



PW

PY

SW

MDF

PL

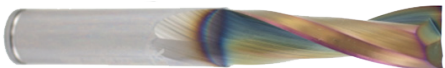
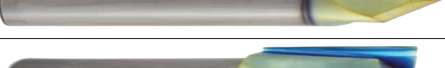
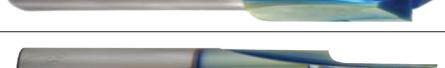
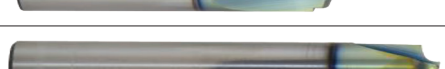
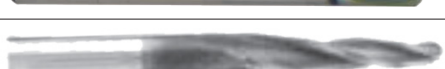
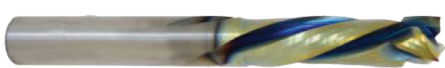
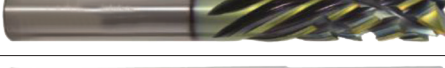
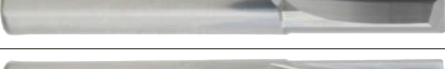
CS

HPL

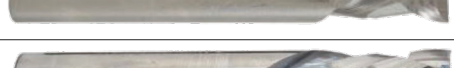


WOODWORKING TOOLS

FREZY DO OBRÓBK DREWNA

Group				ISO	PAGE
UFW01		2		P M K N S H	7
UFW03		2		P M K N S H	8
UFW05		3		P M K N S H	9
UFW07		3		P M K N S H	10
UFW09		4-6		P M K N S H	11
UFW10		3		P M K N S H	12
UFW90		3		P M K N S H	13
UFW92		4		P M K N S H	14
UFW94		3		P M K N S H	15
UFW98		3		P M K N S H	16
UFW80		2		P M K N S H	17
UFW81		1+1		P M K N S H	18
UFW83		2+2		P M K N S H	19
UFW85		3+3		P M K N S H	20
UFW87		2+2		P M K N S H	21
UFW89		2+2		P M K N S H	22
UFW88		2+4		P M K N S H	23
UFW86		3+6		P M K N S H	24
UFW11		2		P M K N S H	25
UFW12		2		P M K N S H	26
UFW13		3		P M K N S H	27

Group				ISO	PAGE
UFW14		1		P M K N S H	28
UFW15		2		P M K N S H	29
UFW16		3		P M K N S H	30
UFW17		2		P M K N S H	31
UFW18		2		P M K N S H	32
UFW19		2		P M K N S H	33
UFW20		3		P M K N S H	34
UFW21		3		P M K N S H	35
UFW22		3		P M K N S H	36
UFW23		3		P M K N S H	37
UFW24		3		P M K N S H	38
UFW25		1		P M K N S H	39
UFW26		2		P M K N S H	40
UFW27		2		P M K N S H	41
UFW28		2		P M K N S H	42
UFW29		2		P M K N S H	43
UFW30		2		P M K N S H	44
UFW31		3		P M K N S H	45
UFW32		3		P M K N S H	46
UFW33		3		P M K N S H	47
UFW34		3		P M K N S H	48

Group				ISO	PAGE
UFW35		3		P M K N S H	49
UFW36		4		P M K N S H	50
UFW37		4		P M K N S H	51
UFW38		4		P M K N S H	52
UFW39		4		P M K N S H	53
UFW50		3		P M K N S H	54
UFW51		3		P M K N S H	54
UFW52		3		P M K N S H	55
UFW54		2-3		P M K N S H	56
UFW55		2		P M K N S H	57
UFW56		3		P M K N S H	58
UFW57		3		P M K N S H	59
UFW58		3		P M K N S H	60
UFW59		3		P M K N S H	61
UFW70		2		P M K N S H	62
UFW71		2-3		P M K N S H	63
UFW72		1+1		P M K N S H	64
UFW73		2+2		P M K N S H	65
UFW74		2+2		P M K N S H	66
UFW75		3+3		P M K N S H	67
UFW76		2+2		P M K N S H	68

Group				ISO	PAGE
UFW77		2+2		P M K N S H	69
UFW78		2-4		P M K N S H	70
UFW79		2-4		P M K N S H	71
UFW60		2-4		P M K N S H	72
UFW61		2-4		P M K N S H	73
UFW62		2-4		P M K N S H	74

PW Chipboard Płyta wiórowa

PY Plywood Płyta Sklejka

SW Solid wood Lite drewno

MDF MDF MDF

PL Plast Tworzywa sztuczne

HPL High Pressure Laminate Laminat

MATERIAL GROUPS / GRUPY MATERIAŁÓW

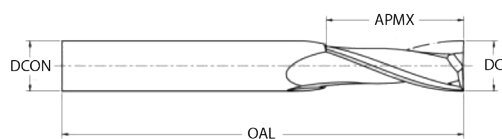
ISO	P										
Description Opis	Non-alloy steel Stal niestopowa					Low alloy steel Stal niskostopowa				High alloyed steel, tool steel Stal wysokostopowa, stal narzędziowa	
VDI3323	1	2	3	4	5	6	7	8	9	10	11
HRC		13	25	28	32	10	29	32	38	15	35
HB	125	190	250	270	300	180	275	300	350	200	325
Composition Structure Heat Treatment Kompozycja Struktura Obróbka cieplna	~0.15% C	~0.45% C	~0.45% C	~0.75% C	~0.75% C						
	Annealed Wyżarzony	Annealed Wyżarzony	Quenched Tempered Hartowany odpuszczony	Annealed Wyżarzony	Quenched Tempered Hartowany odpuszczony	Annealed Wyżarzony	Quenched Tempered Hartowany odpuszczony	Quenched Tempered Hartowany odpuszczony	Quenched Tempered Hartowany odpuszczony	Annealed Wyżarzony	Quenched Tempered Hartowany odpuszczony

ISO	M			K					
Description Opis	Stainless steel Stal nierdzewna			Grey cast iron Żeliwo szare		Nodular cast iron Żeliwo sferoidalne		Malleable cast iron Żeliwo ciągliwe	
VDI3323	12	13	14	15	16	17	18	19	20
HRC	15	23	10	10	26	3	25		21
HB	200	240	180	180	260	160	250	130	230
Composition Structure Heat Treatment Kompozycja Struktura Obróbka cieplna	Ferritic / Martensitic Ferrytyczne/ Martensyty- czne	Martensitic Martensyty- czne	Austenitic Austenityczna	Pearlitic / ferritic Perlityczny / ferrytyczny	Pearlitic (Mar- tensitic) Perlityczny (martensyty- czny)	Ferritic Ferrytyczne	Pearlitic Perlityczny	Ferritic Ferrytyczne	Pearlitic Perlityczny
	Annealed Wyżarzony	Quenched Tempered Hartowany odpuszczony							

ISO	N									
Description Opis	Aluminum wrought alloy Aluminium kute		Aluminum-cast, alloyed Odlew aluminiumowy			Copper and Copper Alloys (Bronze / Brass) Stopy miedzi i stopy miedzi (Brąz / Mosiądz)			Non Metallic Materials Niemetaliczne Materiały	
VDI3323	21	22	23	24	25	26	27	28	29	30
HRC										
HB	60	100	75	90	130	110	90	100		
Composition Structure Heat Treatment Kompozycja Struktura Obróbka cieplna	Not Curable Nieutwardzal- ny	Curable Utwardzalny	≤ 12% Si, Not Curable ≤ 12% Si, nieutwardzal- ny	≤ 12% Si, Curable ≤ 12% Si, utwardzalny	≤ 12% Si, Not Curable ≤ 12% Si, nieutwardzal- ny	Cutting Alloys, PB>1% Stopy tnące, PB>1%	CuZn, CuSnZn (Brass) CuZn, CuSnZn (mosiądz)	CuSn, lead- free copper and electroly- tic copper CuSn, miedź bezołowiowa i miedź elektro- lityczna	Duroplastic, Fiber Rein- forced Plastic Duroplast, wzmocniony włóknem plastik	Rubber, Wood, etc. Guma, drew- no itp.
		Hardened Utwardzony		Hardened Utwardzony						

ISO	S							H			
Description Opis	Heat Resistant Super Alloys Superstopy żaroodporne					Titanium Alloys Stopy tytanu		Hardened steel Stal hartowana		Chilled Cast Iron Chłodzone żeliwo	Hardened Cast Iron Żeliwo ut- wardzone
VDI3323	31	32	33	34	35	36	37	38	39	40	41
HRC	15	30	25	38	34			55	60	42	55
HB	200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Composition Structure Heat Treatment Kompozycja Struktura Obróbka cieplna	Fe Based	Fe Based	Ni or Co Based	Ni or Co Based	Ni or Co Based	Pure Titanium	Alpha + Beta Alloys				
	Annealed Wyżarzony	Cured Utwardzona	Annealed Wyżarzony	Cured Utwardzona	Cast Odlew		Hardened Utwardzony	Hardened Utwardzony	Hardened Utwardzony	Cast Odlew	Hardened Utwardzony

UFW01



SW
MDF
PL
CS

ISO	P										M				K						N										S										H																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
HRC	13	25	28	31	10	29	32	38	15	35	15	23	10	10	26	3	25		21																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												

CODE	DC	APMX	OAL	DCON
UFW01060000A06022070	6	22	70	6
UFW01080000A08022070	8	22	70	8
UFW01080000A08032080	8	32	80	8
UFW01100000A10032080	10	32	80	10
UFW01100000A10042090	10	42	90	10
UFW01100000A10052100	10	52	100	10
UFW01120000A12032080	12	32	80	12
UFW01120000A12042090	12	42	90	12
UFW01120000A12052100	12	52	100	12
UFW01160000A16032080	16	32	80	16
UFW01160000A16042090	16	42	90	16
UFW01160000A16052100	16	52	100	16
UFW01160000A16062110	16	62	110	16
UFW01160000A16072120	16	72	120	16
UFW01200000A20052100	20	52	100	20
UFW01200000A20072120	20	72	120	20
UFW01200000A20085130	20	85	130	20
UFW01200000A20100150	20	100	150	20

CUTTING CONDITIONS PARAMETRY SKRAWANIA

SPIRAL ROUTER 2-FLUTES FINISHING / FREZ SPIRALNY 2-OSTRZOWY WYKAŃCZAJĄCY

ISO	VDI 3323	DC	6.0	8.0	10.0	12.0	14.0	16.0	20.0
N	29-30	rpm obr/min	18000-24000	18000-24000	18000-24000	18000-24000	18000-24000	18000-24000	18000-24000
		feed posuw m/min	3-12	3-12	3-12	3-12	3-12	3-12	3-12

$$V_c = \frac{\pi d n}{1000} \text{ (m/min)}$$

$$n = \frac{1000 \times V_c}{\pi d} \text{ (rpm)}$$

$$f_z = \frac{f}{z n} \text{ (mm/tooth)}$$

V_c = cutting speed – prędkość skrawania (m/min)
 f_z = feed per tooth – posuw na ostrze (mm/tooth)
 f = minute feed – posuw minutowy (mm/min)

n = tool rotation – obroty narzędzia (rpm)
 d = diameter – średnica (mm)
 z = number of teeth – liczba zębów

2 Rough



CS

ISO	P												M				K				N								S								H					
HRc		13	25	28	31	10	29	32	38	15	35	15	23	10	10	26	3	25		21												15	30	25	38	34	400	1050	55	60	42	55
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	60	100	75	90	130	110	90	100				200	280	250	350	320	Rm	Rm	550	630	400	550
VDI3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	

CODE	DC	APMX	OAL	DCON
UFW03060000A06022070	6	22	70	6
UFW03080000A08022070	8	22	70	8
UFW03080000A08032080	8	32	80	8
UFW03100000A10032080	10	32	80	10
UFW03100000A10042090	10	42	90	10
UFW03100000A10052100	10	52	100	10
UFW03120000A12032080	12	32	80	12
UFW03120000A12042090	12	42	90	12
UFW03120000A12052100	12	52	100	12
UFW03160000A16032080	16	32	80	16
UFW03160000A16042090	16	42	90	16
UFW03160000A16052100	16	52	100	16
UFW03160000A16062110	16	62	110	16
UFW03160000A16072120	16	72	120	16
UFW03200000A20052100	20	52	100	20
UFW03200000A20072120	20	72	120	20
UFW03200000A20085130	20	85	130	20
UFW03200000A20100150	20	100	150	20

SPIRAL ROUTER 2-FLUTES / FREZ SPIRALNY 2-OSTRZOWY RYFLOWANY - ZGRUBNINY

ISO	VDI 3323	DC	6.0	8.0	10.0	12.0	14.0	16.0	20.0
N	29-30	rpm obr/min	18000-24000	18000-24000	18000-24000	18000-24000	18000-24000	18000-24000	18000-24000
		feed posuw m/min	3-15	3-15	3-15	3-15	3-15	3-15	3-15

$$V_c = \frac{\pi d n}{1000} \text{ (m/min)}$$

$$n = \frac{1000 \times V_c}{\pi d} \text{ (rpm)}$$

$$f_z = \frac{f}{z_n} \text{ (mm/tooth)}$$

V_c = cutting speed – prędkość skrawania (m/min)

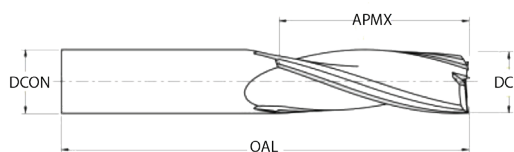
$$fz = \text{feed per tooth} - \text{posuw na ostrze (mm/tooth)}$$
$$f = \text{minute feed} - \text{posuw minutowy (mm/min)}$$

n = tool rotation – obroty narzędzia (rpm)

d = diameter – średnica (mm)

z = number of teeth – liczba zębów

UFW05



SW

MDF

PL

CS

ISO	P										M				K					N										S										H																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
HRc	13	25	28	31	10	29	32	38	15	35	15	23	10	10	26	3	25		21																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								

CODE	DC	APMX	OAL	DCON
UFW05060000A06022070	6	22	70	6
UFW05080000A08022070	8	22	70	8
UFW05080000A08032080	8	32	80	8
UFW05100000A10032080	10	32	80	10
UFW05100000A10042090	10	42	90	10
UFW05100000A10052100	10	52	100	10
UFW05120000A12032080	12	32	80	12
UFW05120000A12042090	12	42	90	12
UFW05120000A12052100	12	52	100	12
UFW05160000A16032080	16	32	80	16
UFW05160000A16042090	16	42	90	16
UFW05160000A16052100	16	52	100	16
UFW05160000A16062110	16	62	110	16
UFW05160000A16072120	16	72	120	16
UFW05200000A20052100	20	52	100	20
UFW05200000A20072120	20	72	120	20
UFW05200000A20085130	20	85	130	20
UFW05200000A20100150	20	100	150	20

CUTTING CONDITIONS PARAMETRY SKRAWANIA

SPIRAL ROUTER 3-FLUTES FINISHING / FREZ SPIRALNY 3-OSTRZOWY WYKAŃCZAJĄCY

ISO	VDI 3323	DC	6.0	8.0	10.0	12.0	14.0	16.0	20.0
N	29-30	rpm obr/min	18000-24000	18000-24000	18000-24000	18000-24000	18000-24000	18000-24000	18000-24000
		feed posuw m/min	4-12	4-12	4-12	4-12	4-12	4-12	4-12

$$V_c = \frac{\pi d n}{1000} \text{ (m/min)}$$

$$n = \frac{1000 \times V_c}{\pi d} \text{ (rpm)}$$

$$f_z = \frac{f}{z n} \text{ (mm/tooth)}$$

V_c = cutting speed – prędkość skrawania (m/min)
 f_z = feed per tooth – posuw na ostrze (mm/tooth)
 f = minute feed – posuw minutowy (mm/min)

n = tool rotation – obroty narzędzia (rpm)
 d = diameter – średnica (mm)
 z = number of teeth – liczba zębów

3 Rough



PY

PL

SW

HPI

CS

MDF

CODE	DC	APMX	OAL	DCON
UFW07060000A06022070	6	22	70	6
UFW07080000A08022070	8	22	70	8
UFW07080000A08032080	8	32	80	8
UFW07100000A10032080	10	32	80	10
UFW07100000A10042090	10	42	90	10
UFW07100000A10052100	10	52	100	10
UFW07120000A12032080	12	32	80	12
UFW07120000A12042090	12	42	90	12
UFW07120000A12052100	12	52	100	12
UFW07140000A14042090	14	42	90	14
UFW07140000A14052100	14	52	100	14
UFW07160000A16032080	16	32	80	16
UFW07160000A16042090	16	42	90	16
UFW07160000A16052100	16	52	100	16
UFW07160000A16062110	16	62	110	16
UFW07160000A16072120	16	72	120	16
UFW07180000A18052100	18	52	100	18
UFW07180000A18072120	18	72	120	18
UFW07200000A20052100	20	52	100	20
UFW07200000A20072120	20	72	120	20
UFW07200000A20085130	20	85	130	20
UFW07200000A20100150	20	100	150	20
UFW07250000A25100150	25	100	150	25

CUTTING CONDITIONS PARAMETRY SKRAWANIA

ISO	VDI 3323	DC	6.0	8.0	10.0	12.0	14.0	16.0	20.0
N	29-30	rpm obr/min	18000-24000	18000-24000	18000-24000	18000-24000	18000-24000	18000-24000	18000-24000
		feed posuw m/min	3-15	3-15	3-15	3-15	3-15	3-15	3-15

$$V_c = \frac{\pi d n}{1000} \text{ (m/min)}$$

$$n = \frac{1000 \times V_c}{\pi d} \text{ (rpm)}$$

$$f_z = \frac{f}{z_n} \text{ (mm/tooth)}$$

V_c = cutting speed – prędkość skrawania (m/min)

$$fz = \text{feed per tooth} - \text{posuw na ostrze (mm/tooth)}$$
$$f = \text{minute feed} - \text{posuw minutowy (mm/min)}$$
$$n = \text{tool rotation} - \text{obroty narzędzia (rpm)}$$

d = diameter – średnica (mm)

z = number of teeth – liczba zębów

Diagram illustrating a sequence of four bars of increasing length, followed by a finish line. The first bar is labeled '4-6'.



