

CARBIDE



Being the best through innovation



X-SPEED ROUGHER

X-SPEED ROUGHER FRÄSER

- Roughing End Mills for High-Feed Machining with reduced vibrations
- Schrupp Fräser für die HSC Bearbeitung mit verminderten Vibrationen

SELECTION GUIDE

ITEM	MODEL	DESCRIPTION	SIZE		PAGE
			MIN	MAX	
G9D75 G9D67		CARBIDE, 4&5 FLUTE MULTIPLE HELIX SHORT LENGTH CORNER RADIUS VOLLHARTMETALL, 4&5 SCHNEIDEN MEHRSPIRAL FRÄSER KURZ ECKENRADIUS	D6.0	D20.0	822
G9D76 G9D68		CARBIDE, 4&5 FLUTE MULTIPLE HELIX LONG LENGTH CORNER RADIUS VOLLHARTMETALL, 4&5 SCHNEIDEN MEHRSPIRAL FRÄSER LANG ECKENRADIUS	D6.0	D20.0	823
G9D77 G9D69		CARBIDE, 4&5 FLUTE MULTIPLE HELIX LONG REACH CORNER RADIUS VOLLHARTMETALL, 4&5 SCHNEIDEN MEHRSPIRAL FRÄSER GROÙE REICHWEITE ECKENRADIUS	D6.0	D20.0	824
GAE53		HSS-PM, 4&5 FLUTE MULTIPLE HELIX SHORT LENGTH CORNER RADIUS HSS-PM, 4&5 SCHNEIDEN MEHRSPIRAL FRÄSER KURZ ECKENRADIUS	D6.0	D20.0	825
RECOMMENDED CUTTING CONDITIONS EMPFOHLENE SCHNEIDKONDITIONEN					826

CHARACTERISTICS

- ▣ Unique flute design for excellent chip evacuation and vibration reduction.
- ▣ Optimal roughing tooth profile to reduce cutting forces.
- ▣ Special tool geometry for high feed rate and heavy cutting.
- ▣ Strong end tooth design for plunge and pocket milling.
- ▣ Custom engineered coating to allow long tool life and excellent chip evacuation.

▶ 4 FLUTE



▶ 5 FLUTE



X-SPEED ROUGHER END MILLS

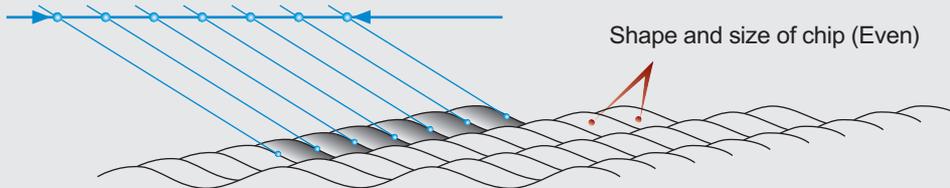
◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		High Hardened Steels	Copper	Graphite	Cast Iron	Aluminum	Stainless Steels	Titanium	Inconel	Acrylic	CFRP
~HB225	HB225~325	HRc30~40	HRc40~45	HRc45~55	HRc55~70									
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CHIP THICKNESS AND SHAPE

