M712B1601632014LN16	160	1.6	1.4	32	63	11	16	8	0.25	4000	LNKX 1616	W220
M712B0500413016LN18	50	1.8	1.6	13	-	-	4	-	0.1	12000	LNKX 1818	W220
M712B0630616016LN18	63	1.8	1.6	16	-	-	6	-	0.1	11000	LNKX 1818	W220
M712B0800822016LN18	80	1.8	1.6	22	-	-	8	6.35	0.15	8000	LNKX 1818	W220
M712B1001022016LN18	100	1.8	1.6	22	-	-	10	6.35	0.15	6300	LNKX 1818	W220

CIRCULAR SAW BLADES FREZ TARCZOWY

M712





EDP No	D	E	P	d	C	B	Z	H	KG	MAX RPM	**Insert** Płytka	**Wrench** Klucz
M712B0500413009LN10	50	1.0-1.1	0.85	13	-	-	4	-	0.1	12000	LNKX 1010-1011	W220
M712B0630616009LN10	63	1.0-1.1	0.85	16	-	-	6	-	0.1	11000	LNKX 1010-1011	W220
M712B0800822009LN10	80	1.0-1.1	0.85	22	-	-	8	-	0.15	8000	LNKX 1010-1011	W220
M712B1001022009LN10	100	1.0-1.1	0.85	22	-	-	10	6.35	0.15	6300	LNKX 1010-1011	W220
M712B1251222009LN10	125	1.0-1.1	0.85	22	-	-	12	6.35	0.2	5000	LNKX 1010-1011	W220
M712B0500413010LN12	50	1.2-1.3	1	13	-	-	4	6.35	0.1	12000	LNKX 1212-1213	W220
M712B0630616010LN12	63	1.2-1.3	1	16	-	-	6	6.35	0.1	11000	LNKX 1212-1213	W220
M712B0800822010LN12	80	1.2-1.3	1	22	-	-	8	6.35	0.15	8000	LNKX 1212-1213	W220
M712B1001022010LN12	100	1.2-1.3	1	22	-	-	10	6.35	0.15	6300	LNKX 1212-1213	W220
M712B1251222010LN12	125	1.2-1.3	1	22	-	-	12	6.35	0.2	5000	LNKX 1212-1213	W220
M712B0500413012LN14	50	1.4-1.5	1.2	13	-	-	4	-	0.1	12000	LNKX 1414-1415	W220
M712B0630616012LN14	63	1.4-1.5	1.2	16	-	-	6	-	0.1	11000	LNKX 1414-1415	W220
M712B0800822012LN14	80	1.4-1.5	1.2	22	-	-	8	6.35	0.15	8000	LNKX 1414-1415	W220
M712B1001022012LN14	100	1.4-1.5	1.2	22	-	-	10	6.35	0.15	6300	LNKX 1414-1415	W220
M712B1251222012LN14	125	1.4-1.5	1.2	22	-	-	12	6.35	0.2	5000	LNKX 1414-1415	W220
M712B0500413014LN16	50	1.6	1.4	13	-	-	4	-	0.1	12000	LNKX 1616	W220
M712B0630616014LN16	63	1.6	1.4	16	-	-	6	-	0.1	11000	LNKX 1616	W220
M712B0800822014LN16	80	1.6	1.4	22	-	-	8	6.35	0.15	8000	LNKX 1616	W220
M712B1001022014LN16	100	1.6	1.4	22	-	-	10	6.35	0.15	6300	LNKX 1616	W220
M712B1251222014LN16	125	1.6	1.4	22	-	-	12	6.35	0.2	5000	LNKX 1616	W220
M712B1601222014LN16	160	1.6	1.4	22	-	-	12	6.35	0.25	5000	LNKX 1616	W220
M712B1601632014LN16	160	1.6	1.4	32	63	11	16	8	0.25	4000	LNKX 1616	W220
M712B0500413016LN18	50	1.8	1.6	13	-	-	4	-	0.1	12000	LNKX 1818	W220
M712B0630616016LN18	63	1.8	1.6	16	-	-	6	-	0.1	11000	LNKX 1818	W220
M712B0800822016LN18	80	1.8	1.6	22	-	-	8	6.35	0.15	8000	LNKX 1818	W220
M712B1001022016LN18	100	1.8	1.6	22	-	-	10	6.35	0.15	6300	LNKX 1818	W220

Standard keyway and pin hole figures
Standardowe otwory mocujące

Fig.1 Typ 1

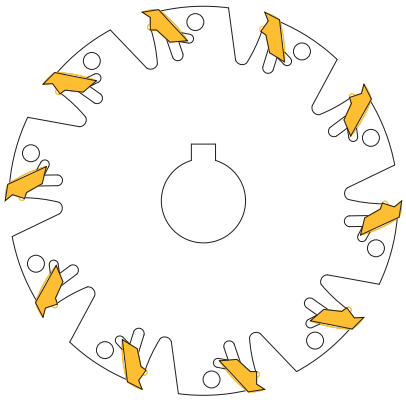


Fig.2 Typ 2

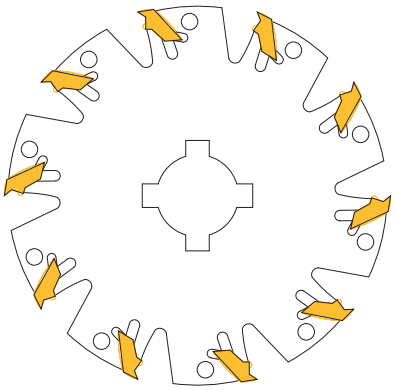
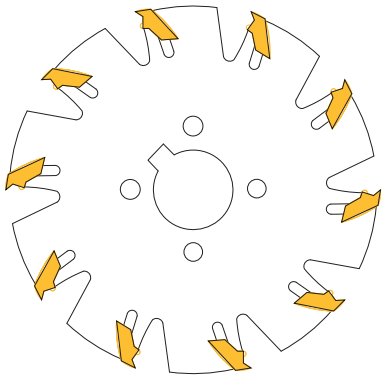


Fig.3 Typ 3



How to use saw blade correctly
Jak poprawnie używać pił tarczowych



Wrong
Błędnie





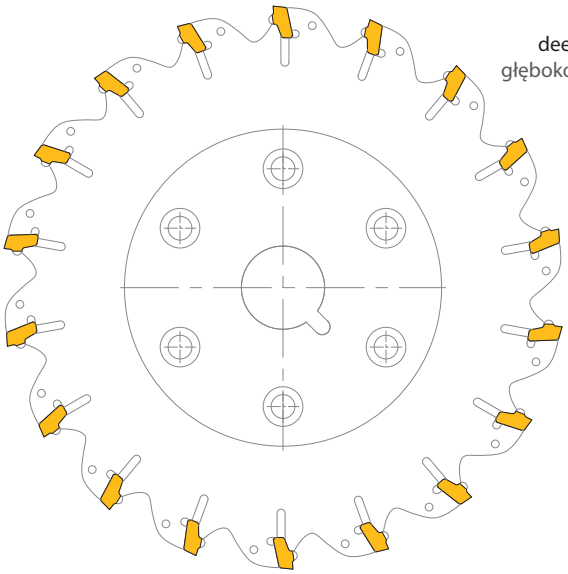
Correct
Poprawnie

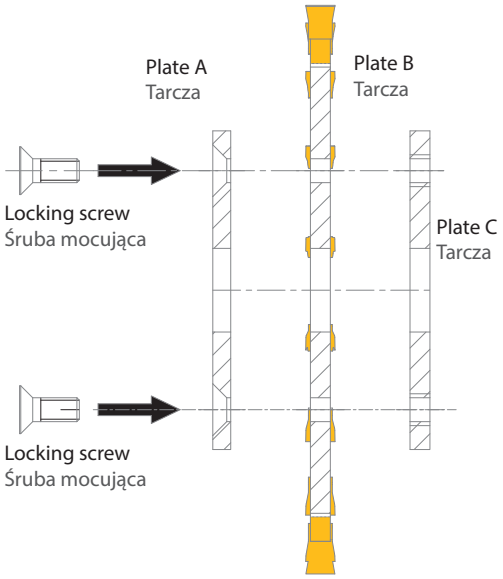


TECHNICAL INFO INFORMACJA TECHNICZNA

Vibrations isolation
Izolacja drgań

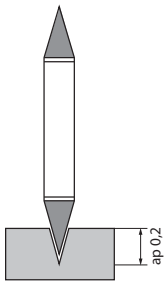
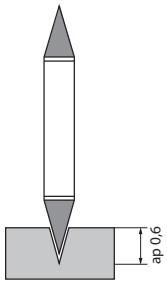






- Improve the stability of cutter and workpiece
  Zwiększa stabilność cięcia
- Minimize tool overhang
  Minimalizuje wysięg narzędzia
- Improve Tool life problems
  Ulepsza żywotność narzędzia
- Custome machining cutter service
  Lepsza obsługa narzędzia

V-TYPE INSERTS PŁYTKI TYPU V

V-cut	Material Materiał	D mm	Z	Vc [m/min]	fz [mm]	ap [mm]	RMP [min-1]	FEED [mm/min]
	Material group NO.		8	1860	0.110	0.2	6000	5000
	Plastic Plastik	100		3720	0.105		12000	10000
				4960	0.118		16000	15000
			10	1860	0.085		6000	5000
				3100	0.100		10000	10000
				4340	0.108		14000	15000
			13	1240	0.09		4000	5000
				2480	0.097		8000	10000
				3720	0.097		12000	15000
				4960	0.100		16000	20000
		120	10	2220	0.085		6000	5000
				3720	0.100		10000	10000
			12	1 488	0.11		4000	5000
				2 970	0.10		8 000	10 000
				4 460	0.11		13 000	15 000
			13	1 488	0.08		4000	5000
				2 230	0.10		8000	10000
				3 720	0.09		10000	15000
				4460	0.10		13 000	20 000
	Material group No.	100	8	2480	0.078	0.6	8 000	5000
	Plastic Plastik			4 960	0.078		16 000	10000
			10	1860	0.085		6000	5 000
				3720	0.085		12 000	10000
			13	1860	0.075		6000	5 000
				3100	0.078		10000	10000
		120	10	2230	0.085		6000	5000
				4460	0.085		13000	10000
			12	2230	0.07		6000	5000
				3720	0.086		10000	10000
			16	1488	0.08		4000	5000
				2970	0.08		8000	10000
				4450	0.08		13000	15000

T-SLOT MILLING CUTERS FREZY T-OWE

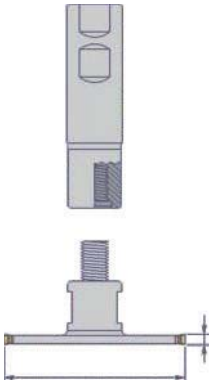
PRODUCT INTRODUCTION
WPROWADZENIE DO PRODUKTU

Full series of groove & slot milling cutter
Seria frezów do rowków i kieszeni

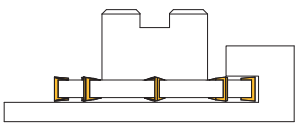
M725 T -slot milling cutters
Frezy T-owe

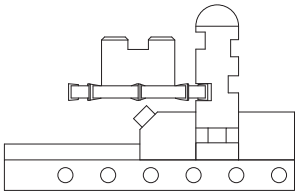


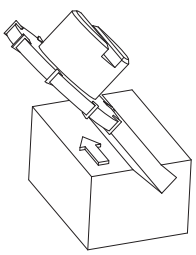


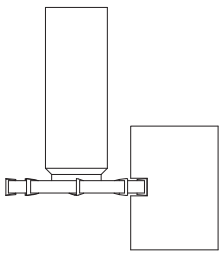


1. Machining (cutting} speed increases 300%- 500%
Prędkość obróbki wzrasta 300%-500%
2. Extending insert life with TiALN coating
2. Wydłużowa żywotność płytki pokrytej powłoką TiALN
3. Cut down the cost of cutting tools
3. Obniżenie kosztów narzędzi skrawających





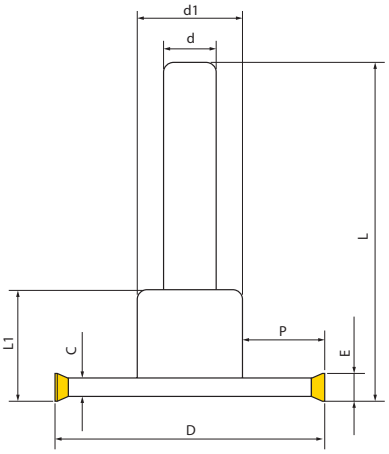




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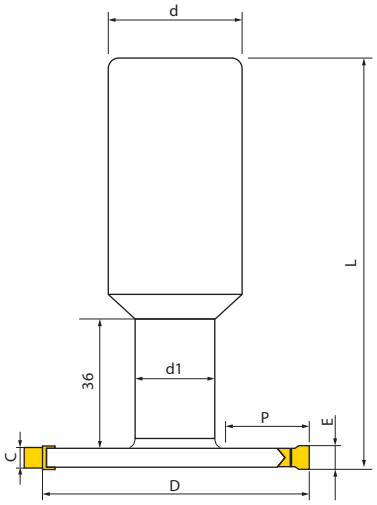


EDP No.	D	E	P	C	d	L	d1	Z	KG	MAX RPM	**Insert** Płytka	**Wrench** Klucz
M725B03002T10009LN10	30	1.0 - 1.1	7	0.85	10	70	14	2	0.1	8000	LNKX 1010-1011	W220
M725B03002T12009LN10	30	1.0 - 1.1	7	0.85	12	70	14	2	0.1	8000	LNKX 1010-1011	W220
M725B03002T10010LN12	30	1.2 - 1.3	7	1.0	10	70	14	2	0.1	8000	LNKX 1212-1213	W220
M725B03002T12010LN12	30	1.2 - 1.3	7	1.0	12	70	14	2	0.1	8000	LNKX 1212-1213	W220
M725B03002T10012LN14	30	1.4 - 1.5	7	1.2	10	70	14	2	0.1	8000	LNKX 1414-1415	W220
M725B03002T12012LN14	30	1.4 - 1.5	7	1.2	12	70	14	2	0.1	8000	LNKX 1414-1415	W220
M725B03002T10014LN16	30	1.6	7	1.4	10	70	14	2	0.1	8000	LNKX 1616	W220
M725B03002T12014LN16	30	1.6	7	1.4	12	70	14	2	0.1	8000	LNKX 1616	W220
M725B03002T10016LN18	30	1.8	7	1.6	10	70	14	2	0.1	8000	LNKX 1818	W220
M725B03002T12016LN18	30	1.8	7	1.6	12	70	14	2	0.1	8000	LNKX 1818	W220
M725B03002T10017LN20	30	2.0 - 2.2 - 2.5	7	1.7	10	70	14	2	0.1	8000	LNKX 2020-2022-2025	W220
M725B03002T12017LN20	30	2.0 - 2.2 - 2.5	7	1.7	12	70	14	2	0.1	8000	LNKX 2020-2022-2025	W220
M725B03002T10022LN25	30	2.5 - 2.7 - 3.0	7	2.2	10	70	14	2	0.12	8000	LNKX 2525-2527-2530	W220
M725B03002T12022LN25	30	2.5 - 2.7 - 3.0	7	2.2	12	70	14	2	0.12	8000	LNKX 2525-2527-2530	W220
M725B03002T10027LN30	30	3.0 - 3.2 - 3.5	7	2.7	10	70	14	2	0.12	8000	LNKX 3030-3032-3035	W220
M725B03002T12027LN30	30	3.0 - 3.2 - 3.5	7	2.7	12	70	14	2	0.12	8000	LNKX 3030-3032-3035	W220
M725B03002T10037LN40	30	4.0 - 4.2 - 4.5	7	3.7	10	70	14	2	0.12	8000	LNKX 4040-4042-4045	W220
M725B03002T12037LN40	30	4.0 - 4.2 - 4.5	7	3.7	12	70	14	2	0.12	8000	LNKX 4040-4042-4045	W220

T-SLOT MILLING CUTERS FREZY T-OWE

M725



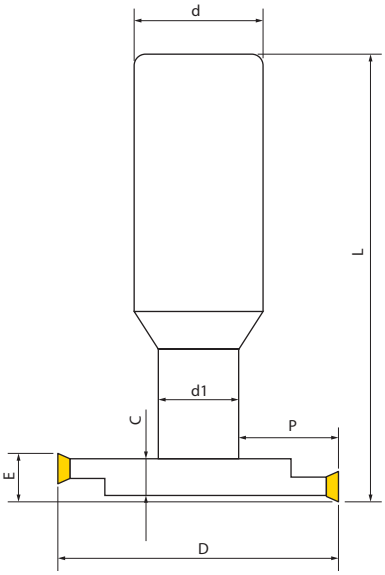


EDP No.	D	E	P	C	d	L	d1	Z	KG	MAX RPM	**Insert** Płytka	**Wrench** Klucz
M725B03002T20009LN10	30	1.0 - 1.1	6.0	0.85	20	100	16	2	0.3	8000	LNKX 1010-1011	W220
M725B03502T20009LN10	35	1.0 - 1.1	8.5	0.85	20	100	16	2	0.4	8000	LNKX 1010-1011	W220
M725B04004T20009LN10	40	1.0 - 1.1	11	0.85	20	100	16	4	0.5	8000	LNKX 1010-1011	W220
M725B03002T20010LN12	30	1.2-1.3	6.0	1.0	20	100	16	2	0.3	8000	LNKX 1212-1213	W220
M725B03502T20010LN12	35	1.2-1.3	8.5	1.0	20	100	16	2	0.4	8000	LNKX 1212-1213	W220
M725B04004T20010LN12	40	1.2-1.3	11	1.0	20	100	16	4	0.5	8000	LNKX 1212-1213	W220
M725B03002T20012LN14	30	1.4 - 1.5	6.0	1.2	20	100	16	2	0.3	8000	LNKX 1414-1415	W220
M725B03502T20012LN14	35	1.4 - 1.5	8.5	1.2	20	100	16	2	0.4	8000	LNKX 1414-1415	W220
M725B04004T20012LN14	40	1.4 - 1.5	11	1.2	20	100	16	4	0.5	8000	LNKX 1414-1415	W220
M725B03002T20014LN16	30	1.6	6.0	1.4	20	100	16	2	0.3	8000	LNKX 1616	W220
M725B03502T20014LN16	35	1.6	8.5	1.4	20	100	16	2	0.4	8000	LNKX 1616	W220
M725B04004T20014LN16	40	1.6	11	1.4	20	100	16	4	0.5	8000	LNKX 1616	W220
M725B03002T20016LN18	30	1.8	6.0	1.6	20	100	16	2	0.3	8000	LNKX 1818	W220
M725B03502T20016LN18	35	1.8	8.5	1.6	20	100	16	2	0.4	8000	LNKX 1818	W220
M725B04004T20016LN18	40	1.8	11	1.6	20	100	16	4	0.5	8000	LNKX 1818	W220
M725B03002T20017LN20	30	2.0 - 2.2 - 2.5	6.0	1.7	20	100	16	2	0.3	8000	LNKX 2020-2022-2025	W220
M725B03502T20017LN20	35	2.0 - 2.2 - 2.5	8.5	1.7	20	100	16	2	0.4	8000	LNKX 2020-2022-2025	W220
M725B04004T20017LN20	40	2.0 - 2.2 - 2.5	11	1.7	20	100	16	4	0.5	8000	LNKX 2020-2022-2025	W220
M725B03002T20022LN25	30	2.5 - 2.7 - 3.0	6.0	2.2	20	100	16	2	0.3	8000	LNKX 2525-2527-2530	W220
M725B03502T20022LN25	35	2.5 - 2.7 - 3.0	8.5	2.2	20	100	16	2	0.4	8000	LNKX 2525-2527-2530	W220
M725B04004T20022LN25	40	2.5 - 2.7 - 3.0	11	2.2	20	100	16	4	0.5	8000	LNKX 2525-2527-2530	W220
M725B03002T20027LN30	30	3.0 - 3.2 - 3.5	6.0	2.7	20	100	16	2	0.3	8000	LNKX 3030-3032-3035	W220
M725B03502T20027LN30	35	3.0 - 3.2 - 3.5	8.5	2.7	20	100	16	2	0.4	8000	LNKX 3030-3032-3035	W220
M725B04004T20027LN30	40	3.0 - 3.2 - 3.5	11	2.7	20	100	16	4	0.5	8000	LNKX 3030-3032-3035	W220
M725B03002T20037LN40	30	4.0 - 4.2 - 4.5	6.0	3.7	20	100	16	2	0.4	8000	LNKX 4040-4042-4045	W220
M725B03502T20037LN40	35	4.0 - 4.2 - 4.5	8.5	3.7	20	100	16	2	0.4	8000	LNKX 4040-4042-4045	W220
M725B04004T20037LN40	40	4.0 - 4.2 - 4.5	11	3.7	20	100	16	4	0.5	8000	LNKX 4040-4042-4045	W220
M725B03002T20045LN50	30	5.0 - 5.2 - 5.5	6.0	4.5	20	100	16	2	0.45	8000	LNKX 5050-5052-5055	W220
M725B03502T20045LN50	35	5.0 - 5.2 - 5.5	8.5	4.5	20	100	16	2	0.45	8000	LNKX 5050-5052-5055	W220
M725B04004T20045LN50	40	5.0 - 5.2 - 5.5	11	4.5	20	100	16	4	0.5	8000	LNKX 5050-5052-5055	W220

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M725



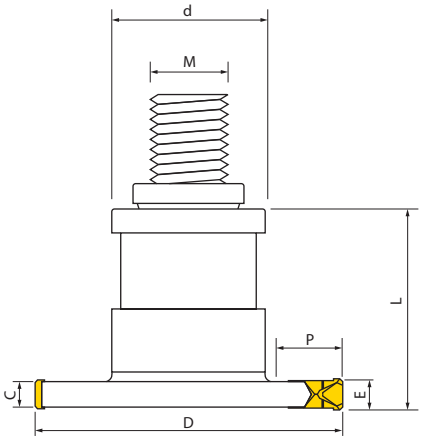


EDP No.	D	E	P	C	d	L	d1	Z	KG	MAX RPM	**Insert** Płytka	**Wrench** Klucz
M725B03002T20055LN50	30	6.0	6.0	5.5	20	100	16	2	0.4	8000	LNKX 5050	W220
M725B03502T20055LN50	35	6.0	8.5	5.5	20	100	16	2	0.5	8000	LNKX 5050	W220
M725B04004T20055LN50	40	6.0	11	5.5	20	100	16	4	0.6	8000	LNKX 5050	W220
M725B03002T20065LN50	30	7.0	6.0	6.5	20	100	16	2	0.5	8000	LNKX 5050	W220
M725B03502T20065LN50	35	7.0	8.5	6.5	20	100	16	2	0.5	8000	LNKX 5050	W220
M725B04004T20065LN50	40	7.0	11	6.5	20	100	16	4	0.6	8000	LNKX 5050	W220
M725B03002T20075LN50	30	8.0	6.0	7.5	20	100	16	2	0.55	8000	LNKX 5050	W220
M725B03502T20075LN50	35	8.0	8.5	7.5	20	100	16	2	0.6	8000	LNKX 5050	W220
M725B04004T20075LN50	40	8.0	11	7.5	20	100	16	4	0.7	8000	LNKX 5050	W220

T-SLOT MILLING CUTERS FREZY T-OWE

M725



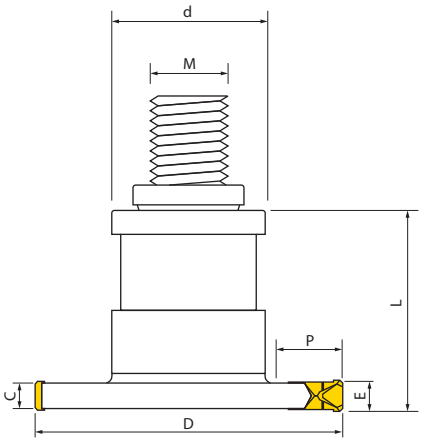


EDP No.	D	E	P	C	d	L	M	Z	KG	MAX RPM	**Insert** Płytka	**Wrench** Klucz
M725B04004M10010LN10	40	1.0 - 1.1	9.5	0.85	19	30	10	4	0.3	8000	LNKX 1010-1011	W220
M725B05004M12010LN10	50	1.0 - 1.1	12	0.85	24	40	12	4	0.4	8000	LNKX 1010-1011	W220
M725B06006M16010LN10	60	1.0 - 1.1	13	0.85	31	40	16	6	0.5	8000	LNKX 1010-1011	W220
M725B04004M10012LN12	40	1.2 - 1.3	9.5	1.0	19	30	10	4	0.3	8000	LNKX 1212-1213	W220
M725B05004M12012LN12	50	1.2 - 1.3	12	1.0	24	40	12	4	0.4	8000	LNKX 1212-1213	W220
M725B06006M16012LN12	60	1.2 - 1.3	13	1.0	31	40	16	6	0.5	8000	LNKX 1212-1213	W220
M725B04004M10014LN14	40	1.4 - 1.5	9.5	1.2	19	30	10	4	0.3	8000	LNKX 1414-1415	W220
M725B05004M12014LN14	50	1.4 - 1.5	12	1.2	24	40	12	4	0.4	8000	LNKX 1414-1415	W220
M725B06006M16014LN14	60	1.4 - 1.5	13	1.2	31	40	16	6	0.5	8000	LNKX 1414-1415	W220
M725B04004M10016LN16	40	1.6	9.5	1.4	19	30	10	4	0.3	8000	LNKX 1616	W220
M725B05004M12016LN16	50	1.6	12	1.4	24	40	12	4	0.4	8000	LNKX 1616	W220
M725B06006M16016LN16	60	1.6	13	1.4	31	40	16	6	0.5	8000	LNKX 1616	W220
M725B04004M10018LN18	40	1.8	9.5	1.6	19	30	10	4	0.3	8000	LNKX 1818	W220
M725B05004M12018LN18	50	1.8	12	1.6	24	40	12	4	0.4	8000	LNKX 1818	W220
M725B06006M16018LN18	60	1.8	13	1.6	31	40	16	6	0.5	8000	LNKX 1818	W220
M725B04004M10020LN20	40	2.0 - 2.2 - 2.5	9.5	1.7	19	30	10	4	0.3	8000	LNKX 2020-2022-2025	W220
M725B05004M12020LN20	50	2.0 - 2.2 - 2.5	12	1.7	24	40	12	4	0.4	8000	LNKX 2020-2022-2025	W220
M725B06006M16020LN20	60	2.0 - 2.2 - 2.5	13	1.7	31	40	16	6	0.5	8000	LNKX 2020-2022-2025	W220