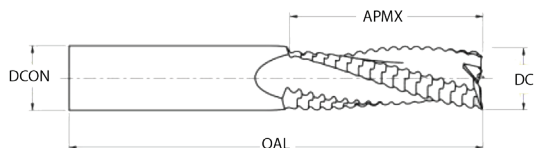
CS

CODE	DC	APMX	OAL	DCON	FLUTE
UFW090800Z4A08022065	8	22	65	8	4
UFW090800Z4A08032080	8	32	80	8	4
UFW091000Z4A12032080	10	32	80	12	4
UFW091000Z4A12042090	10	42	90	12	4
UFW091200Z4A12032080	12	32	80	12	4
UFW091200Z4A12042090	12	42	90	12	4
UFW091200Z4A12052100	12	52	100	12	4
UFW091400Z4A14042090	14	42	90	14	4
UFW091400Z4A14052100	14	52	100	14	4
UFW091600Z4A16032080	16	32	80	16	4
UFW091600Z4A16042090	16	42	90	16	4
UFW091600Z4A16052100	16	52	100	16	4
UFW091600Z4A16062110	16	62	110	16	4
UFW091600Z4A16072120	16	72	120	16	4
UFW091800Z4A18052100	18	52	100	18	4
UFW091800Z4A18072120	18	72	120	18	4
UFW092000Z4A20052100	20	52	100	20	4
UFW092000Z4A20072120	20	72	120	20	4
UFW092000Z4A20085130	20	85	130	20	4
UFW092000Z4A20100150	20	100	150	20	4
UFW092000Z5A20052100	20	52	100	20	5
UFW092000Z5A20072120	20	72	120	20	5
UFW092000Z5A20085130	20	85	130	20	5
UFW092000Z5A20100150	20	100	150	20	5
UFW092500Z5A25085130	25	85	130	25	5
UFW092500Z5A25100150	25	100	150	25	5
UFW092500Z5A25130180	25	130	180	25	5
UFW093000Z6A25080140	30	80	140	25	6
UFW093000Z6A25100160	30	100	160	25	6
UFW093000Z6A25120180	30	120	180	25	6
UFW093000Z6A25150200	30	150	200	25	6

ISO	VDI 3323	DC	8.0	10.0	12.0	14.0	16.0	20.0
N	29-30	rpm obr/min	18000-24000	18000-24000	18000-24000	18000-24000	18000-24000	18000-24000
		feed posuw m/min	4-15	4-15	4-15	4-15	4-15	4-15

n = tool rotation – obroty narzędzia (rpm)
 d = diameter – średnica (mm)
 z = number of teeth – liczba zębów

UFW10


Rough

SW
MDF
PL
CS


ISO	P										M				K						N										S										H																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
HRC	13	25	28	31	10	29	32	38	15	35	15	23	10	10	26	3	25		21																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												

CODE	DC	APMX	OAL	DCON
UFW10060000A06022070	6	22	70	6
UFW10080000A08022070	8	22	70	8
UFW10080000A08032080	8	32	80	8
UFW10100000A10032080	10	32	80	10
UFW10100000A10042090	10	42	90	10
UFW10100000A10052100	10	52	100	10
UFW10120000A12032080	12	32	80	12
UFW10120000A12042090	12	42	90	12
UFW10120000A12052100	12	52	100	12
UFW10160000A16032080	16	32	80	16
UFW10160000A16042090	16	42	90	16
UFW10160000A16052100	16	52	100	16
UFW10160000A16062110	16	62	110	16
UFW10160000A16072120	16	72	120	16
UFW10200000A20052100	20	52	100	20
UFW10200000A20072120	20	72	120	20
UFW10200000A20085130	20	85	130	20
UFW10200000A20100150	20	100	150	20

CUTTING CONDITIONS PARAMETRY SKRAWANIA

SPIRAL ROUTER 3-FLUTES / FREZ SPIRALNY 3-OSTRZOWY ZGRUBNY

ISO	VDI 3323	DC	6.0	8.0	10.0	12.0	14.0	16.0	20.0
N	29-30	rpm obr/min	18000-24000	18000-24000	18000-24000	18000-24000	18000-24000	18000-24000	18000-24000
		feed posuw m/min	3-15	3-15	3-15	3-15	3-15	3-15	3-15

$$V_c = \frac{\pi d n}{1000} \text{ (m/min)}$$

$$n = \frac{1000 \times V_c}{\pi d} \text{ (rpm)}$$

$$f_z = \frac{f}{z n} \text{ (mm/tooth)}$$

V_c = cutting speed – prędkość skrawania (m/min)
 f_z = feed per tooth – posuw na ostrze (mm/tooth)
 f = minute feed – posuw minutowy (mm/min)

n = tool rotation – obroty narzędzia (rpm)
 d = diameter – średnica (mm)
 z = number of teeth – liczba zębów

Diagram of a race track with a start line, a finish line, and a number 3.

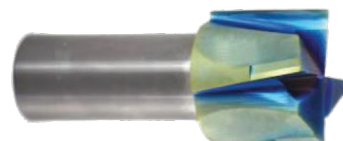


CS

CODE	DC	APMX	OAL	DCON
UFW90100000A10005065	10	5	65	10
UFW90120000A12006065	12	6	65	12
UFW90160000A16008065	16	8	65	16
UFW90200000A20010070	20	10	70	20
UFW90250000A20013075	25	12.5	75	20

ISO	VDI 3323	DC	10.0	12.0	14.0	16.0	20.0
N	29-30	rpm obr/min	18000-24000	18000-24000	18000-24000	18000-24000	18000-24000
		feed posuw m/min	4-15	4-15	4-15	4-15	4-15

n = tool rotation – obroty narzędzia (rpm)
 d = diameter – średnica (mm)
 z = number of teeth – liczba zębów



CS



ISO	P												M				K				N												S								H			
HRC		13	25	28	31	10	29	32	38	15	35	15	23	10	10	26	3	25		21											15	30	25	38	34	400	1050	55	60	42	55			
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	60	100	75	90	130	110	90	100			200	280	250	350	320	Rm	Rm	550	630	400	550			
VDI3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41			

CODE POSITIVE	CODE NEGATIVE	DC	APMX	OAL	DCON
UFW92120000A12012065	UFW92120000A12012065N	12	12	65	12
UFW92160000A16015065	UFW92160000A16015065N	16	15	65	16
UFW92200000A20015065	UFW92200000A20015065N	20	15	65	20
UFW92220000A20015065	UFW92220000A20015065N	22	15	65	20
UFW92250000A20015070	UFW92250000A20015070N	25	15	70	20
UFW92300000A20015070	UFW92300000A20015070N	30	15	70	20



PEŁNO WĘGLIKOWE FREZY DO PLANOWANIA POWIERZCHNI / PEŁNO WĘGLIKOWE FREZY DO PLANOWANIA POWIERZCHNI

ISO	VDI 3323	DC	6.0	8.0	10.0	12.0	14.0	16.0	20.0
N	29-30	rpm obr/min	18000-24000	18000-24000	18000-24000	18000-24000	18000-24000	18000-24000	18000-24000
		feed posuw m/min	4-15	4-15	4-15	4-15	4-15	4-15	4-15

n = tool rotation – obroty narzędzia (rpm)
 d = diameter – średnica (mm)
 z = number of teeth – liczba zębów

3 Rough



MDI

CODE	DC	DC_1	APMX	RE	OAL	DCON
UFW94160002A16018070	16	8	18,2	2	70	16
UFW94160002A16019070	16	8	19,2	2	70	16
UFW94160002A16022070	16	8	22,2	2	70	16
UFW94180002A18018070	18	10	18,2	2	70	18
UFW94180003A18018070	18	10	18,2	3	70	18
UFW94180002A18019070	18	10	19,2	2	70	18
UFW94180003A18019070	18	10	19,2	3	70	18
UFW94180002A18022070	18	10	22,2	2	70	18
UFW94180003A18022070	18	10	22,2	2	70	18
UFW94200002A18018070	20	10	18,2	2	70	18
UFW94200003A18018070	20	10	18,2	3	70	18
UFW94200002A18019070	20	10	19,2	2	70	18
UFW94200003A18019070	20	10	19,2	3	70	18
UFW94200002A18022070	20	10	22,2	2	70	18
UFW94200003A18022070	20	10	22,2	2	70	18

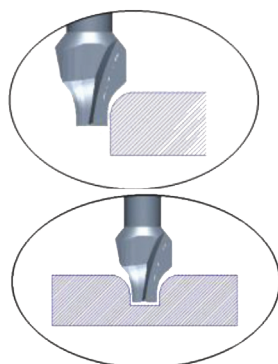
ISO	VDI 3323	DC	6.0	8.0	10.0	12.0	14.0	16.0	20.0
N	29-30	rpm obr/min	16000-20000	16000-20000	16000-20000	16000-20000	16000-20000	16000-20000	16000-20000
		feed posuw m/min	4-12	4-12	4-12	4-12	4-12	4-12	4-12

n = tool rotation – obroty narzędzia (rpm)
 d = diameter – średnica (mm)
 z = number of teeth – liczba zębów



MDF

CODE	DC	DC_1	RE	OAL	DCON
UFW98120002A12000060	12	4	2	60	12
UFW98120003A12000060	12	4	3	60	12
UFW98160004A16000060	16	4	4	60	16
UFW98160005A16000060	16	4	5	60	16



ISO	VDI 3323	DC	12.0	14.0
N	29-30	rpm obr/min	18000-24000	18000-24000
		feed posuw m/min	2-8	2-8

n = tool rotation – obroty narzędzia (rpm)
 d = diameter – średnica (mm)
 z = number of teeth – liczba zębów



CS

ISO	P												M				K				N								S								H					
HRC		13	25	28	31	10	29	32	38	15	35	15	23	10	10	26	3	25		21												15	30	25	38	34	400	1050	55	60	42	55
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	60	100	75	90	130	110	90	100				200	280	250	350	320	Rm	Rm	550	630	400	550
VDI3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	

CODE	RE	DC	APMX	OAL	DCON
UFW80040005A04015050	0,5	4	15	50	4
UFW80040008A04015050	0,75	4	15	50	4
UFW80040010A04015050	1	4	15	50	4
UFW80060005A06020060	0,5	6	20	60	6
UFW80060008A06020060	0,75	6	20	60	6
UFW80060010A06020060	1	6	20	60	6
UFW80060005A06030070	0,5	6	30	70	6
UFW80060008A06030070	0,75	6	30	70	6
UFW80060010A06030070	1	6	30	70	6
UFW80060005A06035080	0,5	6	35	80	6
UFW80060008A06035080	0,75	6	35	80	6
UFW80060010A06035080	1	6	35	80	6
UFW80060015A06035080	1,5	6	35	80	6
UFW80080005A08045090	0,5	8	45	90	8
UFW80080008A08045090	0,75	8	45	90	8
UFW80080010A08045090	1	8	45	90	8
UFW80080015A08045090	1,5	8	45	90	8
UFW80080020A08045090	2	8	45	90	8
UFW80080005A08055100	0,5	8	55	100	8
UFW80080008A08055100	0,75	8	55	100	8
UFW80080010A08055100	1	8	55	100	8
UFW80080015A08055100	1,5	8	55	100	8
UFW80080020A08055100	2	8	55	100	8
UFW80080030A08055100	3	8	55	100	8
UFW80120020A12060120	2	12	60	120	12
UFW80120030A12060120	3	12	60	120	12
UFW80160030A16070150	3	16	70	150	16
UFW80160040A16070150	4	16	70	150	16
UFW80160050A16070150	5	16	70	150	16

2-FLUTE SPIRAL TAPERED ROUTER BIT / FREZY STOŻKOWY Z PROMIENIEM

ISO	VDI 3323	DC	4.0	6.0	8.0	10.0	12.0	14.0	16.0
N	29-30	rpm obr/min	18000-24000	18000-24000	18000-24000	18000-24000	18000-24000	18000-24000	18000-24000
		feed posuw m/min	2-10	2-10	2-10	2-10	2-10	2-10	2-10

z = number of teeth – liczba zębów

Diagram illustrating a particle collision process. On the left, a cloud-like shape contains the text "1+1". To its right are four horizontal bars of increasing length, each with a hatched pattern. Further right is the word "Finish" above three downward-pointing triangles.



CS

ISO	P												M				K					N								S								H				
HRC		13	25	28	31	10	29	32	38	15	35	15	23	10	10	26	3	25		21												15	30	25	38	34	400	1050	55	60	42	55
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	60	100	75	90	130	110	90	100				200	280	250	350	320	Rm	Rm	550	630	400	550
VDI3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	

CODE	DC	APMX	APMX1	OAL	DCON
UFW81030000A03012050	3	12	4	50	3
UFW81040000A04012050	4	12	4	50	4
UFW81050000A05017060	5	17	4	60	5
UFW81060000A06025065	6	25	5	65	6
UFW81080000A08025065	8	25	6	65	8
UFW81100000A10025080	10	25	7	80	10
UFW81100000A10035080	10	35	7	80	10

COMPRESION SPIRAL ROUTER / FREZ SPIRALNY KOMPRESYJNY

ISO	VDI 3323	DC	4.0	6.0	8.0	10.0
N	29-30	rpm obr/min	18000-24000	18000-24000	18000-24000	18000-24000
		feed posuw m/min	10-35	10-35	10-35	10-35

$$V_c = \frac{\pi d n}{1000} \text{ (m/min)}$$

$$n = \frac{1000 \times V_c}{\pi d} \text{ (rpm)}$$

$$f_z = \frac{f}{z n} \text{ (mm/tooth)}$$

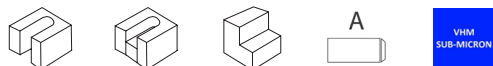
V_c = cutting speed – prędkość skrawania (m/min)

$$fz = \text{feed per tooth} - \text{posuw na ostrze (mm/tooth)}$$
$$f = \text{minute feed} - \text{posuw minutowy (mm/min)}$$

n = tool rotation – obroty narzędzia (rpm)

d = diameter – średnica (mm)

z = number of teeth – liczba zębów



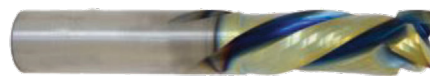
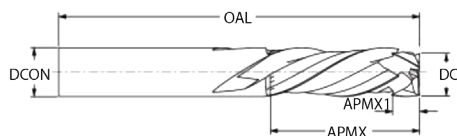
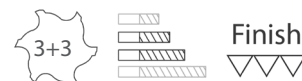
CS

CODE	DC	APMX	APMX1	OAL	DCON
UFW83030000A03012050	3	12	3	50	3
UFW83030000A03013051	3,17	12,7	3	51	3
UFW83040000A04015055	4	15	3	55	4
UFW83050000A05020060	5	20	4	60	5
UFW83060000A06025065	6	25	5	65	6
UFW83063000A06025065	6,35	25,4	5	65	6
UFW83080000A08025065	8	25	6	65	8
UFW83080000A08035080	8	35	6	80	8
UFW83100000A10025076	9,5	25,4	7	76	10
UFW83100000A10025080	10	25	7	80	10
UFW83100000A10035080	10	35	7	80	10
UFW83120000A12025080	12	25	8	80	12
UFW83120000A12035080	12	35	8	80	12
UFW83120000A12042090	12	42	8	90	12
UFW83130000A13025076	12,7	25,4	8	76	12,7
UFW83130000A13035080	12,7	35	8	80	12,7
UFW83160000A16035080	16	35	9	80	16
UFW83160000A16042090	16	42	9	90	16
UFW83160000A16052100	16	52	9	100	16

[illegible]

n = tool rotation – obroty narzędzia (rpm)
 d = diameter – średnica (mm)
 z = number of teeth – liczba zębów

UFW85



SW

MDF

PL

CS

ISO	P												M				K				N								S								H					
HRC		13	25	28	31	10	29	32	38	15	35	15	23	10	10	26	3	25		21												15	30	25	38	34	400	1050	55	60	42	55
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	60	100	75	90	130	110	90	100				200	280	250	350	320	Rm	Rm	550	630	400	550
VDI3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	

CODE	DC	APMX	APMX1	OAL	DCON
UFW85100000A10025076	9,5	25,4	7	76	10
UFW85100000A10025080	10	25	7	80	10
UFW85100000A10035080	10	35	7	80	10
UFW85120000A12025080	12	25	8	80	12
UFW85120000A12035080	12	35	8	80	12
UFW85120000A12042090	12	42	8	90	12
UFW85130000A13025076	12,7	25,4	8	76	12,7
UFW85130000A13035080	12,7	35	8	80	12,7
UFW85160000A16035080	16	35	9	80	16
UFW85160000A16042090	16	42	9	90	16
UFW85160000A16052100	16	52	9	100	16

