

HSS



Being the best through innovation

















TANK-POWER

TANK-POWER FRÄSER

- High Toughness, for Stainless Steels, Carbon steels, Alloy Steels
For General Application, Rough & Finish
- Sehr gute Zähigkeit. Für rostfreie Stähle, Fräsen von Stahl, legiertem Stahl
Allgemeinen Einsatz, Schruppen und schlichten

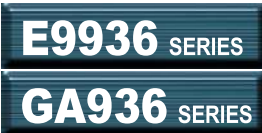
SELECTION GUIDE

ITEM	MODEL	DESCRIPTION	SIZE		PAGE
			MIN	MAX	
E9936 GA936		PREMIUM HSS-PM, 2 FLUTE SHORT LENGTH PREMIUM HSS-PM, 2 SCHNEIDEN KURZ	D1.0	D25.0	1136
E9A29 GAA29		PREMIUM HSS-PM, 2 FLUTE LONG LENGTH PREMIUM HSS-PM, 2 SCHNEIDEN LANG	D1.0	D25.0	1137
E9942 GA942		PREMIUM HSS-PM, 3 FLUTE STUB LENGTH PREMIUM HSS-PM, 3 SCHNEIDEN EXTRA KURZ	D1.0	D25.0	1138
E9A30 GAA30		PREMIUM HSS-PM, 3 FLUTE SHORT LENGTH PREMIUM HSS-PM, 3 SCHNEIDEN KURZ	D1.0	D25.0	1139
E9938 GA938		PREMIUM HSS-PM, 4 FLUTE SHORT LENGTH PREMIUM HSS-PM, 4 SCHNEIDEN KURZ	D1.0	D25.0	1140
E9A31 GAA31		PREMIUM HSS-PM, 4 FLUTE LONG LENGTH PREMIUM HSS-PM, 4 SCHNEIDEN LANG	D2.0	D25.0	1141
E9940 GA940		PREMIUM HSS-PM, 2 FLUTE SHORT LENGTH BALL NOSE PREMIUM HSS-PM, 2 SCHNEIDEN KURZ STIRNRADIUS	R0.5	R12.5	1142
E9A32 GAA32		PREMIUM HSS-PM, 2 FLUTE LONG LENGTH BALL NOSE PREMIUM HSS-PM, 2 SCHNEIDEN LANG STIRNRADIUS	R1.0	R12.5	1143
E9941 GA941		PREMIUM HSS-PM, MULTI FLUTE SHORT LENGTH ROUGHING - FINE PREMIUM HSS-PM, MULTI SCHNEIDEN KURZ SCHRUPFRÄSER - FEIN	D6.0	D25.0	1144
E9A35 GAA35		PREMIUM HSS-PM, MULTI FLUTE LONG LENGTH ROUGHING - FINE PREMIUM HSS-PM, MULTI SCHNEIDEN LANG SCHRUPFRÄSER - FEIN	D6.0	D25.0	1145
E9A26 GAA26		PREMIUM HSS-PM, MULTI FLUTE, 45° HELIX SHORT LENGTH ROUGHING - FINE PREMIUM HSS-PM, MULTI SCHNEIDEN 45° RECHTSSPIRALE KURZ SCHRUPFRÄSER - FEIN	D4.0	D25.0	1146
E9A33 GAA33		PREMIUM HSS-PM, MULTI FLUTE SHORT LENGTH ROUGHING - COARSE PREMIUM HSS-PM, MULTI SCHNEIDEN KURZ SCHRUPFRÄSER - GROB	D6.0	D25.0	1147
E9A34 GAA34		PREMIUM HSS-PM, MULTI FLUTE LONG LENGTH ROUGHING - COARSE PREMIUM HSS-PM, MULTI SCHNEIDEN LANG SCHRUPFRÄSER - GROB	D6.0	D25.0	1148
E9E43 GAE43		PREMIUM HSS-PM, MULTI FLUTE ROUGHING WITH NECK - COARSE PREMIUM HSS-PM, MULTI SCHNEIDEN SCHRUPFRÄSER mit ABGESETZTEM SCHAFTTETL - GROB	D10.0	D25.0	1149
RECOMMENDED CUTTING CONDITIONS EMPFOHLENE SCHNEIDKONDITIONEN					1150

