

# HSS

## HSSCo8 END MILLS FREZY HSSCo8



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

Frezy HSSCo8 do zastosowania ogólnego z pokryciem TiAlN lub bez pokrycia



IMPLEMENTS

P

N

EDP No.		Z	Angle Kąt	Materials Materiały	D / R	Pag. / Str.
HM070 HMF70		2		P N	D 1,0 - 40	5 - 7
HM071 HMF71		2		P N	D 1,5 - 40	8 - 9
HM010 HMF10		2		P N	D 2,5 - 40	10 - 11
HM064		2		P N	D 1,0 - 32	12 - 13
HM009		2		P N	D 2,0 - 20	13 - 14
HM612		2		P N	D 0,6 - 4	16
HM623		2		P N	D 0,5 - 6	17
HM072 HMF72		3		P N	D 1,5 - 32	18 - 22
HM073 HMF73		3		P N	D 1,0 - 40	23 - 27
HM016 HMF16		3		P N	D 2,0 - 40	28 - 32
HM053 HMF53		3		P N	D 1,0 - 20	33 - 37
HM054 HMF54		3		P N	D 1,5 - 10	38 - 42
HM051 HMF51		3		P N	D 1,0 - 10	43 - 47
HM052 HMF52		3		P N	D 1,5 - 10	48 - 52
HM074 HMF74 HM075 HMF75		4-6		P N	D 2,0 - 40	53 - 54
HM076 HMF76 HM077 HMF77		4-6		P N	D 2,0 - 40	55 - 56
HM095 HMF95 HM096 HMF96		4-6		P N	D 2,0 - 40	57 - 58
HM097 HMF97 HM098 HMF98		4-6		P N	D 2,0 - 40	59 - 60
HM061 HMF61 HM062 HMF62 HMF63 HMF63		Multi Wiele		P N	D 2,0 - 30	61 - 62
HM035 HMF35		2		P N	R 1,0 - 16	63 - 64
HM092 HMF92		2		P N	R 1,0 - 15	65 - 66

HM0A0 HMFA0		4-6		P N	R 3,0 - 12,5	67 - 68
HM029 HMF29		4-6		P N	R 5,0 - 12,5	69 - 70
HM012 HMF12		3		P N	R 1,0 - 3	71 - 72
HM0A1 HMFA1		Multi Wiele		P N	D 6,0 - 50	73 - 74
HM0A2 HMFA2		Multi Wiele		P N	D 6,0 - 40	75 - 76
HM0B4 HMF4		3		P N	D 10,0 - 40	77 - 78
HM065 HMF65		3		P N	D 10,0 - 40	79 - 80
HM0A5		3		P N	D 6,0 - 30	81 - 82
HM056		3		P N	D 10,0 - 30	83 - 84
HM057 HMF57		3-4		P N	R 3,0 - 20	85 - 86
HM0B1 HMF1		Multi Wiele		P N	D 6,0 - 25	87 - 88
HM024 HMF24		3-4		P N	D 6,0 - 20	89 - 90
HM046 HMF46		3-4		P N	R 3,0 - 20	91 - 92
HM0A3 HMFA3		3-6		P N	D 6,0 - 40	93 - 94
HM0B2 HMF2		3-6		P N	D 6,0 - 40	95 - 96
HM0A4 HMFA4		3-6		P N	D 6,0 - 40	97 - 98
HM068 HMF68		3-6		P N	D 6,0 - 45	99 - 100
HM015 HMF15		3		P N	D 6,0 - 40	101 - 102
HM049 HMF49		3		P N	D 6,0 - 40	103 - 104
HM0A6		-		P N	D 14,0 - 50	105 - 106
HM0A7 HMFA7		4-6		P N	D 14,0 - 50	107 - 108
HM078 HMF78		4-6		P N	D 16,0 - 50	109 - 110
HM079 HMF79		4-6		P N	D 16,0 - 50	111 - 112
HM0C0 HMFC0		2		P N	D 2,0 - 30	113 - 114
HM0C4 HMFC4 HM0C5 HMFC5		4-6		P N	D 2,0 - 30	115 - 116

UGF

UFX

UFJ

UFD

UFA

UFC







PMT

RB

CBN

HSS

ICT

HM0C6 HMFC6		3-4		P N	D 14,0 - 50	107 - 108
HM0P1 HMFP1		2		P N	D 2,0 - 25	119 - 120
HM059 HMF59		4-6		P N	D 6,0 - 30	121 - 122

UFG

UFX

UFJ

UFD

UFA

UFC

PMT

RB

CBN

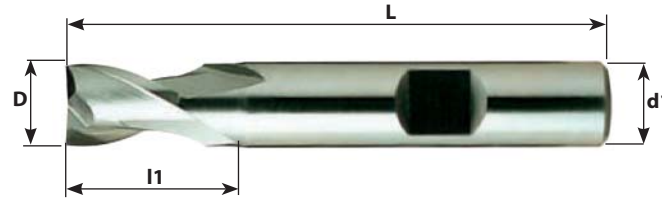
HSS

ICT

**HM070 HMF70**
**SQUARE TYPE WALCOWO-CZOŁOWE**

2 Flute, Short Length 2-ostrzowe, krótkie

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

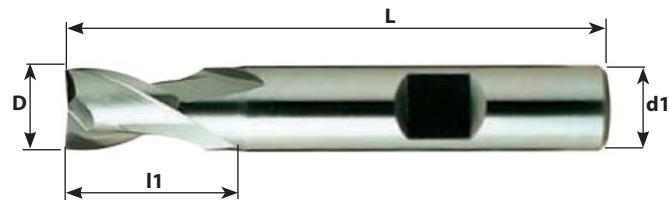


D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM070010000B06003047	HMF70010000B06003047	1.0	6	47	2.5	2	B
HM070015000B06003047	HMF70015000B06003047	1.5	6	47	3	2	B
HM070020000B06004048	HMF70020000B06004048	2.0	6	48	4	2	B
HM070025000B06005049	HMF70025000B06005049	2.5	6	49	5	2	B
HM070028000B06005049	HMF70028000B06005049	2.8	6	49	5	2	B
HM070030000B06005049	HMF70030000B06005049	3.0	6	49	5	2	B
HM070035000B06006050	HMF70035000B06006050	3.5	6	50	6	2	B
HM070038000B06007051	HMF70038000B06007051	3.8	6	51	7	2	B
HM070040000B06007051	HMF70040000B06007051	4.0	6	51	7	2	B
HM070045000B06007051	HMF70045000B06007051	4.5	6	51	7	2	B
HM070048000B06008052	HMF70048000B06008052	4.8	6	52	8	2	B
HM070050000B06008052	HMF70050000B06008052	5.0	6	52	8	2	B
HM070055000B06008052	HMF70055000B06008052	5.5	6	52	8	2	B
HM070058000B06008052	HMF70058000B06008052	5.75	6	52	8	2	B
HM070060000B06008052	HMF70060000B06008052	6.0	6	52	8	2	B
HM070065000B10010060	HMF70065000B10010060	6.5	10	60	10	2	B
HM070068000B10010060	HMF70068000B10010060	6.75	10	60	10	2	B
HM070070000B10010060	HMF70070000B10010060	7.0	10	60	10	2	B
HM070075000B10010060	HMF70075000B10010060	7.5	10	60	10	2	B
HM070078000B10011061	HMF70078000B10011061	7.75	10	61	11	2	B
HM070080000B10011061	HMF70080000B10011061	8.0	10	61	11	2	B
HM070085000B10011061	HMF70085000B10011061	8.5	10	61	11	2	B
HM070087000B10011061	HMF70087000B10011061	8.7	10	61	11	2	B
HM070090000B10011061	HMF70090000B10011061	9.0	10	61	11	2	B
HM070095000B10011061	HMF70095000B10011061	9.5	10	61	11	2	B
HM070097000B10013063	HMF70097000B10013063	9.7	10	63	13	2	B
HM070100000B10013063	HMF70100000B10013063	10.0	10	63	13	2	B
HM070105000B12013070	HMF70105000B12013070	10.5	12	70	13	2	B
HM070107000B12013070	HMF70107000B12013070	10.7	12	70	13	2	B
HM070110000B12013070	HMF70110000B12013070	11.0	12	70	13	2	B
HM070115000B12013070	HMF70115000B12013070	11.5	12	70	13	2	B
HM070117000B12016073	HMF70117000B12016073	11.7	12	73	16	2	B
HM070120000B12016073	HMF70120000B12016073	12.0	12	73	16	2	B
HM070125000B12016073	HMF70125000B12016073	12.5	12	73	16	2	B
HM070127000B12016073	HMF70127000B12016073	12.7	12	73	16	2	B
HM070130000B12016073	HMF70130000B12016073	13.0	12	73	16	2	B
HM070135000B12016073	HMF70135000B12016073	13.5	12	73	16	2	B
HM070137000B12016073	HMF70137000B12016073	13.7	12	73	16	2	B
HM070140000B12016073	HMF70140000B12016073	14.0	12	73	16	2	B
HM070147000B12016073	HMF70147000B12016073	14.7	12	73	16	2	B
HM070150000B12016073	HMF70150000B12016073	15.0	12	73	16	2	B
HM070157000B16019079	HMF70157000B16019079	15.7	16	79	19	2	B
HM070160000B16019079	HMF70160000B16019079	16.0	16	79	19	2	B
HM070167000B16019079	HMF70167000B16019079	16.7	16	79	19	2	B
HM070170000B16019079	HMF70170000B16019079	17.0	16	79	19	2	B
HM070177000B16019079	HMF70177000B16019079	17.7	16	79	19	2	B
HM070180000B16019079	HMF70180000B16019079	18.0	16	79	19	2	B
HM070190000B16019079	HMF70190000B16019079	19.0	16	79	19	2	B
HM070197000B20022088	HMF70197000B20022088	19.7	20	88	22	2	B

**HM070 HMF70**
**SQUARE TYPE WALCOWO-CZOŁOWE**

2 Flute, Short Length 2-ostrzowe, krótkie

<b>P</b>				<b>H</b>		<b>M</b>		<b>K</b>	<b>N</b>			<b>S</b>		
<750 N/mm <sup>2</sup>	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NICO 200-300 HB	Ti 200-410 GB
•	•								○	○			•	•



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM070200000B16022082	HMF70200000B16022082	20.0	16	82	22	2	B
HM070200000B20022088	HMF70200000B20022088	20.0	20	88	22	2	B
HM070210000B20022088	HMF70210000B20022088	21.0	20	88	22	2	B
HM070220000B20022088	HMF70220000B20022088	22.0	20	88	22	2	B
HM070220000B25022098	HMF70220000B25022098	22.0	25	98	22	2	B
HM070240000B25026102	HMF70240000B25026102	24.0	25	102	26	2	B
HM070250000B25026102	HMF70250000B25026102	25.0	25	102	26	2	B
HM070260000B25026102	HMF70260000B25026102	26.0	25	102	26	2	B
HM070270000B25026102	HMF70270000B25026102	27.0	25	102	26	2	B
HM070280000B25026102	HMF70280000B25026102	28.0	25	102	26	2	B
HM070290000B25026102	HMF70290000B25026102	29.0	25	102	26	2	B
HM070300000B25026102	HMF70300000B25026102	30.0	25	102	26	2	B
HM070320000B32032112	HMF70320000B32032112	32.0	32	112	32	2	B
HM070340000B32032112	HMF70340000B32032112	34.0	32	112	32	2	B
HM070350000B32032112	HMF70350000B32032112	35.0	32	112	32	2	B
HM070360000B32032112	HMF70360000B32032112	36.0	32	112	32	2	B
HM070380000B32038118	HMF70380000B32038118	38.0	32	118	38	2	B
HM070380000B40038130	HMF70380000B40038130	38.0	40	130	38	2	B
HM070400000B32038118	HMF70400000B32038118	40.0	32	118	38	2	B
HM070400000B40038130	HMF70400000B40038130	40.0	40	130	38	2	B

**HM070 HMF70**

Cutting Conditions Parametry skrawania

**Uncoated Bez pokrycia**

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
Hardness Twardość			~ 500N/mm2		~ HRC20 500 ~ 800N/mm2		HRC20 ~HRC30 800 ~ 1000N/mm2		HRC30 ~HRC40 1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2.0	2	1	5600	40	4500	30	4000	30	2200	15	12000	160
3.0	3	1,5	3500	55	3200	45	2500	40	1600	20	11000	250
4.0	4	2	2800	70	2200	55	1800	45	1100	30	8000	290
5.0	5	2,5	2200	90	1800	70	1600	60	900	35	6300	310
6.0	6	3	1800	90	1600	80	1200	60	800	40	5600	310
8.0	8	4	1400	100	1100	90	900	70	560	45	4000	390
10.0	10	5	1100	100	900	90	800	80	450	45	3100	400
12.0	12	6	900	110	800	100	630	80	400	50	2500	380
14.0	14	7	800	110	700	90	560	80	350	50	2200	350
16.0	16	8	700	110	560	90	450	70	280	45	2000	350
18.0	18	9	630	100	500	90	400	70	250	45	1800	350
20.0	20	10	560	100	450	90	400	70	220	45	1600	320
22.0	22	11	500	100	450	90	350	70	220	45	1400	300
25.0	25	12,5	450	90	400	80	310	60	180	35	1200	280
28.0	28	14	400	80	350	70	280	55	160	30	1100	270
30.0	30	15	350	70	310	60	250	50	160	30	1100	270
32.0	32	16	350	70	280	55	220	45	140	30	1000	240
36.0	36	18	310	60	250	50	200	40	120	25	900	220
40.0	40	20	280	60	220	50	180	40	110	25	800	200

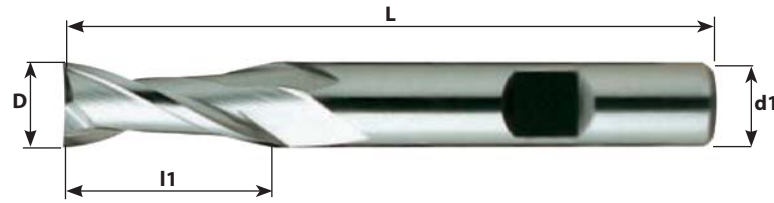
**Coated TiAlN Pokryte TiAlN**

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
Hardness Twardość			~ 500N/mm2		~ HRC20 500 ~ 800N/mm2		HRC20 ~HRC30 800 ~ 1000N/mm2		HRC30 ~HRC40 1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2.0	2	1	7850	55	6300	40	5600	40	3100	20	16800	225
3.0	3	1,5	4900	75	4500	65	3500	55	2250	30	15400	350
4.0	4	2	3900	100	3100	75	2500	65	1550	40	11200	405
5.0	5	2,5	3100	125	2500	100	2250	85	1250	50	8800	435
6.0	6	3	2500	125	2250	110	1700	85	1100	55	7850	435
8.0	8	4	1950	140	1550	125	1250	100	800	65	5600	545
10.0	10	5	1550	140	1250	125	1100	110	650	65	4350	560
12.0	12	6	1250	155	1100	140	900	110	550	70	3500	530
14.0	14	7	1100	155	1000	125	800	110	500	70	3100	490
16.0	16	8	1000	155	800	125	650	100	400	65	2800	490
18.0	18	9	900	140	700	125	550	100	350	65	2500	490
20.0	20	10	800	140	650	125	550	100	300	65	2250	450
22.0	22	11	700	140	650	125	500	100	300	65	1950	420
25.0	25	12,5	650	125	550	110	450	85	250	50	1700	390
28.0	28	14	550	110	500	100	400	75	200	40	1550	380
30.0	30	15	500	100	450	85	350	70	200	40	1550	380
32.0	32	16	500	100	400	75	300	65	200	40	1400	335
36.0	36	18	450	85	350	70	300	55	150	35	1250	310
40.0	40	20	400	85	300	70	250	55	150	35	1100	280

**HM071 HMF71**
**SQUARE TYPE WALCOWO-CZOŁOWE**

2 Flute, Long Length 2-ostrowe, długie

<b>P</b>	<b>H</b>	<b>M</b>	<b>K</b>	<b>N</b>	<b>S</b>									
<750 N/mm <sup>2</sup>	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NICO 200-300 HB	Ti 200-410 GB
•	•							○	○					



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM071015000B06007051	HMF71015000B06007051	1.5	6	51	7	2	B
HM071020000B06007051	HMF71020000B06007051	2.0	6	51	7	2	B
HM071025000B06008052	HMF71025000B06008052	2.5	6	52	8	2	B
HM071030000B06008052	HMF71030000B06008052	3.0	6	52	8	2	B
HM071035000B06010054	HMF71035000B06010054	3.5	6	54	10	2	B
HM071040000B06011055	HMF71040000B06011055	4.0	6	55	11	2	B
HM071045000B06011055	HMF71045000B06011055	4.5	6	55	11	2	B
HM071050000B06013057	HMF71050000B06013057	5.0	6	57	13	2	B
HM071055000B06013057	HMF71055000B06013057	5.5	6	57	13	2	B
HM071060000B06013057	HMF71060000B06013057	6.0	6	57	13	2	B
HM071065000B10016066	HMF71065000B10016066	6.5	10	66	16	2	B
HM071070000B10016066	HMF71070000B10016066	7.0	10	66	16	2	B
HM071075000B10016066	HMF71075000B10016066	7.5	10	66	16	2	B
HM071080000B10019069	HMF71080000B10019069	8.0	10	69	19	2	B
HM071085000B10019069	HMF71085000B10019069	8.5	10	69	19	2	B
HM071090000B10019069	HMF71090000B10019069	9.0	10	69	19	2	B
HM071095000B10019069	HMF71095000B10019069	9.5	10	69	19	2	B
HM071100000B10022072	HMF71100000B10022072	10.0	10	72	22	2	B
HM071110000B12022079	HMF71110000B12022079	11.0	12	79	22	2	B
HM071120000B12026083	HMF71120000B12026083	12.0	12	83	26	2	B
HM071130000B12026083	HMF71130000B12026083	13.0	12	83	26	2	B
HM071140000B12026083	HMF71140000B12026083	14.0	12	83	26	2	B
HM071150000B12026083	HMF71150000B12026083	15.0	12	83	26	2	B
HM071160000B16032092	HMF71160000B16032092	16.0	16	92	32	2	B
HM071180000B16032092	HMF71180000B16032092	18.0	16	92	32	2	B
HM071200000B20038104	HMF71200000B20038104	20.0	20	104	38	2	B
HM071220000B20038104	HMF71220000B20038104	22.0	20	104	38	2	B
HM071240000B25045121	HMF71240000B25045121	24.0	25	121	45	2	B
HM071250000B25045121	HMF71250000B25045121	25.0	25	121	45	2	B
HM071260000B25045121	HMF71260000B25045121	26.0	25	121	45	2	B
HM071270000B25045121	HMF71270000B25045121	27.0	25	121	45	2	B
HM071280000B25045121	HMF71280000B25045121	28.0	25	121	45	2	B
HM071300000B25045121	HMF71300000B25045121	30.0	25	121	45	2	B
HM071320000B32053133	HMF71320000B32053133	32.0	32	133	53	2	B
HM071400000B40063155	HMF71400000B40063155	40.0	40	155	63	2	B



**HM071 HMF71**

Cutting Conditions Parametry skrawania

**Uncoated Bez pokrycia**

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
Hardness Twardość			~ 500N/mm2		~ HRC20		HRC20 ~HRC30		HRC30 ~HRC40			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2.0	2	1	5600	40	4500	30	4000	30	2200	15	12000	160
3.0	3	1,5	3500	55	3200	45	2500	40	1600	20	11000	250
4.0	4	2	2800	70	2200	55	1800	45	1100	30	8000	290
5.0	5	2,5	2200	90	1800	70	1600	60	900	35	6300	310
6.0	6	3	1800	90	1600	80	1200	60	800	40	5600	310
8.0	8	4	1400	100	1100	90	900	70	560	45	4000	390
10.0	10	5	1100	100	900	90	800	80	450	45	3100	400
12.0	12	6	900	110	800	100	630	80	400	50	2500	380
14.0	14	7	800	110	700	90	560	80	350	50	2200	350
16.0	16	8	700	110	560	90	450	70	280	45	2000	350
18.0	18	9	630	100	500	90	400	70	250	45	1800	350
20.0	20	10	560	100	450	90	400	70	220	45	1600	320
22.0	22	11	500	100	450	90	350	70	220	45	1400	300
25.0	25	12,5	450	90	400	80	310	60	180	35	1200	280
28.0	28	14	400	80	350	70	280	55	160	30	1100	270
30.0	30	15	350	70	310	60	250	50	160	30	1100	270
32.0	32	16	350	70	280	55	220	45	140	30	1000	240
36.0	36	18	310	60	250	50	200	40	120	25	900	220
40.0	40	20	280	60	220	50	180	40	110	25	800	200

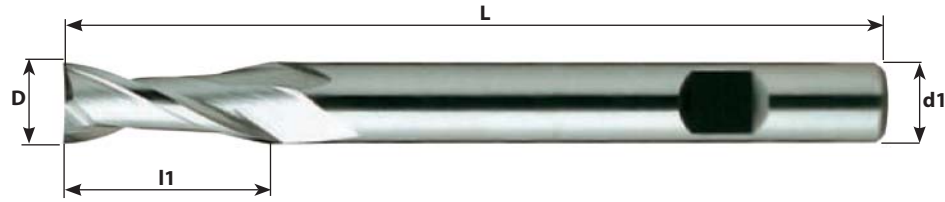
**Coated TiAlN Pokryte TiAlN**

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
Hardness Twardość			~ 500N/mm2		~ HRC20		HRC20 ~HRC30		HRC30 ~HRC40			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2.0	2	1	7850	55	6300	40	5600	40	3100	20	16800	225
3.0	3	1,5	4900	75	4500	65	3500	55	2250	30	15400	350
4.0	4	2	3900	100	3100	75	2500	65	1550	40	11200	405
5.0	5	2,5	3100	125	2500	100	2250	85	1250	50	8800	435
6.0	6	3	2500	125	2250	110	1700	85	1100	55	7850	435
8.0	8	4	1950	140	1550	125	1250	100	800	65	5600	545
10.0	10	5	1550	140	1250	125	1100	110	650	65	4350	560
12.0	12	6	1250	155	1100	140	900	110	550	70	3500	530
14.0	14	7	1100	155	1000	125	800	110	500	70	3100	490
16.0	16	8	1000	155	800	125	650	100	400	65	2800	490
18.0	18	9	900	140	700	125	550	100	350	65	2500	490
20.0	20	10	800	140	650	125	550	100	300	65	2250	450
22.0	22	11	700	140	650	125	500	100	300	65	1950	420
25.0	25	12,5	650	125	550	110	450	85	250	50	1700	390
28.0	28	14	550	110	500	100	400	75	200	40	1550	380
30.0	30	15	500	100	450	85	350	70	200	40	1550	380
32.0	32	16	500	100	400	75	300	65	200	40	1400	335
36.0	36	18	450	85	350	70	300	55	150	35	1250	310
40.0	40	20	400	85	300	70	250	55	150	35	1100	280

**HM010 HMF10**
**SQUARE TYPE WALCOWO-CZOŁOWE**

2 Flute, Extra Long Length 2-ostrzowe, bardzo długie

<b>P</b>				<b>H</b>		<b>M</b>		<b>K</b>	<b>N</b>			<b>S</b>		
<750 N/mm <sup>2</sup>	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NICO 200-300 HB	Ti 200-410 GB
•	•								○	○			•	•



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM010025000B06008056	HMF10025000B06008056	2.5	6	56	8	2	B
HM010030000B06008056	HMF10030000B06008056	3.0	6	56	8	2	B
HM010035000B06010059	HMF10035000B06010059	3.5	6	59	10	2	B
HM010040000B06011063	HMF10040000B06011063	4.0	6	63	11	2	B
HM010045000B06011063	HMF10045000B06011063	4.5	6	63	11	2	B
HM010050000B06013068	HMF10050000B06013068	5.0	6	68	13	2	B
HM010055000B06013068	HMF10055000B06013068	5.5	6	68	13	2	B
HM010060000B06013068	HMF10060000B06013068	6.0	6	68	13	2	B
HM010065000B10016080	HMF10065000B10016080	6.5	10	80	16	2	B
HM010070000B10016080	HMF10070000B10016080	7.0	10	80	16	2	B
HM010080000B10019088	HMF10080000B10019088	8.0	10	88	19	2	B
HM010085000B10019088	HMF10085000B10019088	8.5	10	88	19	2	B
HM010090000B10019088	HMF10090000B10019088	9.0	10	88	19	2	B
HM010100000B10022095	HMF10100000B10022095	10.0	10	95	22	2	B
HM010120000B12026110	HMF10120000B12026110	12.0	12	110	26	2	B
HM010140000B12026110	HMF10140000B12026110	14.0	12	110	26	2	B
HM010160000B16032123	HMF10160000B16032123	16.0	16	123	32	2	B
HM010180000B16032123	HMF10180000B16032123	18.0	16	123	32	2	B
HM010200000B20038141	HMF10200000B20038141	20.0	20	141	38	2	B
HM010220000B20038141	HMF10220000B20038141	22.0	20	141	38	2	B
HM010240000B25045166	HMF10240000B25045166	24.0	25	166	45	2	B
HM010250000B25045166	HMF10250000B25045166	25.0	25	166	45	2	B
HM010260000B25045166	HMF10260000B25045166	26.0	25	166	45	2	B
HM010280000B25045166	HMF10280000B25045166	28.0	25	166	45	2	B
HM010300000B25045166	HMF10300000B25045166	30.0	25	166	45	2	B
HM010320000B32053186	HMF10320000B32053186	32.0	32	186	53	2	B
HM010360000B32053186	HMF10360000B32053186	36.0	32	186	53	2	B
HM010400000B32063207	HMF10400000B32063207	40.0	32	207	63	2	B
HM010400000B40063217	HMF10400000B40063217	40.0	40	217	63	2	B

**HM010 HMF10**

Cutting Conditions Parametry skrawania

**Uncoated Bez pokrycia**

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa, Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa, Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa, Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa, Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
Hardness Twardość			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2.0	2	1	5600	40	4500	30	4000	30	2200	15	12000	160
3.0	3	1,5	3500	55	3200	45	2500	40	1600	20	11000	250
4.0	4	2	2800	70	2200	55	1800	45	1100	30	8000	290
5.0	5	2,5	2200	90	1800	70	1600	60	900	35	6300	310
6.0	6	3	1800	90	1600	80	1200	60	800	40	5600	310
8.0	8	4	1400	100	1100	90	900	70	560	45	4000	390
10.0	10	5	1100	100	900	90	800	80	450	45	3100	400
12.0	12	6	900	110	800	100	630	80	400	50	2500	380
14.0	14	7	800	110	700	90	560	80	350	50	2200	350
16.0	16	8	700	110	560	90	450	70	280	45	2000	350
18.0	18	9	630	100	500	90	400	70	250	45	1800	350
20.0	20	10	560	100	450	90	400	70	220	45	1600	320
22.0	22	11	500	100	450	90	350	70	220	45	1400	300
25.0	25	12,5	450	90	400	80	310	60	180	35	1200	280
28.0	28	14	400	80	350	70	280	55	160	30	1100	270
30.0	30	15	350	70	310	60	250	50	160	30	1100	270
32.0	32	16	350	70	280	55	220	45	140	30	1000	240
36.0	36	18	310	60	250	50	200	40	120	25	900	220
40.0	40	20	280	60	220	50	180	40	110	25	800	200

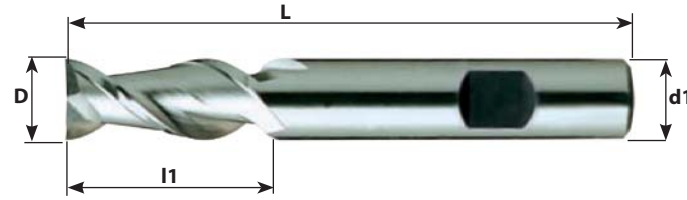
**Coated TiAlN Pokryte TiAlN**

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa, Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa, Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa, Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa, Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
Hardness Twardość			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2.0	2	1	7850	55	6300	40	5600	40	3100	20	16800	225
3.0	3	1,5	4900	75	4500	65	3500	55	2250	30	15400	350
4.0	4	2	3900	100	3100	75	2500	65	1550	40	11200	405
5.0	5	2,5	3100	125	2500	100	2250	85	1250	50	8800	435
6.0	6	3	2500	125	2250	110	1700	85	1100	55	7850	435
8.0	8	4	1950	140	1550	125	1250	100	800	65	5600	545
10.0	10	5	1550	140	1250	125	1100	110	650	65	4350	560
12.0	12	6	1250	155	1100	140	900	110	550	70	3500	530
14.0	14	7	1100	155	1000	125	800	110	500	70	3100	490
16.0	16	8	1000	155	800	125	650	100	400	65	2800	490
18.0	18	9	900	140	700	125	550	100	350	65	2500	490
20.0	20	10	800	140	650	125	550	100	300	65	2250	450
22.0	22	11	700	140	650	125	500	100	300	65	1950	420
25.0	25	12,5	650	125	550	110	450	85	250	50	1700	390
28.0	28	14	550	110	500	100	400	75	200	40	1550	380
30.0	30	15	500	100	450	85	350	70	200	40	1550	380
32.0	32	16	500	100	400	75	300	65	200	40	1400	335
36.0	36	18	450	85	350	70	300	55	150	35	1250	310
40.0	40	20	400	85	300	70	250	55	150	35	1100	280

**HM064**
**SQUARE TYPE WALCOWO-CZOŁOWE**

2 Flute, Short Length 2-ostrzowe, krótkie

<b>P</b>				<b>H</b>		<b>M</b>		<b>K</b>	<b>N</b>				<b>S</b>	
<750 N/mm <sup>2</sup>	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NICO 200-300 HB	Ti 200-410 GB



D code Uncoated Kod bez pokrycia	D	d1	L	l1	Z	Shank Uchwyt
HM064010000B06003049	1.0	6	49	3	2	B
HM064015000B06005049	1.5	6	49	5	2	B
HM064020000B06007051	2.0	6	51	7	2	B
HM064025000B06008052	2.5	6	52	8	2	B
HM064030000B06008052	3.0	6	52	8	2	B
HM064035000B06010054	3.5	6	54	10	2	B
HM064040000B06011055	4.0	6	55	11	2	B
HM064045000B06011055	4.5	6	55	11	2	B
HM064050000B06013057	5.0	6	57	13	2	B
HM064055000B06013057	5.5	6	57	13	2	B
HM064060000B06013057	6.0	6	57	13	2	B
HM064065000B10016066	6.5	10	66	16	2	B
HM064070000B10016066	7.0	10	66	16	2	B
HM064075000B10016066	7.5	10	66	16	2	B
HM064080000B10019069	8.0	10	69	19	2	B
HM064085000B10019069	8.5	10	69	19	2	B
HM064090000B10019069	9.0	10	69	19	2	B
HM064100000B10022072	10.0	10	72	22	2	B
HM064110000B12022079	11.0	12	79	22	2	B
HM064120000B12026083	12.0	12	83	26	2	B
HM064130000B12026083	13.0	12	83	26	2	B
HM064140000B12026083	14.0	12	83	26	2	B
HM064150000B12026083	15.0	12	83	26	2	B
HM064160000B16032092	16.0	16	92	32	2	B
HM064170000B16032092	17.0	16	92	32	2	B
HM064180000B16032092	18.0	16	92	32	2	B
HM064190000B16032092	19.0	16	92	32	2	B
HM064200000B20038104	20.0	20	104	38	2	B
HM064210000B20038104	21.0	20	104	38	2	B
HM064220000B20038104	22.0	20	104	38	2	B
HM064230000B20038104	23.0	20	104	38	2	B
HM064240000B25045121	24.0	25	121	45	2	B
HM064250000B25045121	25.0	25	121	45	2	B
HM064260000B25045121	26.0	25	121	45	2	B
HM064280000B25045121	28.0	25	121	45	2	B
HM064300000B25045121	30.0	25	121	45	2	B
HM064320000B32053133	32.0	32	133	53	2	B

**HM064**

Cutting Conditions Parametry skrawania

**Uncoated - Slotting** Bez pokrycia - Rowkowanie

Material Materiał			Aluminium Nonferrous Metals Aluminium, Metale nieżelazne	
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED
3.0	3	1,5	8000	560
6.0	6	3	7000	700
8.0	8	4	6000	850
10.0	10	5	5000	1200
12.0	12	6	5000	1200
14.0	14	7	3500	1240
16.0	16	8	3500	1240
18.0	18	9	2300	1300
20.0	20	10	2300	1300

**Uncoated - Side Cutting** Bez pokrycia - Frezowanie boku

Material Materiał			Aluminium Nonferrous Metals Aluminium, Metale nieżelazne	
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED
3.0	0,75	3	8000	730
6.0	1,5	6	7000	900
8.0	2	8	6000	1100
10.0	2,5	10	5000	1500
12.0	6	12	5000	1500
14.0	7	14	3500	1600
16.0	8	16	3500	1600
18.0	9	18	2300	1700
20.0	10	20	2300	1700

UGF

UFX

UFJ

UFD

UFA

UFC

PMT

RB

CBN

HSS

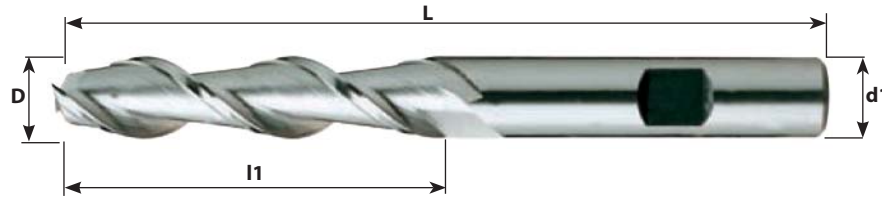
ICT

# HM009

## SQUARE TYPE WALCOWO-CZOŁOWE

2 Flute, Long Length 2-ostrzowe, długie

P				H		M		K	N			S		
<750 N/mm <sup>2</sup>	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NICO 200-300 HB	Ti 200-410 GB



D code Uncoated Kod bez pokrycia	D	d1	L	l1	Z	Shank Uchwyt
HM009020000B06010054	2.0	6	54	10	2	B
HM009030000B06012056	3.0	6	56	12	2	B
HM009040000B06019063	4.0	6	63	19	2	B
HM009050000B06024068	5.0	6	68	24	2	B
HM009060000B06024068	6.0	6	68	24	2	B
HM009070000B10030080	7.0	10	80	30	2	B
HM009080000B10038088	8.0	10	88	38	2	B
HM009090000B10038088	9.0	10	88	38	2	B
HM009100000B10045095	10.0	10	95	45	2	B
HM009110000B12045102	11.0	12	102	45	2	B
HM009120000B12053110	12.0	12	110	53	2	B
HM009130000B12053110	13.0	12	110	53	2	B
HM009140000B12053110	14.0	12	110	53	2	B
HM009150000B12053110	15.0	12	110	53	2	B
HM009160000B16063123	16.0	16	123	63	2	B
HM009180000B16063123	18.0	16	123	63	2	B
HM009200000B20075141	20.0	20	141	75	2	B

**HM009**

Cutting Conditions Parametry skrawania

**Uncoated - Slotting** Bez pokrycia - Rowkowanie

Material Materiał			Aluminium Nonferrous Metals Aluminium, Metale nieżelazne	
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED
3.0	3	1,5	8000	560
6.0	6	3	7000	700
8.0	8	4	6000	850
10.0	10	5	5000	1200
12.0	12	6	5000	1200
14.0	14	7	3500	1240
16.0	16	8	3500	1240
18.0	18	9	2300	1300
20.0	20	10	2300	1300

**Uncoated - Side Cutting** Bez pokrycia - Frezowanie boku

Material Materiał			Aluminium Nonferrous Metals Aluminium, Metale nieżelazne	
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED
3.0	0,75	3	8000	730
6.0	1,5	6	7000	900
8.0	2	8	6000	1100
10.0	2,5	10	5000	1500
12.0	6	12	5000	1500
14.0	7	14	3500	1600
16.0	8	16	3500	1600
18.0	9	18	2300	1700
20.0	10	20	2300	1700

UGF

UFX

UFJ

UFD

UFA

UFC

PMT

RB

CBN

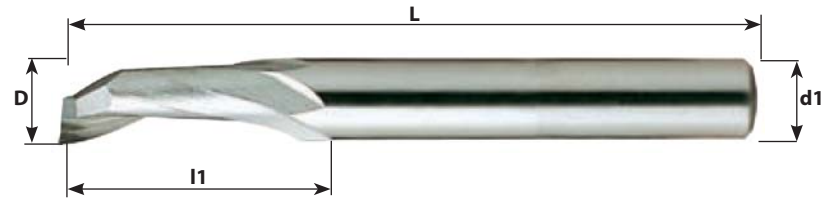
HSS

ICT

**HM612**
**SQUARE TYPE WALCOWO-CZOŁOWE**

1 Flute, 1-ostrzowe

						<b>HSS</b> Co 8%									<b>AIR</b>
<b>P</b>			<b>H</b>			<b>M</b>		<b>K</b>	<b>N</b>				<b>S</b>		
<750 N/mm <sup>2</sup>	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB	