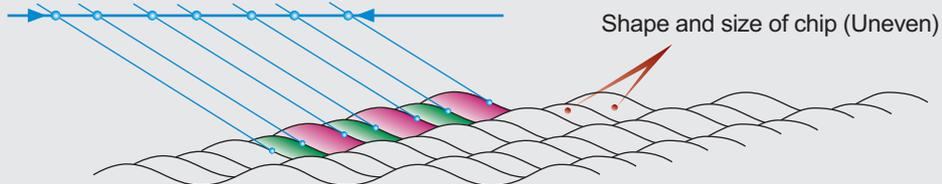
► Conventional Roughing End Mills

Even chip thickness and shape



► X-SPEED Rougher

Uneven chip thickness and shape



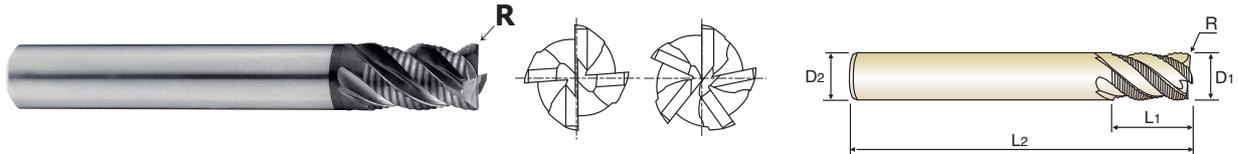


PLAIN SHANK
GLATTER ZYLINDERSCHAFT

FLAT SHANK
SEITLICHE MITNAHMEFLÄCHEN

**CARBIDE, 4&5 FLUTE MULTIPLE HELIX SHORT LENGTH CORNER RADIUS
VOLLHARTMETALL, 4&5 SCHNEIDEN MEHRSPIRAL FRÄSER KURZ ECKENRADIUS**

- ▶ Unique flute design for excellent chip evacuation and vibration reduction.
 - ▶ Optimal roughing tooth profile to reduce cutting forces.
 - ▶ Special tool geometry for high feed rate and heavy cutting.
 - ▶ Strong end tooth design for plunge and pocket milling.
 - ▶ Custom engineered coating to allow long tool life and excellent chip evacuation.
- ▶ einzigartige Nutengeometrie für hervorragenden Späntransport und Vibrationsreduzierung
 - ▶ neuartiges Schruppprofil zur Reduzierung der Schnittkräfte
 - ▶ Spezielle Werkzeuggeometrie für Hochvorschub- und Schwerzerspannung geeignet
 - ▶ speziell entwickelte Schneidengeometrie für Tauch- und Taschenfräsen
 - ▶ YG-1 eigene Beschichtung um lange Lebensdauer und sehr guten Späntransport zu gewährleisten



Unit : mm

EDP No.		Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute
PLAIN	FLAT	R	D1	D2	L1	L2	
G9D75060	G9D67060	R0.5	6.0	6	9	57	4
G9D75080	G9D67080	R0.5	8.0	8	12	63	4
G9D75100	G9D67100	R0.5	10.0	10	15	72	4
G9D75120	G9D67120	R0.5	12.0	12	18	83	4
G9D75160	G9D67160	R1.0	16.0	16	24	92	5
G9D75200	G9D67200	R1.0	20.0	20	30	104	5

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0~-0.05	h6

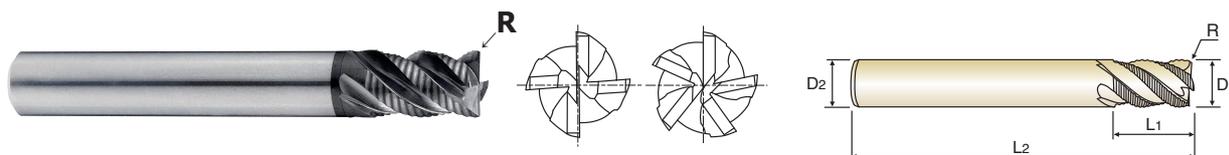
◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		High Hardened Steels	Copper	Graphite	Cast Iron	Aluminum	Stainless Steels	Titanium	Inconel	Acrylic	CFRP
~HB225	HB225~325	HRc30~40	HRc40~45	HRc45~55	HRc55~70									
◎	◎	◎	○			○		◎		○				

CARBIDE, 4&5 FLUTE MULTIPLE HELIX LONG LENGTH CORNER RADIUS VOLLHARTMETALL, 4&5 SCHNEIDEN MEHRSPIRAL FRÄSER LANG ECKENRADIUS

- ▶ Unique flute design for excellent chip evacuation and vibration reduction.
- ▶ Optimal roughing tooth profile to reduce cutting forces.
- ▶ Special tool geometry for high feed rate and heavy cutting.
- ▶ Strong end tooth design for plunge and pocket milling.
- ▶ Custom engineered coating to allow long tool life and excellent chip evacuation.