CUTTING CONDITIONS PARAMETRY SKRAWANIA

SPIRAL ROUTER 3+3 / FREZ SPIRALNY 3+3

ISO	VDI 3323	DC	9.0	10.0	12.0	14.0	16.0
N	29-30	rpm obr/min	18000-24000	18000-24000	18000-24000	18000-24000	18000-24000
		feed posuw m/min	10-35	10-35	10-35	10-35	10-35

$$V_c = \frac{\pi d n}{1000} \text{ (m/min)}$$

$$n = \frac{1000 \times V_c}{\pi d} \text{ (rpm)}$$

$$f_z = \frac{f}{zn} \text{ (mm/tooth)}$$

V_c = cutting speed – prędkość skrawania (m/min)

$$fz = \text{feed per tooth} - \text{posuw na ostrze (mm/tooth)}$$
$$f = \text{minute feed} - \text{posuw minutowy (mm/min)}$$

n = tool rotation – obroty narzędzia (rpm)

d = diameter – średnica (mm)

z = number of teeth – liczba zębów

 Medium



CS

CODE	DC	APMX	APMX1	OAL	DCON
UFW87060000A06025065	6	25	5	65	6
UFW87063000A06025065	6,35	25,4	5	65	6
UFW87080000A08025065	8	25	6	65	8
UFW87080000A08035080	8	35	6	80	8
UFW87100000A10025076	9,5	25,4	7	76	10
UFW87100000A10025080	10	25	7	80	10
UFW87100000A10035080	10	35	7	80	10
UFW87120000A12025080	12	25	8	80	12
UFW87120000A12035080	12	35	8	80	12
UFW87120000A12042090	12	42	8	90	12
UFW87130000A13025076	12,7	25,4	8	76	12,7
UFW87130000A13035080	12,7	35	8	80	12,7
UFW87160000A16035080	16	35	9	80	16
UFW87160000A16042090	16	42	9	90	16
UFW87160000A16052100	16	52	9	100	16

n = tool rotation – obroty narzędzia (rpm)
 d = diameter – średnica (mm)
 z = number of teeth – liczba zębów



CS



MD

CODE	DC	APMX	APMX1	OAL	DCON
UFW88030000A03012050	3	12	3	50	3
UFW88030000A03013051	3,17	12,7	3	50,8	3,17
UFW88040000A04012050	4	12	3	50	4
UFW88050000A05017055	5	17	3	55	5
UFW88060000A06025065	6	25	4	65	6
UFW88060000A06025066	6,35	25,4	4	65,5	6,35
UFW88080000A08025065	8	25	5	65	8
UFW88080000A08035080	8	35	5	80	8
UFW88100000A10025076	9,53	25,4	5	76,2	9,53
UFW88090000A10035080	9,53	35	5	80	9,53
UFW88100000A10025070	10	25	6	70	10
UFW88100000A10035080	10	35	6	80	10
UFW88120000A12025070	12	25	7	70	12
UFW88120000A12035080	12	35	7	80	12
UFW88120000A12042090	12	42	7	90	12
UFW88130000A13025076	12,7	25,4	7	76,2	12,7
UFW88130000A13035080	12,7	35	7	80	12,7
UFW88130000A13045089	12,7	44,5	7	89,2	12,7
UFW88160000A16035080	16	35	8	80	16
UFW88160000A16042090	16	42	8	90	16
UFW88160000A16052100	16	52	8	100	16
UFW88200000A20042100	20	42	8	100	20
UFW88200000A20052110	20	52	8	110	20
UFW88200000A20062120	20	62	8	120	20
UFW88200000A20072130	20	72	8	130	20

[illegible]

n = tool rotation – obroty narzędzia (rpm)
 d = diameter – średnica (mm)
 z = number of teeth – liczba zębów

UFW86



PW

PY

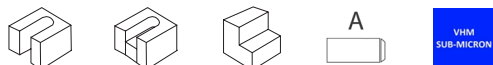
PL

SW

HPL

CS

MDF



ISO	P										M				K						N										S										H				
HRC	13	25	28	31	10	29	32	38	15	35	15	23	10	10	26	3	25		21												15	30	25	38	34	400	1050	55	60	42	55				
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	60	100	75	90	130	110	90	100			200	280	250	350	320	Rm	Rm	550	630	400	550				
VDI3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41				

CODE	DC	APMX	APMX1	OAL	DCON
UFW86090000A10025076	9,53	25,4	5	76,2	9,53
UFW86090000A10035080	9,53	35	5	80	9,53
UFW86100000A10025070	10	25	6	70	10
UFW86100000A10035080	10	35	6	80	10
UFW86120000A12025070	12	25	7	70	12
UFW86120000A12035080	12	35	7	80	12
UFW86120000A12042090	12	42	7	90	12
UFW86130000A13025076	12,7	25,4	7	76,2	12,7
UFW86130000A13035080	12,7	35	7	80	12,7
UFW86130000A13045089	12,7	44,5	7	89,2	12,7
UFW86160000A16035080	16	35	8	80	16
UFW86160000A16042090	16	42	8	90	16
UFW86160000A16052100	16	52	8	100	16
UFW86200000A20042100	20	42	8	100	20
UFW86200000A20052110	20	52	8	110	20
UFW86200000A20062120	20	62	8	120	20
UFW86200000A20072130	20	72	8	130	20

CUTTING CONDITIONS PARAMETRY SKRAWANIA

SPIRAL ROUTER 3+6 / FREZ SPIRALNY 3+6

ISO	VDI 3323	DC	9.0	10.0	12.0	14.0	16.0	20.0
N	29-30	rpm obr/min	18000-22000	18000-22000	18000-22000	18000-22000	18000-22000	18000-22000
		feed posuw m/min	15-40	15-40	15-40	15-40	15-40	15-40

$$V_c = \frac{\pi d n}{1000} \text{ (m/min)}$$

$$n = \frac{1000 \times V_c}{\pi d} \text{ (rpm)}$$

$$f_z = \frac{f}{z n} \text{ (mm/tooth)}$$

V_c = cutting speed – prędkość skrawania (m/min)
 f_z = feed per tooth – posuw na ostrze (mm/tooth)
 f = minute feed – posuw minutowy (mm/min)

n = tool rotation – obroty narzędzia (rpm)
 d = diameter – średnica (mm)
 z = number of teeth – liczba zębów



MDP

CODE	DC	APMX	OAL	DCON
UFW11020000A06006050	2	6	50	6
UFW11030000A06006050	2,5	6	50	6
UFW11030000A06010050	3	10	50	6
UFW11030000A06013051	3,17 (1/8")	12,7 (1/2")	50,8 (2")	6,35 (1/4")
UFW11040000A06012050	3,5	12	50	6
UFW11040000A06015050	4	15	50	6
UFW11050000A06013051	4,75 (3/16")	12,7 (1/2")	50,8 (2")	6,35 (1/4")
UFW11050000A06015050	5	15	50	6
UFW11050000A06020060	5	20	60	6
UFW11060000A06020060	6	20	60	6
UFW11060000A06025065	6	25	65	6
UFW11060000A06025064	6,35 (1/4")	25,4 (1")	63,5 (2 1/2")	6,35 (1/4")

STRAIGHT ROUTER BIT 2-FUTES S-6 / FREZ 2-OSTRZOWY PROSTY S-6

n = tool rotation – obroty narzędzia (rpm)
 d = diameter – średnica (mm)
 z = number of teeth – liczba zębów



MDR

CODE	DC	APMX	OAL	DCON
UFW12020000A08006050	2	6	50	8
UFW12030000A08006050	2,5	6	50	8
UFW12030000A08010050	3	10	50	8
UFW12032000A08010050	3,2	10	50	8
UFW12310000A08013051	3,17 (1/8")	12,7 (1/2")	50,8 (2")	7,95 (5/6")
UFW12040000A08012050	3,5	12	50	8
UFW12040000A08015060	4	15	60	8
UFW12045000A08015060	4,5	15	60	8
UFW12047000A08013051	4,75 (3/16")	12,7 (1/2")	50,8 (2")	7,95 (5/6")
UFW12050000A08015060	5	15	60	8
UFW12050000A08020060	5	20	60	8
UFW12060000A08020060	6	20	60	8
UFW12060000A08025065	6	25	65	8
UFW12063000A07025076	6,35 (1/4")	25,4 (1")	76,2 (2 1/2")	7,95 (5/6")
UFW12070000A08025065	7	25	65	8
UFW12070000A07025076	7,95 (5/6")	25,4 (1")	76,2 (2 1/2")	7,95 (5/6")
UFW12080000A08025065	8	25	65	8
UFW12080000A08030070	8	30	70	8

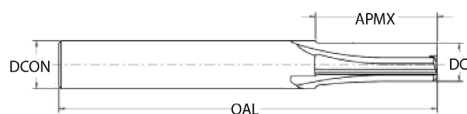
STRAIGHT ROUTER BIT 2-FUTES S-8 / FREZ 2-OSTRZOWY PROSTY S-8

n = tool rotation – obroty narzędzia (rpm)
 d = diameter – średnica (mm)
 z = number of teeth – liczba zębów

UFW13



Finish



PW

PY

PL

SW

HPI

CS

MDI

ISO	P												M				K				N								S								H					
HRC		13	25	28	31	10	29	32	38	15	35	15	23	10	10	26	3	25		21												15	30	25	38	34	400	1050	55	60	42	55
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	60	100	75	90	130	110	90	100				200	280	250	350	320	Rm	Rm	550	630	400	550
VDI3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	

CODE	DC	APMX	OAL	DCON
UFW13060000A06022065	6	22	65	6
UFW13063000A06025063	6,35 (1/4")	25,4 (1")	63,5 (2 1/2")	6,35 (1/4")
UFW13060000A08024065	6	24	65	8
UFW13080000A08025065	8	25	65	8
UFW13080000A08035070	8	35	70	8
UFW13095000A13025076	9,50 (3/8")	25,4 (1")	76,2 (3 ")	12,70 (1/2")
UFW13100000A10025065	10	25	65	10
UFW13100000A10035070	10	35	70	10
UFW13100000A10040080	10	40	80	10
UFW13120000A12025070	12	25	70	12
UFW13120000A12035080	12	35	80	12
UFW13120000A12045080	12	45	80	12
UFW13127000A13025076	12,70 (1/2")	25,4 (1")	76,2 (3 ")	12,70 (1/2")
UFW13127000A13044089	12,70 (1/2")	44,4 (1 3/4")	88,9 (3 1/2")	12,70 (1/2")

CUTTING CONDITIONS PARAMETRY SKRAWANIA

STRAIGHT ROUTER 3-FUTES/ FREZ 3-OSTRZOWY PROSTY

ISO	VDI 3323	DC	6.0	7.0	8.0	10.0	12.0
N	29-30	rpm obr/min	18000-24000	18000-24000	18000-24000	18000-24000	18000-24000
		feed posuw m/min	4-12	4-12	4-12	4-12	4-12

$$V_c = \frac{\pi d n}{1000} \text{ (m/min)}$$

$$n = \frac{1000 \times Vc}{\pi d} \text{ (rpm)}$$

$$f_z = \frac{f}{zm} \text{ (mm/tooth)}$$

V_c = cutting speed – predkość skrawania (m/min)

$$fz = \text{feed per tooth} - \text{posuw na ostrze (mm/tooth)}$$

f = minute feed – posuw minutowy (mm/min)

$$n = \text{tool rotation} - \text{obroty narzędzia (rpm)}$$

d = diameter – średnica (mm)

z = number of teeth – liczba zębów

Diagram illustrating a staircase with 4 steps. The staircase is represented by four horizontal bars of increasing length, each with a hatched pattern. To the left of the staircase is a start icon (a circle with a dot). To the right of the staircase is a finish icon (a triangle with a dot). The word "Finish" is written above the finish icon.



PY

PL

SW

HPI

CS

MDF

ISO	P												M				K						N										S								H			
HRC		13	25	28	31	10	29	32	38	15	35	15	23	10	10	26	3	25		21												15	30	25	38	34	400	1050	55	60	42	55		
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	60	100	75	90	130	110	90	100				200	280	250	350	320	Rm	Rm	550	630	400	550		
VDI3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41			

CODE	DC	DC1	APMX	OAL	DCON	SIG
UFW14040030A04010045	4	0,1	10	45	4	30°
UFW14040045A04010045	4	0,1	10	45	4	45°
UFW14040060A04010045	4	0,1	10	45	4	60°
UFW14040090A04010045	4	0,1	10	45	4	90°
UFW14060030A06012050	6	0,2	12	50	6	30°
UFW14060045A06010050	6	0,2	10	50	6	45°
UFW14060060A06010050	6	0,2	10	50	6	60°
UFW14060090A06010050	6	0,2	10	50	6	90°
UFW14080045A08012055	8	0,2	12	55	8	45°
UFW14080060A08010055	8	0,2	10	55	8	60°
UFW14080090A08010055	8	0,2	10	55	8	90°

ENGRAVING ROUTER 1-FLUTE/ FREZ DO GRAWEROWANIA 1-OSTRZOWY

ISO	VDI 3323	DC	4.0	6.0	8.0
N	29-30	rpm obr/min	18000-24000	18000-24000	18000-24000
		feed posuw m/min	2-8	2-8	2-8

n = tool rotation – obroty narzędzia (rpm)
 d = diameter – średnica (mm)
 z = number of teeth – liczba zębów



PY

PL

SW

HPL

CS

MDP

CODE	DC	DC1	OAL	DCON	SIG
UFW15060030A06000050	6	0,2	50	6	30°
UFW15060045A06000050	6	0,2	50	6	45°
UFW15060060A06000050	6	0,2	50	6	60°
UFW15060090A06000050	6	0,2	50	6	90°
UFW15080045A08000055	8	0,2	55	8	45°
UFW15080060A08000055	8	0,2	55	8	60°
UFW15080090A08000055	8	0,2	55	8	90°
UFW15100045A10000060	10	0,2	60	10	45°
UFW15100060A10000060	10	0,2	60	10	60°
UFW15100090A10000060	10	0,2	60	10	90°
UFW15120045A12000060	12	0,2	60	12	45°
UFW15120060A12000060	12	0,2	60	12	60°
UFW15120090A12000060	12	0,2	60	12	90°

ENGRAVING ROUTER 2-FLUTE/ FREZ DO GRAWEROWANIA 2-OSTRZOWY

$$V_c = \frac{\pi d n}{1000} \text{ (m/min)}$$

$$n = \frac{1000 \times V_c}{\pi d} \text{ (rpm)}$$

$$f_z = \frac{f}{z_n} \text{ (mm/tooth)}$$

$$fz = \text{feed per tooth} - \text{posuw na ostrze (mm/tooth)}$$
$$f = \text{minute feed} - \text{posuw minutowy (mm/min)}$$

d = diameter – średnica (mm)

z = number of teeth – liczba zębów



PY

SW

HPL

CS

MD

ISO	P												M				K						N										S								H				
HRC		13	25	28	31	10	29	32	38	15	35	15	23	10	10	26	3	25		21													15	30	25	38	34	400	1050	55	60	42	55		
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	60	100	75	90	130	110	90	100					200	280	250	350	320	Rm	Rm	550	630	400	550		
VDI3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41				

CODE	DC	DC1	OAL	DCON	RE
UFW16060001A06000060	6	4	60	6	1
UFW16080002A08000060	8	4	60	8	2
UFW16100003A10000060	10	4	60	10	3
UFW16120004A12000060	12	4	60	12	4
UFW16160005A16000060	16	6	60	16	5
UFW16160006A16000060	16	4	60	16	6

RADIUS ROUTER 3-FLUTE / FREZ Z PROMIENIEM 3-OSTRZOWY

ISO	VDI 3323	DC	6.0	8.0	10.0	12.0	16.0
N	29-30	rpm obr/min	18000-24000	18000-24000	18000-24000	18000-24000	18000-24000
		feed posuw m/min	2-8	2-8	2-8	2-8	2-8

n = tool rotation – obroty narzędzia (rpm)
 d = diameter – średnica (mm)
 z = number of teeth – liczba zębów



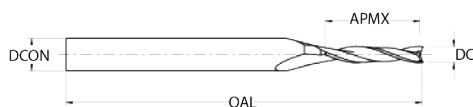
MD

CODE	DC	APMX	OAL	DCON
UFW17020000A06006050	2	6	50	6
UFW17030000A06006050	2,5	6	50	6
UFW17030000A06010050	3	10	50	6
UFW17030000A06013051	3,17 (1/8")	12,7 (1/2")	50,8 (2")	6,35 (1/4")
UFW17040000A06012050	3,5	12	50	6
UFW17040000A06015050	4	15	50	6
UFW17047000A06013051	4,75 (3/16")	12,7 (1/2")	50,8 (2")	6,35 (1/4")
UFW17050000A06020060	5	20	60	6
UFW17063000A06025063	6,35 (1/4")	25,4 (1")	63,5 (2 1/2")	6,35 (1/4")

SPIRAL ROUTER BIT 2-FUTES S-6 / FREZ 2-OSTRZOWY SPIRALNY S-6

n = tool rotation – obroty narzędzia (rpm)
 d = diameter – średnica (mm)
 z = number of teeth – liczba zębów

UFW18



PW

PY

PL

SW

HPL

CS

MDF

ISO	P												M				K						N										S										H					
HRC	13	25	28	31	10	29	32	38	15	35	15	23	10	10	26	3	25		21													15	30	25	38	34	400	1050	55	60	42	55						
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	60	100	75	90	130	110	90	100				200	280	250	350	320	Rm	Rm	550	630	400	550						
VDI3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41							

CODE	DC	APMX	OAL	DCON
UFW18020000A08006050	2	6	50	8
UFW18030000A08006050	2,5	6	50	8
UFW18030000A08010050	3	10	50	8
UFW18031000A08013051	3,17 (1/8")	12,7 (1/2")	50,8 (2")	7,95 (5/6")
UFW18040000A08012050	3,5	12	50	8
UFW18040000A08015060	4	15	60	8
UFW18047000A08013051	4,75 (3/16")	12,7 (1/2")	50,8 (2")	7,95 (5/6")
UFW18050000A08017060	5	17	60	8
UFW18050000A08020065	5	20	65	8
UFW18060000A08017060	6	17	60	8
UFW18060000A08022065	6	22	65	8
UFW18063000A08025076	6,35 (1/4")	25,4 (1")	76,2 (2 1/2")	7,95 (5/6")
UFW18070000A08022065	7	22	65	8
UFW18079000A08025076	7,95 (5/6")	25,4 (1")	76,2 (2 1/2")	7,95 (5/6")

