

STOCK-PLUS 2019



UNIVERSAL

**FRÄSERPROGRAMM
MILLING PROGRAMME**

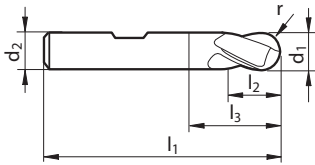
Langlochfräser mit Vollradius (2-Schneider)/Ball nose slot drills (2-fluted)



Katalog-Nr./Catalogue no. 54920

N	WN	VHM	TiAlN	e8	R	HB	30°	9°
P	M	K	N	S	H			
•	•	•	•	•	•	•	•	•

• Zentrumschnitt/centre cutting

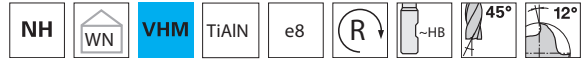


							Katalog-Nr./Catalogue no.	54920	
							Rabattgruppe/Discount group	206	
d1 e8	d2 h6	l1	l2	l3	r	Z	Code-Nr.	EUR/Stück	
mm	mm	mm	mm	mm	mm		Code no.	EUR/piece	
4,000	6,000	50,000	8,000	13,000	2,000	2	4,000	9,50	
5,000	6,000	50,000	10,000	16,500	2,500	2	5,000	9,50	
6,000	6,000	50,000	10,000	20,000	3,000	2	6,000	9,50	
8,000	8,000	60,000	19,000	27,000	4,000	2	8,000	11,50	
10,000	10,000	70,000	22,000	30,000	5,000	2	10,000	14,50	
12,000	12,000	75,000	26,000	39,000	6,000	2	12,000	22,00	
14,000	14,000	75,000	26,000	40,000	7,000	2	14,000	28,00	
16,000	16,000	75,000	26,000	43,000	8,000	2	16,000	34,00	
18,000	18,000	100,000	32,000	52,000	9,000	2	18,000	40,00	
20,000	20,000	100,000	32,000	50,000	10,000	2	20,000	55,00	

Bohrnutenfräser (3-Schneider)/Slot drills (3-fluted)

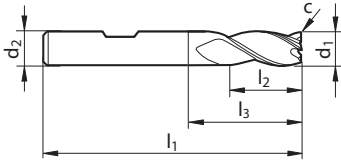


Katalog-Nr./Catalogue no. 54930



P	M	K	N	S	H
•	•	•	○	•	

- Hochleistungs-Bohrnutenfräser mit hohem Spiralwinkel für besonders weichen Schnitt/ high-performance slot drill with a quick helix for an especially smooth cutting operation
- Zentrumschnitt/centre cutting
- mit spezieller Bohrstirn/with special drill face

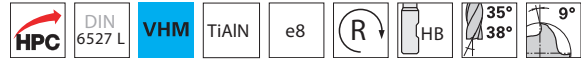


Katalog-Nr./Catalogue no.								54930
Rabattgruppe/Discount group								206
d1 e8 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Code-Nr. Code no.	EUR/Stück EUR/piece
3,000	6,000	57,000	8,000	11,500	0,050	3	3,000	8,50
4,000	6,000	57,000	11,000	14,900	0,060	3	4,000	8,50
5,000	6,000	57,000	13,000	18,400	0,080	3	5,000	8,50
6,000	6,000	57,000	13,000	21,000	0,090	3	6,000	8,50
8,000	8,000	63,000	19,000	27,000	0,120	3	8,000	11,00
10,000	10,000	72,000	22,000	32,000	0,150	3	10,000	15,50
12,000	12,000	83,000	26,000	38,000	0,180	3	12,000	24,00
14,000	14,000	83,000	26,000	38,000	0,210	3	14,000	29,00
16,000	16,000	92,000	32,000	44,000	0,240	3	16,000	39,00
20,000	20,000	104,000	38,000	54,000	0,300	3	20,000	62,00

HPC-Schaftfräser (4-Schneider)/HPC end mills (4-fluted)

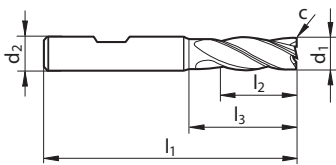


Katalog-Nr./Catalogue no. 54940



P	M	K	N	S	H
•	•	•	○	•	○

- Hochleistungsfräser mit variablem Spiralwinkel/
high-performance end mills with variable helix angle
- Zentrumschnitt/centre cutting