TANK-POWER 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
			HRc40~45	HRc45~55	HRc55~70									
~HB225	HB225~325	HRc30~40	HRc40~45	HRc45~55	HRc55~70									
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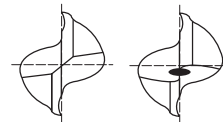


FLAT SHANK
SEITLICHE MITNAHMEFLÄCHEN
FLAT SHANK
SEITLICHE MITNAHMEFLÄCHEN

PREMIUM HSS-PM, 2 FLUTE SHORT LENGTH PREMIUM HSS-PM, 2 SCHNEIDEN KURZ

- ▶ Designed to machine carbon steels, alloyed steels, stainless steels.
- ▶ 2 Flute design for slotting.
- ▶ Suitable for high speed cutting of difficult - to - cut materials.
- ▶ YG-1's new developed TANK-POWER Coating suitable for high speed cutting.

- ▶ Geeignet zum Fräsen von Stahl, legiertem Stahl und rostfreier Stahl.
- ▶ 2 Schneiden, Geeignet für Nutenfräsen.
- ▶ Geeignet für Hochgeschwindigkeitsfräsen von schwer zu zerspanenden Materialien.
- ▶ Neuentwickelte Beschichtung für Hochgeschwindigkeitsfräsen.



up to Ø3mm over Ø3mm



Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TANK-POWER COATED	e8	h6		
E9936010	GA936010	1.0	6	2.5	47
E9936020	GA936020	2.0	6	4	48
E9936030	GA936030	3.0	6	5	49
E9936040	GA936040	4.0	6	7	51
E9936050	GA936050	5.0	6	8	52
E9936060	GA936060	6.0	6	8	52
E9936070	GA936070	7.0	10	10	60
E9936080	GA936080	8.0	10	11	61
E9936090	GA936090	9.0	10	11	61
E9936100	GA936100	10.0	10	13	63
E9936120	GA936120	12.0	12	16	73
E9936140	GA936140	14.0	12	16	73
E9936160	GA936160	16.0	16	19	79
E9936180	GA936180	18.0	16	19	79
E9936200	GA936200	20.0	20	22	88
E9936220	GA936220	22.0	20	22	88
E9936250	GA936250	25.0	25	26	102

Tolerances according to DIN 7160 & 7161 Toleranzen nach DIN 7160 & 7161

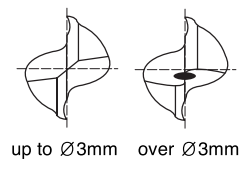
Tolerance range in μm / Toleranzwerte in μm					
Nominal-Diameter in mm / Nennmaßbereich in mm					
	from 1 to 3 von 1 bis 3	over 3 to 6 über 3 bis 6	over 6 to 10 über 6 bis 10	over 10 to 18 über 10 bis 18	over 18 to 30 über 18 bis 30
e8	— 14 — 28	— 20 — 38	— 25 — 47	— 32 — 59	— 40 — 73
h6	0 — 6	0 — 8	0 — 9	0 — 11	0 — 13

◎ : 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									
◎	◎	○				○		◎		◎				

PREMIUM HSS-PM, 2 FLUTE LONG LENGTH PREMIUM HSS-PM, 2 SCHNEIDEN LANG

- ▶ Designed to machine carbon steels, alloyed steels, stainless steels.
- ▶ 2 Flute design for slotting.
- ▶ Suitable for high speed cutting of difficult - to - cut materials.
- ▶ YG-1's new developed TANK-POWER Coating suitable for high speed cutting.
- ▶ Geeignet zum Fräsen von Stahl, legiertem Stahl und rostfreier Stahl.
- ▶ 2 Schneiden, Geeignet für Nutenfräsen.
- ▶ Geeignet für Hochgeschwindigkeitsfräsen von schwer zu zerspanenden Materialien.
- ▶ Neuentwickelte Beschichtung für Hochgeschwindigkeitsfräsen.