T-SLOT MILLING CUTERS FREZY T-OWE

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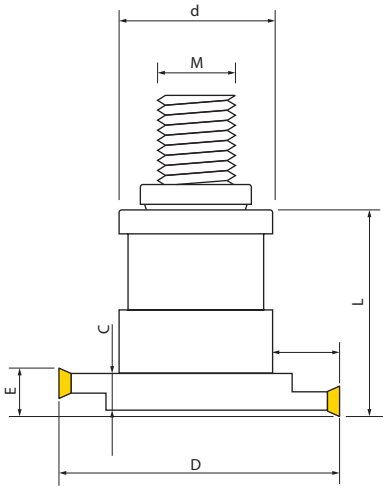


EDP No.	D	E	P	C	d	L	M	Z	KG	MAX RPM	**Insert** Płytka	**Wrench** Klucz
M725B04004M10025LN25	40	2.5 - 2.7 - 3.0	9.5	2.2	19	30	10	4	0.3	8000	LNKX 2525-2527-2530	W220
M725B05004M12025LN25	50	2.5 - 2.7 - 3.0	12	2.2	24	40	12	4	0.4	8000	LNKX 2525-2527-2530	W220
M725B06006M16025LN25	60	2.5 - 2.7 - 3.0	13	2.2	31	40	16	6	0.5	8000	LNKX 2525-2527-2530	W220
M725B04004M10030LN30	40	3.0 - 3.2 - 3.5	9.5	2.7	19	30	10	4	0.3	8000	LNKX 3030-3032-3035	W220
M725B05004M12030LN30	50	3.0 - 3.2 - 3.5	12	2.7	24	40	12	4	0.4	8000	LNKX 3030-3032-3035	W220
M725B06006M16030LN30	60	3.0 - 3.2 - 3.5	13	2.7	31	40	16	6	0.5	8000	LNKX 3030-3032-3035	W220
M725B04004M10040LN40	40	4.0 - 4.2 - 4.5	9.5	3.7	19	30	10	4	0.3	8000	LNKX 4040-4042-4045	W220
M725B05004M12040LN40	50	4.0 - 4.2 - 4.5	12	3.7	24	40	12	4	0.4	8000	LNKX 4040-4042-4045	W220
M725B06006M16040LN40	60	4.0 - 4.2 - 4.5	13	3.7	31	40	16	6	0.5	8000	LNKX 4040-4042-4045	W220
M725B04004M10050LN50	40	5.0 - 5.2 - 5.5	9.5	4.5	19	30	10	4	0.4	8000	LNKX 5050-5052-5055	W220
M725B05004M12050LN50	50	5.0 - 5.2 - 5.5	12	4.5	24	40	12	4	0.5	8000	LNKX 5050-5052-5055	W220
M725B06006M16050LN50	60	5.0 - 5.2 - 5.5	13	4.5	31	40	16	6	0.6	8000	LNKX 5050-5052-5055	W220
M725B04004M10060LN50	40	6.0	9.5	5.5	19	30	10	4	0.4	8000	LNKX 5050	W220

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M725



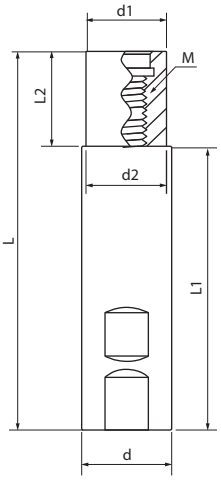


EDP No.	D	E	P	C	d	L	M	Z	KG	MAX RPM	**Insert** Płytka	**Wrench** Klucz
M725B05004M12060LN50	50	6.0	12	5.5	24	40	12	4	0.5	8000	LNKX 5050	W220
M725B06006M16060LN50	60	6.0	13	5.5	31	40	16	6	0.6	8000	LNKX 5050	W220
M725B04004M10070LN50	40	7.0	9.5	6.5	19	30	10	4	0.4	8000	LNKX 5050	W220
M725B05000M12070LN50	50	7.0	12	6.5	24	40	12		0.5	8000	LNKX 5050	W220
M725B06006M16070LN50	60	7.0	13	6.5	31	40	16	6	0.6	8000	LNKX 5050	W220
M725B04004M10080LN50	40	8.0	9.5	7.5	19	30	10	4	0.4	8000	LNKX 5050	W220
M725B05004M12080LN50	50	8.0	12	7.5	24	40	12	4	0.5	8000	LNKX 5050	W220
M725B06006M16080LN50	60	8.0	13	7.5	31	40	16	6	0.6	8000	LNKX 5050	W220

ALTERNATIVE HOLDERS UCHWYT ALTERNATYWNY

EXT





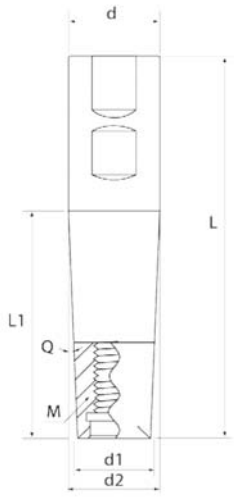
Weldon

EDP No.	d	d1	d2	L1	L2	L	M
EXT-1010-80	10.0	10	10	-	-	60	M6
EXT-1009-100	10.0	9	9	60	20	80	M6
EXT-1212-80	12.0	12	12	-	-	60	M6
EXT-1211-100	12.0	11	11	60	20	80	M6
EXT-1211-120	12.0	11	11	80	20	100	M6
EXT-1211-140	12.0	11	11	100	20	120	M6
EXT-1616-100	16.0	16	16	-	-	70	M8
EXT-1615-120	16.0	15	15	70	20	90	M8
EXT-1615-150	16.0	15	15	95	25	120	M8
EXT-2020-100	20.0	20	20	-	-	70	M10
EXT-2019-120	20.0	19	19	70	20	90	M10
EXT-2019-160	20.0	19	19	95	25	120	M10
EXT-2525-110	25.0	25	25	-	-	70	M12
EXT-2523-130	25.0	23	23	70	20	90	M12
EXT-2523-170	25.0	23	23	100	30	130	M12
EXT-2523-210	25.0	23	23	140	30	170	M12
EXT-2523-240	25.0	23	23	170	30	200	M12
EXT-3232-120	32.0	32	32	-	-	80	M16
EXT-3230-140	32.0	30	30	80	20	100	M16
EXT-3230-200	32.0	30	30	130	30	160	M16
EXT-3230-240	32.0	30	30	170	30	200	M16
EXT-3230-300	32.0	30	30	210	50	260	M16
EXT-4240-220	42.0	40	40	130	20	150	M18
EXT-50.849-215	50.8	49	49	130	20	150	M25
EXT-50.849-265	50.8	49	49	170	30	200	M25

HOLDERS UCHWYT

EXT





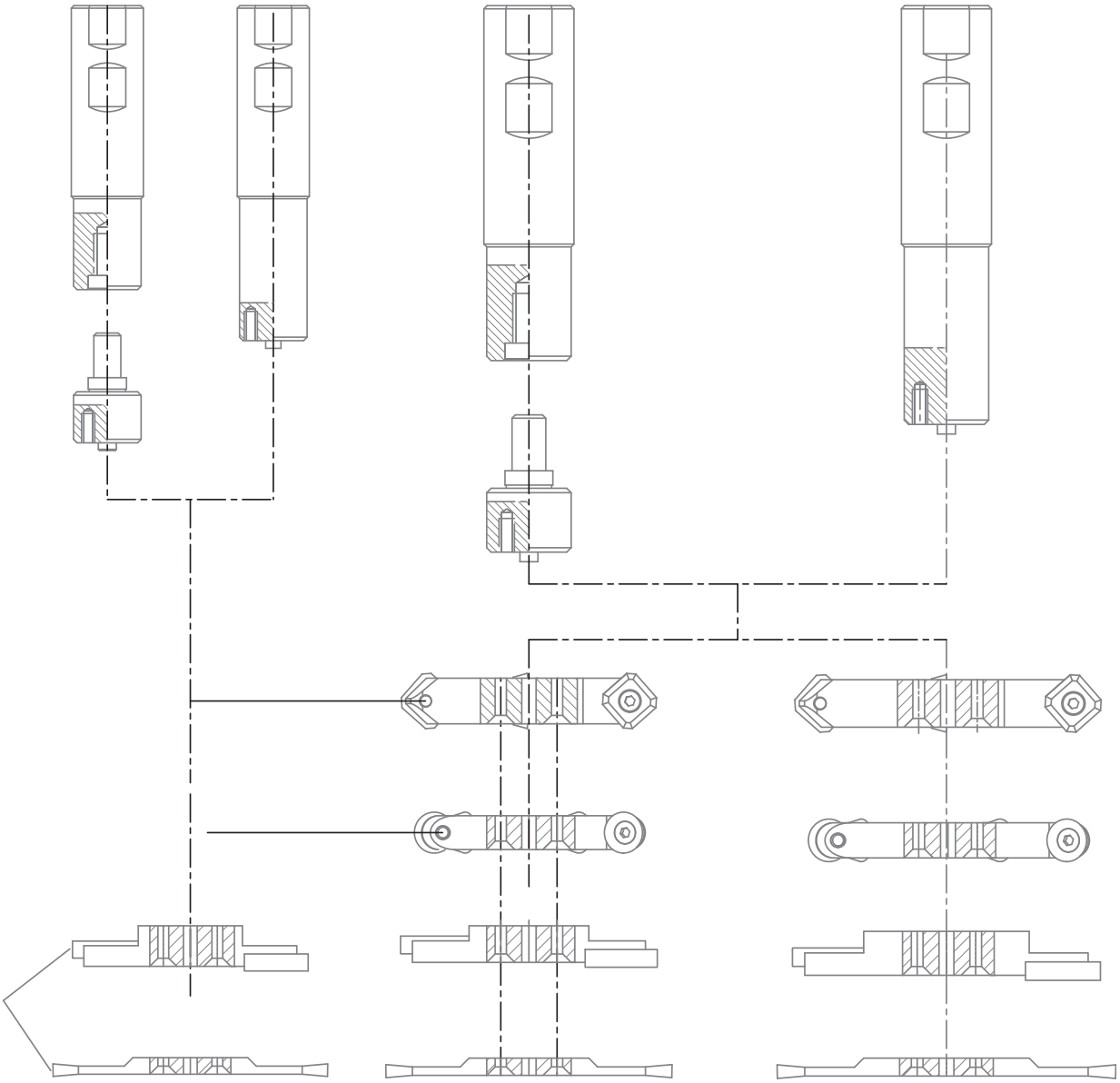
Cylindrical Cylindryczny

EDP No.	d	d1	d2	L1	L	M	Q
EXT-1209-120	12	9	11,9	40	100	M6	2°
EXT-1611-120	16	11	15,5	40	100	M6	2°
EXT-1611-150	16	11	15,5	60	130	M6	2.5°
EXT-2015-160	20	15	19,5	60	130	M8	2°
EXT-2015-180	20	15	19,5	70	150	M8	2°
EXT-2015-230	20	15	19,5	80	200	M8	2°
EXT-2519-180	25	19	24	70	150	M10	2°
EXT-2519-220	25	19	24	90	190	M10	2°
EXT-3223-200	32	23	28	75	160	M12	2°
EXT-3223-240	32	23	31,5	80	200	M12	2°
EXT-3230-240	32	30	39	80	200	M16	2.5°
EXT-3230-280	32	30	39	110	240	M16	2°
EXT-4232-280	42	31	41,5	110	240	M16	2°
EXT-4232-340	42	31	41,5	120	300	M16	2°
EXT-4232-410	42	31	41,5	150	370	M16	2°

T-SLOT MILLING CUTERS FREZY T-OWE

PRODUCT INTRODUCTION
WPROWADZENIE DO PRODUKTU

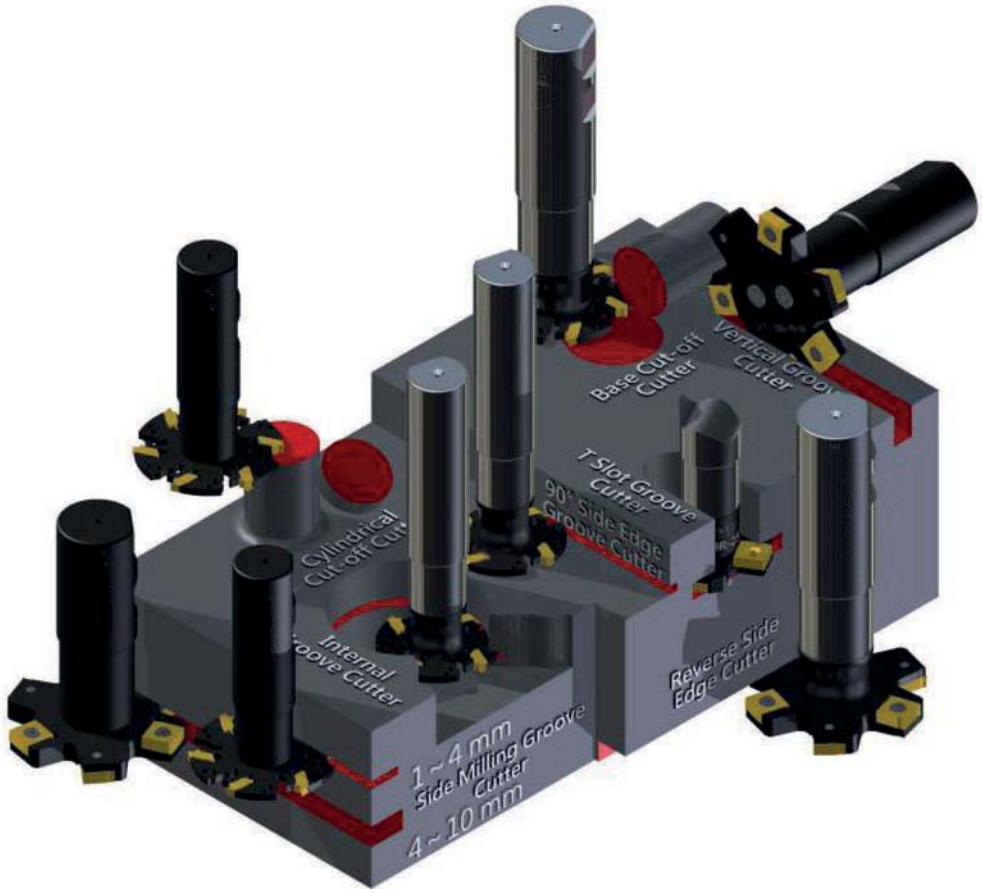
Dia. range 50-80mm
AE 1-12mm



T-SLOT MILLING CUTERS FREZY T-OWE

PRODUCT INTRODUCTION
WPROWADZENIE DO PRODUKTU

Dia. range 50-80mm
AE 1-12mm

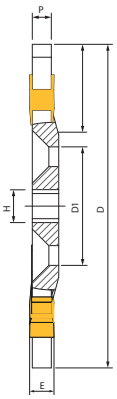


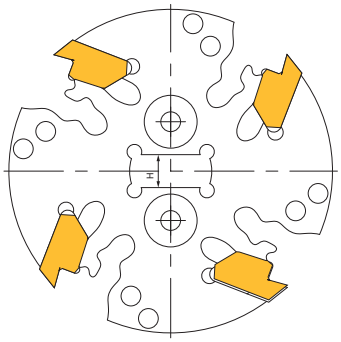
Machining (cutting) speed increases 300%- 500%
Zwiększenie prędkości skrawania o 300%-500%

T-SLOT MILLING CUTERS FREZY T-OWE

M748





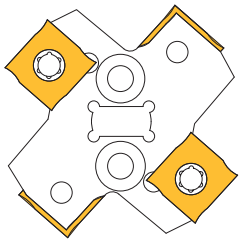


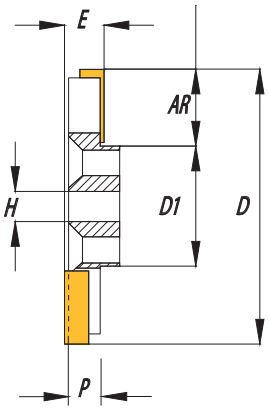
EDP No.	D	E	AR	P	d	H	Z	KG	MAX RPM	**Insert** Płytka	**Wrench** Klucz
M748B05004240009LN10	50	1,0-1,1	9	0,85	24	6	4		9000	LNKX 1010/1011	W220
M748B05004240010LN12	50	1.2 1.3	9	1,0	24	6	4		9000	LNKX1212/1213	W220
M748B05004240012LN14	50	1,4-1,5	9	1,2	24	6	4		9000	LNKX1414/1415	W220
M748B05004240014LN16	50	1,6	9	1,4	24	6	4		9000	LNKX1616	W220
M748B05004240016LN18	50	1,8	9	1,6	24	6	4		9000	LNKX1818	W220
M748B05004240018LN20	50	2.0-2.5	9	1,75	24	6	4		9000	LNKX2020/2022/2025	W220
M748B05004240023LN25	50	2.5-2.1	9	2,25	24	6	4		9000	LNKX2525/2527/2530	W220
M748B05004240027LN30	50	3.0-3.2	9	2,7	24	6	4		9000	LNKX3030/3032/3035	W220
M748B06006300009LN10	60	1,0-1,1	14	0,85	30	6	6		9000	LNKX 1010/1011	W220
M748B08008300009LN10	80	1,0-1,1	24	0,85	30	6	8	0,1	9000	LNKX 1010/1011	W220
M748B06006300010LN12	60	1.2 1.3	14	1,0	30	6	6		9000	LNKX1212/1213	W220
M748B08008300010LN12	80	1.2 1.3	24	1,0	30	6	8		9000	LNKX1212/1213	W220
M748B06006300012LN14	60	1,4-1,5	14	1,2	30	6	6		9000	LNKX1414/1415	W220
M748B08008300012LN14	80	1,4-1,5	24	1,2	30	6	8		9000	LNKX1414/1415	W220
M748B06006300014LN16	60	1,6	14	1,4	30	6	6		9000	LNKX1616	W220
M748B08008300014LN16	80	1,6	24	1,4	30	6	8		9000	LNKX1616	W220
M748B06006300016LN18	60	1,8	14	1,6	30	6	6		9000	LNKX1818	W220
M748B08008300016LN18	80	1,8	24	1,6	30	6	8		9000	LNKX1818	W220
M748B06006300018LN20	60	2.0-2.5	14	1,75	30	6	6		9000	LNKX2020/2022/2025	W220
M748B08008300018LN20	80	2.0-2.5	24	1,75	30	6	8		9000	LNKX2020/2022/2025	W220
M748B06006300023LN25	60	2.5-3.0	14	2,25	30	6	6	0,15	9000	LNKX2525/2527/2530	W220
M748B08008300023LN25	80	2.5-3.0	24	2,25	30	6	8		9000	LNKX2525/2527/2530	W220
M748B06006300027LN30	60	3.0-3.5	14	2,7	30	6	6		9000	LNKX3030/3032/3035	W220
M748B08008300027LN30	80	3.0-3.5	24	2,7	30	6	8		9000	LNKX3030/3032/3035	W220

T-SLOT MILLING CUTERS FREZY T-OWE

M749





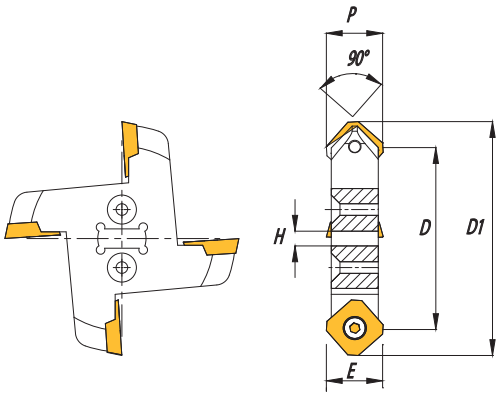


EDP No.	D	E	AR	P	d	H	Z	KG	MAX RPM	**Insert** Płytka	**Screw** Śruba	**Wrench** Klucz
M749B05002240034SN11	50	4	11	3,4	24	6	2		17000	SNEX1102	SC329	W218
M749B05002240042SN11	50	5	11	4,2	24	6	2		17000	SNEX1103	SC330	W254
M749B05002240050SN12	50	6	11	5,0	24	6	2	0,1	17000	SNEX1203	SC482	W249
M749B05002240060SN12	50	7	11	6,0	24	6	2		17000	SNEX1204	SC478	W249
M749B05002240070SN12	50	8	11	7,0	24	6	2		17000	SNEX12045	SC479	W249
M749B05002240090SN12	50	10	11	9,0	24	6	2	0,15	17000	SNEX1205	SC480	W249
M749B05002240110SN12	50	12	11	11	24	6	2		17000	SNEX1207	SC481	W249
M749B06003300034SN11	60	4	14	3,4	30	6	3	0,1	15000	SNEX1102	SC329	W218
M749B08004300034SN11	80	4	24	3,4	30	6	4	0,15	13700	SNEX1102	SC329	W218
M749B06003300042SN11	60	5	14	4,2	30	6	3	0,1	15000	SNEX1103	SC330	W254
M749B08004300042SN11	80	5	24	4,2	30	6	4	0,15	13700	SNEX1103	SC330	W254
M749B06003300050SN11	60	6	14	5,0	30	6	3	0,1	15000	SNEX1103	SC482	W249
M749B08004300050SN11	80	6	24	5,0	30	6	4	0,15	13700	SNEX1103	SC482	W249
M749B06003300060SN12	60	7	14	6,0	30	6	3	0,1	15000	SNEX1204	SC478	W249
M749B08004300060SN12	80	7	24	6,0	30	6	4	0,15	13700	SNEX1204	SC478	W249
M749B06003300070SN12	60	8	14	7,0	30	6	3	0,1	15000	SNEX12045	SC479	W249
M749B08004300070SN12	80	8	24	7,0	30	6	4	0,15	13700	SNEX12045	SC479	W249
M749B06003300090SN12	60	10	14	9,0	30	6	3	0,1	15000	SNEX1205	SC480	W249
M749B08004300090SN12	80	10	24	9,0	30	6	4	0,15	13700	SNEX1205	SC480	W249
M749B06003300110SN12	60	12	14	11	30	6	3	0,1	15000	SNEX1207	SC481	W249
M749B08004300110SN12	80	12	24	11	30	6	4	0,15	13700	SNEX1207	SC481	W249

T-SLOT MILLING CHAMFER CUTERS FREZY T-OWE

M747



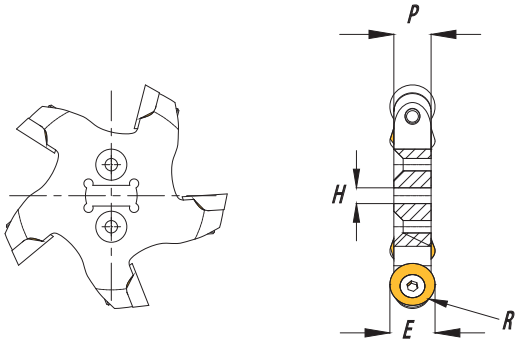


EDP No.	D	E	P	d	H	Z	KG	MAX RPM	**Insert** Płytka	**Screw** Śruba	**Wrench** Klucz
M747B0600576160SE13	60	16	13	76	6	5	0,3	11000	SEHT 13T3	W249	SR232
M747B0800696160SE13	80	16	13	96	6	6	0,4	8500	SEHT 13T3	W249	SR232

T-SLOT MILLING HALF-ROUND GROOVE CUTERS FREZY T-OWE

M750



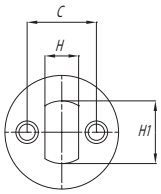


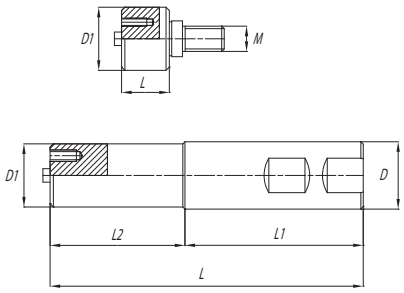
EDP No.	D	E	P	d	H	Z	KG	MAX RPM	**Insert** Płytka	**Screw** Śruba	**Wrench** Klucz
M750B06006062RD80	60	8	6,2	6	6	6	0.3	13000	RDNW803	SC473	W254
M750B08008062RD80	80	8	6,2	6	6	8	0.4	11000	RDNW803	SC473	W254
M750B06004080RD10	60	10	8,0	6	6	4	0.35	13000	RDKT10T3	SC474	W218
M750B08006080RD10	80	10	8,0	6	6	6	0.5	11000	RDKT10T3	SC474	W218
M750B06004100RP12	60	12	10	6	6	4	0.5	9500	RPKT1204	SC475	W249
M750B08006100RP12	80	12	10	6	6	6	0.6	9000	RPKT1204	SC475	W249