D code Uncoated Kod bez pokrycia	D	d1	d2	L	l1	Z	Shank Uchwyt
HM612030000A08012060	3.0	8	-	60	12	1	A
HM612040000A08012060	4.0	8	-	60	12	1	A
HM612050000A08014060	5.0	8	-	60	14	1	A
HM612060000A08014060	6.0	8	-	60	14	1	A
HM612070000A08014060	7.0	8	-	60	14	1	A
HM612080000A08014080	8.0	8	-	80	14	1	A
HM612090000A08014080	9.0	8	-	80	14	1	A
HM612100000A08014080	10.0	8	-	80	14	1	A
HM612050000A08035080	5.0	8	4.8	80	18	1	A
HM612050000A08040100	5.0	8	—	100	40	1	A
HM612080000A08068120	8.0	8	7.5	120	14	1	A

Cutting Conditions Parametry skrawania

**Uncoated** Bez pokrycia

Material Materiał	Aluminium Nonferrous Metals Aluminium, Metale nieżelazne			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED
3.0	3	1,5	20000	1100
4.0	4	2	18000	950
5.0	5	2,5	14000	750
6.0	6	3	11000	600
7.0	7	3,5	10000	550
8.0	8	4	8500	450
10.0	10	5	7000	380

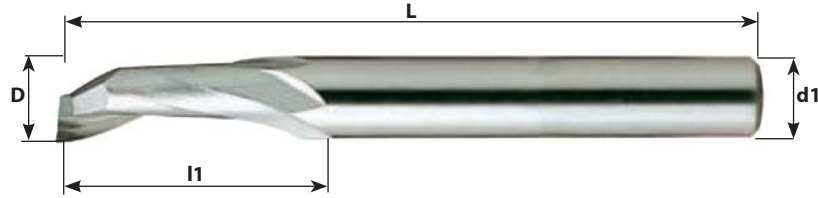
	d1 ≤ 3,0	0 — -6	d1 ≤ 18	0 — -11
	d1 ≤ 6,0	0 — -8	d1 ≤ 30	0 — -13
	d1 ≤ 10	0 — -9	d1 ≤ 50	0 — -16



**HM623**
**SQUARE TYPE WALCOWO-CZOŁOWE**

1 Flute, 1-ostrzowe

P				H		M		K	N			S		
<750 N/mm <sup>2</sup>	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NICO 200-300 HB	Ti 200-410 GB
•	•								○	○				



D code Uncoated Kod bez pokrycia	D	d1	L	l1	Z	Shank Uchwyt
HM623030000A08012060	3.0	8	60	12	1	A
HM623040000A08012060	4.0	8	60	12	1	A
HM623050000A08012060	5.0	8	60	12	1	A
HM623060000A08014060	6.0	8	60	14	1	A
HM623070000A08014060	7.0	8	60	14	1	A
HM623080000A08014080	8.0	8	80	14	1	A
HM623090000A08014080	9.0	8	80	14	1	A
HM623100000A08014080	10.0	8	80	14	1	A

Cutting Conditions Parametry skrawania

**Uncoated** Bez pokrycia

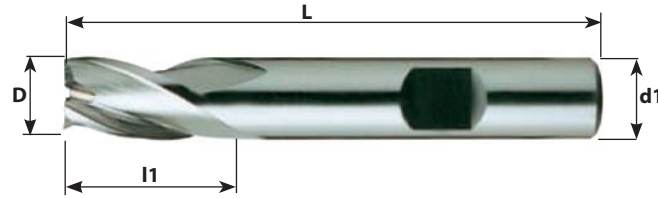
Material Materiał	Aluminium Nonferrous Metals Aluminium, Metale nieżelazne			
	ae(mm)	ap(mm)	RPM	FEED
d1 (mm)				
3.0	3	1,5	20000	1100
4.0	4	2	18000	950
5.0	5	2,5	14000	750
6.0	6	3	11000	600
7.0	7	3,5	10000	550
8.0	8	4	8500	450
10.0	10	5	7000	380

	d1 ≤ 3,0	0 — -6	d1 ≤ 18	0 — -11
	d1 ≤ 6,0	0 — -8	d1 ≤ 30	0 — -13
	d1 ≤ 10	0 — -9	d1 ≤ 50	0 — -16

**HM072 HMF72**
**SQUARE TYPE WALCOWO-CZOŁOWE**

3 Flute, Long Length 3-ostrzowe, długie

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



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM072015000B06003047	HMF72015000B06003047	1.5	6	47	3	3	B
HM072020000B06004048	HMF72020000B06004048	2.0	6	48	4	3	B
HM072025000B06005049	HMF72025000B06005049	2.5	6	49	5	3	B
HM072030000B06005049	HMF72030000B06005049	3.0	6	49	5	3	B
HM072035000B06006050	HMF72035000B06006050	3.5	6	50	6	3	B
HM072040000B06007051	HMF72040000B06007051	4.0	6	51	7	3	B
HM072045000B06007051	HMF72045000B06007051	4.5	6	51	7	3	B
HM072050000B06008052	HMF72050000B06008052	5.0	6	52	8	3	B
HM072055000B06008052	HMF72055000B06008052	5.5	6	52	8	3	B
HM072060000B06008052	HMF72060000B06008052	6.0	6	52	8	3	B
HM072065000B10010060	HMF72065000B10010060	6.5	10	60	10	3	B
HM072070000B10010060	HMF72070000B10010060	7.0	10	60	10	3	B
HM072075000B10010060	HMF72075000B10010060	7.5	10	60	10	3	B
HM072080000B10011061	HMF72080000B10011061	8.0	10	61	11	3	B
HM072085000B10011061	HMF72085000B10011061	8.5	10	61	11	3	B
HM072100000B10013063	HMF72100000B10013063	10.0	10	63	13	3	B
HM072120000B12016073	HMF72120000B12016073	12.0	12	73	16	3	B
HM072140000B12016073	HMF72140000B12016073	14.0	12	73	16	3	B
HM072150000B12016073	HMF72150000B12016073	15.0	12	73	16	3	B
HM072160000B16019079	HMF72160000B16019079	16.0	16	79	19	3	B
HM072180000B16019079	HMF72180000B16019079	18.0	16	79	19	3	B
HM072200000B20022088	HMF72200000B20022088	20.0	20	88	22	3	B
HM072220000B20022088	HMF72220000B20022088	22.0	20	88	22	3	B
HM072240000B25026102	HMF72240000B25026102	24.0	25	102	26	3	B
HM072250000B25026102	HMF72250000B25026102	25.0	25	102	26	3	B
HM072260000B25026102	HMF72260000B25026102	26.0	25	102	26	3	B
HM072280000B25026102	HMF72280000B25026102	28.0	25	102	26	3	B
HM072300000B25026102	HMF72300000B25026102	30.0	25	102	26	3	B
HM072320000B32032112	HMF72320000B32032112	32.0	32	112	32	3	B

	d1 ≤ 3,0	0 — -6	d1 ≤ 18	0 — -11
	d1 ≤ 6,0	0 — -8	d1 ≤ 30	0 — -13
	d1 ≤ 10	0 — -9	d1 ≤ 50	0 — -16

**HM072 HMF72**

Cutting Conditions Parametry skrawania

**Uncoated - Slotting Bez pokrycia - Rowkowanie**

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
	Hardness Twardość		~ 500N/mm2		~ HRC20 500 ~ 800N/mm2		HRC20 ~ HRC30 800 ~ 1000N/mm2		HRC30 ~ HRC40 1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	0,2	3	5600	60	4500	40	4000	35	2200	15	12000	180
3	0,3	4,5	3500	80	3200	60	2500	45	1600	20	11000	280
4	0,4	6	2800	105	2200	75	1800	50	1100	30	8000	330
5	0,5	7,5	2200	135	1800	95	1600	65	900	35	6300	350
6	0,6	9	1800	135	1600	110	1200	65	800	45	5600	350
8	0,8	12	1400	150	1100	120	900	80	560	50	4000	440
10	1	15	1100	150	900	120	800	90	450	50	3100	450
12	1,2	18	900	165	800	135	630	90	400	55	2500	430
14	1,4	21	800	165	700	120	560	90	350	55	2200	400
16	1,6	24	700	165	560	120	450	80	280	50	2000	400
18	1,8	27	630	150	500	120	400	80	250	50	1800	400
20	2	30	560	150	450	120	400	80	220	50	1600	360
22	2,2	33	500	150	450	120	350	80	220	50	1400	340
25	2,5	37,5	450	135	400	110	310	65	180	35	1200	320
28	2,8	42	400	120	350	95	280	60	160	30	1100	300
30	3	45	350	105	310	80	250	55	160	30	1100	300
32	3,2	48	350	105	280	75	220	50	140	30	1000	270
35	3,5	52,5	320	95	260	65	210	45	130	25	950	260
36	3,6	54	310	90	250	65	200	45	120	25	900	250
40	4	60	280	90	220	65	180	45	110	25	800	220

UGF

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**HM072 HMF72**

Cutting Conditions Parametry skrawania

**Coated TiAlN - Slotting Pokryte TiAlN - Rowkowanie**

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
Hardness Twardość					~ HRC20		HRc20 ~HRc30		HRc30 ~HRc40			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2.0	2	1	7900	50	6300	35	5600	30	3100	15	16800	150
3.0	3	1,5	4900	70	4500	50	3500	35	2200	20	15400	240
4.0	4	2	3900	85	3100	60	2500	40	1500	30	11200	280
5.0	5	2,5	3100	110	2500	75	2200	55	1300	30	8800	290
6.0	6	3	2500	110	2200	90	1700	55	1100	35	7800	290
8.0	8	4	2000	125	1500	100	1300	70	780	40	5600	360
10.0	10	5	1500	125	1300	110	1100	75	630	40	4300	380
12.0	12	6	1300	140	1100	110	880	75	560	50	3500	360
14.0	14	7	1100	140	980	100	780	75	490	50	3100	340
16.0	16	8	980	140	780	100	630	70	390	40	2800	340
18.0	18	9	880	125	700	100	560	70	350	40	2500	340
20.0	20	10	780	125	630	100	560	70	310	40	2200	310
22.0	22	11	700	125	630	100	490	70	310	40	1950	280
25.0	25	12,5	630	110	560	90	430	55	250	30	1700	270
28.0	28	14	560	100	490	75	390	50	220	30	1500	250
30.0	30	15	490	85	430	70	350	40	220	30	1500	250
32.0	32	16	490	85	390	65	310	40	200	30	1400	225
35.0	35	17,5	450	80	360	60	290	35	180	25	1300	215
36.0	36	18	430	75	350	55	280	35	170	20	1250	210
40.0	40	20	390	75	310	55	250	35	150	20	1100	180

**HM072 HMF72**

Cutting Conditions Parametry skrawania

**Uncoated - Side Cutting** Bez pokrycia - Frezowanie boku

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
	Hardness Twardość		~ 500N/mm2		~ HRC20 500 ~ 800N/mm2		HRC20 ~ HRC30 800 ~ 1000N/mm2		HRC30 ~ HRC40 1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	0,2	3	5600	60	4500	40	4000	35	2200	15	12000	180
3	0,3	4,5	3500	80	3200	60	2500	45	1600	20	11000	280
4	0,4	6	2800	105	2200	75	1800	50	1100	30	8000	330
5	0,5	7,5	2200	135	1800	95	1600	65	900	35	6300	350
6	0,6	9	1800	135	1600	110	1200	65	800	45	5600	350
8	0,8	12	1400	150	1100	120	900	80	560	50	4000	440
10	1	15	1100	150	900	120	800	90	450	50	3100	450
12	1,2	18	900	165	800	135	630	90	400	55	2500	430
14	1,4	21	800	165	700	120	560	90	350	55	2200	400
16	1,6	24	700	165	560	120	450	80	280	50	2000	400
18	1,8	27	630	150	500	120	400	80	250	50	1800	400
20	2	30	560	150	450	120	400	80	220	50	1600	360
22	2,2	33	500	150	450	120	350	80	220	50	1400	340
25	2,5	37,5	450	135	400	110	310	65	180	35	1200	320
28	2,8	42	400	120	350	95	280	60	160	30	1100	300
30	3	45	350	105	310	80	250	55	160	30	1100	300
32	3,2	48	350	105	280	75	220	50	140	30	1000	270
35	3,5	52,5	320	95	260	65	210	45	130	25	950	260
36	3,6	54	310	90	250	65	200	45	120	25	900	250
40	4	60	280	90	220	65	180	45	110	25	800	220

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## HM072 HMF72

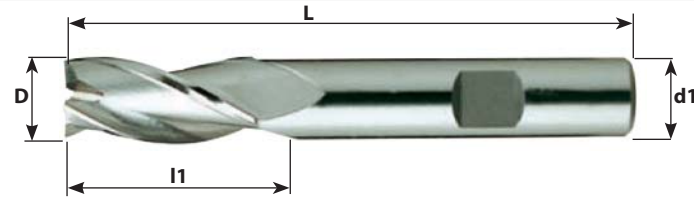
### Coated TiAlN - Side Cutiing Pokryte TiAlN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
	Hardness Twardość		~ 500N/mm2		~ HRC20 500 ~ 800N/mm2		HRC20 ~HRC30 800 ~ 1000N/mm2		HRC30 ~HRC40 1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	0,2	3	7900	85	6300	55	5600	50	3100	20	16800	250
3	0,3	4,5	4900	110	4500	85	3500	60	2200	30	15400	390
4	0,4	6	3900	145	3100	105	2500	70	1500	40	11200	460
5	0,5	7,5	3100	190	2500	130	2200	90	1300	50	8800	490
6	0,6	9	2500	190	2200	155	1700	90	1100	60	7800	490
8	0,8	12	2000	210	1500	170	1300	110	780	70	5600	620
10	1	15	1500	210	1300	170	1100	125	630	70	4300	630
12	1,2	18	1300	230	1100	190	880	125	560	75	3500	600
14	1,4	21	1100	230	980	170	780	125	490	75	3100	560
16	1,6	24	980	230	780	170	630	110	390	70	2800	560
18	1,8	27	880	210	700	170	560	110	350	70	2500	560
20	2	30	780	210	630	170	560	110	310	70	2200	500
22	2,2	33	700	210	630	170	490	110	310	70	1950	480
25	2,5	37,5	630	190	560	155	430	90	250	50	1700	450
28	2,8	42	560	170	490	130	390	85	220	40	1500	420
30	3	45	490	145	430	110	350	75	220	40	1500	420
32	3,2	48	490	145	390	105	310	70	200	40	1400	380
35	3,5	52,5	450	130	360	95	290	65	180	35	1300	360
36	3,6	54	430	125	350	90	280	65	170	35	1250	350
40	4	60	390	125	310	90	250	65	150	35	1100	310

**HM073 HMF73**
**SQUARE TYPE WALCOWO-CZOŁOWE**

3 Flute, Short Length 3-ostrzowe, krótkie

<b>P</b>				<b>H</b>		<b>M</b>		<b>K</b>	<b>N</b>				<b>S</b>	
<750 N/mm <sup>2</sup>	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NICO 200-300 HB	Ti 200-410 GB
•	•								○	○			•	•



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM073010000B06003047	HMF73010000B06003047	1.0	6	47	3	3	B
HM073015000B06007051	HMF73015000B06007051	1.5	6	51	7	3	B
HM073020000B06007051	HMF73020000B06007051	2.0	6	51	7	3	B
HM073025000B06008052	HMF73025000B06008052	2.5	6	52	8	3	B
HM073030000B06008052	HMF73030000B06008052	3.0	6	52	8	3	B
HM073035000B06010054	HMF73035000B06010054	3.5	6	54	10	3	B
HM073040000B06011055	HMF73040000B06011055	4.0	6	55	11	3	B
HM073045000B06011055	HMF73045000B06011055	4.5	6	55	11	3	B
HM073050000B06013057	HMF73050000B06013057	5.0	6	57	13	3	B
HM073055000B06013057	HMF73055000B06013057	5.5	6	57	13	3	B
HM073060000B06013057	HMF73060000B06013057	6.0	6	57	13	3	B
HM073065000B10016066	HMF73065000B10016066	6.5	10	66	16	3	B
HM073070000B10016066	HMF73070000B10016066	7.0	10	66	16	3	B
HM073075000B10016066	HMF73075000B10016066	7.5	10	66	16	3	B
HM073080000B10019069	HMF73080000B10019069	8.0	10	69	19	3	B
HM073085000B10019069	HMF73085000B10019069	8.5	10	69	19	3	B
HM073090000B10019069	HMF73090000B10019069	9.0	10	69	19	3	B
HM073095000B10019069	HMF73095000B10019069	9.5	10	69	19	3	B
HM073100000B10022072	HMF73100000B10022072	10.0	10	72	22	3	B
HM073120000B12026083	HMF73120000B12026083	12.0	12	83	26	3	B
HM073140000B12026083	HMF73140000B12026083	14.0	12	83	26	3	B
HM073150000B12026083	HMF73150000B12026083	15.0	12	83	26	3	B
HM073160000B16032092	HMF73160000B16032092	16.0	16	92	32	3	B
HM073180000B16032092	HMF73180000B16032092	18.0	16	92	32	3	B
HM073200000B20038104	HMF73200000B20038104	20.0	20	104	38	3	B
HM073220000B20038104	HMF73220000B20038104	22.0	20	104	38	3	B
HM073240000B25045121	HMF73240000B25045121	24.0	25	121	45	3	B
HM073250000B25045121	HMF73250000B25045121	25.0	25	121	45	3	B
HM073260000B25045121	HMF73260000B25045121	26.0	25	121	45	3	B
HM073280000B25045121	HMF73280000B25045121	28.0	25	121	45	3	B
HM073300000B25045121	HMF73300000B25045121	30.0	25	121	45	3	B
HM073320000B32053133	HMF73320000B32053133	32.0	32	133	53	3	B
HM073400000B40063155	HMF73400000B40063155	40.0	40	155	63	3	B

UGF

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PMT

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CBN

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ICT

**HM073 HMF73**

Cutting Conditions Parametry skrawania

**Uncoated - Slotting** Bez pokrycia - Rowkowanie

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
	Hardness Twardość				~ HRC20		HRC20 ~HRC30		HRC30 ~HRC40			
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	0,2	3	5600	60	4500	40	4000	35	2200	15	12000	180
3	0,3	4,5	3500	80	3200	60	2500	45	1600	20	11000	280
4	0,4	6	2800	105	2200	75	1800	50	1100	30	8000	330
5	0,5	7,5	2200	135	1800	95	1600	65	900	35	6300	350
6	0,6	9	1800	135	1600	110	1200	65	800	45	5600	350
8	0,8	12	1400	150	1100	120	900	80	560	50	4000	440
10	1	15	1100	150	900	120	800	90	450	50	3100	450
12	1,2	18	900	165	800	135	630	90	400	55	2500	430
14	1,4	21	800	165	700	120	560	90	350	55	2200	400
16	1,6	24	700	165	560	120	450	80	280	50	2000	400
18	1,8	27	630	150	500	120	400	80	250	50	1800	400
20	2	30	560	150	450	120	400	80	220	50	1600	360
22	2,2	33	500	150	450	120	350	80	220	50	1400	340
25	2,5	37,5	450	135	400	110	310	65	180	35	1200	320
28	2,8	42	400	120	350	95	280	60	160	30	1100	300
30	3	45	350	105	310	80	250	55	160	30	1100	300
32	3,2	48	350	105	280	75	220	50	140	30	1000	270
35	3,5	52,5	320	95	260	65	210	45	130	25	950	260
36	3,6	54	310	90	250	65	200	45	120	25	900	250
40	4	60	280	90	220	65	180	45	110	25	800	220



**HM073 HMF73**

Cutting Conditions Parametry skrawania

**Coated TiAlN - Slotting Pokryte TiAlN - Rowkowanie**

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
Hardness Twardość			~ 500N/mm2		~ HRC20 500 ~ 800N/mm2		HRC20 ~HRC30 800 ~ 1000N/mm2		HRC30 ~HRC40 1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2.0	2	1	7900	50	6300	35	5600	30	3100	15	16800	150
3.0	3	1,5	4900	70	4500	50	3500	35	2200	20	15400	240
4.0	4	2	3900	85	3100	60	2500	40	1500	30	11200	280
5.0	5	2,5	3100	110	2500	75	2200	55	1300	30	8800	290
6.0	6	3	2500	110	2200	90	1700	55	1100	35	7800	290
8.0	8	4	2000	125	1500	100	1300	70	780	40	5600	360
10.0	10	5	1500	125	1300	110	1100	75	630	40	4300	380
12.0	12	6	1300	140	1100	110	880	75	560	50	3500	360
14.0	14	7	1100	140	980	100	780	75	490	50	3100	340
16.0	16	8	980	140	780	100	630	70	390	40	2800	340
18.0	18	9	880	125	700	100	560	70	350	40	2500	340
20.0	20	10	780	125	630	100	560	70	310	40	2200	310
22.0	22	11	700	125	630	100	490	70	310	40	1950	280
25.0	25	12,5	630	110	560	90	430	55	250	30	1700	270
28.0	28	14	560	100	490	75	390	50	220	30	1500	250
30.0	30	15	490	85	430	70	350	40	220	30	1500	250
32.0	32	16	490	85	390	65	310	40	200	30	1400	225
35.0	35	17,5	450	80	360	60	290	35	180	25	1300	215
36.0	36	18	430	75	350	55	280	35	170	20	1250	210
40.0	40	20	390	75	310	55	250	35	150	20	1100	180

UGF

UFX

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UFC

PMT

RB

CBN

HSS

ICT

**HM073 HMF73**

Cutting Conditions Parametry skrawania

**Uncoated - Side Cutiing** Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
	Hardness Twardość		~ 500N/mm2		~ HRC20 500 ~ 800N/mm2		HRC20 ~HRC30 800 ~ 1000N/mm2		HRC30 ~HRC40 1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	0,2	3	5600	60	4500	40	4000	35	2200	15	12000	180
3	0,3	4,5	3500	80	3200	60	2500	45	1600	20	11000	280
4	0,4	6	2800	105	2200	75	1800	50	1100	30	8000	330
5	0,5	7,5	2200	135	1800	95	1600	65	900	35	6300	350
6	0,6	9	1800	135	1600	110	1200	65	800	45	5600	350
8	0,8	12	1400	150	1100	120	900	80	560	50	4000	440
10	1	15	1100	150	900	120	800	90	450	50	3100	450
12	1,2	18	900	165	800	135	630	90	400	55	2500	430
14	1,4	21	800	165	700	120	560	90	350	55	2200	400
16	1,6	24	700	165	560	120	450	80	280	50	2000	400
18	1,8	27	630	150	500	120	400	80	250	50	1800	400
20	2	30	560	150	450	120	400	80	220	50	1600	360
22	2,2	33	500	150	450	120	350	80	220	50	1400	340
25	2,5	37,5	450	135	400	110	310	65	180	35	1200	320
28	2,8	42	400	120	350	95	280	60	160	30	1100	300
30	3	45	350	105	310	80	250	55	160	30	1100	300
32	3,2	48	350	105	280	75	220	50	140	30	1000	270
35	3,5	52,5	320	95	260	65	210	45	130	25	950	260
36	3,6	54	310	90	250	65	200	45	120	25	900	250
40	4	60	280	90	220	65	180	45	110	25	800	220

## HM073 HMF73

### Coated TiAlN - Side Cutiing Pokryte TiAlN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
	Hardness Twardość		~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	0,2	3	7900	85	6300	55	5600	50	3100	20	16800	250
3	0,3	4,5	4900	110	4500	85	3500	60	2200	30	15400	390
4	0,4	6	3900	145	3100	105	2500	70	1500	40	11200	460
5	0,5	7,5	3100	190	2500	130	2200	90	1300	50	8800	490
6	0,6	9	2500	190	2200	155	1700	90	1100	60	7800	490
8	0,8	12	2000	210	1500	170	1300	110	780	70	5600	620
10	1	15	1500	210	1300	170	1100	125	630	70	4300	630
12	1,2	18	1300	230	1100	190	880	125	560	75	3500	600
14	1,4	21	1100	230	980	170	780	125	490	75	3100	560
16	1,6	24	980	230	780	170	630	110	390	70	2800	560
18	1,8	27	880	210	700	170	560	110	350	70	2500	560
20	2	30	780	210	630	170	560	110	310	70	2200	500
22	2,2	33	700	210	630	170	490	110	310	70	1950	480
25	2,5	37,5	630	190	560	155	430	90	250	50	1700	450
28	2,8	42	560	170	490	130	390	85	220	40	1500	420
30	3	45	490	145	430	110	350	75	220	40	1500	420
32	3,2	48	490	145	390	105	310	70	200	40	1400	380
35	3,5	52,5	450	130	360	95	290	65	180	35	1300	360
36	3,6	54	430	125	350	90	280	65	170	35	1250	350
40	4	60	390	125	310	90	250	65	150	35	1100	310

UGF

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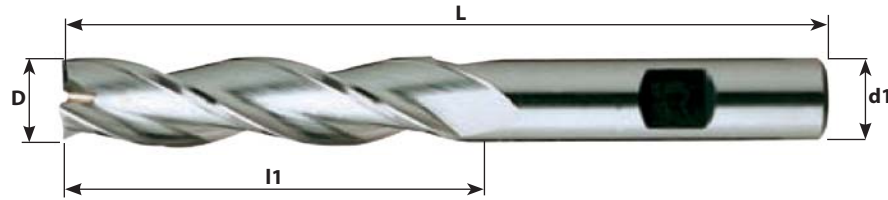
HSS

ICT

**HM016 HMF16**
**SQUARE TYPE WALCOWO-CZOŁOWE**

3 Flute, Long Length 3-ostrzowe, długie

<b>P</b>				<b>H</b>		<b>M</b>		<b>K</b>	<b>N</b>				<b>S</b>	
<750 N/mm <sup>2</sup>	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NICO 200-300 HB	Ti 200-410 GB
•	•								○	○			•	•



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM016020000B06010054	HMF16020000B06010054	2.0	6	54	10	3	B
HM016025000B06012056	HMF16025000B06012056	2.5	6	56	12	3	B
HM016030000B06012056	HMF16030000B06012056	3.0	6	56	12	3	B
HM016035000B06015059	HMF16035000B06015059	3.5	6	59	15	3	B
HM016040000B06019063	HMF16040000B06019063	4.0	6	63	19	3	B
HM016045000B06019063	HMF16045000B06019063	4.5	6	63	19	3	B
HM016050000B06024068	HMF16050000B06024068	5.0	6	68	24	3	B
HM016055000B06024068	HMF16055000B06024068	5.5	6	68	24	3	B
HM016060000B06024068	HMF16060000B06024068	6.0	6	68	24	3	B
HM016070000B10030080	HMF16070000B10030080	7.0	10	80	30	3	B
HM016075000B10030080	HMF16075000B10030080	7.5	10	80	30	3	B
HM016080000B10038088	HMF16080000B10038088	8.0	10	88	38	3	B
HM016090000B10038088	HMF16090000B10038088	9.0	10	88	38	3	B
HM016100000B10045095	HMF16100000B10045095	10.0	10	95	45	3	B
HM016110000B12045102	HMF16110000B12045102	11.0	12	102	45	3	B
HM016120000B12053110	HMF16120000B12053110	12.0	12	110	53	3	B
HM016130000B12053110	HMF16130000B12053110	13.0	12	110	53	3	B
HM016140000B12053110	HMF16140000B12053110	14.0	12	110	53	3	B
HM016150000B12053110	HMF16150000B12053110	15.0	12	110	53	3	B
HM016160000B16063123	HMF16160000B16063123	16.0	16	123	63	3	B
HM016170000B16063123	HMF16170000B16063123	17.0	16	123	63	3	B
HM016180000B16063123	HMF16180000B16063123	18.0	16	123	63	3	B
HM016190000B16063123	HMF16190000B16063123	19.0	16	123	63	3	B
HM016200000B16075135	HMF16200000B16075135	20.0	16	135	75	3	B
HM016200000B20075141	HMF16200000B20075141	20.0	20	141	75	3	B
HM016220000B20075141	HMF16220000B20075141	22.0	20	141	75	3	B
HM016240000B25090166	HMF16240000B25090166	24.0	25	166	90	3	B
HM016250000B25090166	HMF16250000B25090166	25.0	25	166	90	3	B
HM016260000B25090166	HMF16260000B25090166	26.0	25	166	90	3	B
HM016280000B25090166	HMF16280000B25090166	28.0	25	166	90	3	B
HM016300000B25090166	HMF16300000B25090166	30.0	25	166	90	3	B
HM016320000B320106186	HMF16320000B320106186	32.0	32	186	106	3	B
HM016350000B320106186	HMF16350000B320106186	35.0	32	186	106	3	B
HM016360000B320106186	HMF16360000B320106186	36.0	32	186	106	3	B
HM016400000B400125217	HMF16400000B400125217	40.0	40	217	125	3	B

**HM016 HMF16**

Cutting Conditions Parametry skrawania

**Uncoated - Slotting** Bez pokrycia - Rowkowanie

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
Hardness Twardość			~ 500N/mm2		~ HRC20 500 ~ 800N/mm2		HRC20 ~HRC30 800 ~ 1000N/mm2		HRC30 ~HRC40 1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	0,2	3	5600	60	4500	40	4000	35	2200	15	12000	180
3	0,3	4,5	3500	80	3200	60	2500	45	1600	20	11000	280
4	0,4	6	2800	105	2200	75	1800	50	1100	30	8000	330
5	0,5	7,5	2200	135	1800	95	1600	65	900	35	6300	350
6	0,6	9	1800	135	1600	110	1200	65	800	45	5600	350
8	0,8	12	1400	150	1100	120	900	80	560	50	4000	440
10	1	15	1100	150	900	120	800	90	450	50	3100	450
12	1,2	18	900	165	800	135	630	90	400	55	2500	430
14	1,4	21	800	165	700	120	560	90	350	55	2200	400
16	1,6	24	700	165	560	120	450	80	280	50	2000	400
18	1,8	27	630	150	500	120	400	80	250	50	1800	400
20	2	30	560	150	450	120	400	80	220	50	1600	360
22	2,2	33	500	150	450	120	350	80	220	50	1400	340
25	2,5	37,5	450	135	400	110	310	65	180	35	1200	320
28	2,8	42	400	120	350	95	280	60	160	30	1100	300
30	3	45	350	105	310	80	250	55	160	30	1100	300
32	3,2	48	350	105	280	75	220	50	140	30	1000	270
35	3,5	52,5	320	95	260	65	210	45	130	25	950	260
36	3,6	54	310	90	250	65	200	45	120	25	900	250
40	4	60	280	90	220	65	180	45	110	25	800	220

UGF

UFX

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UFA

UFC

PMT

RB

CBN

HSS

ICT

# HM016 HMF16

## Coated TiAlN - Slotting Pokryte TiAlN - Rowkowanie

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
Hardness Twardość												
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2.0	2	1	7900	50	6300	35	5600	30	3100	15	16800	150
3.0	3	1,5	4900	70	4500	50	3500	35	2200	20	15400	240
4.0	4	2	3900	85	3100	60	2500	40	1500	30	11200	280
5.0	5	2,5	3100	110	2500	75	2200	55	1300	30	8800	290
6.0	6	3	2500	110	2200	90	1700	55	1100	35	7800	290
8.0	8	4	2000	125	1500	100	1300	70	780	40	5600	360
10.0	10	5	1500	125	1300	110	1100	75	630	40	4300	380
12.0	12	6	1300	140	1100	110	880	75	560	50	3500	360
14.0	14	7	1100	140	980	100	780	75	490	50	3100	340
16.0	16	8	980	140	780	100	630	70	390	40	2800	340
18.0	18	9	880	125	700	100	560	70	350	40	2500	340
20.0	20	10	780	125	630	100	560	70	310	40	2200	310
22.0	22	11	700	125	630	100	490	70	310	40	1950	280
25.0	25	12,5	630	110	560	90	430	55	250	30	1700	270
28.0	28	14	560	100	490	75	390	50	220	30	1500	250
30.0	30	15	490	85	430	70	350	40	220	30	1500	250
32.0	32	16	490	85	390	65	310	40	200	30	1400	225
35.0	35	17,5	450	80	360	60	290	35	180	25	1300	215
36.0	36	18	430	75	350	55	280	35	170	20	1250	210
40.0	40	20	390	75	310	55	250	35	150	20	1100	180

**HM016 HMF16**

Cutting Conditions Parametry skrawania

**Uncoated - Side Cutiing** Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
	Hardness Twardość		~ 500N/mm2		~ HRC20 500 ~ 800N/mm2		HRC20 ~ HRC30 800 ~ 1000N/mm2		HRC30 ~ HRC40 1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	0,2	3	5600	60	4500	40	4000	35	2200	15	12000	180
3	0,3	4,5	3500	80	3200	60	2500	45	1600	20	11000	280
4	0,4	6	2800	105	2200	75	1800	50	1100	30	8000	330
5	0,5	7,5	2200	135	1800	95	1600	65	900	35	6300	350
6	0,6	9	1800	135	1600	110	1200	65	800	45	5600	350
8	0,8	12	1400	150	1100	120	900	80	560	50	4000	440
10	1	15	1100	150	900	120	800	90	450	50	3100	450
12	1,2	18	900	165	800	135	630	90	400	55	2500	430
14	1,4	21	800	165	700	120	560	90	350	55	2200	400
16	1,6	24	700	165	560	120	450	80	280	50	2000	400
18	1,8	27	630	150	500	120	400	80	250	50	1800	400
20	2	30	560	150	450	120	400	80	220	50	1600	360
22	2,2	33	500	150	450	120	350	80	220	50	1400	340
25	2,5	37,5	450	135	400	110	310	65	180	35	1200	320
28	2,8	42	400	120	350	95	280	60	160	30	1100	300
30	3	45	350	105	310	80	250	55	160	30	1100	300
32	3,2	48	350	105	280	75	220	50	140	30	1000	270
35	3,5	52,5	320	95	260	65	210	45	130	25	950	260
36	3,6	54	310	90	250	65	200	45	120	25	900	250
40	4	60	280	90	220	65	180	45	110	25	800	220

UGF

UFX

UFJ

UFD

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PMT

RB

CBN

HSS

ICT

# HM016 HMF16

## Coated TiAlN - Side Cutiing Pokryte TiAlN - Frezowanie boczne

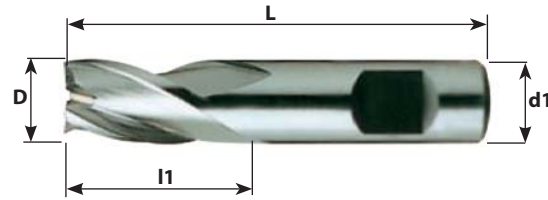
Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
Hardness Twardość					~ HRC20		HRc20 ~HRc30		HRc30 ~HRc40			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	0,2	3	7900	85	6300	55	5600	50	3100	20	16800	250
3	0,3	4,5	4900	110	4500	85	3500	60	2200	30	15400	390
4	0,4	6	3900	145	3100	105	2500	70	1500	40	11200	460
5	0,5	7,5	3100	190	2500	130	2200	90	1300	50	8800	490
6	0,6	9	2500	190	2200	155	1700	90	1100	60	7800	490
8	0,8	12	2000	210	1500	170	1300	110	780	70	5600	620
10	1	15	1500	210	1300	170	1100	125	630	70	4300	630
12	1,2	18	1300	230	1100	190	880	125	560	75	3500	600
14	1,4	21	1100	230	980	170	780	125	490	75	3100	560
16	1,6	24	980	230	780	170	630	110	390	70	2800	560
18	1,8	27	880	210	700	170	560	110	350	70	2500	560
20	2	30	780	210	630	170	560	110	310	70	2200	500
22	2,2	33	700	210	630	170	490	110	310	70	1950	480
25	2,5	37,5	630	190	560	155	430	90	250	50	1700	450
28	2,8	42	560	170	490	130	390	85	220	40	1500	420
30	3	45	490	145	430	110	350	75	220	40	1500	420
32	3,2	48	490	145	390	105	310	70	200	40	1400	380
35	3,5	52,5	450	130	360	95	290	65	180	35	1300	360
36	3,6	54	430	125	350	90	280	65	170	35	1250	350
40	4	60	390	125	310	90	250	65	150	35	1100	310



**HM053 HMF53**
**SQUARE TYPE WALCOWO-CZOŁOWE**

3 Flute, Short Length 3-ostrzowe, krótkie

<b>P</b>				<b>H</b>		<b>M</b>		<b>K</b>	<b>N</b>			<b>S</b>		
<750 N/mm <sup>2</sup>	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NICO 200-300 HB	Ti 200-410 GB
•	•								○	○			•	•