								Katalog-Nr./Catalogue no.	54940
								Rabattgruppe/Discount group	206
d1 e8 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Code-Nr. Code no.	EUR/Stück EUR/piece	
3,000	6,000	57,000	8,000	11,400	0,060	4	3,000	10,50	
4,000	6,000	57,000	11,000	14,900	0,080	4	4,000	10,50	
5,000	6,000	57,000	13,000	17,400	0,100	4	5,000	10,50	
6,000	6,000	57,000	13,000	21,000	0,120	4	6,000	12,50	
8,000	8,000	63,000	19,000	27,000	0,160	4	8,000	17,00	
10,000	10,000	72,000	22,000	32,000	0,200	4	10,000	26,00	
12,000	12,000	83,000	26,000	38,000	0,240	4	12,000	33,00	
14,000	14,000	83,000	26,000	38,000	0,280	4	14,000	45,00	
16,000	16,000	92,000	32,000	44,000	0,320	4	16,000	57,00	
20,000	20,000	104,000	38,000	54,000	0,400	4	20,000	88,00	

Mehrzahn-Schaftfräser (6-Schneider)/Multi-tooth end mills (6-fluted)

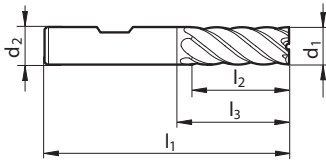


Katalog-Nr./Catalogue no. 54960



P	M	K	N	S	H
•	•	•	•	•	○

• ohne Zentrumschnitt/without centre cutting



						Katalog-Nr./Catalogue no.	54960
						Rabattgruppe/Discount group	206
d1 e8 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	Z	Code-Nr. Code no.	EUR/Stück EUR/piece
4,000	6,000	57,000	11,000	15,900	6	4,000	10,50
5,000	6,000	57,000	13,000	17,900	6	5,000	10,50
6,000	6,000	57,000	13,000	21,000	6	6,000	10,50
8,000	8,000	63,000	19,000	27,000	6	8,000	12,50
10,000	10,000	72,000	22,000	32,000	6	10,000	20,00
12,000	12,000	83,000	26,000	38,000	6	12,000	27,00
14,000	14,000	83,000	26,000	38,000	6	14,000	37,00
16,000	16,000	92,000	32,000	44,000	6	16,000	48,00
18,000	18,000	92,000	32,000	44,000	6	18,000	56,00
20,000	20,000	104,000	38,000	54,000	6	20,000	68,00

Arbeitsrichtwerte/ Application recommendations

		Vorschubreihen/ Feed column																Vorschube f (mm/Zahn) Feed f (mm/tooth)
Code	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W		
Werkzeug-Ø mm Tool-Ø mm	2,00	0,001	0,001	0,001	0,002	0,002	0,004	0,005	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,018	0,020	
	3,00	0,002	0,002	0,003	0,003	0,004	0,007	0,010	0,010	0,010	0,015	0,016	0,013	0,019	0,022	0,024	0,030	
	5,00	0,005	0,006	0,007	0,009	0,010	0,014	0,020	0,020	0,022	0,025	0,026	0,026	0,028	0,030	0,032	0,038	
	6,00	0,006	0,008	0,009	0,011	0,013	0,017	0,024	0,025	0,027	0,031	0,029	0,033	0,039	0,036	0,041	0,047	
	8,00	0,010	0,012	0,014	0,016	0,019	0,024	0,032	0,032	0,035	0,042	0,042	0,047	0,053	0,052	0,058	0,064	
	10,00	0,013	0,015	0,018	0,021	0,025	0,030	0,038	0,039	0,044	0,050	0,053	0,059	0,065	0,066	0,073	0,080	
	12,00	0,010	0,018	0,022	0,026	0,030	0,036	0,046	0,048	0,052	0,059	0,063	0,072	0,079	0,085	0,090	0,100	
	16,00	0,020	0,023	0,027	0,032	0,038	0,045	0,054	0,058	0,063	0,071	0,079	0,088	0,095	0,100	0,110	0,120	
	20,00	0,023	0,028	0,033	0,038	0,045	0,057	0,066	0,073	0,080	0,090	0,097	0,100	0,110	0,120	0,130	0,140	
	25,00	0,030	0,035	0,040	0,045	0,055	0,065	0,075	0,100	0,120	0,130	0,140	0,150	0,165	0,170	0,180	0,190	

Fett gedruckte Vorschubreihen-Codebuchstaben sind bevorzugt einzusetzen, wenn es die Fräsfreigabe gestattet.
Feed rate codes in bold are the preferred choice for the respective material group.