ALTERNATIVE HOLDERS UCHWYT ALTERNATYWNY

HLR



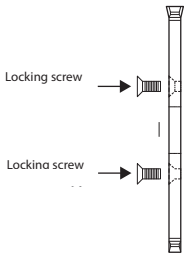




Weldon

EDP No.	D	d1	L	L1	L2	C	H	H1	B	M
HLR02524040	25	24	40	63	37	17	6	12	5	12
HLR02523100	25	23	100							12
HLR02531040	25	31	40							16
HLR03230100	32	30	100							16

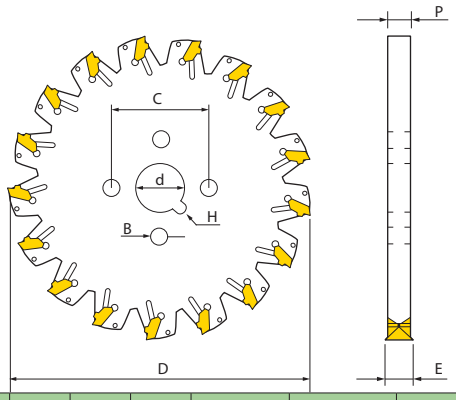
Holders Uchwyty	**Screw** Śruba
M748B05004240009LN10 - M748B05004240027LN30	SC459
M749B05002240034SN11 - M749B05002240050SN12	SC460
M749B05002240060SN12 - M749B05002240110SN12	SC461
M748B06006300009LN10 - M748B06006300027LN30	SC459
M748B08008300009LN10 - M748B08008300027LN30	
M749B06003300034SN11 - M749B06003300050SN11	SC460
M749B08004300034SN11 - M749B08004300050SN11	
M749B06003300060SN12 - M749B06003300110SN12	SC461
M749B08004300060SN12 - M749B08004300110SN12	
M747B06005760130SE13 - M747B08006960130SE13	SC461
M750B06006600000RD80 - M750B08008600000RD80	SC462
M750B06004600000RD10 - M750B08006600000RD10	
M750B06004600000RD12 - M750B08006600000RD12	SC461



T-SLOT MILLING CUTERS FREZY T-OWE

M715



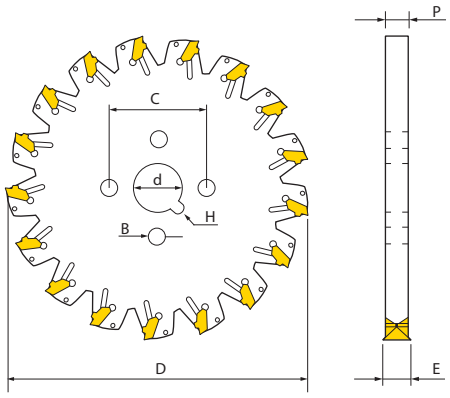


EDP No.	D	E	P	d	C	B	Z	H	KG	MAX RPM	**Insert** Płytka	**Wrench** Klucz
M715B08000220009LN10	80	1.0 - 1.1	0.85	22	34	4.5	8	6	0.15	8000	LNKX 1010-1011	W220
M715B08000220010LN12	80	1.2 - 1.3	1.0	22	34	4.5	8	6	0.15	8000	LNKX 1212-1213	W220
M715B08000220012LN14	80	1.4 - 1.5	1.2	22	34	4.5	8	6	0.15	8000	LNKX 1414-1415	W220
M715B08000220014LN16	80	1.6	1.4	22	34	4.5	8	6	0.15	8000	LNKX 1616	W220
M715B08000220016LN18	80	1.8	1.6	22	34	4.5	8	6	0.15	8000	LNKX 1818	W220
M715B08000220018LN20	80	2.0 - 2.2 - 2.5	1.75	22	34	4.5	8	6	0.15	8000	LNKX 2020-2022-2025	W220
M715B08000220023LN25	80	2.5 - 2.7 - 3.0	2.25	22	34	4.5	8	6	0.15	8000	LNKX 2525-2527-2530	W220
M715B08000220027LN30	80	3.0 - 3.2 - 3.5	2.7	22	34	4.5	8	6	0.17	8000	LNKX 3030-3032-3035	W220
M715B08000220037LN40	80	4.0 - 4.2 - 4.5	3.7	22	34	4.5	8	6	0.2	8000	LNKX 4040-4042-4045	W220
M715B08000220045LN50	80	5.0 - 5.2- 5.5	4.5	22	34	4.5	8	6	0.22	8000	LNKX 5050-5052-5055	W220
M715B10000220009LN10	100	1.0 - 1.1	0.85	22	34	4.5	10	6	0.15	6300	LNKX 1010-1011	W220
M715B10000220010LN12	100	1.2 -1.3	1.0	22	34	4.5	10	6	0.15	6300	LNKX 1212-1213	W220
M715B10000220012LN14	100	1.4 - 1.5	1.2	22	34	4.5	10	6	0.15	6300	LNKX 1414-1415	W220
M715B10000220014LN16	100	1.6	1.4	22	34	4.5	10	6	0.15	6300	LNKX 1616	W220
M715B10000220016LN18	100	1.8	1.6	22	34	4.5	10	6	0.15	6300	LNKX 1818	W220
M715B10000220018LN20	100	2.0 2.2 2.5	1.75	22	34	4.5	10	6	0.15	6300	LNKX 2020-2022-2025	W220
M715B10000220023LN25	100	2.5 2.7 3.0	2.25	22	34	4.5	10	6	0.15	6300	LNKX 2525-2527-2530	W220
M715B10000220027LN30	100	3.0 3.2 3.5	2.7	22	34	4.5	10	6	0.17	6300	LNKX 3030-3032-3035	W220
M715B10000220037LN40	100	4.0 4.2 4.5	3.7	22	34	4.5	10	6	0.2	6300	LNKX 4040-4042-4045	W220
M715B10000220045LN50	100	5.0 5.2 5.5	4.5	22	34	4.5	10	6	0.22	6300	LNKX 5050-5052-5055	W220
M715B12500320009LN10	125	1.0 1.1	0.85	32	44	5.5	12	6	0.2	5000	LNKX 1010-1011	W220
M715B12500320010LN12	125	1.2 1.3	1.0	32	44	5.5	12	6	0.2	5000	LNKX 1212-1213	W220
M715B12500320012LN14	125	1.4 1.5	1.2	32	44	5.5	12	6	0.2	5000	LNKX 1414-1415	W220
M715B12500320014LN16	125	1.6	1.4	32	44	5.5	12	6	0.2	5000	LNKX 1616	W220
M715B12500320016LN18	125	1.8	1.6	32	44	5.5	12	6	0.2	5000	LNKX 1818	W220
M715B12500320018LN20	125	2.0 2.2 2.5	1.75	32	44	5.5	12	6	0.2	5000	LNKX 2020-2022-2025	W220
M715B12500320023LN25	125	2.5 2.7 3.0	2.25	32	44	5.5	12	6	0.2	5000	LNKX 2525-2527-2530	W220
M715B12500320027LN30	125	3.0 3.2 3.5	2.7	32	44	5.5	12	6	0.22	5000	LNKX 3030-3032-3035	W220
M715B12500320037LN40	125	4.0 4.2 4.5	3.7	32	44	5.5	12	6	0.25	5000	LNKX 4040-4042-4045	W220

T-SLOT MILLING CUTERS FREZY T-OWE

M715



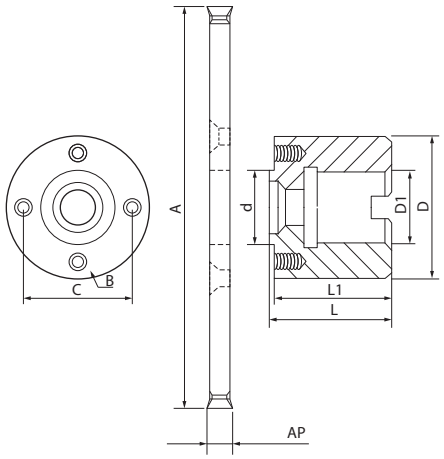


EDP No.	D	E	P	d	C	B	Z	H	KG	MAX RPM	**Insert** Płytka	**Wrench** Klucz
M715B12500320045LN50	125	5.0 5.2 5.5	4.5	32	44	5.5	12	6	0.3	5000	LNKX 5050-5052-5055	W220
M715B16000320012LN14	160	1.4 1.5	1.2	32	44	5.5	16	6	0.28	4000	LNKX 1414-1415	W220
M715B16000320014LN16	160	1.6	1.4	32	44	5.5	16	6	0.28	4000	LNKX 1616	W220
M715B16000320016LN18	160	1.8	1.6	32	44	5.5	16	6	0.28	4000	LNKX 1818	W220
M715B16000320018LN20	160	2.0 2.2 2.5	1.75	32	44	5.5	16	6	0.28	4000	LNKX 2020-2022-2025	W220
M715B16000320023LN25	160	2.5 2.7 3.0	2.25	32	44	5.5	16	6	0.28	4000	LNKX 2525-2527-2530	W220
M715B16000320027LN30	160	3.0 3.2 3.5	2.7	32	44	5.5	16	6	0.30	4000	LNKX 3030-3032-3035	W220
M715B16000320037LN40	160	4.0 4.2 4.5	3.7	32	44	5.5	16	6	0.35	4000	LNKX 4040-4042-4045	W220
M715B16000320045LN50	160	5.0 5.2 5.5	4.5	32	44	5.5	16	6	0.38	4000	LNKX 5050-5052-5055	W220

DISC MILLING CUTTERS HOLDER UCHWYTY FREZARSKIE DYSKOWE

DM

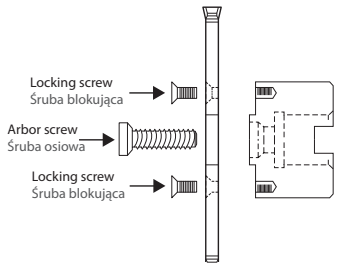




EDP No.	D	D1	d	C	B	L	L1	A	**Screw** Śruba	KG	ap
DM04202222	42	22	22	34	4	41	40	80 100	SC321	0.4	1-2 mm
DM04225422	55	32	32	44	5	41	40	125 160	SC322	0.55	1-2 mm
DM05503232	42	22	22	34	4	42.5	40	80 100	SC321	0.4	2,5-5 mm
DM05531732	55	32	32	44	5	42.5	40	125 160	SC322	0.55	2,5-5 mm

Spare parts Części zamienne

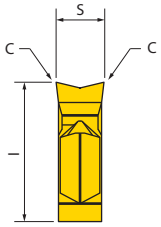
For Do	**For** Do	**Screw** Śruba	**Arbor screw** Śruba osiowa
DMM04202222	DMM04225422	SC321	SC323
DMM05503232	DMM05531732	SC321	SC324



INSERT PŁYTKI

Milling Inserts Płytki do frezowania

LNKX



Tolerances

±0,03

Insert shape Krztałt płytki	Insert arangement Ukad płytek	Type Typ	Dimensions Wymiary (mm)			Coating						Cermet						Uncoated					
			S	I	C	P322	P323	P324				P326						P327	P329				
 C320		LNKX 1616 C320	1.6	9	0.03			•											•				
		LNKX 1818 C320	1.8	9	0.03			•											•				
		LNKX 2020 C320	2.0	9	0.03			•											•				
		LNKX 2022 C320	2.2	9	0.03			•											•				
		LNKX 2025 C320	2.5	9	0.03			•											•				
		LNKX 2525 C320	2.5	9	0.05			•											•				
		LNKX 2527 C320	2.7	9	0.05			•											•				
		LNKX 2530 C320	3.0	9	0.05			•											•				
		LNKX 3030 C320	3.0	9	0.05			•											•				
		LNKX 3032 C320	3.2	9	0.05			•											•				
		LNKX 3035 C320	3.5	9	0.05			•											•				
		LNKX 4040 C320	4.0	9	0.05			•											•				
		LNKX 4042 C320	4.2	9	0.05			•											•				
		LNKX 4045 C320	4.5	9	0.05			•											•				
		LNKX 5050 C320	5.0	9	0.05			•											•				
		LNKX 5052 C320	5.2	9	0.05			•											•				
		LNKX 5055 C320	5.5	9	0.05			•											•				

Material Materiał

Wood Drewno
Calcium Silicate Płyta gipsowa
Gypsum Gips
Bakelite Bakelit

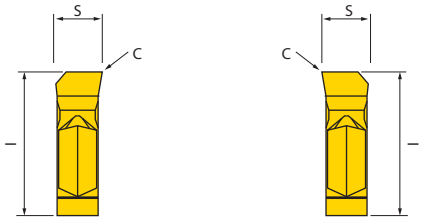
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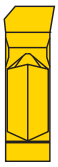
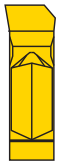
Milling Inserts Płytki do frezowania

LNKX

Tolerances

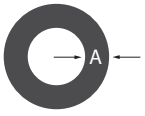
±0,03



Insert shape Krztałt płytki	Insert arangement Ukad płytek	Type Typ	Dimensions Wymiary (mm)			Coating						Cermet						Uncoated					
			S	I	C	P322	P323	P324				P326						P327	P329				
 C321		LNKX 1010 C321	1.0	9	0.03			•											•				
		LNKX 1011 C321	1.1	9	0.03			•											•				
		LNKX 1212 C321	1.2	9	0.03			•											•				
		LNKX 1213 C321	1.3	9	0.03			•											•				
		LNKX 1414 C321	1.4	9	0.03			•											•				
		LNKX 1415 C321	1.5	9	0.03			•											•				
		LNKX 1616 C321	1.6	9	0.03			•											•				
		LNKX 1818 C321	1.8	9	0.03			•											•				
 C322		LNKX 1010 C322	1.0	9	0.03			•											•				
		LNKX 1011 C322	1.1	9	0.03			•											•				
		LNKX 1212 C322	1.2	9	0.03			•											•				
		LNKX 1213 C322	1.3	9	0.03			•											•				
		LNKX 1414 C322	1.4	9	0.03			•											•				
		LNKX 1415 C322	1.5	9	0.03			•											•				
		LNKX 1616 C322	1.6	9	0.03			•											•				
		LNKX 1818 C322	1.8	9	0.03			•											•				

Material Materiał

Wood Drewno	Copper Miedź
Aluminium Aluminium	Copper pipe Miedziana rura
Aluminium pipe Rury aluminium	
Bakelite Bakelit	
Bakelite pipe	
Acrylic Akryl	
Plastic Plastik	
Plastic pipe Plastikowa rura	
Paper Papier	
Drapery Draperia	



A For over 1mm pipe cut

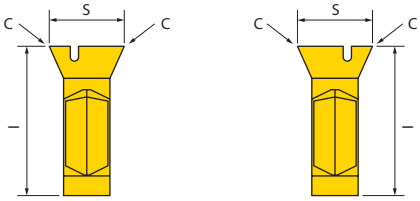
INSERT PŁYTKI

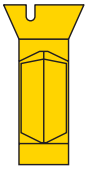
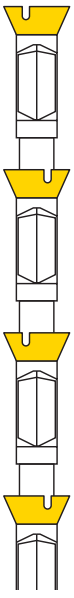
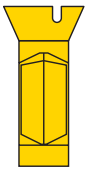
Milling Inserts Płytki do frezowania

LNKX

Tolerances

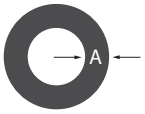
±0,03



Insert shape Krztałt płytki	Insert arangement Ukad płytek	Type Typ	Dimensions Wymiary (mm)			Coating						Cermet						Uncoated					
			S	I	C	P322	P323	P324				P326						P327	P329				
 C321		LNKX 2020 C321	2.0	9	0.05							•							•				
		LNKX 2022 C321	2.2	9	0.05							•							•				
		LNKX 2025 C321	2.5	9	0.05							•							•				
		LNKX 2525 C321	2.5	9	0.05							•							•				
		LNKX 2527 C321	2.7	9	0.05							•							•				
		LNKX 2530 C321	3.0	9	0.05							•							•				
		LNKX 3030 C321	3.0	9	0.05							•							•				
		LNKX 3032 C321	3.2	9	0.05							•							•				
		LNKX 3035 C321	3.5	9	0.05							•							•				
		LNKX 4040 C321	4.0	9	0.05							•							•				
		LNKX 4042 C321	4.2	9	0.05							•							•				
		LNKX 4045 C321	4.5	9	0.05							•							•				
		LNKX 5050 C321	5.0	9	0.05							•							•				
		LNKX 5052 C321	5.2	9	0.05							•							•				
		LNKX 5055 C321	5.5	9	0.05							•							•				
 C322		LNKX 2020 C322	2.0	9	0.05							•							•				
		LNKX 2022 C322	2.2	9	0.05							•							•				
		LNKX 2025 C322	2.5	9	0.05							•							•				
		LNKX 2525 C322	2.5	9	0.05							•							•				
		LNKX 2527 C322	2.7	9	0.05							•							•				
		LNKX 2530 C322	3.0	9	0.05							•							•				
		LNKX 3030 C322	3.0	9	0.05							•							•				
		LNKX 3032 C322	3.2	9	0.05							•							•				
		LNKX 3035 C322	3.5	9	0.05							•							•				
		LNKX 4040 C322	4.0	9	0.05							•							•				
		LNKX 4042 C322	4.2	9	0.05							•							•				
		LNKX 4045 C322	4.5	9	0.05							•							•				
		LNKX 5050 C322	5.0	9	0.05							•							•				
		LNKX 5052 C322	5.2	9	0.05							•							•				
		LNKX 5055 C322	5.5	9	0.05							•							•				

Material Materiał

Wood Drewno	Plastic pipe Plastikowa rura
Aluminium Aluminium	Paper Papier
Aluminium pipe Rury aluminium	Drapery Draperia
Bakelite Bakelit	Copper Miedź
Bakelite pipe	Copper pipe Miedziana rura
Acrylic Akryl	
Plastic Plastik	

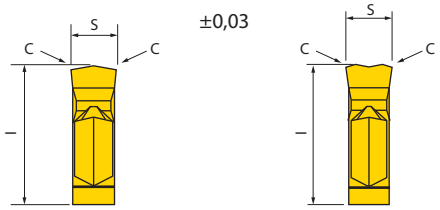


A For over 1mm pipe cut
Cięcie rury o grubości powyżej 1mm

INSERT PŁYTKI

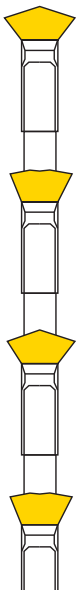
Milling Inserts Płytki do frezowania

LNKX



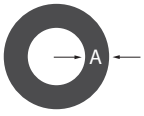
Tolerances

±0,03

Insert shape Krztałt płytki	Insert arangement Ukad płytek	Type Typ	Dimensions Wymiary (mm)			Coating						Cermet						Uncoated					
			S	I	C	P322	P323	P324				P326						P327	P329				
 C394		LNKX 2020 C394	2.0	9	0.05							•											
		LNKX 2025 C394	2.5	9	0.05							•											
		LNKX 2530 C394	3.0	9	0.05							•											
		LNKX 4040 C394	4.0	9	0.05							•											
		LNKX 5050 C394	5.0	9	0.05							•											
 C324		LNKX 2020 C324	2.0	9	0.05							•											
		LNKX 2025 C324	2.5	9	0.05							•											
		LNKX 2530 C324	3.0	9	0.05							•											
		LNKX 4040 C324	4.0	9	0.05							•											
		LNKX 5050 C324	5.0	9	0.05							•											

Material Materiał

Stainless steel Stal nierdzewna
Stainless steel pipe Rura ze stali nierdzewnej
Difficult cuting material Trudno obrabialne materiały



A For over 1mm pipe cut

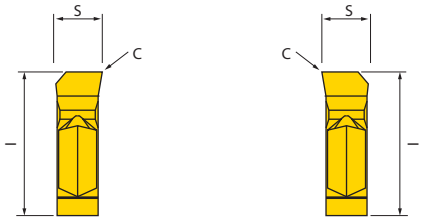
INSERT PYTKI

Milling Inserts Płytki do frezowania

LNKX

Tolerances

±0,03



Insert shape Krztałt płytki	Insert arangement Ukad płytek	Type Typ	Dimensions Wymiary (mm)			Coating						Cermet						Uncoated					
			S	I	C	P322	P323	P324				P326						P327	P329				
 C325		LNKX 1010 C325	1.0	9	0.03							•											
		LNKX 1011 C325	1.1	9	0.03							•											
		LNKX 1212 C325	1.2	9	0.03							•											
		LNKX 1213 C325	1.3	9	0.03							•											
		LNKX 1414 C325	1.4	9	0.03							•											
		LNKX 1415 C325	1.5	9	0.03							•											
		LNKX 1616 C325	1.6	9	0.03							•											
		LNKX 1818 C325	1.8	9	0.03							•											
 C326		LNKX 1010 C326	1.0	9	0.03							•											
		LNKX 1011 C326	1.1	9	0.03							•											
		LNKX 1212 C326	1.2	9	0.03							•											
		LNKX 1213 C326	1.3	9	0.03							•											
		LNKX 1414 C326	1.4	9	0.03							•											
		LNKX 1415 C326	1.5	9	0.03							•											
		LNKX 1616 C326	1.6	9	0.03							•											
		LNKX 1818 C326	1.8	9	0.03							•											

Material Materiał

Steel Stal
Stainless steel Stal nierdzewna
Cast Iron Żeliwo
Difficult cuting material Trudno obrabialne materiały

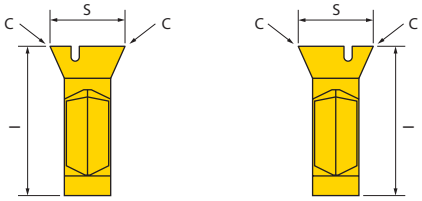
INSERT PYTKI

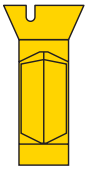
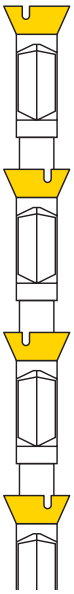
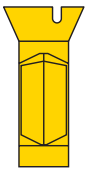
Milling Inserts Płytki do frezowania

LNKX

Tolerances

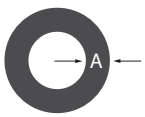
±0,03



Insert shape Krztałt płytki	Insert arangement Ukad płytek	Type Typ	Dimensions Wymiary (mm)			Coating						Cermet						Uncoated					
			S	I	C	P322	P323	P324				P326						P327	P329				
 C421		LNKX 2020 C412	2.0	9	0.05			•				•											
		LNKX 2022 C412	2.2	9	0.05			•				•											
		LNKX 2025 C412	2.5	9	0.05			•				•											
		LNKX 2525 C412	2.5	9	0.05			•				•											
		LNKX 2527 C412	2.7	9	0.05			•				•											
		LNKX 2530 C412	3.0	9	0.05			•				•											
		LNKX 3030 C412	3.0	9	0.05			•				•											
		LNKX 3032 C412	3.2	9	0.05			•				•											
		LNKX 3035 C412	3.5	9	0.05			•				•											
		LNKX 4040 C412	4.0	9	0.05			•				•											
		LNKX 4042 C412	4.2	9	0.05			•				•											
		LNKX 4045 C412	4.5	9	0.05			•				•											
		LNKX 5050 C412	5.0	9	0.05			•				•											
		LNKX 5052 C412	5.2	9	0.05			•				•											
		LNKX 5055 C412	5.5	9	0.05			•				•											
 C414																							
		LNKX 2020 C414	2.0	9	0.05			•				•											
		LNKX 2022 C414	2.2	9	0.05			•				•											
		LNKX 2025 C414	2.5	9	0.05			•				•											
		LNKX 2525 C414	2.5	9	0.05			•				•											
		LNKX 2527 C414	2.7	9	0.05			•				•											
		LNKX 2530 C414	3.0	9	0.05			•				•											
		LNKX 3030 C414	3.0	9	0.05			•				•											
		LNKX 3032 C414	3.2	9	0.05			•				•											
		LNKX 3035 C414	3.5	9	0.05			•				•											
		LNKX 4040 C414	4.0	9	0.05			•				•											
		LNKX 4042 C414	4.2	9	0.05			•				•											
		LNKX 4045 C414	4.5	9	0.05			•				•											
		LNKX 5050 C414	5.0	9	0.05			•				•											
		LNKX 5052 C414	5.2	9	0.05			•				•											
		LNKX 5055 C414	5.5	9	0.05			•				•											

Material Materiał

Steel Stal Stal
Steel pipe Stalowa rura
Stainless steel Stal nierdzewna
Stainless steel pipe Rura ze stali nierdzewnej
Cast Iron Żeliwo
Difficult cuting material Trudno obrabialne materiały

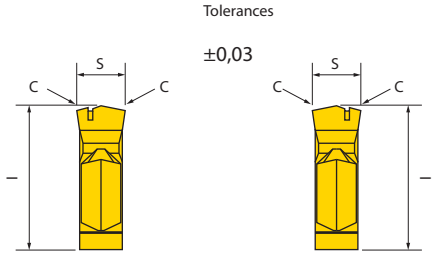


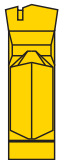
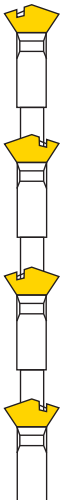
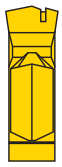
A For over 1mm pipe cut