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM053010000B06002034	HMF53010000B06002034	1.0	6	34	2	3	B
HM053013000B06003034	HMF53013000B06003034	1.3	6	34	3	3	B
HM053015000B06003034	HMF53015000B06003034	1.5	6	34	3	3	B
HM053018000B06003034	HMF53018000B06003034	1.8	6	34	3	3	B
HM053020000B06004035	HMF53020000B06004035	2.0	6	35	4	3	B
HM053023000B06004035	HMF53023000B06004035	2.3	6	35	4	3	B
HM053025000B06005036	HMF53025000B06005036	2.5	6	36	5	3	B
HM053028000B06005036	HMF53028000B06005036	2.8	6	36	5	3	B
HM053030000B06005036	HMF53030000B06005036	3.0	6	36	5	3	B
HM053033000B06006037	HMF53033000B06006037	3.3	6	37	6	3	B
HM053035000B06006037	HMF53035000B06006037	3.5	6	37	6	3	B
HM053038000B06007038	HMF53038000B06007038	3.8	6	38	7	3	B
HM053040000B06007038	HMF53040000B06007038	4.0	6	38	7	3	B
HM053043000B06007038	HMF53043000B06007038	4.3	6	38	7	3	B
HM053045000B06007038	HMF53045000B06007038	4.5	6	38	7	3	B
HM053048000B06008039	HMF53048000B06008039	4.8	6	39	8	3	B
HM053050000B06008039	HMF53050000B06008039	5.0	6	39	8	3	B
HM053053000B06008039	HMF53053000B06008039	5.3	6	39	8	3	B
HM053055000B06008039	HMF53055000B06008039	5.5	6	39	8	3	B
HM053058000B06008039	HMF53058000B06008039	5.75	6	39	8	3	B
HM053060000B06008039	HMF53060000B06008039	6.0	6	39	8	3	B
HM053065000B08010042	HMF53065000B08010042	6.5	8	42	10	3	B
HM053070000B08010042	HMF53070000B08010042	7.0	8	42	10	3	B
HM053075000B08010042	HMF53075000B08010042	7.5	8	42	10	3	B
HM053080000B08011043	HMF53080000B08011043	8.0	8	43	11	3	B
HM053085000B10011048	HMF53085000B10011048	8.5	10	48	11	3	B
HM053090000B10011048	HMF53090000B10011048	9.0	10	48	11	3	B
HM053095000B10011048	HMF53095000B10011048	9.5	10	48	11	3	B
HM053100000B10013050	HMF53100000B10013050	10.0	10	50	13	3	B
HM053120000B12016058	HMF53120000B12016058	12.0	12	58	16	3	B
HM053160000B16019064	HMF53160000B16019064	16.0	16	64	19	3	B
HM053200000B20022078	HMF53200000B20022078	20.0	20	78	22	3	B

UGF

UFX

UFJ

UFD

UFA

UFC

PMT

RB

CBN

HSS

ICT

**HM053 HMF53**

Cutting Conditions Parametry skrawania

**Uncoated - Slotting** Bez pokrycia - Rowkowanie

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
	Hardness Twardość		~ 500N/mm2		~ HRC20 500 ~ 800N/mm2		HRC20 ~HRC30 800 ~ 1000N/mm2		HRC30 ~HRC40 1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	0,2	3	5600	60	4500	40	4000	35	2200	15	12000	180
3	0,3	4,5	3500	80	3200	60	2500	45	1600	20	11000	280
4	0,4	6	2800	105	2200	75	1800	50	1100	30	8000	330
5	0,5	7,5	2200	135	1800	95	1600	65	900	35	6300	350
6	0,6	9	1800	135	1600	110	1200	65	800	45	5600	350
8	0,8	12	1400	150	1100	120	900	80	560	50	4000	440
10	1	15	1100	150	900	120	800	90	450	50	3100	450
12	1,2	18	900	165	800	135	630	90	400	55	2500	430
14	1,4	21	800	165	700	120	560	90	350	55	2200	400
16	1,6	24	700	165	560	120	450	80	280	50	2000	400
18	1,8	27	630	150	500	120	400	80	250	50	1800	400
20	2	30	560	150	450	120	400	80	220	50	1600	360
22	2,2	33	500	150	450	120	350	80	220	50	1400	340
25	2,5	37,5	450	135	400	110	310	65	180	35	1200	320
28	2,8	42	400	120	350	95	280	60	160	30	1100	300
30	3	45	350	105	310	80	250	55	160	30	1100	300
32	3,2	48	350	105	280	75	220	50	140	30	1000	270
35	3,5	52,5	320	95	260	65	210	45	130	25	950	260
36	3,6	54	310	90	250	65	200	45	120	25	900	250
40	4	60	280	90	220	65	180	45	110	25	800	220

**HM053 HMF53**

Cutting Conditions Parametry skrawania

**Coated TiAlN - Slotting Pokryte TiAlN - Rowkowanie**

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
Hardness Twardość			~ 500N/mm2		~ HRC20 500 ~ 800N/mm2		HRC20 ~ HRC30 800 ~ 1000N/mm2		HRC30 ~ HRC40 1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2.0	2	1	7900	50	6300	35	5600	30	3100	15	16800	150
3.0	3	1,5	4900	70	4500	50	3500	35	2200	20	15400	240
4.0	4	2	3900	85	3100	60	2500	40	1500	30	11200	280
5.0	5	2,5	3100	110	2500	75	2200	55	1300	30	8800	290
6.0	6	3	2500	110	2200	90	1700	55	1100	35	7800	290
8.0	8	4	2000	125	1500	100	1300	70	780	40	5600	360
10.0	10	5	1500	125	1300	110	1100	75	630	40	4300	380
12.0	12	6	1300	140	1100	110	880	75	560	50	3500	360
14.0	14	7	1100	140	980	100	780	75	490	50	3100	340
16.0	16	8	980	140	780	100	630	70	390	40	2800	340
18.0	18	9	880	125	700	100	560	70	350	40	2500	340
20.0	20	10	780	125	630	100	560	70	310	40	2200	310
22.0	22	11	700	125	630	100	490	70	310	40	1950	280
25.0	25	12,5	630	110	560	90	430	55	250	30	1700	270
28.0	28	14	560	100	490	75	390	50	220	30	1500	250
30.0	30	15	490	85	430	70	350	40	220	30	1500	250
32.0	32	16	490	85	390	65	310	40	200	30	1400	225
35.0	35	17,5	450	80	360	60	290	35	180	25	1300	215
36.0	36	18	430	75	350	55	280	35	170	20	1250	210
40.0	40	20	390	75	310	55	250	35	150	20	1100	180

UGF

UFX

UFJ

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UFC

PMT

RB

CBN

HSS

ICT

**HM053 HMF53**

Cutting Conditions Parametry skrawania

**Uncoated - Side Cutiing** Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
	Hardness Twardość		~ 500N/mm2		~ HRC20 500 ~ 800N/mm2		HRC20 ~HRC30 800 ~ 1000N/mm2		HRC30 ~HRC40 1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	0,2	3	5600	60	4500	40	4000	35	2200	15	12000	180
3	0,3	4,5	3500	80	3200	60	2500	45	1600	20	11000	280
4	0,4	6	2800	105	2200	75	1800	50	1100	30	8000	330
5	0,5	7,5	2200	135	1800	95	1600	65	900	35	6300	350
6	0,6	9	1800	135	1600	110	1200	65	800	45	5600	350
8	0,8	12	1400	150	1100	120	900	80	560	50	4000	440
10	1	15	1100	150	900	120	800	90	450	50	3100	450
12	1,2	18	900	165	800	135	630	90	400	55	2500	430
14	1,4	21	800	165	700	120	560	90	350	55	2200	400
16	1,6	24	700	165	560	120	450	80	280	50	2000	400
18	1,8	27	630	150	500	120	400	80	250	50	1800	400
20	2	30	560	150	450	120	400	80	220	50	1600	360
22	2,2	33	500	150	450	120	350	80	220	50	1400	340
25	2,5	37,5	450	135	400	110	310	65	180	35	1200	320
28	2,8	42	400	120	350	95	280	60	160	30	1100	300
30	3	45	350	105	310	80	250	55	160	30	1100	300
32	3,2	48	350	105	280	75	220	50	140	30	1000	270
35	3,5	52,5	320	95	260	65	210	45	130	25	950	260
36	3,6	54	310	90	250	65	200	45	120	25	900	250
40	4	60	280	90	220	65	180	45	110	25	800	220

## HM053 HMF53

### Coated TiAlN - Side Cutiing Pokryte TiAlN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
	Hardness Twardość		~ 500N/mm2		~ HRC20 500 ~ 800N/mm2		HRC20 ~HRC30 800 ~ 1000N/mm2		HRC30 ~HRC40 1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	0,2	3	7900	85	6300	55	5600	50	3100	20	16800	250
3	0,3	4,5	4900	110	4500	85	3500	60	2200	30	15400	390
4	0,4	6	3900	145	3100	105	2500	70	1500	40	11200	460
5	0,5	7,5	3100	190	2500	130	2200	90	1300	50	8800	490
6	0,6	9	2500	190	2200	155	1700	90	1100	60	7800	490
8	0,8	12	2000	210	1500	170	1300	110	780	70	5600	620
10	1	15	1500	210	1300	170	1100	125	630	70	4300	630
12	1,2	18	1300	230	1100	190	880	125	560	75	3500	600
14	1,4	21	1100	230	980	170	780	125	490	75	3100	560
16	1,6	24	980	230	780	170	630	110	390	70	2800	560
18	1,8	27	880	210	700	170	560	110	350	70	2500	560
20	2	30	780	210	630	170	560	110	310	70	2200	500
22	2,2	33	700	210	630	170	490	110	310	70	1950	480
25	2,5	37,5	630	190	560	155	430	90	250	50	1700	450
28	2,8	42	560	170	490	130	390	85	220	40	1500	420
30	3	45	490	145	430	110	350	75	220	40	1500	420
32	3,2	48	490	145	390	105	310	70	200	40	1400	380
35	3,5	52,5	450	130	360	95	290	65	180	35	1300	360
36	3,6	54	430	125	350	90	280	65	170	35	1250	350
40	4	60	390	125	310	90	250	65	150	35	1100	310

UGF

UFX

UFJ

UFD

UFA

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PMT

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CBN

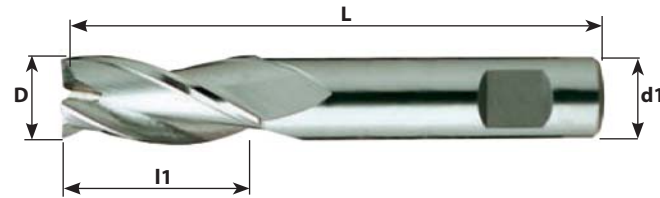
HSS

ICT

**HM054 HMF54**
**SQUARE TYPE WALCOWO-CZOŁOWE**

3 Flute, Short Length 3-ostrzowe, krótkie

					<b>HSS</b> Co 8%									<b>AIR</b>
<b>P</b>				<b>H</b>		<b>M</b>		<b>K</b>	<b>N</b>			<b>S</b>		
<750 N/mm <sup>2</sup>	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NICO 200-300 HB	Ti 200-410 GB
•	•								○	○				



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM054015000B06004035	HMF54015000B06004035	1.5	6	35	4	3	B
HM054020000B06007038	HMF54020000B06007038	2.0	6	38	7	3	B
HM054025000B06008039	HMF54025000B06008039	2.5	6	39	8	3	B
HM054030000B06008039	HMF54030000B06008039	3.0	6	39	8	3	B
HM054035000B06010041	HMF54035000B06010041	3.5	6	41	10	3	B
HM054040000B06011042	HMF54040000B06011042	4.0	6	42	11	3	B
HM054045000B060X2042	HMF54045000B060X2042	4.5	6	42	11	3	B
HM054050000B06013044	HMF54050000B06013044	5.0	6	44	13	3	B
HM054055000B06013044	HMF54055000B06013044	5.5	6	44	13	3	B
HM054060000B06013044	HMF54060000B06013044	6.0	6	44	13	3	B
HM054065000B08016048	HMF54065000B08016048	6.5	8	48	16	3	B
HM054070000B08016048	HMF54070000B08016048	7.0	8	48	16	3	B
HM054075000B08016048	HMF54075000B08016048	7.5	8	48	16	3	B
HM054080000B08019051	HMF54080000B08019051	8.0	8	51	19	3	B
HM054085000B10019056	HMF54085000B10019056	8.5	10	56	19	3	B
HM054090000B10019056	HMF54090000B10019056	9.0	10	56	19	3	B
HM054095000B10019056	HMF54095000B10019056	9.5	10	56	19	3	B
HM054100000B10022059	HMF54100000B10022059	10.0	10	59	22	3	B

	d1 ≤ 3,0	0 — -6	d1 ≤ 18	0 — -11
	d1 ≤ 6,0	0 — -8	d1 ≤ 30	0 — -13
	d1 ≤ 10	0 — -9	d1 ≤ 50	0 — -16

**HM054 HMF54**

Cutting Conditions Parametry skrawania

**Uncoated - Slotting** Bez pokrycia - Rowkowanie

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
	Hardness Twardość		~ 500N/mm2		~ HRC20 500 ~ 800N/mm2		HRC20 ~ HRC30 800 ~ 1000N/mm2		HRC30 ~ HRC40 1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	0,2	3	5600	60	4500	40	4000	35	2200	15	12000	180
3	0,3	4,5	3500	80	3200	60	2500	45	1600	20	11000	280
4	0,4	6	2800	105	2200	75	1800	50	1100	30	8000	330
5	0,5	7,5	2200	135	1800	95	1600	65	900	35	6300	350
6	0,6	9	1800	135	1600	110	1200	65	800	45	5600	350
8	0,8	12	1400	150	1100	120	900	80	560	50	4000	440
10	1	15	1100	150	900	120	800	90	450	50	3100	450
12	1,2	18	900	165	800	135	630	90	400	55	2500	430
14	1,4	21	800	165	700	120	560	90	350	55	2200	400
16	1,6	24	700	165	560	120	450	80	280	50	2000	400
18	1,8	27	630	150	500	120	400	80	250	50	1800	400
20	2	30	560	150	450	120	400	80	220	50	1600	360
22	2,2	33	500	150	450	120	350	80	220	50	1400	340
25	2,5	37,5	450	135	400	110	310	65	180	35	1200	320
28	2,8	42	400	120	350	95	280	60	160	30	1100	300
30	3	45	350	105	310	80	250	55	160	30	1100	300
32	3,2	48	350	105	280	75	220	50	140	30	1000	270
35	3,5	52,5	320	95	260	65	210	45	130	25	950	260
36	3,6	54	310	90	250	65	200	45	120	25	900	250
40	4	60	280	90	220	65	180	45	110	25	800	220

UGF

UFX

UFJ

UFD

UFA

UFC

PMT

RB

CBN

HSS

ICT

# HM054 HMF54

## Coated TiAlN - Slotting Pokryte TiAlN - Rowkowanie

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
Hardness Twardość												
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2.0	2	1	7900	50	6300	35	5600	30	3100	15	16800	150
3.0	3	1,5	4900	70	4500	50	3500	35	2200	20	15400	240
4.0	4	2	3900	85	3100	60	2500	40	1500	30	11200	280
5.0	5	2,5	3100	110	2500	75	2200	55	1300	30	8800	290
6.0	6	3	2500	110	2200	90	1700	55	1100	35	7800	290
8.0	8	4	2000	125	1500	100	1300	70	780	40	5600	360
10.0	10	5	1500	125	1300	110	1100	75	630	40	4300	380
12.0	12	6	1300	140	1100	110	880	75	560	50	3500	360
14.0	14	7	1100	140	980	100	780	75	490	50	3100	340
16.0	16	8	980	140	780	100	630	70	390	40	2800	340
18.0	18	9	880	125	700	100	560	70	350	40	2500	340
20.0	20	10	780	125	630	100	560	70	310	40	2200	310
22.0	22	11	700	125	630	100	490	70	310	40	1950	280
25.0	25	12,5	630	110	560	90	430	55	250	30	1700	270
28.0	28	14	560	100	490	75	390	50	220	30	1500	250
30.0	30	15	490	85	430	70	350	40	220	30	1500	250
32.0	32	16	490	85	390	65	310	40	200	30	1400	225
35.0	35	17,5	450	80	360	60	290	35	180	25	1300	215
36.0	36	18	430	75	350	55	280	35	170	20	1250	210
40.0	40	20	390	75	310	55	250	35	150	20	1100	180



**HM054 HMF54**

Cutting Conditions Parametry skrawania

**Uncoated - Side Cutiing** Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
	Hardness Twardość		~ 500N/mm2		~ HRC20 500 ~ 800N/mm2		HRC20 ~HRC30 800 ~ 1000N/mm2		HRC30 ~HRC40 1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	0,2	3	5600	60	4500	40	4000	35	2200	15	12000	180
3	0,3	4,5	3500	80	3200	60	2500	45	1600	20	11000	280
4	0,4	6	2800	105	2200	75	1800	50	1100	30	8000	330
5	0,5	7,5	2200	135	1800	95	1600	65	900	35	6300	350
6	0,6	9	1800	135	1600	110	1200	65	800	45	5600	350
8	0,8	12	1400	150	1100	120	900	80	560	50	4000	440
10	1	15	1100	150	900	120	800	90	450	50	3100	450
12	1,2	18	900	165	800	135	630	90	400	55	2500	430
14	1,4	21	800	165	700	120	560	90	350	55	2200	400
16	1,6	24	700	165	560	120	450	80	280	50	2000	400
18	1,8	27	630	150	500	120	400	80	250	50	1800	400
20	2	30	560	150	450	120	400	80	220	50	1600	360
22	2,2	33	500	150	450	120	350	80	220	50	1400	340
25	2,5	37,5	450	135	400	110	310	65	180	35	1200	320
28	2,8	42	400	120	350	95	280	60	160	30	1100	300
30	3	45	350	105	310	80	250	55	160	30	1100	300
32	3,2	48	350	105	280	75	220	50	140	30	1000	270
35	3,5	52,5	320	95	260	65	210	45	130	25	950	260
36	3,6	54	310	90	250	65	200	45	120	25	900	250
40	4	60	280	90	220	65	180	45	110	25	800	220

UGF

UFX

UFJ

UFD

UFA

UFC

PMT

RB

CBN

HSS

ICT

# HM054 HMF54

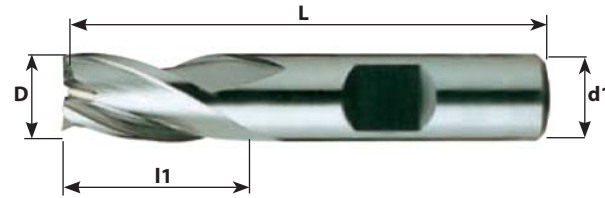
## Coated TiAlN - Side Cutiing Pokryte TiAlN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
	Hardness Twardość		~ 500N/mm2		~ HRC20 500 ~ 800N/mm2		HRC20 ~HRC30 800 ~ 1000N/mm2		HRC30 ~HRC40 1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	0,2	3	7900	85	6300	55	5600	50	3100	20	16800	250
3	0,3	4,5	4900	110	4500	85	3500	60	2200	30	15400	390
4	0,4	6	3900	145	3100	105	2500	70	1500	40	11200	460
5	0,5	7,5	3100	190	2500	130	2200	90	1300	50	8800	490
6	0,6	9	2500	190	2200	155	1700	90	1100	60	7800	490
8	0,8	12	2000	210	1500	170	1300	110	780	70	5600	620
10	1	15	1500	210	1300	170	1100	125	630	70	4300	630
12	1,2	18	1300	230	1100	190	880	125	560	75	3500	600
14	1,4	21	1100	230	980	170	780	125	490	75	3100	560
16	1,6	24	980	230	780	170	630	110	390	70	2800	560
18	1,8	27	880	210	700	170	560	110	350	70	2500	560
20	2	30	780	210	630	170	560	110	310	70	2200	500
22	2,2	33	700	210	630	170	490	110	310	70	1950	480
25	2,5	37,5	630	190	560	155	430	90	250	50	1700	450
28	2,8	42	560	170	490	130	390	85	220	40	1500	420
30	3	45	490	145	430	110	350	75	220	40	1500	420
32	3,2	48	490	145	390	105	310	70	200	40	1400	380
35	3,5	52,5	450	130	360	95	290	65	180	35	1300	360
36	3,6	54	430	125	350	90	280	65	170	35	1250	350
40	4	60	390	125	310	90	250	65	150	35	1100	310

**HM051 HMF51**
**SQUARE TYPE WALCOWO-CZOŁOWE**

3 Flute, Short Length 3-ostrzowe, krótkie

						<b>HSS</b> Co 8%									<b>AIR</b>
<b>P</b>				<b>H</b>		<b>M</b>		<b>K</b>	<b>N</b>				<b>S</b>		
<750 N/mm <sup>2</sup>	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NICO 200-300 HB	Ti 200-410 GB	
•	•								○	○					



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM051010000B06002025	HMF51010000B06002025	1.0	6	24.5	2	3	B
HM051015000B06003025	HMF51015000B06003025	1.5	6	24.5	2.5	3	B
HM051020000B06003026	HMF51020000B06003026	2.0	6	25.5	3	3	B
HM051025000B06004026	HMF51025000B06004026	2.5	6	26	4	3	B
HM051028000B06005028	HMF51028000B06005028	2.8	6	28	4.5	3	B
HM051030000B06005028	HMF51030000B06005028	3.0	6	28	4.5	3	B
HM051035000B06006030	HMF51035000B06006030	3.5	6	30	5.5	3	B
HM051038000B06007033	HMF51038000B06007033	3.8	6	32.5	6.5	3	B
HM051040000B06007033	HMF51040000B06007033	4.0	6	32.5	6.5	3	B
HM051045000B06007035	HMF51045000B06007035	4.5	6	34.5	7	3	B
HM051048000B06008036	HMF51048000B06008036	4.8	6	36	7.5	3	B
HM051050000B06008036	HMF51050000B06008036	5.0	6	36	7.5	3	B
HM051055000B06009036	HMF51055000B06009036	5.5	6	36	8.5	3	B
HM051058000B06010036	HMF51058000B06010036	5.75	6	36	9.5	3	B
HM051060000B06010036	HMF51060000B06010036	6.0	6	36	9.5	3	B
HM051075000B10011048	HMF51075000B10011048	7.5	10	47.5	11	3	B
HM051080000B10011048	HMF51080000B10011048	8.0	10	47.5	11	3	B
HM051095000B10013052	HMF51095000B10013052	9.5	10	51.5	13	3	B
HM051100000B10013052	HMF51100000B10013052	10.0	10	51.5	13	3	B

	d1 ≤ 3,0	0 — -6	d1 ≤ 18	0 — -11
	d1 ≤ 6,0	0 — -8	d1 ≤ 30	0 — -13
	d1 ≤ 10	0 — -9	d1 ≤ 50	0 — -16

**HM051 HMF51**

Cutting Conditions Parametry skrawania

**Uncoated - Slotting Bez pokrycia - Rowkowanie**

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
Hardness Twardość					~ HRC20		HRC20 ~HRC30		HRC30 ~HRC40			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	0,2	3	5600	60	4500	40	4000	35	2200	15	12000	180
3	0,3	4,5	3500	80	3200	60	2500	45	1600	20	11000	280
4	0,4	6	2800	105	2200	75	1800	50	1100	30	8000	330
5	0,5	7,5	2200	135	1800	95	1600	65	900	35	6300	350
6	0,6	9	1800	135	1600	110	1200	65	800	45	5600	350
8	0,8	12	1400	150	1100	120	900	80	560	50	4000	440
10	1	15	1100	150	900	120	800	90	450	50	3100	450
12	1,2	18	900	165	800	135	630	90	400	55	2500	430
14	1,4	21	800	165	700	120	560	90	350	55	2200	400
16	1,6	24	700	165	560	120	450	80	280	50	2000	400
18	1,8	27	630	150	500	120	400	80	250	50	1800	400
20	2	30	560	150	450	120	400	80	220	50	1600	360
22	2,2	33	500	150	450	120	350	80	220	50	1400	340
25	2,5	37,5	450	135	400	110	310	65	180	35	1200	320
28	2,8	42	400	120	350	95	280	60	160	30	1100	300
30	3	45	350	105	310	80	250	55	160	30	1100	300
32	3,2	48	350	105	280	75	220	50	140	30	1000	270
35	3,5	52,5	320	95	260	65	210	45	130	25	950	260
36	3,6	54	310	90	250	65	200	45	120	25	900	250
40	4	60	280	90	220	65	180	45	110	25	800	220

**HM051 HMF51**

Cutting Conditions Parametry skrawania

**Coated TiAlN - Slotting Pokryte TiAlN - Rowkowanie**

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
	Hardness Twardość		~ 500N/mm2		~ HRC20 500 ~ 800N/mm2		HRC20 ~HRC30 800 ~ 1000N/mm2		HRC30 ~HRC40 1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2.0	2	1	7900	50	6300	35	5600	30	3100	15	16800	150
3.0	3	1,5	4900	70	4500	50	3500	35	2200	20	15400	240
4.0	4	2	3900	85	3100	60	2500	40	1500	30	11200	280
5.0	5	2,5	3100	110	2500	75	2200	55	1300	30	8800	290
6.0	6	3	2500	110	2200	90	1700	55	1100	35	7800	290
8.0	8	4	2000	125	1500	100	1300	70	780	40	5600	360
10.0	10	5	1500	125	1300	110	1100	75	630	40	4300	380
12.0	12	6	1300	140	1100	110	880	75	560	50	3500	360
14.0	14	7	1100	140	980	100	780	75	490	50	3100	340
16.0	16	8	980	140	780	100	630	70	390	40	2800	340
18.0	18	9	880	125	700	100	560	70	350	40	2500	340
20.0	20	10	780	125	630	100	560	70	310	40	2200	310
22.0	22	11	700	125	630	100	490	70	310	40	1950	280
25.0	25	12,5	630	110	560	90	430	55	250	30	1700	270
28.0	28	14	560	100	490	75	390	50	220	30	1500	250
30.0	30	15	490	85	430	70	350	40	220	30	1500	250
32.0	32	16	490	85	390	65	310	40	200	30	1400	225
35.0	35	17,5	450	80	360	60	290	35	180	25	1300	215
36.0	36	18	430	75	350	55	280	35	170	20	1250	210
40.0	40	20	390	75	310	55	250	35	150	20	1100	180

UGF

UFX

UFJ

UFD

UFA

UFC

PMT

RB

CBN

HSS

ICT

**HM051 HMF51**

Cutting Conditions Parametry skrawania

**Uncoated - Side Cutiing** Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		~ HRC20 500 ~ 800N/mm2		HRC20 ~HRC30 800 ~ 1000N/mm2		HRC30 ~HRC40 1000 ~ 1300N/mm2			
Hardness Twardość												
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	0,2	3	5600	60	4500	40	4000	35	2200	15	12000	180
3	0,3	4,5	3500	80	3200	60	2500	45	1600	20	11000	280
4	0,4	6	2800	105	2200	75	1800	50	1100	30	8000	330
5	0,5	7,5	2200	135	1800	95	1600	65	900	35	6300	350
6	0,6	9	1800	135	1600	110	1200	65	800	45	5600	350
8	0,8	12	1400	150	1100	120	900	80	560	50	4000	440
10	1	15	1100	150	900	120	800	90	450	50	3100	450
12	1,2	18	900	165	800	135	630	90	400	55	2500	430
14	1,4	21	800	165	700	120	560	90	350	55	2200	400
16	1,6	24	700	165	560	120	450	80	280	50	2000	400
18	1,8	27	630	150	500	120	400	80	250	50	1800	400
20	2	30	560	150	450	120	400	80	220	50	1600	360
22	2,2	33	500	150	450	120	350	80	220	50	1400	340
25	2,5	37,5	450	135	400	110	310	65	180	35	1200	320
28	2,8	42	400	120	350	95	280	60	160	30	1100	300
30	3	45	350	105	310	80	250	55	160	30	1100	300
32	3,2	48	350	105	280	75	220	50	140	30	1000	270
35	3,5	52,5	320	95	260	65	210	45	130	25	950	260
36	3,6	54	310	90	250	65	200	45	120	25	900	250
40	4	60	280	90	220	65	180	45	110	25	800	220

## HM051 HMF51

### Coated TiAlN - Side Cutting Pokryte TiAlN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
	Hardness Twardość		~ 500N/mm2		~ HRC20 500 ~ 800N/mm2		HRC20 ~HRC30 800 ~ 1000N/mm2		HRC30 ~HRC40 1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	0,2	3	7900	85	6300	55	5600	50	3100	20	16800	250
3	0,3	4,5	4900	110	4500	85	3500	60	2200	30	15400	390
4	0,4	6	3900	145	3100	105	2500	70	1500	40	11200	460
5	0,5	7,5	3100	190	2500	130	2200	90	1300	50	8800	490
6	0,6	9	2500	190	2200	155	1700	90	1100	60	7800	490
8	0,8	12	2000	210	1500	170	1300	110	780	70	5600	620
10	1	15	1500	210	1300	170	1100	125	630	70	4300	630
12	1,2	18	1300	230	1100	190	880	125	560	75	3500	600
14	1,4	21	1100	230	980	170	780	125	490	75	3100	560
16	1,6	24	980	230	780	170	630	110	390	70	2800	560
18	1,8	27	880	210	700	170	560	110	350	70	2500	560
20	2	30	780	210	630	170	560	110	310	70	2200	500
22	2,2	33	700	210	630	170	490	110	310	70	1950	480
25	2,5	37,5	630	190	560	155	430	90	250	50	1700	450
28	2,8	42	560	170	490	130	390	85	220	40	1500	420
30	3	45	490	145	430	110	350	75	220	40	1500	420
32	3,2	48	490	145	390	105	310	70	200	40	1400	380
35	3,5	52,5	450	130	360	95	290	65	180	35	1300	360
36	3,6	54	430	125	350	90	280	65	170	35	1250	350
40	4	60	390	125	310	90	250	65	150	35	1100	310

UGF

UFX

UFJ

UFD

UFA

UFC

PMT

RB

CBN

HSS

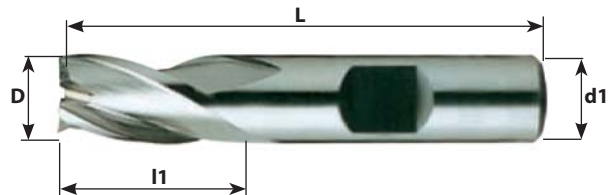
ICT

# HM052 HMF52

## SQUARE TYPE WALCOWO-CZOŁOWE

3 Flute, Long Length 3-ostrzowe, długie

						<b>HSS</b> Co 8%										
<b>P</b>				<b>H</b>		<b>M</b>		<b>K</b>	<b>N</b>				<b>S</b>			
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NICO 200-300 HB	Ti 200-410 GB		
•	•								○	○						



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM052015000B06004028	HMF52015000B06004028	1.5	6	28	4	3	B
HM052020000B06005029	HMF52020000B06005029	2.0	6	29	4.5	3	B
HM052025000B06007032	HMF52025000B06007032	2.5	6	32	6.5	3	B
HM052030000B06008034	HMF52030000B06008034	3.0	6	34	7.5	3	B
HM052035000B06009037	HMF52035000B06009037	3.5	6	36.5	8.5	3	B
HM052040000B06010039	HMF52040000B06010039	4.0	6	39	9.5	3	B
HM052045000B060X1042	HMF52045000B060X1042	4.5	6	42	11	3	B
HM052050000B06013045	HMF52050000B06013045	5.0	6	44.5	12.5	3	B
HM052055000B06015046	HMF52055000B06015046	5.5	6	46	14.5	3	B
HM052060000B06016045	HMF52060000B06016045	6.0	6	44.5	16	3	B
HM052080000B10019056	HMF52080000B10019056	8.0	10	55.5	19	3	B
HM052090000B10023061	HMF52090000B10023061	9.0	10	61	22.5	3	B
HM052100000B10023061	HMF52100000B10023061	10.0	10	61	22.5	3	B

	d1 ≤ 3,0	0 — -6	d1 ≤ 18	0 — -11
	d1 ≤ 6,0	0 — -8	d1 ≤ 30	0 — -13
	d1 ≤ 10	0 — -9	d1 ≤ 50	0 — -16



**HM052 HMF52**

Cutting Conditions Parametry skrawania

**Uncoated - Slotting** Bez pokrycia - Rowkowanie

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
	Hardness Twardość		~ 500N/mm2		~ HRC20 500 ~ 800N/mm2		HRC20 ~HRC30 800 ~ 1000N/mm2		HRC30 ~HRC40 1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	0,2	3	5600	60	4500	40	4000	35	2200	15	12000	180
3	0,3	4,5	3500	80	3200	60	2500	45	1600	20	11000	280
4	0,4	6	2800	105	2200	75	1800	50	1100	30	8000	330
5	0,5	7,5	2200	135	1800	95	1600	65	900	35	6300	350
6	0,6	9	1800	135	1600	110	1200	65	800	45	5600	350
8	0,8	12	1400	150	1100	120	900	80	560	50	4000	440
10	1	15	1100	150	900	120	800	90	450	50	3100	450
12	1,2	18	900	165	800	135	630	90	400	55	2500	430
14	1,4	21	800	165	700	120	560	90	350	55	2200	400
16	1,6	24	700	165	560	120	450	80	280	50	2000	400
18	1,8	27	630	150	500	120	400	80	250	50	1800	400
20	2	30	560	150	450	120	400	80	220	50	1600	360
22	2,2	33	500	150	450	120	350	80	220	50	1400	340
25	2,5	37,5	450	135	400	110	310	65	180	35	1200	320
28	2,8	42	400	120	350	95	280	60	160	30	1100	300
30	3	45	350	105	310	80	250	55	160	30	1100	300
32	3,2	48	350	105	280	75	220	50	140	30	1000	270
35	3,5	52,5	320	95	260	65	210	45	130	25	950	260
36	3,6	54	310	90	250	65	200	45	120	25	900	250
40	4	60	280	90	220	65	180	45	110	25	800	220

UGF

UFX

UFJ

UFD

UFA

UFC

PMT

RB

CBN

HSS

ICT

**HM052 HMF52**

Cutting Conditions Parametry skrawania

**Coated TiAlN - Slotting** Pokryte TiAlN - Rowkowanie С покрытием TiAlN - Обработка канавок

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
	Hardness Twardość		~ 500N/mm2		~ HRC20 500 ~ 800N/mm2		HRC20 ~ HRC30 800 ~ 1000N/mm2		HRC30 ~ HRC40 1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2.0	2	1	7900	50	6300	35	5600	30	3100	15	16800	150
3.0	3	1,5	4900	70	4500	50	3500	35	2200	20	15400	240
4.0	4	2	3900	85	3100	60	2500	40	1500	30	11200	280
5.0	5	2,5	3100	110	2500	75	2200	55	1300	30	8800	290
6.0	6	3	2500	110	2200	90	1700	55	1100	35	7800	290
8.0	8	4	2000	125	1500	100	1300	70	780	40	5600	360
10.0	10	5	1500	125	1300	110	1100	75	630	40	4300	380
12.0	12	6	1300	140	1100	110	880	75	560	50	3500	360
14.0	14	7	1100	140	980	100	780	75	490	50	3100	340
16.0	16	8	980	140	780	100	630	70	390	40	2800	340
18.0	18	9	880	125	700	100	560	70	350	40	2500	340
20.0	20	10	780	125	630	100	560	70	310	40	2200	310
22.0	22	11	700	125	630	100	490	70	310	40	1950	280
25.0	25	12,5	630	110	560	90	430	55	250	30	1700	270
28.0	28	14	560	100	490	75	390	50	220	30	1500	250
30.0	30	15	490	85	430	70	350	40	220	30	1500	250
32.0	32	16	490	85	390	65	310	40	200	30	1400	225
35.0	35	17,5	450	80	360	60	290	35	180	25	1300	215
36.0	36	18	430	75	350	55	280	35	170	20	1250	210
40.0	40	20	390	75	310	55	250	35	150	20	1100	180

**HM052 HMF52**

Cutting Conditions Parametry skrawania

**Uncoated - Side Cutiing** Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
	Hardness Twardość		~ 500N/mm2		~ HRC20 500 ~ 800N/mm2		HRC20 ~HRC30 800 ~ 1000N/mm2		HRC30 ~HRC40 1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	0,2	3	5600	60	4500	40	4000	35	2200	15	12000	180
3	0,3	4,5	3500	80	3200	60	2500	45	1600	20	11000	280
4	0,4	6	2800	105	2200	75	1800	50	1100	30	8000	330
5	0,5	7,5	2200	135	1800	95	1600	65	900	35	6300	350
6	0,6	9	1800	135	1600	110	1200	65	800	45	5600	350
8	0,8	12	1400	150	1100	120	900	80	560	50	4000	440
10	1	15	1100	150	900	120	800	90	450	50	3100	450
12	1,2	18	900	165	800	135	630	90	400	55	2500	430
14	1,4	21	800	165	700	120	560	90	350	55	2200	400
16	1,6	24	700	165	560	120	450	80	280	50	2000	400
18	1,8	27	630	150	500	120	400	80	250	50	1800	400
20	2	30	560	150	450	120	400	80	220	50	1600	360
22	2,2	33	500	150	450	120	350	80	220	50	1400	340
25	2,5	37,5	450	135	400	110	310	65	180	35	1200	320
28	2,8	42	400	120	350	95	280	60	160	30	1100	300
30	3	45	350	105	310	80	250	55	160	30	1100	300
32	3,2	48	350	105	280	75	220	50	140	30	1000	270
35	3,5	52,5	320	95	260	65	210	45	130	25	950	260
36	3,6	54	310	90	250	65	200	45	120	25	900	250
40	4	60	280	90	220	65	180	45	110	25	800	220

