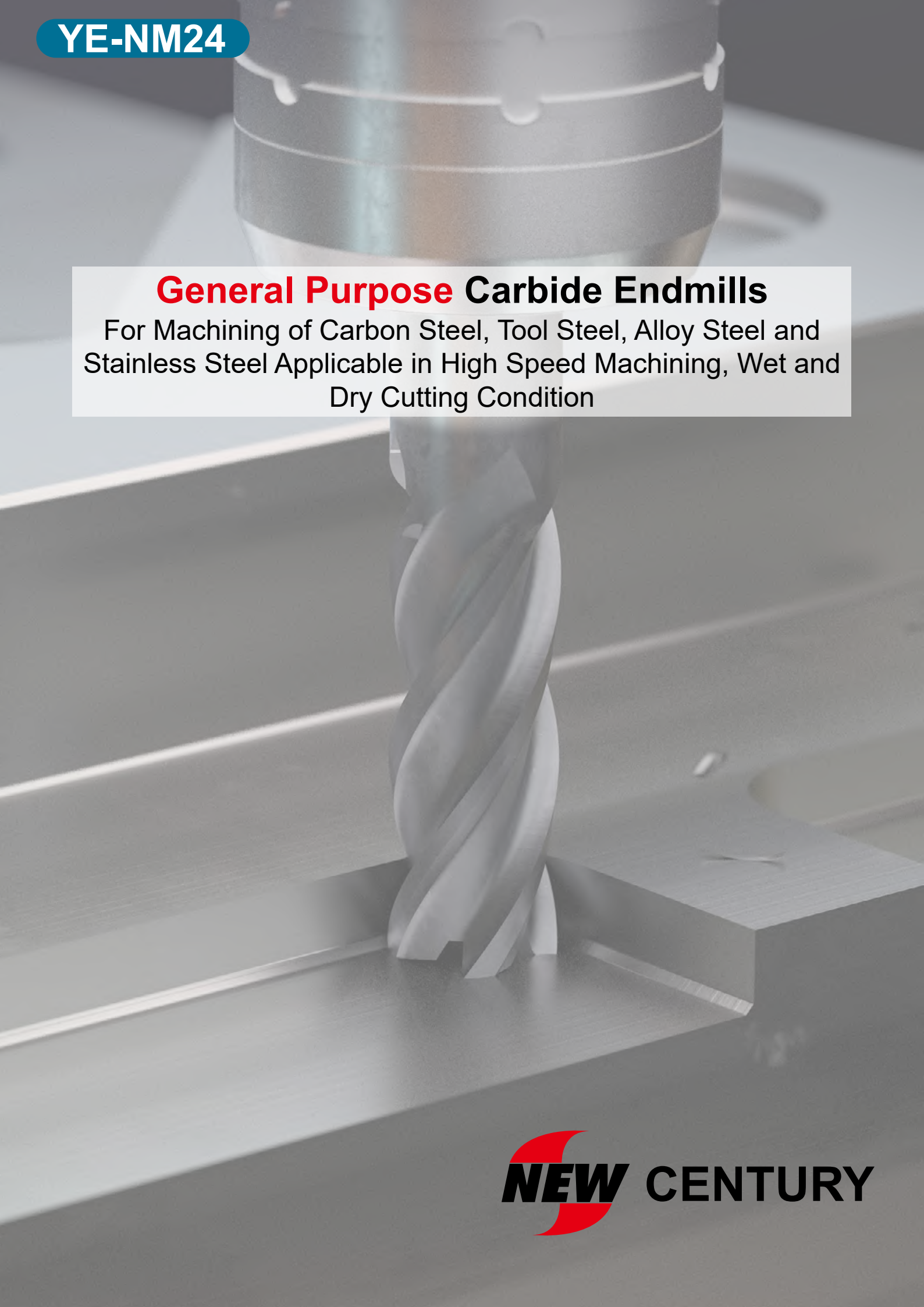
YE-NM24

General Purpose Carbide Endmills

For Machining of Carbon Steel, Tool Steel, Alloy Steel and Stainless Steel Applicable in High Speed Machining, Wet and Dry Cutting Condition



NEW CENTURY

SELECTION GUIDE

SERIES	G9F44	G9J56	G9J62	G9F41
FLUTE	2	2	2	2
HELIX ANGLE	30°	30°	30°	30°
CUTTING EDGE SHAPE	BALL NOSE	BALL NOSE	BALL NOSE	SQUARE
SIZE MIN	R1.0	R1.5	R0.2	D1.0
SIZE MAX	R10.0	R10.0	R2.0	D20.0
PAGE	4	5	6-7	8-9
	SHORT LENGTH	LONG REACH	RIB PROCESSING	SHORT LENGTH
	X-Coating	X-Coating	X-Coating	X-Coating

SOLID CARBIDE
END MILLS

General Purpose
Conventional or High Speed Milling
Wet & Dry Cutting

◎ : Excellent ○ : Good

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc	G9F44	G9J56	G9J62	G9F41
P	1	Non-alloy steel	About 0.15% C	Annealed	125		◎	◎	◎	◎
	2		About 0.45% C	Annealed	190	13	◎	◎	◎	◎
	3		About 0.45% C	Quenched & Tempered	250	25	◎	◎	◎	◎
	4		About 0.75% C	Annealed	270	28	◎	◎	◎	◎
	5		About 0.75% C	Quenched & Tempered	300	32	◎	◎	◎	◎
	6	Low alloy steel		Annealed	180	10	◎	◎	◎	◎
	7			Quenched & Tempered	275	29	◎	◎	◎	◎
	8			Quenched & Tempered	300	32	◎	◎	◎	◎
	9			Quenched & Tempered	350	38	◎	◎	◎	◎
	10	High alloyed steel, and tool steel		Annealed	200	15	◎	◎	◎	◎
	11			Quenched & Tempered	325	35	◎	◎	◎	◎
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15	○	○		
	13		Martensitic	Quenched & Tempered	240	23	○	○		
	14		Austenitic		180	10	○	○		
K	15	Grey cast iron	Pearlitic / ferritic		180	10	○	○		
	16		Pearlitic (Martensitic)		260	26	○	○		○
	17	Nodular cast iron	Ferritic		160	3	○	○		○
	18		Pearlitic		250	25	○	○		○
	19	Malleable cast iron	Ferritic		130		○	○		○
	20		Pearlitic		230	21	○	○		○
N	21	Aluminum-wrought alloy	Not Curable		60					
	22		Curable	Hardened	100					
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75					
	24		≤ 12% Si, Curable	Hardened	90					
	25		> 12% Si, Not Curable		130					
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110					
	27		CuZn, CuSnZn (Brass)		90					
	28		CuSn, lead-free copper and electrolytic copper		100					
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic							
	30		Rubber, Wood, etc.							
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15				
	32			Cured	280	30				
	33		Ni or Co Based	Annealed	250	25				
	34			Cured	350	38				
	35			Cast	320	34				
	36	Titanium Alloys	Pure Titanium		400 Rm					
	37		Alpha + Beta Alloys	Hardened	1050 Rm					
H	38	Hardened steel		Hardened	550	55	○	○	○	○
	39			Hardened	630	60				
	40	Chilled Cast Iron		Cast	400	42	○	○	○	○
	41	Hardened Cast Iron		Hardened	550	55			○	

G9J54	G9J61	G9F43	G9J59	G9F42	G9J55	G9J57	G9J58	G9J60
2	2	3	3	4	4	4	4&6	Multi Flute
30°	30°	30°	30°	30°	30°	30°	45°	30°
SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	CORNER RADIUS	SQUARE	ROUGHING
D3.0	D0.4	D1.0	D0.5	D1.0	D3.0	D2.0	D3.0	D6.0
D20.0	D4.0	D20.0	D20.0	D20.0	D20.0	D12.0	D20.0	D25.0
10	**11-12**	**13-14**	**15-16**	**17-18**	**19**	**20-21**	**22**	**23**
EXTRA LONG LENGTH	RIB PROCESSING	SHORT LENGTH	THROW AWAY	SHORT LENGTH	EXTRA LONG LENGTH	SHORT LENGTH	SHORT LENGTH LONG LENGTH	LONG LENGTH
X-Coating	X-Coating	X-Coating	X-Coating	X-Coating	X-Coating	X-Coating	X-Coating	X-Coating

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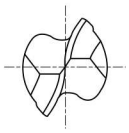
	○						○		41	

CARBIDE, 2 FLUTE SHORT LENGTH BALL NOSE

VOLLHARTMETALL, 2 SCHNEIDEN KURZ STIRNRADIUS
FRAISE CARBURE, 2 DENTS, HÉMISPHÉRIQUE, COURTE
2 TAGLIENTI, SEMISFERICA, SERIE CORTA

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- Designed for milling of radius bottom slots, fillets and special contours.

- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- Bestimmt für das Fräsen von Nuten mit konvexem Grund, Sonderprofilen und zum Kopieren.



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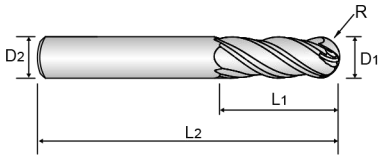


EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Price
	R	D_1	D_2	L_1	L_2	EUR
G9F44020N	R1.0	2.0	4	5	50	6,16
G9F44030N	R1.5	3.0	4	6	50	6,16
G9F44040N	R2.0	4.0	6	8	50	7,27
G9F44050N	R2.5	5.0	6	10	50	7,27
G9F44060N	R3.0	6.0	6	12	50	7,27
G9F44080N	R4.0	8.0	8	14	60	12,11
G9F44100N	R5.0	10.0	10	20	75	19,34
G9F44120N	R6.0	12.0	12	24	75	24,83
G9F44160N	R8.0	16.0	16	32	75	41,69
G9F44200N	R10.0	20.0	20	32	75	64,24

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ - 0,030	h6

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

MATERIAL	CARBON STEELS ALLOY STEELS TOOL STEELS				CARBON STEELS ALLOY STEELS PRE-HARDEND STEELS				HARDENED STEELS				CAST IRON			
HARDNESS	~ HRc30				HRc30 ~ HRc50				HRc50 ~							
STRENGTH	~ 1000N/mm^2				1000 ~ 1500N/mm^2				1500N/mm^2 ~							
DIAMETER	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz
2	13350	690	84	0,026	9900	450	62	0,023	4300	135	27	0,016	11350	240	71	0,011
3	12300	620	116	0,025	9250	420	87	0,023	4100	135	39	0,016	7600	250	72	0,016
4	9650	680	121	0,035	7700	485	97	0,031	3900	160	49	0,021	5550	310	70	0,028
5	8400	755	132	0,045	6700	530	105	0,040	3350	160	53	0,024	4500	355	71	0,039
6	7850	940	148	0,060	6350	760	120	0,060	2900	170	55	0,029	3650	390	69	0,053
8	6600	1180	166	0,089	5300	850	133	0,080	2200	205	55	0,047	2700	495	68	0,092
10	5900	1435	185	0,122	4700	940	148	0,100	1900	205	60	0,054	2200	495	69	0,113
12	5400	1620	204	0,150	4250	1026	160	0,121	1600	225	60	0,070	1900	495	72	0,130
16	4400	1590	221	0,181	3450	975	173	0,141	1250	225	63	0,090	1400	495	70	0,177
20	3850	1540	242	0,200	3000	955	188	0,159	1050	225	66	0,107	1150	450	72	0,196
	Ap : D1~D6=0.2mm, D8~D20=0.3mm, Ae : 0.2D												Ap : 0.3D, Ae : 0.7D			

RPM = rev./min. FEED = mm/min. Vc = m/min. fz = mm/t

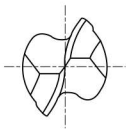
CARBIDE, 2 FLUTE LONG REACH BALL NOSE

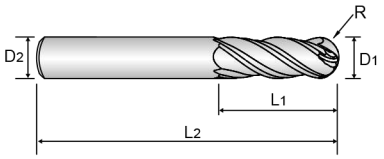
VOLLHARTMETALL, 2 SCHNEIDEN GROSSE REICHWEITE STIRNRADIUS
FRAISE CARBURE, 2 DENTS, HÉMISPHÉRIQUE LONGUE PORTÉE
2 TAGLIENTI, SEMISFERICA, GAMBO LUNGO

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- Designed for milling of radius bottom slots, fillets and special contours.

- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- Bestimmt für das Fräsen von Nuten mit konvexem Grund, Sonderprofilen und zum Kopieren.

EM815





Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Price
	R	D1	D2	L1	L2	EUR
G9J56999N	R1.5	3.0	3	5	75	9,13
G9J56998N	R2.0	4.0	4	8	75	9,13
G9J56997N	R2.5	5.0	5	10	75	9,94
G9J56996N	R3.0	6.0	6	12	100	11,31
G9J56995N	R4.0	8.0	8	16	100	17,06
G9J56994N	R5.0	10.0	10	20	100	28,82
G9J56993N	R6.0	12.0	12	24	100	36,85

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ - 0,030	h6

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

MATERIAL	CARBON STEELS ALLOY STEELS TOOL STEELS				CARBON STEELS ALLOY STEELS PRE-HARDEND STEELS				HARDENED STEELS				CAST IRON			
HARDNESS	~ HRc30				HRc30 ~ HRc50				HRc50 ~							
STRENGTH	~ 1000N/mm^2				1000 ~ 1500N/mm^2				1500N/mm^2 ~							
DIAMETER	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz
3	12300	620	116	0,025	9250	420	87	0,023	4100	135	39	0,016	7600	250	72	0,016
4	9650	680	121	0,035	7700	485	97	0,031	3900	160	49	0,021	5550	310	70	0,028
5	8400	755	132	0,045	6700	530	105	0,040	3350	160	53	0,024	4500	355	71	0,039
6	7850	940	148	0,060	6350	760	120	0,060	2900	170	55	0,029	3650	390	69	0,053
8	6600	1180	166	0,089	5300	850	133	0,080	2200	205	55	0,047	2700	495	68	0,092
10	5900	1435	185	0,122	4700	940	148	0,100	1900	205	60	0,054	2200	495	69	0,113
12	5400	1620	204	0,150	4250	1026	160	0,121	1600	225	60	0,070	1900	495	72	0,130
	Ap : D1~D6=0.2mm, D8~D20=0.3mm, Ae : 0.2D												Ap : 0.3D, Ae : 0.7D			

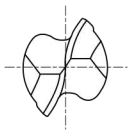
RPM = rev./min. FEED = mm/min. Vc = m/min. fz = mm/t

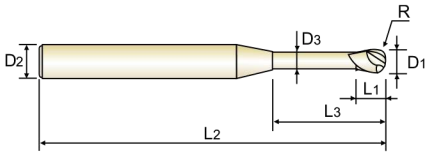
CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING

VOLLHARTMETALL, 2 SCHNEIDEN STIRNRADIUS FÜR SCHMALE RIPPEN
FRAISE CARBURE, 2 DENTS, HÉMISPHÉRIQUE POUR USINAGE DE RAINURE
2 TAGLIENTI, SEMISFERICA, SCARICATA PER NERVATURE

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- Designed for milling of radius bottom slots, fillets and special contours.

- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- Bestimmt für das Fräsen von Nuten mit konvexem Grund, Sonderprofilen und zum Kopieren.





EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Price
	R	D1	D2	L1	L3	L2	D3	EUR
G9J62999N	R0.25	0.5	4	0.75	2	50	0.45	17,39
G9J62998N	R0.3	0.6	4	0.9	6	50	0.55	17,39
G9J62997N	R0.4	0.8	4	1.2	6	50	0.75	13,46
G9J62996N	R0.4	0.8	4	1.2	8	50	0.75	13,46
G9J62995N	R0.5	1.0	4	1.5	6	50	0.95	12,39
G9J62994N	R0.5	1.0	4	1.5	8	50	0.95	12,39
G9J62993N	R0.5	1.0	4	1.5	10	50	0.95	12,39
G9J62992N	R0.5	1.0	4	1.5	12	50	0.95	13,22
G9J62991N	R0.75	1.5	4	2.3	6	50	1.45	12,39
G9J62990N	R0.75	1.5	4	2.3	8	50	1.45	12,39
G9J62989N	R0.75	1.5	4	2.3	10	50	1.45	12,39
G9J62988N	R0.75	1.5	4	2.3	12	50	1.45	13,22
G9J62987N	R0.8	1.6	4	2.4	8	50	1.55	12,39
G9J62986N	R1.0	2.0	4	3	8	50	1.95	11,58
G9J62985N	R1.0	2.0	4	3	10	50	1.95	11,58
G9J62984N	R1.0	2.0	4	3	12	50	1.95	11,58
G9J62983N	R1.0	2.0	4	3	14	50	1.95	12,29
G9J62982N	R1.0	2.0	4	3	16	50	1.95	12,29
G9J62981N	R1.0	2.0	4	3	20	50	1.95	12,81
G9J62980N	R1.5	3.0	6	4.5	10	50	2.85	13,95
G9J62979N	R1.5	3.0	6	4.5	12	50	2.85	13,95
G9J62978N	R1.5	3.0	6	4.5	16	60	2.85	16,88
G9J62977N	R1.5	3.0	6	4.5	20	60	2.85	18,12
G9J62976N	R1.5	3.0	6	4.5	25	75	2.85	18,79
G9J62975N	R2.0	4.0	6	6	12	50	3.85	13,50
G9J62974N	R2.0	4.0	6	6	25	75	3.85	18,79
G9J62973N	R2.0	4.0	6	6	30	75	3.85	19,48