INSERT PYTKI

Milling Inserts Płytki do frezowania

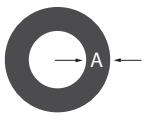
LNKX



Insert shape Krztałt płytki	Insert arangement Ukad płytek	Type Typ	Dimensions Wymiary (mm)			Coating						Cermet						Uncoated					
			S	I	C	P322	P323	P324				P326						P327	P329				
 C327		LNKX 2020 C327	2.0	9	0.05							•											
		LNKX 2022 C327	2.2	9	0.05							•											
		LNKX 2025 C327	2.5	9	0.05							•											
		LNKX 2525 C327	2.5	9	0.05							•											
		LNKX 2527 C327	2.7	9	0.05							•											
		LNKX 2530 C327	3.0	9	0.05							•											
		LNKX 3030 C327	3.0	9	0.05							•											
		LNKX 3032 C327	3.2	9	0.05							•											
		LNKX 3035 C327	3.5	9	0.05							•											
		LNKX 4040 C327	4.0	9	0.05							•											
		LNKX 4042 C327	4.2	9	0.05							•											
		LNKX 4045 C327	4.5	9	0.05							•											
		LNKX 5050 C327	5.0	9	0.05							•											
		LNKX 5052 C327	5.2	9	0.05							•											
		LNKX 5055 C327	5.5	9	0.05							•											
 C328																							
		LNKX 2020 C328	2.0	9	0.05							•											
		LNKX 2022 C328	2.2	9	0.05							•											
		LNKX 2025 C328	2.5	9	0.05							•											
		LNKX 2525 C328	2.5	9	0.05							•											
		LNKX 2527 C328	2.7	9	0.05							•											
		LNKX 2530 C328	3.0	9	0.05							•											
		LNKX 3030 C328	3.0	9	0.05							•											
		LNKX 3032 C328	3.2	9	0.05							•											
		LNKX 3035 C328	3.5	9	0.05							•											
		LNKX 4040 C328	4.0	9	0.05							•											
		LNKX 4042 C328	4.2	9	0.05							•											
		LNKX 4045 C328	4.5	9	0.05							•											
		LNKX 5050 C328	5.0	9	0.05							•											
		LNKX 5052 C328	5.2	9	0.05							•											
		LNKX 5055 C328	5.5	9	0.05							•											

Material Materiał

Steel Stal Stal
Steel pipe Stalowa rura
Stainless steel Stal nierdzewna
Stainless steel pipe Rura ze stali nierdzewnej
Cast Iron Żeliwo
Difficult cuting material Trudno obrabialne materiały

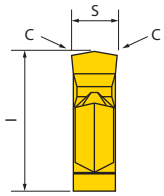


A For over 5mm pipe cut

INSERT PYTKI

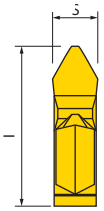
Milling Inserts Płytki do frezowania

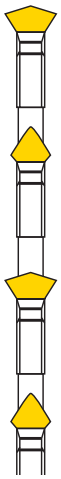
LNKX



Tolerances

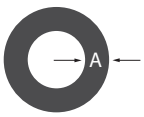
±0,03



Insert shape Krztałt płytki	Insert arangement Ukad płytek	Type Typ	Dimensions Wymiary (mm)			Coating						Cermet						Uncoated					
			S	I	C	P322	P323	P324				P326						P327	P329				
 C323		LNKX 2020 C323	2.0	9	0.05							•											
		LNKX 2022 C323	2.2	9	0.05							•											
		LNKX 2025 C323	2.5	9	0.05							•											
		LNKX 2525 C323	2.5	9	0.05							•											
		LNKX 2527 C323	2.7	9	0.05							•											
		LNKX 2530 C323	3.0	9	0.05							•											
 C330		LNKX 2020 C330	2.0	9	0.05							•											
		LNKX 2022 C330	2.2	9	0.05							•											
		LNKX 2025 C330	2.5	9	0.05							•											
		LNKX 2525 C330	2.5	9	0.05							•											
		LNKX 2527 C330	2.7	9	0.05							•											
		LNKX 2530 C330	3.0	9	0.05							•											

Material Materiał

Steel pipe Stalowa rura Rura stalowa
Stainless steel pipe Rura ze stali nierdzewnej
Difficult cuting material Trudno obrabialne materiały



A For over 5mm pipe cut

TECHNICAL INFO INFORMACJA TECHNICZNA

Series Seria - LNKX

Material Materiał	Material group No.	Recom. feed fz mm/tooth ae/ Dc=10%	LNKX-C326	LNKX-C332
Steel Stal	1	0.04-0.12	P323/P326	
	2	0.04-0.10	P323/P326	
	3	0.04-0.10	P323/P326	
	4	0.04-0.10	P323/P326	
	5	0.04-0.08	P323/P326	
	6	0.04-0.07	P323/P326	
Hardened Steel Stal hartowana	7	0.03-0.06	P323/P326	
Stainless Steel Stal nierdzewna	8	0.04-0.12	P323/P326	
	9	0.04-0.10	P323/P326	
	10	0.04-0.09	P323/P326	
	11	0.04-0.08	P323/P326	
Cast Iron Żeliwo	12	0.04-0.12	P327/P324	
	13	0.04-0.12	P327/P324	
	14	0.04-0.11	P327/P324	
	15	0.04-0.10	P327/P324	
Non-ferrous materials Materiały nieżelazne	16	0.06-0.13		P324
	17	0.06-0.12		P324
Plastics Tworzywa Sztuczne	20	0.06-0.08	P323/P326	
	21	0.04-0.06	P323/P326	
	22	0.04-0.07	P323/P326	

TECHNICAL INFO INFORMACJA TECHNICZNA

Cutting Conditions / Parametry skrawania (ae/De=10%)

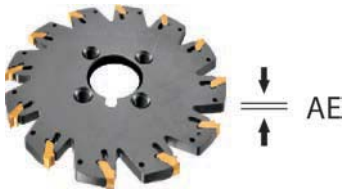
Material Materiał	Group № N° Grup	Grade Gatunek														
		P321			P323			P324			P326			P329		
		Vc (m/min)														
Steel Stal	1	-	-	-	-	-	-	-	-	-	179	161	140	-	-	-
	2	-	-	-	-	-	-	-	-	-	140	126	113	-	-	-
	3	-	-	-	-	-	-	-	-	-	126	113	102	-	-	-
	4	-	-	-	-	-	-	-	-	-	112	102	91	-	-	-
	5										101	91	81			
	6	-	-	-	-	-	-	-	-	-	91	-	-	-	-	-
Hardened Steel Stal hartowana	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stainless Steel Stal nierdzewna	8	-	-	-	-	-	-	-	-	-	128	109	99	-	-	-
	9	-	-	-	-	-	-	-	-	-	112	96	86	-	-	-
	10	-	-	-	-	-	-	-	-	-	96	80	74	-	-	-
	11	-	-	-	-	-	-	-	-	-	74	64	-	-	-	-
Cast Iron Żeliwo	12	-	-	-	-	-	-	140	119	105	-	-	-	-	-	-
	13	-	-	-	-	-	-	126	105	98	-	-	-	-	-	-
	14	-	-	-	-	-	-	112	98	91	-	-	-	-	-	-
	15	-	-	-	-	-	-	88	81	-	-	-	-	-	-	-
Non-ferrous materials Materiały nieżelazne	16	-	-	-	-	-	-	1150	950	850	-	-	-	1150	950	850
	17	-	-	-	-	-	-	950	780	700	-	-	-	950	750	700
Plastics Tworzywa Sztuczne	20	-	-	-	-	-	-	30	25	-	50	45	-	-	-	-
	21	-	-	-	-	-	-	20	15	-	35	40	-	-	-	-
	22	-	-	-	-	-	-	30	25	-	50	45	-	-	-	-

Cutting Conditions / Parametry skrawania

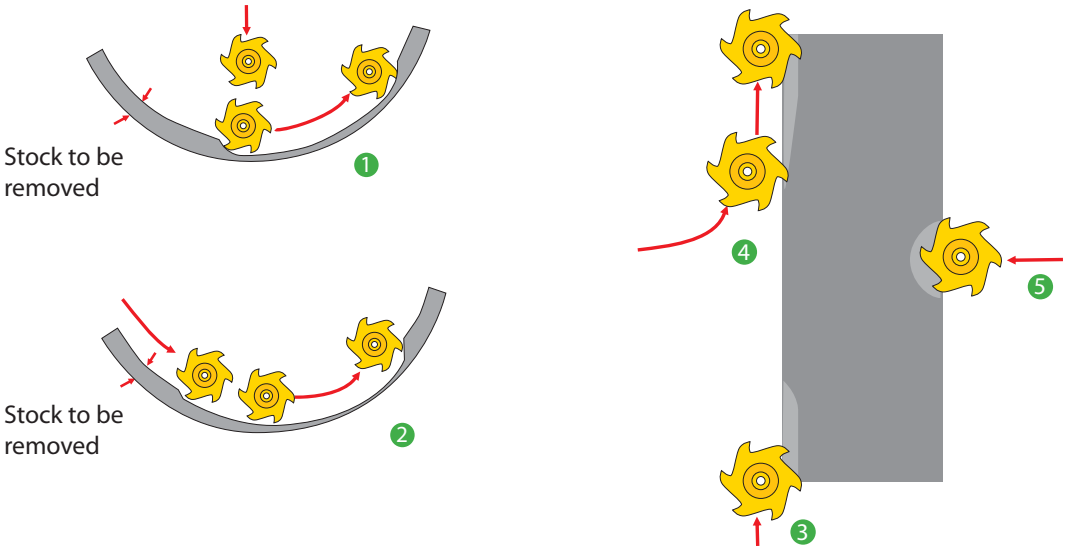
Operations Operacje	ae/De	fz mm/tooth			Speed factor Współczynnik prędkości
Radial infeed Zagłębianie	-	0,05	0,10	0,14	0,65
Side milling Frezowanie boczne	2%	0,21	0,44	0,65	1,20
	5%	0,14	0,28	0,41	1,10
	10%	0,10	0,20	0,30	1,00
	20%	0,07	0,14	0,21	0,90
	30%	0,06	0,12	0,18	0,85
Average chip thickness hm Średni przekrój wióra		0,03	0,06	0,09	-

TECHNICAL INFO INFORMACJA TECHNICZNA

fz (mm/tooth)



AE	Feed Posuw fz					
	Material group Grupa materiału					
	1 2 3 4	5 6	8 9 10 11	12 13 14 15	16 17	20 21 22
1.0-1.3mm	0.015-0.025	0.015-0.02	0.015-0.02	0.02-0.03	0.01-0.03	0.01-0.015
1.4-1.7mm	0.02-0.03	0.015-0.025	0.02-0.03	0.02-0.04	0.02-0.04	0.015-0.025
1.8-2.2mm	0.03-0.05	0.03-0.04	0.02-0.03	0.03-0.06	0.03-0.08	0.02-0.03
2.5-3.0mm	0.03-0.06	0.03-0.05	0.03-0.05	0.03-0.08	0.03-0.1	0.03-0.04
3.0-3.5mm	0.04-0.08	0.03-0.06	0.03-0.06	0.04-0.1	0.04-0.1	0.03-0.05
4.0-4.5mm	0.04-0.08	0.03-0.06	0.03-0.06	0.04-0.1	0.04-0.1	0.03-0.05
5.0-5.5mm	0.05-0.1	0.04-0.08	0.04-0.07	0.05-0.12	0.05-0.17	0.04-0.06



1. Pluging to mill FZ-50%
2. Ramping to mill Fz-100%
3. Mill Fz-100%
4. Ramping Fz-100%
5. Pluging o mill Fz-50%

TECHNICAL INFO INFORMACJA TECHNICZNA

SAW BLADE FREZ TARCZOWY

Material Materiał	**Group №** N° Grup	D [mm]	Z	Vc [m/min]	fz [mm]	[mm]	RPM [min1]	FEED [mm/min]
Alloy Steel Stal stopowa	1 2 3 4	80	8	160	0.06	12	636	305
		100	10	160	0.06	15	509	305
		125	12	160	0.06	18	407	293
		160	16	160	0.06	24	318	305
		200	20	160	0.06	30	255	306
		250	26	160	0.06	37	203	316
		300	30	160	0.06	45	170	306
		350	36	160	0.06	52	145	313
		400	40	160	0.06	60	127	305
		450	46	160	0.06	67	113	312
High Alloy Steel Stal wysokosto-powa	5 6	80	8	120	0.05	12	500	200
		100	10	120	0.05	15	400	200
		125	12	120	0.05	18	320	230
		160	16	120	0.05	24	250	200
		200	20	120	0.05	30	200	200
		250	26	120	0.05	37	160	208
		300	30	120	0.05	45	130	195
		350	36	120	0.05	52	115	207
		400	40	120	0.05	60	100	200
		450	46	120	0.05	67	85	195
Stainless steel Stal nierdzewna	8 9 10	80	8	70	0.06	12	278	133
		100	10	70	0.06	15	222	133
		125	12	70	0.06	18	178	128
		160	16	70	0.06	24	139	133
		200	20	70	0.06	30	111	133
		250	26	70	0.06	37	89	138
		300	30	70	0.06	45	74	133
		350	36	70	0.06	52	63	136
		400	40	70	0.06	60	55	132
		450	46	70	0.06	67	49	135
Grey Cast Iron Żeliwo szare	12 13 14	80	8	120	0.1	12	500	400
		100	10	120	0.1	15	400	400
		125	12	120	0.1	18	320	380
		160	16	120	0.1	24	250	400
		200	20	120	0.1	30	200	400
		250	26	120	0.1	37	160	410
		300	30	120	0.1	45	130	390
		350	36	120	0.1	52	110	390
		400	40	120	0.1	60	100	400
		450	46	120	0.1	67	85	390

TECHNICAL INFO INFORMACJA TECHNICZNA

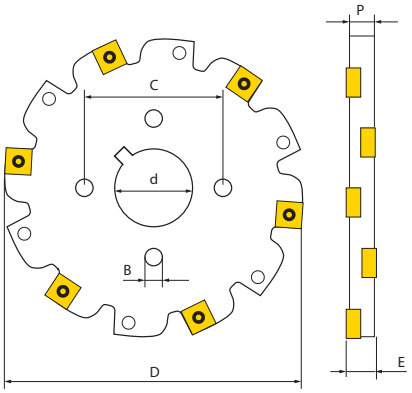
SAW BLADE FREZ TARCZOWY

Material Materiał	**Group №** Nº Grup	D [mm]	Z	Vc [m/min]	fz [mm]	[mm]	RPM [min1]	FEED [mm/min]
Aluminium Aluminium	16 17	80	8	1100	0.1	12	4500	3600
		100	10	1100	0.1	15	3600	3600
		125	12	1100	0.1	18	2900	3480
		160	16	1100	0.1	24	2500	4000
		200	20	1100	0.1	30	1800	3600
		250	26	1100	0.1	37	1400	3600
		300	30	1100	0.1	45	1210	3630
		350	36	1100	0.1	52	1030	3700
		400	40	1100	0.1	60	910	3640
		450	46	1100	0.1	67	810	3720
Ti alloy Stop tytanu	20 21 22	80	8	40	0.05	12	160	64
		100	10	40	0.05	15	130	65
		125	12	40	0.05	18	105	63
		160	16	40	0.05	24	82	65
		200	20	40	0.05	30	65	65
		250	26	40	0.05	37	52	67
		300	30	40	0.05	45	43	64
		350	36	40	0.05	52	38	68
		400	40	40	0.05	60	33	66
		450	46	40	0.05	67	29	66
Wood Drewno		80	8	1600	0.12	12	6500	6800
		100	10	1600	0.12	15	5300	6300
		125	12	1600	0.12	18	4250	6100
		160	16	1600	0.12	24	3320	6350
		200	20	1600	0.12	30	2650	6300
		250	26	1600	0.12	37	2100	6500
		300	30	1600	0.12	45	1750	6300
		350	36	1600	0.12	52	1510	6500
		400	40	1600	0.12	60	1320	6300
		450	46	1600	0.12	67	1160	6400
Plastics Tworzywa Sztuczne		80	8	1800	0.1	12	7500	6000
		100	10	1800	0.1	15	6000	6000
		125	12	1800	0.1	18	4800	5760
		160	16	1800	0.1	24	3750	6000
		200	20	1800	0.1	30	3000	6000
		250	26	1800	0.1	37	2400	6240
		300	30	1800	0.1	45	2000	6000
		350	36	1800	0.1	52	1700	6120
		400	40	1800	0.1	60	1500	6000
		450	46	1800	0.1	67	1320	6000

T-SLOT MILLING CUTERS FREZY T-OWE

M718





EDP No.	D	E	P	d	C	B	Z	H	KG	MAX RPM	**Insert** Płytka	**Screw** Śruba	**Wrench** Klucz
M718B0800822003SN11	80	4	3.4	22	34	4.5	8	6	0.2	13700	SNEX 1102	SC329	W218
M718B0800822004SN11	80	5	4.2	22	34	4.5	8	6	0.2	13700	SNEX 1103	SC330	W254
M718B1001022003SN11	100	4	3.4	22	34	4.5	10	6	0.5	12000	SNEX 1102	SC329	W218
M718B1001022004SN11	100	5	4.2	22	34	4.5	10	6	0.5	12000	SNEX 1103	SC330	W254
M718B1251232003SN11	125	4	3.4	32	44	5.5	12	6	0.6	10900	SNEX 1102	SC329	W218
M718B1251232004SN11	125	5	4.2	32	44	5.5	12	6	0.6	10900	SNEX 1103	SC330	W254
M718B1601632003SN11	160	4	3.4	32	44	5.5	16	6	0.7	8300	SNEX 1102	SC329	W218
M718B1601632004SN11	160	5	4.2	32	44	5.5	16	6	0.7	8300	SNEX 1103	SC330	W254

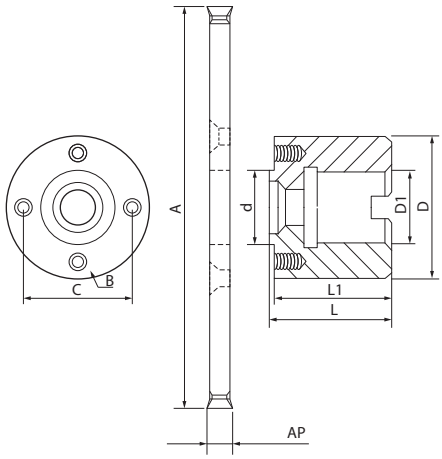
Accessories / Akcesoria

Tool Narzędzie	**Insert** Płytka	**Screw** Śruba	**Wrench** Klucz					
M718	LNKT 1102	SC329	W218					
	LNKT 1103	SC330	W218					

DISC MILLING CUTTERS HOLDER UCHWYTY FREZARSKIE DYSKOWE

DM

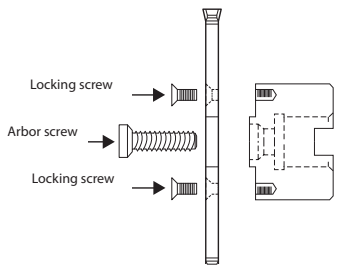




EDP No.	D	D1	d	C	B	L	L1	A	**Screw** Śruba	KG	ap
DM04202222	42	22	22	34	4	41	40	80 100	SC321	0.4	1-2 mm
DM04225422	55	32	32	44	5	41	40	125 160	SC322	0.55	1-2 mm
DM05503232	42	22	22	34	4	42.5	40	80 100	SC321	0.4	2,5-5 mm
DM05531732	55	32	32	44	5	42.5	40	125 160	SC322	0.55	2,5-5 mm

Spare parts Części zamienne

For Do	**For** Do	**Screw** Śruba	**Arbor screw** Śruba osiowa
DMM04202222	DMM04225422	SC321	SC323
DMM05503232	DMM05531732	SC321	SC324

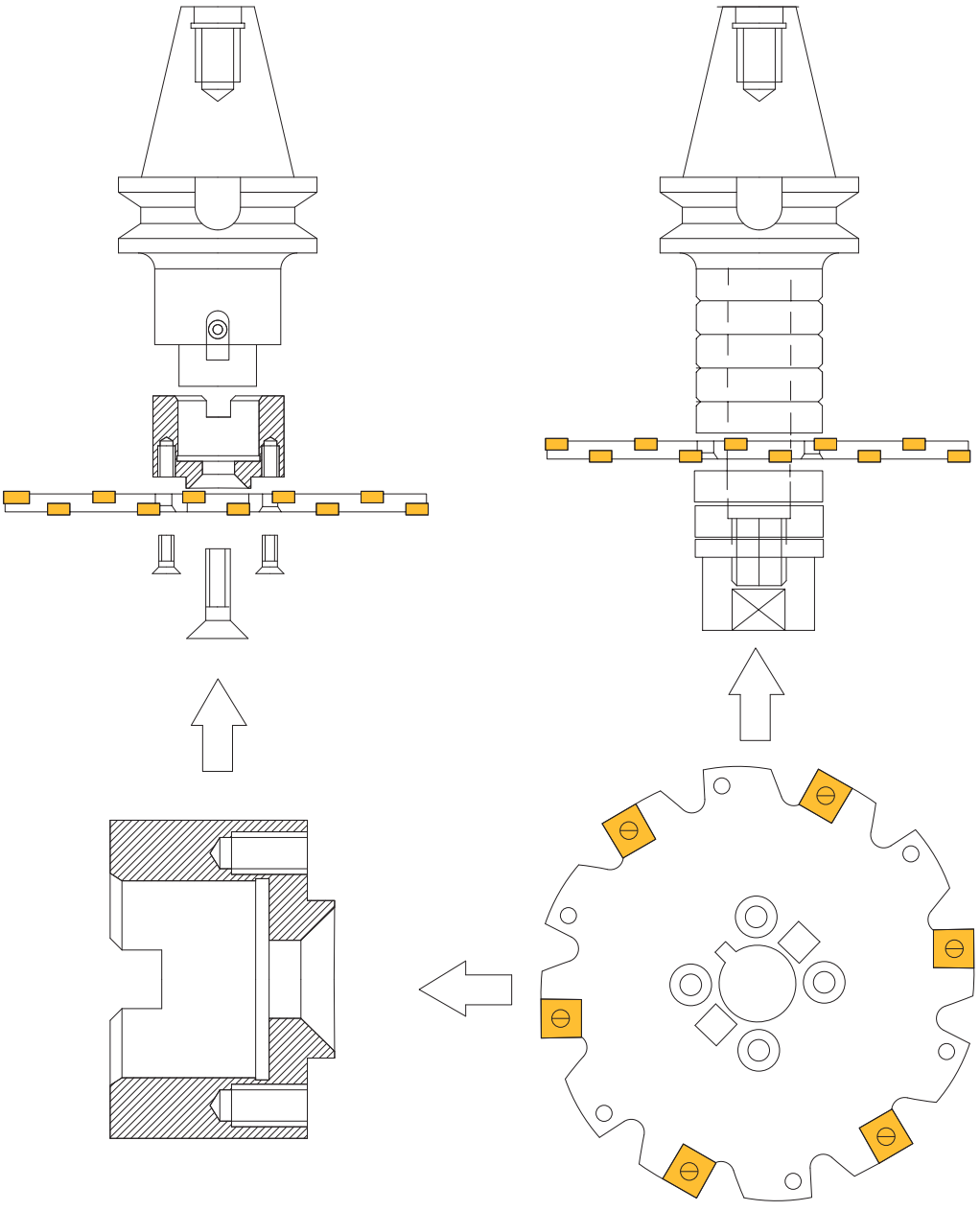


T-SLOT MILLING CUTERS FREZY T-OWE

PRODUCT INTRODUCTION
WPROWADZENIE DO PRODUKTU

M745 T -slot transformer series
Seria T-owa z converterem

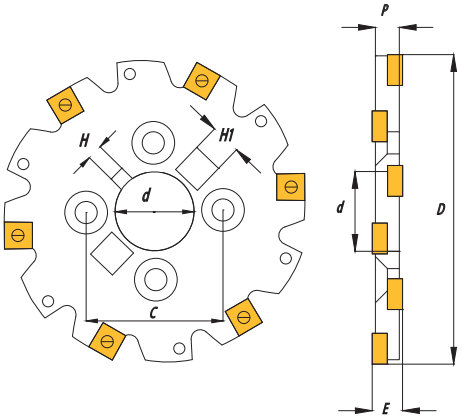
Dia. range 160-250mm AE 6-30mm



DISC MILLING CUTTERS FREZY TARCZOWE

M745



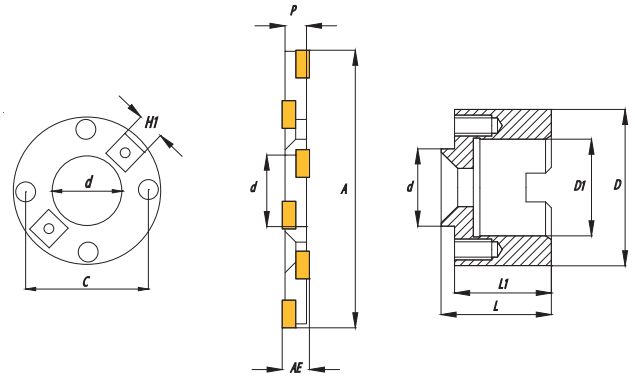


EDP No.	D	E	P	C	H	d	Z	Zc	KG	MAX RPM	**Insert** Płytka	**Screw** Śruba	**Wrench** Klucz
M745B16016320050SN12	160	6	5	52	8	32	16	8	0,8	8300	SNEX1203	SC482	W249
M745B16016320070SN12	160	8	7	52	8	32	16	8	0,8	8300	SNEX12045	SC479	W249
M745B16016320090SN12	160	10	9	52	8	32	16	8	1,1	8300	SNEX1205	SC480	W249
M745B16016320110SN12	160	12	11	52	8	32	16	8	1,3	8300	SNEX1207	SC481	W249
M745B20018400050SN12	200	6	5	70	10	40	18	9	1,6	4200	SNEX1203	SC482	W249
M745B20018400070SN12	200	8	7	70	10	40	18	9	1,7	4200	SNEX12045	SC479	W249
M745B20018400090SN12	200	10	9	70	10	40	18	9	1,8	4200	SNEX1205	SC480	W249
M745B20018400110SN12	200	12	11	70	10	40	18	9	2,1	4200	SNEX1207	SC481	W249
M745B25024400050SN12	250	6	5	70	10	40	24	12	3,3	3800	SNEX1203	SC482	W249
M745B25024400070SN12	250	8	7	70	10	40	24	12	3,5	3800	SNEX12045	SC479	W249
M745B25024400090SN12	250	10	9	70	10	40	24	12	3,7	3800	SNEX1205	SC480	W249
M745B25024400110SN12	250	12	11	70	10	40	24	12	3,9	3800	SNEX1207	SC481	W249