YPM DIN 844 2 30° DIN 1835B P.1150, 1151

Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TANK-POWER COATED	e8	h6		
E9A29010	GAA29010	1.0	6	3	47
E9A29020	GAA29020	2.0	6	7	51
E9A29030	GAA29030	3.0	6	8	52
E9A29040	GAA29040	4.0	6	11	55
E9A29050	GAA29050	5.0	6	13	57
E9A29060	GAA29060	6.0	6	13	57
E9A29070	GAA29070	7.0	10	16	66
E9A29080	GAA29080	8.0	10	19	69
E9A29090	GAA29090	9.0	10	19	69
E9A29100	GAA29100	10.0	10	22	72
E9A29120	GAA29120	12.0	12	26	83
E9A29140	GAA29140	14.0	12	26	83
E9A29160	GAA29160	16.0	16	32	92
E9A29180	GAA29180	18.0	16	32	92
E9A29200	GAA29200	20.0	20	38	104
E9A29220	GAA29220	22.0	20	38	104
E9A29250	GAA29250	25.0	25	45	121

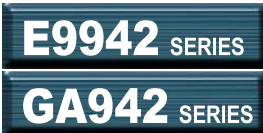
**Tolerances according to DIN 7160 & 7161
Toleranzen nach DIN 7160 & 7161**

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
e8	-14 -28	-20 -38	-25 -47	-32 -59	-40 -73
h6	0 -6	0 -8	0 -9	0 -11	0 -13

◎ : 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									
◎	◎	○				○		◎		◎				

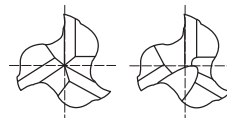
- CBN END MILLS
- i-Xmill END MILLS
- i-HS mill END MILLS
- X5070 END MILLS
- 4G MILL END MILLS
- X-SPEED ROUGHER END MILLS
- X-POWER END MILLS
- JET-POWER END MILLS
- TN MILL END MILLS
- V7 Mill END MILLS
- ALU-POWER END MILLS
- CRX S END MILLS
- D-POWER GRAPHITE END MILLS
- D-POWER CFRP END MILLS
- ROUTERS
- K-2 CARBIDE END MILLS
- GENERAL CARBIDE END MILLS
- TANK-POWER END MILLS
- GENERAL HSS END MILLS
- MILLING CUTTERS
- TECHNICAL DATA



FLAT SHANK
SEITLICHE MITNAHMEFLÄCHEN
FLAT SHANK
SEITLICHE MITNAHMEFLÄCHEN

PREMIUM HSS-PM, 3 FLUTE STUB LENGTH PREMIUM HSS-PM, 3 SCHNEIDEN EXTRA KURZ

- ▶ Designed to machine carbon steels, alloyed steels, stainless steels.
- ▶ Well balanced web design to minimize deflection and chattering.
- ▶ 3 flute design possess the advantage of 2 flute and 4 flute end mill.
- ▶ YG-1's new developed TANK-POWER Coating suitable for high speed cutting.
- ▶ Geeignet zum Fräsen von Stahl, legiertem Stahl und rostfreier Stahl.
- ▶ Verstärkter Kern zur Erhöhung der Stabilität.
- ▶ 3 Schneiden Design besitzt die Vorteile von 2-bzw 4 Schneiden Fräsem.
- ▶ Neuentwickelte Beschichtung für Hochgeschwindigkeitsfräsen.



up to Ø1mm over Ø1mm



P.1152, 1153, 1154, 1155

Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TANK-POWER COATED	e8	h6		
E9942010	GA942010	1.0	6	2.5	47
E9942020	GA942020	2.0	6	4	48
E9942030	GA942030	3.0	6	5	49
E9942040	GA942040	4.0	6	7	51
E9942050	GA942050	5.0	6	8	52
E9942060	GA942060	6.0	6	8	52
E9942070	GA942070	7.0	10	10	60
E9942080	GA942080	8.0	10	11	61
E9942090	GA942090	9.0	10	11	61
E9942100	GA942100	10.0	10	13	63
E9942120	GA942120	12.0	12	16	73
E9942140	GA942140	14.0	12	16	73
E9942160	GA942160	16.0	16	19	79
E9942180	GA942180	18.0	16	19	79
E9942200	GA942200	20.0	20	22	88
E9942220	GA942220	22.0	20	22	88
E9942250	GA942250	25.0	25	26	102