UGF

UFX

UFJ

UFD

UFA

UFC

PMT

RB

CBN

HSS

ICT

**HM052 HMF52**

Cutting Conditions Parametry skrawania

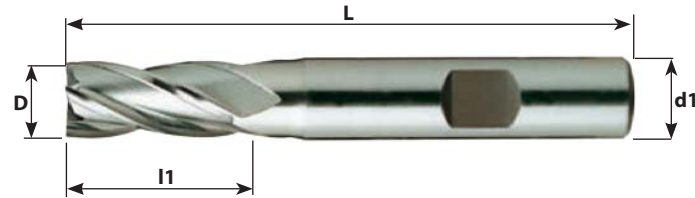
**Coated TiAlN - Side Cutiing Pokryte TiAlN - Frezowanie boczne**

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
Hardness Twardość					~ HRC20		HRc20 ~HRc30		HRc30 ~HRc40			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2	0,2	3	7900	85	6300	55	5600	50	3100	20	16800	250
3	0,3	4,5	4900	110	4500	85	3500	60	2200	30	15400	390
4	0,4	6	3900	145	3100	105	2500	70	1500	40	11200	460
5	0,5	7,5	3100	190	2500	130	2200	90	1300	50	8800	490
6	0,6	9	2500	190	2200	155	1700	90	1100	60	7800	490
8	0,8	12	2000	210	1500	170	1300	110	780	70	5600	620
10	1	15	1500	210	1300	170	1100	125	630	70	4300	630
12	1,2	18	1300	230	1100	190	880	125	560	75	3500	600
14	1,4	21	1100	230	980	170	780	125	490	75	3100	560
16	1,6	24	980	230	780	170	630	110	390	70	2800	560
18	1,8	27	880	210	700	170	560	110	350	70	2500	560
20	2	30	780	210	630	170	560	110	310	70	2200	500
22	2,2	33	700	210	630	170	490	110	310	70	1950	480
25	2,5	37,5	630	190	560	155	430	90	250	50	1700	450
28	2,8	42	560	170	490	130	390	85	220	40	1500	420
30	3	45	490	145	430	110	350	75	220	40	1500	420
32	3,2	48	490	145	390	105	310	70	200	40	1400	380
35	3,5	52,5	450	130	360	95	290	65	180	35	1300	360
36	3,6	54	430	125	350	90	280	65	170	35	1250	350
40	4	60	390	125	310	90	250	65	150	35	1100	310

**HM074 HMF74 HM075 HMF75**
**SQUARE TYPE WALCOWO-CZOŁOWE**

4-6 Flute, Short Length 4-6-ostrzowe, krótkie

<b>P</b>		<b>H</b>		<b>M</b>		<b>K</b>	<b>N</b>		<b>S</b>					
<750 N/mm <sup>2</sup>	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NICO 200-300 HB	Ti 200-410 GB



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM074020000B06007051	HMF74020000B06007051	2.0	6	51	7	4	B
HM074025000B06008052	HMF74025000B06008052	2.5	6	52	8	4	B
HM074030000B06008052	HMF74030000B06008052	3.0	6	52	8	4	B
HM074035000B06010054	HMF74035000B06010054	3.5	6	54	10	4	B
HM074040000B06011055	HMF74040000B06011055	4.0	6	55	11	4	B
HM074050000B06013057	HMF74050000B06013057	5.0	6	57	13	4	B
HM074060000B06013057	HMF74060000B06013057	6.0	6	57	13	4	B
HM074070000B10016066	HMF74070000B10016066	7.0	10	66	16	4	B
HM074080000B10019069	HMF74080000B10019069	8.0	10	69	19	4	B
HM074090000B10019069	HMF74090000B10019069	9.0	10	69	19	4	B
HM074100000B10022072	HMF74100000B10022072	10.0	10	72	22	4	B
HM074110000B12022079	HMF74110000B12022079	11.0	12	79	22	4	B
HM074120000B12026083	HMF74120000B12026083	12.0	12	83	26	4	B
HM074130000B12026083	HMF74130000B12026083	13.0	12	83	26	4	B
HM074140000B12026083	HMF74140000B12026083	14.0	12	83	26	4	B
HM074150000B12026083	HMF74150000B12026083	15.0	12	83	26	4	B
HM074160000B16032092	HMF74160000B16032092	16.0	16	92	32	4	B
HM074170000B16032092	HMF74170000B16032092	17.0	16	92	32	4	B
HM074180000B16032092	HMF74180000B16032092	18.0	16	92	32	4	B
HM074190000B16032092	HMF74190000B16032092	19.0	16	92	32	4	B
HM074200000B20038104	HMF74200000B20038104	20.0	20	104	38	4	B
HM075210000B20038104	HMF75210000B20038104	21.0	20	104	38	6	B
HM075220000B20038104	HMF75220000B20038104	22.0	20	104	38	6	B
HM075230000B20038104	HMF75230000B20038104	23.0	20	104	38	6	B
HM075240000B25045121	HMF75240000B25045121	24.0	25	121	45	6	B
HM075250000B25045121	HMF75250000B25045121	25.0	25	121	45	6	B
HM075260000B25045121	HMF75260000B25045121	26.0	25	121	45	6	B
HM075280000B25045121	HMF75280000B25045121	28.0	25	121	45	6	B
HM075300000B25045121	HMF75300000B25045121	30.0	25	121	45	6	B
HM075320000B32053133	HMF75320000B32053133	32.0	32	133	53	6	B
HM075340000B32053133	HMF75340000B32053133	34.0	32	133	53	6	B
HM075350000B32053133	HMF75350000B32053133	35.0	32	133	53	6	B
HM075360000B32053133	HMF75360000B32053133	36.0	32	133	53	6	B
HM075400000B32063143	HMF75400000B32063143	40.0	32	143	63	6	B

	d1 h6			
	D 0~+0.04			

**HM074 HMF74 HM075 HMF75**

Cutting Conditions Parametry skrawania

**Uncoated - Side Cutiing** Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
Hardness Twardość					~ HRC20		HRc20 ~HRc30		HRc30 ~HRc40			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2.0	0,2	3	5600	80	4500	55	4000	45	2200	20	12000	240
3.0	0,3	4,5	3500	110	3200	80	2500	60	1600	30	11000	380
4.0	0,4	6	2800	140	2200	100	1800	65	1100	45	8000	440
5.0	0,5	7,5	2200	180	1800	125	1600	90	900	50	6300	470
6.0	0,6	9	1800	180	1600	145	1200	90	800	60	5600	470
8.0	0,8	12	1400	200	1100	160	900	105	560	65	4000	580
10.0	1	15	1100	200	900	160	800	120	450	65	3100	600
12.0	1,2	18	900	220	800	180	630	120	400	75	2500	570
14.0	1,4	21	800	220	700	160	560	120	350	75	2200	530
16.0	1,6	24	700	220	560	160	450	105	280	65	2000	530
18.0	1,8	27	630	200	500	160	400	105	250	65	1800	530
20.0	2	30	560	200	450	160	400	105	220	65	1600	480
22.0	2,2	33	500	200	450	160	350	105	220	65	1400	450
25.0	2,5	37,5	450	180	400	145	310	90	180	50	1200	420
28.0	2,8	42	400	160	350	125	280	80	160	45	1100	400
30.0	3	45	350	140	310	110	250	75	160	45	1100	400
32.0	3,2	48	350	140	280	100	220	65	140	45	1000	360
36.0	3,6	54	310	120	250	90	200	60	120	35	900	330
40.0	4	60	280	120	220	90	180	60	110	35	800	300

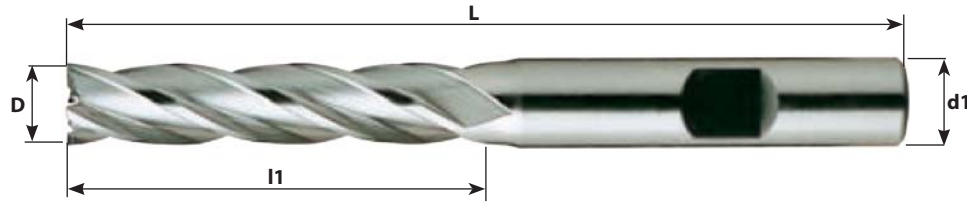
**Coated TiAlN - Side Cutiing** Pokryte TiAlN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
Hardness Twardość					~ HRC20		HRc20 ~HRc30		HRc30 ~HRc40			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2.0	0,2	3	7850	110	6300	75	5600	65	3100	30	16800	335
3.0	0,3	4,5	4900	155	4500	110	3500	85	2250	40	15400	530
4.0	0,4	6	3900	195	3100	140	2500	90	1550	65	11200	615
5.0	0,5	7,5	3100	250	2500	175	2250	125	1250	70	8800	660
6.0	0,6	9	2500	250	2250	205	1700	125	1100	85	7850	660
8.0	0,8	12	1950	280	1550	225	1250	145	800	90	5600	810
10.0	1	15	1550	280	1250	225	1100	170	650	90	4350	840
12.0	1,2	18	1250	310	1100	250	900	170	550	105	3500	800
14.0	1,4	21	1100	310	1000	225	800	170	500	105	3100	740
16.0	1,6	24	1000	310	800	225	650	145	400	90	2800	740
18.0	1,8	27	900	280	700	225	550	145	350	90	2500	740
20.0	2	30	800	280	650	225	550	145	300	90	2250	670
22.0	2,2	33	700	280	650	225	500	145	300	90	1950	630
25.0	2,5	37,5	650	250	550	205	450	125	250	70	1700	590
28.0	2,8	42	550	225	500	175	400	110	200	65	1550	560
30.0	3	45	500	195	450	155	350	105	200	65	1550	560
32.0	3,2	48	500	195	400	140	300	90	200	65	1400	505
36.0	3,6	54	450	170	350	125	300	85	150	50	1250	460
40.0	4	60	400	170	300	125	250	85	150	50	1100	420

**HM076 HMF76 HM077 HMF77**
**SQUARE TYPE WALCOWO-CZOŁOWE**

4-6 Flute, Long Length 4-6-ostrzowe, długie

<b>P</b>	<b>H</b>	<b>M</b>	<b>K</b>	<b>N</b>		<b>S</b>								
<750 N/mm <sup>2</sup>	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NICO 200-300 HB	Ti 200-410 GB



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM076020000B06010054	HMF76020000B06010054	2.0	6	54	10	4	B
HM076025000B06012056	HMF76025000B06012056	2.5	6	56	12	4	B
HM076030000B06012056	HMF76030000B06012056	3.0	6	56	12	4	B
HM076035000B06015059	HMF76035000B06015059	3.5	6	59	15	4	B
HM076040000B06019063	HMF76040000B06019063	4.0	6	63	19	4	B
HM076045000B06019063	HMF76045000B06019063	4.5	6	63	19	4	B
HM076050000B06024068	HMF76050000B06024068	5.0	6	68	24	4	B
HM076060000B06024068	HMF76060000B06024068	6.0	6	68	24	4	B
HM076070000B10030080	HMF76070000B10030080	7.0	10	80	30	4	B
HM076080000B10038088	HMF76080000B10038088	8.0	10	88	38	4	B
HM076090000B10038088	HMF76090000B10038088	9.0	10	88	38	4	B
HM076100000B10045095	HMF76100000B10045095	10.0	10	95	45	4	B
HM076110000B12045102	HMF76110000B12045102	11.0	12	102	45	4	B
HM076120000B12053110	HMF76120000B12053110	12.0	12	110	53	4	B
HM076130000B12053110	HMF76130000B12053110	13.0	12	110	53	4	B
HM076140000B12053110	HMF76140000B12053110	14.0	12	110	53	4	B
HM076150000B12053110	HMF76150000B12053110	15.0	12	110	53	4	B
HM076160000B16063123	HMF76160000B16063123	16.0	16	123	63	4	B
HM076170000B16063123	HMF76170000B16063123	17.0	16	123	63	4	B
HM076180000B16063123	HMF76180000B16063123	18.0	16	123	63	4	B
HM076190000B16063123	HMF76190000B16063123	19.0	16	123	63	4	B
HM076200000B16075135	HMF76200000B16075135	20.0	16	135	75	4	B
HM076200000B20075141	HMF76200000B20075141	20.0	20	141	75	4	B
HM077220000B20075141	HMF77220000B20075141	22.0	20	141	75	6	B
HM077240000B25090166	HMF77240000B25090166	24.0	25	166	90	6	B
HM077250000B25090166	HMF77250000B25090166	25.0	25	166	90	6	B
HM077260000B25090166	HMF77260000B25090166	26.0	25	166	90	6	B
HM077280000B25090166	HMF77280000B25090166	28.0	25	166	90	6	B
HM077300000B25090166	HMF77300000B25090166	30.0	25	166	90	6	B
HM077320000B320106186	HMF77320000B320106186	32.0	32	186	106	6	B
HM077360000B320106186	HMF77360000B320106186	36.0	32	186	106	6	B
HM077400000B400125217	HMF77400000B400125217	40.0	40	217	125	6	B

	d1 h6			
	D ≤ 6	0~+0.04		
	D > 6	0~+0.05		

**HM076 HMF76 HM077 HMF77**

Cutting Conditions Parametry skrawania

**Uncoated - Side Cutiing** Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
Hardness Twardość					~ HRC20		HRC20 ~HRC30		HRC30 ~HRC40			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2.0	0,2	3	5600	80	4500	55	4000	45	2200	20	12000	240
3.0	0,3	4,5	3500	110	3200	80	2500	60	1600	30	11000	380
4.0	0,4	6	2800	140	2200	100	1800	65	1100	45	8000	440
5.0	0,5	7,5	2200	180	1800	125	1600	90	900	50	6300	470
6.0	0,6	9	1800	180	1600	145	1200	90	800	60	5600	470
8.0	0,8	12	1400	200	1100	160	900	105	560	65	4000	580
10.0	1	15	1100	200	900	160	800	120	450	65	3100	600
12.0	1,2	18	900	220	800	180	630	120	400	75	2500	570
14.0	1,4	21	800	220	700	160	560	120	350	75	2200	530
16.0	1,6	24	700	220	560	160	450	105	280	65	2000	530
18.0	1,8	27	630	200	500	160	400	105	250	65	1800	530
20.0	2	30	560	200	450	160	400	105	220	65	1600	480
22.0	2,2	33	500	200	450	160	350	105	220	65	1400	450
25.0	2,5	37,5	450	180	400	145	310	90	180	50	1200	420
28.0	2,8	42	400	160	350	125	280	80	160	45	1100	400
30.0	3	45	350	140	310	110	250	75	160	45	1100	400
32.0	3,2	48	350	140	280	100	220	65	140	45	1000	360
36.0	3,6	54	310	120	250	90	200	60	120	35	900	330
40.0	4	60	280	120	220	90	180	60	110	35	800	300

**Coated TiAlN - Side Cutiing** Pokryte TiAlN - Frezowanie boczne

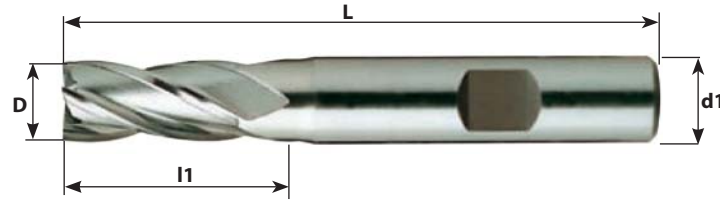
Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
Hardness Twardość					~ HRC20		HRC20 ~HRC30		HRC30 ~HRC40			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2.0	0,2	3	7850	110	6300	75	5600	65	3100	30	16800	335
3.0	0,3	4,5	4900	155	4500	110	3500	85	2250	40	15400	530
4.0	0,4	6	3900	195	3100	140	2500	90	1550	65	11200	615
5.0	0,5	7,5	3100	250	2500	175	2250	125	1250	70	8800	660
6.0	0,6	9	2500	250	2250	205	1700	125	1100	85	7850	660
8.0	0,8	12	1950	280	1550	225	1250	145	800	90	5600	810
10.0	1	15	1550	280	1250	225	1100	170	650	90	4350	840
12.0	1,2	18	1250	310	1100	250	900	170	550	105	3500	800
14.0	1,4	21	1100	310	1000	225	800	170	500	105	3100	740
16.0	1,6	24	1000	310	800	225	650	145	400	90	2800	740
18.0	1,8	27	900	280	700	225	550	145	350	90	2500	740
20.0	2	30	800	280	650	225	550	145	300	90	2250	670
22.0	2,2	33	700	280	650	225	500	145	300	90	1950	630
25.0	2,5	37,5	650	250	550	205	450	125	250	70	1700	590
28.0	2,8	42	550	225	500	175	400	110	200	65	1550	560
30.0	3	45	500	195	450	155	350	105	200	65	1550	560
32.0	3,2	48	500	195	400	140	300	90	200	65	1400	505
36.0	3,6	54	450	170	350	125	300	85	150	50	1250	460
40.0	4	60	400	170	300	125	250	85	150	50	1100	420



**HM095 HMF95 HM096 HMF96**
**SQUARE TYPE WALCOWO-CZOŁOWE**

4-6 Flute, Short Length 4-6-ostrzowe, krótkie

<b>P</b>				<b>H</b>		<b>M</b>		<b>K</b>	<b>N</b>			<b>S</b>		
<750 N/mm <sup>2</sup>	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NICO 200-300 HB	Ti 200-410 GB
•	•								○	○			•	•



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM095020000B06007051	HMF95020000B06007051	2.0	6	51	7	4	B
HM095030000B06008052	HMF95030000B06008052	3.0	6	52	8	4	B
HM095040000B06011055	HMF95040000B06011055	4.0	6	55	11	4	B
HM095050000B06013057	HMF95050000B06013057	5.0	6	57	13	4	B
HM095060000B06013057	HMF95060000B06013057	6.0	6	57	13	4	B
HM095070000B10016066	HMF95070000B10016066	7.0	10	66	16	4	B
HM095080000B10019069	HMF95080000B10019069	8.0	10	69	19	4	B
HM095090000B10019069	HMF95090000B10019069	9.0	10	69	19	4	B
HM095100000B10022072	HMF95100000B10022072	10.0	10	72	22	4	B
HM095110000B12022079	HMF95110000B12022079	11.0	12	79	22	4	B
HM095120000B12026083	HMF95120000B12026083	12.0	12	83	26	4	B
HM095130000B12026083	HMF95130000B12026083	13.0	12	83	26	4	B
HM095140000B12026083	HMF95140000B12026083	14.0	12	83	26	4	B
HM095150000B12026083	HMF95150000B12026083	15.0	12	83	26	4	B
HM095160000B16032092	HMF95160000B16032092	16.0	16	92	32	4	B
HM095170000B16032092	HMF95170000B16032092	17.0	16	92	32	4	B
HM095180000B16032092	HMF95180000B16032092	18.0	16	92	32	4	B
HM095190000B16032092	HMF95190000B16032092	19.0	16	92	32	4	B
HM095200000B16038098	HMF95200000B16038098	20.0	16	98	38	4	B
HM095200000B20038104	HMF95200000B20038104	20.0	20	104	38	4	B
HM095220000B200X1104	HMF95220000B200X1104	22.0	20	104	38	4	B
HM095250000B250X1121	HMF95250000B250X1121	25.0	25	121	45	4	B
HM096220000B20038104	HMF96220000B200X2104	22.0	20	104	38	6	B
HM096240000B25045121	HMF96240000B25045121	24.0	25	121	45	6	B
HM096250000B25045121	HMF96250000B250X2121	25.0	25	121	45	6	B
HM096260000B25045121	HMF96260000B25045121	26.0	25	121	45	6	B
HM096280000B25045121	HMF96280000B25045121	28.0	25	121	45	6	B
HM096300000B25045121	HMF96300000B25045121	30.0	25	121	45	6	B
HM096320000B32053133	HMF96320000B32053133	32.0	32	133	53	6	B
HM096340000B32053133	HMF96340000B32053133	34.0	32	133	53	6	B
HM096350000B32053133	HMF96350000B32053133	35.0	32	133	53	6	B
HM096360000B32053133	HMF96360000B32053133	36.0	32	133	53	6	B
HM096380000B32063143	HMF96380000B32063143	38.0	32	143	63	6	B
HM096400000B32063143	HMF96400000B32063143	40.0	32	143	63	6	B
HM096400000B40063155	HMF96400000B40063155	40.0	40	155	63	6	B

	d1 h6				
	D 0~+0.04				

**HM095 HMF95 HM096 HMF96**

Cutting Conditions Parametry skrawania

**Uncoated - Side Cuting Bez pokrycia - Frezowanie boczne**

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		~ HRC20 500 ~ 800N/mm2		HRC20 ~ HRC30 800 ~ 1000N/mm2		HRC30 ~ HRC40 1000 ~ 1300N/mm2			
Hardness Twardość			~ 500N/mm2		~ HRC20 500 ~ 800N/mm2		HRC20 ~ HRC30 800 ~ 1000N/mm2		HRC30 ~ HRC40 1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2.0	0,2	3	5600	80	4500	55	4000	45	2200	20	12000	240
3.0	0,3	4,5	3500	110	3200	80	2500	60	1600	30	11000	380
4.0	0,4	6	2800	140	2200	100	1800	65	1100	45	8000	440
5.0	0,5	7,5	2200	180	1800	125	1600	90	900	50	6300	470
6.0	0,6	9	1800	180	1600	145	1200	90	800	60	5600	470
8.0	0,8	12	1400	200	1100	160	900	105	560	65	4000	580
10.0	1	15	1100	200	900	160	800	120	450	65	3100	600
12.0	1,2	18	900	220	800	180	630	120	400	75	2500	570
14.0	1,4	21	800	220	700	160	560	120	350	75	2200	530
16.0	1,6	24	700	220	560	160	450	105	280	65	2000	530
18.0	1,8	27	630	200	500	160	400	105	250	65	1800	530
20.0	2	30	560	200	450	160	400	105	220	65	1600	480
22.0	2,2	33	500	200	450	160	350	105	220	65	1400	450
25.0	2,5	37,5	450	180	400	145	310	90	180	50	1200	420
28.0	2,8	42	400	160	350	125	280	80	160	45	1100	400
30.0	3	45	350	140	310	110	250	75	160	45	1100	400
32.0	3,2	48	350	140	280	100	220	65	140	45	1000	360
36.0	3,6	54	310	120	250	90	200	60	120	35	900	330
40.0	4	60	280	120	220	90	180	60	110	35	800	300

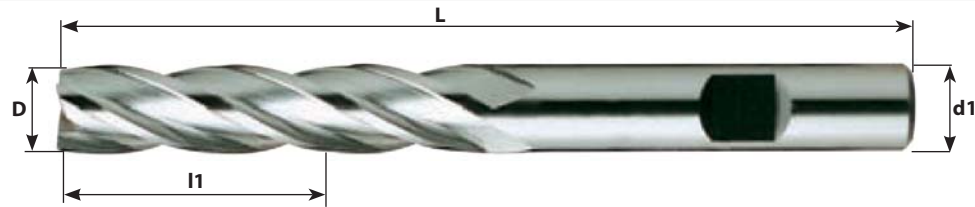
**Coated TiAlN - Side Cuting Pokryte TiAlN - Frezowanie boczne**

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		~ HRC20 500 ~ 800N/mm2		HRC20 ~ HRC30 800 ~ 1000N/mm2		HRC30 ~ HRC40 1000 ~ 1300N/mm2			
Hardness Twardość			~ 500N/mm2		~ HRC20 500 ~ 800N/mm2		HRC20 ~ HRC30 800 ~ 1000N/mm2		HRC30 ~ HRC40 1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2.0	0,2	3	7850	110	6300	75	5600	65	3100	30	16800	335
3.0	0,3	4,5	4900	155	4500	110	3500	85	2250	40	15400	530
4.0	0,4	6	3900	195	3100	140	2500	90	1550	65	11200	615
5.0	0,5	7,5	3100	250	2500	175	2250	125	1250	70	8800	660
6.0	0,6	9	2500	250	2250	205	1700	125	1100	85	7850	660
8.0	0,8	12	1950	280	1550	225	1250	145	800	90	5600	810
10.0	1	15	1550	280	1250	225	1100	170	650	90	4350	840
12.0	1,2	18	1250	310	1100	250	900	170	550	105	3500	800
14.0	1,4	21	1100	310	1000	225	800	170	500	105	3100	740
16.0	1,6	24	1000	310	800	225	650	145	400	90	2800	740
18.0	1,8	27	900	280	700	225	550	145	350	90	2500	740
20.0	2	30	800	280	650	225	550	145	300	90	2250	670
22.0	2,2	33	700	280	650	225	500	145	300	90	1950	630
25.0	2,5	37,5	650	250	550	205	450	125	250	70	1700	590
28.0	2,8	42	550	225	500	175	400	110	200	65	1550	560
30.0	3	45	500	195	450	155	350	105	200	65	1550	560
32.0	3,2	48	500	195	400	140	300	90	200	65	1400	505
36.0	3,6	54	450	170	350	125	300	85	150	50	1250	460
40.0	4	60	400	170	300	125	250	85	150	50	1100	420

**HM097 HMF97 HM098 HMF98**
**SQUARE TYPE WALCOWO-CZOŁOWE**

4-6 Flute, Long Length 4-6-ostrowe, długie

<b>P</b>	<b>H</b>	<b>M</b>	<b>K</b>	<b>N</b>	<b>S</b>										
<750 N/mm <sup>2</sup>	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10%	130HB	CU, ZN 35-300 HB	GFK	NICO 200-300 HB	Ti 200-410 GB



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM097020000B06010054	HMF97020000B06010054	2.0	6	54	10	4	B
HM097025000B06012056	HMF97025000B06012056	2.5	6	56	12	4	B
HM097030000B06012056	HMF97030000B06012056	3.0	6	56	12	4	B
HM097035000B06015059	HMF97035000B06015059	3.5	6	59	15	4	B
HM097040000B06019063	HMF97040000B06019063	4.0	6	63	19	4	B
HM097045000B06019063	HMF97045000B06019063	4.5	6	63	19	4	B
HM097050000B06024068	HMF97050000B06024068	5.0	6	68	24	4	B
HM097055000B06024068	HMF97055000B06024068	5.5	6	68	24	4	B
HM097060000B06024068	HMF97060000B06024068	6.0	6	68	24	4	B
HM097070000B10030080	HMF97070000B10030080	7.0	10	80	30	4	B
HM097080000B10038088	HMF97080000B10038088	8.0	10	88	38	4	B
HM097090000B10038088	HMF97090000B10038088	9.0	10	88	38	4	B
HM097100000B10045095	HMF97100000B10045095	10.0	10	95	45	4	B
HM097110000B12045102	HMF97110000B12045102	11.0	12	102	45	4	B
HM097120000B12053110	HMF97120000B12053110	12.0	12	110	53	4	B
HM097130000B12053110	HMF97130000B12053110	13.0	12	110	53	4	B
HM097140000B12053110	HMF97140000B12053110	14.0	12	110	53	4	B
HM097150000B12053110	HMF97150000B12053110	15.0	12	110	53	4	B
HM097160000B16063123	HMF97160000B16063123	16.0	16	123	63	4	B
HM097170000B16063123	HMF97170000B16063123	17.0	16	123	63	4	B
HM097180000B16063123	HMF97180000B16063123	18.0	16	123	63	4	B
HM097190000B16063123	HMF97190000B16063123	19.0	16	123	63	4	B
HM097200000B20075141	HMF97200000B20075141	20.0	20	141	75	4	B
HM098220000B20075141	HMF98220000B20075141	22.0	20	141	75	6	B
HM098240000B25090166	HMF98240000B25090166	24.0	25	166	90	6	B
HM098250000B25090166	HMF98250000B25090166	25.0	25	166	90	6	B
HM098260000B25090166	HMF98260000B25090166	26.0	25	166	90	6	B
HM098280000B25090166	HMF98280000B25090166	28.0	25	166	90	6	B
HM098300000B25090166	HMF98300000B25090166	30.0	25	166	90	6	B
HM098320000B320106186	HMF98320000B320106186	32.0	32	186	106	6	B
HM098360000B320106186	HMF98360000B320106186	36.0	32	186	106	6	B
HM098400000B400125217	HMF98400000B400125217	40.0	40	217	125	6	B

	d1 h6			
	D ≤ 6	0~+0.04		
	D > 6	0~+0.05		

**HM097 HMF97 HM098 HMF98**

Cutting Conditions Parametry skrawania

**Uncoated - Side Cutiing** Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
Hardness Twardość					~ HRC20		HRC20 ~HRC30		HRC30 ~HRC40			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2.0	0,2	3	5600	80	4500	55	4000	45	2200	20	12000	240
3.0	0,3	4,5	3500	110	3200	80	2500	60	1600	30	11000	380
4.0	0,4	6	2800	140	2200	100	1800	65	1100	45	8000	440
5.0	0,5	7,5	2200	180	1800	125	1600	90	900	50	6300	470
6.0	0,6	9	1800	180	1600	145	1200	90	800	60	5600	470
8.0	0,8	12	1400	200	1100	160	900	105	560	65	4000	580
10.0	1	15	1100	200	900	160	800	120	450	65	3100	600
12.0	1,2	18	900	220	800	180	630	120	400	75	2500	570
14.0	1,4	21	800	220	700	160	560	120	350	75	2200	530
16.0	1,6	24	700	220	560	160	450	105	280	65	2000	530
18.0	1,8	27	630	200	500	160	400	105	250	65	1800	530
20.0	2	30	560	200	450	160	400	105	220	65	1600	480
22.0	2,2	33	500	200	450	160	350	105	220	65	1400	450
25.0	2,5	37,5	450	180	400	145	310	90	180	50	1200	420
28.0	2,8	42	400	160	350	125	280	80	160	45	1100	400
30.0	3	45	350	140	310	110	250	75	160	45	1100	400
32.0	3,2	48	350	140	280	100	220	65	140	45	1000	360
36.0	3,6	54	310	120	250	90	200	60	120	35	900	330
40.0	4	60	280	120	220	90	180	60	110	35	800	300

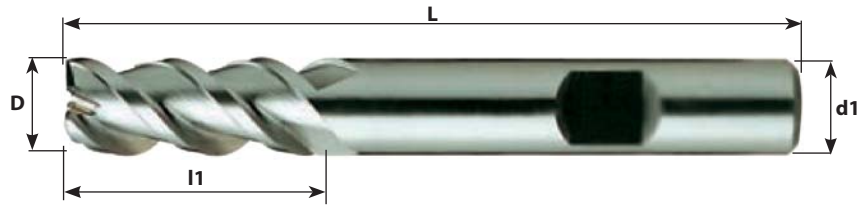
**Coated TiAlN - Side Cutiing** Pokryte TiAlN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
Hardness Twardość					~ HRC20		HRC20 ~HRC30		HRC30 ~HRC40			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2.0	0,2	3	7850	110	6300	75	5600	65	3100	30	16800	335
3.0	0,3	4,5	4900	155	4500	110	3500	85	2250	40	15400	530
4.0	0,4	6	3900	195	3100	140	2500	90	1550	65	11200	615
5.0	0,5	7,5	3100	250	2500	175	2250	125	1250	70	8800	660
6.0	0,6	9	2500	250	2250	205	1700	125	1100	85	7850	660
8.0	0,8	12	1950	280	1550	225	1250	145	800	90	5600	810
10.0	1	15	1550	280	1250	225	1100	170	650	90	4350	840
12.0	1,2	18	1250	310	1100	250	900	170	550	105	3500	800
14.0	1,4	21	1100	310	1000	225	800	170	500	105	3100	740
16.0	1,6	24	1000	310	800	225	650	145	400	90	2800	740
18.0	1,8	27	900	280	700	225	550	145	350	90	2500	740
20.0	2	30	800	280	650	225	550	145	300	90	2250	670
22.0	2,2	33	700	280	650	225	500	145	300	90	1950	630
25.0	2,5	37,5	650	250	550	205	450	125	250	70	1700	590
28.0	2,8	42	550	225	500	175	400	110	200	65	1550	560
30.0	3	45	500	195	450	155	350	105	200	65	1550	560
32.0	3,2	48	500	195	400	140	300	90	200	65	1400	505
36.0	3,6	54	450	170	350	125	300	85	150	50	1250	460
40.0	4	60	400	170	300	125	250	85	150	50	1100	420

**HM061 HMF61 HM062 HMF62 HMF63 HMF63**
**SQUARE TYPE WALCOWO-CZOŁOWE**

Multi Flute, Long Length Wielostrzowe, długie

						<b>HSS</b> Co 8%										<b>AIR</b>
<b>P</b>				<b>H</b>		<b>M</b>		<b>K</b>	<b>N</b>				<b>S</b>			
<750 N/mm <sup>2</sup>	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NICO 200-300 HB	Ti 200-410 GB		
•	•								○	○						



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM061020000B06007051	HMF61020000B06007051	2.0	6	51	7	2	B
HM061030000B06008052	HMF61030000B06008052	3.0	6	52	8	2	B
HM061040000B06011055	HMF61040000B06011055	4.0	6	55	11	2	B
HM061050000B06013057	HMF61050000B06013057	5.0	6	57	13	2	B
HM062060000B06013057	HMF62060000B06013057	6.0	6	57	13	3	B
HM062070000B10016066	HMF62070000B10016066	7.0	10	66	16	3	B
HM062080000B10019069	HMF62080000B10019069	8.0	10	69	19	3	B
HM062090000B10019069	HMF62090000B10019069	9.0	10	69	19	3	B
HM062100000B10022072	HMF62100000B10022072	10.0	10	72	22	3	B
HM062110000B12022079	HMF62110000B12022079	11.0	12	79	22	3	B
HM062120000B12026083	HMF62120000B12026083	12.0	12	83	26	3	B
HM062130000B12026083	HMF62130000B12026083	13.0	12	83	26	3	B
HM062140000B12026083	HMF62140000B12026083	14.0	12	83	26	3	B
HM062150000B12026083	HMF62150000B12026083	15.0	12	83	26	3	B
HM062160000B16032092	HMF62160000B16032092	16.0	16	92	32	3	B
HM062180000B16032092	HMF62180000B16032092	18.0	16	92	32	3	B
HM062200000B20038104	HMF62200000B20038104	20.0	20	104	38	3	B
HM062230000B20038104	HMF62230000B20038104	23.0	20	104	38	3	B
HM063220000B25045121	HMF63220000B25045121	22.0	25	121	45	4	B
HM063250000B25045121	HMF63250000B25045121	25.0	25	121	45	4	B
HM063300000B25045121	HMF63300000B25045121	30.0	25	121	45	4	B

	d1 h6		D 7 - 10	0~+0.058	
	D ≤ 3	0~+0.04	D 10,5 - 18	0~+0.07	
	D 4 - 6	0~+0.048	D > 3	0~+0.084	

**HM061 HMF61 HM062 HMF62 HMF63 HMF63**

Cutting Conditions Parametry skrawania

**Uncoated - Side Cutiing** Bez pokrycia - Frezowanie boczne

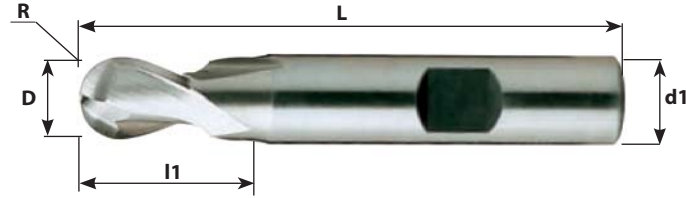
Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa	
			~ HRC20 500 ~ 800N/mm2		HRC20 ~HRC30 800 ~ 1000N/mm2		HRC30 ~HRC40 1000 ~ 1300N/mm2	
Hardness Twardość								
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED
2.0	0,6	3	5000	35	4500	25	2500	10
3.0	0,9	4,5	3500	50	2800	35	1800	20
4.0	1,2	6	2500	60	2000	40	1200	25
5.0	1,5	7,5	2000	75	1800	55	1000	30
6.0	1,8	9	1800	85	1300	55	900	35
8.0	2,4	12	1200	95	1000	65	600	40
10.0	3	15	1000	95	900	70	500	40
12.0	3,6	18	900	110	700	70	450	45
14.0	4,2	21	800	95	600	70	400	45
16.0	4,8	24	600	95	500	65	300	40
18.0	5,4	27	550	95	450	65	280	40
20.0	6	30	500	95	450	65	250	40
22.0	6,6	33	500	95	400	65	250	40
25.0	7,5	37,5	450	85	350	55	200	30
28.0	8,4	42	400	75	300	50	180	25
30.0	9	45	350	65	280	45	180	25

**Coated TiAlN - Side Cutiing** Pokryte TiAlN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa	
			~ HRC20 500 ~ 800N/mm2		HRC20 ~HRC30 800 ~ 1000N/mm2		HRC30 ~HRC40 1000 ~ 1300N/mm2	
Hardness Twardość								
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED
2.0	0,6	3	7000	50	6300	35	3500	15
3.0	0,9	4,5	4900	70	3920	50	2520	30
4.0	1,2	6	3500	85	2800	55	1680	35
5.0	1,5	7,5	2800	105	2520	75	1400	40
6.0	1,8	9	2520	120	1820	75	1260	50
8.0	2,4	12	1680	135	1400	90	840	55
10.0	3	15	1400	135	1260	100	700	55
12.0	3,6	18	1260	155	980	100	630	65
14.0	4,2	21	1120	135	840	100	560	65
16.0	4,8	24	840	135	700	90	420	55
18.0	5,4	27	770	135	630	90	390	55
20.0	6	30	700	135	630	90	350	55
22.0	6,6	33	700	135	560	90	350	55
25.0	7,5	37,5	630	120	490	75	280	40
28.0	8,4	42	560	105	420	70	250	35
30.0	9	45	490	90	390	65	250	35