- ▶ einzigartige Nutengeometrie für hervorragenden Spänetransport und Vibrationsreduzierung
- ▶ neuartiges Schruppprofil zur Reduzierung der Schnittkräfte
- ▶ Spezielle Werkzeuggeometrie für Hochvorschub- und Schwerzerspannung geeignet
- ▶ speziell entwickelte Schneidengeometrie für Tauch- und Taschenfräsen
- ▶ YG-1 eigene Beschichtung um lange Lebensdauer und sehr guten Spänetransport zu gewährleisten



Unit : mm

EDP No.		Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	No. of Flute
PLAIN	FLAT						
G9D76060	G9D68060	RO.5	6.0	6	12	57	4
G9D76080	G9D68080	RO.5	8.0	8	16	63	4
G9D76100	G9D68100	RO.5	10.0	10	20	72	4
G9D76120	G9D68120	RO.5	12.0	12	24	83	4
G9D76160	G9D68160	R1.0	16.0	16	32	92	5
G9D76200	G9D68200	R1.0	20.0	20	40	104	5

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0~-0.05	h6

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		High Hardened Steels	Copper	Graphite	Cast Iron	Aluminum	Stainless Steels	Titanium	Inconel	Acrylic	CFRP
~HB225	HB225~325	HRc30~40	HRc40~45	HRc45~55	HRc55~70									
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**YG X-SPEED ROUGHER
END MILLS**

G9D77 SERIES
G9D69 SERIES

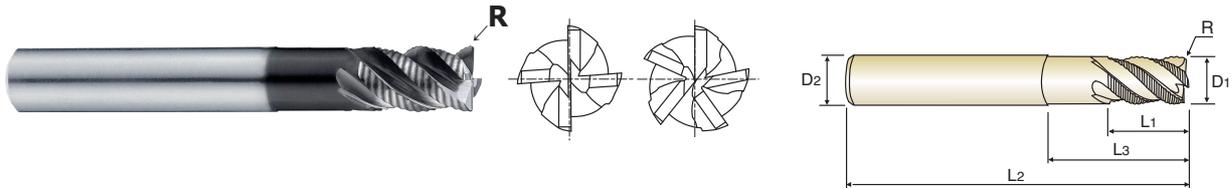
PLAIN SHANK
GLATTER ZYLINDERSCHAFT

FLAT SHANK
SEITLICHE MITNAHMEFLÄCHEN

**CARBIDE, 4&5 FLUTE MULTIPLE HELIX LONG REACH CORNER RADIUS
VOLLHARTMETALL, 4&5 SCHNEIDEN MEHRSPIRAL FRÄSER GROÙE REICHWEITE ECKENRADIUS**

- ▶ Unique flute design for excellent chip evacuation and vibration reduction.
- ▶ Optimal roughing tooth profile to reduce cutting forces.
- ▶ Special tool geometry for high feed rate and heavy cutting.
- ▶ Strong end tooth design for plunge and pocket milling.
- ▶ Custom engineered coating to allow long tool life and excellent chip evacuation.

- ▶ einzigartige Nutengeometrie für hervorragenden Späntransport und Vibrationsreduzierung
- ▶ neuartiges Schruppprofil zur Reduzierung der Schnittkräfte
- ▶ Spezielle Werkzeuggeometrie für Hochvorschub- und Schwerzerspannung geeignet
- ▶ speziell entwickelte Schneidengeometrie für Tauch- und Taschenfräsen
- ▶ YG-1 eigene Beschichtung um lange Lebensdauer und sehr guten Späntransport zu gewährleisten



Unit : mm

EDP No.		Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	No. of Flute
PLAIN	FLAT	R	D1	D2	L1	L3	L2	
G9D77060	G9D69060	R0.5	6.0	6	9	18	57	4
G9D77080	G9D69080	R0.5	8.0	8	12	24	63	4
G9D77100	G9D69100	R0.5	10.0	10	15	30	72	4
G9D77120	G9D69120	R0.5	12.0	12	18	36	83	4
G9D77160	G9D69160	R1.0	16.0	16	24	48	100	5
G9D77200	G9D69200	R1.0	20.0	20	30	60	110	5

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0~-0.05	h6

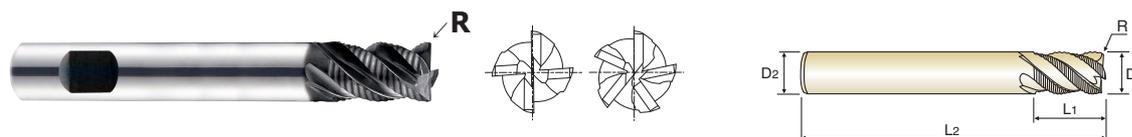
◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		High Hardened Steels	Copper	Graphite	Cast Iron	Aluminum	Stainless Steels	Titanium	Inconel	Acrylic	CFRP
~HB225	HB225~325	HRc30~40	HRc40~45	HRc45~55	HRc55~70									
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HSS-PM, 4&5 FLUTE MULTIPLE HELIX SHORT LENGTH CORNER RADIUS