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
e8	-14 -28	-20 -38	-25 -47	-32 -59	-40 -73
h6	0 -6	0 -8	0 -9	0 -11	0 -13

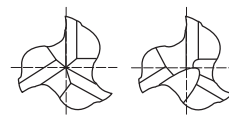
◎ : Excellent ○ : Good

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									
◎	◎	○				○		◎		◎				

PREMIUM HSS-PM, 3 FLUTE SHORT LENGTH
PREMIUM HSS-PM, 3 SCHNEIDEN KURZ

- ▶ Designed to machine carbon steels, alloyed steels, stainless steels.
- ▶ Well balanced web design to minimize deflection and chattering.
- ▶ 3 flute design possess the advantage of 2 flute and 4 flute end mill.
- ▶ YG-1's new developed TANK-POWER Coating suitable for high speed cutting.

- ▶ Geeignet zum Fräsen von Stahl, legiertem Stahl und rostfreier Stahl.
- ▶ Verstärkter Kern zur Erhöhung der Stabilität.
- ▶ 3 Schneiden Design besitzt die Vorteile von 2-bzw 4 Schneiden Fräsem.
- ▶ Neuentwickelte Beschichtung für Hochgeschwindigkeitsfräsen.



up to Ø1mm over Ø1mm

YPM DIN 844 3 30° DIN 1835B P.1152, 1153, 1154, 1155

Unit : mm

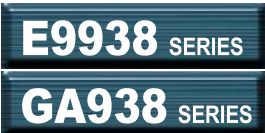
EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TANK-POWER COATED	e8	h6		
E9A30010	GAA30010	1.0	6	3	47
E9A30020	GAA30020	2.0	6	7	51
E9A30030	GAA30030	3.0	6	8	52
E9A30040	GAA30040	4.0	6	11	55
E9A30050	GAA30050	5.0	6	13	57
E9A30060	GAA30060	6.0	6	13	57
E9A30070	GAA30070	7.0	10	16	66
E9A30080	GAA30080	8.0	10	19	69
E9A30090	GAA30090	9.0	10	19	69
E9A30100	GAA30100	10.0	10	22	72
E9A30120	GAA30120	12.0	12	26	83
E9A30140	GAA30140	14.0	12	26	83
E9A30160	GAA30160	16.0	16	32	92
E9A30180	GAA30180	18.0	16	32	92
E9A30200	GAA30200	20.0	20	38	104
E9A30220	GAA30220	22.0	20	38	104
E9A30250	GAA30250	25.0	25	45	121

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
e8	— 14 — 28	— 20 — 38	— 25 — 47	— 32 — 59	— 40 — 73
h6	0 — 6	0 — 8	0 — 9	0 — 11	0 — 13

◎ : 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									
◎	◎	○				○		◎		◎				



FLAT SHANK
SEITLICHE MITNAHMEFLÄCHEN
FLAT SHANK
SEITLICHE MITNAHMEFLÄCHEN

PREMIUM HSS-PM, 4 FLUTE SHORT LENGTH
PREMIUM HSS-PM, 4 SCHNEIDEN KURZ

- ▶ Designed to machine carbon steels, alloyed steels, stainless steels.
- ▶ Recommended for pocketing, cam milling, die sinking and slotting..
- ▶ Designed for high speed cutting of difficult - to - cut materials.
- ▶ YG-1's new developed TANK-POWER Coating suitable for high speed cutting.

- ▶ Geeignet zum Fräsen von Stahl, legiertem Stahl und rostfreier Stahl.
- ▶ Empfohlen für Taschenfräsen, Nockenfräsen, Gussformen und Nutenfräsen.
- ▶ Geeignet für Hochgeschwindigkeitsfräsen von schwer zu zerspanenden Materialien.
- ▶ Neuentwickelte Beschichtung für Hochgeschwindigkeitsfräsen.