Kühlmittel/ Lubricants :
 Schneidöl, hochaktiviert/ cutting oil, highly activated ■
 Bohrölemulsion/ soluble oil (emulsion) ■
 nur Luftkühlung/ air only □

Werkstoffgruppe Material group	Werkstoffbeispiele (Fettgedruckte Zahlen = Werkstoff-Nr. nach DIN EN) Materials examples (Figures in bold = material no. to DIN EN)	Zugfestigk./ Tensile str. MPa (N/mm ²)	Härte Hardness	Kühlmittel Coolant
Allgemeine Baustähle General purpose steels	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 >500-850		■
Automatenstähle Free-cutting steels	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 850-1000		■
Unlegierte Vergütungsstähle Unalloyed tempering steels	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤ 700 700-850 850-1000		■
Legierte Vergütungsstähle Alloyed tempering steels	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	850-≤1000 1000-1200		■
Unleg. Einsatzst./ Unall. case hard. st.	1.0301 (C10), 1.1121 C10E (Ck10)	≤750		■
Legierte Einsatzstähle Alloyed case hardened steels	1.7043 38Cr4 1.5752 15NiCr13 (15NiCr13), 1.7131 16MnCr5, 1.7264 20CrMo5	850-≤1000 1000-1200	■	■
Nitrierstähle/ Nitriding steels	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≥850-≤1000 >1000-1200		■
Werkzeugstähle/ Tool steels	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 >850-1000		■
Schnellarbeitsstähle/ High speed steels	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≥650-1000		■
Federstähle/ Spring steels	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤330 HB	■
Gehärtete Stähle/ Hardened steels	-		≤40-48 HRC >48-60 HRC	■
Rostfreie St., geschwefelt/ sulphured Stainless st. austenitisch/ austenitic martensitisch/ martensitic	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A) 1.4057 X20CrNi 17 2 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤850 ≤850 ≤850		■
Gusseisen/ Cast iron	0.6010 EN-GJL-100(GG10), 0.6020 EN-GJL-200(GG20) 0.6025 EN-GJL-250(GG25), 0.6035 EN-GJL-350(GG35)	850-≤1000 1000-1200		■
Kugelgraphit- und Temperguss Spher. graphite iron and mall. cast iron	0.7050 EN-GJS-500-7(GGG50), 0.8035 EN-GJMW-350-4(GTW35) 0.7070 EN-GJS-700-2(GGG70), 0.8170 EN-GJMB-700-2(GTS70)		≤240 HB <300 HB	■
Hartguss/ Chilled cast iron	-		≤350 HB	■
Neue Gusswerkstoffe GGV New Cast iron GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo6			■
Neue Gusswerkstoffe ADI New Cast iron ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	800-1000 1200-1400		■
Sonderlegierungen/ Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤1200		■
Titan und Titan-Leg./ Ti and Ti-alloys	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 >850-1200		■
Al und Al-Leg./ Al and Al-alloys	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		■
Al-Knetleg./ Al wrought alloys	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤450		■
Al-Gusslegierungen ≤ 10 % Si Al cast alloys > 10 % Si	3.2131 G-ALSi5Cu1, 3.2153 G-ALSi7Cu3, 3.2573 G-ALSi9 3.2581 G-ALSi12, 3.2583 G-ALSi12Cu, - G-ALSi12CuNiMg	≤600 ≤600		■
Magnesium-Leg./ Magnesium alloys	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤450		□
Kupfer, niedrigleg. Copper, low alloyed	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤400		■
Messing, kurzspanend/ short-chipping Brass langspanend/ long-chipping	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600 ≤600		■
Bronzen, kurzspanend Bronze, short-chipping	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0790 CuNi18Zn19Pb	≤600 >600-850		■
Bronzen, langspanend Bronze, long-chipping	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 >850-1000		■
Kunststoffe, duroplast./ Duroplastics thermopl./ Thermoplastics	Epoxidharz, Resopal, Pertinax, Moltopren Plexiglas, Hostalen, Novodur, Makralon			- □
Kunststoffe, aramidfaserverst./ Kevlar glas-/kohlefaser/ Glass/carbon-conc.pl.	Kevlar GFK/CFK			- □

Nutenfräsen Slot drilling

Schruppen Roughing

Feinstschlichten Super finishing

Kopieren Copying

Katalog-Nr.
Catalogue
no.