DISC MILLING CUTTERS HOLDER UCHWYTY FREZARSKIE DYSKOWE

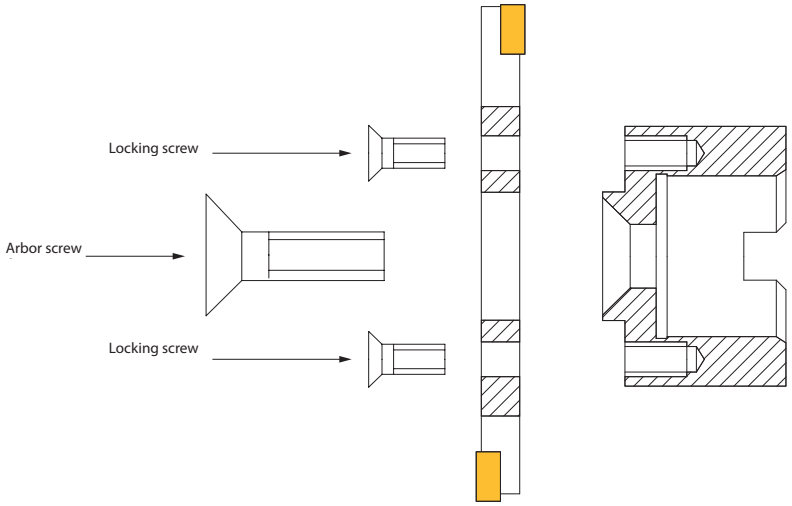
DNM





EDP No.	D	D1	d	C	B	L	L1	A	KG
DNM065320045	65	32	32	52	8	45	39,5	160	0,8
DNM065318045	65	31,75	32	52		45	39,5	160	
DNM065400045	65	40	32	52		45	39,5	160	
DNM065381045	65	38,1	32	52		45	39,5	160	
DNM090400050	90	40	40	70		50	44,5	200 250	1,2
DNM090381050	90	38,1	40	70		50	44,5	200 250	
DNM090508050	90	50,8	40	70		50	44,5	200 250	

MILLING CUTTER SPARE PARTS CZĘŚCI ZAMIENNE FREZÓW



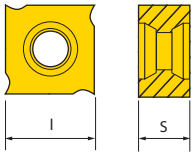
Spare parts Części zamienne

Holders Uchwyty	**Screw** Śruba	**Arbor Screw** Śruba osiowa	**Holders** Uchwyty	**Screw** Śruba	**Arbor Screw** Śruba osiowa
M745B16016320050SN12	SC463	SC472	M743B16016320125SN10	SC464	SC472
M745B16016320070SN12			M743B16016320145SN10		
M745B16016320090SN12	SC464		M743B16016320165SN13	SC465	
M745B16016320110SN12			M743B16016320185SN13		
M745B20018400050SN12	SC463		M743B16016320205SN13	SC466	
M745B20018400070SN12			M743B16016320235SN16		
M745B20018400090SN12	SC464		M743B16016320285SN16	SC467	
M745B20018400110SN12			M743B20020400125SN10	SC464	
M745B25024400050SN12	SC463		M743B20020400145SN10		
M745B25024400070SN12			M743B20020400165SN13	SC465	
M745B25024400090SN12	SC464		M743B20020400185SN13		
M745B25024400110SN12			M743B20020400205SN13	SC466	
M744B16016320000LN13	SC465		M743B20020400235SN16		
M744B20020400000LN13			M743B20020400285SN16	SC467	
M744B25024400000LN13			M743B25024400125SN10	SC464	
			M743B25024400145SN10		
			M743B25024400165SN13	SC465	
			M743B25024400185SN13		
			M743B25024400205SN13	SC466	
			M743B25024400235SN16		
			M743B25024400285SN16	SC467	

INSERT PYTKI

Milling Inserts Płytki do frezowania

SNEX



Insert shape Krztałt płytki	Type Typ	Dimensions Wymiary (mm)			Coating						Cermet						Uncoated					
		Cutting rake Kąt cięcia	S	I	P322	P323	P324				P326						P327	P329				
 C331	SNEX 1102 C331	25°	2.3	11.0			•															
	SNEX 1103 C331		2.7	11.0			•															
	SNEX 1203 C331		3.2	12.7			•															
	SNEX 1204 C331		4.0	12.7			•															
	SNEX 1204 C331		4.5	12.7			•															
	SNEX 1205 C331		5.4	12.7			•															
	SNEX 1207 C331		7.0	12.7			•															
 C337	SNEX 1102 C337	15°	2.3	11.0		•					•											
	SNEX 1103 C337		2.7	11.0		•					•											
	SNEX 1203 C337		3.2	12.7		•					•											
	SNEX 1204 C337		4.0	12.7		•					•											
	SNEX 1204 C337		4.5	12.7		•					•											
	SNEX 1205 C337		5.4	12.7		•					•											
	SNEX 1207 C337		7.0	12.7		•					•											

TECHNICAL INFO INFORMACJA TECHNICZNA

Series Serie - SNEX

Material Materiał	Material group No.	Recom. feed fz mm/tooth ae/ Dc=10%	SNEX-C326	SNEX-C332
Steel Stal	1	0.14-0.30	P323/P326	
	2	0.14-0.25	P323/P326	
	3	0.14-0.22	P323/P326	
	4	0.14-0.22	P323/P326	
	5	0.14-0.20	P323/P326	
	6	0.10-0.15	P323/P326	
Hardened Steel Stal hartowana	7	0.10-0.13	P323/P326	
Stainless Steel Stal nierdzewna	8	0.14-0.25	P323/P326	
	9	0.14-0.22	P323/P326	
	10	0.14-0.20	P323/P326	
	11	0.10-0.15	P323/P326	
Cast Iron Żeliwo	12	0.14-0.30	P327/P324	
	13	0.14-0.22	P327/P324	
	14	0.14-0.20	P327/P324	
	15	0.10-0.15	P327/P324	
Non-ferrous materials Materiały nieżelazne	16	0.16-0.30		P324
	17	0.16-0.25		P324
Plastics Tworzywa Sztuczne	20	0.14-0.20	P323/P326	
	21	0.10-0.13	P323/P326	
	22	0.14-0.20	P323/P326	

TECHNICAL INFO INFORMACJA TECHNICZNA

Cutting Conditions / Parametry skrawania (ae/De=10%)

Material Materiał	Group № N° Grup	Grade Gatunek											
		P323			P327			P324			P326		
		Vc (m/min)											
		0,10	0,20	0,30	0,10	0,20	0,30	0,10	0,20	0,30	0,10	0,20	0,30
Steel Stal	1	205	175	155	-	-	-	232	208	188	-	-	-
	2	180	155	135	-	-	-	210	188	169	-	-	-
	3	150	125	115	-	-	-	189	170	153	-	-	-
	4	140	115	105	-	-	-	170	153	138	-	-	-
	5	110	100	90	-	-	-	150	138	124	-	-	-
	6	85	70		-	-	-	115	98	-			
Hardened Steel Stal hartowana	7	40	-	-	-	-	-	-	-	-	-	-	-
Stainless Steel Stal nierdzewna	8	200	170	155	-	-	-	-	-	-	-	-	-
	9	175	150	135	-	-	-	-	-	-	-	-	-
	10	150	125	115	-	-	-	-	-	-	-	-	-
	11	115	100	-	-	-	-	-	-	-	-	-	-
Cast Iron Żeliwo	12	-	-	-	-	-	-	200	170	150	-	-	-
	13	-	-	-	-	-	-	180	150	140	-	-	-
	14	-	-	-	-	-	-	170	140	130	-	-	-
	15	-	-	-	-	-	-	130	125	-	-	-	-
Non-ferrous materials Materiały nieżelazne	16	-	-	-	-	-	-	1150	950	850	-	-	-
	17	-	-	-	-	-	-	950	780	700	-	-	-
Plastics Tworzywa Sztuczne	20	50	45	-	-	-	-	-	-	-	55	45	-
	21	30	30	--	-	-	-	-	-	-	46	38	-
	22	50	45		-	-	-	-	-	-	55	45	-

Cutting Conditions / Parametry skrawania

	ae/De	fz mm/tooth			Speed factor Współczynnik prędkości
Radial infeed Zagłębianie	-	0.05	0.10	0.14	0.65
Side milling Frezowanie boczne	2%	0.21	0.44	0.65	1.20
	5%	0.14	0.28	0.41	1.10
	10%	0.10	0.20	0.30	1.00
	20%	0.07	0.14	0.21	0.90
	30%	0.06	0.12	0.18	0.85
Average chip thickness hm Średni przekrój wióra		0,03	0,06	0,09	-

TECHNICAL INFO INFORMACJA TECHNICZNA

T-SLOT MILLING CUTERS FREZY T-OWE

Material Materiał	D mm	Z	Vc [m/min]	fz [mm]	ap [mm]	RMP [min-1]	FEED [mm/min]
Alloy Steel Stal stopowa	50	2	160	0.18	5	1019	366
	63	2			6	808	290
	80	4			8	636	457
	100	5			10	509	450
	125	6			12	407	439
	160	8			16	318	457
	200	9			20	254	411
	250	12			25	203	438
High Alloy Steel Stal wysokostopowa	50	2	120	0.15	5	764	229
	63	2			6	606	181
	80	4			8	477	286
	100	5			10	382	286
	125	6			12	305	274
	160	8			16	238	285
	200	9			20	191	258
	250	12			25	152	273
Stainless steel Stal nierdzewna	50	2	70	0.18	5	445	160
	63	2			6	353	127
	80	4			8	278	200
	100	5			10	222	200
	125	6			12	178	192
	160	8			16	139	200
	200	9			20	111	179
	250	12			25	89	192
Grey Cast Iron Żeliwo szare	50	2	120	0.18	5	764	275
	63	2			6	606	318
	80	4			8	477	343
	100	5			10	382	343
	125	6			12	305	329
	160	8			16	238	342
	200	9			20	191	309
	250	12			25	152	328
Aluminium Aluminium	50	2	900	0.2	5	6 000	2400
	63	2			6	4 700	1880
	80	4			8	3 750	3000
	100	5			10	3 000	3000
	125	6			12	2 400	2 880
	160	8			16	1 850	3000
	200	9			20	1 500	2900
	250	12			25	1 200	2880

TECHNICAL INFO INFORMACJA TECHNICZNA

T-SLOT MILLING CUTERS FREZY T-OWE

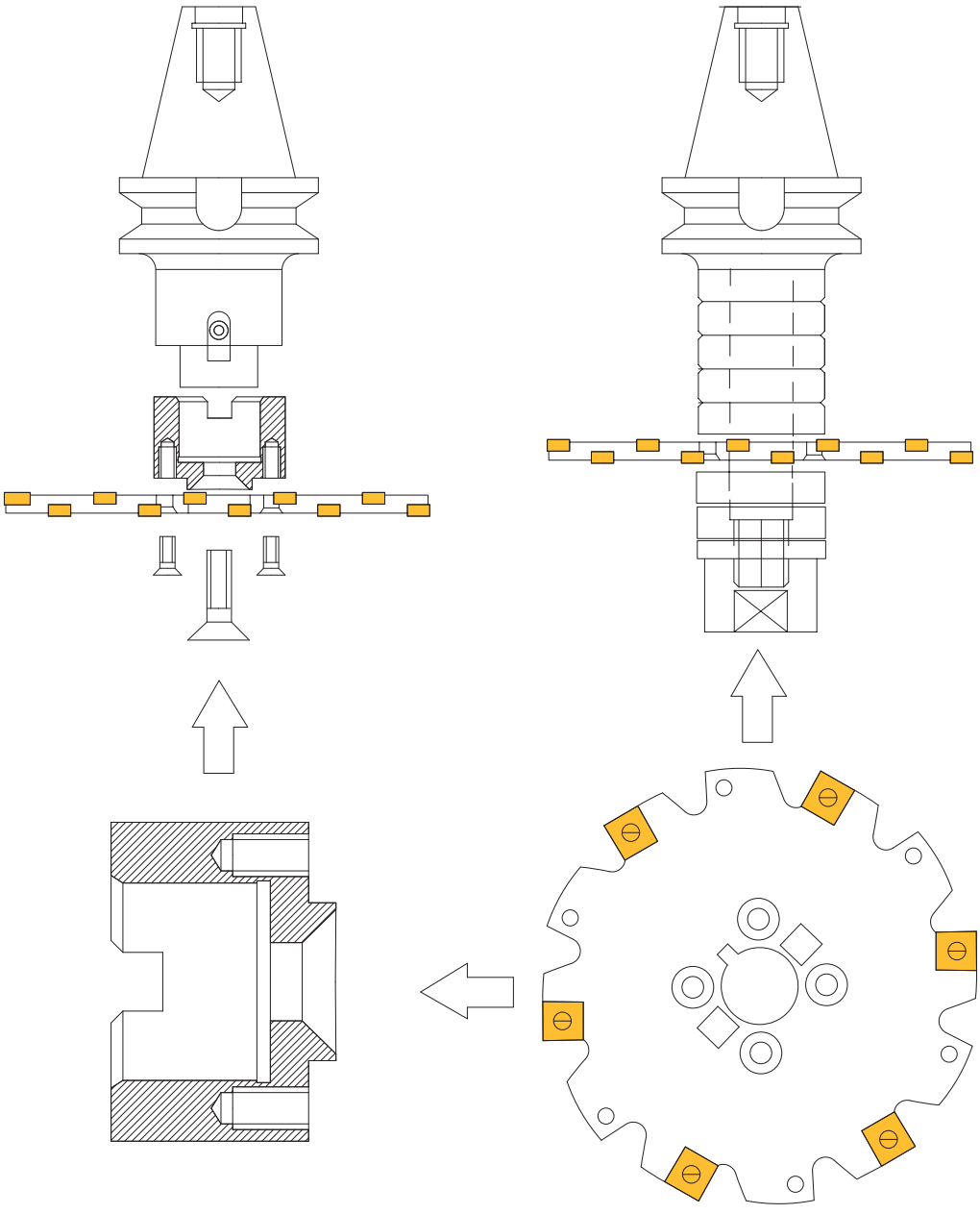
Material Materiał	D mm	Z	Vc [m/min]	fz [mm]	ap [mm]	RMP [min-1]	FEED [mm/min]
Ti alloy Stop tytanu	50	2	45	0.12	5	300	72
	63	2			6	235	56
	80	4			8	189	90
	100	5			10	150	90
	125	6			12	120	86
	160	8			16	94	90
	200	9			20	75	86
	250	12			25	60	86
Wood Drewno	50	2	1600	0.12	5	10 500	2500
	63	2			6	8 400	2000
	80	4			8	6600	3100
	100	5			10	5300	3100
	125	6			12	4200	3000
	160	8			16	3300	3400
	200	9			20	2600	2800
	250	12			25	2100	3000
Plastics Tworzywa Sztuczne	50	2	1800	0.14	5	12000	3360
	63	2			6	9400	2600
	80	4			8	7500	5700
	100	5			10	6000	4200
	125	6			12	4800	4000
	160	8			16	3750	3900
	200	9			20	3000	3780
	250	12			25	2400	4000

T-SLOT MILLING CUTERS FREZY T-OWE

PRODUCT INTRODUCTION
WPROWADZENIE DO PRODUKTU

M743 M744 T -slot transformer series
Seria T-owa z converterem

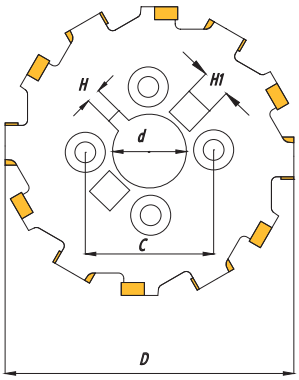
Dia. range 160-250mm AE 6-30mm

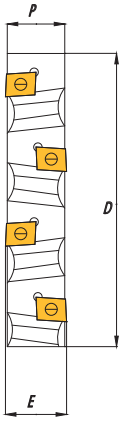


DISC MILLING CUTTERS FREZY TARCZOWE

M743





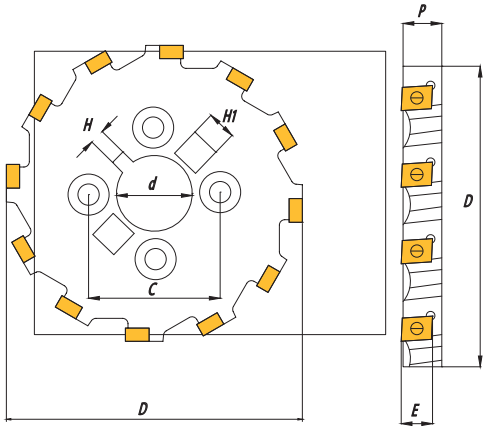


EDP No.	D	E	P	C	H	d	Z	Zc	KG	MAX RPM	**Insert** Płytka	**Screw** Śruba	**Wrench** Klucz
M743B16016320125SN10	160	14	12,5	52	8	32	16	8	1,7	6900	SNEX1005	SR232	W249
M743B16016320145SN10	160	16	14,5	52	8	32	16	8	1,7	6900	SNEX1005	SR232	W249
M743B16016320165SN13	160	18	16,5	52	8	32	16	8	1,9	6900	SNEX1305	SR232	W249
M743B16016320185SN13	160	20	18,5	52	8	32	16	8	2,0	6900	SNEX1305	SR232	W249
M743B16016320205SN13	160	22	20,5	52	8	32	16	8	2,1	6900	SNEX1305	SR232	W249
M743B16016320235SN16	160	25	23,5	52	8	32	16	8	2,3	6900	SNEX1605	SR232	W249
M743B16016320285SN16	160	30	28,5	52	8	32	16	8	2,5	6900	SNEX1605	SR232	W249
M743B20020400125SN10	200	14	12,5	70	10	40	20	10	1,9	6100	SNEX1005	SR232	W249
M743B20020400145SN10	200	16	14,5	70	10	40	20	10	2,1	6100	SNEX1005	SR232	W249
M743B20020400165SN13	200	18	16,5	70	10	40	20	10	2,3	6100	SNEX1305	SR232	W249
M743B20020400185SN13	200	20	18,5	70	10	40	20	10	2,5	6100	SNEX1305	SR232	W249
M743B20020400205SN13	200	22	20,5	70	10	40	20	10	2,7	6100	SNEX1305	SR232	W249
M743B20020400235SN16	200	25	23,5	70	10	40	20	10	3,0	6100	SNEX1605	SR232	W249
M743B20020400285SN16	200	30	28,5	70	10	40	20	10	3,5	6100	SNEX1605	SR232	W249
M743B25024400125SN10	250	14	12,5	70	10	40	24	12	2,9	5500	SNEX1005	SR232	W249
M743B25024400145SN10	250	16	14,5	70	10	40	24	12	3,1	5500	SNEX1005	SR232	W249
M743B25024400165SN13	250	18	16,5	70	10	40	24	12	3,2	5500	SNEX1305	SR232	W249
M743B25024400185SN13	250	20	18,5	70	10	40	24	12	3,5	5500	SNEX1305	SR232	W249
M743B25024400205SN13	250	22	20,5	70	10	40	24	12	3,9	5500	SNEX1305	SR232	W249
M743B25024400235SN16	250	25	23,5	70	10	40	24	12	4,2	5500	SNEX1605	SR232	W249
M743B25024400285SN16	250	30	28,5	70	10	40	24	12	4,5	5500	SNEX1605	SR232	W249

T-SLOT TRANSFORMER SERIES FREZY T-OWE SERIA Z CONVERTEREM

M744



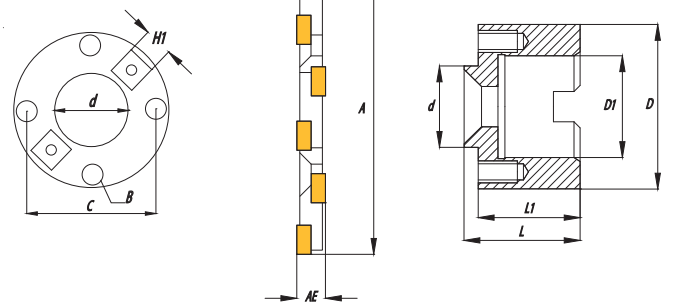


EDP No.	D	E	C	H	d	Z	KG	MAX RPM	Insert Płytka	Screw Śruba	Wrench Klucz
M744B16016320000LN13	160	12	52	8	32	16	1,9	6900	LNGX 1305	SR232	W249
M744B20020400000LN13	200	12	70	10	40	20	2,3	6100	LNGX 1306	SR235	W249
M744B25024400000LN13	250	12	70	10	40	24	3,2	5500	LNGX 1307	SC476	W249

DISC MILLING CUTTERS HOLDER UCHWYTY FREZARSKIE DYSKOWE

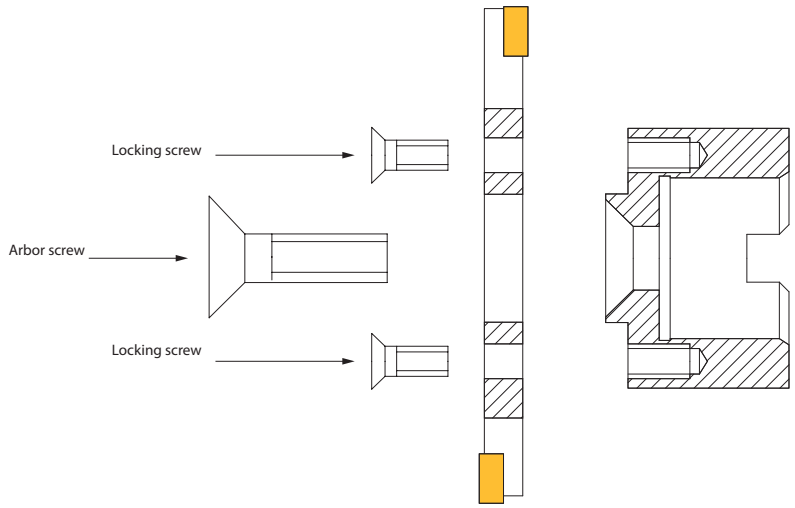
DNM





EDP No.	D	D1	d	C	B	L	L1	A	KG
DNM065320045	65	32	32	52		45	39,5	160	
DNM065318045	65	31,75	32	52		45	39,5	160	0,8
DNM065400045	65	40	32	52		45	39,5	160	
DNM065381045	65	38,1	32	52	8	45	39,5	160	
DNM090400050	90	40	40	70		50	44,5	200 250	
DNM090381050	90	38,1	40	70		50	44,5	200 250	1,2
DNM090508050	90	50,8	40	70		50	44,5	200 250	

MILLING CUTTER SPARE PARTS CZĘŚCI ZAMIENNE FREZÓW



Spare parts Części zamienne

Holders Uchwyty	**Screw** Śruba	**Arbor Screw** Śruba osiowa	**Holders** Uchwyty	**Screw** Śruba	**Arbor Screw** Śruba osiowa
M745B16016320050SN12	SC463	SC472	M743B16016320125SN10	SC464	SC472
M745B16016320070SN12			M743B16016320145SN10		
M745B16016320090SN12	SC464		M743B16016320165SN13	SC465	
M745B16016320110SN12			M743B16016320185SN13		
M745B20018400050SN12	SC463		M743B16016320205SN13	SC466	
M745B20018400070SN12			M743B16016320235SN16		
M745B20018400090SN12	SC464		M743B16016320285SN16	SC467	
M745B20018400110SN12			M743B20020400125SN10	SC464	
M745B25024400050SN12	SC463		M743B20020400145SN10		
M745B25024400070SN12			M743B20020400165SN13	SC465	
M745B25024400090SN12	SC464		M743B20020400185SN13		
M745B25024400110SN12			M743B20020400205SN13	SC466	
M744B16016320000LN13	SC465		M743B20020400235SN16		
M744B20020400000LN13			M743B20020400285SN16	SC467	
M744B25024400000LN13			M743B25024400125SN10	SC464	
			M743B25024400145SN10		
			M743B25024400165SN13	SC465	
			M743B25024400185SN13		
			M743B25024400205SN13	SC466	
			M743B25024400235SN16		
			M743B25024400285SN16	SC467	

PRODUCT INTRODUCTION WPROWADZENIE DO PRODUKTU

The inserts of groove & back milling cutter series can be used up to 4 times and 8 times.
Płytki do rowkowania oraz frezowania od tylu moga być użyte od 4 do 8 razy.