YPM DIN 844 4 30° DIN 1835B P.1156, 1157

Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TANK-POWER COATED				
E9938010	GA938010	1.0	6	3	49
E9938020	GA938020	2.0	6	7	51
E9938030	GA938030	3.0	6	8	52
E9938040	GA938040	4.0	6	11	55
E9938050	GA938050	5.0	6	13	57
E9938060	GA938060	6.0	6	13	57
E9938070	GA938070	7.0	10	16	66
E9938080	GA938080	8.0	10	19	69
E9938090	GA938090	9.0	10	19	69
E9938100	GA938100	10.0	10	22	72
E9938120	GA938120	12.0	12	26	83
E9938140	GA938140	14.0	12	26	83
E9938160	GA938160	16.0	16	32	92
E9938180	GA938180	18.0	16	32	92
E9938200	GA938200	20.0	20	38	104
E9938220	GA938220	22.0	20	38	104
E9938250	GA938250	25.0	25	45	121

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0~+0.03	h6

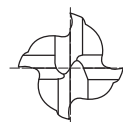
◎ : Excellent ○ : Good

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									
◎	◎	○				○		◎		◎				

PREMIUM HSS-PM, 4 FLUTE LONG LENGTH
PREMIUM HSS-PM, 4 SCHNEIDEN LANG

- ▶ Designed to machine carbon steels, alloyed steels, stainless steels.
- ▶ Recommended for pocketing, cam milling, die sinking and slotting.
- ▶ Designed for high speed cutting of difficult - to - cut materials.
- ▶ YG-1's new developed TANK-POWER Coating suitable for high speed cutting.

- ▶ Geeignet zum Fräsen von Stahl, legiertem Stahl und rostfreier Stahl.
- ▶ Empfohlen für Taschenfräsen, Nockenfräsen, Gussformen und Nutenfräsen.
- ▶ Geeignet für Hochgeschwindigkeitsfräsen von schwer zu zerspanenden Materialien.
- ▶ Neuentwickelte Beschichtung für Hochgeschwindigkeitsfräsen.



YPM DIN 844 4 30° DIN 1835B P.1156, 1157

Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TANK-POWER COATED				
E9A31020	GAA31020	2.0	6	10	54
E9A31030	GAA31030	3.0	6	12	56
E9A31040	GAA31040	4.0	6	19	63
E9A31050	GAA31050	5.0	6	24	68
E9A31060	GAA31060	6.0	6	24	68
E9A31070	GAA31070	7.0	10	30	80
E9A31080	GAA31080	8.0	10	38	88
E9A31090	GAA31090	9.0	10	38	88
E9A31100	GAA31100	10.0	10	45	95
E9A31120	GAA31120	12.0	12	53	110
E9A31140	GAA31140	14.0	12	53	110
E9A31160	GAA31160	16.0	16	63	123
E9A31180	GAA31180	18.0	16	63	123
E9A31200	GAA31200	20.0	20	75	141
E9A31220	GAA31220	22.0	20	75	141
E9A31250	GAA31250	25.0	25	90	166

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0~+0.03	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
- HSS
- CBN END MILLS
- i-Xmill END MILLS
- i-HS mill END MILLS
- X5070 END MILLS
- 4G MILL END MILLS
- X-SPEED ROUGHER END MILLS
- X-POWER END MILLS
- JET-POWER END MILLS
- TN MILL END MILLS
- V7 Mill END MILLS
- ALU-POWER END MILLS
- CRX S END MILLS
- D-POWER GRAPHITE END MILLS
- D-POWER CFRP END MILLS
- ROUTERS
- K-2 CARBIDE END MILLS
- GENERAL CARBIDE END MILLS
- TANK-POWER END MILLS
- GENERAL HSS END MILLS
- MILLING CUTTERS
- TECHNICAL DATA