CUTTING CONDITIONS PARAMETRY SKRAWANIA

SPIRAL ROUTER BIT 2-FUTES S-8 / FREZ 2-OSTRZOWY SPIRALNY S-8

ISO	VDI 3323	DC	2.0	3.0	4.0	5.0	6.0	7.0	8.0
N	29-30	rpm obr/min	18000-24000	18000-24000	18000-24000	18000-24000	18000-24000	18000-24000	18000-24000
		feed posuw m/min	2-8	2-8	2-8	2-8	2-8	2-8	2-8

$$V_c = \frac{\pi d n}{1000} \text{ (m/min)}$$

$$n = \frac{1000 \times V_c}{\pi d} \text{ (rpm)}$$

$$f_z = \frac{f}{z_n} \text{ (mm/tooth)}$$

V_c = cutting speed – prędkość skrawania (m/min)

$$fz = \text{feed per tooth} - \text{posuw na ostrze (mm/tooth)}$$
$$f = \text{minute feed} - \text{posuw minutowy (mm/min)}$$

n = tool rotation – obroty narzędzia (rpm)

d = diameter – średnica (mm)

z = number of teeth – liczba zębów

UFW19



PW

PY

PL

SW

HPL

CS

MDF

ISO	P										M				K						N										S										H				
HRC		13	25	28	31	10	29	32	38	15	35	15	23	10	10	26	3	25		21											15	30	25	38	34	400	1050	55	60	42	55				
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	60	100	75	90	130	110	90	100			200	280	250	350	320	Rm	Rm	550	630	400	550				
VDI3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41				

CODE	DC	SIG	APMX	OAL	DCON
UFW19080000A08007060	7,8	18°	6,8	60	8
UFW19100000A10010060	10	7°	10	60	10
UFW19120000A12010060	12	7°	10	60	12
UFW19160000A12016060	16	7°	16	60	12
UFW19160000A12018065	16	14°	18	65	12
UFW19200000A12018065	20	7°	18	65	12
UFW19200000A12022070	20	14°	22	70	12

CUTTING CONDITIONS PARAMETRY SKRAWANIA

DOVETAIL ROUTER BITS 2-FLUTE / FREZ DO POŁĄCZEŃ 2-OSTRZOWY

ISO	VDI 3323	DC	8.0	10.0	12.0	16.0	20.0
N	29-30	rpm obr/min	18000-24000	18000-24000	18000-24000	18000-24000	18000-24000
		feed posuw m/min	4-12	4-12	4-12	4-12	4-12

$$V_c = \frac{\pi d n}{1000} \text{ (m/min)}$$

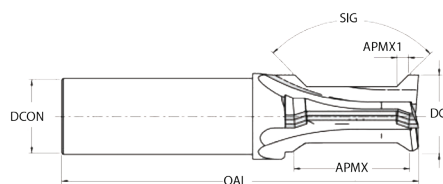
$$n = \frac{1000 \times V_c}{\pi d} \text{ (rpm)}$$

$$f_z = \frac{f}{z n} \text{ (mm/tooth)}$$

V_c = cutting speed – prędkość skrawania (m/min)
 f_z = feed per tooth – posuw na ostrze (mm/tooth)
 f = minute feed – posuw minutowy (mm/min)

n = tool rotation – obroty narzędzia (rpm)
 d = diameter – średnica (mm)
 z = number of teeth – liczba zębów

UFW20



PW

PY

PL

SW

HPL

CS

MDF

ISO	P										M				K				N										S										H				
HRC		13	25	28	31	10	29	32	38	15	35	15	23	10	10	26	3	25		21												15	30	25	38	34	400	1050	55	60	42	55	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	60	100	75	90	130	110	90	100			200	280	250	350	320	Rm	Rm	550	630	400	550		
VDI3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37						

CODE	DC	APMX	APMX1	SIG	OAL	DCON
UFW20160000A16012070	16	12	2	90°	70	16
UFW20160000A16016070	16	16	3	90°	70	16
UFW20160000A16020070	16	20	3	90°	70	16
UFW20180000A18016070	18	16	3	90°	70	18
UFW20180000A18020070	18	20	3	90°	70	18
UFW20180000A18024070	18	24	3	90°	70	18
UFW20200000A20028080	20	28	4	90°	80	20

CUTTING CONDITIONS PARAMETRY SKRAWANIA

PROFIL ROUTER 3-FLUTE / FREZ DO PROFILOWANIA 3-OSTRZOWY

ISO	VDI 3323	DC	16.0	18.0	20.0
N	29-30	rpm obr/min	16000-20000	16000-20000	16000-20000
		feed posuw m/min	4-12	4-12	4-12

$$V_c = \frac{\pi d n}{1000} \text{ (m/min)}$$

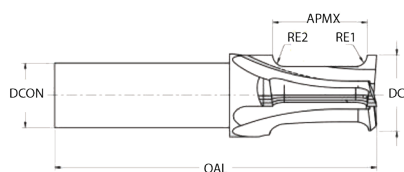
$$n = \frac{1000 \times V_c}{\pi d} \text{ (rpm)}$$

$$f_z = \frac{f}{z n} \text{ (mm/tooth)}$$

V_c = cutting speed – prędkość skrawania (m/min)
 f_z = feed per tooth – posuw na ostrze (mm/tooth)
 f = minute feed – posuw minutowy (mm/min)

n = tool rotation – obroty narzędzia (rpm)
 d = diameter – średnica (mm)
 z = number of teeth – liczba zębów

UFW21



PW

PY

PL

SW

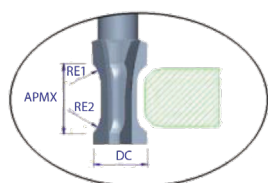
HPL

CS

MDF

ISO	P										M				K					N										S										H																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
HRc		13	25	28	31	10	29	32	38	15	35	15	23	10	10	26	3	25		21																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	

CODE	DC	APMX	RE1	RE2	OAL	DCON
UFW21160000A16012070	16	12	2	2	70	16
UFW21160000A16016070	16	16	3	3	70	16
UFW21160000A16020070	16	20	3	3	70	16
UFW21180000A18016070	18	16	3	3	70	18
UFW21180000A18020070	18	20	3	3	70	18
UFW21180000A18024070	18	24	3	3	70	18
UFW21200000A20028080	20	28	4	4	80	20



CUTTING CONDITIONS PARAMETRY SKRAWANIA

PROFIL ROUTER 3-FLUTE / FREZ DO PROFILOWANIA 3-OSTRZOWY

ISO	VDI 3323	DC	16.0	18.0	20.0
N	29-30	rpm obr/min	16000-20000	16000-20000	16000-20000
		feed posuw m/min	4-12	4-12	4-12

$$V_c = \frac{\pi d n}{1000} \text{ (m/min)}$$

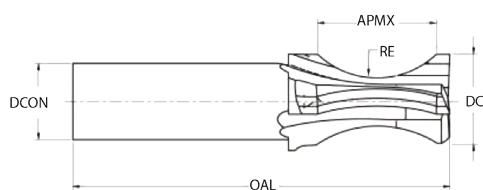
$$n = \frac{1000 \times V_c}{\pi d} \text{ (rpm)}$$

$$f_z = \frac{f}{z n} \text{ (mm/tooth)}$$

V_c = cutting speed – prędkość skrawania (m/min)
 f_z = feed per tooth – posuw na ostrze (mm/tooth)
 f = minute feed – posuw minutowy (mm/min)

n = tool rotation – obroty narzędzia (rpm)
 d = diameter – średnica (mm)
 z = number of teeth – liczba zębów

UFW22



PW

PY

PL

SW

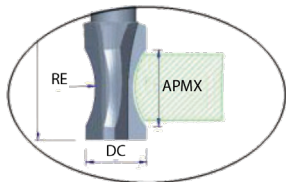
HPL

CS

MD

ISO	P												M				K				N								S								H							
HRC	13	25	28	31	10	29	32	38	15	35	15	23	10	10	26	3	25		21													15	30	25	38	34	400	1050	55	60	42	55		
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	60	100	75	90	130	110	90	100						200	280	250	350	320	Rm	Rm	550	630	400	550
VDI3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41			

CODE	DC	APMX	RE	OAL	DCON
UFW22160012A16012070	16	12	12	70	16
UFW22160016A16016070	16	16	16	70	16
UFW22160018A16020070	16	20	18	70	16
UFW22180016A18016070	18	16	16	70	18
UFW22180018A18020070	18	20	18	70	18
UFW22180020A18024070	18	24	20	70	18
UFW22200020A20028080	20	28	20	80	20



CUTTING CONDITIONS PARAMETRY SKRAWANIA

PROFIL ROUTER 3-FLUTE / FREZ DO PROFILOWANIA 3-OSTRZOWY

ISO	VDI 3323	DC	16.0	18.0	20.0
N	29-30	rpm obr/min	16000-20000	16000-20000	16000-20000
		feed posuw m/min	4-12	4-12	4-12

$$V_c = \frac{\pi d n}{1000} \text{ (m/min)}$$

$$n = \frac{1000 \times V_c}{\pi d} \text{ (rpm)}$$

$$f_z = \frac{f}{zn} \text{ (mm/tooth)}$$

V_c = cutting speed – prędkość skrawania (m/min)

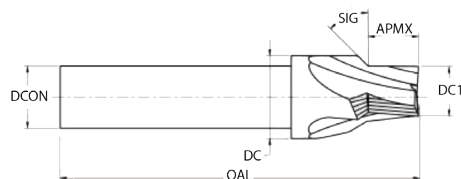
$$fz = \text{feed per tooth} - \text{posuw na ostrze (mm/tooth)}$$
$$f = \text{minute feed} - \text{posuw minutowy (mm/min)}$$

n = tool rotation – obroty narzędzia (rpm)

d = diameter – średnica (mm)

z = number of teeth – liczba zębów

UFW23



PW

PY

PL

SW

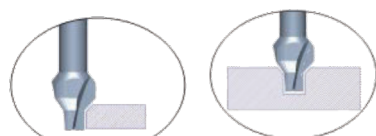
HPL

CS

MDP

ISO	P										M				K						N										S										H																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
HRC	13	25	28	31	10	29	32	38	15	35	15	23	10	10	26	3	25		21																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															

CODE	DC	DC1	APMX	SIG	OAL	DCON
UFW23080000A08012065	8	5	12	45°	65	8
UFW23080000A08020070	8	5	20	45°	70	8
UFW23120000A12020070	12	6	20	45°	70	12
UFW23120000A12025080	12	6	25	45°	80	12
UFW23160000A16008065	16	10	8	45°	65	16
UFW23160000A16012070	16	10	12	45°	70	16
UFW23160000A16016070	16	10	16	45°	70	16
UFW23180000A18010070	18	10	10	45°	70	18
UFW23180000A18014070	18	10	14	45°	70	18
UFW23180000A18018070	18	10	18	45°	70	18
UFW23200000A20020080	20	10	20	45°	80	20



CUTTING CONDITIONS PARAMETRY SKRAWANIA

PROFIL ROUTER 3-FLUTE / FREZ DO PROFILOWANIA 3-OSTRZOWY

ISO	VDI 3323	DC	8.0	12.0	16.0	18.0	20.0
N	29-30	rpm obr/min	16000-20000	16000-20000	16000-20000	16000-20000	16000-20000
		feed posuw m/min	4-12	4-12	4-12	4-12	4-12

$$V_c = \frac{\pi d n}{1000} \text{ (m/min)}$$

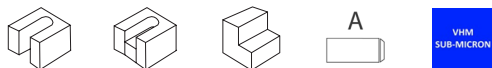
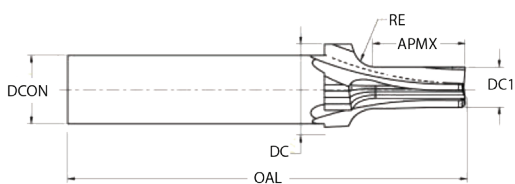
$$n = \frac{1000 \times V_c}{\pi d} \text{ (rpm)}$$

$$f_z = \frac{f}{z n} \text{ (mm/tooth)}$$

V_c = cutting speed – prędkość skrawania (m/min)
 f_z = feed per tooth – posuw na ostrze (mm/tooth)
 f = minute feed – posuw minutowy (mm/min)

n = tool rotation – obroty narzędzia (rpm)
 d = diameter – średnica (mm)
 z = number of teeth – liczba zębów

UFW24



PW

PY

PL

SW

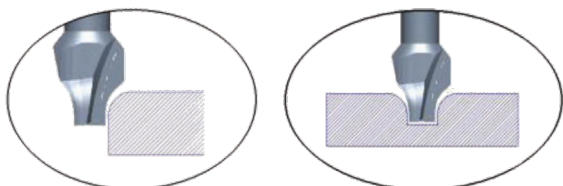
HP

CS

MD

ISO	P												M				K				N								S								H					
HRc		13	25	28	31	10	29	32	38	15	35	15	23	10	10	26	3	25		21											15	30	25	38	34	400	1050	55	60	42	55	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	60	100	75	90	130	110	90	100				200	280	250	350	320	Rm	Rm	550	630	400	550
VDI3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	

CODE	DC	DC1	APMX	RE	OAL	DCON
UFW24120002A12008065	12	8	8	2	65	12
UFW24120002A12012065	12	8	12	2	65	12
UFW24160002A16008065	16	10	8	2	65	16
UFW24160003A16012070	16	9	12	3	70	16
UFW24160004A16016070	16	8	16	4	70	16
UFW24180003A18010070	18	12	10	3	70	18
UFW24180004A18014070	18	10	14	4	70	18
UFW24180005A18018070	18	8	18	5	70	18
UFW24200006A20020080	20	8	20	6	80	20



CUTTING CONDITIONS PARAMETRY SKRAWANIA

PROFIL ROUTER 3-FLUTE / FREZ DO PROFILOWANIA 3-OSTRZOWY

ISO	VDI 3323	DC	12.0	16.0	18.0	20.0
N	29-30	rpm obr/min	16000-20000	16000-20000	16000-20000	16000-20000
		feed posuw m/min	4-12	4-12	4-12	4-12

$$V_c = \frac{\pi d n}{1000} \text{ (m/min)}$$

$$n = \frac{1000 \times V_c}{\pi d} \text{ (rpm)}$$

$$f_z = \frac{f}{zn} \text{ (mm/tooth)}$$

V_c = cutting speed – prędkość skrawania (m/min)

$$fz = \text{feed per tooth} - \text{posuw na ostrze (mm/tooth)}$$
$$f = \text{minute feed} - \text{posuw minutowy (mm/min)}$$

n = tool rotation – obroty narzędzia (rpm)

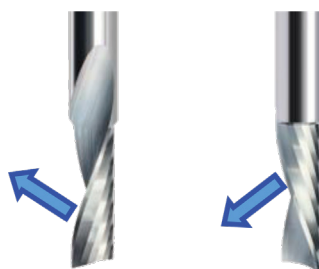
d = diameter – średnica (mm)

z = number of teeth – liczba zębów



MDI

CODE POSITIVE	CODE NEGATIVE	DC	APMX	OAL	DON
UFW25020000A03008050	UFW25020000A03008050N	2	8	50	3
UFW25030000A03014050	UFW25030000A03014050N	3	14	50	3
UFW25031000A03013051	UFW25031000A03013051N	3,17 (1/8")	12,7 (1/2")	50,8 (2")	3,17 (1/8")
UFW25040000A04014050	UFW25040000A04014050N	4	14	50	4
UFW25040000A04020050	UFW25040000A04020050N	4	20	50	4
UFW25047000A06013051	UFW25047000A06013051N	4,75 (3/16")	12,7 (1/2")	50,8 (2")	6,35 (1/4")
UFW25050000A05017050	UFW25050000A05017050N	5	17	50	5
UFW25050000A05022060	UFW25050000A05022060N	5	22	60	5
UFW25060000A06022060	UFW25060000A06022060N	6	22	60	6
UFW25060000A06027070	UFW25060000A06027070N	6	27	70	6
UFW25063000A06025063	UFW25063000A06025063N	6,35 (1/4")	25,4 (1")	63,5 (2 1/2")	6,35 (1/4")
UFW25080000A08022070	UFW25080000A08022070N	8	22	70	8
UFW25080000A08032080	UFW25080000A08032080N	8	32	80	8
UFW25095000A09025076	UFW25095000A09025076N	9,52 (3/8")	25,4 (1")	76,2 (3")	9,52 (3/8")
UFW25100000A10032080	UFW25100000A10032080N	10	32	80	10
UFW25100000A10042090	UFW25100000A10042090N	10	42	90	10
UFW25120000A12032080	UFW25120000A12032080N	12	32	80	12
UFW25120000A12042090	UFW25120000A12042090N	12	42	90	12



z = number of teeth – liczba zębów



MD

CODE POSITIVE	CODE NEGATIVE	DC	APMX	OAL	DCON
UFW26020000A03008050	UFW26020000A03008050N	2	8	50	3
UFW26030000A03012050	UFW26030000A03012050N	3	12	50	3
UFW26040000A04012050	UFW26040000A04012050N	4	12	50	4
UFW26050000A05017070	UFW26050000A05017070N	5	17	70	5
UFW26060000A06022070	UFW26060000A06022070N	6	22	70	6
UFW26080000A08022070	UFW26080000A08022070N	8	22	70	8
UFW26080000A08032080	UFW26080000A08032080N	8	32	80	8
UFW26100000A10032080	UFW26100000A10032080N	10	32	80	10
UFW26100000A10042090	UFW26100000A10042090N	10	42	90	10
UFW26100000A10052100	UFW26100000A10052100N	10	52	100	10
UFW26120000A12032080	UFW26120000A12032080N	12	32	80	12
UFW26120000A12042090	UFW26120000A12042090N	12	42	90	12
UFW26120000A12052100	UFW26120000A12052100N	12	52	100	12
UFW26140000A14042090	UFW26140000A14042090N	14	42	90	14
UFW26140000A14052100	UFW26140000A14052100N	14	52	100	14
UFW26160000A16032080	UFW26160000A16032080N	16	32	80	16
UFW26160000A16042090	UFW26160000A16042090N	16	42	90	16
UFW26160000A16052100	UFW26160000A16052100N	16	52	100	16
UFW26160000A16062110	UFW26160000A16062110N	16	62	110	16
UFW26160000A16072120	UFW26160000A16072120N	16	72	120	16
UFW26180000A18052100	UFW26180000A18052100N	18	52	100	18
UFW26180000A18072120	UFW26180000A18072120N	18	72	120	18
UFW26200000A20052100	UFW26200000A20052100N	20	52	100	20
UFW26200000A20072120	UFW26200000A20072120N	20	72	120	20
UFW26200000A20082130	UFW26200000A20082130N	20	82	130	20
UFW26200000A20100150	UFW26200000A20100150N	20	100	150	20

n = tool rotation – obroty narzędzia (rpm)
 d = diameter – średnica (mm)
 z = number of teeth – liczba zębów