**HM035 HMF35**
**BALLNOSE KULISTE**  
 2 Flute, Short Length 2-ostrzowe, krótkie

<b>P</b>	<b>H</b>	<b>M</b>	<b>K</b>	<b>N</b>	<b>S</b>									
<750 N/mm <sup>2</sup>	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NICO 200-300 HB	Ti 200-410 GB
•	•								○	○			•	•



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	R	D	d1	L	l1	Z	Shank Uchwyt
HM035020010B06004048	HMF35020010B06004048	1	2.0	6	48	4	2	B
HM035025013B06005049	HMF35025013B06005049	1,25	2.5	6	49	5	2	B
HM035030015B06005049	HMF35030015B06005049	1,5	3.0	6	49	5	2	B
HM035035018B06006050	HMF35035018B06006050	1,75	3.5	6	50	6	2	B
HM035040020B06007051	HMF35040020B06007051	2	4.0	6	51	7	2	B
HM035045023B06007051	HMF35045023B06007051	2,25	4.5	6	51	7	2	B
HM035050025B06008052	HMF35050025B06008052	2,5	5.0	6	52	8	2	B
HM035055028B06008052	HMF35055028B06008052	2,75	5.5	6	52	8	2	B
HM035060030B06008052	HMF35060030B06008052	3	6.0	6	52	8	2	B
HM035070035B10010060	HMF35070035B10010060	3,5	7.0	10	60	10	2	B
HM035080040B10011061	HMF35080040B10011061	4	8.0	10	61	11	2	B
HM035090045B10011061	HMF35090045B10011061	4,5	9.0	10	61	11	2	B
HM035100050B10013063	HMF35100050B10013063	5	10.0	10	63	13	2	B
HM035110055B12013070	HMF35110055B12013070	5,5	11.0	12	70	13	2	B
HM035120060B12016073	HMF35120060B12016073	6	12.0	12	73	16	2	B
HM035130065B12016073	HMF35130065B12016073	6,5	13.0	12	73	16	2	B
HM035140070B12016073	HMF35140070B12016073	7	14.0	12	73	16	2	B
HM035150075B12016073	HMF35150075B12016073	7,5	15.0	12	73	16	2	B
HM035160080B16019079	HMF35160080B16019079	8	16.0	16	79	19	2	B
HM035170085B16019079	HMF35170085B16019079	8,5	17.0	16	79	19	2	B
HM035180090B16019079	HMF35180090B16019079	9	18.0	16	79	19	2	B
HM035190095B16019079	HMF35190095B16019079	9,5	19.0	16	79	19	2	B
HM035200100B16022082	HMF35200100B16022082	10	20.0	16	82	22	2	B
HM035200100B20022088	HMF35200100B20022088	10	20.0	20	88	22	2	B
HM035220110B20022088	HMF35220110B20022088	11	22.0	20	88	22	2	B
HM035220110B25022098	HMF35220110B25022098	11	22.0	25	98	22	2	B
HM035240120B25026102	HMF35240120B25026102	12	24.0	25	102	26	2	B
HM035250125B25026102	HMF35250125B25026102	12,5	25.0	25	102	26	2	B
HM035260130B25026102	HMF35260130B25026102	13	26.0	25	102	26	2	B
HM035280140B25026102	HMF35280140B25026102	14	28.0	25	102	26	2	B
HM035300150B25026102	HMF35300150B25026102	15	30.0	25	102	26	2	B
HM035320160B32032112	HMF35320160B32032112	16	32.0	32	112	32	2	B

	d1 h6		± 0,02
	D 0~-0.03		

**HM035 HMF35**

Cutting Conditions Parametry skrawania

**Uncoated Bez pokrycia**

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		~ HRC20 500 ~ 800N/mm2		HRC20 ~HRC30 800 ~ 1000N/mm2		HRC30 ~HRC40 1000 ~ 1300N/mm2			
Hardness Twardość			~ 500N/mm2		~ HRC20 500 ~ 800N/mm2		HRC20 ~HRC30 800 ~ 1000N/mm2		HRC30 ~HRC40 1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
R1.5 x 3.0	1,05	0,45	4500	95	3400	70	2000	30	1400	20	11000	230
R2.0 x 4.0	1,4	0,6	3200	115	2400	80	1400	35	1000	25	8000	260
R3.0 x 6.0	2,1	0,9	2200	135	1700	90	1000	45	700	25	5600	280
R4.0 x 8.0	2,8	1,2	1600	160	1200	105	700	50	500	30	4000	350
R5.0 x 10.0	3,5	1,5	1300	180	1000	120	560	60	400	35	3200	360
R6.0 x 12.0	4,2	1,8	1000	170	800	105	450	55	320	35	2500	340
R8.0 x 16.0	5,6	2,4	800	150	600	100	350	55	250	35	2000	300
R10.0 x 20.0	7	3	600	140	500	85	300	50	200	35	1600	280
R12.5 x 25.0	8,75	3,75	500	130	400	70	220	40	160	30	1300	250

**Coated TiAlN Pokryte TiAlN**

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		~ HRC20 500 ~ 800N/mm2		HRC20 ~HRC30 800 ~ 1000N/mm2		HRC30 ~HRC40 1000 ~ 1300N/mm2			
Hardness Twardość			~ 500N/mm2		~ HRC20 500 ~ 800N/mm2		HRC20 ~HRC30 800 ~ 1000N/mm2		HRC30 ~HRC40 1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
R1.5 x 3.0	1,05	0,45	6300	135	4750	100	2800	40	1950	30	15400	320
R2.0 x 4.0	1,4	0,6	4500	160	3350	110	1950	50	1400	35	11200	365
R3.0 x 6.0	2,1	0,9	3100	190	2400	125	1400	65	1000	35	7850	390
R4.0 x 8.0	2,8	1,2	2250	225	1700	145	1000	70	700	40	5600	490
R5.0 x 10.0	3,5	1,5	1800	250	1400	170	800	85	550	50	4500	505
R6.0 x 12.0	4,2	1,8	1400	240	1100	145	650	75	450	50	3500	475
R8.0 x 16.0	5,6	2,4	1100	210	850	140	500	75	350	50	2800	420
R10.0 x 20.0	7	3	850	195	700	120	400	70	300	50	2250	390
R12.5 x 25.0	8,75	3,75	700	180	550	100	300	55	200	40	1800	350

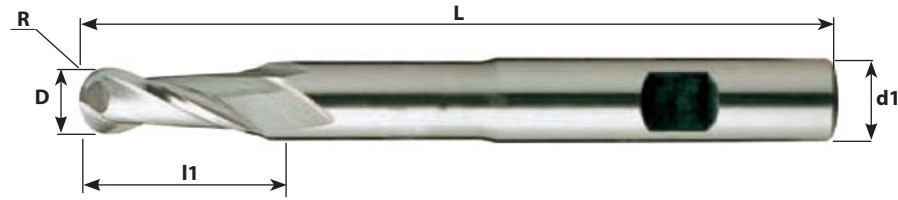


# HM092 HMF92

## BALLNOSE KULISTE

2 Flute, Long Length 2-ostrzowe, długie

<b>P</b>	<b>H</b>	<b>M</b>	<b>K</b>	<b>N</b>	<b>S</b>									
<750 N/mm <sup>2</sup>	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NICO 200-300 HB	Ti 200-410 GB



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	R	D	d1	L	l1	Z	Shank Uchwyt
HM092020010B06007054	HMF92020010B06007054	1	2.0	6	54	7	2	B
HM092030015B06008056	HMF92030015B06008056	1,5	3.0	6	56	8	2	B
HM092040020B06011063	HMF92040020B06011063	2	4.0	6	63	11	2	B
HM092050025B06013068	HMF92050025B06013068	2,5	5.0	6	68	13	2	B
HM092060030B06013068	HMF92060030B06013068	3	6.0	6	68	13	2	B
HM092070035B10016080	HMF92070035B10016080	3,5	7.0	10	80	16	2	B
HM092080040B10019088	HMF92080040B10019088	4	8.0	10	88	19	2	B
HM092090045B10019088	HMF92090045B10019088	4,5	9.0	10	88	19	2	B
HM092100050B10022095	HMF92100050B10022095	5	10.0	10	95	22	2	B
HM092110055B12022102	HMF92110055B12022102	5,5	11.0	12	102	22	2	B
HM092120060B12026110	HMF92120060B12026110	6	12.0	12	110	26	2	B
HM092130065B12026110	HMF92130065B12026110	6,5	13.0	12	110	26	2	B
HM092140070B12026110	HMF92140070B12026110	7	14.0	12	110	26	2	B
HM092150075B12026110	HMF92150075B12026110	7,5	15.0	12	110	26	2	B
HM092160080B16032123	HMF92160080B16032123	8	16.0	16	123	32	2	B
HM092170085B16032123	HMF92170085B16032123	8,5	17.0	16	123	32	2	B
HM092180090B16032123	HMF92180090B16032123	9	18.0	16	123	32	2	B
HM092190095B16032123	HMF92190095B16032123	9,5	19.0	16	123	32	2	B
HM092200100B20038141	HMF92200100B20038141	10	20.0	20	141	38	2	B
HM092220110B20038141	HMF92220110B20038141	11	22.0	20	141	38	2	B
HM092240120B25045166	HMF92240120B25045166	12	24.0	25	166	45	2	B
HM092250125B25045166	HMF92250125B25045166	12,5	25.0	25	166	45	2	B
HM092260130B25045166	HMF92260130B25045166	13	26.0	25	166	45	2	B
HM092280140B25045166	HMF92280140B25045166	14	28.0	25	166	45	2	B
HM092300150B25045166	HMF92300150B25045166	15	30.0	25	166	45	2	B

	d1 h6		± 0,02
	D 0~-0.03		

**HM092 HMF92**

Cutting Conditions Parametry skrawania

**Uncoated Bez pokrycia**

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
Hardness Twardość			~ HRC20		HRC20 ~HRC30		HRC30 ~HRC40					
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
R1.5 x 3.0	1,05	0,45	4500	95	3400	70	2000	30	1400	20	11000	230
R2.0 x 4.0	1,4	0,6	3200	115	2400	80	1400	35	1000	25	8000	260
R3.0 x 6.0	2,1	0,9	2200	135	1700	90	1000	45	700	25	5600	280
R4.0 x 8.0	2,8	1,2	1600	160	1200	105	700	50	500	30	4000	350
R5.0 x 10.0	3,5	1,5	1300	180	1000	120	560	60	400	35	3200	360
R6.0 x 12.0	4,2	1,8	1000	170	800	105	450	55	320	35	2500	340
R8.0 x 16.0	5,6	2,4	800	150	600	100	350	55	250	35	2000	300
R10.0 x 20.0	7	3	600	140	500	85	300	50	200	35	1600	280
R12.5 x 25.0	8,75	3,75	500	130	400	70	220	40	160	30	1300	250

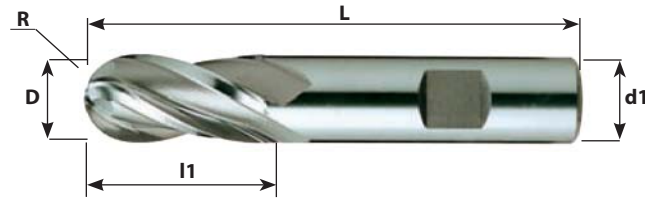
**Coated TiAlN Pokryte TiAlN**

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
Hardness Twardość			~ HRC20		HRC20 ~HRC30		HRC30 ~HRC40					
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
R1.5 x 3.0	1,05	0,45	6300	135	4750	100	2800	40	1950	30	15400	320
R2.0 x 4.0	1,4	0,6	4500	160	3350	110	1950	50	1400	35	11200	365
R3.0 x 6.0	2,1	0,9	3100	190	2400	125	1400	65	1000	35	7850	390
R4.0 x 8.0	2,8	1,2	2250	225	1700	145	1000	70	700	40	5600	490
R5.0 x 10.0	3,5	1,5	1800	250	1400	170	800	85	550	50	4500	505
R6.0 x 12.0	4,2	1,8	1400	240	1100	145	650	75	450	50	3500	475
R8.0 x 16.0	5,6	2,4	1100	210	850	140	500	75	350	50	2800	420
R10.0 x 20.0	7	3	850	195	700	120	400	70	300	50	2250	390
R12.5 x 25.0	8,75	3,75	700	180	550	100	300	55	200	40	1800	350

# HM0A0 HMFA0

## BALLNOSE KULISTE 4-6 Flute, Short Length 4-6-ostrzowe, krótkie

<b>P</b>		<b>H</b>		<b>M</b>		<b>K</b>		<b>N</b>		<b>S</b>				
<750 N/mm <sup>2</sup>	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NICO 200-300 HB	Ti 200-410 GB
•	•								o	o				



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	R	D	d1	L	l1	Z	Shank Uchwyt
HM0A0060030B06013057	HMFA0060030B06013057	3	6.0	6	57	13	4	B
HM0A0080040B10019069	HMFA0080040B10019069	4	8.0	10	69	19	4	B
HM0A0100050B10022072	HMFA0100050B10022072	5	10.0	10	72	22	4	B
HM0A0120060B12026083	HMFA0120060B12026083	6	12.0	12	83	26	4	B
HM0A0160080B16032092	HMFA0160080B16032092	8	16.0	16	92	32	4	B
HM0A0200100B20038104	HMFA0200100B20038104	10	20.0	20	104	38	4	B
HM0A0250125B25045121	HMFA0250125B25045121	12,5	25.0	25	121	45	6	B

	d1 h6		± 0,02
	D 0~-0.03		

**HMOAO HMFAO**

Cutting Conditions Parametry skrawania

**Uncoated Bez pokrycia**

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm <sup>2</sup>		500 ~ 800N/mm <sup>2</sup>		800 ~ 1000N/mm <sup>2</sup>		1000 ~ 1300N/mm <sup>2</sup>			
Hardness Twardość			~ HRC20		HRC20 ~ HRC30		HRC30 ~ HRC40					
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
R3.0 x 6.0	2,1	0,9	2200	200	1700	135	1000	70	700	40	5600	420
R4.0 x 8.0	2,8	1,2	1600	240	1200	160	700	75	500	45	4000	530
R5.0 x 10.0	3,5	1,5	1300	270	1000	180	560	90	400	50	3200	540
R6.0 x 12.0	4,2	1,8	1000	260	800	160	450	80	320	50	2500	510
R8.0 x 16.0	5,6	2,4	800	230	600	150	350	80	250	50	2000	450
R10.0 x 20.0	7	3	600	210	500	130	300	75	200	50	1600	420
R12.5 x 25.0	8,75	3,75	500	200	400	105	220	60	160	45	1300	380

**Coated TiAlN Pokryte TiAlN**

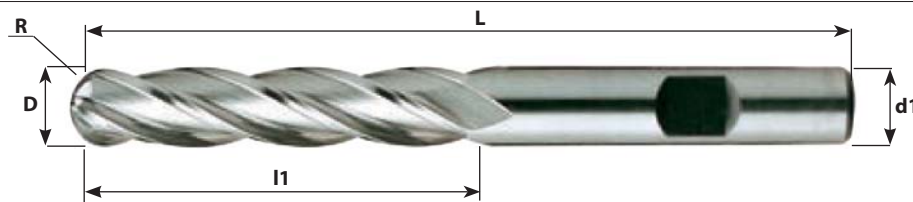
Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm <sup>2</sup>		500 ~ 800N/mm <sup>2</sup>		800 ~ 1000N/mm <sup>2</sup>		1000 ~ 1300N/mm <sup>2</sup>			
Hardness Twardość			~ HRC20		HRC20 ~ HRC30		HRC30 ~ HRC40					
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
R3.0 x 6.0	2,1	0,9	3100	280	2400	190	1400	100	1000	55	7850	590
R4.0 x 8.0	2,8	1,2	2250	335	1700	225	1000	105	700	65	5600	740
R5.0 x 10.0	3,5	1,5	1800	380	1400	250	800	125	550	70	4500	755
R6.0 x 12.0	4,2	1,8	1400	365	1100	225	650	110	450	70	3500	715
R8.0 x 16.0	5,6	2,4	1100	320	850	210	500	110	350	70	2800	630
R10.0 x 20.0	7	3	850	295	700	180	400	105	300	70	2250	590
R12.5 x 25.0	8,75	3,75	700	280	550	145	300	85	200	65	1800	530

# HM029 HMF29

## BALLNOSE KULISTE

4-6 Flute, Long Length 4-6-ostrzowe, długie

<b>P</b>			<b>H</b>		<b>M</b>	<b>K</b>	<b>N</b>		<b>S</b>					
<750 N/mm <sup>2</sup>	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NICO 200-300 HB	Ti 200-410 GB
•	•								○	○			•	•



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	R	D	d1	L	l1	Z	Shank Uchwyt
HM029100050B10045095	HMF29100050B10045095	5	10.0	10	95	45	4	B
HM029120060B12053110	HMF29120060B12053110	6	12.0	12	110	53	4	B
HM029160080B16063123	HMF29160080B16063123	8	16.0	16	123	63	4	B
HM029200100B20075141	HMF29200100B20075141	10	20.0	20	141	75	4	B
HM029250125B25090166	HMF29250125B25090166	12,5	25.0	25	166	90	6	B

	d1 h6		± 0,02
	D 0~-0.03		

**HM029 HMF29**

Cutting Conditions Parametry skrawania

**Uncoated Bez pokrycia**

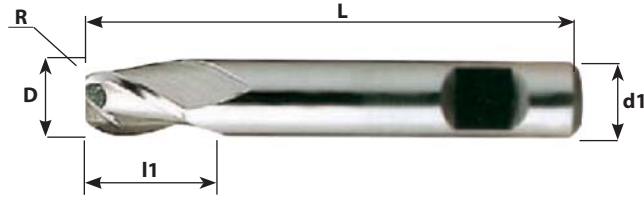
Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
Hardness Twardość			~ HRC20		HRC20 ~ HRC30		HRC30 ~ HRC40					
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
R3.0 x 6.0	2,1	0,9	2200	200	1700	135	1000	70	700	40	5600	420
R4.0 x 8.0	2,8	1,2	1600	240	1200	160	700	75	500	45	4000	530
R5.0 x 10.0	3,5	1,5	1300	270	1000	180	560	90	400	50	3200	540
R6.0 x 12.0	4,2	1,8	1000	260	800	160	450	80	320	50	2500	510
R8.0 x 16.0	5,6	2,4	800	230	600	150	350	80	250	50	2000	450
R10.0 x 20.0	7	3	600	210	500	130	300	75	200	50	1600	420
R12.5 x 25.0	8,75	3,75	500	200	400	105	220	60	160	45	1300	380

**Coated TiAlN Pokryte TiAlN**

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
Hardness Twardość			~ HRC20		HRC20 ~ HRC30		HRC30 ~ HRC40					
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
R3.0 x 6.0	2,1	0,9	3100	280	2400	190	1400	100	1000	55	7850	590
R4.0 x 8.0	2,8	1,2	2250	335	1700	225	1000	105	700	65	5600	740
R5.0 x 10.0	3,5	1,5	1800	380	1400	250	800	125	550	70	4500	755
R6.0 x 12.0	4,2	1,8	1400	365	1100	225	650	110	450	70	3500	715
R8.0 x 16.0	5,6	2,4	1100	320	850	210	500	110	350	70	2800	630
R10.0 x 20.0	7	3	850	295	700	180	400	105	300	70	2250	590
R12.5 x 25.0	8,75	3,75	700	280	550	145	300	85	200	65	1800	530

**HM012 HMF12**
**BALLNOSE KULISTE**  
 3 Flute, Short Length 3-ostrzowe, krótkie

						<b>HSS</b> Co 8%									<b>AIR</b>
<b>P</b>				<b>H</b>		<b>M</b>		<b>K</b>	<b>N</b>				<b>S</b>		
<750 N/mm <sup>2</sup>	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NICO 200-300 HB	Ti 200-410 GB	
•	•								o	o					



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	R	D	d1	L	l1	Z	Shank Uchwyt
HM012020010B06004035	HMF12020010B06004035	1	2.0	6	35	4	3	B
HM012025013B06005036	HMF12025013B06005036	1,25	2.5	6	36	5	3	B
HM012030015B06005036	HMF12030015B06005036	1,5	3.0	6	36	5	3	B
HM012040020B06007038	HMF12040020B06007038	2	4.0	6	38	7	3	B
HM012050025B06008039	HMF12050025B06008039	2,5	5.0	6	39	8	3	B
HM012060030B06008039	HMF12060030B06008039	3	6.0	6	39	8	3	B

	d1 h6		± 0,02		
	D 0~-0.03				

**HM012 HMF12**

Cutting Conditions Parametry skrawania

**Uncoated Bez pokrycia**

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
Hardness Twardość			~ HRC20		HRC20 ~HRC30		HRC30 ~HRC40					
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
R3.0 x 6.0	2,1	0,9	2200	200	1700	135	1000	70	700	40	5600	420
R4.0 x 8.0	2,8	1,2	1600	240	1200	160	700	75	500	45	4000	530
R5.0 x 10.0	3,5	1,5	1300	270	1000	180	560	90	400	50	3200	540
R6.0 x 12.0	4,2	1,8	1000	260	800	160	450	80	320	50	2500	510
R8.0 x 16.0	5,6	2,4	800	230	600	150	350	80	250	50	2000	450
R10.0 x 20.0	7	3	600	210	500	130	300	75	200	50	1600	420
R12.5 x 25.0	8,75	3,75	500	200	400	105	220	60	160	45	1300	380

**Coated TiAlN Pokryte TiAlN**

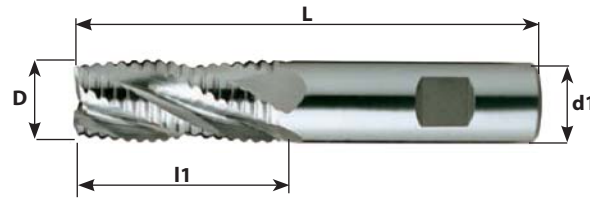
Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
Hardness Twardość			~ HRC20		HRC20 ~HRC30		HRC30 ~HRC40					
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
R3.0 x 6.0	2,1	0,9	3100	280	2400	190	1400	100	1000	55	7850	590
R4.0 x 8.0	2,8	1,2	2250	335	1700	225	1000	105	700	65	5600	740
R5.0 x 10.0	3,5	1,5	1800	380	1400	250	800	125	550	70	4500	755
R6.0 x 12.0	4,2	1,8	1400	365	1100	225	650	110	450	70	3500	715
R8.0 x 16.0	5,6	2,4	1100	320	850	210	500	110	350	70	2800	630
R10.0 x 20.0	7	3	850	295	700	180	400	105	300	70	2250	590
R12.5 x 25.0	8,75	3,75	700	280	550	145	300	85	200	65	1800	530



**HM0A1 HMFA1**
**SQUARE TYPE WALCOWO-CZOŁOWE**

Multi Flute, Short Length Wielostrzowe, krótkie

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



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM0A1060030B06013057	HMFA1060030B06013057	6.0	6	57	13	3	B
HM0A1070030B10016066	HMFA1070030B10016066	7.0	10	66	16	3	B
HM0A1080030B10019069	HMFA1080030B10019069	8.0	10	69	19	3	B
HM0A1090030B10019069	HMFA1090030B10019069	9.0	10	69	19	3	B
HM0A1095030B10019069	HMFA1095030B10019069	9.5	10	69	19	3	B
HM0A1100040B10022072	HMFA1100040B10022072	10.0	10	72	22	4	B
HM0A1110040B12022079	HMFA1110040B12022079	11.0	12	79	22	4	B
HM0A1120040B12026083	HMFA1120040B12026083	12.0	12	83	26	4	B
HM0A1125040B12026083	HMFA1125040B12026083	12.5	12	83	26	4	B
HM0A1130040B12026083	HMFA1130040B12026083	13.0	12	83	26	4	B
HM0A1140040B12026083	HMFA1140040B12026083	14.0	12	83	26	4	B
HM0A1145040B12026083	HMFA1145040B12026083	14.5	12	83	26	4	B
HM0A1150040B12026083	HMFA1150040B12026083	15.0	12	83	26	4	B
HM0A1160040B16032092	HMFA1160040B16032092	16.0	16	92	32	4	B
HM0A1170040B16032092	HMFA1170040B16032092	17.0	16	92	32	4	B
HM0A1180040B16032092	HMFA1180040B16032092	18.0	16	92	32	4	B
HM0A1190040B16032092	HMFA1190040B16032092	19.0	16	92	32	4	B
HM0A1200040B20038104	HMFA1200040B20038104	20.0	20	104	38	4	B
HM0A1200040B16038098	HMFA1200040B16038098	20.0	16	98	38	4	B
HM0A1220050B20038104	HMFA1220050B20038104	22.0	20	104	38	5	B
HM0A1240050B25045121	HMFA1240050B25045121	24.0	25	121	45	5	B
HM0A1250050B25045121	HMFA1250050B25045121	25.0	25	121	45	5	B
HM0A1260060B25045121	HMFA1260060B25045121	26.0	25	121	45	6	B
HM0A1280060B25045121	HMFA1280060B25045121	28.0	25	121	45	6	B
HM0A1300060B25045121	HMFA1300060B25045121	30.0	25	121	45	6	B
HM0A1320060B32053133	HMFA1320060B32053133	32.0	32	133	53	6	B
HM0A1340060B32053133	HMFA1340060B32053133	34.0	32	133	53	6	B
HM0A1350060B32053133	HMFA1350060B32053133	35.0	32	133	53	6	B
HM0A1360060B32053133	HMFA1360060B32053133	36.0	32	133	53	6	B
HM0A1380060B32063155	HMFA1380060B32063155	38.0	32	155	63	6	B
HM0A1380060B40063155	HMFA1380060B40063155	38.0	40	155	63	6	B
HM0A1400060B32063155	HMFA1400060B32063155	40.0	32	155	63	6	B
HM0A1400060B40063155	HMFA1400060B40063155	40.0	40	155	63	6	B
HM0A1450060B32063143	HMFA1450060B32063143	45.0	32	143	63	6	B
HM0A1500060B50075177	HMFA1500060B50075177	50.0	50	177	75	6	B
HM0A1060000B06013057	HMFA1060000B06013057	6.0	6	57	13	3	B
HM0A1080000B10019069	HMFA1080000B10019069	8.0	10	69	19	3	B

	d1 ≤ 3,0	0 — -6	d1 ≤ 18	0 — -11
	d1 ≤ 6,0	0 — -8	d1 ≤ 30	0 — -13
	d1 ≤ 10	0 — -9	d1 ≤ 50	0 — -16

**HM0A1 HMFA1**

Cutting Conditions Parametry skrawania

**Uncoated - Side Cuting** Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		~ HRC20 500 ~ 800N/mm2		HRC20 ~ HRC30 800 ~ 1000N/mm2		HRC30 ~ HRC40 1000 ~ 1300N/mm2			
Hardness Twardość												
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	1800	80	1600	60	1200	55	800	30	4500	200
8.0	4	12	1400	105	1100	75	900	65	560	35	3100	230
10.0	5	15	1100	150	900	120	800	110	450	60	2500	350
12.0	6	18	900	180	800	140	630	110	400	70	2000	400
14.0	7	21	800	180	700	140	560	110	350	70	1800	420
16.0	8	24	700	180	560	140	450	110	280	70	1600	450
18.0	9	27	630	180	500	140	400	110	250	70	1400	470
20.0	10	30	560	180	450	140	400	110	220	70	1200	500
22.0	11	33	500	220	450	170	350	140	220	85	1100	470
25.0	12,5	37,5	450	220	400	170	310	140	180	85	1000	450
28.0	14	42	400	210	350	160	280	130	160	85	900	510
30.0	15	45	350	210	310	160	250	130	160	85	900	530
32.0	16	48	350	210	280	160	220	130	140	85	800	500
36.0	18	54	310	210	250	160	200	130	120	85	700	470
40.0	20	60	280	200	220	150	180	120	110	80	630	450
50.0	25	75	220	200	180	170	160	140	90	80	500	370

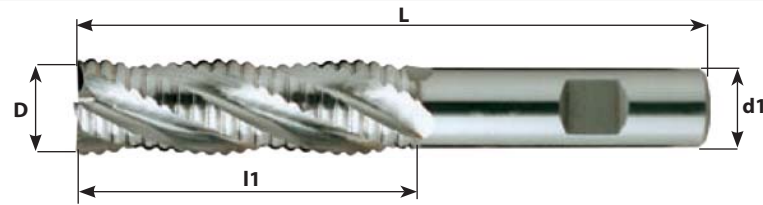
**Coated TiAlN - Side Cuting** Pokryte TiAlN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		~ HRC20 500 ~ 800N/mm2		HRC20 ~ HRC30 800 ~ 1000N/mm2		HRC30 ~ HRC40 1000 ~ 1300N/mm2			
Hardness Twardość												
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	2500	110	2250	85	1700	75	1100	40	6300	280
8.0	4	12	1950	145	1550	105	1250	90	800	50	4350	320
10.0	5	15	1550	210	1250	170	1100	155	650	85	3500	490
12.0	6	18	1250	250	1100	195	900	155	550	100	2800	560
14.0	7	21	1100	250	1000	195	800	155	500	100	2500	590
16.0	8	24	1000	250	800	195	650	155	400	100	2250	630
18.0	9	27	900	250	700	195	550	155	350	100	1950	660
20.0	10	30	800	250	650	195	550	155	300	100	1700	700
22.0	11	33	700	310	650	240	500	195	300	120	1550	660
25.0	12,5	37,5	650	310	550	240	450	195	250	120	1400	630
28.0	14	42	550	295	500	225	400	180	220	120	1250	715
30.0	15	45	500	295	450	225	350	180	220	120	1250	740
32.0	16	48	500	295	400	225	300	180	200	120	1100	700
36.0	18	54	450	295	350	225	300	180	170	120	1000	660
40.0	20	60	400	280	300	210	250	170	130	110	900	630
50.0	25	75	300	280	250	240	220	195	120	110	700	520

**HM0A2 HMFA2**
**SQUARE TYPE WALCOWO-CZOŁOWE**

Multi Flute, Long Length Wielostrzowe, długie

<b>P</b>				<b>H</b>		<b>M</b>		<b>K</b>	<b>N</b>				<b>S</b>	
<750 N/mm <sup>2</sup>	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NICO 200-300 HB	Ti 200-410 GB



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM0A2060030B06024068	HMFA2060030B06024068	6.0	6	68	24	3	B
HM0A2070030B10030080	HMFA2070030B10030080	7.0	10	80	30	3	B
HM0A2080030B10038088	HMFA2080030B10038088	8.0	10	88	38	3	B
HM0A2090030B10038088	HMFA2090030B10038088	9.0	10	88	38	3	B
HM0A2100040B10045095	HMFA2100040B10045095	10.0	10	95	45	4	B
HM0A2110040B12045102	HMFA2110040B12045102	11.0	12	102	45	4	B
HM0A2120040B12053110	HMFA2120040B12053110	12.0	12	110	53	4	B
HM0A2130040B12053110	HMFA2130040B12053110	13.0	12	110	53	4	B
HM0A2140040B12053110	HMFA2140040B12053110	14.0	12	110	53	4	B
HM0A2150040B12053110	HMFA2150040B12053110	15.0	12	110	53	4	B
HM0A2160040B16063123	HMFA2160040B16063123	16.0	16	123	63	4	B
HM0A2170040B16063123	HMFA2170040B16063123	17.0	16	123	63	4	B
HM0A2180040B16063123	HMFA2180040B16063123	18.0	16	123	63	4	B
HM0A2190040B16063123	HMFA2190040B16063123	19.0	16	123	63	4	B
HM0A2200040B20075141	HMFA2200040B20075141	20.0	20	141	75	4	B
HM0A2200040B16075135	HMFA2200040B16075135	20.0	16	135	75	4	B
HM0A2220050B20075141	HMFA2220050B20075141	22.0	20	141	75	5	B
HM0A2220050B25075151	HMFA2220050B25075151	22.0	25	151	75	5	B
HM0A2240050B25090166	HMFA2240050B25090166	24.0	25	166	90	5	B
HM0A2250050B25090166	HMFA2250050B25090166	25.0	25	166	90	5	B
HM0A2260060B25090166	HMFA2260060B25090166	26.0	25	166	90	6	B
HM0A2280060B25090166	HMFA2280060B25090166	28.0	25	166	90	6	B
HM0A2300060B25090166	HMFA2300060B25090166	30.0	25	166	90	6	B
HM0A232060B320106186	HMFA232060B320106186	32.0	32	186	106	6	B
HM0A235060B320106186	HMFA235060B320106186	35.0	32	186	106	6	B
HM0A236060B320106186	HMFA236060B320106186	36.0	32	186	106	6	B
HM0A238060B320125217	HMFA238060B320125217	38.0	32	217	125	6	B
HM0A238060B400125217	HMFA238060B400125217	38.0	40	217	125	6	B
HM0A240060B320125217	HMFA240060B320125217	40.0	32	217	125	6	B
HM0A240060B400125217	HMFA240060B400125217	40.0	40	217	125	6	B

	d1 ≤ 3,0	0 — -6	d1 ≤ 18	0 — -11
	d1 ≤ 6,0	0 — -8	d1 ≤ 30	0 — -13
	d1 ≤ 10	0 — -9	d1 ≤ 50	0 — -16

**HM0A2 HMFA2**

Cutting Conditions Parametry skrawania

**Uncoated - Side Cuting** Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		~ HRC20 500 ~ 800N/mm2		HRC20 ~ HRC30 800 ~ 1000N/mm2		HRC30 ~ HRC40 1000 ~ 1300N/mm2			
Hardness Twardość												
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	1800	80	1600	60	1200	55	800	30	4500	200
8.0	4	12	1400	105	1100	75	900	65	560	35	3100	230
10.0	5	15	1100	150	900	120	800	110	450	60	2500	350
12.0	6	18	900	180	800	140	630	110	400	70	2000	400
14.0	7	21	800	180	700	140	560	110	350	70	1800	420
16.0	8	24	700	180	560	140	450	110	280	70	1600	450
18.0	9	27	630	180	500	140	400	110	250	70	1400	470
20.0	10	30	560	180	450	140	400	110	220	70	1200	500
22.0	11	33	500	220	450	170	350	140	220	85	1100	470
25.0	12,5	37,5	450	220	400	170	310	140	180	85	1000	450
28.0	14	42	400	210	350	160	280	130	160	85	900	510
30.0	15	45	350	210	310	160	250	130	160	85	900	530
32.0	16	48	350	210	280	160	220	130	140	85	800	500
36.0	18	54	310	210	250	160	200	130	120	85	700	470
40.0	20	60	280	200	220	150	180	120	110	80	630	450
50.0	25	75	220	200	180	170	160	140	90	80	500	370

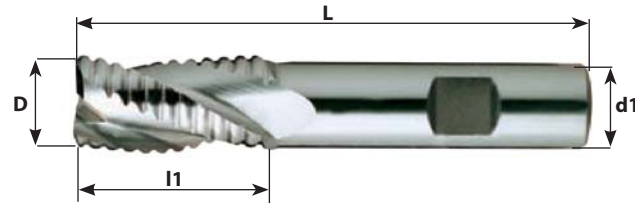
**Coated TiAlN - Side Cuting** Pokryte TiAlN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		~ HRC20 500 ~ 800N/mm2		HRC20 ~ HRC30 800 ~ 1000N/mm2		HRC30 ~ HRC40 1000 ~ 1300N/mm2			
Hardness Twardość												
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	2500	110	2250	85	1700	75	1100	40	6300	280
8.0	4	12	1950	145	1550	105	1250	90	800	50	4350	320
10.0	5	15	1550	210	1250	170	1100	155	650	85	3500	490
12.0	6	18	1250	250	1100	195	900	155	550	100	2800	560
14.0	7	21	1100	250	1000	195	800	155	500	100	2500	590
16.0	8	24	1000	250	800	195	650	155	400	100	2250	630
18.0	9	27	900	250	700	195	550	155	350	100	1950	660
20.0	10	30	800	250	650	195	550	155	300	100	1700	700
22.0	11	33	700	310	650	240	500	195	300	120	1550	660
25.0	12,5	37,5	650	310	550	240	450	195	250	120	1400	630
28.0	14	42	550	295	500	225	400	180	220	120	1250	715
30.0	15	45	500	295	450	225	350	180	220	120	1250	740
32.0	16	48	500	295	400	225	300	180	200	120	1100	700
36.0	18	54	450	295	350	225	300	180	170	120	1000	660
40.0	20	60	400	280	300	210	250	170	130	110	900	630
50.0	25	75	300	280	250	240	220	195	120	110	700	520

**HM0B4 HMFB4**
**SQUARE TYPE WALCOWO-CZOŁOWE**

3 Flute, Short Length 3-ostrzowe, krótkie

<b>P</b>				<b>H</b>		<b>M</b>		<b>K</b>	<b>N</b>				<b>S</b>		
<750 N/mm <sup>2</sup>	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB	
•	•								○	○			•	•	•