FLAT SHANK
SEITLICHE MITNAHMEFLÄCHEN
FLAT SHANK
SEITLICHE MITNAHMEFLÄCHEN

PREMIUM HSS-PM, 2 FLUTE SHORT LENGTH BALL NOSE
PREMIUM HSS-PM, 2 SCHNEIDEN STIRNRADIUS KURZ

- ▶ Designed to machine carbon steels, alloyed steels, stainless steels.
- ▶ Designed for milling of radius bottom slots, fillets and special contours.
- ▶ YG-1's new developed TANK-POWER Coating suitable for high speed cutting.
- ▶ Geeignet zum Fräsen von Stahl, legiertem Stahl und rostfreier Stahl.
- ▶ Entworfen zum Fräsen von Nuten mit Radien, Rippen und speziellen Konturen.
- ▶ Neuentwickelte Beschichtung für Hochgeschwindigkeitsfräsen.



Unit : mm

EDP No.		Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TANK-POWER COATED	R (±0.02)				
E9940010	GA940010	R0.5	1.0	6	2.5	47
E9940020	GA940020	R1.0	2.0	6	4	48
E9940030	GA940030	R1.5	3.0	6	5	49
E9940040	GA940040	R2.0	4.0	6	7	51
E9940050	GA940050	R2.5	5.0	6	8	52
E9940060	GA940060	R3.0	6.0	6	8	52
E9940070	GA940070	R3.5	7.0	10	10	60
E9940080	GA940080	R4.0	8.0	10	11	61
E9940090	GA940090	R4.5	9.0	10	11	61
E9940100	GA940100	R5.0	10.0	10	13	63
E9940120	GA940120	R6.0	12.0	12	16	73
E9940140	GA940140	R7.0	14.0	12	16	73
E9940160	GA940160	R8.0	16.0	16	19	79
E9940180	GA940180	R9.0	18.0	16	19	79
E9940200	GA940200	R10.0	20.0	20	22	88
E9940220	GA940220	R11.0	22.0	20	22	88
E9940250	GA940250	R12.5	25.0	25	26	102

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0~-0.03	h6

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									
◎	◎	○				○		◎		◎				

◎ : Excellent ○ : Good

PREMIUM HSS-PM, 2 FLUTE LONG LENGTH BALL NOSE PREMIUM HSS-PM, 2 SCHNEIDEN STIRNRADIUS LANG

- ▶ Designed to machine carbon steels, alloyed steels, stainless steels.
- ▶ Designed for milling of radius bottom slots, fillets and special contours.
- ▶ YG-1's new developed TANK-POWER Coating suitable for high speed cutting.
- ▶ Geeignet zum Fräsen von Stahl, legiertem Stahl und rostfreier Stahl.
- ▶ Entworfen zum Fräsen von Nuten mit Radien, Rippen und speziellen Konturen.
- ▶ Neuentwickelte Beschichtung für Hochgeschwindigkeitsfräsen.



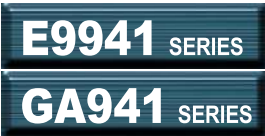
Unit : mm

EDP No.		Radius of Ball Nose R (±0.02)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TANK-POWER COATED					
E9A32020	GAA32020	R1.0	2.0	6	7	54
E9A32030	GAA32030	R1.5	3.0	6	8	56
E9A32040	GAA32040	R2.0	4.0	6	11	63
E9A32050	GAA32050	R2.5	5.0	6	13	68
E9A32060	GAA32060	R3.0	6.0	6	13	68
E9A32070	GAA32070	R3.5	7.0	10	16	80
E9A32080	GAA32080	R4.0	8.0	10	19	88
E9A32090	GAA32090	R4.5	9.0	10	19	88
E9A32100	GAA32100	R5.0	10.0	10	22	95
E9A32120	GAA32120	R6.0	12.0	12	26	110
E9A32140	GAA32140	R7.0	14.0	12	26	110
E9A32160	GAA32160	R8.0	16.0	16	32	123
E9A32180	GAA32180	R9.0	18.0	16	32	123
E9A32200	GAA32200	R10.0	20.0	20	38	141
E9A32220	GAA32220	R11.0	22.0	20	38	141
E9A32250	GAA32250	R12.5	25.0	25	45	166