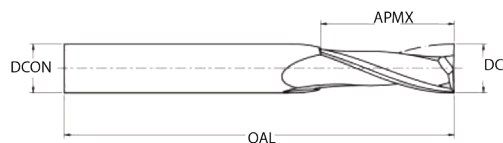


MDI

CODE POSITIVE	CODE NEGATIVE	DC	APMX	OAL	DCON
UFW27060000A06022070	UFW27060000A06022070N	6	22	70	6
UFW27080000A08022070	UFW27080000A08022070N	8	22	70	8
UFW27080000A08032080	UFW27080000A08032080N	8	32	80	8
UFW27100000A10032080	UFW27100000A10032080N	10	32	80	10
UFW27100000A10042090	UFW27100000A10042090N	10	42	90	10
UFW27100000A10052100	UFW27100000A10052100N	10	52	100	10
UFW27120000A12032080	UFW27120000A12032080N	12	32	80	12
UFW27120000A12042090	UFW27120000A12042090N	12	42	90	12
UFW27120000A12052100	UFW27120000A12052100N	12	52	100	12
UFW27140000A14042090	UFW27140000A14042090N	14	42	90	14
UFW27140000A14052100	UFW27140000A14052100N	14	52	100	14
UFW27160000A16032080	UFW27160000A16032080N	16	32	80	16
UFW27160000A16042090	UFW27160000A16042090N	16	42	90	16
UFW27160000A16052100	UFW27160000A16052100N	16	52	100	16
UFW27160000A16062110	UFW27160000A16062110N	16	62	110	16
UFW27160000A16072120	UFW27160000A16072120N	16	72	120	16
UFW27180000A18052100	UFW27180000A18052100N	18	52	100	18
UFW27180000A18072120	UFW27180000A18072120N	18	72	120	18
UFW27200000A20052100	UFW27200000A20052100N	20	52	100	20
UFW27200000A20072120	UFW27200000A20072120N	20	72	120	20
UFW27200000A20082130	UFW27200000A20082130N	20	82	130	20
UFW27200000A20100150	UFW27200000A20100150N	20	100	150	20

z = number of teeth – liczba zębów

UFW28


Finish

PW
PY
PL
SW
HPL
CS
MDF


ISO	P										M				K						N										S										H				
HRC		13	25	28	31	10	29	32	38	15	35	15	23	10	10	26	3	25		21											15	30	25	38	34	400	1050	55	60	42	55				
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	60	100	75	90	130	110	90	100			200	280	250	350	320	Rm	Rm	550	630	400	550				
VDI3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41				

CODE POSITIVE	CODE NEGATIVE	DC	APMX	OAL	DCON
UFW28030000A03003050	UFW28030000A03003050N	3	3	50	3
UFW28040000A04004050	UFW28040000A04004050N	4	4	50	4
UFW28050000A05005070	UFW28050000A05005070N	5	5	70	5
UFW28060000A06006070	UFW28060000A06006070N	6	6	70	6
UFW28080000A08008070	UFW28080000A08008070N	8	8	70	8
UFW28080000A08008080	UFW28080000A08008080N	8	8	80	8
UFW28100000A10010080	UFW28100000A10010080N	10	10	80	10
UFW28100000A10010090	UFW28100000A10010090N	10	10	90	10
UFW28100000A10010100	UFW28100000A10010100N	10	10	100	10
UFW28120000A12012080	UFW28120000A12012080N	12	12	80	12
UFW28120000A12012090	UFW28120000A12012090N	12	12	90	12
UFW28120000A12012100	UFW28120000A12012100N	12	12	100	12
UFW28140000A14014090	UFW28140000A14014090N	14	14	90	14
UFW28140000A14014100	UFW28140000A14014100N	14	14	100	14
UFW28160000A16016080	UFW28160000A16016080N	16	16	80	16
UFW28160000A16016090	UFW28160000A16016090N	16	16	90	16
UFW28160000A16016100	UFW28160000A16016100N	16	16	100	16
UFW28160000A16016110	UFW28160000A16016110N	16	16	110	16
UFW28160000A16016120	UFW28160000A16016120N	16	16	120	16
UFW28180000A18018100	UFW28180000A18018100N	18	18	100	18
UFW28180000A18018120	UFW28180000A18018120N	18	18	120	18
UFW28200000A20020100	UFW28200000A20020100N	20	20	100	20
UFW28200000A20020120	UFW28200000A20020120N	20	20	120	20
UFW28200000A20020130	UFW28200000A20020130N	20	20	130	20
UFW28200000A20020150	UFW28200000A20020150N	20	20	150	20

CUTTING CONDITIONS PARAMETRY SKRAWANIA

SPIRAL ROUTER 2-FLUTE FOR SOFT WOOD / FREZ SPIRALNY 2-OSTRZOWY DO MIĘKKIEGO DREWNA

ISO	VDI 3323	DC	3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0-20.0
N	29-30	rpm obr/min	18000-24000	18000-24000	18000-24000	18000-24000	18000-24000	18000-24000	18000-24000	18000-24000
		feed posuw m/min	2-10	2-10	2-10	2-10	2-10	2-10	2-10	2-10

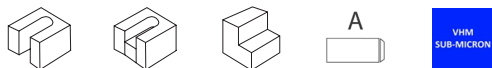
$$V_c = \frac{\pi d n}{1000} \text{ (m/min)}$$

$$n = \frac{1000 \times V_c}{\pi d} \text{ (rpm)}$$

$$f_z = \frac{f}{z n} \text{ (mm/tooth)}$$

V_c = cutting speed – prędkość skrawania (m/min)
 f_z = feed per tooth – posuw na ostrze (mm/tooth)
 f = minute feed – posuw minutowy (mm/min)

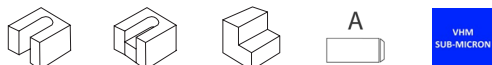
n = tool rotation – obroty narzędzia (rpm)
 d = diameter – średnica (mm)
 z = number of teeth – liczba zębów



MD

CODE POSITIVE	CODE NEGATIVE	DC	APMX	OAL	DCON
UFW29060000A06022070	UFW29060000A06022070N	6	22	70	6
UFW29080000A08022070	UFW29080000A08022070N	8	22	70	8
UFW29080000A08032080	UFW29080000A08032080N	8	32	80	8
UFW29100000A10032080	UFW29100000A10032080N	10	32	80	10
UFW29100000A10042090	UFW29100000A10042090N	10	42	90	10
UFW29100000A10052100	UFW29100000A10052100N	10	52	100	10
UFW29120000A12032080	UFW29120000A12032080N	12	32	80	12
UFW29120000A12042090	UFW29120000A12042090N	12	42	90	12
UFW29120000A12052100	UFW29120000A12052100N	12	52	100	12
UFW29140000A14042090	UFW29140000A14042090N	14	42	90	14
UFW29140000A14052100	UFW29140000A14052100N	14	52	100	14
UFW29160000A16032080	UFW29160000A16032080N	16	32	80	16
UFW29160000A16042090	UFW29160000A16042090N	16	42	90	16
UFW29160000A16052100	UFW29160000A16052100N	16	52	100	16
UFW29160000A16062110	UFW29160000A16062110N	16	62	110	16
UFW29160000A16072120	UFW29160000A16072120N	16	72	120	16
UFW29180000A18052100	UFW29180000A18052100N	18	52	100	18
UFW29180000A18072120	UFW29180000A18072120N	18	72	120	18
UFW29200000A20052100	UFW29200000A20052100N	20	52	100	20
UFW29200000A20072120	UFW29200000A20072120N	20	72	120	20
UFW29200000A20082130	UFW29200000A20082130N	20	82	130	20
UFW29200000A20100150	UFW29200000A20100150N	20	100	150	20

n = tool rotation – obroty narzędzia (rpm)
 d = diameter – średnica (mm)
 z = number of teeth – liczba zębów



PY

PL

SW

HPI

CS

MD

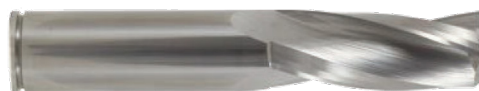
ISO	P												M				K						N										S								H							
HRC	13	25	28	31	10	29	32	38	15	35	15	23	10	10	26	3	25		21													15	30	25	38	34	400	1050	55	60	42	55						
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	60	100	75	90	130	110	90	100				200	280	250	350	320	Rm	Rm	550	630	400	550						
VDI3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41							

CODE POSITIVE	CODE NEGATIVE	DC	APMX	OAL	DCON
UFW30060000A06022070	UFW30060000A06022070N	6	22	70	6
UFW30080000A08022070	UFW30080000A08022070N	8	22	70	8
UFW30080000A08032080	UFW30080000A08032080N	8	32	80	8
UFW30100000A10032080	UFW30100000A10032080N	10	32	80	10
UFW30100000A10042090	UFW30100000A10042090N	10	42	90	10
UFW30100000A10052100	UFW30100000A10052100N	10	52	100	10
UFW30120000A12032080	UFW30120000A12032080N	12	32	80	12
UFW30120000A12042090	UFW30120000A12042090N	12	42	90	12
UFW30120000A12052100	UFW30120000A12052100N	12	52	100	12
UFW30140000A14042090	UFW30140000A14042090N	14	42	90	14
UFW30140000A14052100	UFW30140000A14052100N	14	52	100	14
UFW30160000A16032080	UFW30160000A16032080N	16	32	80	16
UFW30160000A16042090	UFW30160000A16042090N	16	42	90	16
UFW30160000A16052100	UFW30160000A16052100N	16	52	100	16
UFW30160000A16062110	UFW30160000A16062110N	16	62	110	16
UFW30160000A16072120	UFW30160000A16072120N	16	72	120	16
UFW30180000A18052100	UFW30180000A18052100N	18	52	100	18
UFW30180000A18072120	UFW30180000A18072120N	18	72	120	18
UFW30200000A20052100	UFW30200000A20052100N	20	52	100	20
UFW30200000A20072120	UFW30200000A20072120N	20	72	120	20
UFW30200000A20085130	UFW30200000A20085130N	20	85	130	20
UFW30200000A20100150	UFW30200000A20100150N	20	100	150	20

SPIRAL ROUTER 2-FLUTE/ FREZ SPIRALNY 2-OSTRZOWY ZGRUBNY

ISO	VDI 3323	DC	6.0	8.0	10.0	12.0	16.0	18.0	20.0
N	29-30	rpm obr/min	18000-24000	18000-24000	18000-24000	18000-24000	18000-24000	18000-24000	18000-24000
		feed posuw m/min	2-10	2-10	2-10	2-10	2-10	2-10	2-10

n = tool rotation – obroty narzędzia (rpm)
 d = diameter – średnica (mm)
 z = number of teeth – liczba zębów



MD

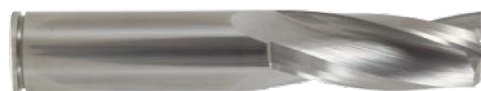
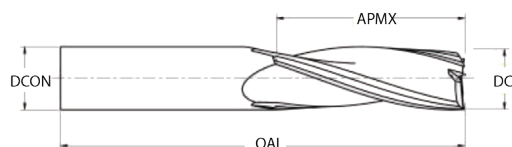
CODE POSITIVE	CODE NEGATIVE	DC	APMX	OAL	DCON
UFW31060000A06022070	UFW31060000A06022070N	6	22	70	6
UFW31080000A08022070	UFW31080000A08022070N	8	22	70	8
UFW31080000A08032080	UFW31080000A08032080N	8	32	80	8
UFW31100000A10032080	UFW31100000A10032080N	10	32	80	10
UFW31100000A10042090	UFW31100000A10042090N	10	42	90	10
UFW31100000A10052100	UFW31100000A10052100N	10	52	100	10
UFW31120000A12032080	UFW31120000A12032080N	12	32	80	12
UFW31120000A12042090	UFW31120000A12042090N	12	42	90	12
UFW31120000A12052100	UFW31120000A12052100N	12	52	100	12
UFW31140000A14042090	UFW31140000A14042090N	14	42	90	14
UFW31140000A14052100	UFW31140000A14052100N	14	52	100	14
UFW31160000A16032080	UFW31160000A16032080N	16	32	80	16
UFW31160000A16042090	UFW31160000A16042090N	16	42	90	16
UFW31160000A16052100	UFW31160000A16052100N	16	52	100	16
UFW31160000A16062110	UFW31160000A16062110N	16	62	110	16
UFW31160000A16072120	UFW31160000A16072120N	16	72	120	16
UFW31180000A18052100	UFW31180000A18052100N	18	52	100	18
UFW31180000A18072120	UFW31180000A18072120N	18	72	120	18
UFW31200000A20052100	UFW31200000A20052100N	20	52	100	20
UFW31200000A20072120	UFW31200000A20072120N	20	72	120	20
UFW31200000A20085130	UFW31200000A20085130N	20	85	130	20
UFW31200000A20100150	UFW31200000A20100150N	20	100	150	20
UFW31250000A25100150	UFW31250000A25100150N	25	100	150	25

z = number of teeth – liczba zębów

UFW32



Finish



PW

PY

PL

SW

HPI

CS

MD

ISO	P												M				K				N										S								H			
HRC		13	25	28	31	10	29	32	38	15	35	15	23	10	10	26	3	25		21											15	30	25	38	34	400	1050	55	60	42	55	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	60	100	75	90	130	110	90	100			200	280	250	350	320	Rm	Rm	550	630	400	550	
VDI3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	

CODE POSITIVE	CODE NEGATIVE	DC	APMX	OAL	DCON
UFW32060000A06022070	UFW32060000A06022070N	6	22	70	6
UFW32080000A08022070	UFW32080000A08022070N	8	22	70	8
UFW32080000A08032080	UFW32080000A08032080N	8	32	80	8
UFW32100000A10032080	UFW32100000A10032080N	10	32	80	10
UFW32100000A10042090	UFW32100000A10042090N	10	42	90	10
UFW32100000A10052100	UFW32100000A10052100N	10	52	100	10
UFW32120000A12032080	UFW32120000A12032080N	12	32	80	12
UFW32120000A12042090	UFW32120000A12042090N	12	42	90	12
UFW32120000A12052100	UFW32120000A12052100N	12	52	100	12
UFW32140000A14042090	UFW32140000A14042090N	14	42	90	14
UFW32140000A14052100	UFW32140000A14052100N	14	52	100	14
UFW32160000A16032080	UFW32160000A16032080N	16	32	80	16
UFW32160000A16042090	UFW32160000A16042090N	16	42	90	16
UFW32160000A16052100	UFW32160000A16052100N	16	52	100	16
UFW32160000A16062110	UFW32160000A16062110N	16	62	110	16
UFW32160000A16072120	UFW32160000A16072120N	16	72	120	16
UFW32180000A18052100	UFW32180000A18052100N	18	52	100	18
UFW32180000A18072120	UFW32180000A18072120N	18	72	120	18
UFW32200000A20052100	UFW32200000A20052100N	20	52	100	20
UFW32200000A20072120	UFW32200000A20072120N	20	72	120	20
UFW32200000A20085130	UFW32200000A20085130N	20	85	130	20
UFW32200000A20100150	UFW32200000A20100150N	20	100	150	20
UFW32250000A25100150	UFW32250000A25100150N	25	100	150	25

CUTTING CONDITIONS PARAMETRY SKRAWANIA

SPIRAL ROUTER 3-FLUTE FOR SOFT WOOD / FREZ SPIRALNY 3-OSTRZOWY DO MIĘKKIEGO DREWNA

ISO	VDI 3323	DC	6.0	8.0	10.0	12.0	16.0	18.0	20.0
N	29-30	rpm obr/min	18000-24000	18000-24000	18000-24000	18000-24000	18000-24000	18000-24000	18000-24000
		feed posuw m/min	2-10	2-10	2-10	2-10	2-10	2-10	2-10

$$V_c = \frac{\pi d n}{1000} \text{ (m/min)}$$

$$n = \frac{1000 \times V_c}{\pi d} \text{ (rpm)}$$

$$f_z = \frac{f}{zn} \text{ (mm/tooth)}$$

V_c = cutting speed – predkość skrawania (m/min)

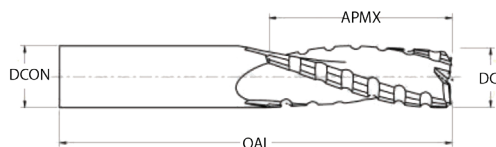
$$fz = \text{feed per tooth} - \text{posuw na ostrze (mm/tooth)}$$
$$f = \text{minute feed} - \text{posuw minutowy (mm/min)}$$

n = tool rotation – obroty narzędzia (rpm)