M730

Disc milling cutters
Frezy tarczowe



M732

T -slot milling cutters
Frezy T-owe



M734

T -slot milling cutters
Frezy T-owe

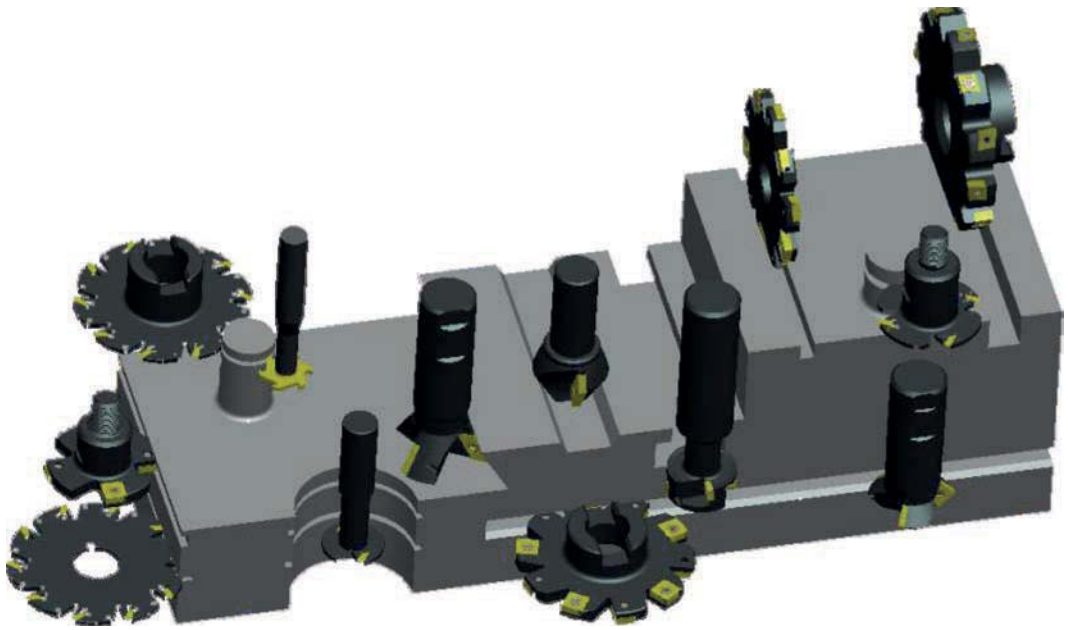


1. Machining (cutting} speed increases 3000Al - 500%
1. Prędkość obróbki wzrasta 300%-500%
2. Extending insert life with TIALN coating
2. Wydłużowa żywotność płytki pokrytej powłoką TiALN
3. Cut down the cost of cutting tools
3. Obniżenie kosztow narzędzi skrawających

PRODUCT INTRODUCTION WPROWADZENIE DO PRODUKTU

Slotting & grooving empire
Imprerium rowkowania

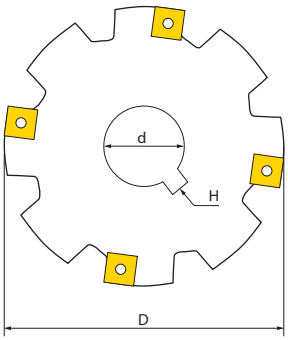
Dia. range 12-600mm
Ae 0.5-30mm



DISC MILLING CUTTERS FREZY TARCZOWE

M730



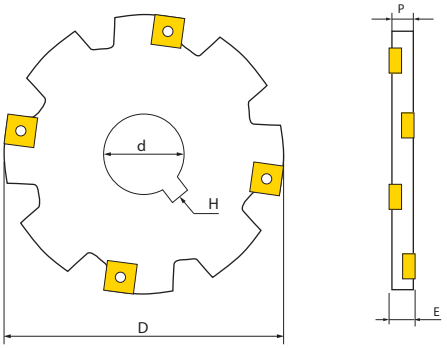


EDP No.	D	E	P	H	d1	Z	Zc	KG	MAX RPM	**Insert** Płytka	**Screw** Śruba	**Wrench** Klucz
M730B08008220034SN11	80	4	3,4	6,4	22	8	4	0,2	13700	SNEX1102	SC329	W218
M730B08008220042SN11	80	5	4,2	6,4	22	8	4	0,2	13700	SNEX1103	SC330	W254
M730B08008220050SN12	80	6	5	6,4	22	8	4	0,3	13700	SNEX1203	SC482	W249
M730B08008220060SN12	80	7	6	6,4	22	8	4	0,3	13700	SNEX1204	SC478	W249
M730B08008220070SN12	80	8	7	6,4	22	8	4	0,3	13700	SNEX12045	SC479	W249
M730B08008220090SN12	80	10	9	6,4	22	8	4	0,4	13700	SNEX1205	SC480	W249
M730B08008220110SN12	80	12	11	6,4	22	8	4	0,7	13700	SNEX1207	SC481	W249
M730B10010270034SN11	100	4	3,4	7	27	10	5	0,5	12000	SNEX1102	SC329	W218
M730B10010270042SN11	100	5	4,2	7	27	10	5	0,5	12000	SNEX1103	SC330	W254
M730B10010270050SN12	100	6	5	7	27	10	5	0,6	12000	SNEX1203	SC482	W249
M730B10010270060SN12	100	7	6	7	27	10	5	0,7	12000	SNEX1204	SC478	W249
M730B10010270070SN12	100	8	7	7	27	10	5	0,8	12000	SNEX12045	SC479	W249
M730B10010270090SN12	100	10	9	7	27	10	5	0,9	12000	SNEX1205	SC480	W249
M730B10010270110SN12	100	12	11	7	27	10	5	1,0	12000	SNEX1207	SC481	W249
M730B12512320034SN11	125	4	3,4	8	32	12	6	0,5	10900	SNEX1102	SC329	W218
M730B12512320042SN11	125	5	4,2	8	32	12	6	0,5	10900	SNEX1103	SC330	W254
M730B12512320050SN12	125	6	5	8	32	12	6	0,6	10900	SNEX1203	SC482	W249
M730B12512320060SN12	125	7	6	8	32	12	6	0,7	10900	SNEX1204	SC478	W249
M730B12512320070SN12	125	8	7	8	32	12	6	0,7	10900	SNEX12045	SC479	W249
M730B12512320090SN12	125	10	9	8	32	12	6	0,8	10900	SNEX1205	SC480	W249
M730B12512320110SN12	125	12	11	8	32	12	6	0,9	10900	SNEX1207	SC481	W249
M730B16016320034SN11	160	4	3,4	8	32	16	8	0,7	8300	SNEX1102	SC329	W218
M730B16016320042SN11	160	5	4,2	8	32	16	8	0,7	8300	SNEX1103	SC330	W254
M730B16016320050SN12	160	6	5	8	32	16	8	0,8	8300	SNEX1203	SC482	W249
M730B16016320060SN12	160	7	6	8	32	16	8	0,8	8300	SNEX1204	SC478	W249
M730B16016320070SN12	160	8	7	8	32	16	8	0,8	8300	SNEX12045	SC479	W249
M730B16016320090SN12	160	10	9	8	32	16	8	1,1	8300	SNEX1205	SC480	W249
M730B16016320110SN12	160	12	11	8	32	16	8	1,3	8300	SNEX1207	SC481	W249
M730B08008254034SN11	80	4	3,4	6,3	25,4	8	4	0,2	13700	SNEX1102	SC329	W218
M730B08008254042SN11	80	5	4,2	6,3	25,4	8	4	0,2	13700	SNEX1103	SC330	W254
M730B08008254050SN12	80	6	5	6,3	25,4	8	4	0,3	13700	SNEX1203	SC482	W249
M730B08008254060SN12	80	7	6	6,3	25,4	8	4	0,3	13700	SNEX1204	SC478	W249
M730B08008254070SN12	80	8	7	6,3	25,4	8	4	0,3	13700	SNEX12045	SC479	W249
M730B08008254090SN12	80	10	9	6,3	25,4	8	4	0,,4	13700	SNEX1205	SC480	W249

DISC MILLING CUTTERS FREZY TARCZOWE

M730



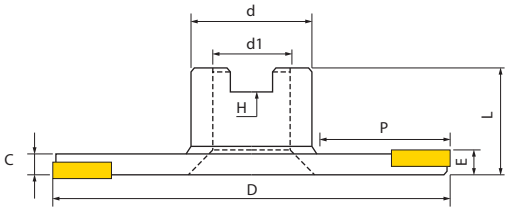


EDP No.	D	E	P	H	d1	Z	Zc	KG	MAX RPM	**Insert** Płytka	**Screw** Śruba	**Wrench** Klucz
M730B08008254110SN12	80	12	11	6,3	25,4	8	4	0,7	13700	SNEX1207	SC481	W249
M730B10010254034SN11	100	4	3,4	6,3	25,4	10	5	0,5	12000	SNEX1102	SC329	W218
M730B10010254042SN11	100	5	4,2	6,3	25,4	10	5	0,5	12000	SNEX1103	SC330	W254
M730B10010254050SN12	100	6	5	6,3	25,4	10	5	0,6	12000	SNEX1203	SC482	W249
M730B10010254060SN12	100	7	6	6,3	25,4	10	5	0,7	12000	SNEX1204	SC478	W249
M730B10010254070SN12	100	8	7	6,3	25,4	10	5	0,8	12000	SNEX12045	SC479	W249
M730B10010254090SN12	100	10	9	6,3	25,4	10	5	0,9	12000	SNEX1205	SC480	W249
M730B10010254110SN12	100	12	11	6,3	25,4	10	5	1,0	12000	SNEX1207	SC481	W249
M730B12512254034SN11	125	4	3,4	6,3	25,4	12	6	0,5	10900	SNEX1102	SC329	W218
M730B12512254042SN11	125	5	4,2	6,3	25,4	12	6	0,5	10900	SNEX1103	SC330	W254
M730B12512254050SN12	125	6	5	6,3	25,4	12	6	0,6	10900	SNEX1203	SC482	W249
M730B12512254060SN12	125	7	6	6,3	25,4	12	6	0,7	10900	SNEX1204	SC478	W249
M730B12512254070SN12	125	8	7	6,3	25,4	12	6	0,7	10900	SNEX12045	SC479	W249
M730B12512254090SN12	125	10	9	6,3	25,4	12	6	0,8	10900	SNEX1205	SC480	W249
M730B12512254110SN12	125	12	11	6,3	25,4	12	6	0,9	10900	SNEX1207	SC481	W249
M730B16016254034SN11	160	4	3,4	8	25,4	16	8	0,7	8300	SNEX1102	SC329	W218
M730B16016254042SN11	160	5	4,2	8	25,4	16	8	0,7	8300	SNEX1103	SC330	W254
M730B16016254050SN12	160	6	5	8	25,4	16	8	0,8	8300	SNEX1203	SC482	W249
M730B16016254060SN12	160	7	6	8	25,4	16	8	0,8	8300	SNEX1204	SC478	W249
M730B16016254070SN12	160	8	7	8	25,4	16	8	0,8	8300	SNEX12045	SC479	W249
M730B16016254090SN12	160	10	9	8	25,4	16	8	1,1	8300	SNEX1205	SC480	W249
M730B16016254110SN12	160	12	11	8	25,4	16	8	1,3	8300	SNEX1207	SC481	W249
M730B16016318034SN11	160	4	3,4	8	31,75	16	8	0,7	8300	SNEX1102	SC329	W218
M730B16016318042SN11	160	5	4,2	8	31,75	16	8	0,7	8300	SNEX1103	SC330	W254
M730B16016318050SN12	160	6	5	8	31,75	16	8	0,8	8300	SNEX1203	SC482	W249
M730B16016318060SN12	160	7	6	8	31,75	16	8	0,8	8300	SNEX1204	SC478	W249
M730B16016318070SN12	160	8	7	8	31,75	16	8	0,,8	8300	SNEX12045	SC479	W249
M730B16016318090SN12	160	10	9	8	31,75	16	8	1,1	8300	SNEX1205	SC480	W249
M730B16016318110SN12	160	12	11	8	31,75	16	8	1,3	8300	SNEX1207	SC481	W249

T-SLOT MILLING CUTERS FREZY T-OWE

M732



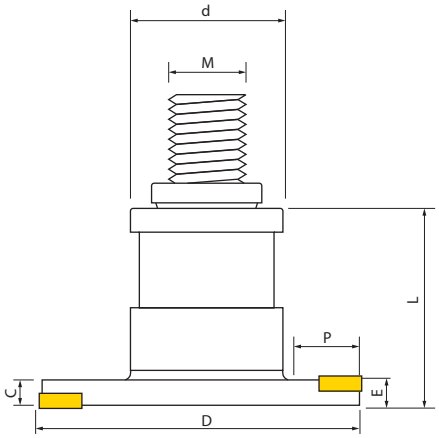


EDP No.	D	E	P	C	H	d1	Z	Zc	KG	MAX RPM	**Insert** Płytka	**Screw** Śruba	**Wrench** Klucz
M732B0800822050SN12	80	6	16.5	5	40	22	8	4	0.6	13700	SNEX 1203	SC331	W222
M732B0800822060SN12	80	7	16.5	6	40	22	8	4	0.6	13700	SNEX 1204	SC332	W222
M732B0800822070SN12	80	8	16.5	7	40	22	8	4	0.6	13700	SNEX 12045	SC332	W222
M732B0800822090SN12	80	10	16.5	9	40	22	8	4	0.8	13700	SNEX 1205	SC333	W222
M732B1001027050SN12	100	6	26.5	5	40	27	10	5	0.7	12000	SNEX 1203	SC331	W222
M732B1001027060SN12	100	7	26.5	6	40	27	10	5	0.7	12000	SNEX 1204	SC332	W222
M732B1001027070SN12	100	8	26.5	7	40	27	10	5	0.8	12000	SNEX 12045	SC332	W222
M732B1001027090SN12	100	10	26.5	9	40	27	10	5	0.8	12000	SNEX 1205	SC333	W222
M732B10010270110SN1	100	12	26.5	11	40	27	10	5	0.9	12000	SNEX 1207	SC334	W222
M732B1251232050SN12	125	6	30.5	5	55	32	12	6	1.5	10900	SNEX 1203	SC331	W222
M732B1251232060SN12	125	7	30.5	6	55	32	12	6	1.5	10900	SNEX 1204	SC332	W222
M732B1251232070SN12	125	8	30.5	7	55	32	12	6	1.5	10900	SNEX 12045	SC332	W222
M732B1251232090SN12	125	10	30.5	9	55	32	12	6	1.6	10900	SNEX 1205	SC333	W222
M732B1251232110SN12	125	12	30.5	11	55	32	12	6	1.6	10900	SNEX 1207	SC334	W222
M732B1601632050SN12	160	6	48.0	5	55	32	16	8	2.0	8300	SNEX 1203	SC331	W222
M732B1601632060SN12	160	7	48.0	6	55	32	16	8	2.0	8300	SNEX 1204	SC332	W222
M732B1601632070SN12	160	8	48.0	7	55	32	16	8	2.0	8300	SNEX 12045	SC332	W222
M732B1601632090SN12	160	10	48.0	9	55	32	16	8	2.1	8300	SNEX 1205	SC333	W222
M732B1601632110SN12	160	12	48.0	11	55	32	16	8	2.1	8300	SNEX 1207	SC334	W222

T-SLOT MILLING CUTERS FREZY T-OWE

M734





EDP No.	D	E	P	C	d	M	L	Z	Zc	KG	MAX RPM	**Insert** Płytka	**Screw** Śruba	**Wrench** Klucz
M734B05004M12034SN11	50	4	13	3.4	24	12	25	4	2	0.2	17000	SNEX -1102	SC329	W221
M734B05004M12042SN11	50	5	13	4.2	24	12	25	4	2	0.2	17000	SNEX -1103	SC330	W221
M734B05004M12050SN12	50	6	13	5.0	24	12	25	4	2	0.2	17000	SNEX -1203	SC331	W222
M734B05004M12070SN12	50	7/8	13	7.0	24	12	25	4	2	0.6	17000	SNEX -12045	SC332	W222
M734B05004M12090SN12	50	10	13	9.0	24	12	25	4	2	0.8	17000	SNEX -1205	SC333	W222
M734B06304M16034SN11	63	4	16	3.4	31	16	25	4	2	0.2	15000	SNEX -1102	SC329	W221
M734B06304M16042SN11	63	5	16	4.2	31	16	25	4	2	0.3	15000	SNEX -1103	SC330	W221
M734B06304M16050SN12	63	6	16	5.0	31	16	25	4	2	0.3	15000	SNEX -1203	SC331	W222
M734B06304M16070SN12	63	7/8	16	7.0	31	16	25	4	2	0.6	15000	SNEX -12045	SC332	W222
M734B06304M16090SN12	63	10	16	9.0	31	16	25	4	2	0.8	15000	SNEX -1205	SC333	W222

PRODUCT INTRODUCTION WPROWADZENIE DO PRODUKTU

The inserts of groove & back milling cutter series can be used up to 4 times.
Płytki do rowkowania oraz frezowania od tyłu mogą być użyte 4razy.

M739

Disc milling cutters
Frezy tarczowe



M740

T -slot milling cutters
Frezy T-owe

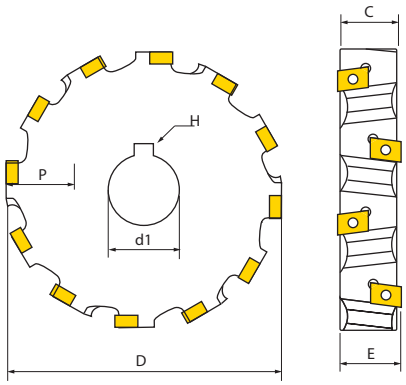


1. Machining (cutting} speed increases 3000Al - 500%
1. Prędkość obróbki wzrasta 300%-500%
2. Extending insert life with TIALN coating
2. Wydłużowa żywotność płytki pokrytej powłoką TiALN
3. Cut down the cost of cutting tools
3. Obniżenie kosztow narzędzi skrawających

DISC MILLING CUTTERS FREZY TARCZOWE

M739



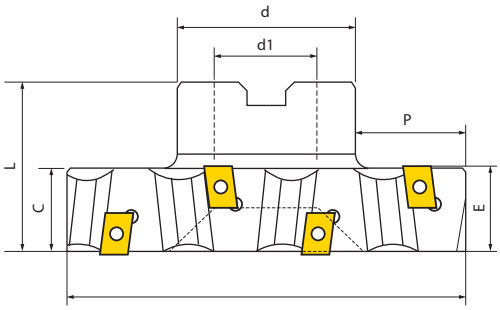


EDP No.	D	E	P	C	H	d1	Z	Zc	KG	MAX RPM	**Insert** Płytka	**Screw** Śruba	**Wrench** Klucz
M739B0800822140LN10	80	14	16	12.5	7	22	8	4	0.65	13700	LNGX 1005	SC336	W218
M739B0800822160LN10	80	16	16	14.5	7	22	8	4	0.7	13700	LNGX 1005	SC336	W218
M739B0800822180LN10	80	18	16	16.5	7	22	8	4	0.8	13700	LNGX 1305	SC336	W218
M739B0800822200LN13	80	20	16	18.5	7	22	8	4	1.0	13700	LNGX 1305	SC336	W218
M739B0800822220LN13	80	22	16	20.5	7	22	8	4	1.2	13700	LNGX 1305	SC336	W218
M739B0800822250LN16	80	25	16	23.5	7	22	8	4	1.4	13700	LNGX 1605	SC336	W218
M739B0800822300LN16	80	30	16	28.5	7	22	8	4	1.5	13700	LNGX 1605	SC336	W218
M739B1001027140LN10	100	14	26	12.5	7	27	10	5	0.9	12000	LNGX 1005	SC336	W218
M739B1001027160LN10	100	16	26	14.5	7	27	10	5	1.0	12000	LNGX 1005	SC336	W218
M739B1001027180LN10	100	18	26	16.5	7	27	10	5	1.1	12000	LNGX 1305	SC336	W218
M739B1001027200LN13	100	20	26	18.5	7	27	10	5	1.2	12000	LNGX 1305	SC336	W218
M739B1001027220LN13	100	22	26	20.5	7	27	10	5	1.4	12000	LNGX 1305	SC336	W218
M739B1001027250LN16	100	25	26	23.5	7	27	10	5	1.6	12000	LNGX 1605	SC336	W218
M739B1001027300LN16	100	30	26	28.5	7	27	10	5	1.9	12000	LNGX 1605	SC336	W218
M739B1251232140LN10	125	14	30	12.5	8	32	12	6	1.3	10900	LNGX 1005	SC336	W218
M739B1251232160LN10	125	16	30	14.5	8	32	12	6	1.5	10900	LNGX 1005	SC336	W218
M739B1251232180LN10	125	18	30	16.5	8	32	12	6	1.7	10900	LNGX 1305	SC336	W218
M739B1251232200LN13	125	20	30	18.5	8	32	12	6	1.9	10900	LNGX 1305	SC336	W218
M739B1251232220LN13	125	22	30	20.5	8	32	12	6	2.3	10900	LNGX 1305	SC336	W218
M739B1251232250LN16	125	25	30	23.5	8	32	12	6	2.5	10900	LNGX 1605	SC336	W218
M739B1251232300LN16	125	30	30	28.5	8	32	12	6	2.8	10900	LNGX 1605	SC336	W218

T-SLOT MILLING CUTERS FREZY T-OWE

M740



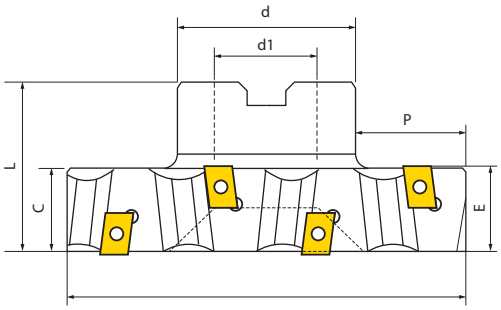


EDP No.	D	E	P	C	d	d1	L	Z	Zc	KG	MAX RPM	**Insert** Płytka	**Screw** Śruba	**Wrench** Klucz
M740B0800822125LN10	80	14	16.5	12.5	40	22	35	8	4	0.75	13700	LNGX 1005	SC336	W218
M740B0800822145LN10	80	16	16.5	14.5	40	22	35	8	4	0.8	13700	LNGX 1005	SC336	W218
M740B0800822165LN10	80	18	16.5	16.5	40	22	35	8	4	0.9	13700	LNGX 1305	SC336	W218
M740B0800822185LN13	80	20	16.5	18.5	40	22	35	8	4	1.1	13700	LNGX 1305	SC336	W218
M740B0800822205LN13	80	22	16.5	20.5	40	22	35	8	4	1.3	13700	LNGX 1305	SC336	W218
M740B0800822235LN16	80	25	16.5	23.5	40	22	35	8	4	1.55	13700	LNGX 1605	SC336	W218
M740B0800822285LN16	80	30	16.6	28.5	40	22	40	8	4	1.7	13700	LNGX 1605	SC336	W218
M740B1001027125LN10	100	14	26.5	12.5	45	27	35	10	5	1.0	12000	LNGX 1005	SC336	W218
M740B1001027145LN10	100	16	26.5	14.5	45	27	35	10	5	1.1	12000	LNGX 1005	SC336	W218
M740B1001027165LN10	100	18	26.5	16.5	45	27	35	10	5	1.2	12000	LNGX 1305	SC336	W218
M740B1001027185LN13	100	20	26.5	18.5	45	27	35	10	5	1.3	12000	LNGX 1305	SC336	W218
M740B1001027205LN13	100	22	26.5	20.5	45	27	35	10	5	1.6	12000	LNGX 1305	SC336	W218
M740B1001027235LN16	100	25	26.5	23.5	45	27	35	10	5	1.8	12000	LNGX 1605	SC336	W218
M740B1001027285LN16	100	30	26.5	28.5	45	27	40	10	5	2.3	12000	LNGX 1605	SC336	W218
M740B1251232125LN10	125	14	30	12.5	55	32	35	12	6	1.5	10900	LNGX 1005	SC336	W218
M740B1251232145LN10	125	16	30	14.5	55	32	35	12	6	1.7	10900	LNGX 1005	SC336	W218
M740B1251232165LN10	125	18	30	16.5	55	32	35	12	6	1.9	10900	LNGX 1305	SC336	W218
M740B1251232185LN13	125	20	30	18.5	55	32	35	12	6	2.1	10900	LNGX 1305	SC336	W218
M740B1251232205LN13	125	22	30	20.5	55	32	35	12	6	2.5	10900	LNGX 1305	SC336	W218
M740B1251232235LN16	125	25	30	23.5	55	32	35	12	6	2.8	10900	LNGX 1605	SC336	W218
M740B1251232285LN16	125	30	30	28.5	55	32	40	12	6	3.4	10900	LNGX 1605	SC336	W218
M740B1601632125LN10	160	14	48	12.5	60	32	35	16	8	1.5	6900	LNGX 1005	SC336	W218
M740B1601632145LN10	160	16	48	14.5	60	32	35	16	8	1.8	6900	LNGX 1005	SC336	W218
M740B1601632165LN10	160	18	48	16.5	60	32	35	16	8	2.0	6900	LNGX 1305	SC336	W218
M740B1601632185LN13	160	20	48	18.5	60	32	35	16	8	2.3	6900	LNGX 1305	SC336	W218
M740B1601632205LN13	160	22	48	20.5	60	32	35	16	8	2.7	6900	LNGX 1305	SC336	W218

T-SLOT MILLING CUTERS FREZY T-OWE

M740





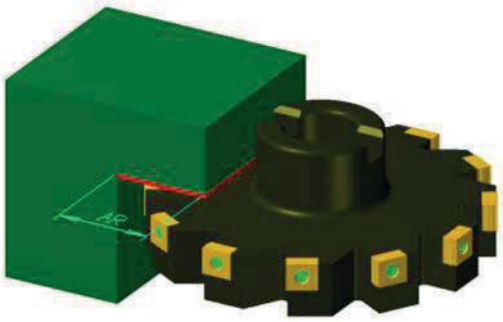
EDP No.	D	E	P	C	d	d1	L	Z	Zc	KG	MAX RPM	**Insert** Płytka	**Screw** Śruba	**Wrench** Klucz
M740B1601632235LN16	160	25	48	23.5	60	32	35	16	8	3.0	6900	LNGX 1605	SC336	W218
M740B1601632285LN16	160	30	48	28.5	60	32	40	16	8	3.3	6900	LNGX 1605	SC336	W218
M740B2002040125LN10	200	14	65	12.5	70	40	40	20	10	2.2	6100	LNGX 1005	SC336	W218
M740B2002040145LN10	200	16	65	14.5	70	40	40	20	10	2.4	6100	LNGX 1005	SC336	W218
M740B2002040165LN10	200	18	65	16.5	70	40	40	20	10	2.8	6100	LNGX 1305	SC336	W218
M740B2002040185LN13	200	20	65	18.5	70	40	40	20	10	3.2	6100	LNGX 1305	SC336	W218
M740B2002040205LN13	200	22	65	20.5	70	40	40	20	10	3.5	6100	LNGX 1305	SC336	W218
M740B2002040235LN16	200	25	65	23.5	70	40	40	20	10	3.7	6100	LNGX 1605	SC336	W218
M740B2002040285LN16	200	30	65	28.5	70	40	40	20	10	4.0	6100	LNGX 1605	SC336	W218
M740B2502440125LN10	250	14	82	12.5	85	40	40	24	12	3.5	5500	LNGX 1005	SC336	W218
M740B2502440145LN10	250	16	82	14.5	85	40	40	24	12	3.8	5500	LNGX 1005	SC336	W218
M740B2502440165LN10	250	18	82	16.5	85	40	40	24	12	4.2	5500	LNGX 1305	SC336	W218
M740B2502440185LN13	250	20	82	18.5	85	40	40	24	12	4.5	5500	LNGX 1305	SC336	W218
M740B2502440205LN13	250	22	82	20.5	85	40	40	24	12	4.8	5500	LNGX 1305	SC336	W218
M740B2502440235LN16	250	25	82	23.5	85	40	40	24	12	5.0	5500	LNGX 1605	SC336	W218
M740B2502440285LN16	250	30	82	28.5	85	40	40	24	12	5.5	5500	LNGX 1605	SC336	W218

PRODUCT INTRODUCTION WPROWADZENIE DO PRODUKTU

The inserts of back milling and side grooving cutter can be used up to 4 times
Płytki do rowkowania oraz frezowania od tylu moga być użyte 4 razy.