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0~-0.03	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									
◎	◎	○				○		◎		◎				



FLAT SHANK
SEITLICHE MITNAHMEFLÄCHEN
FLAT SHANK
SEITLICHE MITNAHMEFLÄCHEN

PREMIUM HSS-PM, MULTI FLUTE SHORT LENGTH ROUGHING - FINE
PREMIUM HSS-PM, MULTI SCHNEIDEN KURZ SCHRUPPFRÄSER - FEIN

- ▶ Suitable for high-feed roughing milling.
- ▶ Designed to machine carbon steels, alloyed steels, stainless steels.
- ▶ Providing excellent finished surfaces in many cases.
- ▶ YG-1's new developed TANK-POWER Coating suitable for high speed cutting.
- ▶ up to $\varnothing 20$: center cut, over $\varnothing 20$: non center cut

- ▶ Geeignet zum HSC - Schrapp - Fräsen.
- ▶ Geeignet zum Fräsen von Stahl, legiertem Stahl und rostfreier Stahl.
- ▶ Liefert in vielen Fällen exzellente bearbeitete Oberflächen.
- ▶ Neuentwickelte Beschichtung für Hochgeschwindigkeitsfräsen.
- ▶ Bis D=20mm : Mit Zentrumschneide, über D=20mm : Ohne Zentrumschneide.



Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute
UNCOATED	TANK-POWER COATED	js12	h6			
E9941060	GA941060	6.0	6	13	57	3
E9941070	GA941070	7.0	10	16	66	3
E9941080	GA941080	8.0	10	19	69	3
E9941090	GA941090	9.0	10	19	69	3
E9941100	GA941100	10.0	10	22	72	4
E9941120	GA941120	12.0	12	26	83	4
E9941140	GA941140	14.0	12	26	83	4
E9941160	GA941160	16.0	16	32	92	4
E9941180	GA941180	18.0	16	32	92	4
E9941200	GA941200	20.0	20	38	104	4
E9941220	GA941220	22.0	20	38	104	5
E9941250	GA941250	25.0	25	45	121	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	$\begin{matrix} 0 \\ -6 \end{matrix}$	$\begin{matrix} 0 \\ -8 \end{matrix}$	$\begin{matrix} 0 \\ -9 \end{matrix}$	$\begin{matrix} 0 \\ -11 \end{matrix}$	$\begin{matrix} 0 \\ -13 \end{matrix}$	$\begin{matrix} 0 \\ -16 \end{matrix}$

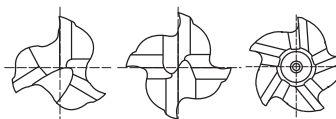
◎ : Excellent ○ : Good

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									
◎	◎	○				○		◎		◎				

PREMIUM HSS-PM, MULTI FLUTE LONG LENGTH ROUGHING - FINE
PREMIUM HSS-PM, MULTI SCHNEIDEN LANG SCHRUPFRÄSER - FEIN

- ▶ Suitable for high-feed roughing milling.
- ▶ Designed to machine carbon steels, alloyed steels, stainless steels..
- ▶ Providing excellent finished surfaces in many cases.
- ▶ YG-1's new developed TANK-POWER Coating suitable for high speed cutting.
- ▶ up to Ø20 : center cut, over Ø20 : non center cut

- ▶ Geeignet zum HSC - Schrupp - Fräsen.
- ▶ Geeignet zum Fräsen von Stahl, legiertem Stahl und rostfreier Stahl.
- ▶ Liefert in vielen Fällen exzellente Oberflächen.
- ▶ Neuentwickelte Beschichtung für Hochgeschwindigkeitsfräsen.
- ▶ Bis D=20mm : Mit Zentrumschneide, über D=20mm : Ohne Zentrumschneide.