$d \equiv$ diameter – średnica (mm)

z = number of teeth – liczba zębów

UFW33



PW

PY

PL

SW

HPL

CS

MDF



ISO	P										M				K				N										S							H					
HRC		13	25	28	31	10	29	32	38	15	35	15	23	10	10	26	3	25		21											15	30	25	38	34	400	1050	55	60	42	55
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	60	100	75	90	130	110	90	100			200	280	250	350	320	Rm	Rm	550	630	400	550
VDI3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41

CODE POSITIVE	CODE NEGATIVE	DC	APMX	OAL	DCON
UFW33060000A06022070	UFW33060000A06022070N	6	22	70	6
UFW33080000A08022070	UFW33080000A08022070N	8	22	70	8
UFW33080000A08032080	UFW33080000A08032080N	8	32	80	8
UFW33100000A10032080	UFW33100000A10032080N	10	32	80	10
UFW33100000A10042090	UFW33100000A10042090N	10	42	90	10
UFW33100000A10052100	UFW33100000A10052100N	10	52	100	10
UFW33120000A12032080	UFW33120000A12032080N	12	32	80	12
UFW33120000A12042090	UFW33120000A12042090N	12	42	90	12
UFW33120000A12052100	UFW33120000A12052100N	12	52	100	12
UFW33140000A14042090	UFW33140000A14042090N	14	42	90	14
UFW33140000A14052100	UFW33140000A14052100N	14	52	100	14
UFW33160000A16032080	UFW33160000A16032080N	16	32	80	16
UFW33160000A16042090	UFW33160000A16042090N	16	42	90	16
UFW33160000A16052100	UFW33160000A16052100N	16	52	100	16
UFW33160000A16062110	UFW33160000A16062110N	16	62	110	16
UFW33160000A16072120	UFW33160000A16072120N	16	72	120	16
UFW33180000A18052100	UFW33180000A18052100N	18	52	100	18
UFW33180000A18072120	UFW33180000A18072120N	18	72	120	18
UFW33200000A20052100	UFW33200000A20052100N	20	52	100	20
UFW33200000A20072120	UFW33200000A20072120N	20	72	120	20
UFW33200000A20085130	UFW33200000A20085130N	20	85	130	20
UFW33200000A20100150	UFW33200000A20100150N	20	100	150	20
UFW33250000A25100150	UFW33250000A25100150N	25	100	150	25

CUTTING CONDITIONS PARAMETRY SKRAWANIA

SPIRAL ROUTER 3-FLUTE FOR SOFT WOOD / FREZ SPIRALNY 3-OSTRZOWY DO MIĘKKIEGO DREWNA Z ŁAMACZEM WIÓRA

ISO	VDI 3323	DC	6.0	8.0	10.0	12.0	16.0	18.0	20.0
N	29-30	rpm obr/min	18000-24000	18000-24000	18000-24000	18000-24000	18000-24000	18000-24000	18000-24000
		feed posuw m/min	2-16	2-16	2-16	2-16	2-16	2-16	2-16

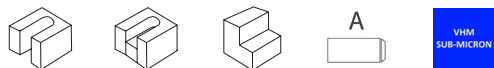
$$V_c = \frac{\pi d n}{1000} \text{ (m/min)}$$

$$n = \frac{1000 \times V_c}{\pi d} \text{ (rpm)}$$

$$f_z = \frac{f}{z n} \text{ (mm/tooth)}$$

V_c = cutting speed – prędkość skrawania (m/min)
 f_z = feed per tooth – posuw na ostrze (mm/tooth)
 f = minute feed – posuw minutowy (mm/min)

n = tool rotation – obroty narzędzia (rpm)
 d = diameter – średnica (mm)
 z = number of teeth – liczba zębów



MDF

CODE POSITIVE	CODE NEGATIVE	DC	APMX	OAL	DCON
UFW34060000A06022070	UFW34060000A06022070N	6	22	70	6
UFW34080000A08022070	UFW34080000A08022070N	8	22	70	8
UFW34080000A08032080	UFW34080000A08032080N	8	32	80	8
UFW34100000A10032080	UFW34100000A10032080N	10	32	80	10
UFW34100000A10042090	UFW34100000A10042090N	10	42	90	10
UFW34100000A10052100	UFW34100000A10052100N	10	52	100	10
UFW34120000A12032080	UFW34120000A12032080N	12	32	80	12
UFW34120000A12042090	UFW34120000A12042090N	12	42	90	12
UFW34120000A12052100	UFW34120000A12052100N	12	52	100	12
UFW34140000A14042090	UFW34140000A14042090N	14	42	90	14
UFW34140000A14052100	UFW34140000A14052100N	14	52	100	14
UFW34160000A16032080	UFW34160000A16032080N	16	32	80	16
UFW34160000A16042090	UFW34160000A16042090N	16	42	90	16
UFW34160000A16052100	UFW34160000A16052100N	16	52	100	16
UFW34160000A16062110	UFW34160000A16062110N	16	62	110	16
UFW34160000A16072120	UFW34160000A16072120N	16	72	120	16
UFW34180000A18052100	UFW34180000A18052100N	18	52	100	18
UFW34180000A18072120	UFW34180000A18072120N	18	72	120	18
UFW34200000A20052100	UFW34200000A20052100N	20	52	100	20
UFW34200000A20072120	UFW34200000A20072120N	20	72	120	20
UFW34200000A20085130	UFW34200000A20085130N	20	85	130	20
UFW34200000A20100150	UFW34200000A20100150N	20	100	150	20
UFW34250000A25100150	UFW34250000A25100150N	25	100	150	25

SPIRAL ROUTER 3-FLUTE WITH CHIPBREAKER / FREZ SPIRALNY 3-OSTRZOWY Z ŁAMACZEM WIÓRA

$$V_c = \frac{\pi d n}{1000} \text{ (m/min)}$$

$$n = \frac{1000 \times V_c}{\pi d} \text{ (rpm)}$$

$$f_z = \frac{f}{zn} \text{ (mm/tooth)}$$

$$fz = \text{feed per tooth} - \text{posuw na ostrze (mm/tooth)}$$
$$f = \text{minute feed} - \text{posuw minutowy (mm/min)}$$

d = diameter – średnica (mm)

z = number of teeth – liczba zębów

3 Rough



MDF

CODE POSITIVE	CODE NEGATIVE	DC	APMX	OAL	DCON
UFW35060000A06022070	UFW35060000A06022070N	6	22	70	6
UFW35080000A08022070	UFW35080000A08022070N	8	22	70	8
UFW35080000A08032080	UFW35080000A08032080N	8	32	80	8
UFW35100000A10032080	UFW35100000A10032080N	10	32	80	10
UFW35100000A10042090	UFW35100000A10042090N	10	42	90	10
UFW35100000A10052100	UFW35100000A10052100N	10	52	100	10
UFW35120000A12032080	UFW35120000A12032080N	12	32	80	12
UFW35120000A12042090	UFW35120000A12042090N	12	42	90	12
UFW35120000A12052100	UFW35120000A12052100N	12	52	100	12
UFW35120000A14042090	UFW35120000A14042090N	12	42	90	14
UFW35140000A14052100	UFW35140000A14052100N	14	52	100	14
UFW35160000A16032080	UFW35160000A16032080N	16	32	80	16
UFW35160000A16042090	UFW35160000A16042090N	16	42	90	16
UFW35160000A16052100	UFW35160000A16052100N	16	52	100	16
UFW35160000A16062110	UFW35160000A16062110N	16	62	110	16
UFW35160000A16072120	UFW35160000A16072120N	16	72	120	16
UFW35180000A18052100	UFW35180000A18052100N	18	52	100	18
UFW35180000A18072120	UFW35180000A18072120N	18	72	120	18
UFW35200000A20052100	UFW35200000A20052100N	20	52	100	20
UFW35200000A20072120	UFW35200000A20072120N	20	72	120	20
UFW35200000A20085130	UFW35200000A20085130N	20	85	130	20
UFW35200000A20100150	UFW35200000A20100150N	20	100	150	20
UFW35250000A25100150	UFW35250000A25100150N	25	100	150	25

n = tool rotation – obroty narzędzia (rpm)
 d = diameter – średnica (mm)
 z = number of teeth – liczba zębów



PY

PI

SW

HDI

CS

MDI

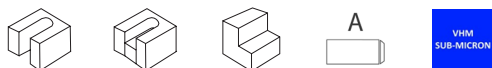
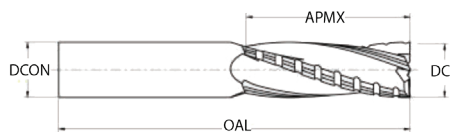
CODE POSITIVE	CODE NEGATIVE	DC	APMX	OAL	DCON
UFW36100000A10032080	UFW36100000A10032080N	10	32	80	10
UFW36100000A10042090	UFW36100000A10042090N	10	42	90	10
UFW36120000A12032080	UFW36120000A12032080N	12	32	80	12
UFW36120000A12042090	UFW36120000A12042090N	12	42	90	12
UFW36120000A12052100	UFW36120000A12052100N	12	52	100	12
UFW36140000A14042090	UFW36140000A14042090N	14	42	90	14
UFW36140000A14052100	UFW36140000A14052100N	14	52	100	14
UFW36160000A16032080	UFW36160000A16032080N	16	32	80	16
UFW36160000A16042090	UFW36160000A16042090N	16	42	90	16
UFW36160000A16052100	UFW36160000A16052100N	16	52	100	16
UFW36160000A16062110	UFW36160000A16062110N	16	62	110	16
UFW36160000A16072120	UFW36160000A16072120N	16	72	120	16
UFW36180000A18052100	UFW36180000A18052100N	18	52	100	18
UFW36180000A18072120	UFW36180000A18072120N	18	72	120	18
UFW36200000A20052100	UFW36200000A20052100N	20	52	100	20
UFW36200000A20072120	UFW36200000A20072120N	20	72	120	20
UFW36200000A20085130	UFW36200000A20085130N	20	85	130	20
UFW36200000A20100150	UFW36200000A20100150N	20	100	150	20
UFW36250000A25100150	UFW36250000A25100150N	25	100	150	25

SPIRAL ROUTER 4-FLUTE / FREZ SPIRALNY 4-OSTRZOWY

ISO	VDI 3323	DC	10.0	12.0	16.0	18.0	20.0
N	29-30	rpm obr/min	18000-24000	18000-24000	18000-24000	18000-24000	18000-24000
		feed posuw m/min	2-16	2-16	2-16	2-16	2-16

n = tool rotation – obroty narzędzia (rpm)
 d = diameter – średnica (mm)
 z = number of teeth – liczba zębów

UFW37



PW

PY

PL

SW

HPI

CS

MD

ISO	P												M				K				N								S								H				
HRc		13	25	28	31	10	29	32	38	15	35	15	23	10	10	26	3	25		21											15	30	25	38	34	400	1050	55	60	42	55
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	60	100	75	90	130	110	90	100			200	280	250	350	320	Rm	Rm	550	630	400	550
VDI3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41

CODE POSITIVE	CODE NEGATIVE	DC	APMX	OAL	DCON
UFW37100000A10032080	UFW37100000A10032080N	10	32	80	10
UFW37100000A10042090	UFW37100000A10042090N	10	42	90	10
UFW37120000A12032080	UFW37120000A12032080N	12	32	80	12
UFW37120000A12042090	UFW37120000A12042090N	12	42	90	12
UFW37120000A12052100	UFW37120000A12052100N	12	52	100	12
UFW37140000A14042090	UFW37140000A14042090N	14	42	90	14
UFW37140000A14052100	UFW37140000A14052100N	14	52	100	14
UFW37160000A16032080	UFW37160000A16032080N	16	32	80	16
UFW37160000A16042090	UFW37160000A16042090N	16	42	90	16
UFW37160000A16052100	UFW37160000A16052100N	16	52	100	16
UFW37160000A16062110	UFW37160000A16062110N	16	62	110	16
UFW37160000A16072120	UFW37160000A16072120N	16	72	120	16
UFW37180000A18052100	UFW37180000A18052100N	18	52	100	18
UFW37180000A18072120	UFW37180000A18072120N	18	72	120	18
UFW37200000A20052100	UFW37200000A20052100N	20	52	100	20
UFW37200000A20072120	UFW37200000A20072120N	20	72	120	20
UFW37200000A20085130	UFW37200000A20085130N	20	85	130	20
UFW37200000A20100150	UFW37200000A20100150N	20	100	150	20
UFW37250000A25100150	UFW37250000A25100150N	25	100	150	25

CUTTING CONDITIONS PARAMETRY SKRAWANIA

SPIRAL ROUTER 4-FLUTE (2 BLADE FINISHING 2 BLADE CHIPBREAKER) / FREZ SPIRALNY 4-OSTRZOWY (2 OSTRZA GŁADKIE 2 Z ŁAMACZEM)

ISO	VDI 3323	DC	10.0	12.0	16.0	18.0	20.0
N	29-30	rpm obr/min	18000-24000	18000-24000	18000-24000	18000-24000	18000-24000
		feed posuw m/min	2-16	2-16	2-16	2-16	2-16

$$V_c = \frac{\pi d n}{1000} \text{ (m/min)}$$

$$n = \frac{1000 \times Vc}{\pi d} \text{ (rpm)}$$

$$f_z = \frac{f}{zm} \text{ (mm/tooth)}$$

V_c = cutting speed – predkość skrawania (m/min)

$$fz = \text{feed per tooth} - \text{posuw na ostrze (mm/tooth)}$$

f = minute feed – posuw minutowy (mm/min)

$$n = \text{tool rotation} - \text{obroty narzędzia (rpm)}$$

d = diameter – średnica (mm)

z = number of teeth – liczba zębów

4 Rough



MDF

ISO	P												M				K				N								S								H				
HRc	13	25	28	31	10	29	32	38	15	35	15	23	10	10	26	3	25		21											15	30	25	38	34	400	1050	55	60	42	55	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	60	100	75	90	130	110	90	100		200	280	250	350	320	Rm	Rm	550	630	400	550	
VDI3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41

CODE POSITIVE	CODE NEGATIVE	DC	APMX	OAL	DCON
UFW38100000A10032080	UFW38100000A10032080N	10	32	80	10
UFW38100000A10042090	UFW38100000A10042090N	10	42	90	10
UFW38120000A12032080	UFW38120000A12032080N	12	32	80	12
UFW38120000A12042090	UFW38120000A12042090N	12	42	90	12
UFW38120000A12052100	UFW38120000A12052100N	12	52	100	12
UFW38140000A14042090	UFW38140000A14042090N	14	42	90	14
UFW38140000A14052100	UFW38140000A14052100N	14	52	100	14
UFW38160000A16032080	UFW38160000A16032080N	16	32	80	16
UFW38160000A16042090	UFW38160000A16042090N	16	42	90	16
UFW38160000A16052100	UFW38160000A16052100N	16	52	100	16
UFW38160000A16062110	UFW38160000A16062110N	16	62	110	16
UFW38160000A16072120	UFW38160000A16072120N	16	72	120	16
UFW38180000A18052100	UFW38180000A18052100N	18	52	100	18
UFW38180000A18072120	UFW38180000A18072120N	18	72	120	18
UFW38200000A20052100	UFW38200000A20052100N	20	52	100	20
UFW38200000A20072120	UFW38200000A20072120N	20	72	120	20
UFW38200000A20085130	UFW38200000A20085130N	20	85	130	20
UFW38200000A20100150	UFW38200000A20100150N	20	100	150	20
UFW38250000A25100150	UFW38250000A25100150N	25	100	150	25

SPIRAL ROUTER 4-FLUTE ROUGH / FREZ SPIRALNY 4-OSTRZOWY ZGRUBNY

ISO	VDI 3323	DC	10.0	12.0	16.0	18.0	20.0
N	29-30	rpm obr/min	18000-24000	18000-24000	18000-24000	18000-24000	18000-24000
		feed posuw m/min	2-16	2-16	2-16	2-16	2-16

$$V_c = \frac{\pi d n}{1000} \text{ (m/min)}$$

$$n = \frac{1000 \times V_c}{\pi d} \text{ (rpm)}$$

$$f_z = \frac{f}{z_n} \text{ (mm/tooth)}$$

V_c = cutting speed – prędkość skrawania (m/min)

$$fz = \text{feed per tooth} - \text{posuw na ostrze (mm/tooth)}$$

f = minute feed – posuw minutowy (mm/min)

$$n = \text{tool rotation} - \text{obroty narzędzia (rpm)}$$

d = diameter = średnica (mm)

$z \equiv$ number of teeth = liczba zębów

UFW39



PW

PY

PL

SW

HPL

CS

MDP

ISO	P										M				K						N										S										H				
HRC		13	25	28	31	10	29	32	38	15	35	15	23	10	10	26	3	25		21											15	30	25	38	34	400	1050	55	60	42	55				
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	60	100	75	90	130	110	90	100			200	280	250	350	320	Rm	Rm	550	630	400	550				
VDI3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41				