54930

54940

54960

54920

VHM/ Solid carbide

VHM/ Solid carbide

VHM/ Solid carbide

VHM/ Solid carbide

6527 K

6527 K

6527 K

6527 K

NH

N

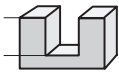
NH

N

DIN/Standard
Typ/Type



$a_e = 1 \times D$



$a_p = 1 \times D$



$a_e = 0,5-1,0 \times D$



$a_p = 1 \times D$



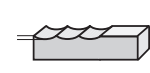
$a_e = 0,05 \times D$



$a_p = 1,5 \times D$



$a_e = 0,05 \times D$



$a_p = 0,05 \times D$

v_c m/min	VR-Code Feed column no.	v_c m/min	VR-Code Feed column no.	v_c m/min	VR-Code Feed column no.	v_c m/min	VR-Code Feed column no.
94 - 116	N	170 - 208	V	171 - 209	S	153 - 187	S
89 - 109	M	157 - 193	U	157 - 193	R	144 - 176	R
94 - 116	M	170 - 208	U	171 - 209	R	153 - 187	R
69 - 85	N	126 - 154	T	126 - 154	Q	153 - 187	Q
94 - 116	M	170 - 208	U	171 - 209	R	135 - 165	R
84 - 104	M	151 - 185	U	153 - 187	R	135 - 165	R
69 - 85	N	126 - 154	T	126 - 154	Q	117 - 1N	Q
84 - 104	N	151 - 185	T	153 - 187	Q	126 - 154	Q
69 - 85	N	126 - 154	S	126 - 154	P	153 - 187	P
99 - 121	M	189 - 231	U	189 - 231	R	198 - 2M	R
84 - 104	M	151 - 185	U	153 - 187	R	171 - 209	R
59 - 73	N	113 - 139	T	117 - 1N	Q	108 - 132	Q
94 - 116	M	170 - 208	U	171 - 209	R	144 - 176	R
84 - 104	L	151 - 185	S	153 - 187	P	135 - 165	P
84 - 104	M	151 - 185	U	153 - 187	R	135 - 165	R
69 - 85	L	126 - 154	S	126 - 154	P	117 - 1N	P
49 - 61	N	94 - 116	T	94 - 116	Q	85 - 105	Q
49 - 61	L	94 - 116	S	94 - 116	P	85 - 105	P
49 - 61	L	44 - 54	Q	49 - 61	N	49 - 61	O
49 - 61	N	80 - 100	T	94 - 116	Q	85 - 105	Q
45 - 55	L	70 - 90	S	81 - 99	P	76 - 94	P
39 - 49	M	65 - 70	T	76 - 94	Q	67 - 83	Q
118 - 146	M	220 - 270	U	220 - 270	R	198 - 2M	R
108 - 134	L	201 - 247	T	202 - 248	Q	189 - 231	Q
99 - 121	M	182 - 224	U	180 - 220	R	171 - 209	R
89 - 109	L	157 - 193	T	157 - 193	Q	144 - 176	Q
59 - 73	L	107 - 131	R			99 - 121	O
29 - 37	L	56 - 70	S	54 - 66	P	49 - 61	P
49 - 61	L	54 - 86	N	94 - 116	P		
39 - 49	L	44 - 72	M	76 - 94	O		
				810 - 990	U	720 - 880	U
				720 - 880	U	855 - 1045	U
217 - 267	N			405 - 495	S	3M - L8	S
178 - 218	O			324 - 396	T	288 - 352	T
				450 - 550	U	405 - 495	U
118 - 146	O			216 - 264	T	180 - 220	T
99 - 121	O			198 - 2M	S	171 - 209	S
				162 - 198	S	162 - 198	S
99 - 121	N			198 - 2M	S	180 - 220	S
79 - 97	M			153 - 187	R	171 - 209	R
				153 - 187	R	198 - 2M	R
				126 - 154	Q	189 - 231	Q
				216 - 264	Q		
				198 - 2M	Q		



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