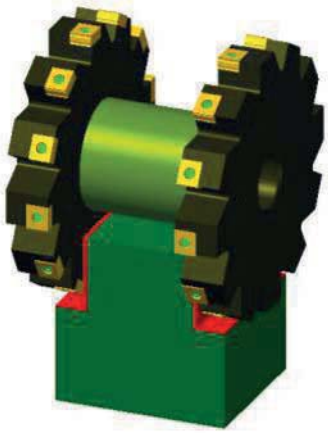
M746 T -slot transformer series - reverse side cutter

Frezy T-owe z seri z conwerterem- odwrotna strona freza



M753 M754 T -slot transformer series - double side groove cutter

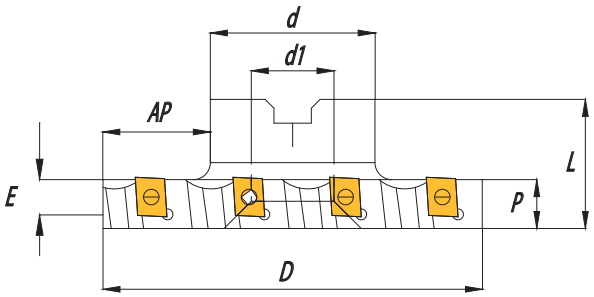
Frezy T-owe z seri - frezy dwustronne



T-SLOT TRANSFORMER SERIES - REVERSE SIDE CUTTER

M746



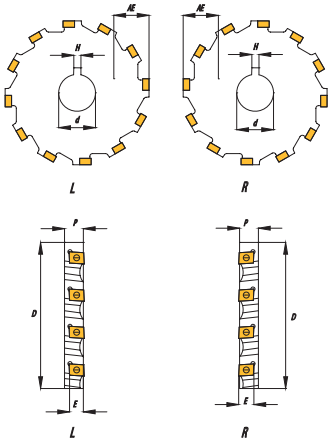


EDP No.	D	E	P	d	d1	L	Z	KG	MAX RPM	Insert Płytka	Screw Śruba	Wrench Klucz
M746B10010450165LN13	100	12	16,5	45	27	35	10	1,3	12000	LNGX1305	SR232	W249
M746B12512550165LN13	125	12	16,5	55	32	35	12	1,9	10900	LNGX1305	SR235	W249

T-SLOT TRANSFORMER SERIES - DOUBLE SIDE GROOVE CUTTER

M753
M754



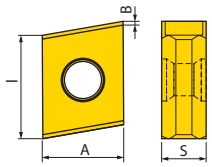


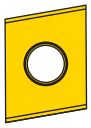
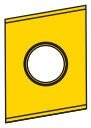
EDP No.	D	E	P	d	H	L/R	Z	KG	MAX RPM	Insert Płytka	Screw Śruba	Wrench Klucz
M753B10010270165LN13	100	12	16,5	27	7	L	10	1,1	12000	LNGX1305	SR232	W249
M753B10010270165LN13	100	12	16,5	27	7	R	10		12000	LNGX1305	SR232	W249
M753B12512320165LN13	125	12	16,5	32	8	L	12	1,7	10900	LNGX1305	SR232	W249
M754B12512320165LN13	125	12	16,5	32	8	R	12		10900	LNGX1305	SR232	W249
M753B16016400165LN13	160	12	16,5	40	10	L	16	1,9	6900	LNGX1305	SR232	W249
M754B16016400165LN13	160	12	16,5	40	10	R	16		6900	LNGX1305	SR232	W249

INSERT PYTKI

Milling Inserts Płytki do frezowania

LNGX



Insert shape Krztałt płytki	Type Typ	Dimensions Wymiary (mm)				Coating						Cermet						Uncoated					
		Cutting rake Kąt cięcia	S	I	A	P322	P323	P324				P326						P327	P329				
 C331	LNGX 1005 C331	20°	5.4	10.0	10			•															
	LNGX 1305 C331		5.4	12.7	10			•															
	LNGX 1605 C331		5.4	16.0	10			•															
 C337	LNGX 1005 C337	15°	5.4	10.0	10		•					•											
	LNGX 1305 C337		5.4	12.7	10		•					•											
	LNGX 1305 C337		5.4	16.0	10		•					•											

TECHNICAL INFO INFORMACJA TECHNICZNA

Series Seria - LNGX

Material Materiał	Material group No.	Recom. feed fz mm/tooth ae/ Dc=10%	LNGX 1005	LNGX 1305
Steel Stal	1	0.2-0.4	LNGX 1005T-C420,P323 LNGX 1005T-C420,P326	LNGX 1305T-C420P323 LNGX 1305T-C420P326
	2			
	3	0.2-0.35		
	4			
	5	0.2-0.32	LNGX 1005T-C420.P326	LNGX 1305T-C420.P326
	6			
Hardened Steel Stal hartowana	7	0.15-0.3		
Stainless Steel Stal nierdzewna	8	0.2-0.4	LNGX 1005T-C420.P326	LNGX 1305T-C420.P326
	9			
	10	0.2-0.33		
	11			
Cast Iron Żeliwo	12	0.22-0.4	LNGX 1005T-C420.P324	LNGX 1305T-C420.P324
	13			
	14	0.2-0.35		
	15			
Non-ferrous materials Materiały nieżelazne	16	0.22-0.42	LNGX 1005T-C318.P324	LNGX 1305T-C318.P324
	17			
Plastics Tworzywa Sztuczne	20	0.2-0.3	LNGX 1005T-C420.P323 LNGX 1005T-C420,P326	LNGX 1305T-C420.P323 LNGX 1305T-C420,P326
	21	0.15-0.25		
	22	0.2-0.25		

Cutting data- 10% engagement width(ac/De=10%)
Dane skrawania -10%

TECHNICAL INFO INFORMACJA TECHNICZNA

Cutting Conditions / Parametry skrawania (ae/De=10%)

Material Materiał	Group № N° Grup	Grade Gatunek													
		P321			P323			P324			P324-C318			P326		
		Vc (m/min)														
		0,15	0,20	0,40	0,15	0,20	0,40	0,15	0,20	0,40	0,15	0,20	0,40	0,15	0,20	0,40
Steel Stal	1	-	-	-	162	140	123	-	-	-	-	-	-	162	140	123
	2	-	-	-	146	123	109	-	-	-	-	-	-	146	123	105
	3	-	-	-	120	101	92	-	-	-	-	-	-	120	101	92
	4	-	-	-	109	92	84	-	-	-	-	-	-	109	92	84
	5	-	-	-	90	78	70	-	-	-	-	-	-	90	78	70
	6	-	-	-	64	56	-	-	-	-	-	-	-	63	56	-
Hardened Steel Stal hartowana	7	-	-	-	28	-	-	-	-	-	-	-	-	-	-	-
Stainless Steel Stal nierdzewna	8	-	-	-	112	95	87	-	-	-	-	-	-	112	95	87
	9	-	-	-	98	84	76	-	-	-	-	-	-	98	84	76
	10	-	-	-	84	70	64	-	-	-	-	-	-	84	70	64
	11	-	-	-	64	56	-	-	-	-	-	-	-	64	56	-
Cast Iron Żeliwo	12	-	-	-	-	-	-	140	119	105	-	-	-	-	-	-
	13	-	-	-	-	-	-	126	105	98	-	-	-	-	-	-
	14	-	-	-	-	-	-	119	98	91	-	-	-	-	-	-
	15	-	-	-	-	-	-	91	84		-	-	-	-	-	-
Non-ferrous materials Materiały nieżelazne	16	-	-	-	-	-	-	-	-	-	800	680	610	-	-	-
	17	-	-	-	-	-	-	-	-	-	465	550	490	-	-	-
Plastics Tworzywa Sztuczne	20	-	-	-	40	37	-	-	-	-	-	-	-	40	37	-
	21	-	-	-	35	30	-	-	-	-	-	-	-	35	30	-
	22	-	-	-	40	37	-	-	-	-	-	-	-	40	37	-

Cutting Conditions / Parametry skrawania

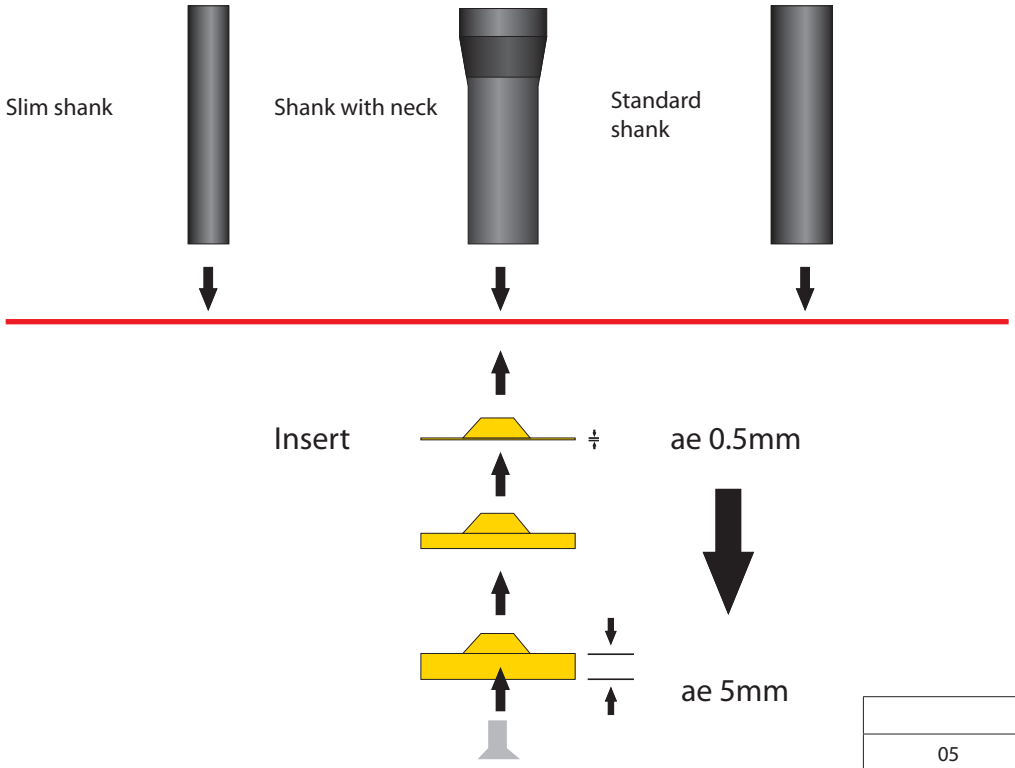
Operations Operacje	ae/De	fz mm/tooth			Speed factor Współczynnik prędkości
Radial infeed zagłębianie	-	0.08	0.12	0.20	0.65
Side milling Frezowanie boczne	2%	0.35	0.55	0.92	1.20
	5%	0.23	0.35	0.59	1.10
	10%	0.16	0.25	0.42	1.00
	20%	0.12	0.18	0.30	0.90
	30%	0.10	0.15	0.25	0.85
Average chip thickness hm Średni przekrój wióra		0.05	0.08	0.13	-

TECHNICAL INFO INFORMACJA TECHNICZNA

T-SLOT MILLING CUTERS FREZY T-OWE

Material Materiał	D mm	Z	Vc [m/min]	fz [mm]	ap [mm]	RMP [min-1]	FEED [mm/min]
Alloy Steel Stal stopowa	80	4	160	0.2	15	636	509
	100	5				509	509
	125	6				407	489
	160	8			20	318	509
	200	10				254	509
	250	12			30	203	489
High Alloy Steel Stal wysokostopowa	80	4	120	0.18	15	477	343
	100	5				382	343
	125	6				305	330
	160	8			20	238	343
	200	10				191	343
	250	12			30	152	330
Stainless steel Stal nierdzewna	80	4	70	0.2	15	278	222
	100	5				222	222
	125	6				178	214
	160	8			20	139	222
	200	10				111	222
	250	12			30	89	214
Grey Cast Iron Żeliwo szare	80	4	120	0.2	15	477	382
	100	5				382	382
	125	6				305	366
	160	8			20	238	382
	200	10				191	382
	250	12			30	152	366
Aluminium Aluminium	80	4	800	0.25	15	3200	3200
	100	5				2580	3220
	125	6				2060	3090
	160	8			20	1600	3200
	200	10				1290	3200
	250	12			30	1032	3090
Ti alloy Stop tytanu	80	4	40	0.12	10	161	77
	100	5				129	77
	125	6				103	74
	160	8			15	80	77
	200	10				64	77
	250	12			20	51	73

TLC MILING CUTTERS
NOŻE FREZARSKIE



Example insert order code
Przykładowy kod zamówienia płytki

Insert code Kod płytki	D	s	ae	Z	Chamfer Łamacz
TRTF	12	06	xxx	04	C318

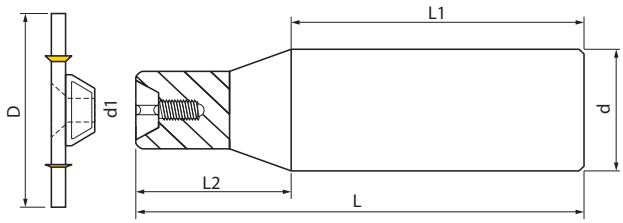
D - insert diameter średnica płytki
AE - insert thickness grubość płytki
Z - number of teeth ilość zębów

AE	
05	0.5
06	0.6
07	0.7
08	0.8
09	0.9
10	1.0
11	1.1
12	1.2
13	1.3
14	1.4
15	1.5
16	1.6
17	1.7
18	1.8
19	1.9
20	2.0
22	2.2
25	2.5
30	3.0
40	4.0
50	5.0

T-SLOT MILLING CUTERS FREZY T-OWE

TLC Shank with neck Uchwyt z zwężaną szyjką





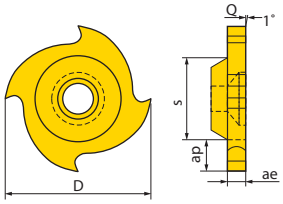
EDP No	AR	D	d	d1	L	L1	Q	Screw Śruba	Wrench Klucz
TLC01206040	2,5	12	6	5,9	40	10	-	SC319	W218
TLC01206055	2,5	12	6	5,9	55	10	-	SC319	W218
TLC01208060	1,5	12	8	7,9	60	10	-	SC319	W218
TLC01208080	1,5	12	8	7,9	80	10	-	SC319	W218
TLC01210070	2,5	12	10	5,9	70	15	1°	SC319	W218
TLC01210100	2,5	12	10	5,9	100	20	1°	SC319	W218
TLC01210101	1,5	12	10	7,9	100	30	1°	SC319	W218
TLC01508040	3	15	8	7,9	40	10	-	SC319	W218
TLC01508055	3	15	8	7,9	55	10	-	SC319	W218
TLC01510070	2	15	10	9,9	70	10	-	SC319	W218
TLC01510090	2	15	10	9,9	90	10	-	SC319	W218
TLC01512090	3	15	12	7,9	90	25	1°	SC319	W218
TLC01512110	3	15	12	7,9	110	30	1°	SC319	W218
TLC01512120	3	15	12	9,9	120	30	1°	SC319	W218
TLC02010050	4,5	20	10	9,9	50	10	-	SC319	W218
TLC02010065	4,5	20	10	9,9	65	10	-	SC319	W218
TLC02012080	3,5	20	12	11,9	80	10	-	SC319	W218
TLC02012100	3,5	20	12	11,9	100	10	-	SC319	W218
TLC02012120	4,5	20	12	9,9	120	30	1°	SC319	W218
TLC02016090	4,5	20	16	9,9	90	25	1°	SC319	W218
TLC02016150	3,5	20	16	11,9	150	30	1°	SC319	W218
TLC02510050	7	25	10	9,9	50	10	-	SC319	W218
TLC02510065	7	25	10	9,9	65	10	-	SC319	W218
TLC02512080	6	25	12	11,9	80	10	-	SC319	W218
TLC02512100	6	25	12	11,9	100	10	-	SC319	W218
TLC02512120	7	25	12	9,9	120	30	1°	SC319	W218
TLC02516090	7	25	16	9,9	90	25	1°	SC319	W218
TLC02516150	6	25	16	11,9	150	30	1°	SC319	W218
TLC03012065	8,5	30	12	11,9	65	15	-	SC319	W218
TLC03012080	8,5	30	12	11,9	80	15	-	SC319	W218
TLC03016120	6,5	30	16	15,9	120	15	-	SC319	W218
TLC03016150	6,5	30	16	15,9	150	15	-	SC319	W218
TLC03016100	8,5	30	16	11,9	100	25	1°	SC319	W218
TLC03016151	8,5	30	16	11,9	150	30	1°	SC319	W218
TLC03020180	6,5	30	20	15,9	180	30	1°	SC319	W218

INSERTS PŁYTKI

Milling Inserts Płytki do frezowania

TRTF

4 teeth-4 zębów 4зубн.




C318

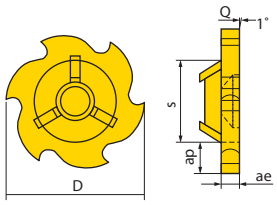

C319

Insert Shape	Type	Basic Dimensions (mm)					Coating						Cermet						Uncoated					
		D	s	ae	ap	Z	P321	P322	P323	P324			P325	P326					P327	P328				
	TRTF120604-C318	12	5,9	0,5 -3,0	2,5	4													•					
	TRTF120604-C319	12	5,9	0,5 -3,0	2,5	4				•														
	TRTF150804-C318	15	7,9	0,5 -3,0	3,0	4													•					
	TRTF150804-C319	15	7,9	0,5 -3,0	3,0	4				•														

Milling Inserts Płytki do frezowania

TRTF

6 teeth-6 zębów



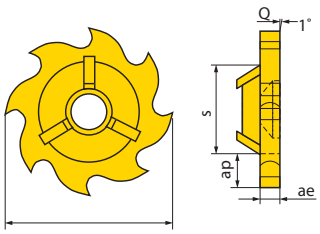

C318


C319

Insert Shape	Type	Basic Dimensions (mm)					Coating						Cermet						Uncoated					
		D	s	ae	ap	Z	P321	P322	P323	P324			P325	P326					P327	P328				
	TRTF201006-C318	20	9,9	0,5 -5,0	4,5	6													•					
	TRTF201006-C319	20	9,9	0,5 -5,0	4,5	6				•														
	TRTF251006-C318	25	9,9	0,5 -5,0	7,0	6													•					
	TRTF251006-C319	25	9,9	0,5 -5,0	7,0	6				•														

INSERTS PŁYTKI

Milling Inserts Płytki do frezowania



TRTF
8 teeth-8 zębów

C318

C319

Insert Shape	Type	Basic Dimensions (mm)					Coating						Cermet						Uncoated					
		D	s	ae	ap	Z	P321	P322	P323	P324			P325	P326					P327	P328				
	TRTF301208-C318	30	11,9	0,8 -5,0	8,0	8													•					
	TRTF301208-C319	30	11,9	0,8 -5,0	8,0	8				•														

C318

Material Materiał

Aluminium Aluminium
Bakelite Bakelit
Acrylic Akryl
Plastic Plastilk
Paper Papier
Copper Miedź

C319

Material Materiał

Steel Stal
Stainless steel Stal nierdzewna
Stainless steel pipe Rura ze stali nierdzewnej
Cast Iron Żeliwo
Difficult cuting material Trudno obrabialne materiały

TECHNICAL INFO INFORMACJA TECHNICZNA

Series Seria - TLC

Material Materiał	Material group No.	Recom. feed fz mm/tooth ae/ Dc=10%	TRTF C318	TRTF C319
Steel Stal	1	0.14-0.30	P326	
	2	0.14-0.25	P326	
	3	0.14-0.22	P326	
	4	0.14-0.22	P326	
	5	0.14-0.20	P326	
	6	0.10-0.15	P326	
Hardened Steel Stal hartowana	7	0.10-0.13	P326	
Stainless Steel Stal nierdzewna	8	0.14-0.25	P326	
	9	0.14-0.22	P326	
	10	0.14-0.20	P326	
	11	0.10-0.15	P326	
Cast Iron Żeliwo	12	0.14-0.30	P324	
	13	0.14-0.22	P324	
	14	0.14-0.20	P324	
	15	0.10-0.15	P324	
Non-ferrous materials Materiały nieżelazne	16	0.16-0.30		P324
	17	0.16-0.25		P324
Plastics Tworzywa Sztuczne	20	0.14-0.20	P326	
	21	0.10-0.13	P326	
	22	0.14-0.20	P326	

TECHNICAL INFO INFORMACJA TECHNICZNA

Cutting Conditions / Parametry skrawania (ae/De=10%)

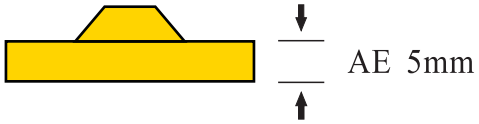
Material Materiał	Group № N° Grup	Grade Gatunek														
		P321			P323			P324			P326			P327		
		Vc (m/min)														
Steel Stal	1	-	-	-	-	-	-	-	-	-	255	230	200	-	-	-
	2	-	-	-	-	-	-	-	-	-	200	180	162	-	-	-
	3	-	-	-	-	-	-	-	-	-	180	162	145	-	-	-
	4	-	-	-	-	-	-	-	-	-	160	145	130	-	-	-
	5	-	-	-	-	-	-	-	-	-	144	130	116	-	-	-
	6	-	-	-	-	-	-	-	-	-	130	117	105	-	-	-
Hardened Steel Stal hartowana	7	-	-	-	-	-	-	-	-	-	40	-	-	-	-	-
Stainless Steel Stal nierdzewna	8	-	-	-	-	-	-	-	-	-	180	162	145	-	-	-
	9	-	-	-	-	-	-	-	-	-	130	118	105	-	-	-
	10	-	-	-	-	-	-	-	-	-	95	86	77	-	-	-
	11	-	-	-	-	-	-	-	-	-	70	63	56	-	-	-
Cast Iron Żeliwo	12	-	-	-	-	-	-	200	170	150	-	-	-	-	-	-
	13	-	-	-	-	-	-	180	150	140	-	-	-	-	-	-
	14	-	-	-	-	-	-	160	140	130	-	-	-	-	-	-
	15	-	-	-	-	-	-	125	115	-	-	-	-	-	-	-
Non-ferrous materials Materiały nieżelazne	16	-	-	-	-	-	-	-	-	-	-	-	-	1150	950	850
	17	-	-	-	-	-	-	-	-	-	-	-	-	950	780	700
Plastics Tworzywa Sztuczne	20	-	-	-	-	-	-	-	-	-	50	45	-	-	-	-
	21	-	-	-	-	-	-	-	-	-	35	40	-	-	-	-
	22	-	-	-	-	-	-	-	-	-	50	45	-	-	-	-