CODE POSITIVE	CODE NEGATIVE	DC	APMX	OAL	DCON
UFW39100000A10032080	UFW39100000A10032080N	10	32	80	10
UFW39100000A10042090	UFW39100000A10042090N	10	42	90	10
UFW39120000A12032080	UFW39120000A12032080N	12	32	80	12
UFW39120000A12042090	UFW39120000A12042090N	12	42	90	12
UFW39120000A12052100	UFW39120000A12052100N	12	52	100	12
UFW39140000A14042090	UFW39140000A14042090N	14	42	90	14
UFW39140000A14052100	UFW39140000A14052100N	14	52	100	14
UFW39160000A16032080	UFW39160000A16032080N	16	32	80	16
UFW39160000A16042090	UFW39160000A16042090N	16	42	90	16
UFW39160000A16052100	UFW39160000A16052100N	16	52	100	16
UFW39160000A16062110	UFW39160000A16062110N	16	62	110	16
UFW39160000A16072120	UFW39160000A16072120N	16	72	120	16
UFW39180000A18052100	UFW39180000A18052100N	18	52	100	18
UFW39180000A18072120	UFW39180000A18072120N	18	72	120	18
UFW39200000A20052100	UFW39200000A20052100N	20	52	100	20
UFW39200000A20072120	UFW39200000A20072120N	20	72	120	20
UFW39200000A20085130	UFW39200000A20085130N	20	85	130	20
UFW39200000A20100150	UFW39200000A20100150N	20	100	150	20
UFW39250000A25100150	UFW39250000A25100150N	25	100	150	25

CUTTING CONDITIONS PARAMETRY SKRAWANIA

SPIRAL ROUTER 4-FLUTE (2 BLADE FINISHING 2 BLADE CHIPBREAKER) / FREZ SPIRALNY 4-OSTRZOWY (2 OSTRZA GŁADKIE 2 Z ŁAMACZEM)

ISO	VDI 3323	DC	10.0	12.0	16.0	18.0	20.0
N	29-30	rpm obr/min	18000-24000	18000-24000	18000-24000	18000-24000	18000-24000
		feed posuw m/min	2-16	2-16	2-16	2-16	2-16

$$V_c = \frac{\pi d n}{1000} \text{ (m/min)}$$

$$n = \frac{1000 \times V_c}{\pi d} \text{ (rpm)}$$

$$f_z = \frac{f}{z n} \text{ (mm/tooth)}$$

V_c = cutting speed – prędkość skrawania (m/min)
 f_z = feed per tooth – posuw na ostrze (mm/tooth)
 f = minute feed – posuw minutowy (mm/min)

n = tool rotation – obroty narzędzia (rpm)
 d = diameter – średnica (mm)
 z = number of teeth – liczba zębów



PY

PL

SW

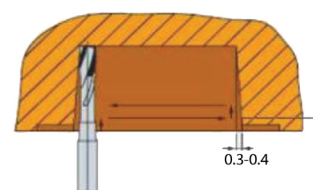
HPL

CS

MDF

ISO	P										M				K						N								S							H							
HRC		13	25	28	31	10	29	32	38	15	35	15	23	10	10	26	3	25		21													15	30	25	38	34	400	1050	55	60	42	55
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	60	100	75	90	130	110	90	100				200	280	250	350	320	Rm	Rm	550	630	400	550	
VDI3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41		

CODE		DC	LU	OAL	DON	APMX
UFW50120000A12095150	UFW51120000A12095150	12	95	150	12	40
UFW50140000A14095150	UFW51140000A14095150	14	95	150	14	40
UFW50140000A14105170	UFW51140000A14105170	14	105	170	14	40
UFW50160000A16095150	UFW51160000A16095150	16	95	150	16	40
UFW50160000A16105170	UFW51160000A16105170	16	105	170	16	40
UFW50180000A18095150	UFW51180000A18095150	18	95	150	18	40
UFW50180000A18105170	UFW51180000A18105170	18	105	170	18	40
UFW50200000A20095150	UFW51200000A20095150	20	95	150	20	40
UFW50200000A20105170	UFW51200000A20105170	20	105	170	20	40



SPIRAL ROUTER 3-FLUTE FOR DOOR LOCKS / FREZ SPIRALNY 3-OSTRZOWY POD ZAMKI

ISO	VDI 3323	DC	12.0	14.0	16.0	18.0	20.0
N	29-30	rpm obr/min	18000-20000	18000-20000	18000-20000	18000-20000	18000-20000
		feed posuw m/min	4-10	4-10	4-10	4-10	4-10

$$V_c = \frac{\pi d n}{1000} \text{ (m/min)}$$

$$n = \frac{1000 \times V_c}{\pi d} \text{ (rpm)}$$

$$f_z = \frac{f}{zn} \text{ (mm/tooth)}$$

V_c = cutting speed – prędkość skrawania (m/min)

$$fz = \text{feed per tooth} - \text{posuw na ostrze (mm/tooth)}$$

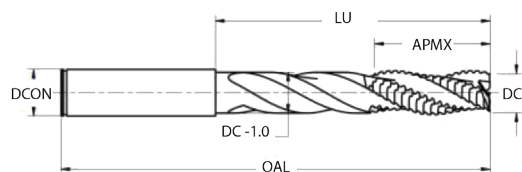
f = minute feed – posuw minutowy (mm/min)

n = tool rotation – obroty narzędzia (rpm)

d = diameter – średnica (mm)

z = number of teeth – liczba zębów

UFW52



PW

PY

PL

SW

HPL

CS

MDF

ISO	P										M				K						N										S										H																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
HRC		13	25	28	31	10	29	32	38	15	35	15	23	10	10	26	3	25		21																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											

CODE	DC	LU	OAL	DCON	APMX
UFW52120000A12095150	12	95	150	12	40
UFW52140000A14095150	14	95	150	14	40
UFW52140000A14105170	14	105	170	14	40
UFW52160000A16095150	16	95	150	16	40
UFW52160000A16105170	16	105	170	16	40
UFW52180000A18095150	18	95	150	18	40
UFW52180000A18105170	18	105	170	18	40
UFW52200000A20095150	20	95	150	20	40
UFW52200000A20105170	20	105	170	20	40

CUTTING CONDITIONS PARAMETRY SKRAWANIA

SPIRAL ROUTER 3-FLUTE FOR DOOR LOCKS / FREZ SPIRALNY 3-OSTRZOWY POD ZAMKI

ISO	VDI 3323	DC	12.0	14.0	16.0	18.0	20.0
N	29-30	rpm obr/min	18000-20000	18000-20000	18000-20000	18000-20000	18000-20000
		feed posuw m/min	4-10	4-10	4-10	4-10	4-10

$$V_c = \frac{\pi d n}{1000} \text{ (m/min)}$$

$$n = \frac{1000 \times V_c}{\pi d} \text{ (rpm)}$$

$$f_z = \frac{f}{z n} \text{ (mm/tooth)}$$

V_c = cutting speed – prędkość skrawania (m/min)
 f_z = feed per tooth – posuw na ostrze (mm/tooth)
 f = minute feed – posuw minutowy (mm/min)

n = tool rotation – obroty narzędzia (rpm)
 d = diameter – średnica (mm)
 z = number of teeth – liczba zębów



PY

SV

MDF

CODE	DC	LU	OAL	DCON	FLUTE	APMX
UFW540800Z2A08080115	8	80	115	8	2	25
UFW540800Z2A08095130	8	95	130	8	2	25
UFW540800Z3A08080115	8	80	115	8	3	25
UFW540800Z3A08095130	8	95	130	8	3	25
UFW541000Z2A10080115	10	80	115	10	2	25
UFW541000Z2A10095130	10	95	130	10	2	25
UFW541000Z3A10080115	10	80	115	10	3	25
UFW541000Z3A10095130	10	95	130	10	3	25
UFW541200Z2A12080115	12	80	115	12	2	30
UFW541200Z2A12095130	12	95	130	12	2	30
UFW541200Z3A12080115	12	80	115	12	3	30
UFW541200Z3A12095130	12	95	130	12	3	30

SPIRAL ROUTER 3-FLUTE / FREZ SPIRALNY 3-OSTRZOWY DO WYKONANIA FREZOWAŃ W RAMACH OKIEN

$$V_c = \frac{\pi d n}{1000} \text{ (m/min)}$$

$$n = \frac{1000 \times V_c}{\pi d} \text{ (rpm)}$$

$$f_z = \frac{f}{z_n} \text{ (mm/tooth)}$$

$$fz = \text{feed per tooth} - \text{posuw na ostrze (mm/tooth)}$$

f = minute feed – posuw minutowy (mm/min)

d = diameter – średnica (mm)

z = number of teeth – liczba zębów

UFW55



PW

PY

PL

SW

HPL

CS

MDF

ISO	P										M				K						N										S										H																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
HRC		13	25	28	31	10	29	32	38	15	35	15	23	10	10	26	3	25		21																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												</

CODE	DC	APMX	OAL	DCON
UFW55100000A10030080	10	30	80	10
UFW55120000A10030080	12	30	80	10
UFW55140000A10030080	14	30	80	10

CUTTING CONDITIONS PARAMETRY SKRAWANIA

SPIRAL ROUTER FOR DOOR 2-FLUTE/ FREZ SPIRALNY 2-OSTRZOWY DO WYKONYWANIA FREZOWAŃ W DRZWIACH I OKNAH

ISO	VDI 3323	DC	10.0	12.0	14.0
N	29-30	rpm obr/min	18000-24000	18000-24000	18000-24000
		feed posuw m/min	4-10	4-10	4-10

$$V_c = \frac{\pi d n}{1000} \text{ (m/min)}$$

$$n = \frac{1000 \times V_c}{\pi d} \text{ (rpm)}$$

$$f_z = \frac{f}{z n} \text{ (mm/tooth)}$$

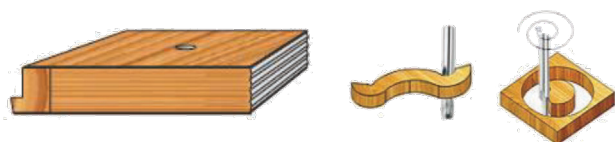
V_c = cutting speed – prędkość skrawania (m/min)
 f_z = feed per tooth – posuw na ostrze (mm/tooth)
 f = minute feed – posuw minutowy (mm/min)

n = tool rotation – obroty narzędzia (rpm)
 d = diameter – średnica (mm)
 z = number of teeth – liczba zębów



MDF

CODE	DC	APMX	OAL	DCON
UFW56140000A14060110	14	60	110	14
UFW56140000A14065120	14	65	120	14
UFW56160000A16060110	16	60	110	16
UFW56160000A16065120	16	65	120	16
UFW56180000A18060110	18	60	110	18
UFW56180000A18065120	18	65	120	18



SPIRAL ROUTER FOR V-POINT DOOR LOCKSET 3-FLUTE/ FREZ SPIRALNY 3-OSTRZOWY Z FAZĄ DO WYKONYWANIA FREZOWAŃ OTWORÓW POD KLAMKI W DRZWIACH

$$V_c = \frac{\pi d n}{1000} \text{ (m/min)}$$

$$n = \frac{1000 \times V_c}{\pi d} \text{ (rpm)}$$

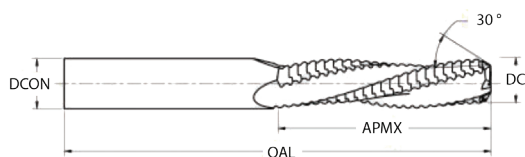
$$f_z = \frac{f}{zn} \text{ (mm/tooth)}$$

$$fz = \text{feed per tooth} - \text{posuw na ostrze (mm/tooth)}$$
$$f = \text{minute feed} - \text{posuw minutowy (mm/min)}$$

d = diameter – średnica (mm)

z = number of teeth – liczba zębów

UFW57



PW

PY

PL

SW

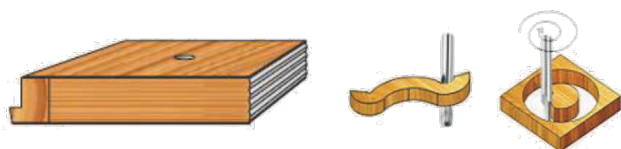
HPL

CS

MDF

ISO	P										M				K				N										S										H																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
HRC		13	25	28	31	10	29	32	38	15	35	15	23	10	10	26	3	25		21																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													</

CODE	DC	APMX	OAL	DCON
UFW57140000A14060110	14	60	110	14
UFW57140000A14065120	14	65	120	14
UFW57160000A16060110	16	60	110	16
UFW57160000A16065120	16	65	120	16
UFW57180000A18060110	18	60	110	18
UFW57180000A18065120	18	65	120	18



CUTTING CONDITIONS PARAMETRY SKRAWANIA

SPIRAL ROUTER FOR V-POINT DOOR LOCKSET 3-FLUTE/ FREZ SPIRALNY 3-OSTRZOWY Z FAZĄ DO WYKONYWANIA FREZOWAN OTWORÓW POD KLAMKI W DRZWIACH

ISO	VDI 3323	DC	14.0	16.0	18.0
N	29-30	rpm obr/min	18000-24000	18000-24000	18000-24000
		feed posuw m/min	4-10	4-10	4-10

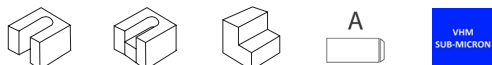
$$V_c = \frac{\pi d n}{1000} \text{ (m/min)}$$

$$n = \frac{1000 \times V_c}{\pi d} \text{ (rpm)}$$

$$f_z = \frac{f}{z n} \text{ (mm/tooth)}$$

V_c = cutting speed – prędkość skrawania (m/min)
 f_z = feed per tooth – posuw na ostrze (mm/tooth)
 f = minute feed – posuw minutowy (mm/min)

n = tool rotation – obroty narzędzia (rpm)
 d = diameter – średnica (mm)
 z = number of teeth – liczba zębów



PY

PL

SW

HPI

CS

MD

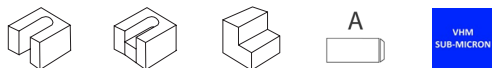
ISO	P												M				K						N										S								H			
HRC	13	25	28	31	10	29	32	38	15	35	15	23	10	10	26	3	25		21												15	30	25	38	34	400	1050	55	60	42	55			
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	60	100	75	90	130	110	90	100			200	280	250	350	320	Rm	Rm	550	630	400	550			
VDI3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41			

CODE	DC	APMX	OAL	DCON
UFW58030000A03010050	3	10	50	3
UFW58040000A04012050	4	12	50	4
UFW58050000A05015060	5	15	60	5
UFW58060000A06015060	6	15	60	6
UFW58060000A06022070	6	22	70	6
UFW58080000A08022070	8	22	70	8
UFW58100000A10032080	10	32	80	10
UFW58100000A10042090	10	42	90	10
UFW58120000A12032080	12	32	80	12
UFW58120000A12042090	12	42	90	12
UFW58140000A14042090	14	42	90	14
UFW58160000A16042090	16	42	90	16
UFW58160000A16052100	16	52	100	16
UFW58180000A18052100	18	52	100	18
UFW58200000A20050100	20	50	100	20
UFW58200000A20100160	20	100	160	20
UFW58250000A25050100	25	50	100	25
UFW58250000A25070130	25	70	130	25

2-FLUTE SPIRAL ROUTER BIT WITH RADIUS / FREZ SPIRALNY 2-OSTRZOWY Z CZOŁEM KULISTYM

ISO	VDI 3323	DC	3.0-5.0	6.0	8.0	10.0	12.0	16.0-20.0
N	29-30	rpm obr/min	18000-24000	18000-24000	18000-24000	18000-24000	18000-24000	18000-24000
		feed posuw m/min	2-10	2-10	2-10	2-10	2-10	2-10

z = number of teeth – liczba zębów



MD

CODE	DC	APMX	OAL	DCON
UFW59100000A10032080	10	32	80	10
UFW59100000A10042090	10	42	90	10
UFW59120000A12032080	12	32	80	12
UFW59120000A12042090	12	42	90	12
UFW59140000A14042090	14	42	90	14
UFW59160000A16042090	16	42	90	16
UFW59160000A16052100	16	52	100	16
UFW59180000A18052100	18	52	100	18
UFW59200000A20052100	20	52	100	20
UFW59200000A20100160	20	100	160	20
UFW59250000A25052100	25	52	100	25
UFW59250000A25072130	25	72	130	25

2-FLUTE SPIRAL ROUTER BIT WITH RADIUS / FREZ SPIRALNY 2-OSTRZOWY Z CZOŁEM KULISTYM

$$V_c = \frac{\pi d n}{1000} \text{ (m/min)}$$

$$n = \frac{1000 \times V_c}{\pi d} \text{ (rpm)}$$

$$f_z = \frac{f}{zn} \text{ (mm/tooth)}$$

$$fz = \text{feed per tooth} - \text{posuw na ostrze (mm/tooth)}$$
$$f = \text{minute feed} - \text{posuw minutowy (mm/min)}$$

d = diameter – średnica (mm)

z = number of teeth – liczba zębów



MDR

CODE	DC	RE	APMX	OAL	DCON
UFW70040005A04015050	4	0,5	15	50	4
UFW70040008A04015050	4	0,75	15	50	4
UFW70040010A04015050	4	1	15	50	4
UFW70060005A06020060	6	0,5	20	60	6
UFW70060008A06020060	6	0,75	20	60	6
UFW70060010A06020060	6	1	20	60	6
UFW70060005A06030070	6	0,5	30	70	6
UFW70060008A06030070	6	0,75	30	70	6
UFW70060010A06030070	6	1	30	70	6
UFW70060005A06035080	6	0,5	35	80	6
UFW70060008A06035080	6	0,75	35	80	6
UFW70060010A06035080	6	1	35	80	6
UFW70060015A06035080	6	1,5	35	80	6
UFW70080005A08045090	8	0,5	45	90	8
UFW70080008A08045090	8	0,75	45	90	8
UFW70080010A08045090	8	1	45	90	8
UFW70080015A08045090	8	1,5	45	90	8
UFW70080020A08045090	8	2	45	90	8
UFW70080005A08055100	8	0,5	55	100	8
UFW70080008A08055100	8	0,75	55	100	8
UFW70080010A08055100	8	1	55	100	8
UFW70080015A08055100	8	1,5	55	100	8
UFW70080020A08055100	8	2	55	100	8
UFW70080030A08055100	8	3	55	100	8
UFW70120020A12060120	12	2	60	120	12
UFW70120030A12060120	12	3	60	120	12
UFW70160030A16070150	16	3	70	150	16
UFW70160040A16070150	16	4	70	150	16
UFW70160050A16070150	16	5	70	150	16