HSS-PM, 4&5 SCHNEIDEN MEHRSPIRAL FRÄSER KURZ ECKENRADIUS

- ▶ Unique flute design for excellent chip evacuation and vibration reduction.
 - ▶ Optimal roughing tooth profile to reduce cutting forces.
 - ▶ Special tool geometry for high feed rate and heavy cutting.
 - ▶ Strong end tooth design for plunge and pocket milling.
 - ▶ Custom engineered coating to allow long tool life and excellent chip evacuation.
- ▶ einzigartige Nutengeometrie für hervorragenden Spänetransport und Vibrationsreduzierung
 - ▶ neuartiges Schruppprofil zur Reduzierung der Schnittkräfte
 - ▶ Spezielle Werkzeuggeometrie für Hochvorschub- und Schwerzerspannung geeignet
 - ▶ speziell entwickelte Schneidengeometrie für Tauch- und Taschenfräsen
 - ▶ YG-1 eigene Beschichtung um lange Lebensdauer und sehr guten Spänetransport zu gewährleisten



Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute
FLAT	R	D1(js12)	D2(h6)	L1	L2	
GAE53060	R0.5	6.0	6	13	57	4
GAE53070	R0.5	7.0	10	16	66	4
GAE53080	R0.5	8.0	10	19	69	4
GAE53090	R0.5	9.0	10	19	69	4
GAE53100	R0.5	10.0	10	22	72	4
GAE53120	R0.5	12.0	12	26	83	4
GAE53140	R1.0	14.0	16	26	83	5
GAE53160	R1.0	16.0	16	32	92	5
GAE53180	R1.0	18.0	20	32	92	5
GAE53200	R1.0	20.0	20	38	104	5

Tolerances according to DIN 7160 & 7161

Toleranzen nach DIN 7160 & 7161

Tolerance range in μm / Toleranzwerte in μm						
Nominal-Diameter in mm / Nennmaßbereich in mm						
	from 1 to 3 von 1 bis 3	over 3 to 6 über 3 bis 6	over 6 to 10 über 6 bis 10	over 10 to 18 über 10 bis 18	over 18 to 30 über 18 bis 30	over 30 to 50 über 30 bis 50
js12	± 50	± 60	± 75	± 90	± 105	± 125
h6	$\begin{matrix} 0 \\ -6 \end{matrix}$	$\begin{matrix} 0 \\ -8 \end{matrix}$	$\begin{matrix} 0 \\ -9 \end{matrix}$	$\begin{matrix} 0 \\ -11 \end{matrix}$	$\begin{matrix} 0 \\ -13 \end{matrix}$	$\begin{matrix} 0 \\ -16 \end{matrix}$

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		High Hardened Steels	Copper	Graphite	Cast Iron	Aluminum	Stainless Steels	Titanium	Inconel	Acrylic	CFRP
~HB225	HB225~325	HRc30~40	HRc40~45	HRc45~55	HRc55~70									
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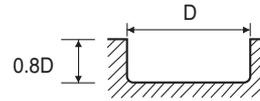
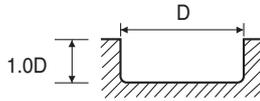
**X-SPEED ROUGHER
END MILLS**

**RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDKONDITIONEN**

**CARBIDE, 4&5 FLUTE MULTIPLE HELIX CORNER RADIUS - SLOTTING
VOLLHARTMETALL, 4&5 SCHNEIDEN MEHRSPIRAL FRÄSER ECKENRADIUS - NUTENFRÄSEN**