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ - 0,030	h6

CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING

VOLLHARTMETALL, 2 SCHNEIDEN STIRNRADIUS FÜR SCHMALE RIPPEN
FRAISE CARBURE, 2 DENTS, HÉMISPHÉRIQUE POUR USINAGE DE RAINURE
2 TAGLIENTI, SEMISFERICA, SCARICATA PER NERVATURE

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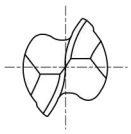
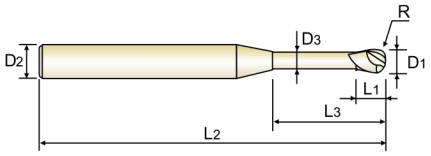




Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ - 0,030	h6

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

MATERIAL	NON-ALLOYED STEELS ALLOY STEELS CAST IRON			ALLOY STEELS HEAT RESISTANT STEELS			HARDENED STEELS		
HARDNESS	~ HRc30			HRc30 ~ HRc45			HRc45 ~ HRc55		
STRENGTH	~ 1000N/mm^2			1000 ~ 1500N/mm^2			1500 ~ 2000N/mm^2		
DIAMETER	RPM	FEED	Ap(mm)	RPM	FEED	Ap(mm)	RPM	FEED	Ap(mm)
R 0.25	30600~38950	180~490	0.023~0.045	22250~27800	90~270	0.023~0.045	13900~17600	90~180	0.005~0.009
R 0.3	30600~38950	225~630	0.027~0.054	22250~27800	110~350	0.027~0.054	13900~17600	110~225	0.005~0.011
R 0.4	30600~38950	225~630	0.036~0.072	22250~27800	110~350	0.036~0.072	13900~17600	110~225	0.007~0.014
R 0.5	27800~35250	250~690	0.045~0.090	20400~25000	130~390	0.045~0.090	12500~16200	130~250	0.009~0.018
R 0.6	23200~29650	250~770	0.055~0.100	16700~21300	130~390	0.055~0.100	10650~13450	130~250	0.010~0.022
R 0.7	20400~25050	250~770	0.062~0.125	14850~17600	130~390	0.062~0.125	9250~11600	130~250	0.012~0.025
R 0.75	18550~23200	250~770	0.070~0.135	13450~17150	130~390	0.070~0.135	8800~10650	130~250	0.014~0.028
R 0.8	17600~23200	250~770	0.075~0.145	13000~16200	130~390	0.075~0.145	8350~10200	130~250	0.015~0.030
R 0.9	16700~21300	250~770	0.080~0.160	11600~14850	130~390	0.080~0.160	7400~9250	130~250	0.016~0.032
R 1	14850~18550	250~770	0.090~0.180	10650~13450	130~390	0.090~0.180	6950~8350	130~250	0.018~0.035
R 1.5	10200~13000	250~770	0.135~0.270	6950~8800	130~390	0.135~0.270	4650~5550	130~250	0.028~0.055
R 2	8350~11100	250~770	0.180~0.360	5650~7600	130~390	0.180~0.360	3700~4650	130~250	0.035~0.070

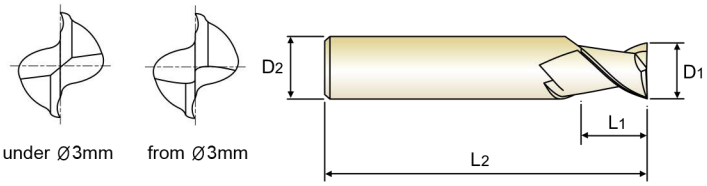
RPM = rev./min. FEED = mm/min. Vc = m/min. fz = mm/t

CARBIDE, 2 FLUTE SHORT LENGTH

VOLLHARTMETALL, 2 SCHNEIDEN KURZ
FRAISE CARBURE, 2 DENTS, COURTE
2 TAGLIENTI, CORTA

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- 2 flute design for slotting.

- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- 2 Schneiden zum Nutenfräsen.



Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Price
	D1	D2	L1	L2	EUR
G9F41010N	1.0	4	3	50	4,68
G9F41999N	1.5	4	4	50	4,68
G9F41020N	2.0	4	6	50	4,68
G9F41998N	2.5	4	8	50	4,68
G9F41030N	3.0	4	8	50	4,68
G9F41997N	3.5	4	10	50	4,68
G9F41040N	4.0	4	11	50	4,68
G9F41996N	4.5	4.5	12	50	5,54
G9F41050N	5.0	6	13	50	6,53
G9F41995N	5.5	5.5	15	50	6,07
G9F41060N	6.0	6	16	50	6,53
G9F41994N	7.0	7	20	60	9,35
G9F41080N	8.0	8	20	60	10,56
G9F41993N	9.0	9	20	60	14,12
G9F41100N	10.0	10	25	75	15,90
G9F41120N	12.0	12	32	75	21,80
G9F41140N	14.0	14	32	75	31,00
G9F41160N	16.0	16	32	75	40,72
G9F41200N	20.0	20	32	100	68,97

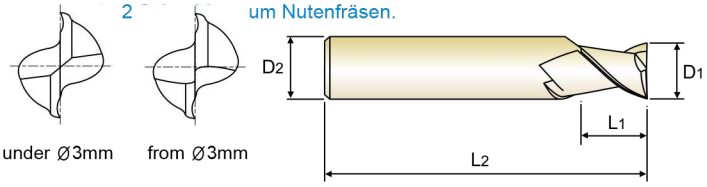
Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ - 0,030	h6

CARBIDE, 2 FLUTE SHORT LENGTH

VOLLHARTMETALL, 2 SCHNEIDEN KURZ
FRAISE CARBURE, 2 DENTS, COURTE
2 TAGLIENTI, CORTA

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- 2 flute design for slotting.

- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- 2 [illegible] um Nutenfräsen.



CARBIDE | 2 | 30° | DIN 6535HA | X Coating

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ - 0,030	h6

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER
SLOTTING

MATERIAL	CARBON STEELS ALLOY STEELS TOOL STEELS				ALLOY STEELS PRE-HARDEND STEELS				STAINLESS STEELS				CAST IRON			
HARDNESS	~ HRc30				HRc30 ~ HRc50											
STRENGTH	~ 1000N/mm^2				1000 ~ 1500N/mm^2											
DIAMETER	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz
1	15450	115	49	0,004	9200	70	29	0,004	7700	55	24	0,004	20200	220	63	0,005
1,5	10100	160	48	0,008	6000	90	28	0,008	6050	85	29	0,007	13050	220	61	0,008
2	8500	170	53	0,010	5550	110	35	0,010	4650	85	29	0,009	10100	240	63	0,012
2,5	7380	180	58	0,012	4710	120	37	0,013	3820	90	30	0,012	7890	235	62	0,015
3	6600	190	62	0,014	4100	130	39	0,016	3400	110	32	0,016	6550	240	62	0,018
3,5	6000	240	66	0,020	3730	150	41	0,020	3090	125	34	0,020	5640	240	62	0,021
4	5550	275	70	0,025	3400	165	43	0,024	2850	140	36	0,025	4950	240	62	0,024
4,5	5090	285	72	0,028	3040	165	43	0,027	2550	140	36	0,028	4390	240	62	0,027
5	4650	290	73	0,031	2750	170	43	0,031	2300	145	36	0,032	3950	240	62	0,030
5,5	4340	305	75	0,035	2600	190	45	0,036	2200	160	38	0,036	3530	260	61	0,037
6	4100	325	77	0,040	2500	205	47	0,041	2100	165	40	0,039	3200	275	60	0,043
6,5	3770	360	77	0,048	2250	205	46	0,045	1910	175	39	0,046	2940	305	60	0,052
8	3100	350	78	0,056	1850	185	46	0,050	1550	165	39	0,053	2400	295	60	0,061
9	2690	325	76	0,060	1630	165	46	0,050	1380	150	39	0,055	2190	305	62	0,069
10	2350	300	74	0,064	1450	145	46	0,050	1250	145	39	0,058	2000	310	63	0,078
12	2000	260	75	0,065	1250	120	47	0,048	1050	120	40	0,057	1550	320	58	0,103
14	1850	230	81	0,062	1150	110	51	0,048	900	110	40	0,061	1400	335	62	0,120
16	1600	200	80	0,063	1000	100	50	0,050	750	100	38	0,067	1200	345	60	0,144
20	1250	155	79	0,062	750	75	47	0,050	600	75	38	0,063	950	365	60	0,192
	Ap : 0.5D(UP to ϕ3 : 0.2D), Ae : D												Ap : D, Ae : D			