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM0B4100000B10022072	HMFB4100000B10022072	10.0	10	72	22	3	B
HM0B4120000B12026083	HMFB4120000B12026083	12.0	12	83	26	3	B
HM0B4140000B12026083	HMFB4140000B12026083	14.0	12	83	26	3	B
HM0B4160000B16032092	HMFB4160000B16032092	16.0	16	92	32	3	B
HM0B4180000B16032092	HMFB4180000B16032092	18.0	16	92	32	3	B
HM0B4200000B20038104	HMFB4200000B20038104	20.0	20	104	38	3	B
HM0B4220000B20038104	HMFB4220000B20038104	22.0	20	104	38	3	B
HM0B4250000B25045121	HMFB4250000B25045121	25.0	25	121	45	3	B
HM0B4280000B25045121	HMFB4280000B25045121	28.0	25	121	45	3	B
HM0B4300000B25045121	HMFB4300000B25045121	30.0	25	121	45	3	B
HM0B4320000B32053133	HMFB4320000B32053133	32.0	32	133	53	3	B
HM0B4360000B32053133	HMFB4360000B32053133	36.0	32	133	53	3	B
HM0B4400000B32063155	HMFB4400000B32063155	40.0	32	155	63	3	B

	d1 ≤ 3,0	0 — -6	d1 ≤ 18	0 — -11
	d1 ≤ 6,0	0 — -8	d1 ≤ 30	0 — -13
	d1 ≤ 10	0 — -9	d1 ≤ 50	0 — -16

**HMOB4 HMFB4**

Cutting Conditions Parametry skrawania

**Uncoated - Side Cuting** Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		~ HRC20 500 ~ 800N/mm2		HRC20 ~ HRC30 800 ~ 1000N/mm2		HRC30 ~ HRC40 1000 ~ 1300N/mm2			
Hardness Twardość												
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	1800	80	1600	60	1200	55	800	30	4500	200
8.0	4	12	1400	105	1100	75	900	65	560	35	3100	230
10.0	5	15	1100	150	900	120	800	110	450	60	2500	350
12.0	6	18	900	180	800	140	630	110	400	70	2000	400
14.0	7	21	800	180	700	140	560	110	350	70	1800	420
16.0	8	24	700	180	560	140	450	110	280	70	1600	450
18.0	9	27	630	180	500	140	400	110	250	70	1400	470
20.0	10	30	560	180	450	140	400	110	220	70	1200	500
22.0	11	33	500	220	450	170	350	140	220	85	1100	470
25.0	12,5	37,5	450	220	400	170	310	140	180	85	1000	450
28.0	14	42	400	210	350	160	280	130	160	85	900	510
30.0	15	45	350	210	310	160	250	130	160	85	900	530
32.0	16	48	350	210	280	160	220	130	140	85	800	500
36.0	18	54	310	210	250	160	200	130	120	85	700	470
40.0	20	60	280	200	220	150	180	120	110	80	630	450
50.0	25	75	220	200	180	170	160	140	90	80	500	370

**Coated TiAlN - Side Cuting** Pokryte TiAlN - Frezowanie boczne

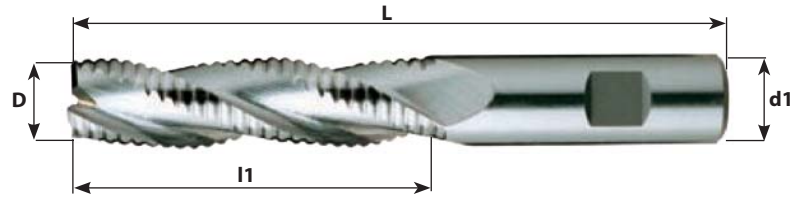
Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		~ HRC20 500 ~ 800N/mm2		HRC20 ~ HRC30 800 ~ 1000N/mm2		HRC30 ~ HRC40 1000 ~ 1300N/mm2			
Hardness Twardość												
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	2500	110	2250	85	1700	75	1100	40	6300	280
8.0	4	12	1950	145	1550	105	1250	90	800	50	4350	320
10.0	5	15	1550	210	1250	170	1100	155	650	85	3500	490
12.0	6	18	1250	250	1100	195	900	155	550	100	2800	560
14.0	7	21	1100	250	1000	195	800	155	500	100	2500	590
16.0	8	24	1000	250	800	195	650	155	400	100	2250	630
18.0	9	27	900	250	700	195	550	155	350	100	1950	660
20.0	10	30	800	250	650	195	550	155	300	100	1700	700
22.0	11	33	700	310	650	240	500	195	300	120	1550	660
25.0	12,5	37,5	650	310	550	240	450	195	250	120	1400	630
28.0	14	42	550	295	500	225	400	180	220	120	1250	715
30.0	15	45	500	295	450	225	350	180	220	120	1250	740
32.0	16	48	500	295	400	225	300	180	200	120	1100	700
36.0	18	54	450	295	350	225	300	180	170	120	1000	660
40.0	20	60	400	280	300	210	250	170	130	110	900	630
50.0	25	75	300	280	250	240	220	195	120	110	700	520

# HM065 HMF65

## SQUARE TYPE WALCOWO-CZOŁOWE

3 Flute, Long Length 3-ostrzowe, długie

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



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM065100000B10045095	HMF65100000B10045095	10.0	10	95	45	3	B
HM065120000B12053110	HMF65120000B12053110	12.0	12	110	53	3	B
HM065140000B12053110	HMF65140000B12053110	14.0	12	110	53	3	B
HM065160000B16063123	HMF65160000B16063123	16.0	16	123	63	3	B
HM065180000B16063123	HMF65180000B16063123	18.0	16	123	63	3	B
HM065200000B20075141	HMF65200000B20075141	20.0	20	141	75	3	B
HM065220000B20075141	HMF65220000B20075141	22.0	20	141	75	3	B
HM065250000B25090166	HMF65250000B25090166	25.0	25	166	90	3	B
HM065280000B25090166	HMF65280000B25090166	28.0	25	166	90	3	B
HM065300000B25090166	HMF65300000B25090166	30.0	25	166	90	3	B
HM065360000B320106186	HMF65360000B320106186	36.0	32	186	106	3	B
HM065400000B320125217	HMF65400000B320125217	40.0	32	217	125	3	B

	d1 ≤ 3,0	0 — -6	d1 ≤ 18	0 — -11
	d1 ≤ 6,0	0 — -8	d1 ≤ 30	0 — -13
	d1 ≤ 10	0 — -9	d1 ≤ 50	0 — -16

**HM065 HMF65**

Cutting Conditions Parametry skrawania

**Uncoated - Side Cuting** Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		~ HRC20 500 ~ 800N/mm2		HRC20 ~ HRC30 800 ~ 1000N/mm2		HRC30 ~ HRC40 1000 ~ 1300N/mm2			
Hardness Twardość												
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	1800	80	1600	60	1200	55	800	30	4500	200
8.0	4	12	1400	105	1100	75	900	65	560	35	3100	230
10.0	5	15	1100	150	900	120	800	110	450	60	2500	350
12.0	6	18	900	180	800	140	630	110	400	70	2000	400
14.0	7	21	800	180	700	140	560	110	350	70	1800	420
16.0	8	24	700	180	560	140	450	110	280	70	1600	450
18.0	9	27	630	180	500	140	400	110	250	70	1400	470
20.0	10	30	560	180	450	140	400	110	220	70	1200	500
22.0	11	33	500	220	450	170	350	140	220	85	1100	470
25.0	12,5	37,5	450	220	400	170	310	140	180	85	1000	450
28.0	14	42	400	210	350	160	280	130	160	85	900	510
30.0	15	45	350	210	310	160	250	130	160	85	900	530
32.0	16	48	350	210	280	160	220	130	140	85	800	500
36.0	18	54	310	210	250	160	200	130	120	85	700	470
40.0	20	60	280	200	220	150	180	120	110	80	630	450
50.0	25	75	220	200	180	170	160	140	90	80	500	370

**Coated TiAlN - Side Cuting** Pokryte TiAlN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		~ HRC20 500 ~ 800N/mm2		HRC20 ~ HRC30 800 ~ 1000N/mm2		HRC30 ~ HRC40 1000 ~ 1300N/mm2			
Hardness Twardość												
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	2500	110	2250	85	1700	75	1100	40	6300	280
8.0	4	12	1950	145	1550	105	1250	90	800	50	4350	320
10.0	5	15	1550	210	1250	170	1100	155	650	85	3500	490
12.0	6	18	1250	250	1100	195	900	155	550	100	2800	560
14.0	7	21	1100	250	1000	195	800	155	500	100	2500	590
16.0	8	24	1000	250	800	195	650	155	400	100	2250	630
18.0	9	27	900	250	700	195	550	155	350	100	1950	660
20.0	10	30	800	250	650	195	550	155	300	100	1700	700
22.0	11	33	700	310	650	240	500	195	300	120	1550	660
25.0	12,5	37,5	650	310	550	240	450	195	250	120	1400	630
28.0	14	42	550	295	500	225	400	180	220	120	1250	715
30.0	15	45	500	295	450	225	350	180	220	120	1250	740
32.0	16	48	500	295	400	225	300	180	200	120	1100	700
36.0	18	54	450	295	350	225	300	180	170	120	1000	660
40.0	20	60	400	280	300	210	250	170	130	110	900	630
50.0	25	75	300	280	250	240	220	195	120	110	700	520

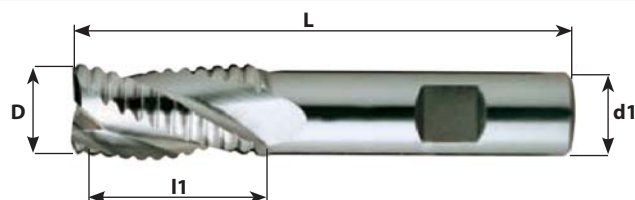


# HM0A5

## SQUARE TYPE WALCOWO-CZOŁOWE

3 Flute, Short Length 3-ostrzowe, krótkie

	<b>HSS</b> Co 8%													
<b>P</b>	<b>H</b>	<b>M</b>	<b>K</b>	<b>N</b>	<b>S</b>									
<750 N/mm <sup>2</sup>	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NICO 200-300 HB	Ti 200-410 GB
•	○								•	•				



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM0A5060000B06013057	HMFA5060000B06013057	6.0	6	57	13	3	B
HM0A5080000B10019069	HMFA5080000B10019069	8.0	10	69	19	3	B
HM0A5100000B10022072	HMFA5100000B10022072	10.0	10	72	22	3	B
HM0A5120000B12026083	HMFA5120000B12026083	12.0	12	83	26	3	B
HM0A5140000B12026083	HMFA5140000B12026083	14.0	12	83	26	3	B
HM0A5160000B16032092	HMFA5160000B16032092	16.0	16	92	32	3	B
HM0A5180000B16032092	HMFA5180000B16032092	18.0	16	92	32	3	B
HM0A5200000B20038104	HMFA5200000B20038104	20.0	20	104	38	3	B
HM0A5220000B20038104	HMFA5220000B20038104	22.0	20	104	38	3	B
HM0A5250000B25045121	HMFA5250000B25045121	25.0	25	121	45	3	B
HM0A5300000B25045121	HMFA5300000B25045121	30.0	25	121	45	3	B

	d1 ≤ 3,0	0 — -6	d1 ≤ 18	0 — -11
	d1 ≤ 6,0	0 — -8	d1 ≤ 30	0 — -13
	d1 ≤ 10	0 — -9	d1 ≤ 50	0 — -16

**HMOA5**

Cutting Conditions Parametry skrawania

**Uncoated - Side Cutting** Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
Hardness Twardość					~ HRC20		HRC20 ~HRC30		HRC30 ~HRC40			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	1800	80	1600	60	1200	55	800	30	4500	200
8.0	4	12	1400	105	1100	75	900	65	560	35	3100	230
10.0	5	15	1100	150	900	120	800	110	450	60	2500	350
12.0	6	18	900	180	800	140	630	110	400	70	2000	400
14.0	7	21	800	180	700	140	560	110	350	70	1800	420
16.0	8	24	700	180	560	140	450	110	280	70	1600	450
18.0	9	27	630	180	500	140	400	110	250	70	1400	470
20.0	10	30	560	180	450	140	400	110	220	70	1200	500
22.0	11	33	500	220	450	170	350	140	220	85	1100	470
25.0	12,5	37,5	450	220	400	170	310	140	180	85	1000	450
30.0	15	45	350	210	310	160	250	130	160	85	900	530

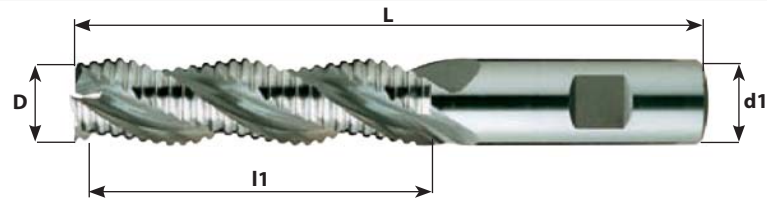
**Coated TiAlN - Side Cutting** Pokryte TiAlN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
Hardness Twardość					~ HRC20		HRC20 ~HRC30		HRC30 ~HRC40			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	2500	110	2250	85	1700	75	1100	40	6300	280
8.0	4	12	1950	145	1550	105	1250	90	800	50	4350	320
10.0	5	15	1550	210	1250	170	1100	155	650	85	3500	490
12.0	6	18	1250	250	1100	195	900	155	550	100	2800	560
14.0	7	21	1100	250	1000	195	800	155	500	100	2500	590
16.0	8	24	1000	250	800	195	650	155	400	100	2250	630
18.0	9	27	900	250	700	195	550	155	350	100	1950	660
20.0	10	30	800	250	650	195	550	155	300	100	1700	700
22.0	11	33	700	310	650	240	500	195	300	120	1550	660
25.0	12,5	37,5	650	310	550	240	450	195	250	120	1400	630
30.0	15	45	500	295	450	225	350	180	220	120	1250	740

**HM056**
**SQUARE TYPE WALCOWO-CZOŁOWE**

3 Flute, Long Length 3-ostrzowe, długie

P				H		M		K	N			S		
<750 N/mm <sup>2</sup>	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NICO 200-300 HB	Ti 200-410 GB



D code Uncoated Kod bez pokrycia	D	d1	L	l1	Z	Shank Uchwyt
HM056100000B10045095	10.0	10	95	45	3	B
HM056120000B12053110	12.0	12	110	53	3	B
HM056140000B12053110	14.0	12	110	53	3	B
HM056160000B16063123	16.0	16	123	63	3	B
HM056180000B16063123	18.0	16	123	63	3	B
HM056200000B20075141	20.0	20	141	75	3	B
HM056220000B20075141	22.0	20	141	75	3	B
HM056250000B25090166	25.0	25	166	90	3	B
HM056300000B25090166	30.0	25	166	90	3	B

	d1 ≤ 3,0	0 — -6	d1 ≤ 18	0 — -11	
	d1 ≤ 6,0	0 — -8	d1 ≤ 30	0 — -13	
	d1 ≤ 10	0 — -9	d1 ≤ 50	0 — -16	

**HM056**

Cutting Conditions Parametry skrawania

**Uncoated - Side Cutiing** Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
Hardness Twardość			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	1800	80	1600	60	1200	55	800	30	4500	200
8.0	4	12	1400	105	1100	75	900	65	560	35	3100	230
10.0	5	15	1100	150	900	120	800	110	450	60	2500	350
12.0	6	18	900	180	800	140	630	110	400	70	2000	400
14.0	7	21	800	180	700	140	560	110	350	70	1800	420
16.0	8	24	700	180	560	140	450	110	280	70	1600	450
18.0	9	27	630	180	500	140	400	110	250	70	1400	470
20.0	10	30	560	180	450	140	400	110	220	70	1200	500
22.0	11	33	500	220	450	170	350	140	220	85	1100	470
25.0	12,5	37,5	450	220	400	170	310	140	180	85	1000	450
30.0	15	45	350	210	310	160	250	130	160	85	900	530

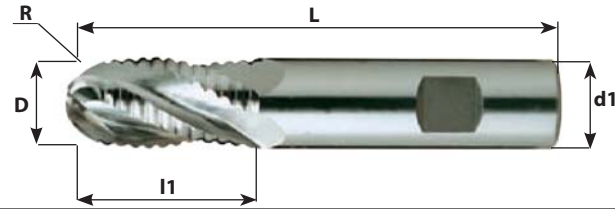
**Coated TiAlN - Side Cutiing** Pokryte TiAlN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
Hardness Twardość			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	2500	110	2250	85	1700	75	1100	40	6300	280
8.0	4	12	1950	145	1550	105	1250	90	800	50	4350	320
10.0	5	15	1550	210	1250	170	1100	155	650	85	3500	490
12.0	6	18	1250	250	1100	195	900	155	550	100	2800	560
14.0	7	21	1100	250	1000	195	800	155	500	100	2500	590
16.0	8	24	1000	250	800	195	650	155	400	100	2250	630
18.0	9	27	900	250	700	195	550	155	350	100	1950	660
20.0	10	30	800	250	650	195	550	155	300	100	1700	700
22.0	11	33	700	310	650	240	500	195	300	120	1550	660
25.0	12,5	37,5	650	310	550	240	450	195	250	120	1400	630
30.0	15	45	500	295	450	225	350	180	220	120	1250	740

**HM057 HMF57**
**SQUARE TYPE WALCOWO-CZOŁOWE**

3-4 Flute, Short Length 3-4-ostrzowe, krótkie

						<b>HSS</b> Co 8%										<b>AIR</b>
<b>P</b>				<b>H</b>		<b>M</b>		<b>K</b>	<b>N</b>				<b>S</b>			
<750 N/mm <sup>2</sup>	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NICO 200-300 HB	Ti 200-410 GB		
•	•								o	o						



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	R	D	d1	L	l1	Z	Shank Uchwyt
HM057060030B06013057	HMF57060030B06013057	3	6.0	6	57	13	3	B
HM057080040B10019069	HMF57080040B10019069	4	8.0	10	69	19	3	B
HM057100050B10022072	HMF57100050B10022072	5	10.0	10	72	22	3	B
HM057120060B12026083	HMF57120060B12026083	6	12.0	12	83	26	4	B
HM057160080B16032092	HMF57160080B16032092	8	16.0	16	92	32	4	B
HM057200100B20038104	HMF57200100B20038104	10	20.0	20	104	38	4	B
HM057250125B25045121	HMF57250125B25045121	12,5	25.0	25	121	45	4	B
HM057320160B32053133	HMF57320160B32053133	16	32.0	32	133	53	4	B
HM057400200B32063155	HMF57400200B32063155	20	40.0	32	155	63	4	B

	d1 ≤ 3,0	0 — -6	d1 ≤ 18	0 — -11	
	d1 ≤ 6,0	0 — -8	d1 ≤ 30	0 — -13	
	d1 ≤ 10	0 — -9	d1 ≤ 50	0 — -16	

**HM057 HMF57**

Cutting Conditions Parametry skrawania

**Uncoated - Side Cutiing** Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
Hardness Twardość			~ HRC20		HRC20 ~HRC30		HRC30 ~HRC40					
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
R4.0 x 8.0	2	6	1400	105	1100	75	900	65	560	35	3100	230
R5.0 x 10.0	2,5	7,5	1100	150	900	120	800	110	450	60	2500	250
R6.0 x 12.0	3	9	900	180	800	140	630	110	400	70	2000	400
R8.0 x 16.0	4	12	700	180	560	140	450	110	280	70	1600	450
R10.0 x 20.0	5	15	560	180	450	140	400	110	220	70	1200	500
R12.5 x 25.0	6,25	18,75	450	220	400	170	310	140	180	85	1000	450
R16.0 x 32.0	8	24	350	210	280	160	220	130	140	85	800	500
R20.0 x 40.0	10	30	280	200	220	150	180	120	110	80	630	450

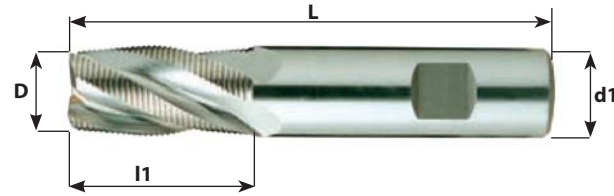
**Coated TiAlN - Side Cutiing** Pokryte TiAlN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
Hardness Twardość			~ HRC20		HRC20 ~HRC30		HRC30 ~HRC40					
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
R4.0 x 8.0	2	6	1960	150	1540	105	1260	90	790	50	4340	320
R5.0 x 10.0	2,5	7,5	1540	210	1260	170	1120	155	630	85	3500	350
R6.0 x 12.0	3	9	1260	250	1120	195	880	155	560	100	2800	560
R8.0 x 16.0	4	12	980	250	790	195	630	155	390	100	2240	630
R10.0 x 20.0	5	15	790	250	630	195	560	155	310	100	1680	700
R12.5 x 25.0	6,25	18,75	630	310	560	240	440	195	250	120	1400	630
R16.0 x 32.0	8	24	490	295	390	225	310	180	200	120	1120	700
R20.0 x 40.0	10	30	390	280	310	210	250	170	160	110	880	630

**HM0B1 HMFB1**
**SQUARE TYPE WALCOWO-CZOŁOWE**

Multi Flute, Long Length Wielostrzowe, długie

<b>P</b>				<b>H</b>		<b>M</b>		<b>K</b>	<b>N</b>			<b>S</b>		
<750 N/mm <sup>2</sup>	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NICO 200-300 HB	Ti 200-410 GB
•	•								○	○			•	•



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM0B1060000B06013057	HMFB1060000B06013057	6.0	6	57	13	3	B
HM0B1070000B10016066	HMFB1070000B10016066	7.0	10	66	16	3	B
HM0B1080000B10019069	HMFB1080000B10019069	8.0	10	69	19	3	B
HM0B1090000B10019069	HMFB1090000B10019069	9.0	10	69	19	3	B
HM0B1100000B10022072	HMFB1100000B10022072	10.0	10	72	22	4	B
HM0B1120000B12026083	HMFB1120000B12026083	12.0	12	83	26	4	B
HM0B1140000B12026083	HMFB1140000B12026083	14.0	12	83	26	4	B
HM0B1160000B16032092	HMFB1160000B16032092	16.0	16	92	32	4	B
HM0B1180000B16032092	HMFB1180000B16032092	18.0	16	92	32	4	B
HM0B1200000B20038104	HMFB1200000B20038104	20.0	20	104	38	4	B
HM0B1220000B20038104	HMFB1220000B20038104	22.0	20	104	38	5	B
HM0B1250000B25045121	HMFB1250000B25045121	25.0	25	121	45	5	B

	d1 ≤ 3,0	0 — -6	d1 ≤ 18	0 — -11
	d1 ≤ 6,0	0 — -8	d1 ≤ 30	0 — -13
	d1 ≤ 10	0 — -9	d1 ≤ 50	0 — -16

**HMOB1 HMFB1**

Cutting Conditions Parametry skrawania

**Uncoated - Side Cutiing** Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		~ HRC20 500 ~ 800N/mm2		HRC20 ~ HRC30 800 ~ 1000N/mm2		HRC30 ~ HRC40 1000 ~ 1300N/mm2			
Hardness Twardość												
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	1800	80	1600	60	1200	55	800	30	4500	200
8.0	4	12	1400	105	1100	75	900	65	560	35	3100	230
10.0	5	15	1100	150	900	120	800	110	450	60	2500	350
12.0	6	18	900	180	800	140	630	110	400	70	2000	400
14.0	7	21	800	180	700	140	560	110	350	70	1800	420
16.0	8	24	700	180	560	140	450	110	280	70	1600	450
18.0	9	27	630	180	500	140	400	110	250	70	1400	470
20.0	10	30	560	180	450	140	400	110	220	70	1200	500
22.0	11	33	500	220	450	170	350	140	220	85	1100	470
25.0	12,5	37,5	450	220	400	170	310	140	180	85	1000	450
28.0	14	42	400	210	350	160	280	130	160	85	900	510
30.0	15	45	350	210	310	160	250	130	160	85	900	530
32.0	16	48	350	210	280	160	220	130	140	85	800	500
36.0	18	54	310	210	250	160	200	130	120	85	700	470
40.0	20	60	280	200	220	150	180	120	110	80	630	450
50.0	25	75	220	200	180	170	160	140	90	80	500	370

**Coated TiAlN - Side Cutiing** Pokryte TiAlN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		~ HRC20 500 ~ 800N/mm2		HRC20 ~ HRC30 800 ~ 1000N/mm2		HRC30 ~ HRC40 1000 ~ 1300N/mm2			
Hardness Twardość												
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	2500	110	2250	85	1700	75	1100	40	6300	280
8.0	4	12	1950	145	1550	105	1250	90	800	50	4350	320
10.0	5	15	1550	210	1250	170	1100	155	650	85	3500	490
12.0	6	18	1250	250	1100	195	900	155	550	100	2800	560
14.0	7	21	1100	250	1000	195	800	155	500	100	2500	590
16.0	8	24	1000	250	800	195	650	155	400	100	2250	630
18.0	9	27	900	250	700	195	550	155	350	100	1950	660
20.0	10	30	800	250	650	195	550	155	300	100	1700	700
22.0	11	33	700	310	650	240	500	195	300	120	1550	660
25.0	12,5	37,5	650	310	550	240	450	195	250	120	1400	630
28.0	14	42	550	295	500	225	400	180	220	120	1250	715
30.0	15	45	500	295	450	225	350	180	220	120	1250	740
32.0	16	48	500	295	400	225	300	180	200	120	1100	700
36.0	18	54	450	295	350	225	300	180	170	120	1000	660
40.0	20	60	400	280	300	210	250	170	130	110	900	630
50.0	25	75	300	280	250	240	220	195	120	110	700	520

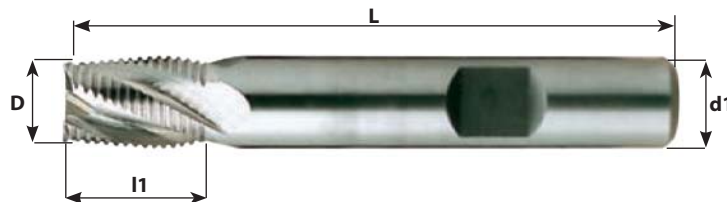


# HM024 HMF24

## SQUARE TYPE WALCOWO-CZOŁOWE

3-4 Flute, Short Length 3-4-ostrzowe, krótkie

					<b>HSS</b> Co 8%										<b>AIR</b>
<b>P</b>				<b>H</b>		<b>M</b>		<b>K</b>	<b>N</b>				<b>S</b>		
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NiCO 200-300 HB	Ti 200-410 GB	
•	•								○	○					



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM024060000B06008052	HMF24060000B06008052	6.0	6	52	8	3	B
HM024080000B10011061	HMF24080000B10011061	8.0	10	61	11	4	B
HM024100000B10013063	HMF24100000B10013063	10.0	10	63	13	4	B
HM024120000B12016073	HMF24120000B12016073	12.0	12	73	16	4	B
HM024140000B12016073	HMF24140000B12016073	14.0	12	73	16	4	B
HM024160000B16019079	HMF24160000B16019079	16.0	16	79	19	4	B
HM024180000B16019079	HMF24180000B16019079	18.0	16	79	19	4	B
HM024200000B20022088	HMF24200000B20022088	20.0	20	88	22	4	B

	d1 ≤ 3,0	0 — -6	d1 ≤ 18	0 — -11
	d1 ≤ 6,0	0 — -8	d1 ≤ 30	0 — -13
	d1 ≤ 10	0 — -9	d1 ≤ 50	0 — -16

UGF  
UFX  
UFJ  
UFD  
UFA  
UFC  
PMT  
RB  
CBN  
HSS  
ICT

**HM024 HMF24**

Cutting Conditions Parametry skrawania

**Uncoated - Side Cutiing** Bez pokrycia - Frezowanie boczne

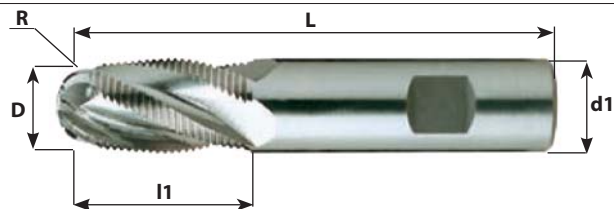
Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
Hardness Twardość			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	1800	80	1600	60	1200	55	800	30	4500	200
8.0	4	12	1400	105	1100	75	900	65	560	35	3100	230
10.0	5	15	1100	150	900	120	800	110	450	60	2500	350
12.0	6	18	900	180	800	140	630	110	400	70	2000	400
14.0	7	21	800	180	700	140	560	110	350	70	1800	420
16.0	8	24	700	180	560	140	450	110	280	70	1600	450
18.0	9	27	630	180	500	140	400	110	250	70	1400	470
20.0	10	30	560	180	450	140	400	110	220	70	1200	500

**Coated TiAlN - Side Cutiing** Pokryte TiAlN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
Hardness Twardość			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	2500	110	2250	85	1700	75	1100	40	6300	280
8.0	4	12	1950	145	1550	105	1250	90	800	50	4350	320
10.0	5	15	1550	210	1250	170	1100	155	650	85	3500	490
12.0	6	18	1250	250	1100	195	900	155	550	100	2800	560
14.0	7	21	1100	250	1000	195	800	155	500	100	2500	590
16.0	8	24	1000	250	800	195	650	155	400	100	2250	630
18.0	9	27	900	250	700	195	550	155	350	100	1950	660
20.0	10	30	800	250	650	195	550	155	300	100	1700	700

**HM046 HMF46**
**BALLNOSE KULISTE**  
 3-4 Flute, Short Length 3-4-ostrzowe, krótkie

<b>P</b>		<b>H</b>		<b>M</b>		<b>K</b>	<b>N</b>		<b>S</b>					
<750 N/mm <sup>2</sup>	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NICO 200-300 HB	Ti 200-410 GB
•	•								○	○				



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	R	D	d1	L	l1	Z	Shank Uchwyt
HM046060030B06013057	HMF46060030B06013057	3	6.0	6	57	13	3	B
HM046080040B10019069	HMF46080040B10019069	4	8.0	10	69	19	3	B
HM046100050B10022072	HMF46100050B10022072	5	10.0	10	72	22	3	B
HM046120060B12026083	HMF46120060B12026083	6	12.0	12	83	26	4	B
HM046160080B16032092	HMF46160080B16032092	8	16.0	16	92	32	4	B
HM046200100B20038104	HMF46200100B20038104	10	20.0	20	104	38	4	B
HM046250125B25045121	HMF46250125B25045121	12,5	25.0	25	121	45	4	B
HM046320160B32053133	HMF46320160B32053133	16	32.0	32	133	53	4	B
HM046400200B32063155	HMF46400200B32063155	20	40.0	32	155	63	4	B

	d1 ≤ 3,0	0 — -6	d1 ≤ 18	0 — -11
	d1 ≤ 6,0	0 — -8	d1 ≤ 30	0 — -13
	d1 ≤ 10	0 — -9	d1 ≤ 50	0 — -16

**HM046 HMF46**

Cutting Conditions Parametry skrawania

**Uncoated - Side Cutting** Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm <sup>2</sup>		500 ~ 800N/mm <sup>2</sup>		800 ~ 1000N/mm <sup>2</sup>		1000 ~ 1300N/mm <sup>2</sup>			
Hardness Twardość					~ HRC20		HRc20 ~HRc30		HRc30 ~HRc40			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
R4.0 x 8.0	2	6	1400	105	1100	75	900	65	560	35	3100	230
R5.0 x 10.0	2,5	7,5	1100	150	900	120	800	110	450	60	2500	250
R6.0 x 12.0	3	9	900	180	800	140	630	110	400	70	2000	400
R8.0 x 16.0	4	12	700	180	560	140	450	110	280	70	1600	450
R10.0 x 20.0	5	15	560	180	450	140	400	110	220	70	1200	500
R12.5 x 25.0	6,25	18,75	450	220	400	170	310	140	180	85	1000	450
R16.0 x 32.0	8	24	350	210	280	160	220	130	140	85	800	500
R20.0 x 40.0	10	30	280	200	220	150	180	120	110	80	630	450

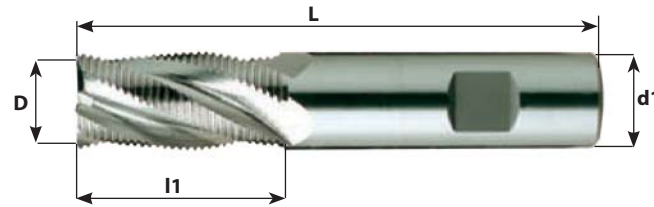
**Coated TiAlN - Side Cutting** Pokryte TiAlN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm <sup>2</sup>		500 ~ 800N/mm <sup>2</sup>		800 ~ 1000N/mm <sup>2</sup>		1000 ~ 1300N/mm <sup>2</sup>			
Hardness Twardość					~ HRC20		HRc20 ~HRc30		HRc30 ~HRc40			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
R4.0 x 8.0	2	6	1960	150	1540	105	1260	90	790	50	4340	320
R5.0 x 10.0	2,5	7,5	1540	210	1260	170	1120	155	630	85	3500	350
R6.0 x 12.0	3	9	1260	250	1120	195	880	155	560	100	2800	560
R8.0 x 16.0	4	12	980	250	790	195	630	155	390	100	2240	630
R10.0 x 20.0	5	15	790	250	630	195	560	155	310	100	1680	700
R12.5 x 25.0	6,25	18,75	630	310	560	240	440	195	250	120	1400	630
R16.0 x 32.0	8	24	490	295	390	225	310	180	200	120	1120	700
R20.0 x 40.0	10	30	390	280	310	210	250	170	160	110	880	630

**HM0A3 HMFA3**
**SQUARE TYPE WALCOWO-CZOŁOWE**

Multi Flute, Short Length Wielostrzowe, krótkie

<b>P</b>				<b>H</b>		<b>M</b>		<b>K</b>	<b>N</b>				<b>S</b>	
<750 N/mm <sup>2</sup>	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NICO 200-300 HB	Ti 200-410 GB
•	•								○	○			•	•



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM0A3060000B06013057	HMFA3060000B06013057	6.0	6	57	13	3	B
HM0A3070000B10016066	HMFA3070000B10016066	7.0	10	66	16	3	B
HM0A3080000B10019069	HMFA3080000B10019069	8.0	10	69	19	3	B
HM0A3090000B10019069	HMFA3090000B10019069	9.0	10	69	19	3	B
HM0A3100000B10022072	HMFA3100000B10022072	10.0	10	72	22	4	B
HM0A3110000B12022079	HMFA3110000B12022079	11.0	12	79	22	4	B
HM0A3120000B12026083	HMFA3120000B12026083	12.0	12	83	26	4	B
HM0A3130000B12026083	HMFA3130000B12026083	13.0	12	83	26	4	B
HM0A3140000B12026083	HMFA3140000B12026083	14.0	12	83	26	4	B
HM0A3150000B12026083	HMFA3150000B12026083	15.0	12	83	26	4	B
HM0A3160000B16032092	HMFA3160000B16032092	16.0	16	92	32	4	B
HM0A3180000B16032092	HMFA3180000B16032092	18.0	16	92	32	4	B
HM0A3200000B20038104	HMFA3200000B20038104	20.0	20	104	38	4	B
HM0A3250000B25045121	HMFA3250000B25045121	25.0	25	121	45	5	B
HM0A3280000B25045121	HMFA3280000B25045121	28.0	25	121	45	6	B
HM0A3300000B25045121	HMFA3300000B25045121	30.0	25	121	45	6	B
HM0A3320000B32053133	HMFA3320000B32053133	32.0	32	133	53	6	B
HM0A3350000B32053133	HMFA3350000B32053133	35.0	32	133	53	6	B
HM0A3400000B32063155	HMFA3400000B32063155	40.0	32	155	63	6	B

	d1 ≤ 3,0	0 — -6	d1 ≤ 18	0 — -11
	d1 ≤ 6,0	0 — -8	d1 ≤ 30	0 — -13
	d1 ≤ 10	0 — -9	d1 ≤ 50	0 — -16

 UGF  
 UFX  
 UFJ  
 UFD  
 UFA  
 UFC  
 PMT  
 RB  
 CBN  
 HSS  
 ICT

**HM0A3 HMFA3**

Cutting Conditions Parametry skrawania

**Uncoated - Side Cuting** Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		~ HRC20 500 ~ 800N/mm2		HRC20 ~ HRC30 800 ~ 1000N/mm2		HRC30 ~ HRC40 1000 ~ 1300N/mm2			
Hardness Twardość												
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	1800	80	1600	60	1200	55	800	30	4500	200
8.0	4	12	1400	105	1100	75	900	65	560	35	3100	230
10.0	5	15	1100	150	900	120	800	110	450	60	2500	350
12.0	6	18	900	180	800	140	630	110	400	70	2000	400
14.0	7	21	800	180	700	140	560	110	350	70	1800	420
16.0	8	24	700	180	560	140	450	110	280	70	1600	450
18.0	9	27	630	180	500	140	400	110	250	70	1400	470
20.0	10	30	560	180	450	140	400	110	220	70	1200	500
22.0	11	33	500	220	450	170	350	140	220	85	1100	470
25.0	12,5	37,5	450	220	400	170	310	140	180	85	1000	450
28.0	14	42	400	210	350	160	280	130	160	85	900	510
30.0	15	45	350	210	310	160	250	130	160	85	900	530
32.0	16	48	350	210	280	160	220	130	140	85	800	500
36.0	18	54	310	210	250	160	200	130	120	85	700	470
40.0	20	60	280	200	220	150	180	120	110	80	630	450
50.0	25	75	220	200	180	170	160	140	90	80	500	370