G9D75, G9D67, G9D76, G9D68, G9D77, G9D69 SERIES

MATERIAL	ALLOYED STEELS, CARBON STEELS TOOL STEELS, CAST IRON				ALLOYED STEELS, CARBON STEELS TOOL STEELS, CAST IRON PREHARDENED STEELS			
	~ HRC 25				HRC 25 ~ HRC 40			
HARDNESS	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz
DIAMETER								
6.0	12000	1550	225	0.032	10600	1100	200	0.026
8.0	9000	1650	225	0.046	8100	1180	205	0.036
10.0	7200	1650	225	0.057	6400	1180	200	0.046
12.0	6000	1540	225	0.064	5400	1140	205	0.053
16.0	4500	1500	225	0.067	4100	1050	205	0.051
20.0	3600	1330	225	0.074	3200	900	200	0.056

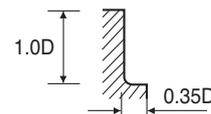
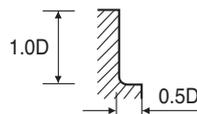


RPM = rev./min.
FEED = mm/min.
Vc = m/min.
fz = mm/t

**CARBIDE, 4&5 FLUTE MULTIPLE HELIX CORNER RADIUS - SIDE CUTTING
VOLLHARTMETALL, 4&5 SCHNEIDEN MEHRSPIRAL FRÄSER ECKENRADIUS- SEITENFRÄSEN**

G9D75, G9D67, G9D76, G9D68, G9D77, G9D69 SERIES

MATERIAL	ALLOYED STEELS, CARBON STEELS TOOL STEELS, CAST IRON				ALLOYED STEELS, CARBON STEELS TOOL STEELS, CAST IRON PREHARDENED STEELS			
	~ HRC 25				HRC 25 ~ HRC 40			
HARDNESS	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz
DIAMETER								
6.0	15800	2570	300	0.041	14300	1850	270	0.032
8.0	11900	2700	300	0.057	10700	1950	270	0.046
10.0	9500	2700	300	0.071	8500	1950	265	0.057
12.0	8000	2570	300	0.080	7100	1850	270	0.065
16.0	6000	2450	300	0.082	5400	1750	270	0.065
20.0	4800	2140	300	0.089	4300	1500	270	0.070

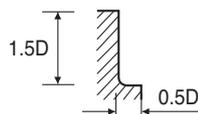


RPM = rev./min.
FEED = mm/min.
Vc = m/min.
fz = mm/t

HSS-PM, 4&5 FLUTE MULTIPLE HELIX SHORT LENGTH CORNER RADIUS
HSS-PM, 4&5 SCHNEIDEN MEHRSPIRAL FRÄSER KURZ ECKENRADIUS
GAE53 SERIES

MATERIAL	STRUCTURAL STEELS CARBON STEELS				STRUCTURAL STEELS CARBON STEELS, CAST IRONS				CARBON STEELS ALLOY STEELS, TOOL STEELS			
HARDNESS					~ HRc 20				HRc 20 ~ 30			
STRENGTH	~ 500N/mm ²				500 ~ 800N/mm ²				800 ~ 1000N/mm ²			
DIAMETER	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz
6.0	3250	240	60	0.019	2500	185	48	0.018	1800	120	34	0.017
8.0	2750	300	70	0.027	2150	240	54	0.028	1550	170	38	0.027
10.0	2150	430	70	0.050	1700	330	54	0.049	1200	205	38	0.043
12.0	1800	430	70	0.060	1400	350	54	0.063	1000	240	38	0.059
14.0	1550	430	70	0.055	1200	350	54	0.073	850	240	38	0.069
16.0	1400	430	70	0.063	1100	350	54	0.081	750	240	38	0.080
18.0	1200	430	70	0.072	1000	350	54	0.085	700	240	38	0.086
20.0	1100	445	70	0.080	850	350	54	0.101	600	240	38	0.100

MATERIAL	PREHARDENED STEELS ALLOY STEELS, TOOL STEELS				STAINLESS STEELS			
HARDNESS	HRc 30 ~ 40							
STRENGTH	1000 ~ 1300N/mm ²							
DIAMETER	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz
6.0	1500	110	28	0.018	1750	130	33	0.019
8.0	1200	130	32	0.028	1450	170	36	0.029
10.0	1000	170	32	0.041	1150	200	36	0.045
12.0	850	190	32	0.055	950	245	36	0.064
14.0	700	190	32	0.065	850	245	36	0.074
16.0	600	190	32	0.075	700	245	36	0.085
18.0	550	190	32	0.082	650	245	36	0.093
20.0	500	190	32	0.092	600	245	36	0.107



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