Cutting Conditions / Parametry skrawania

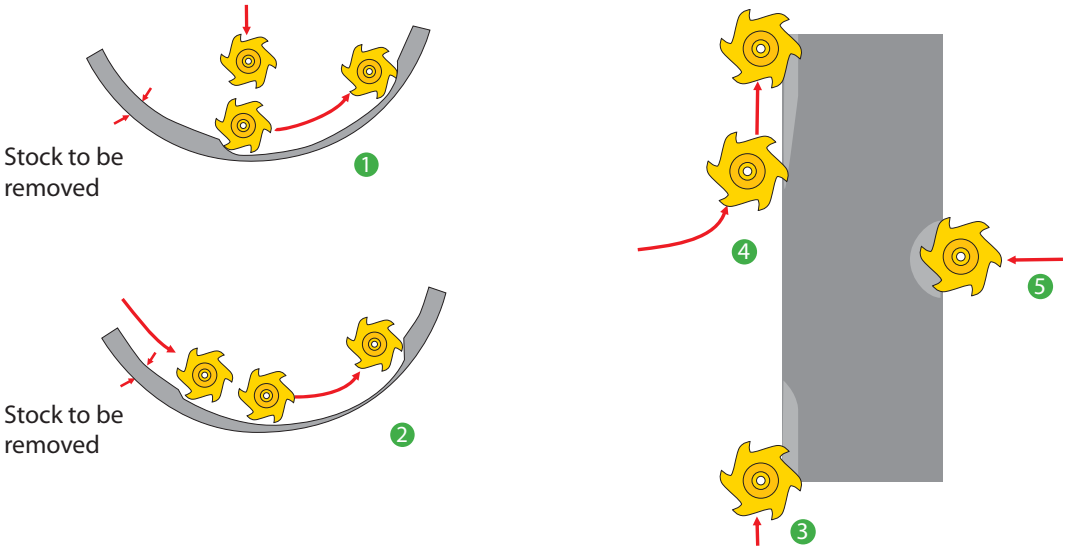
Operations Operacje	ae/De	fz mm/tooth			Speed factor Współczynnik prędkości
Radial infeed zagłębianie	-	0,05	0,10	0,14	0,65
Side milling Frezowanie boczne	2%	0,21	0,44	0,65	1,20
	5%	0,14	0,28	0,41	1,10
	10%	0,10	0,20	0,30	1,00
	20%	0,07	0,14	0,21	0,90
	30%	0,06	0,12	0,18	0,85
		0,03	0,06	0,09	-
Average chip thickness hm Średni przekrój wióra		0,03	0,06	0,09	-

TECHNICAL INFO INFORMACJA TECHNICZNA

fz (mm/tooth)



AE	Feed Posuw fz					
	Material group Grupa materiału					
	1 2 3 4	5 6	8 9 10 11	12 13 14 15	16 17	20 21 22
0.5-0.7mm	0.01-0.02	0.01-0.015	0.01-0.02	0.015-0.02	0.02-0.03	0.01-0.015
0.8-1.0mm	0.01-0.025	0.01-0.02	0.01-0.025	0.015-0.025	0.02-0.035	0.01-0.02
l.l-1.3mm	0.015-0.03	0.015-0.025	0.015-0.03	0.02-0.03	0.02-0.04	0.015-0.025
1.4-1.6mm	0.02-0.035	0.02-0.03	0.02-0.035	0.025-0.04	0.03-0.05	0.02-0.03
1.7-2.2mm	0.02-0.04	0.02-0.04	0.02-0.04	0.03-0.05	0.03-0.06	0.02-0.035
2.5-3.0mm	0.03-0.05	0.03-0.045	0.03-0.04	0.03-0.06	0.04-0.07	0.025-0.04
3.54.0mm						
4.2-5.0mm	0.04-0.07	0.03-0.06	0.04-0.07	0.05-0.09	0.05-0.10	0.025-0.05

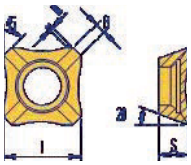


1. Pluging to mill Pionowe wcięcie FZ-50%
2. Ramping to mill Wcięcie po łuku Fz-100%
3. Mill Frezowanie Fz-100%
4. Ramping Zagłębianie Fz-100%
5. Pluging on mill Wcięcie proste Fz-50%

INSERT PYTKI

Milling Inserts Płytki do frezowania

SNHT



Insert shape Krztałt płytki	Type Typ	Dimensions Wymiary (mm)		Coating						Cermet						Uncoated					
		S	I	P322	P323	P324				P326						P327	P329				
 C421	SNHT 13T3 C421	3,97	13,4		•	•				•											

Milling Inserts Płytki do frezowania

RDKW
RDKT
RPKT





Insert shape Krztałt płytki	Type Typ	Dimensions Wymiary (mm)			Coating						Cermet						Uncoated					
		S	D	R	P322	P323	P324				P326						P327	P329				
	RDKW 0800 C410	2,2	8	4		•					•											
	RDKT 10T3 C422	3,97	10	5		•					•											
	RPKT 1204 C410	4,7	12	6		•					•											
	RPKT 1204 C422	4,7	12	6		•					•											

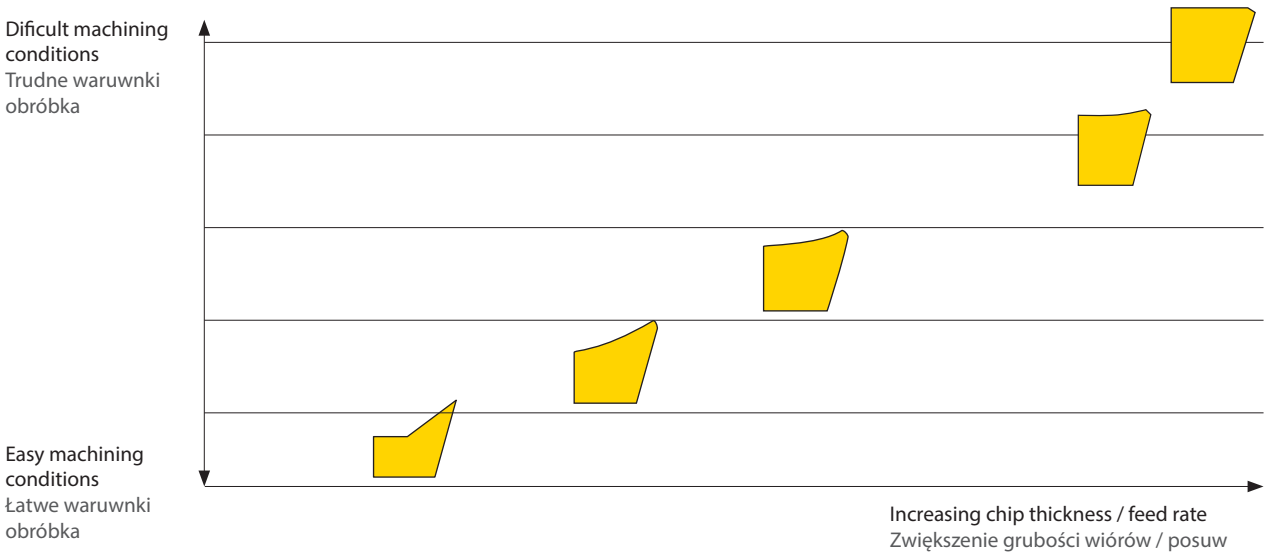
TECHNICAL INFO INFORMACJA TECHNICZNA

Insert Grades Gatunki Płytek

	Grades Gatunki	P						M					K					N				S				H			
		P01	P10	P20	P30	P40	P50	M01	M10	M20	M30	M40	K01	K10	K20	K30	K40	N01	N10	M20	N30	S01	S10	S20	S30	H01	H10	H20	H30
PVD	P332																												
	P321																												
	P333																												
	P322																												
	P323																												
	P326																												
	P324																												

	P331 P332 P333	Hard and wear resistant grade for milling in aluminium and nonferrous alloys. Excellent grade, in combination with protected cutting edges, for high speed machining in hardened steel. Twardy i odporny na ścieranie materiał do frezowania w aluminium i stopach metali nieżelaznych. Doskonały gatunek chroniący krawędź tnąca przy obróbce szybkościowej w stali hartowanej. (Ti,Al) N-TiN
	P322	Tough grade for rough milling in tool steels. Twardy gatunek do obróbki zgrubnej stali narzędzowej. (Ti,Al) N-TiN
	P324	This substrate is in accordance to the ISO K classification. For application in Cast Iron, Aluminum,Copper or Plastic etc.. Gatunek zgodny z klasyfikacją ISO K. Stosowany do żeliwa, aluminium, miedzi, lub towrzywa sztucznego itp. (Ti,Al) N-TiN
	P323	This substrate is in the ISO P20-P35 application areas. It has a tough substrate and suitable for hardened steels. Gatunek z przedziału ISO P20-P35. Twardy gatunek z zastosowaniem obróbki stali hartowanej. (Ti,Al) N-TiN
	P326	Cermet grade is oxidation resistant and wear resistant for fine to medium rough milling of steel at high cutting speed and for finishing in austenitic stainless steel.First choice for high demand on surface finishes. Garunek cermet - odporny na utlenianie oraz na ścieranie. Przeznaczony do obróbki średnio zgrubnej stali, przy wysokich prędkościach skrawnia oraz do obróbki wykańczającej stali austenitycznej. Pierwszy wybór dla osiągnięcia powierzni wykańczającej. (Ti,Al) N-TiN
	P330	Polycrystalline diamond for milling aluminium alloys and graphite. Diament polikrystaliczny do frezowania stopów aluminium oraz grafitu.

TECHNICAL INFO INFORMACJA TECHNICZNA





C434

Negative and very protected cutting edge
Łamacz ujemny z dobrze zabezpieczoną krawędzią cięcia.



C434

Negative and very protected cutting edge
Łamacz ujemny z dobrze zabezpieczoną krawędzią cięcia.



C421

Positive and very protected cutting edge
Łamacz dodatni z dobrze zabezpieczoną krawędzią cięcia.



C437

Positive and very protected cutting edge
Łamacz dodatni z dobrze zabezpieczoną krawędzią cięcia.

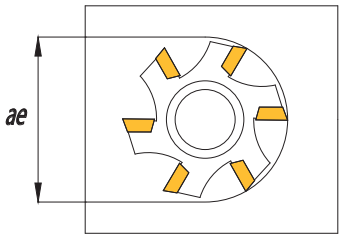


C438

Positive and very sharp cutting edge
Łamacz dodatni z bardzo ostrą krawędzią cięcia. кромкой.

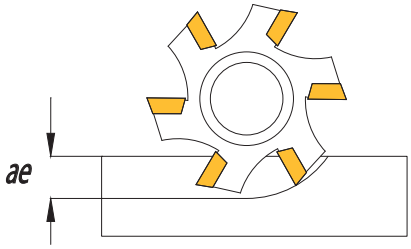
TECHNICAL INFO INFORMACJA TECHNICZNA

Slot milling compared with side milling
Zestawienie frezowania rowków z frezowaniem bocznym



Slot milling
Frezowanie kieszeni

Relative engagement of the cutter diameter / Względne zaangażowanie średnicy freza (ac/D%)	Multiply the feed per tooth by the following factor / Pomnóż posuw na ząb przez następujący czynnik
30%	1.25
20%	1.5
10%	2
5%	3



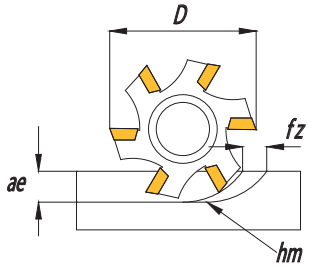
Side milling
Frezowanie boczne

Calculation of feed per tooth and cutting speed for side milling operations. When using side milling it is necessary to increase 1he feed per tooth to keep the chip thickness at the same value. It is also possible to increase the cutting speed and keep the same tool life. Use 1be tables below.

Obliczenie posuwu na ząb i szybkość cięcia frezowania bocznego. Podczas frezowania bocznego, konieczne jest zwiększenie 1 he posuwu na ząb, aby utrzymać tą samą grubość wiórów. Możliwe jest również zwiększenie prędkości skrawania, a tym samym zachować trwałość narzędzia. Użyj 1be z tabeli poniżej.

ae/D %	Feed per tooth Posuw na ząb mm/ząb, mm/tooth (fz)													Speed factor
	0,03	0,06	0,08	0,10	0,15	0,20	0,25	0,30	0,40	0,50	0,60	0,80	1,00	
	Average chip thickness / Średnia grubość wiurów, mm (hm)													
Width of cut up to and including D/2 / Szerokość cięcia równy lub większy niż D/2														
2 (0.02)					0,02	0,03	0,04	0,04	0,06	0,07	0,08	0,11	0,14	1,8
3 (0.03)				0.()2	0,03	0,03	0,04	0,05	0,07	0,09	0,10	0,14	0,17	1,7
5 (0.05)			0,02	0,02	0,03	0,04	0,06	0,07	0,09	0,11	0,13	0,18	0,22	1,6
10 (0.10)		0,02	0,02	0,03	0,05	0,06	0,08	0,09	0,12	0,16	0,19	0,25	0,31	1,5
15 (0.15)	0,011	0,02	0,03	0,04	0,06	0,08	0,09	0,11	0,15	0,19	0,23	0,30		1,4
20(0.20)	0,013	0.03	0,03	0,04	0,06	0,09	0,11	0,13	0,17	0,22	0,26			1,35
30(0.30)	0,016	0.03	0,04	0.05	0,08	0,10	0,13	0,16	0,21	0,26	0,31			1,3
40(0.40)	0,018	0,04	0.05	0,06	0,09	0,12	0,15	0,18	0,23	0,29				1,25
50 (0.50)	0,02	0,04	0.05	0,06	0,10	0,13	0,16	0,19	0,25	0,32				1,2
Slotting(Width of cut = D) / Rowkowanie (Szerokosc = D)														
100(1.00)	0,02	0,04	0,05	0,06	0,10	0,13	0,16	0,19	0,25	0,32				1,0
=Feed per tooth correction example: at .20% engagement also increase speed by 1.3S. =Poprawny posuw na ząb przykładowo: 20% zwieksza prędkość 1,3s														

Instead of using the table above for calculating hm and fz the following formula could be used if ae/D<30%
Zamiast korzystania z powyższej tabeli do obliczenia hm i fz można użyć formuły ae / D <30%



TECHNICAL INFO INFORMACJA TECHNICZNA

Cutting data calculation
Obliczanie parametrów skrawania

Nomenclature and formula
Nomenklatura i wzór

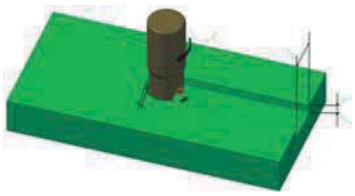
RPM (rev/min)	n=(vc×1000)/(π×D)
Cutting speed (m/min) Prędkość skrawania	vc=(n×π×D)/1000
Feed speed (mm/mim) Prędkość posuwu	vf=n×z×fz vf=n×k×fz
Feed per revolution (mm/rev) Posuw na obrót	f=z×fz f=k×fz
Metal removal rate (cm3/min) Wydajność skrawania	Q=(ae×ap×vf)/1000

Cutting speed and RPM for copying
Prędkość skrawanie oraz RPM dla kopiowania

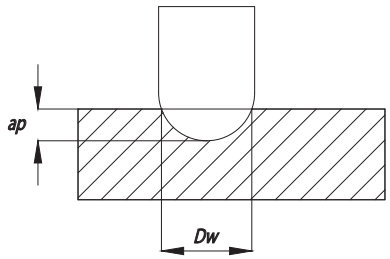
vc =(n×π×Dw)/1000 (m/min)

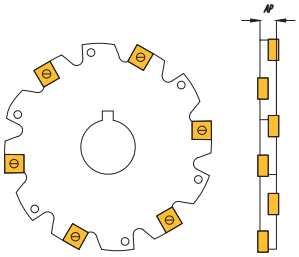
vc =(n×1000)/(π×Dw) (RPM)

Dw=2√(ap (D-ap)) (mm)



ae = Width of cut mm/radial depth of cut (mm)
Szerokość cięcia mm/głębokosc skrawania (mm)
ap = Depth of cut mm/axial depth of cut (mm)
Głębokość skrawania/osiowa głębokosc skrawania (mm)
D= cutter diameter (mm)/średnica freza
f =Feed per revolution (mm/rev)
Posuw na obrót (mm/obr)
fz = feed per tooth (mm/tooth)
Posuw na ząb (mm/z)
K= Effective No. of teeth for calculation of feed per rev
Efektywna liczba zębów do obliczenia posuwu
n=RPM
Q = Material removal rate (cm3/min)
Wydajność usuwania materiału
vc=Cutting speed / prędkość skrawania
z = No of teeth / liczba zębów





Effective No. of teeth {K) The effective No. of teeth (K) is used to calculate the feed speed (vf) and the feed per revolution (f). For most of the cutters the effective No. of teeth (K) ia equal to the No. of teeth in the cutter (z), but for some of the cutters K. is less than z.

Efektywna liczba zębów {K) Efektywną liczbę zębów (K) stosuje się do obliczenia prędkości posuwu(vf) oraz do posuwu na obrót (f). W większości noży efektywna liczba zębów (K) jest liczona jako liczba zębów (z) ale niektóre w niektórych nożazch K jest mniejsza niż z.

Example: Disc mill
Total No. of teeth(z)= 12 Effective No. of teeth(K)=6
Explanation: 6 inserts on one side of the cutter and 6 overlapping inserts on the on the other side are used to get tho full width (ap), which means K=6.

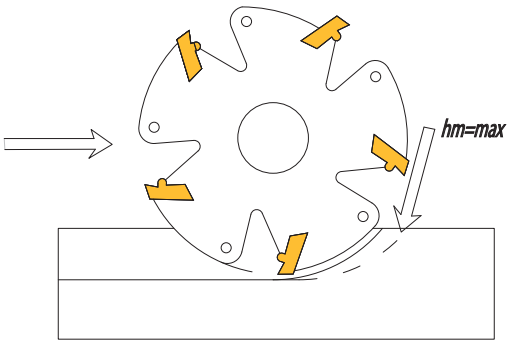
Przykład: Tarcza frezująca
Ilość zębów (z) = 12 Skuteczne Liczba zębów (K) = 6
Objaśnienie: 6 płytek po jednej stronie noża i 6 płytek na drugiej stronie aby frezowanie bylo na pełnej szerokości (ap), co oznacza K = 6.

TECHNICAL INFO INFORMACJA TECHNICZNA

Climb & conventional milling
Frezowanie współbieżne i przeciwbieżne

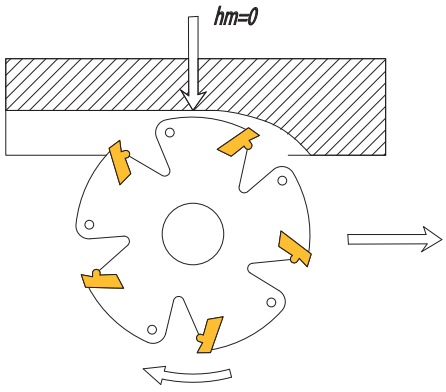
Mould and Die.
Climb milling or down milling.
Obróbka form i stempli.
Frezowanie współbieżne lub dolne.

The only alternative in difficult stainless steels and superalloys.
Jedyna alternatywa obróbki trudnej stali i stali nietypowych.



Climb milling: (ae < 0,5 *D) Entrance with max. chip thickness.
Frezowanie współbieżne: (ae < 0,5 *D) wejście z maks. grubością wióra.

Mould and Die.
Conventional milling or Up milling.
Obróbka form i stempli.
Frezowanie przeciwbieżne lub górne.

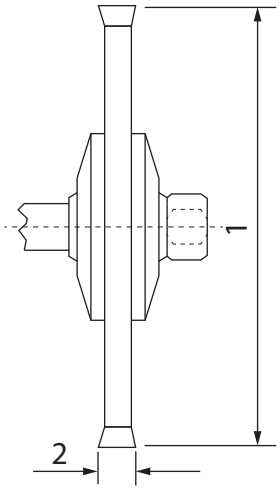


Conventional milling: Entrance with chip thickness 0mm.
Frezowanie przeciwbieżne: Wejscie z grubością wióra 0mm

TECHNICAL INFO INFORMACJA TECHNICZNA

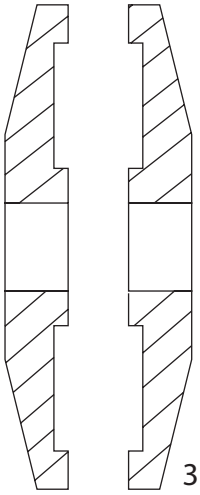
Trouble shooting
Rozwiązywanie problemów

The strategy for vibrations and unstable machining
Strategia przeciw wibracji i obróbki niestabilnej.

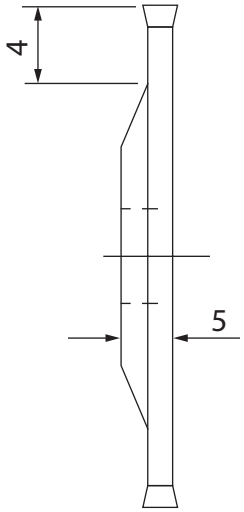


l. Reduce the diameter of the saw blades
Zmniejsz średnice tarczy tnącej

2. Increase the thickness of the saw blades
Zwiększenie grubości tarcz tnących



3. Change to bigger flange
Zmiana na większy kołnierz



4. Reduce the length of the efficient blade
Zmniejszenie długości efektywnej narzędzia

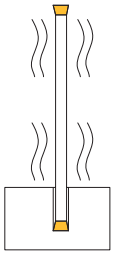
5. Increase body thickness
Zwiększenie grubości oprawki

***Attention** / Uwaga
Please follow the trouble shooting above in order to obtain better cutting surfaces.
Must conform to the speed factor.
Proszę przestrzegać powyższych wskazówek w celu uzyskania lepszej powierzchni cięcia.
Musi zostać zachowany współczynnik prędkości.

TECHNICAL INFO INFORMACJA TECHNICZNA

Trouble shooting
Rozwiązywanie problemów

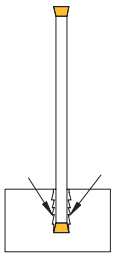
Vibrations



- Improve the stability of cutter and workpiece.
- Change cutter positioning.
- Minimize tool overhang.
- Reduce the cutting speed.
- Increase the feed rate.
- Reduce the depth of cut.

- Poprawa stabilności noża i przedmiotu obrabianego.
- Zmiana ustawienia noża.
- Minimalizacja wysięgu narzędzia.
- Zmnieszenie prędkości skrawania.
- Zwiększenie posuwu.
- Zmniejszenie głębokości cięcia.

Poor surface finish

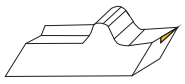


- Improve the stability of cutter and workpiece.
- Minimize tool overhang.
- Reduce the feed rate.
- Increase the cutting speed..
- Use a coolant.
- Use wiper inserts.

- Poprawa stabilności noża i przedmiotu obrabianego.
- Minimalizacja wysięgu narzędzia.
- Redukcja posuwu skrawania.
- Zwiększenie prędkości skrawania.
- Zastosowanie chłodzenia.
- Użycie płytek wiper.

Tool life problems
Problemy żywotności narzędzia

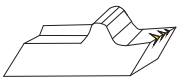
Rapid flank wear
Szybkie zużycie powierzchni przyłożenia



- Reduce the cutting speed.
- Increase the feed fate.
- Climb milling.

- Zmnieszenie prędkości skrawania.
- Zwiększenie posuwu.
- Frezwanie współbieżne.

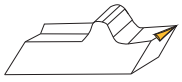
Comb cracks
Pęknięcia zębowe



- Reduce the cutting speed .
- Reduce the feed rate.
- No coolant.
- Change cutter positioning.

- Zmnieszenie prędkości skrawania.
- Zmnieszenie posuwu.
- Brak chłodzenia.
- Zmiana ustawienia noża.

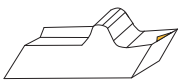
Rapid notch wear
Szybkie uszczerbianie



- Reduce the cutting speed.
- Reduce the feed rate.
- No coolant.
- Change cutter positioning.

- Zmnieszenie prędkości skrawania.
- Zmnieszenie posuwu.
- Brak chłodzenia.
- Zmiana ustawienia noża.

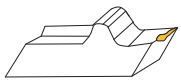
Built up edge
Wyrabianie krawędzi



- Increase the cutting speed.
- Increase the feed rate.
- No coolant.
- Climb milling.
- Change cutter positioning.

- Zwiększenie prędkości skrawania.
- Zwiększenie posuwu.
- Brak chłodzenia.
- Frezowanie współbieżne.
- Zmiana ustawienia noża.

Chipping
Odpryskiwanie



- Increase the cutting speed.
- Reduce the feed rate.
- Conventional milling.
- Improve chip evacuation.
- Change cutter positioning.
- Minimize tool overhang.
- Improve stability.

- Zwiększenie prędkości skrawania.
- Redukcja posuwu skrawania.
- Frezwowania przeciwbieżne.
- Ulepszone odrpowadzanie wiórów.
- Zmiana ustawienia noża.
- Minimalizacja wysięgu narzędzia.
- Poprawa stabilności.