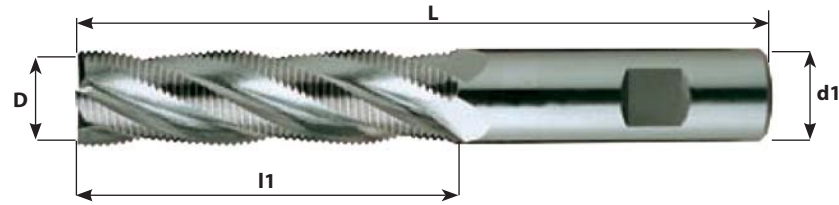
**Coated TiAlN - Side Cuting** Pokryte TiAlN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		~ HRC20 500 ~ 800N/mm2		HRC20 ~ HRC30 800 ~ 1000N/mm2		HRC30 ~ HRC40 1000 ~ 1300N/mm2			
Hardness Twardość												
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	2500	110	2250	85	1700	75	1100	40	6300	280
8.0	4	12	1950	145	1550	105	1250	90	800	50	4350	320
10.0	5	15	1550	210	1250	170	1100	155	650	85	3500	490
12.0	6	18	1250	250	1100	195	900	155	550	100	2800	560
14.0	7	21	1100	250	1000	195	800	155	500	100	2500	590
16.0	8	24	1000	250	800	195	650	155	400	100	2250	630
18.0	9	27	900	250	700	195	550	155	350	100	1950	660
20.0	10	30	800	250	650	195	550	155	300	100	1700	700
22.0	11	33	700	310	650	240	500	195	300	120	1550	660
25.0	12,5	37,5	650	310	550	240	450	195	250	120	1400	630
28.0	14	42	550	295	500	225	400	180	220	120	1250	715
30.0	15	45	500	295	450	225	350	180	220	120	1250	740
32.0	16	48	500	295	400	225	300	180	200	120	1100	700
36.0	18	54	450	295	350	225	300	180	170	120	1000	660
40.0	20	60	400	280	300	210	250	170	130	110	900	630
50.0	25	75	300	280	250	240	220	195	120	110	700	520

**HMOB2 HMFB2**
**SQUARE TYPE WALCOWO-CZOŁOWE**

Multi Flute, Long Length Wielostrzowe, długie

<b>P</b>			<b>H</b>		<b>M</b>		<b>K</b>	<b>N</b>				<b>S</b>		
<750 N/mm <sup>2</sup>	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NICO 200-300 HB	Ti 200-410 GB
•	•								○	○				



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HMOB2060000B06024068	HMFB2060000B06024068	6.0	6	68	24	3	B
HMOB2070000B10030080	HMFB2070000B10030080	7.0	10	80	30	3	B
HMOB2080000B10038088	HMFB2080000B10038088	8.0	10	88	38	3	B
HMOB2090000B10038088	HMFB2090000B10038088	9.0	10	88	38	3	B
HMOB2100000B10045095	HMFB2100000B10045095	10.0	10	95	45	4	B
HMOB2110000B12045102	HMFB2110000B12045102	11.0	12	102	45	4	B
HMOB2120000B12053110	HMFB2120000B12053110	12.0	12	110	53	4	B
HMOB2130000B12053110	HMFB2130000B12053110	13.0	12	110	53	4	B
HMOB2140000B12053110	HMFB2140000B12053110	14.0	12	110	53	4	B
HMOB2150000B12053110	HMFB2150000B12053110	15.0	12	110	53	4	B
HMOB2160000B16063123	HMFB2160000B16063123	16.0	16	123	63	4	B
HMOB2170000B16063123	HMFB2170000B16063123	17.0	16	123	63	4	B
HMOB2180000B16063123	HMFB2180000B16063123	18.0	16	123	63	4	B
HMOB2190000B16063123	HMFB2190000B16063123	19.0	16	123	63	4	B
HMOB2200000B20075141	HMFB2200000B20075141	20.0	20	141	75	4	B
HMOB2220000B20075141	HMFB2220000B20075141	22.0	20	141	75	5	B
HMOB2240000B25090166	HMFB2240000B25090166	24.0	25	166	90	5	B
HMOB2250000B25090166	HMFB2250000B25090166	25.0	25	166	90	5	B
HMOB2260000B25090166	HMFB2260000B25090166	26.0	25	166	90	6	B
HMOB2280000B25090166	HMFB2280000B25090166	28.0	25	166	90	6	B
HMOB2300000B25090166	HMFB2300000B25090166	30.0	25	166	90	6	B
HMOB2320000B320106186	HMFB2320000B320106186	32.0	32	186	106	6	B
HMOB2350000B320106186	HMFB2350000B320106186	35.0	32	186	106	6	B
HMOB2360000B320106186	HMFB2360000B320106186	36.0	32	186	106	6	B
HMOB2380000B320125217	HMFB2380000B320125217	38.0	32	217	125	6	B
HMOB2400000B320125217	HMFB2400000B320125217	40.0	32	217	125	6	B
HMOB2400000B400125217	HMFB2400000B400125217	40.0	40	217	125	6	B

	d1 ≤ 3,0	0 — -6	d1 ≤ 18	0 — -11
	d1 ≤ 6,0	0 — -8	d1 ≤ 30	0 — -13
	d1 ≤ 10	0 — -9	d1 ≤ 50	0 — -16

**HMOB2 HMFB2**

Cutting Conditions Parametry skrawania

**Uncoated - Side Cuting** Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		~ HRC20 500 ~ 800N/mm2		HRC20 ~ HRC30 800 ~ 1000N/mm2		HRC30 ~ HRC40 1000 ~ 1300N/mm2			
Hardness Twardość			~ 500N/mm2		~ HRC20 500 ~ 800N/mm2		HRC20 ~ HRC30 800 ~ 1000N/mm2		HRC30 ~ HRC40 1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	1800	80	1600	60	1200	55	800	30	4500	200
8.0	4	12	1400	105	1100	75	900	65	560	35	3100	230
10.0	5	15	1100	150	900	120	800	110	450	60	2500	350
12.0	6	18	900	180	800	140	630	110	400	70	2000	400
14.0	7	21	800	180	700	140	560	110	350	70	1800	420
16.0	8	24	700	180	560	140	450	110	280	70	1600	450
18.0	9	27	630	180	500	140	400	110	250	70	1400	470
20.0	10	30	560	180	450	140	400	110	220	70	1200	500
22.0	11	33	500	220	450	170	350	140	220	85	1100	470
25.0	12,5	37,5	450	220	400	170	310	140	180	85	1000	450
28.0	14	42	400	210	350	160	280	130	160	85	900	510
30.0	15	45	350	210	310	160	250	130	160	85	900	530
32.0	16	48	350	210	280	160	220	130	140	85	800	500
36.0	18	54	310	210	250	160	200	130	120	85	700	470
40.0	20	60	280	200	220	150	180	120	110	80	630	450
50.0	25	75	220	200	180	170	160	140	90	80	500	370

**Coated TiAlN - Side Cuting** Pokryte TiAlN - Frezowanie boczne

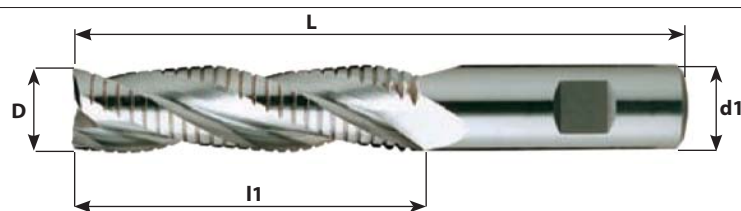
Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		~ HRC20 500 ~ 800N/mm2		HRC20 ~ HRC30 800 ~ 1000N/mm2		HRC30 ~ HRC40 1000 ~ 1300N/mm2			
Hardness Twardość			~ 500N/mm2		~ HRC20 500 ~ 800N/mm2		HRC20 ~ HRC30 800 ~ 1000N/mm2		HRC30 ~ HRC40 1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	2500	110	2250	85	1700	75	1100	40	6300	280
8.0	4	12	1950	145	1550	105	1250	90	800	50	4350	320
10.0	5	15	1550	210	1250	170	1100	155	650	85	3500	490
12.0	6	18	1250	250	1100	195	900	155	550	100	2800	560
14.0	7	21	1100	250	1000	195	800	155	500	100	2500	590
16.0	8	24	1000	250	800	195	650	155	400	100	2250	630
18.0	9	27	900	250	700	195	550	155	350	100	1950	660
20.0	10	30	800	250	650	195	550	155	300	100	1700	700
22.0	11	33	700	310	650	240	500	195	300	120	1550	660
25.0	12,5	37,5	650	310	550	240	450	195	250	120	1400	630
28.0	14	42	550	295	500	225	400	180	220	120	1250	715
30.0	15	45	500	295	450	225	350	180	220	120	1250	740
32.0	16	48	500	295	400	225	300	180	200	120	1100	700
36.0	18	54	450	295	350	225	300	180	170	120	1000	660
40.0	20	60	400	280	300	210	250	170	130	110	900	630
50.0	25	75	300	280	250	240	220	195	120	110	700	520



**HM0A4 HMFA4**
**SQUARE TYPE WALCOWO-CZOŁOWE**

Multi Flute, Short Length Wielostrzowe, krótkie

<b>P</b>				<b>H</b>		<b>M</b>		<b>K</b>	<b>N</b>				<b>S</b>	
<750 N/mm <sup>2</sup>	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NICO 200-300 HB	Ti 200-410 GB
•	•								○	○				



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM0A4060000B06013057	HMFA4060000B06013057	6.0	6	57	13	3	B
HM0A4070000B10016066	HMFA4070000B10016066	7.0	10	66	16	3	B
HM0A4080000B10019069	HMFA4080000B10019069	8.0	10	69	19	4	B
HM0A4090000B10019069	HMFA4090000B10019069	9.0	10	69	19	4	B
HM0A4100000B10022072	HMFA4100000B10022072	10.0	10	72	22	4	B
HM0A4110000B12022079	HMFA4110000B12022079	11.0	12	79	22	4	B
HM0A4120000B12026083	HMFA4120000B12026083	12.0	12	83	26	4	B
HM0A4130000B12026083	HMFA4130000B12026083	13.0	12	83	26	4	B
HM0A4140000B12026083	HMFA4140000B12026083	14.0	12	83	26	4	B
HM0A4150000B12026083	HMFA4150000B12026083	15.0	12	83	26	4	B
HM0A4160000B16032092	HMFA4160000B16032092	16.0	16	92	32	4	B
HM0A4180000B16032092	HMFA4180000B16032092	18.0	16	92	32	4	B
HM0A4200000B20038104	HMFA4200000B20038104	20.0	20	104	38	4	B
HM0A4220000B20038104	HMFA4220000B20038104	22.0	20	104	38	5	B
HM0A4250000B25045121	HMFA4250000B25045121	25.0	25	121	45	5	B
HM0A4280000B25045121	HMFA4280000B25045121	28.0	25	121	45	5	B
HM0A4300000B25045121	HMFA4300000B25045121	30.0	25	121	45	5	B
HM0A4320000B32053133	HMFA4320000B32053133	32.0	32	133	53	5	B
HM0A4360000B32053133	HMFA4360000B32053133	36.0	32	133	53	6	B
HM0A4400000B32063155	HMFA4400000B32063155	40.0	32	155	63	6	B

	d1 ≤ 3,0	0 — -6	d1 ≤ 18	0 — -11
	d1 ≤ 6,0	0 — -8	d1 ≤ 30	0 — -13
	d1 ≤ 10	0 — -9	d1 ≤ 50	0 — -16

 UGF  
UFX  
UFJ  
UFD  
UFA  
UFC  
PMT  
RB  
CBN  
HSS  
ICT

**HM0A4 HMFA4**

Cutting Conditions Parametry skrawania

**Uncoated - Side Cutiing** Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		~ HRC20 500 ~ 800N/mm2		HRC20 ~ HRC30 800 ~ 1000N/mm2		HRC30 ~ HRC40 1000 ~ 1300N/mm2			
Hardness Twardość			~ 500N/mm2		~ HRC20 500 ~ 800N/mm2		HRC20 ~ HRC30 800 ~ 1000N/mm2		HRC30 ~ HRC40 1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	1800	65	1600	50	1200	45	800	25	4500	160
8.0	4	12	1400	85	1100	60	900	50	560	30	3100	185
10.0	5	15	1100	120	900	95	800	90	450	50	2500	280
12.0	6	18	900	145	800	110	630	90	400	55	2000	320
14.0	7	21	800	145	700	110	560	90	350	55	1800	340
16.0	8	24	700	145	560	110	450	90	280	55	1600	360
18.0	9	27	630	145	500	110	400	90	250	55	1400	380
20.0	10	30	560	145	450	110	400	90	220	55	1200	400
22.0	11	33	500	175	450	135	350	110	220	70	1100	380
25.0	12,5	37,5	450	175	400	135	310	110	180	70	1000	360
28.0	14	42	400	170	350	130	280	105	160	70	900	410
30.0	15	45	350	170	310	130	250	105	160	70	900	420
32.0	16	48	350	170	280	130	220	105	140	70	800	400
36.0	18	54	310	170	250	130	200	105	120	70	700	380
40.0	20	60	280	160	220	120	180	95	110	65	630	360

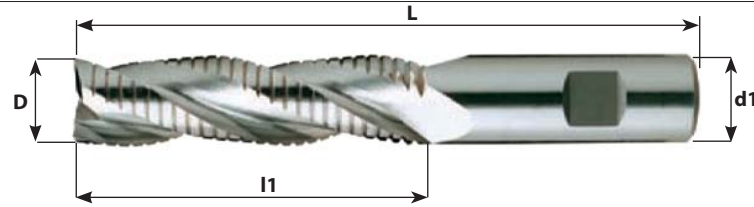
**Coated TiAlN - Side Cutiing** Pokryte TiAlN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		~ HRC20 500 ~ 800N/mm2		HRC20 ~ HRC30 800 ~ 1000N/mm2		HRC30 ~ HRC40 1000 ~ 1300N/mm2			
Hardness Twardość			~ 500N/mm2		~ HRC20 500 ~ 800N/mm2		HRC20 ~ HRC30 800 ~ 1000N/mm2		HRC30 ~ HRC40 1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	2500	90	2250	70	1700	65	1100	35	6300	225
8.0	4	12	1950	120	1550	85	1250	70	800	40	4350	260
10.0	5	15	1550	170	1250	135	1100	125	650	70	3500	390
12.0	6	18	1250	205	1100	155	900	125	550	75	2800	450
14.0	7	21	1100	205	1000	155	800	125	500	75	2500	475
16.0	8	24	1000	205	800	155	650	125	400	75	2250	505
18.0	9	27	900	205	700	155	550	125	350	75	1950	530
20.0	10	30	800	205	650	155	550	125	300	75	1700	560
22.0	11	33	700	245	650	190	500	155	300	100	1550	530
25.0	12,5	37,5	650	245	550	190	450	155	250	100	1400	505
28.0	14	42	550	240	500	180	400	145	200	100	1250	575
30.0	15	45	500	240	450	180	350	145	200	100	1250	590
32.0	16	48	500	240	400	180	300	145	170	100	1100	560
36.0	18	54	450	240	350	180	280	145	150	100	1000	530
40.0	20	60	400	225	300	170	250	135	150	90	900	505
50.0	25	75	300	280	250	240	220	195	120	110	700	520

**HM068 HMF68**
**SQUARE TYPE WALCOWO-CZOŁOWE**

Multi Flute, Long Length Wielostrzowe, długie

	<b>HSS</b> Co 8%													
<b>P</b>				<b>H</b>		<b>M</b>		<b>K</b>	<b>N</b>				<b>S</b>	
<750 N/mm <sup>2</sup>	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NICO 200-300 HB	Ti 200-410 GB
•	•								○	○			•	•



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM068060000B06024068	HMF68060000B06024068	6.0	6	68	24	3	B
HM068080000B10038088	HMF68080000B10038088	8.0	10	88	38	4	B
HM068100000B10045095	HMF68100000B10045095	10.0	10	95	45	4	B
HM068120000B12053110	HMF68120000B12053110	12.0	12	110	53	4	B
HM068140000B12053110	HMF68140000B12053110	14.0	12	110	53	4	B
HM068160000B16063123	HMF68160000B16063123	16.0	16	123	63	4	B
HM068180000B16063123	HMF68180000B16063123	18.0	16	123	63	4	B
HM068200000B20075141	HMF68200000B20075141	20.0	20	141	75	4	B
HM068220000B20075141	HMF68220000B20075141	22.0	20	141	75	5	B
HM068250000B25090166	HMF68250000B25090166	25.0	25	166	90	5	B
HM068300000B25090166	HMF68300000B25090166	30.0	25	166	90	5	B
HM068320000B320106186	HMF68320000B320106186	32.0	32	186	106	5	B
HM068450000B400125217	HMF68450000B400125217	45.0	40	217	125	6	B

	d1 ≤ 3,0	0 — -6	d1 ≤ 18	0 — -11
	d1 ≤ 6,0	0 — -8	d1 ≤ 30	0 — -13
	d1 ≤ 10	0 — -9	d1 ≤ 50	0 — -16

**HM068 HMF68**

Cutting Conditions Parametry skrawania

**Uncoated - Side Cutiing** Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
Hardness Twardość			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	1800	65	1600	50	1200	45	800	25	4500	160
8.0	4	12	1400	85	1100	60	900	50	560	30	3100	185
10.0	5	15	1100	120	900	95	800	90	450	50	2500	280
12.0	6	18	900	145	800	110	630	90	400	55	2000	320
14.0	7	21	800	145	700	110	560	90	350	55	1800	340
16.0	8	24	700	145	560	110	450	90	280	55	1600	360
18.0	9	27	630	145	500	110	400	90	250	55	1400	380
20.0	10	30	560	145	450	110	400	90	220	55	1200	400
22.0	11	33	500	175	450	135	350	110	220	70	1100	380
25.0	12,5	37,5	450	175	400	135	310	110	180	70	1000	360
28.0	14	42	400	170	350	130	280	105	160	70	900	410
30.0	15	45	350	170	310	130	250	105	160	70	900	420
32.0	16	48	350	170	280	130	220	105	140	70	800	400
36.0	18	54	310	170	250	130	200	105	120	70	700	380
40.0	20	60	280	160	220	120	180	95	110	65	630	360

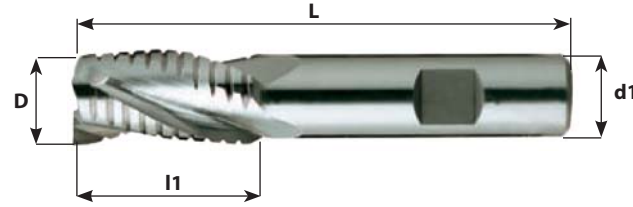
**Coated TiAlN - Side Cutiing** Pokryte TiAlN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
Hardness Twardość			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	2500	90	2250	70	1700	65	1100	35	6300	225
8.0	4	12	1950	120	1550	85	1250	70	800	40	4350	260
10.0	5	15	1550	170	1250	135	1100	125	650	70	3500	390
12.0	6	18	1250	205	1100	155	900	125	550	75	2800	450
14.0	7	21	1100	205	1000	155	800	125	500	75	2500	475
16.0	8	24	1000	205	800	155	650	125	400	75	2250	505
18.0	9	27	900	205	700	155	550	125	350	75	1950	530
20.0	10	30	800	205	650	155	550	125	300	75	1700	560
22.0	11	33	700	245	650	190	500	155	300	100	1550	530
25.0	12,5	37,5	650	245	550	190	450	155	250	100	1400	505
28.0	14	42	550	240	500	180	400	145	200	100	1250	575
30.0	15	45	500	240	450	180	350	145	200	100	1250	590
32.0	16	48	500	240	400	180	300	145	170	100	1100	560
36.0	18	54	450	240	350	180	280	145	150	100	1000	530
40.0	20	60	400	225	300	170	250	135	150	90	900	505
50.0	25	75	300	280	250	240	220	195	120	110	700	520

**HM015 HMF15**
**SQUARE TYPE WALCOWO-CZOŁOWE**

3 Flute, Short Length 3-ostrzowe, krótkie

<b>P</b>				<b>H</b>		<b>M</b>		<b>K</b>	<b>N</b>				<b>S</b>	
<750 N/mm <sup>2</sup>	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NICO 200-300 HB	Ti 200-410 GB
•	•								○	○			•	•



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM015060000B06013057	HMF15060000B06013057	6.0	6	57	13	3	B
HM015080000B10019069	HMF15080000B10019069	8.0	10	69	19	3	B
HM015100000B10022072	HMF15100000B10022072	10.0	10	72	22	3	B
HM015120000B12026083	HMF15120000B12026083	12.0	12	83	26	3	B
HM015130000B12026083	HMF15130000B12026083	13.0	12	83	26	3	B
HM015140000B12026083	HMF15140000B12026083	14.0	12	83	26	3	B
HM015160000B16032092	HMF15160000B16032092	16.0	16	92	32	3	B
HM015180000B16032092	HMF15180000B16032092	18.0	16	92	32	3	B
HM015200000B20038104	HMF15200000B20038104	20.0	20	104	38	3	B
HM015220000B20038104	HMF15220000B20038104	22.0	20	104	38	3	B
HM015250000B25045121	HMF15250000B25045121	25.0	25	121	45	3	B
HM015280000B25045121	HMF15280000B25045121	28.0	25	121	45	3	B
HM015300000B25045121	HMF15300000B25045121	30.0	25	121	45	3	B
HM015320000B32053133	HMF15320000B32053133	32.0	32	133	53	3	B
HM015360000B32053133	HMF15360000B32053133	36.0	32	133	53	3	B
HM015400000B32063155	HMF15400000B32063155	40.0	32	155	63	3	B

	d1 ≤ 3,0	0 — -6	d1 ≤ 18	0 — -11
	d1 ≤ 6,0	0 — -8	d1 ≤ 30	0 — -13
	d1 ≤ 10	0 — -9	d1 ≤ 50	0 — -16

**HM015 HMF15**

Cutting Conditions Parametry skrawania

**Uncoated - Side Cutiing** Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		~ HRC20 500 ~ 800N/mm2		HRC20 ~HRC30 800 ~ 1000N/mm2		HRC30 ~HRC40 1000 ~ 1300N/mm2			
Hardness Twardość												
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	1800	65	1600	50	1200	45	800	25	4500	160
8.0	4	12	1400	85	1100	60	900	50	560	30	3100	185
10.0	5	15	1100	120	900	95	800	90	450	50	2500	280
12.0	6	18	900	145	800	110	630	90	400	55	2000	320
14.0	7	21	800	145	700	110	560	90	350	55	1800	340
16.0	8	24	700	145	560	110	450	90	280	55	1600	360
18.0	9	27	630	145	500	110	400	90	250	55	1400	380
20.0	10	30	560	145	450	110	400	90	220	55	1200	400
22.0	11	33	500	175	450	135	350	110	220	70	1100	380
25.0	12,5	37,5	450	175	400	135	310	110	180	70	1000	360
28.0	14	42	400	170	350	130	280	105	160	70	900	410
30.0	15	45	350	170	310	130	250	105	160	70	900	420
32.0	16	48	350	170	280	130	220	105	140	70	800	400
36.0	18	54	310	170	250	130	200	105	120	70	700	380
40.0	20	60	280	160	220	120	180	95	110	65	630	360

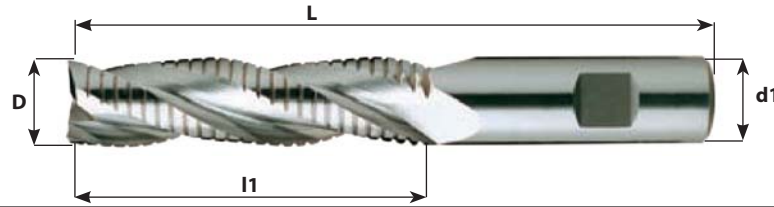
**Coated TiAlN - Side Cutiing** Pokryte TiAlN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		~ HRC20 500 ~ 800N/mm2		HRC20 ~HRC30 800 ~ 1000N/mm2		HRC30 ~HRC40 1000 ~ 1300N/mm2			
Hardness Twardość												
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	2500	90	2250	70	1700	65	1100	35	6300	225
8.0	4	12	1950	120	1550	85	1250	70	800	40	4350	260
10.0	5	15	1550	170	1250	135	1100	125	650	70	3500	390
12.0	6	18	1250	205	1100	155	900	125	550	75	2800	450
14.0	7	21	1100	205	1000	155	800	125	500	75	2500	475
16.0	8	24	1000	205	800	155	650	125	400	75	2250	505
18.0	9	27	900	205	700	155	550	125	350	75	1950	530
20.0	10	30	800	205	650	155	550	125	300	75	1700	560
22.0	11	33	700	245	650	190	500	155	300	100	1550	530
25.0	12,5	37,5	650	245	550	190	450	155	250	100	1400	505
28.0	14	42	550	240	500	180	400	145	200	100	1250	575
30.0	15	45	500	240	450	180	350	145	200	100	1250	590
32.0	16	48	500	240	400	180	300	145	170	100	1100	560
36.0	18	54	450	240	350	180	280	145	150	100	1000	530
40.0	20	60	400	225	300	170	250	135	150	90	900	505
50.0	25	75	300	280	250	240	220	195	120	110	700	520

**HM049 HMF49**
**SQUARE TYPE WALCOWO-CZOŁOWE**

3 Flute, Long Length 3-ostrzowe, długie

<b>P</b>				<b>H</b>		<b>M</b>		<b>K</b>	<b>N</b>				<b>S</b>	
<750 N/mm <sup>2</sup>	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NICO 200-300 HB	Ti 200-410 GB
•	•								○	○			•	•



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM049060000B06024068	HMF49060000B06024068	6.0	6	68	24	3	B
HM049080000B10038088	HMF49080000B10038088	8.0	10	88	38	3	B
HM049100000B10045095	HMF49100000B10045095	10.0	10	95	45	3	B
HM049120000B12053110	HMF49120000B12053110	12.0	12	110	53	3	B
HM049140000B12053110	HMF49140000B12053110	14.0	12	110	53	3	B
HM049160000B16063123	HMF49160000B16063123	16.0	16	123	63	3	B
HM049180000B16063123	HMF49180000B16063123	18.0	16	123	63	3	B
HM049200000B20075141	HMF49200000B20075141	20.0	20	141	75	3	B
HM049220000B20075141	HMF49220000B20075141	22.0	20	141	75	3	B
HM049250000B25090166	HMF49250000B25090166	25.0	25	166	90	3	B
HM049280000B25090166	HMF49280000B25090166	28.0	25	166	90	3	B
HM049300000B25090166	HMF49300000B25090166	30.0	25	166	90	3	B
HM049360000B320106186	HMF49360000B320106186	36.0	32	186	106	3	B
HM049400000B320125217	HMF49400000B320125217	40.0	32	217	125	3	B

	d1 ≤ 3,0	0 — -6	d1 ≤ 18	0 — -11
	d1 ≤ 6,0	0 — -8	d1 ≤ 30	0 — -13
	d1 ≤ 10	0 — -9	d1 ≤ 50	0 — -16

**HM049 HMF49**

Cutting Conditions Parametry skrawania

**Uncoated - Side Cuting** Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		~ HRC20 500 ~ 800N/mm2		HRC20 ~ HRC30 800 ~ 1000N/mm2		HRC30 ~ HRC40 1000 ~ 1300N/mm2			
Hardness Twardość												
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	1800	65	1600	50	1200	45	800	25	4500	160
8.0	4	12	1400	85	1100	60	900	50	560	30	3100	185
10.0	5	15	1100	120	900	95	800	90	450	50	2500	280
12.0	6	18	900	145	800	110	630	90	400	55	2000	320
14.0	7	21	800	145	700	110	560	90	350	55	1800	340
16.0	8	24	700	145	560	110	450	90	280	55	1600	360
18.0	9	27	630	145	500	110	400	90	250	55	1400	380
20.0	10	30	560	145	450	110	400	90	220	55	1200	400
22.0	11	33	500	175	450	135	350	110	220	70	1100	380
25.0	12,5	37,5	450	175	400	135	310	110	180	70	1000	360
28.0	14	42	400	170	350	130	280	105	160	70	900	410
30.0	15	45	350	170	310	130	250	105	160	70	900	420
32.0	16	48	350	170	280	130	220	105	140	70	800	400
36.0	18	54	310	170	250	130	200	105	120	70	700	380
40.0	20	60	280	160	220	120	180	95	110	65	630	360

**Coated TiAlN - Side Cuting** Pokryte TiAlN - Frezowanie boczne

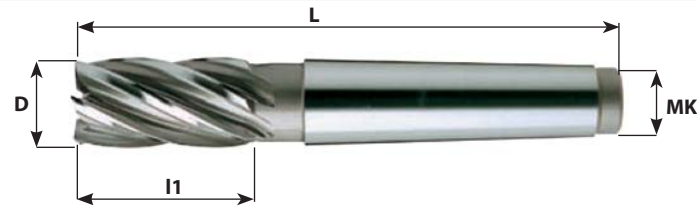
Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		~ HRC20 500 ~ 800N/mm2		HRC20 ~ HRC30 800 ~ 1000N/mm2		HRC30 ~ HRC40 1000 ~ 1300N/mm2			
Hardness Twardość												
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	2500	90	2250	70	1700	65	1100	35	6300	225
8.0	4	12	1950	120	1550	85	1250	70	800	40	4350	260
10.0	5	15	1550	170	1250	135	1100	125	650	70	3500	390
12.0	6	18	1250	205	1100	155	900	125	550	75	2800	450
14.0	7	21	1100	205	1000	155	800	125	500	75	2500	475
16.0	8	24	1000	205	800	155	650	125	400	75	2250	505
18.0	9	27	900	205	700	155	550	125	350	75	1950	530
20.0	10	30	800	205	650	155	550	125	300	75	1700	560
22.0	11	33	700	245	650	190	500	155	300	100	1550	530
25.0	12,5	37,5	650	245	550	190	450	155	250	100	1400	505
28.0	14	42	550	240	500	180	400	145	200	100	1250	575
30.0	15	45	500	240	450	180	350	145	200	100	1250	590
32.0	16	48	500	240	400	180	300	145	170	100	1100	560
36.0	18	54	450	240	350	180	280	145	150	100	1000	530
40.0	20	60	400	225	300	170	250	135	150	90	900	505
50.0	25	75	300	280	250	240	220	195	120	110	700	520



**HM0A6**
**SQUARE TYPE WALCOWO-CZOŁOWE**

Multi Flute, Short Length Wielostrzowe, krótkie

				<b>HSS</b> Co 8%											
												o	•	•	•
<b>P</b>				<b>H</b>		<b>M</b>		<b>K</b>	<b>N</b>				<b>S</b>		
<750 N/mm2	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NICO 200-300 HB	Ti 200-410 GB	
•	•								o	o					



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	MK	L	l1	Z
HM0A6140000M02026111	HMFA6140000M02026111	14.0	2	111	26	4
HM0A6150000M02026111	HMFA6150000M02026111	15.0	2	111	26	4
HM0A6160000M02032117	HMFA6160000M02032117	16.0	2	117	32	4
HM0A6180000M02032117	HMFA6180000M02032117	18.0	2	117	32	4
HM0A6200000M02038123	HMFA6200000M02038123	20.0	2	123	38	4
HM0A6220000M02038123	HMFA6220000M02038123	22.0	2	123	38	6
HM0A6240000M03045147	HMFA6240000M03045147	24.0	3	147	45	6
HM0A6250000M03045147	HMFA6250000M03045147	25.0	3	147	45	6
HM0A6260000M03045147	HMFA6260000M03045147	26.0	3	147	45	6
HM0A6280000M03045147	HMFA6280000M03045147	28.0	3	147	45	6
HM0A6300000M03045147	HMFA6300000M03045147	30.0	3	147	45	6
HM0A6320000M04053178	HMFA6320000M04053178	32.0	4	178	53	6
HM0A6350000M04053178	HMFA6350000M04053178	35.0	4	178	53	6
HM0A6360000M04053178	HMFA6360000M04053178	36.0	4	178	53	6
HM0A6380000M04063188	HMFA6380000M04063188	38.0	4	188	63	6
HM0A6400000M04063188	HMFA6400000M04063188	40.0	4	188	63	6
HM0A6420000M04063188	HMFA6420000M04063188	42.0	4	188	63	6
HM0A6440000M04063188	HMFA6440000M04063188	44.0	4	188	63	6
HM0A6450000M04063188	HMFA6450000M04063188	45.0	4	188	63	8
HM0A6500000M05075233	HMFA6500000M05075233	50.0	5	233	75	8

**HM0A6**

Cutting Conditions Parametry skrawania

**Uncoated - Side Cutiing** Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
Hardness Twardość			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2.0	0,2	3	5600	80	4500	55	4000	45	2200	20	12000	240
3.0	0,3	4,5	3500	110	3200	80	2500	60	1600	30	11000	380
4.0	0,4	6	2800	140	2200	100	1800	65	1100	45	8000	440
5.0	0,5	7,5	2200	180	1800	125	1600	90	900	50	6300	470
6.0	0,6	9	1800	180	1600	145	1200	90	800	60	5600	470
8.0	0,8	12	1400	200	1100	160	900	105	560	65	4000	580
10.0	1	15	1100	200	900	160	800	120	450	65	3100	600
12.0	1,2	18	900	220	800	180	630	120	400	75	2500	570
14.0	1,4	21	800	220	700	160	560	120	350	75	2200	530
16.0	1,6	24	700	220	560	160	450	105	280	65	2000	530
18.0	1,8	27	630	200	500	160	400	105	250	65	1800	530
20.0	2	30	560	200	450	160	400	105	220	65	1600	480
22.0	2,2	33	500	200	450	160	350	105	220	65	1400	450
25.0	2,5	37,5	450	180	400	145	310	90	180	50	1200	420
28.0	2,8	42	400	160	350	125	280	80	160	45	1100	400
30.0	3	45	350	140	310	110	250	75	160	45	1100	400
32.0	3,2	48	350	140	280	100	220	65	140	45	1000	360
36.0	3,6	54	310	120	250	90	200	60	120	35	900	330
40.0	4	60	280	120	220	90	180	60	110	35	800	300

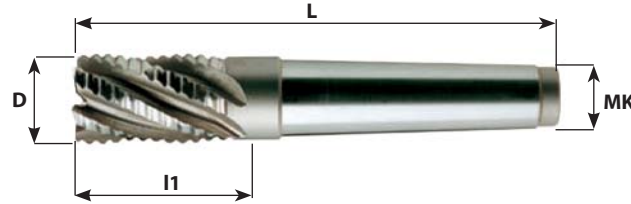
**Coated TiAlN - Side Cutiing** Pokryte TiAlN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
Hardness Twardość			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
2.0	0,2	3	7850	110	6300	75	5600	65	3100	30	16800	335
3.0	0,3	4,5	4900	155	4500	110	3500	85	2250	40	15400	530
4.0	0,4	6	3900	195	3100	140	2500	90	1550	65	11200	615
5.0	0,5	7,5	3100	250	2500	175	2250	125	1250	70	8800	660
6.0	0,6	9	2500	250	2250	205	1700	125	1100	85	7850	660
8.0	0,8	12	1950	280	1550	225	1250	145	800	90	5600	810
10.0	1	15	1550	280	1250	225	1100	170	650	90	4350	840
12.0	1,2	18	1250	310	1100	250	900	170	550	105	3500	800
14.0	1,4	21	1100	310	1000	225	800	170	500	105	3100	740
16.0	1,6	24	1000	310	800	225	650	145	400	90	2800	740
18.0	1,8	27	900	280	700	225	550	145	350	90	2500	740
20.0	2	30	800	280	650	225	550	145	300	90	2250	670
22.0	2,2	33	700	280	650	225	500	145	300	90	1950	630
25.0	2,5	37,5	650	250	550	205	450	125	250	70	1700	590
28.0	2,8	42	550	225	500	175	400	110	200	65	1550	560
30.0	3	45	500	195	450	155	350	105	200	65	1550	560
32.0	3,2	48	500	195	400	140	300	90	200	65	1400	505
36.0	3,6	54	450	170	350	125	300	85	150	50	1250	460
40.0	4	60	400	170	300	125	250	85	150	50	1100	420

**HM0A7 HMFA7**
**SQUARE TYPE WALCOWO-CZOŁOWE**

Multi Flute, Short Length Wielostrzowe, krótkie

	<b>HSS</b> Co 8%													
<b>P</b>				<b>H</b>		<b>M</b>		<b>K</b>	<b>N</b>				<b>S</b>	
<750 N/mm <sup>2</sup>	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NICO 200-300 HB	Ti 200-410 GB
•	•								○	○			•	•