* The FEED, in long & extra long types, should be reduced by around 50%

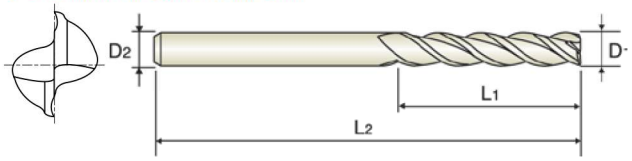
RPM = rev./min. FEED = mm/min. Vc = m/min. fz = mm/t

CARBIDE, 2 FLUTE EXTRA LONG LENGTH

VOLLHARTMETALL, 2 SCHNEIDEN EXTRA LANG
FRAISE CARBURE, 2 DENTS, EXTRA-LONGUE
2 TAGLIENTI, SERIE EXTRA LUNGA

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- 2 flute design for slotting.

- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- 2 Schneiden zum Nutenfräsen.



Unit : mm

EDP No.	Mill Diameter R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	Price EUR
G9J54999N	R1.5	3.0	3	10	75	5,22
G9J54998N	R2.0	4.0	4	12	75	5,78
G9J54997N	R2.5	5.0	5	20	75	9,55
G9J54996N	R3.0	6.0	6	20	75	10,61
G9J54995N	R4.0	8.0	8	25	75	23,34
G9J54994N	R5.0	10.0	10	40	100	24,80
G9J54993N	R6.0	12.0	12	45	100	33,28

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ - 0,030	h6

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER
SLOTTING

MATERIAL	CARBON STEELS ALLOY STEELS TOOL STEELS				ALLOY STEELS PRE-HARDEND STEELS				STAINLESS STEELS				CAST IRON			
HARDNESS	~ HRc30				HRc30 ~ HRc50											
STRENGTH	~ 1000N/mm^2				1000 ~ 1500N/mm^2											
DIAMETER	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz
3	6600	190	62	0,014	4100	130	39	0,016	3400	110	32	0,016	6550	240	62	0,018
3,5	6000	240	66	0,020	3730	150	41	0,020	3090	125	34	0,020	5640	240	62	0,021
4	5550	275	70	0,025	3400	165	43	0,024	2850	140	36	0,025	4950	240	62	0,024
4,5	5090	285	72	0,028	3040	165	43	0,027	2550	140	36	0,028	4390	240	62	0,027
5	4650	290	73	0,031	2750	170	43	0,031	2300	145	36	0,032	3950	240	62	0,030
5,5	4340	305	75	0,035	2600	190	45	0,036	2200	160	38	0,036	3530	260	61	0,037
6	4100	325	77	0,040	2500	205	47	0,041	2100	165	40	0,039	3200	275	60	0,043
6,5	3770	360	77	0,048	2250	205	46	0,045	1910	175	39	0,046	2940	305	60	0,052
8	3100	350	78	0,056	1850	185	46	0,050	1550	165	39	0,053	2400	295	60	0,061
9	2690	325	76	0,060	1630	165	46	0,050	1380	150	39	0,055	2190	305	62	0,069
10	2350	300	74	0,064	1450	145	46	0,050	1250	145	39	0,058	2000	310	63	0,078
12	2000	260	75	0,065	1250	120	47	0,048	1050	120	40	0,057	1550	320	58	0,103
	Ap : 0.5D(UP to ϕ3 : 0.2D), Ae : D												Ap : D, Ae : D			

* The FEED, in long & extra long types, should be reduced by around 50%

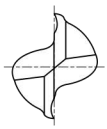
RPM = rev./min. FEED = mm/min. Vc = m/min. fz = mm/t

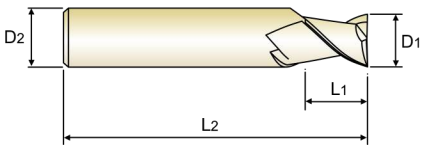
CARBIDE, 2 FLUTE RIB PROCESSING

VOLLHARTMETALL, 2 SCHNEIDEN SCHMALE RIPPEN
FRAISE CARBURE, 2 DENTS POUR USINAGE DE RAINURE
2 TAGLIENTI, SCARICATA PER NERVATURE

- ▶ Suitable for dry milling applications at high temperatures.
- ▶ Excellent high-performance end mills.
- ▶ 2 flute design for slotting.

- ▶ Für die Trockenbearbeitung.
- ▶ Hervorragendes Preis - Leistungsverhältnis.
- ▶ 2 Schneiden zum Nutenfräsen.





Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Price
	D1	D2	L1	L3	L2	D3	EUR
G9J61999N	0.4	4	0.7	2	50	0.37	12,6
G9J61998N	0.4	4	0.7	4	50	0.37	12,6
G9J61997N	0.5	4	0.75	2	50	0.45	11,48
G9J61996N	0.5	4	0.75	6	50	0.45	11,48
G9J61995N	0.7	4	1.1	4	50	0.65	10,45
G9J61994N	0.7	4	1.1	6	50	0.65	10,45
G9J61993N	0.8	4	1.2	6	50	0.75	10,45
G9J61992N	1.0	4	1.5	6	50	0.95	9,31
G9J61991N	1.0	4	1.5	8	50	0.95	9,31
G9J61990N	1.0	4	1.5	10	50	0.95	9,31
G9J61989N	1.0	4	1.5	12	50	0.95	9,88
G9J61988N	1.2	4	1.8	6	50	1.15	9,31
G9J61987N	1.2	4	1.8	8	50	1.15	9,31
G9J61986N	1.2	4	1.8	12	50	1.15	9,88
G9J61985N	1.5	4	2.3	6	50	1.45	9,31
G9J61984N	1.5	4	2.3	8	50	1.45	9,31
G9J61983N	1.5	4	2.3	10	50	1.45	9,31
G9J61982N	1.5	4	2.3	12	50	1.45	9,88
G9J61981N	1.5	4	2.3	16	50	1.45	10,26
G9J61980N	1.5	4	2.3	20	50	1.45	10,26
G9J61979N	2.0	4	3	6	50	1.95	8,87
G9J61978N	2.0	4	3	10	50	1.95	8,87
G9J61977N	2.0	4	3	12	50	1.95	8,87
G9J61976N	2.0	4	3	14	50	1.95	8,87
G9J61975N	2.0	4	3	16	50	1.95	9,22
G9J61974N	2.0	4	3	18	50	1.95	9,22
G9J61973N	2.0	4	3	20	50	1.95	9,22
G9J61972N	2.5	4	3.7	12	50	2.4	8,87
G9J61971N	2.5	4	3.7	16	50	2.4	9,22
G9J61970N	2.5	4	3.7	20	50	2.4	9,22
G9J61969N	3.0	6	4.5	12	50	2.85	13,34
G9J61968N	3.0	6	4.5	16	60	2.85	13,64
G9J61967N	3.0	6	4.5	20	60	2.85	13,64
G9J61966N	3.0	6	4.5	25	75	2.85	13,64
G9J61965N	4.0	6	6	12	50	3.85	13,34
G9J61964N	4.0	6	6	16	60	3.85	13,64
G9J61963N	4.0	6	6	20	75	3.85	13,64
G9J61962N	4.0	6	6	25	75	3.85	13,64

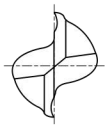
Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ - 0,030	h6

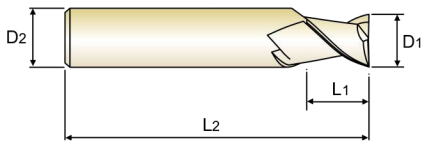
CARBIDE, 2 FLUTE RIB PROCESSING

VOLLHARTMETALL, 2 SCHNEIDEN SCHMALE RIPPEN
FRAISE CARBURE, 2 DENTS POUR USINAGE DE RAINURE
2 TAGLIENTI, SCARICATA PER NERVATURE

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- 2 flute design for slotting.

- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- 2 Schneiden zum Nutenfräsen.





Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ - 0,030	h6

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

MATERIAL	NON-ALLOYED STEELS ALLOY STEELS CAST IRON			ALLOY STEELS HEAT RESISTANT STEELS			HARDENED STEELS		
HARDNESS	~ HRc30			HRc30 ~ HRc45			HRc45 ~ HRc55		
STRENGTH	~ 1000N/mm^2			1000 ~ 1500N/mm^2			1500 ~ 2000N/mm^2		
DIAMETER	RPM	FEED	Ap(mm)	RPM	FEED	Ap(mm)	RPM	FEED	Ap(mm)
0,4	30600~100750	200~440	0.007~0.018	22250~27800	90~340	0.007~0.018	13900~1670	30~90	0.004~0.008
0,5	30600~100750	200~440	0.009~0.022	22250~27800	90~340	0.009~0.022	13900~1670	30~90	0.004~0.009
0,6	30600~100750	250~570	0.011~0.026	22250~27800	110~440	0.011~0.026	13900~1670	40~110	0.005~0.011
0,7	30600~100750	250~570	0.012~0.031	22250~27800	110~440	0.012~0.031	13900~1670	40~110	0.006~0.013
0,8	26400~34300	280~630	0.014~0.035	19000~24100	120~480	0.014~0.035	12050~14350	45~130	0.007~0.015
0,9	24100~30600	280~720	0.030~0.060	17600~22250	160~540	0.030~0.060	10650~12500	50~130	0.008~0.016
1	22250~27800	280~810	0.045~0.090	15300~19450	190~590	0.045~0.090	9750~12500	70~130	0.009~0.018
1,2	18100~22250	280~890	0.055~0.100	13000~15750	190~590	0.055~0.100	8350~10200	70~130	0.010~0.022
1,4	15750~19450	280~890	0.062~0.125	11100~13900	190~590	0.062~0.125	6950~8800	70~130	0.012~0.025
1,5	14350~18550	280~890	0.070~0.135	10200~13450	190~590	0.070~0.135	6500~7900	70~130	0.014~0.028
1,6	13900~17600	280~890	0.075~0.145	10200~12500	190~590	0.075~0.140	6050~7900	70~130	0.015~0.030
1,8	13000~16700	280~890	0.080~0.160	9250~11100	190~590	0.080~0.160	5550~6950	70~130	0.016~0.032
2	11600~14350	280~890	0.090~0.180	8350~10200	190~590	0.090~0.180	5100~6500	70~130	0.018~0.035
2,5	9250~12050	280~890	0.112~0.235	6500~8350	190~590	0.112~0.235	4150~5100	70~130	0.022~0.045
3	1700~9750	280~890	0.135~0.270	5550~6950	190~590	0.135~0.270	3250~4150	70~130	0.028~0.055
4	6050~7400	280~890	0.180~0.360	4150~5100	190~590	0.180~0.360	2500~3250	70~130	0.036~0.072

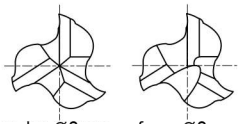
RPM = rev./min. FEED = mm/min. Vc = m/min. fz = mm/t

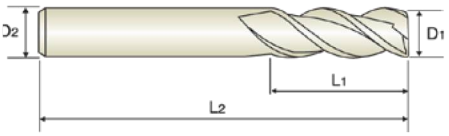
CARBIDE, 3 FLUTE SHORT LENGTH

VOLLHARTMETALL, 3 SCHNEIDEN KURZ
FRAISE CARBURE, 3 DENTS, COURTE
3 TAGLIENTI, SERIE CORTA

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- 3 flute design possesses the advantage of 2 flute and 4 flute end mill.

- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- 3 Schneiden verbinden die Vorteile von 2 - und 4 - schneidigen Schaftfräsern.





Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Price
	D_1	D_2	L_1	L_2	EUR
G9F43010N	1.0	4	3	50	4,68
G9F43020N	2.0	4	6	50	4,68
G9F43030N	3.0	4	8	50	4,68
G9F43040N	4.0	4	11	50	4,68
G9F43050N	5.0	6	13	50	6,53
G9F43060N	6.0	6	16	50	6,53
G9F43080N	8.0	8	20	60	10,56
G9F43100N	10.0	10	25	75	15,90
G9F43120N	12.0	12	32	75	21,80
G9F43140N	14.0	14	32	75	31,00
G9F43160N	16.0	16	32	75	40,72
G9F43200N	20.0	20	32	100	68,97

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ - 0,030	h6

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

SLOTTING

MATERIAL	CARBON STEELS ALLOY STEELS TOOL STEELS				ALLOY STEELS PRE-HARDEND STEELS				STAINLESS STEELS				CAST IRON			
HARDNESS	~ HRc30				HRc30 ~ HRc50											
STRENGTH	~ 1000N/mm^2				1000 ~ 1500N/mm^2											
DIAMETER	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz
1	15450	175	49	0,004	9200	105	29	0,004	7700	85	24	0,004	20200	330	63	0,005
2	8500	255	53	0,010	5550	165	35	0,010	4650	130	29	0,009	10100	360	63	0,012
2,5	7385	265	58	0,012	4710	185	37	0,013	3820	140	30	0,012	7895	355	62	0,015
3	6600	285	62	0,014	4100	195	39	0,016	3400	165	32	0,016	6550	360	62	0,018
3,5	6000	340	66	0,019	3730	225	41	0,020	3090	185	34	0,020	5640	355	62	0,021
4	5550	415	70	0,025	3400	250	43	0,024	2850	210	36	0,025	4950	360	62	0,024
5	4650	435	73	0,031	2750	255	43	0,031	2300	220	36	0,032	3950	360	62	0,030
6	4100	490	77	0,040	2500	310	47	0,041	2100	220	40	0,039	3200	415	60	0,043
8	3100	525	78	0,056	1850	280	46	0,050	1550	220	39	0,053	2400	445	60	0,061
10	2350	450	74	0,064	1450	220	46	0,050	1250	220	39	0,058	2000	465	63	0,078
12	2000	390	75	0,065	1250	180	47	0,048	1050	180	40	0,057	1550	480	58	0,103
14	1850	345	81	0,062	1150	165	51	0,048	900	165	40	0,061	1400	505	62	0,120
16	1600	300	80	0,063	1000	150	50	0,050	750	150	38	0,067	1200	520	60	0,144
20	1250	235	79	0,062	750	115	47	0,050	600	115	38	0,063	950	550	60	0,192
	Ap : 0.5D(UP to ϕ3 : 0.2D), Ae : D												Ap : D, Ae : D			

SIDE CUTTING

MATERIAL	CARBON STEELS ALLOY STEELS TOOL STEELS				ALLOY STEELS PRE-HARDEND STEELS				STAINLESS STEELS				CAST IRON			
HARDNESS	~ HRc30				HRc30 ~ HRc50											
STRENGTH	~ 1000N/mm^2				1000 ~ 1500N/mm^2											
DIAMETER	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz
1	15450	210	49	0,005	9200	125	29	0,005	7700	100	24	0,004	20200	365	63	0,006
2	8500	305	53	0,012	5550	200	35	0,012	4650	155	29	0,011	10100	395	63	0,013
2,5	7385	310	58	0,014	4710	225	37	0,016	3820	170	30	0,015	7895	405	62	0,017
3	6600	340	62	0,017	4100	235	39	0,019	3400	200	32	0,020	6550	395	62	0,020
3,5	600	430	66	0,024	3730	270	41	0,024	3090	225	34	0,024	5640	390	62	0,023
4	5550	500	70	0,030	3400	300	43	0,029	2850	250	36	0,029	4950	395	62	0,027
5	4650	520	73	0,037	2750	305	43	0,037	2300	265	36	0,038	3950	395	62	0,033
6	4100	590	77	0,048	2500	370	47	0,049	2100	265	40	0,042	3200	455	60	0,047
8	3100	630	78	0,068	1850	335	46	0,060	1550	265	39	0,057	2400	490	60	0,068
10	2350	540	74	0,077	1450	265	46	0,061	1250	265	39	0,071	2000	510	63	0,085
12	2000	470	75	0,078	1250	215	47	0,057	1050	215	40	0,068	1550	530	58	0,114
14	1850	415	81	0,075	1150	200	51	0,058	900	200	40	0,074	1400	555	62	0,132
16	1600	360	80	0,075	1000	180	50	0,060	750	180	38	0,080	1200	570	60	0,158
20	1250	280	79	0,075	750	140	47	0,062	600	140	38	0,078	950	605	60	0,212
	Ap : D, Ae : 0.05D															