ISO	VDI 3323	DC	4.0	6.0	8.0	12.0	16.0
N	29-30	rpm obr/min	18000-24000	18000-24000	18000-24000	18000-24000	18000-24000
		feed posuw m/min	2-10	2-10	2-10	2-10	2-10

n = tool rotation – obroty narzędzia (rpm)
 d = diameter – średnica (mm)
 z = number of teeth – liczba zębów

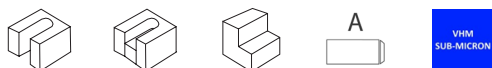
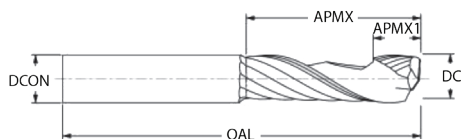


MD

CODE	DC	RE	APMX	OAL	DCON	FLUTE
UFW71100020A10016080	10	2	16	80	10	2
UFW71120020A12022080	12	2	22	80	12	3
UFW71140020A14032090	14	2	32	90	14	3
UFW71160020A16042090	16	2	42	90	16	3
UFW71160030A16052100	16	3	52	100	16	3
UFW71180020A18062110	18	2	62	110	18	3
UFW71180030A18052100	18	3	52	100	18	3
UFW71200030A20070120	20	3	70	120	20	3
UFW71200050A20070120	20	5	70	120	20	3

n = tool rotation – obroty narzędzia (rpm)
 d = diameter – średnica (mm)
 z = number of teeth – liczba zębów

UFW72



PW

PY

PL

SW

HPL

CS

MDF

ISO	P												M				K				N								S								H							
HRC		13	25	28	31	10	29	32	38	15	35	15	23	10	10	26	3	25		21													15	30	25	38	34	400	1050	55	60	42	55	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	60	100	75	90	130	110	90	100						200	280	250	350	320	Rm	Rm	550	630	400	550
VDI3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41			

CODE	DC	APMX	APMX1	OAL	DCON	FLUTE
UFW72030000A03012050	3	12	4	50	3	1+1
UFW72040000A04012050	4	12	4	50	4	1+1
UFW72050000A05017060	5	17	4	60	5	1+1
UFW72060000A06025065	6	25	5	65	6	1+1
UFW72080000A08025065	8	25	6	65	8	1+1
UFW72100000A10025080	10	25	7	80	10	1+1
UFW72100000A10035080	10	35	7	80	10	1+1

CUTTING CONDITIONS PARAMETRY SKRAWANIA

COMPRESSION ROUTER 1+1 FLUTE / FREZ KOMPRESYJNY 1+1 OSTRZOWY

ISO	VDI 3323	DC	3.0	4.0	5.0	6.0	8.0	10.0
N	29-30	rpm obr/min	18000-24000	18000-24000	18000-24000	18000-24000	18000-24000	18000-24000
		feed posuw m/min	2-12	2-12	2-12	2-12	2-12	2-12

$$V_c = \frac{\pi d n}{1000} \text{ (m/min)}$$

$$n = \frac{1000 \times V_c}{\pi d} \text{ (rpm)}$$

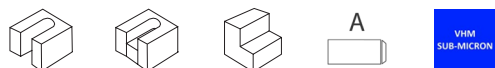
$$f_z = \frac{f}{z_n} \text{ (mm/tooth)}$$

V_c = cutting speed – prędkość skrawania (m/min)

$$fz = \text{feed per tooth} - \text{posuw na ostrze (mm/tooth)}$$
$$f = \text{minute feed} - \text{posuw minutowy (mm/min)}$$
$$n \equiv \text{tool rotation} - \text{obrotы narzędzia (rpm)}$$

d = diameter – średnica (mm)

$z \equiv$ number of teeth – liczba zębów



MDF

ISO	P												M				K				N												S								H			
HRC		13	25	28	31	10	29	32	38	15	35	15	23	10	10	26	3	25		21												15	30	25	38	34	400	1050	55	60	42	55		
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	60	100	75	90	130	110	90	100				200	280	250	350	320	Rm	Rm	550	630	400	550		
VDI3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41			

CODE	DC	APMX	APMX1	OAL	DCON	FLUTE
UFW73060000A06025065	6	25	5	65	6	2+2
UFW73080000A08025065	8	25	6	65	8	2+2
UFW73080000A08035080	8	35	6	80	8	2+2
UFW73100000A10025080	10	25	7	80	10	2+2
UFW73100000A10035080	10	35	7	80	10	2+2
UFW73120000A12025080	12	25	7	80	12	2+2
UFW73120000A12035080	12	35	7	80	12	2+2
UFW73120000A12042090	12	42	7	90	12	2+2
UFW73140000A14035080	14	35	7	80	14	2+2
UFW73140000A14042090	14	42	7	90	14	2+2
UFW73140000A14050100	14	50	7	100	14	2+2
UFW73160000A16035080	16	35	8	80	16	2+2
UFW73160000A16042090	16	42	8	90	16	2+2
UFW73160000A16050100	16	50	8	100	16	2+2
UFW73200000A20035080	20	35	9	80	20	2+2
UFW73200000A20042090	20	42	9	90	20	2+2
UFW73200000A20050100	20	50	9	100	20	2+2

COMPRESSION ROUTER 2+2 FLUTE / FREZ KOMPRESYJNY 2+2 OSTRZOWY

ISO	VDI 3323	DC	6.0	0.8	10.0	12.0	16.0	20.0
N	29-30	rpm obr/min	18000-24000	18000-24000	18000-24000	18000-24000	18000-24000	18000-24000
		feed posuw m/min	6-16	6-16	6-16	6-16	6-16	6-16

n = tool rotation – obroty narzędzia (rpm)
 d = diameter – średnica (mm)
 z = number of teeth – liczba zębów



MDF

ISO	P												M				K				N												S								H			
HRC		13	25	28	31	10	29	32	38	15	35	15	23	10	10	26	3	25		21												15	30	25	38	34	400	1050	55	60	42	55		
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	60	100	75	90	130	110	90	100					200	280	250	350	320	Rm	Rm	550	630	400	550	
VDI3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41			

CODE	DC	APMX	APMX1	OAL	DCON	FLUTE
UFW74060000A06025065	6	25	5	65	6	2+2
UFW74080000A08025065	8	25	6	65	8	2+2
UFW74080000A08035080	8	35	6	80	8	2+2
UFW74100000A10025080	10	25	7	80	10	2+2
UFW74100000A10035080	10	35	7	80	10	2+2
UFW74120000A12025080	12	25	7	80	12	2+2
UFW74120000A12035080	12	35	7	80	12	2+2
UFW74120000A12042090	12	42	7	90	12	2+2
UFW74160000A16035080	16	35	8	80	16	2+2
UFW74160000A16042090	16	42	8	90	16	2+2
UFW74160000A16050100	16	50	8	100	16	2+2

COMPRESSION ROUTER 2+2 FLUTE / FREZ KOMPRESYJNY 2+2 OSTRZOWY

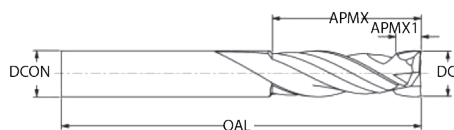
ISO	VDI 3323	DC	6.0	0.8	10.0	12.0	16.0
N	29-30	rpm obr/min	18000-24000	18000-24000	18000-24000	18000-24000	18000-24000
		feed posuw m/min	10-20	10-20	10-20	10-20	10-20

n = tool rotation – obroty narzędzia (rpm)
 d = diameter – średnica (mm)
 z = number of teeth – liczba zębów

UFW75



Finish



PW

PY

PL

SW

HP

CS

MDF

ISO	P												M				K				N								S								H				
HRc	13	25	28	31	10	29	32	38	15	35	15	23	10	10	26	3	25		21											15	30	25	38	34	400	1050	55	60	42	55	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	60	100	75	90	130	110	90	100		200	280	250	350	320	Rm	Rm	550	630	400	550	
VDI3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41

CODE	DC	APMX	APMX1	OAL	DCON	FLUTE
UFW75100000A10025080	10	25	7	80	10	3+3
UFW75100000A10035080	10	35	7	80	10	3+3
UFW75120000A12025080	12	25	7	80	12	3+3
UFW75120000A12035080	12	35	7	80	12	3+3
UFW75120000A12042090	12	42	7	90	12	3+3
UFW75160000A16035080	16	35	8	80	16	3+3
UFW75160000A16042090	16	42	8	90	16	3+3
UFW75160000A16050100	16	50	8	100	16	3+3

CUTTING CONDITIONS PARAMETRY SKRAWANIA

COMPRESSION ROUTER 3+3 FLUTE / FREZ KOMPRESYJNY 3+3 OSTRZOWY

ISO	VDI 3323	DC	10.0	12.0	16.0
N	29-30	rpm obr/min	18000-24000	18000-24000	18000-24000
		feed posuw m/min	10-25	10-25	10-25

$$V_c = \frac{\pi d n}{1000} \text{ (m/min)}$$

$$n = \frac{1000 \times V_c}{\pi d} \text{ (rpm)}$$

$$f_z = \frac{f}{zn} \text{ (mm/tooth)}$$

V_c = cutting speed – prędkość skrawania (m/min)

$$fz = \text{feed per tooth} - \text{posuw na ostrze (mm/tooth)}$$
$$f = \text{minute feed} - \text{posuw minutowy (mm/min)}$$

n = tool rotation – obroty narzędzia (rpm)

d = diameter – średnica (mm)

z = number of teeth – liczba zębów



MDF

ISO	P												M				K				N												S								H			
HRC		13	25	28	31	10	29	32	38	15	35	15	23	10	10	26	3	25		21													15	30	25	38	34	400	1050	55	60	42	55	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	60	100	75	90	130	110	90	100						200	280	250	350	320	Rm	Rm	550	630	400	550
VDI3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41			

CODE	DC	APMX	APMX1	OAL	DCON	FLUTE
UFW76080000A08025065	8	25	6	65	8	2+2
UFW76080000A08035080	8	35	6	80	8	2+2
UFW76100000A10025080	10	25	7	80	10	2+2
UFW76100000A10035080	10	35	7	80	10	2+2
UFW76120000A12025080	12	25	7	80	12	2+2
UFW76120000A12035080	12	35	7	80	12	2+2
UFW76120000A12042090	12	42	7	90	12	2+2
UFW76160000A16035080	16	35	8	80	16	2+2
UFW76160000A16042090	16	42	8	90	16	2+2
UFW76160000A16050100	16	50	8	100	16	2+2

COMPRESSION ROUTER 2+2 FLUTE / FREZ KOMPRESYJNY 2+2 OSTRZOWY

ISO	VDI 3323	DC	6.0	0.8	10.0	12.0	16.0	20.0
N	29-30	rpm obr/min	18000-24000	18000-24000	18000-24000	18000-24000	18000-24000	18000-24000
		feed posuw m/min	10-25	10-25	10-25	10-25	10-25	10-25

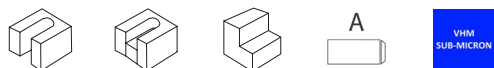
$$V_c = \frac{\pi d n}{1000} \text{ (m/min)}$$

$$n = \frac{1000 \times V_c}{\pi d} \text{ (rpm)}$$

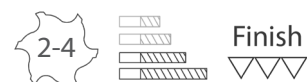
$$f_z = \frac{f}{z_n} \text{ (mm/tooth)}$$

f = minute feed – posuw minutowy (mm/min)

$z \equiv$ number of teeth – liczba zębów



MDF



PY

PL

SW

HPL

CS

MDP



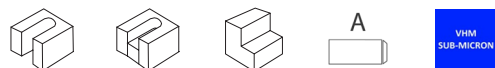
MD

CODE	DC	RE	APMX	LU	OAL	DCON	FLUTE
UFW79060Z21A06020120	6	1	20	85	120	6	2
UFW79080Z22A08030120	8	2	30	85	120	8	2
UFW79100Z22A10030140	10	2	30	100	140	10	2
UFW79120Z23A12040150	12	3	40	110	150	12	2
UFW79120Z33A12040150	12	3	40	110	150	12	3
UFW79160Z23A16040180	16	3	40	130	180	16	2
UFW79160Z33A16040180	16	3	40	130	180	16	3
UFW79200Z23A20040200	20	3	40	150	200	20	2
UFW79200Z33A20040200	20	3	40	150	200	20	3
UFW79250Z23A25050220	25	3	50	160	220	25	2
UFW79250Z33A25050220	25	3	50	160	220	25	3
UFW79250Z43A25050220	25	3	50	160	220	25	4

EXTRA LONG ROUTER BITS FOR 3D WITH RADIOUS ON TOP / FREZ DO MODELOWANIA 3D DŁUGI Z PROMIENIEM

n = tool rotation – obroty narzędzia (rpm)
 d = diameter – średnica (mm)
 z = number of teeth – liczba zębów

Diagram illustrating the merging of two 2-4 nodes into a 4 node. The 2-4 node is shown on the left, and the 4 node is shown on the right. The word "Finish" is written above the 4 node, and a sawtooth symbol is shown below it.



PY

PL

SW

HPI

CS

MD

ISO	P												M				K				N												S								H			
HRC	13	25	28	31	10	29	32	38	15	35	15	23	10	10	26	3	25		21												15	30	25	38	34	400	1050	55	60	42	55			
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	60	100	75	90	130	110	90	100			200	280	250	350	320	Rm	Rm	550	630	400	550			
VDI3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41			

CODE	DC	APMX	LU	OAL	DCON	FLUTE
UFW600600Z2A06020120	6	20	85	120	6	2
UFW600800Z2A08030120	8	30	85	120	8	2
UFW601000Z2A10030140	10	30	100	140	10	2
UFW601200Z2A12040150	12	40	110	150	12	2
UFW601200Z3A12040150	12	40	110	150	12	3
UFW601600Z2A16040180	16	40	130	180	16	2
UFW601600Z3A16040180	16	40	130	180	16	3
UFW602000Z2A20040200	20	40	150	200	20	2
UFW602000Z3A20040200	20	40	150	200	20	3
UFW602500Z2A25050220	25	50	160	220	25	2
UFW602500Z3A25050220	25	50	160	220	25	3
UFW602500Z4A25050220	25	50	160	220	25	4

EXTRA LONG ROUTER BITS FOR 3D / FREZ DO MODELOWANIA 3D DŁUGI

ISO	VDI 3323	DC	6.0	0.8	10.0	12.0	16.0	20.0
N	29-30	rpm obr/min	16000-20000	16000-20000	16000-20000	16000-20000	16000-20000	16000-20000
		feed posuw m/min	2-10	2-10	2-10	2-10	2-10	2-10

n = tool rotation – obroty narzędzia (rpm)
 d = diameter – średnica (mm)
 z = number of teeth – liczba zębów

2-4

Rough



MD

CODE	DC	APMX	LU	OAL	DCON	FLUTE
UFW610600Z2A06020120	6	20	85	120	6	2
UFW610800Z2A08030120	8	30	85	120	8	2
UFW611000Z2A10030140	10	30	100	140	10	2
UFW611200Z2A12040150	12	40	110	150	12	2
UFW611200Z3A12040150	12	40	110	150	12	3
UFW611600Z2A16040180	16	40	130	180	16	2
UFW611600Z3A16040180	16	40	130	180	16	3
UFW612000Z2A20040200	20	40	150	200	20	2
UFW612000Z3A20040200	20	40	150	200	20	3
UFW612500Z2A25050220	25	50	160	220	25	2
UFW612500Z3A25050220	25	50	160	220	25	3
UFW612500Z4A25050220	25	50	160	220	25	4

EXTRA LONG ROUTER BITS FOR 3D / FREZ DO MODELOWANIA 3D DŁUGI

ISO	VDI 3323	DC	6.0	0.8	10.0	12.0	16.0	20.0
N	29-30	rpm obr/min	16000-20000	16000-20000	16000-20000	16000-20000	16000-20000	16000-20000
		feed posuw m/min	2-10	2-10	2-10	2-10	2-10	2-10

n = tool rotation – obroty narzędzia (rpm)
 d = diameter – średnica (mm)
 z = number of teeth – liczba zębów



MDI

CODE	DC	APMX	LU	OAL	DN	DCON	FLUTE
UFW62060000A06005100	6	5.2	35	100	4.5	6	2
UFW62080000A08007100	8	6.9	40	100	5.9	8	2
UFW62100000A10009100	10	8.6	40	100	7.2	10	3
UFW62120000A12010100	12	10.3	45	100	8.7	12	3
UFW62120000A12010120	12	10.3	55	120	8.7	12	3
UFW62160000A16014130	16	13,7	60	130	11.5	16	4
UFW62160000A16014150	16	13,7	80	150	11.5	16	4
UFW62200000A20017150	20	17.1	80	150	14.0	20	4
UFW62200000A20017180	20	17.1	110	180	14.0	20	4
UFW62250000A25021200	25	21.4	100	200	17.6	25	4
UFW62250000A25021220	25	21.4	130	220	17.6	25	4
UFW62250000A25021250	25	21.4	150	250	17.6	25	4
UFW62300000A25026200	30	25.6	130	200	21.2	25	4
UFW62300000A25026260	30	25.6	160	260	21.2	25	4
UFW62300000A25026300	30	25.6	160	300	21.2	25	4

n = tool rotation – obroty narzędzia (rpm)
 d = diameter – średnica (mm)
 z = number of teeth – liczba zębów



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