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	l1	MK	L	Z
HM0A7140000M02026111	HMFA7140000M02026111	14.0	26	2	111	4
HM0A7160000M02032117	HMFA7160000M02032117	16.0	32	2	117	4
HM0A7180000M02032117	HMFA7180000M02032117	18.0	32	2	117	4
HM0A7200000M02038123	HMFA7200000M02038123	20.0	38	2	123	4
HM0A7220000M02038123	HMFA7220000M02038123	22.0	38	2	123	5
HM0A7240000M03045147	HMFA7240000M03045147	24.0	45	3	147	5
HM0A7250000M03045147	HMFA7250000M03045147	25.0	45	3	147	5
HM0A7260000M03045147	HMFA7260000M03045147	26.0	45	3	147	5
HM0A7270000M03045147	HMFA7270000M03045147	27.0	45	3	147	6
HM0A7280000M03045147	HMFA7280000M03045147	28.0	45	3	147	6
HM0A7300000M03045147	HMFA7300000M03045147	30.0	45	3	147	6
HM0A7320000M04053178	HMFA7320000M04053178	32.0	53	4	178	6
HM0A7350000M04053178	HMFA7350000M04053178	35.0	53	4	178	6
HM0A7360000M04053178	HMFA7360000M04053178	36.0	53	4	178	6
HM0A7380000M04063188	HMFA7380000M04063188	38.0	63	4	188	6
HM0A7400000M04063188	HMFA7400000M04063188	40.0	63	4	188	6
HM0A7450000M04063188	HMFA7450000M04063188	45.0	63	4	188	6
HM0A7500000M05075233	HMFA7500000M05075233	50.0	75	5	233	6

 UGF  
 UFX  
 UFJ  
 UFD  
 UFA  
 UFC  
 PMT  
 RB  
 CBN  
 HSS  
 ICT

**HM0A7 HMFA7**

Cutting Conditions Parametry skrawania

**Uncoated - Side Cuting** Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		~ HRC20 500 ~ 800N/mm2		HRC20 ~ HRC30 800 ~ 1000N/mm2		HRC30 ~ HRC40 1000 ~ 1300N/mm2			
Hardness Twardość												
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	1800	80	1600	60	1200	55	800	30	4500	200
8.0	4	12	1400	105	1100	75	900	65	560	35	3100	230
10.0	5	15	1100	150	900	120	800	110	450	60	2500	350
12.0	6	18	900	180	800	140	630	110	400	70	2000	400
14.0	7	21	800	180	700	140	560	110	350	70	1800	420
16.0	8	24	700	180	560	140	450	110	280	70	1600	450
18.0	9	27	630	180	500	140	400	110	250	70	1400	470
20.0	10	30	560	180	450	140	400	110	220	70	1200	500
22.0	11	33	500	220	450	170	350	140	220	85	1100	470
25.0	12,5	37,5	450	220	400	170	310	140	180	85	1000	450
28.0	14	42	400	210	350	160	280	130	160	85	900	510
30.0	15	45	350	210	310	160	250	130	160	85	900	530
32.0	16	48	350	210	280	160	220	130	140	85	800	500
36.0	18	54	310	210	250	160	200	130	120	85	700	470
40.0	20	60	280	200	220	150	180	120	110	80	630	450
50.0	25	75	220	200	180	170	160	140	90	80	500	370

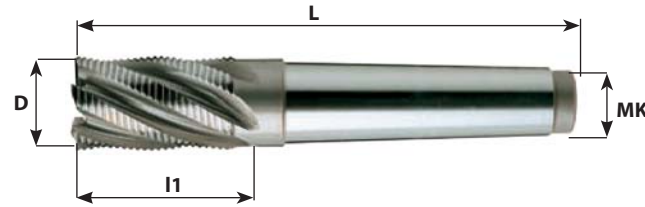
**Coated TiAlN - Side Cuting** Pokryte TiAlN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		~ HRC20 500 ~ 800N/mm2		HRC20 ~ HRC30 800 ~ 1000N/mm2		HRC30 ~ HRC40 1000 ~ 1300N/mm2			
Hardness Twardość												
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	2500	110	2250	85	1700	75	1100	40	6300	280
8.0	4	12	1950	145	1550	105	1250	90	800	50	4350	320
10.0	5	15	1550	210	1250	170	1100	155	650	85	3500	490
12.0	6	18	1250	250	1100	195	900	155	550	100	2800	560
14.0	7	21	1100	250	1000	195	800	155	500	100	2500	590
16.0	8	24	1000	250	800	195	650	155	400	100	2250	630
18.0	9	27	900	250	700	195	550	155	350	100	1950	660
20.0	10	30	800	250	650	195	550	155	300	100	1700	700
22.0	11	33	700	310	650	240	500	195	300	120	1550	660
25.0	12,5	37,5	650	310	550	240	450	195	250	120	1400	630
28.0	14	42	550	295	500	225	400	180	220	120	1250	715
30.0	15	45	500	295	450	225	350	180	220	120	1250	740
32.0	16	48	500	295	400	225	300	180	200	120	1100	700
36.0	18	54	450	295	350	225	300	180	170	120	1000	660
40.0	20	60	400	280	300	210	250	170	130	110	900	630
50.0	25	75	300	280	250	240	220	195	120	110	700	520

**HM078 HMF78**
**SQUARE TYPE WALCOWO-CZOŁOWE**

Multi Flute, Short Length Wielostrzowe, krótkie

	<b>HSS</b> Co 8%														
												○	●	●	●
<b>P</b>				<b>H</b>		<b>M</b>		<b>K</b>	<b>N</b>				<b>S</b>		
<750 N/mm <sup>2</sup>	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NICO 200-300 HB	Ti 200-410 GB	
●	●								○	○					



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	l1	MK	L	Z
HM078160000M02032117	HMF78160000M02032117	16.0	32	2	117	4
HM078180000M02032117	HMF78180000M02032117	18.0	32	2	117	4
HM078200000M02038123	HMF78200000M02038123	20.0	38	2	123	4
HM078220000M02038123	HMF78220000M02038123	22.0	38	2	123	5
HM078240000M03045147	HMF78240000M03045147	24.0	45	3	147	5
HM078250000M03045147	HMF78250000M03045147	25.0	45	3	147	5
HM078260000M03045147	HMF78260000M03045147	26.0	45	3	147	5
HM078280000M03045147	HMF78280000M03045147	28.0	45	3	147	6
HM078300000M03045147	HMF78300000M03045147	30.0	45	3	147	6
HM078320000M04053178	HMF78320000M04053178	32.0	53	4	178	6
HM078350000M04053178	HMF78350000M04053178	35.0	53	4	178	6
HM078360000M04053178	HMF78360000M04053178	36.0	53	4	178	6
HM078380000M04063188	HMF78380000M04063188	38.0	63	4	188	6
HM078400000M04063188	HMF78400000M04063188	40.0	63	4	188	6
HM078450000M04063188	HMF78450000M04063188	45.0	63	4	188	6
HM078500000M05075233	HMF78500000M05075233	50.0	75	5	233	6

 UGF  
 UFX  
 UFJ  
 UFD  
 UFA  
 UFC  
 PMT  
 RB  
 CBN  
 HSS  
 ICT

**HM078 HMF78**

Cutting Conditions Parametry skrawania

**Uncoated - Side Cuting** Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		~ HRC20 500 ~ 800N/mm2		HRC20 ~ HRC30 800 ~ 1000N/mm2		HRC30 ~ HRC40 1000 ~ 1300N/mm2			
Hardness Twardość												
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	1800	80	1600	60	1200	55	800	30	4500	200
8.0	4	12	1400	105	1100	75	900	65	560	35	3100	230
10.0	5	15	1100	150	900	120	800	110	450	60	2500	350
12.0	6	18	900	180	800	140	630	110	400	70	2000	400
14.0	7	21	800	180	700	140	560	110	350	70	1800	420
16.0	8	24	700	180	560	140	450	110	280	70	1600	450
18.0	9	27	630	180	500	140	400	110	250	70	1400	470
20.0	10	30	560	180	450	140	400	110	220	70	1200	500
22.0	11	33	500	220	450	170	350	140	220	85	1100	470
25.0	12,5	37,5	450	220	400	170	310	140	180	85	1000	450
28.0	14	42	400	210	350	160	280	130	160	85	900	510
30.0	15	45	350	210	310	160	250	130	160	85	900	530
32.0	16	48	350	210	280	160	220	130	140	85	800	500
36.0	18	54	310	210	250	160	200	130	120	85	700	470
40.0	20	60	280	200	220	150	180	120	110	80	630	450
50.0	25	75	220	200	180	170	160	140	90	80	500	370

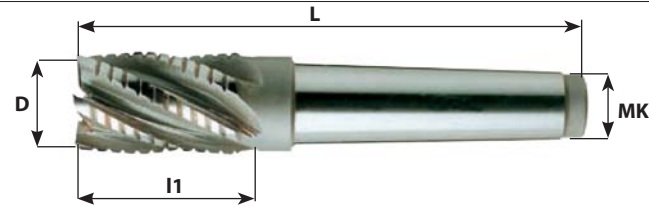
**Coated TiAlN - Side Cuting** Pokryte TiAlN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		~ HRC20 500 ~ 800N/mm2		HRC20 ~ HRC30 800 ~ 1000N/mm2		HRC30 ~ HRC40 1000 ~ 1300N/mm2			
Hardness Twardość												
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	2500	110	2250	85	1700	75	1100	40	6300	280
8.0	4	12	1950	145	1550	105	1250	90	800	50	4350	320
10.0	5	15	1550	210	1250	170	1100	155	650	85	3500	490
12.0	6	18	1250	250	1100	195	900	155	550	100	2800	560
14.0	7	21	1100	250	1000	195	800	155	500	100	2500	590
16.0	8	24	1000	250	800	195	650	155	400	100	2250	630
18.0	9	27	900	250	700	195	550	155	350	100	1950	660
20.0	10	30	800	250	650	195	550	155	300	100	1700	700
22.0	11	33	700	310	650	240	500	195	300	120	1550	660
25.0	12,5	37,5	650	310	550	240	450	195	250	120	1400	630
28.0	14	42	550	295	500	225	400	180	220	120	1250	715
30.0	15	45	500	295	450	225	350	180	220	120	1250	740
32.0	16	48	500	295	400	225	300	180	200	120	1100	700
36.0	18	54	450	295	350	225	300	180	170	120	1000	660
40.0	20	60	400	280	300	210	250	170	130	110	900	630
50.0	25	75	300	280	250	240	220	195	120	110	700	520

**HM079 HMF79**
**SQUARE TYPE WALCOWO-CZOŁOWE**

Multi Flute, Short Length Wielostrzowe, krótkie

	<b>HSS</b> Co 8%													
												o	•	•
<b>P</b>				<b>H</b>		<b>M</b>		<b>K</b>	<b>N</b>				<b>S</b>	
<750 N/mm <sup>2</sup>	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NICO 200-300 HB	Ti 200-410 GB
•	•								o	o				



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	I1	MK	L	Z
HM079160000M02032117	HMF79160000M02032117	16.0	32	2	117	4
HM079180000M02032117	HMF79180000M02032117	18.0	32	2	117	4
HM079200000M02038123	HMF79200000M02038123	20.0	38	2	123	4
HM079220000M02038123	HMF79220000M02038123	22.0	38	2	123	5
HM079240000M03045147	HMF79240000M03045147	24.0	45	3	147	5
HM079250000M03045147	HMF79250000M03045147	25.0	45	3	147	5
HM079260000M03045147	HMF79260000M03045147	26.0	45	3	147	5
HM079280000M03045147	HMF79280000M03045147	28.0	45	3	147	6
HM079300000M03045147	HMF79300000M03045147	30.0	45	3	147	6
HM079320000M04053178	HMF79320000M04053178	32.0	53	4	178	6
HM079350000M04053178	HMF79350000M04053178	35.0	53	4	178	6
HM079360000M04053178	HMF79360000M04053178	36.0	53	4	178	6
HM079380000M04063188	HMF79380000M04063188	38.0	63	4	188	6
HM079400000M04063188	HMF79400000M04063188	40.0	63	4	188	6
HM079450000M04063188	HMF79450000M04063188	45.0	63	4	188	6
HM079500000M05075233	HMF79500000M05075233	50.0	75	5	233	6

UGF

UFX

UFJ

UFD

UFA

UFC

PMT

RB

CBN

HSS

ICT

**HM079 HMF79**

Cutting Conditions Parametry skrawania

**Uncoated - Side Cutting** Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
Hardness Twardość			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
16.0	8	24	700	145	560	110	450	90	280	55	1600	360
18.0	9	27	630	145	500	110	400	90	250	55	1400	380
20.0	10	30	560	145	450	110	400	90	220	55	1200	400
22.0	11	33	500	175	450	135	350	110	220	70	1100	380
25.0	12,5	37,5	450	175	400	135	310	110	180	70	1000	360
28.0	14	42	400	170	350	130	280	105	160	70	900	410
30.0	15	45	350	170	310	130	250	105	160	70	900	420
32.0	16	48	350	170	280	130	220	105	140	70	800	400
36.0	18	54	310	170	250	130	200	105	120	70	700	380
40.0	20	60	280	160	220	120	180	95	110	65	630	360
45.0	22,5	67,5	250	150	210	125	180	95	100	60	560	330
50.0	25	75	220	145	190	120	160	90	90	55	500	330

**Coated TiAlN - Side Cutting** Pokryte TiAlN - Frezowanie boczne

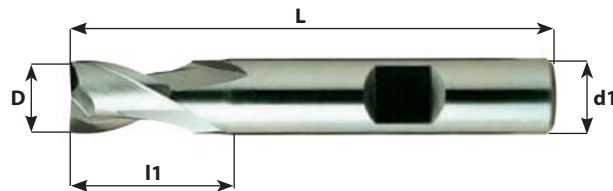
Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Aluminium, Aluminium Alloys Aluminium, Stopy aluminium	
			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
Hardness Twardość			~ 500N/mm2		500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2			
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
16.0	8	24	1000	205	800	155	650	125	400	75	2250	505
18.0	9	27	900	205	700	155	550	125	350	75	1950	530
20.0	10	30	800	205	650	155	550	125	300	75	1700	560
22.0	11	33	700	245	650	190	500	155	300	100	1550	530
25.0	12,5	37,5	650	245	550	190	450	155	250	100	1400	505
28.0	14	42	550	240	500	180	400	145	200	100	1250	575
30.0	15	45	500	240	450	180	350	145	200	100	1250	590
32.0	16	48	500	240	400	180	300	145	170	100	1100	560
36.0	18	54	450	240	350	180	280	145	150	100	1000	530
40.0	20	60	400	225	300	170	250	135	150	90	900	505
45.0	22,5	67,5	350	205	280	170	210	115	140	85	810	485
50.0	25	75	310	190	250	165	190	110	120	75	730	460



**HM0xxx**
**SQUARE TYPE WALCOWO-CZOŁOWE**

2 Flute, Short Length 2-ostrzowe, krótkie

<b>P</b>				<b>H</b>		<b>M</b>		<b>K</b>	<b>N</b>				<b>S</b>		
<750 N/mm <sup>2</sup>	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NICO 200-300 HB	Ti 200-410 GB	
•	•								○	○					



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HMOC0020000B06004048	HMFC0020000B06004048	2.0	6	48	4	2	B
HMOC0025000B06005049	HMFC0025000B06005049	2.5	6	49	5	2	B
HMOC0030000B06005049	HMFC0030000B06005049	3.0	6	49	5	2	B
HMOC0040000B06007051	HMFC0040000B06007051	4.0	6	51	7	2	B
HMOC0050000B06008052	HMFC0050000B06008052	5.0	6	52	8	2	B
HMOC0060000B06008052	HMFC0060000B06008052	6.0	6	52	8	2	B
HMOC0070000B10010060	HMFC0070000B10010060	7.0	10	60	10	2	B
HMOC0080000B10011061	HMFC0080000B10011061	8.0	10	61	11	2	B
HMOC0090000B10011061	HMFC0090000B10011061	9.0	10	61	11	2	B
HMOC0100000B10013063	HMFC0100000B10013063	10.0	10	63	13	2	B
HMOC0110000B12013070	HMFC0110000B12013070	11.0	12	70	13	2	B
HMOC0120000B12016073	HMFC0120000B12016073	12.0	12	73	16	2	B
HMOC0130000B12016073	HMFC0130000B12016073	13.0	12	73	16	2	B
HMOC0140000B12016073	HMFC0140000B12016073	14.0	12	73	16	2	B
HMOC0150000B12016073	HMFC0150000B12016073	15.0	12	73	16	2	B
HMOC0160000B16019079	HMFC0160000B16019079	16.0	16	79	19	2	B
HMOC0170000B16019079	HMFC0170000B16019079	17.0	16	79	19	2	B
HMOC0180000B16019079	HMFC0180000B16019079	18.0	16	79	19	2	B
HMOC0190000B16019079	HMFC0190000B16019079	19.0	16	79	19	2	B
HMOC0200000B20022088	HMFC0200000B20022088	20.0	20	88	22	2	B
HMOC0220000B20022088	HMFC0220000B20022088	22.0	20	88	22	2	B
HMOC0240000B25026102	HMFC0240000B25026102	24.0	25	102	26	2	B
HMOC0250000B25026102	HMFC0250000B25026102	25.0	25	102	26	2	B
HMOC0280000B25026102	HMFC0280000B25026102	28.0	25	102	26	2	B
HMOC0300000B25026102	HMFC0300000B25026102	30.0	25	102	26	2	B

**HMOxxx**

Cutting Conditions Parametry skrawania

**Uncoated - Sloting** Bez pokrycia - Rowkowanie

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa	
			~ HRC20		HRC20 ~HRC30		HRC30 ~HRC40	
Hardness Twardość			500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2	
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED
2.0	2	1	5000	35	4500	35	2400	15
3.0	3	1,5	3500	50	2800	45	1800	20
4.0	4	2	2500	60	2000	50	1200	35
5.0	5	2,5	2000	75	1800	65	1000	40
6.0	6	3	1800	90	1300	65	900	45
8.0	8	4	1200	100	1000	75	600	50
10.0	10	5	1000	100	900	90	500	50
12.0	12	6	900	110	700	90	450	55
14.0	14	7	800	100	600	90	400	55
16.0	16	8	600	100	500	75	300	50
18.0	18	9	550	100	450	75	280	50
20.0	20	10	500	100	450	75	250	50
22.0	22	11	500	100	400	75	250	50
25.0	25	12,5	450	90	350	65	200	40

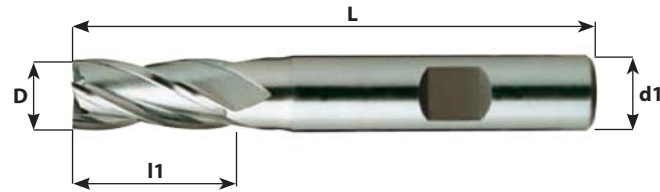
**Coated TiAlN - Sloting** Pokryte TiAlN - Rowkowanie

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa	
			~ HRC20		HRC20 ~HRC30		HRC30 ~HRC40	
Hardness Twardość			500 ~ 800N/mm2		800 ~ 1000N/mm2		1000 ~ 1300N/mm2	
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED
16.0	8	24	800	155	650	125	400	75
18.0	9	27	700	155	550	125	350	75
20.0	10	30	650	155	550	125	300	75
22.0	11	33	650	190	500	155	300	100
25.0	12,5	37,5	550	190	450	155	250	100
28.0	14	42	500	180	400	145	200	100
30.0	15	45	450	180	350	145	200	100
32.0	16	48	400	180	300	145	170	100
36.0	18	54	350	180	280	145	150	100
40.0	20	60	300	170	250	135	150	90
45.0	22,5	67,5	280	170	210	115	140	85
50.0	25	75	250	165	190	110	120	75

**HM0C4 HMFC4 HM0C5 HMFC5**
**SQUARE TYPE WALCOWO-CZOŁOWE**

3-4 Flute, Short Length 3-4-ostrzowe, krótkie

<b>P</b>				<b>H</b>		<b>M</b>		<b>K</b>	<b>N</b>				<b>S</b>		
<750 N/mm <sup>2</sup>	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NICO 200-300 HB	Ti 200-410 GB	
•	•								○	○					



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM0C4020000B06007051	HMFC4020000B06007051	2.0	6	51	7	4	B
HM0C4030000B06008052	HMFC4030000B06008052	3.0	6	52	8	4	B
HM0C4040000B06011055	HMFC4040000B06011055	4.0	6	55	11	4	B
HM0C4050000B06013057	HMFC4050000B06013057	5.0	6	57	13	4	B
HM0C4060000B06013057	HMFC4060000B06013057	6.0	6	57	13	4	B
HM0C4070000B10016066	HMFC4070000B10016066	7.0	10	66	16	4	B
HM0C4080000B10019069	HMFC4080000B10019069	8.0	10	69	19	4	B
HM0C4090000B10019069	HMFC4090000B10019069	9.0	10	69	19	4	B
HM0C4100000B10022072	HMFC4100000B10022072	10.0	10	72	22	4	B
HM0C4120000B12026083	HMFC4120000B12026083	12.0	12	83	26	4	B
HM0C4140000B12026083	HMFC4140000B12026083	14.0	12	83	26	4	B
HM0C4160000B16032092	HMFC4160000B16032092	16.0	16	92	32	4	B
HM0C4180000B16032092	HMFC4180000B16032092	18.0	16	92	32	4	B
HM0C4200000B20038104	HMFC4200000B20038104	20.0	20	104	38	4	B
HM0C5220000B20038104	HMFC5220000B20038104	22.0	20	104	38	6	B
HM0C5240000B25045121	HMFC5240000B25045121	24.0	25	121	45	6	B
HM0C5250000B25045121	HMFC5250000B25045121	25.0	25	121	45	6	B
HM0C5280000B25045121	HMFC5280000B25045121	28.0	25	121	45	6	B
HM0C5300000B25045121	HMFC5300000B25045121	30.0	25	121	45	6	B

	d1 h6				
	D + 0.04 - 0				

 UGF  
 UFX  
 UFJ  
 UFD  
 UFA  
 UFC  
 PMT  
 RB  
 CBN  
 HSS  
 ICT

**HM0C4 HMFC4 HM0C5 HMFC5**

Cutting Conditions Parametry skrawania

**Uncoated - Side Cutting** Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa	
			~ HRC20 500 ~ 800N/mm2		HRC20 ~HRC30 800 ~ 1000N/mm2		HRC30 ~HRC40 1000 ~ 1300N/mm2	
Hardness Twardość								
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED
2.0	0,2	3	5000	60	4500	50	2400	20
3.0	0,3	4,5	3500	90	2800	65	1800	35
4.0	0,4	6	2500	110	2000	70	1200	50
5.0	0,5	7,5	2000	140	1800	100	1000	55
6.0	0,6	9	1800	160	1300	100	900	65
8.0	0,8	12	1200	180	1000	115	600	70
10.0	1	15	1000	180	900	130	500	70
12.0	1,2	18	900	200	700	130	450	80
14.0	1,4	21	800	180	600	130	400	80
16.0	1,6	24	600	180	500	115	300	70
18.0	1,8	27	550	180	450	115	280	70
20.0	2	30	500	180	450	115	250	70
22.0	2,2	33	500	180	400	115	250	70
25.0	2,5	37,5	450	160	350	100	200	55

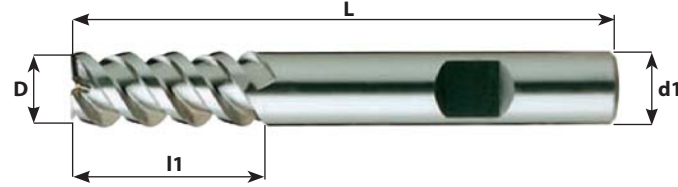
**Coated TiAlN - Side Cutting** Pokryte TiAlN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa	
			~ HRC20 500 ~ 800N/mm2		HRC20 ~HRC30 800 ~ 1000N/mm2		HRC30 ~HRC40 1000 ~ 1300N/mm2	
Hardness Twardość								
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED
2.0	0,2	3	7000	85	6300	70	3350	30
3.0	0,3	4,5	4900	125	3900	90	2500	50
4.0	0,4	6	3500	155	2800	100	1700	70
5.0	0,5	7,5	2800	195	2500	140	1400	75
6.0	0,6	9	2500	225	1800	140	1250	90
8.0	0,8	12	1700	250	1400	160	250	100
10.0	1	15	1400	250	1260	180	700	100
12.0	1,2	18	1250	280	980	180	600	110
14.0	1,4	21	1100	250	840	180	550	110
16.0	1,6	24	850	250	700	160	400	95
18.0	1,8	27	750	250	630	160	390	95
20.0	2	30	700	250	630	160	350	95
22.0	2,2	33	700	250	560	160	350	95
25.0	2,5	37,5	630	225	490	140	280	75

**HM0C6 HMFC6**
**SQUARE TYPE WALCOWO-CZOŁOWE**

3-4 Flute, Short Length 3-4-ostrzowe, krótkie

P				H		M		K	N				S							
<750 N/mm <sup>2</sup>	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NICO 200-300 HB	Ti 200-410 GB						
•	•								○	○										



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HMOC6060000B06013057	HMFC6060000B06013057	6.0	6	57	13	3	B
HMOC6070000B10016066	HMFC6070000B10016066	7.0	10	66	16	3	B
HMOC6080000B10019069	HMFC6080000B10019069	8.0	10	69	19	3	B
HMOC6090000B10019069	HMFC6090000B10019069	9.0	10	69	19	3	B
HMOC6100000B10022072	HMFC6100000B10022072	10.0	10	72	22	3	B
HMOC6120000B12026083	HMFC6120000B12026083	12.0	12	83	26	3	B
HMOC6140000B12026083	HMFC6140000B12026083	14.0	12	83	26	3	B
HMOC6150000B12026083	HMFC6150000B12026083	15.0	12	83	26	3	B
HMOC6160000B16032092	HMFC6160000B16032092	16.0	16	92	32	3	B
HMOC6180000B16032092	HMFC6180000B16032092	18.0	16	92	32	3	B
HMOC6200000B20038104	HMFC6200000B20038104	20.0	20	104	38	3	B
HMOC6250000B25045121	HMFC6250000B25045121	25.0	25	121	45	4	B
HMOC6300000B25045121	HMFC6300000B25045121	30.0	25	121	45	4	B

**HM0C6 HMFC6**

Cutting Conditions Parametry skrawania

**Uncoated - Side Cutiing** Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa	
			~ HRC20 500 ~ 800N/mm2		HRC20 ~HRC30 800 ~ 1000N/mm2		HRC30 ~HRC40 1000 ~ 1300N/mm2	
Hardness Twardość			RPM	FEED	RPM	FEED	RPM	FEED
d1 (mm)	ae(mm)	ap(mm)						
6.0	1,8	9	2000	100	1600	65	1200	45
8.0	2,4	12	1500	100	1300	80	1000	45
10.0	3	15	1300	110	1000	80	800	50
12.0	3,6	18	1000	120	800	80	600	50
14.0	4,2	21	800	130	650	80	500	55
16.0	4,8	24	660	140	520	110	400	70
18.0	5,4	27	500	180	400	140	310	100
20.0	6	30	400	190	330	160	250	100

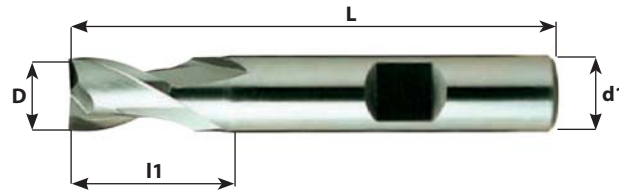
**Coated TiAlN - Side Cutiing** Pokryte TiAlN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa	
			~ HRC20 500 ~ 800N/mm2		HRC20 ~HRC30 800 ~ 1000N/mm2		HRC30 ~HRC40 1000 ~ 1300N/mm2	
Hardness Twardość			RPM	FEED	RPM	FEED	RPM	FEED
d1 (mm)	ae(mm)	ap(mm)						
6.0	1,8	9	2800	140	2240	90	1680	60
8.0	2,4	12	2100	140	1820	110	1400	60
10.0	3	15	1800	155	1400	110	1120	70
12.0	3,6	18	1400	170	1120	110	840	70
14.0	4,2	21	1100	180	910	110	700	75
16.0	4,8	24	920	195	730	155	560	100
18.0	5,4	27	700	250	560	195	430	140
20.0	6	30	560	265	460	225	350	140

**HM0P1 HMFP1**
**SQUARE TYPE WALCOWO-CZOŁOWE**

2 Flute, Short Length 2-ostrzowe, krótkie

<b>P</b>				<b>H</b>		<b>M</b>		<b>K</b>	<b>N</b>			<b>S</b>		
<750 N/mm <sup>2</sup>	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NICO 200-300 HB	Ti 200-410 GB
•	•								○	○				



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HMOP1020000B06004048	HMFP1020000B06004048	2.0	6	48	4	2	B
HMOP1030000B06005049	HMFP1030000B06005049	3.0	6	49	5	2	B
HMOP1040000B06007051	HMFP1040000B06007051	4.0	6	51	7	2	B
HMOP1050000B06008052	HMFP1050000B06008052	5.0	6	52	8	2	B
HMOP1060000B06008052	HMFP1060000B06008052	6.0	6	52	8	2	B
HMOP1080000B10011061	HMFP1080000B10011061	8.0	10	61	11	2	B
HMOP1100000B10013063	HMFP1100000B10013063	10.0	10	63	13	2	B
HMOP1120000B12016073	HMFP1120000B12016073	12.0	12	73	16	2	B
HMOP1140000B12016073	HMFP1140000B12016073	14.0	12	73	16	2	B
HMOP1160000B16019079	HMFP1160000B16019079	16.0	16	79	19	2	B
HMOP1180000B16019079	HMFP1180000B16019079	18.0	16	79	19	2	B
HMOP1200000B20022088	HMFP1200000B20022088	20.0	20	88	22	2	B
HMOP1220000B20022088	HMFP1220000B20022088	22.0	20	88	22	2	B
HMOP1250000B25026102	HMFP1250000B25026102	25.0	25	102	26	2	B

	d1 ≤ 3,0	0 — -6	d1 ≤ 18	0 — -11
	d1 ≤ 6,0	0 — -8	d1 ≤ 30	0 — -13
	d1 ≤ 10	0 — -9	d1 ≤ 50	0 — -16

**HM0P1 HMFP1**

Cutting Conditions Parametry skrawania

**Uncoated - Sloting Bez pokrycia - Rowkowanie**

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa	
			~ HRC20 500 ~ 800N/mm2		HRC20 ~HRC30 800 ~ 1000N/mm2		HRC30 ~HRC40 1000 ~ 1300N/mm2	
Hardness Twardość								
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED
2.0	2	1	5600	35	5000	35	2800	20
3.0	3	1,5	4000	55	3000	50	2000	25
4.0	4	2	2800	70	2200	55	1400	35
5.0	5	2,5	2200	85	2000	75	1100	45
6.0	6	3	2000	100	1500	75	1000	50
8.0	8	4	1400	110	1100	85	700	55
10.0	10	5	1100	110	1000	100	560	55
12.0	12	6	1000	125	800	100	500	60
14.0	14	7	900	110	700	100	450	60
16.0	16	8	700	110	560	85	350	55
18.0	18	9	600	110	500	85	300	55
20.0	20	10	560	110	500	85	280	55
22.0	22	11	560	110	450	85	280	55
25.0	25	12,5	500	100	400	75	230	45

**Coated TiAlN - Sloting Pokryte TiAlN - Rowkowanie**

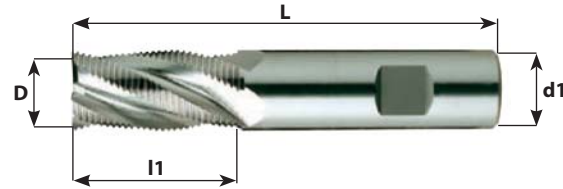
Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa	
			~ HRC20 500 ~ 800N/mm2		HRC20 ~HRC30 800 ~ 1000N/mm2		HRC30 ~HRC40 1000 ~ 1300N/mm2	
Hardness Twardość								
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED
2.0	2	1	7840	50	7000	50	3900	30
3.0	3	1,5	5600	80	4200	70	2800	35
4.0	4	2	3900	100	3100	75	1950	50
5.0	5	2,5	3100	120	2800	105	1540	60
6.0	6	3	2800	140	2100	105	1400	70
8.0	8	4	1950	155	1540	120	1000	75
10.0	10	5	1550	155	1400	150	800	75
12.0	12	6	1400	175	1100	150	700	85
14.0	14	7	1250	155	1000	150	600	85
16.0	16	8	1000	155	800	120	500	75
18.0	18	9	840	155	700	120	390	75
20.0	20	10	780	155	700	120	390	75
22.0	22	11	780	155	600	120	390	75
25.0	25	12,5	700	140	550	105	320	65



**HM059 HMF59**
**SQUARE TYPE WALCOWO-CZOŁOWE**

Multi Flute, Short Length Wielostrzowe, krótkie

<b>P</b>				<b>H</b>		<b>M</b>		<b>K</b>	<b>N</b>				<b>S</b>	
<750 N/mm <sup>2</sup>	<30 HRC	<42 HRC	<55 HRC	<65 HRC	<70 HRC	<250 HB	<320 HB	GG	Al 100 HB	Al, Si <10% 130HB	CU, ZN 35-300 HB	GFK	NICO 200-300 HB	Ti 200-410 GB
•	•								○	○				



D code Uncoated Kod bez pokrycia	D code TiAlN Kod TiAlN	D	d1	L	l1	Z	Shank Uchwyt
HM059060000B06013057	HMF59060000B06013057	6.0	6	57	13	4	B
HM059070000B10016066	HMF59070000B10016066	7.0	10	66	16	4	B
HM059080000B10019069	HMF59080000B10019069	8.0	10	69	19	4	B
HM059090000B10019069	HMF59090000B10019069	9.0	10	69	19	5	B
HM059100000B10022072	HMF59100000B10022072	10.0	10	72	22	5	B
HM059110000B12022079	HMF59110000B12022079	11.0	12	79	22	5	B
HM059120000B12026083	HMF59120000B12026083	12.0	12	83	26	5	B
HM059130000B12026083	HMF59130000B12026083	13.0	12	83	26	5	B
HM059140000B12026083	HMF59140000B12026083	14.0	12	83	26	5	B
HM059150000B12026083	HMF59150000B12026083	15.0	12	83	26	5	B
HM059160000B16032092	HMF59160000B16032092	16.0	16	92	32	5	B
HM059180000B16032092	HMF59180000B16032092	18.0	16	92	32	5	B
HM059200000B20038104	HMF59200000B20038104	20.0	20	104	38	5	B
HM059220000B20038104	HMF59220000B20038104	22.0	20	104	38	5	B
HM059250000B25045121	HMF59250000B25045121	25.0	25	121	45	6	B
HM059300000B25045121	HMF59300000B25045121	30.0	25	121	45	6	B

	d1 ≤ 3,0	0 — -6	d1 ≤ 18	0 — -11
	d1 ≤ 6,0	0 — -8	d1 ≤ 30	0 — -13
	d1 ≤ 10	0 — -9	d1 ≤ 50	0 — -16

**HM059 HMF59**

Cutting Conditions Parametry skrawania

**Uncoated - Side Cuting** Bez pokrycia - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa	
			~ HRC20		HRC20 ~HRC30		HRC30 ~HRC40		HRC30 ~HRC40	
Hardness Twardość			500 ~ 800N/mm2		800 ~ 900N/mm2		900 ~ 1100N/mm2		1100 ~ 1300N/mm2	
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	2300	100	2000	75	1500	70	1000	35
8.0	4	12	1800	130	1400	95	1100	80	700	45
10.0	5	15	1400	190	1100	150	1000	140	560	75
12.0	6	18	1100	230	1000	180	800	140	500	85
14.0	7	21	1000	230	900	180	700	140	450	85
16.0	8	24	900	230	700	180	560	140	350	85
18.0	9	27	800	230	600	180	500	140	300	85
20.0	10	30	700	230	560	180	500	140	300	85
22.0	11	33	600	280	560	210	450	180	300	105
25.0	12,5	37,5	560	280	500	210	400	180	230	105
28.0	14	42	500	260	450	200	350	160	200	105
30.0	15	45	450	260	400	200	300	160	200	105

**Coated TiAlN - Side Cuting** Pokryte TiAlN - Frezowanie boczne

Material Materiał			Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa		Carbon Steels, Alloy Steels, Tool Steels Stal węglowa, Stal stopowa. Stal narzędziowa	
			~ HRC20		HRC20 ~HRC30		HRC30 ~HRC40		HRC30 ~HRC40	
Hardness Twardość			500 ~ 800N/mm2		800 ~ 900N/mm2		900 ~ 1100N/mm2		1100 ~ 1300N/mm2	
d1 (mm)	ae(mm)	ap(mm)	RPM	FEED	RPM	FEED	RPM	FEED	RPM	FEED
6.0	3	9	3220	140	2800	105	2100	95	1400	50
8.0	4	12	2520	180	1960	135	1540	110	980	60
10.0	5	15	1960	265	1540	210	1400	195	780	105
12.0	6	18	1540	320	1400	250	1120	195	700	120
14.0	7	21	1400	320	1260	250	980	195	630	120
16.0	8	24	1260	320	980	250	780	195	490	120
18.0	9	27	1120	320	840	250	700	195	420	120
20.0	10	30	980	320	780	250	700	195	420	120
22.0	11	33	840	390	780	295	630	250	420	145
25.0	12,5	37,5	780	390	700	295	560	250	320	145
28.0	14	42	700	365	630	280	490	225	280	145
30.0	15	45	630	365	560	280	420	225	280	145