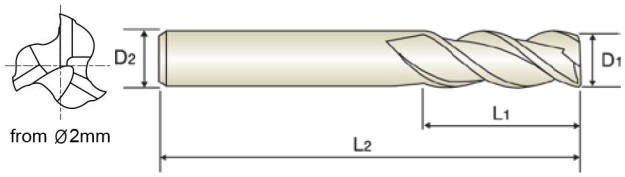
RPM = rev./min. FEED = mm/min. Vc = m/min. fz = mm/t

CARBIDE, 3 FLUTE SHORT LENGTH THROW AWAY

VOLLHARTMETALL, 3 SCHNEIDEN KURZ EINWEGFRÄSER
FRAISE CARBURE, 3 DENTS, À JETER, COURTE
3 TAGLIENTI, SERIE EXTRA CORTA

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- 3 flute design possesses the advantage of 2 flute and 4 flute end mill.

- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- 3 Schneiden verbinden die Vorteile von 2 - und 4 - schneidigen Schaftfräsern.



Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Price
	D1	D2	L1	L2	EUR
G9J59999N	2.0	6	4	35	6,21
G9J59998N	2.5	6	5	36	6,21
G9J59997N	3.0	6	5	36	6,21
G9J59996N	3.5	6	6	37	6,21
G9J59995N	4.0	6	7	38	6,21
G9J59994N	5.0	6	8	39	6,21
G9J59993N	6.0	6	8	39	6,21
G9J59992N	8.0	8	11	43	9,81
G9J59991N	10.0	10	13	50	14,11
G9J59990N	12.0	12	15	55	19,45

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ - 0,030	h6

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

SLOTTING

MATERIAL	CARBON STEELS ALLOY STEELS TOOL STEELS				ALLOY STEELS PRE-HARDEND STEELS				STAINLESS STEELS				CAST IRON			
HARDNESS	~ HRc30				HRc30 ~ HRc50											
STRENGTH	~ 1000N/mm^2				1000 ~ 1500N/mm^2											
DIAMETER	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz
2	8500	255	53	0,010	5550	165	35	0,010	4650	130	29	0,009	10100	360	63	0,012
2,5	7385	265	58	0,012	4710	185	37	0,013	3820	140	30	0,012	7895	355	62	0,015
3	6600	285	62	0,014	4100	195	39	0,016	3400	165	32	0,016	6550	360	62	0,018
3,5	6000	340	66	0,019	3730	225	41	0,020	3090	185	34	0,020	5640	355	62	0,021
4	5550	415	70	0,025	3400	250	43	0,024	2850	210	36	0,025	4950	360	62	0,024
5	4650	435	73	0,031	2750	255	43	0,031	2300	220	36	0,032	3950	360	62	0,030
6	4100	490	77	0,040	2500	310	47	0,041	2100	220	40	0,039	3200	415	60	0,043
8	3100	525	78	0,056	1850	280	46	0,050	1550	220	39	0,053	2400	445	60	0,061
10	2350	450	74	0,064	1450	220	46	0,050	1250	220	39	0,058	2000	465	63	0,078
12	2000	390	75	0,065	1250	180	47	0,048	1050	180	40	0,057	1550	480	58	0,103
	Ap : 0.5D(UP to ϕ3 : 0.2D), Ae : D												Ap : D, Ae : D			

SIDE CUTTING

MATERIAL	CARBON STEELS ALLOY STEELS TOOL STEELS				ALLOY STEELS PRE-HARDEND STEELS				STAINLESS STEELS				CAST IRON			
HARDNESS	~ HRc30				HRc30 ~ HRc50											
STRENGTH	~ 1000N/mm^2				1000 ~ 1500N/mm^2											
DIAMETER	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz
2	8500	305	53	0,012	5550	200	35	0,012	4650	155	29	0,011	10100	395	63	0,013
2,5	7385	310	58	0,014	4710	225	37	0,016	3820	170	30	0,015	7895	405	62	0,017
3	6600	340	62	0,017	4100	235	39	0,019	3400	200	32	0,020	6550	395	62	0,020
3,5	600	430	66	0,024	3730	270	41	0,024	3090	225	34	0,024	5640	390	62	0,023
4	5550	500	70	0,030	3400	300	43	0,029	2850	250	36	0,029	4950	395	62	0,027
5	4650	520	73	0,037	2750	305	43	0,037	2300	265	36	0,038	3950	395	62	0,033
6	4100	590	77	0,048	2500	370	47	0,049	2100	265	40	0,042	3200	455	60	0,047
8	3100	630	78	0,068	1850	335	46	0,060	1550	265	39	0,057	2400	490	60	0,068
10	2350	540	74	0,077	1450	265	46	0,061	1250	265	39	0,071	2000	510	63	0,085
12	2000	470	75	0,078	1250	215	47	0,057	1050	215	40	0,068	1550	530	58	0,114
	Ap : D, Ae : 0.05D															

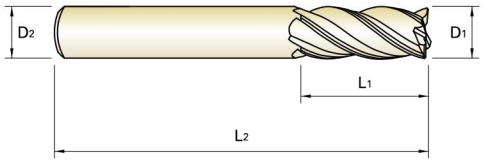
RPM = rev./min. FEED = mm/min. Vc = m/min. fz = mm/t

CARBIDE, 4 FLUTE SHORT LENGTH

VOLLHARTMETALL, 4 SCHNEIDEN KURZ
FRAISE CARBURE, 4 DENTS, COURTE
4 TAGLIENTI, CORTA

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- 4 flute allows for better work piece finishes.

- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- 4 Schneiden erzeugen eine bessere Oberflächengüte des Werkstücks.



Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Price
	D1	D2	L1	L2	EUR
G9F42010N	1.0	4	3	50	4,68
G9F42999N	1.5	4	4	50	4,68
G9F42020N	2.0	4	6	50	4,68
G9F42998N	2.5	4	8	50	4,68
G9F42030N	3.0	4	8	50	4,68
G9F42997N	3.5	4	10	50	4,68
G9F42040N	4.0	4	11	50	4,68
G9F42996N	4.5	4.5	12	50	5,54
G9F42050N	5.0	6	13	50	6,53
G9F42060N	6.0	6	16	50	6,53
G9F42995N	7.0	7	20	60	9,35
G9F42080N	8.0	8	20	60	10,56
G9F42994N	9.0	9	20	60	14,12
G9F42100N	10.0	10	25	75	15,90
G9F42120N	12.0	12	32	75	21,80
G9F42140N	14.0	14	32	75	31,00
G9F42160N	16.0	16	32	75	40,72
G9F42200N	20.0	20	32	100	68,97

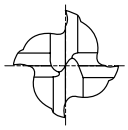
Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ - 0,030	h6

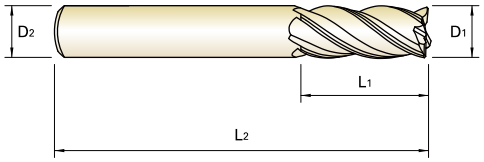
CARBIDE, 4 FLUTE SHORT LENGTH

VOLLHARTMETALL, 4 SCHNEIDEN KURZ
FRAISE CARBURE, 4 DENTS, COURTE
4 TAGLIENTI, CORTA

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- 4 flute allows for better work piece finishes.

- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- 4 Schneiden erzeugen eine bessere Oberflächengüte des Werkstücks.





Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ - 0,030	h6

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER
SIDE CUTTING

MATERIAL	CARBON STEELS ALLOY STEELS TOOL STEELS				ALLOY STEELS PRE-HARDEND STEELS				STAINLESS STEELS				CAST IRON			
HARDNESS	~ HRc30				HRc30 ~ HRc50											
STRENGTH	~ 1000N/mm^2				1000 ~ 1500N/mm^2											
DIAMETER	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz
1	19000	160	60	0,002	11050	90	35	0,002	9350	80	29	0,002	20200	670	63	0,008
1,5	12750	230	60	0,005	7600	125	36	0,004	7600	130	36	0,004	13050	670	61	0,013
2	10650	260	67	0,006	6950	155	44	0,006	5800	130	36	0,006	10100	690	63	0,017
2,5	9165	255	72	0,007	5855	165	46	0,007	4840	135	38	0,007	4895	695	62	0,022
3	8200	290	77	0,009	5150	185	49	0,009	4250	155	40	0,009	6550	690	62	0,026
3,5	7460	420	82	0,014	4640	260	51	0,014	3820	200	42	0,013	5640	700	62	0,031
4	6950	525	87	0,019	4250	325	53	0,019	3550	260	45	0,018	4950	690	62	0,035
4,5	6295	530	89	0,021	3750	315	53	0,021	3185	270	45	0,021	4385	700	62	0,040
5	5800	550	91	0,024	3450	330	54	0,024	2900	275	46	0,024	3950	690	62	0,044
6	5100	605	96	0,030	3100	380	58	0,031	2600	300	49	0,029	3200	830	60	0,065
7	4365	645	96	0,037	2640	370	58	0,035	2230	315	49	0,035	2730	865	60	0,079
8	3850	655	97	0,043	2300	350	58	0,038	1950	325	49	0,042	2400	880	60	0,092
9	3395	611	96	0,045	2050	305	58	0,037	1700	300	48	0,044	2195	915	62	0,104
10	2950	560	93	0,047	1850	275	58	0,037	1500	275	47	0,046	2000	930	63	0,116
12	2550	475	96	0,047	1550	230	58	0,037	1250	220	47	0,044	1550	970	58	0,156
14	2250	425	99	0,047	1400	210	62	0,038	1150	205	51	0,045	1400	1020	62	0,182
16	2000	380	101	0,048	1250	185	63	0,037	1050	185	53	0,044	1200	1050	60	0,219
20	1550	290	97	0,047	950	145	60	0,038	750	140	47	0,047	950	1120	60	0,295
	Ap : 1.0D, Ae : 0.1D												Ap : 1.5D, Ae : 0.1D			

* The FEED, in long & extra long types, should be reduced by around 50%

RPM = rev./min. FEED = mm/min. Vc = m/min. fz = mm/t

CARBIDE, 4 FLUTE EXTRA LONG LENGTH

VOLLHARTMETALL, 4 SCHNEIDEN EXTRA LANG
FRAISE CARBURE, 4 DENTS, EXTRA-LONGUE
4 TAGLIENTI, SERIE EXTRA LUNGA

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- 4 flute allows for better work piece finishes.

- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- 4 Schneiden erzeugen eine bessere Oberflächengüte des Werkstücks.

CARBIDE | 4 | 30° | DIN 6535HA | X Coating

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Price
	D1	D2	L1	L2	EUR
G9J55999N	3.0	3	10	75	5,22
G9J55998N	4.0	4	12	75	5,78
G9J55997N	5.0	5	20	75	9,55
G9J55996N	6.0	6	20	75	10,61
G9J55995N	8.0	8	25	75	18,21
G9J55994N	10.0	10	40	100	24,80
G9J55993N	12.0	12	45	100	33,28

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ - 0,030	h6

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER
SIDE CUTTING

MATERIAL	CARBON STEELS ALLOY STEELS TOOL STEELS				ALLOY STEELS PRE-HARDEND STEELS				STAINLESS STEELS				CAST IRON			
HARDNESS	~ HRc30				HRc30 ~ HRc50											
STRENGTH	~ 1000N/mm^2				1000 ~ 1500N/mm^2											
DIAMETER	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz
3	8200	290	77	0,009	5150	185	49	0,009	4250	155	40	0,009	6550	690	62	0,026
4	6950	525	87	0,019	4250	325	53	0,019	3550	260	45	0,018	4950	690	62	0,035
5	5800	550	91	0,024	3450	330	54	0,024	2900	275	46	0,024	3950	690	62	0,044
6	5100	605	96	0,030	3100	380	58	0,031	2600	300	49	0,029	3200	830	60	0,065
8	3850	655	97	0,043	2300	350	58	0,038	1950	325	49	0,042	2400	880	60	0,092
10	2950	560	93	0,047	1850	275	58	0,037	1500	275	47	0,046	2000	930	63	0,116
12	2550	475	96	0,047	1550	230	58	0,037	1250	220	47	0,044	1550	970	58	0,156
	Ap : 1.0D, Ae : 0.1D												Ap : 1.5D, Ae : 0.1D			

* The FEED, in long & extra long types, should be reduced by around 50%

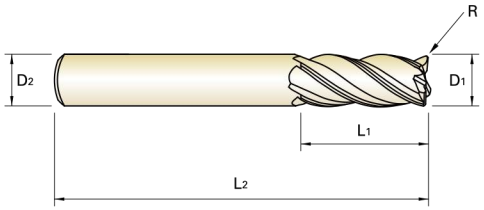
RPM = rev./min. FEED = mm/min. Vc = m/min. fz = mm/t

CARBIDE, 4 FLUTE SHORT LENGTH CORNER RADIUS

VOLLHARTMETALL, 4 SCHNEIDEN KURZ ECKENRADIUS
FRAISE CARBURE, 4 DENTS, TORIQUE, COURTE
4 TAGLIENTI, SERIE CORTA, TORICA

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- Designed for milling of radius bottom slots, fillets and special contours.

- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- Bestimmt für das Fräsen von Nuten mit konvexem Grund, Sonderprofilen und zum Kopieren.



Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Price
	R	D1	D2	L1	L2	EUR
G9J57999N	R0.2	2.0	4	6	50	6,52
G9J57998N	R0.3	2.0	4	6	50	6,52
G9J57997N	R0.5	2.0	4	6	50	6,52
G9J57996N	R0.2	3.0	4	8	50	6,52
G9J57995N	R0.3	3.0	4	8	50	6,52
G9J57994N	R0.5	3.0	4	8	50	6,52
G9J57993N	R1.0	3.0	4	8	50	6,52
G9J57992N	R0.2	4.0	4	10	50	6,52
G9J57991N	R0.3	4.0	4	10	50	6,52
G9J57990N	R0.5	4.0	4	10	50	6,52
G9J57989N	R1.0	4.0	4	10	50	6,52
G9J57898N	R0.2	5.0	6	13	50	9,66
G9J57897N	R0.3	5.0	6	13	50	9,66
G9J57896N	R0.5	5.0	6	13	50	9,66
G9J57895N	R1.0	5.0	6	13	50	9,66
G9J57894N	R0.2	6.0	6	15	50	9,66
G9J57893N	R0.3	6.0	6	15	50	9,66
G9J57892N	R0.5	6.0	6	15	50	9,66
G9J57891N	R1.0	6.0	6	15	50	9,66
G9J57890N	R0.5	8.0	8	20	60	13,37
G9J57889N	R1.0	8.0	8	20	60	13,37
G9J57888N	R1.5	8.0	8	20	60	13,37
G9J57887N	R2.0	8.0	8	20	60	13,37
G9J57886N	R2.5	8.0	8	20	60	13,37
G9J57885N	R0.5	10.0	10	25	75	20,73
G9J57884N	R1.0	10.0	10	25	75	20,73
G9J57883N	R1.5	10.0	10	25	75	20,73
G9J57882N	R2.0	10.0	10	25	75	20,73
G9J57881N	R2.5	10.0	10	25	75	20,73
G9J57880N	R0.5	12.0	12	30	75	29,12
G9J57879N	R1.0	12.0	12	30	75	29,12
G9J57878N	R1.5	12.0	12	30	75	29,12
G9J57877N	R2.0	12.0	12	30	75	29,12
G9J57876N	R2.5	12.0	12	30	75	29,12

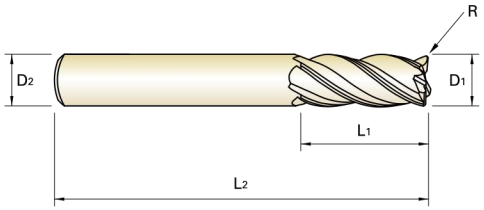
Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ - 0,030	h6

CARBIDE, 4 FLUTE SHORT LENGTH CORNER RADIUS

VOLLHARTMETALL, 4 SCHNEIDEN KURZ ECKENRADIUS
FRAISE CARBURE, 4 DENTS, TORIQUE, COURTE
4 TAGLIENTI, SERIE CORTA, TORICA

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- Designed for milling of radius bottom slots, fillets and special contours.

- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- Bestimmt für das Fräsen von Nuten mit konvexem Grund, Sonderprofilen und zum Kopieren.



Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ - 0,030	h6

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER
SIDE CUTTING

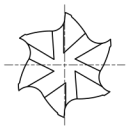
MATERIAL	NON-ALLOYED STEELS ALLOY STEELS				ALLOY STEELS HEAT RESISTANT STEELS				STAINLESS STEELS				CAST IRON			
HARDNESS	~ HRc30				HRc30 ~ HRc50											
STRENGTH	~ 1000N/mm^2				1000 ~ 1500N/mm^2											
DIAMETER	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz
2	10640	290	67	0,007	6965	155	44	0,006	4265	130	27	0,008	10010	690	63	0,017
3	8200	525	77	0,016	5150	185	49	0,009	3550	155	34	0,011	6550	690	62	0,026
4	6950	550	87	0,020	4250	325	53	0,019	2900	260	36	0,022	4950	690	62	0,035
5	5800	605	91	0,026	3450	330	54	0,024	2600	275	41	0,026	3950	690	62	0,044
6	5150	655	97	0,032	3100	380	58	0,031	1950	300	37	0,038	3200	830	60	0,065
8	3850	560	97	0,036	2300	350	58	0,038	1550	325	39	0,052	2400	880	60	0,092
10	2950	475	93	0,040	1850	275	58	0,037	1250	275	39	0,055	2000	930	63	0,116
12	2550	260	96	0,025	1550	230	58	0,037	1050	220	40	0,052	1550	970	58	0,156
	Ap : 1.0D, Ae : 0.1D												Ap : 1.5D, Ae : 0.1D			

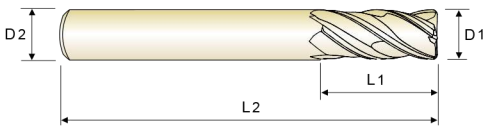
RPM = rev./min. FEED = mm/min. Vc = m/min. fz = mm/t

CARBIDE, FLUTE 45° HELIX SHORT / LONG LENGTH

VOLLHARTMETALL, SCHNEIDEN 45° RECHTSSPIRALE KURZ / LANG
FRAISE CARBURE, DENTS, HÉLICE 45°, COURTE / LONGUE
TAGLIENTI, ELICA 45°, SERIE CORTA / LUNGA

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- Für die Trockenbearbeitung geeignet.
- Exzellente Hochleistungs Mühlen.

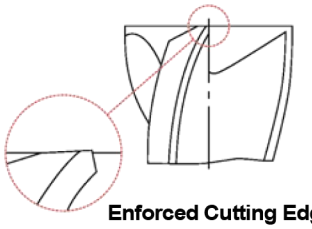




Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Price
	D_1	D_2	L_1	L_2	EUR
G9J58999N	6.0	6	15	50	10,47
G9J58998N	8.0	8	20	60	12,81
G9J58997N	10.0	10	25	75	19,54
G9J58996N	12.0	12	30	75	25,53
G9J58995N	16.0	16	40	100	50,40

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ - 0,030	h6



Enforced Cutting Edge

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER
SIDE CUTTING

MATERIAL	NON-ALLOY STEELS ALLOY STEELS CAST IRON				ALLOY STEELS HEAT RESISTANT STEELS				HARDENED STEELS				HARDENED STEELS			
HARDNESS	~ HRc30				HRc30 ~ HRc50				HRc50 ~ HRc60				HRc50 ~ HRc65			
STRENGTH	~ 1000N/mm^2				1000 ~ 1750N/mm^2				1750 ~ 2080N/mm^2				2080N/mm^2			
DIAMETER	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz
6	5590	995	105	0,030	3725	675	70	0,030	2860	400	54	0,023	2270	250	43	0,018
8	4210	960	106	0,038	2810	640	71	0,038	2160	370	54	0,029	1730	235	44	0,023
10	3320	900	104	0,045	2215	600	70	0,045	1730	340	54	0,033	1380	220	43	0,027
12	2835	895	107	0,053	1890	600	71	0,053	1440	340	54	0,039	1135	215	43	0,032
16	2105	785	106	0,062	1405	520	71	0,062	1080	300	54	0,046	865	195	44	0,038
	Ap : 1.5D, Ae : 0.05D				Ap : 1.5D, Ae : 0.03D				Ap : 1.5D, Ae : 0.03D				Ap : 1.0D, Ae : 0.02D			

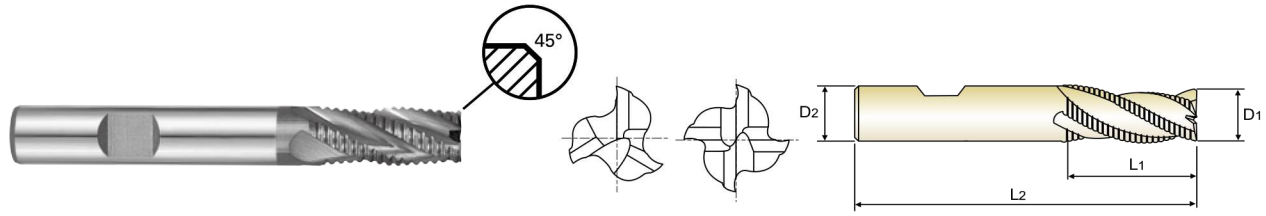
RPM = rev./min. FEED = mm/min. Vc = m/min. fz = mm/t

CARBIDE, MULTI FLUTE LONG LENGTH ROUGHING - COARSE

VOLLHARTMETALL, MEHRSCHNEIDEN LANG SCHRUPPFRÄSER - GROB
FRAISE CARBURE, MULTI-DENTS, ÉBAUCHE, PAS GROSSIER, LONGUE
3 - 4 TAGLIENTI, PER SGROSSATURA, SERIE LUNGA - BOMBATO GROSSO

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- Fast chip ejection.

- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- Guter Spanauswurf.

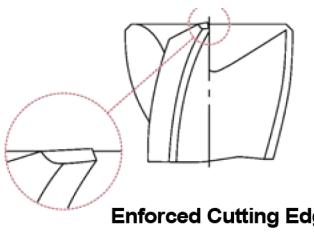


Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Chamfer	No. of Flute	Price EUR
	D1	D2	L1	L2			
G9J60999	6.0	6	16	57	0.38	3	14,66
G9J60998	8.0	8	16	63	0.38	3	16,22
G9J60997	10.0	10	22	72	0.60	4	26,16
G9J60996	12.0	12	26	83	0.60	4	35,54
G9J60995	16.0	16	32	92	0.60	4	55,39
G9J60994	20.0	20	38	104	0.60	4	84,31

Tolerances according to DIN 7160 & 7161

Tolerance range in µm / Nominal-Diameter in mm						Shank Dia. Tolerance
	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30	
h10	0 / - 40	0 / - 48	0 / - 58	0 / - 70	0 / - 84	h6



Enforced Cutting Edge

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER
SIDE CUTTING

MATERIAL	NON-ALLOYED STEELS ALLOY STEELS CAST IRON				ALLOY STEELS HEAT RESISTANT STEELS				STAINLESS STEELS			
HARDNESS	~ HRc30				HRc30 ~ HRc38							
STRENGTH	~ 1000N/mm^2				1000 ~ 1200N/mm^2							
DIAMETER	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz
6	14040	2090	265	0,050	11160	755	210	0,023	7560	515	143	0,023
8	10440	2090	262	0,067	8280	755	208	0,030	5670	515	143	0,030
10	8280	2090	260	0,063	6840	755	215	0,028	4590	515	144	0,028
12	7200	2160	271	0,075	5400	720	204	0,033	3780	515	143	0,034
16	5400	2160	271	0,100	4320	685	217	0,040	2970	500	149	0,042
20	4320	1945	271	0,113	3240	505	204	0,039	2160	325	136	0,038
	Ap : D, Ae : 0.05D											

RPM = rev./min. FEED = mm/min. Vc = m/min. fz = mm/t

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