up to Ø9 Ø10 ~ Ø20 over Ø20

Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute
UNCOATED	TANK-POWER COATED	js12	h6			
E9A35060	GAA35060	6.0	6	24	68	3
E9A35070	GAA35070	7.0	10	30	80	3
E9A35080	GAA35080	8.0	10	38	88	3
E9A35090	GAA35090	9.0	10	38	88	3
E9A35100	GAA35100	10.0	10	45	95	4
E9A35120	GAA35120	12.0	12	53	110	4
E9A35140	GAA35140	14.0	12	53	110	4
E9A35160	GAA35160	16.0	16	63	123	4
E9A35180	GAA35180	18.0	16	63	123	4
E9A35200	GAA35200	20.0	20	75	141	4
E9A35220	GAA35220	22.0	20	75	141	5
E9A35250	GAA35250	25.0	25	90	166	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	0 -6	0 -8	0 -9	0 -11	0 -13	0 -16

◎ : 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									
◎	◎	○				○		◎		◎				

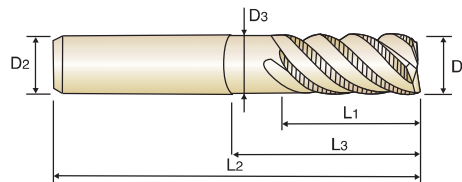
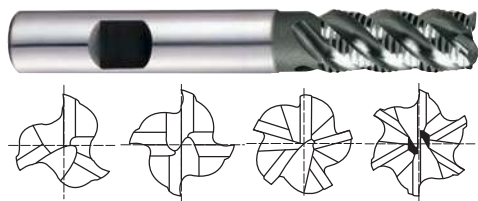


FLAT SHANK
SEITLICHE MITNAHMEFLÄCHEN
FLAT SHANK
SEITLICHE MITNAHMEFLÄCHEN

PREMIUM HSS-PM, MULTI FLUTE 45° HELIX SHORT LENGTH ROUGHING - FINE
PREMIUM HSS-PM, MULTI SCHNEIDEN 45° RECHTSSPIRALE KURZ SCHRUPFRÄSER - FEIN

- ▶ High chip removal and minimizing breakages of cutting edges.
- ▶ Designed to machine carbon steels, alloyed steels, stainless steels
- ▶ YG-1's new developed TANK-POWER Coating suitable for high speed cutting

- ▶ Schnelle Spanabfuhr und Minimierung von Schneidkantenausbrüchen
- ▶ Geeignet zum Fräsen von Stahl, legiertem Stahl und rostfreier Stahl.
- ▶ Neuentwickelte Beschichtung für Hochgeschwindigkeitsfräsen.



Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	No. of Flute
UNCOATED	TANK-POWER COATED	D1(js12)	D2(h6)	L1	L3	L2	D3	
E9A26040	GAA26040	4.0	6	11	-	57	-	3
E9A26050	GAA26050	5.0	6	13	-	57	-	4
E9A26060	GAA26060	6.0	6	13	-	57	-	4
E9A26070	GAA26070	7.0	10	16	-	66	-	4
E9A26080	GAA26080	8.0	10	19	-	69	-	4
E9A26090	GAA26090	9.0	10	19	-	69	-	4
E9A26100	GAA26100	10.0	10	22	31	72	9.5	4
E9A26120	GAA26120	12.0	12	26	37	83	11.5	4
E9A26140	GAA26140	14.0	12	26	-	83	-	5
E9A26160	GAA26160	16.0	16	32	44	92	15	5
E9A26180	GAA26180	18.0	16	32	-	92	-	6
E9A26200	GAA26200	20.0	20	38	54	104	19	6
E9A26250	GAA26250	25.0	25	45	63	121	24	6

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	$\frac{0}{-6}$	$\frac{0}{-8}$	$\frac{0}{-9}$	$\frac{0}{-11}$	$\frac{0}{-13}$	$\frac{0}{-16}$

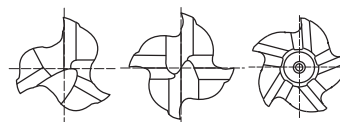
◎ : Excellent ○ : Good

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									
◎	◎	○				○		◎		◎				

PREMIUM HSS-PM, MULTI FLUTE SHORT LENGTH ROUGHING - COARSE
PREMIUM HSS-PM, MULTI SCHNEIDEN KURZ SCHRUPFRÄSER - GROB

- ▶ Suitable for high-feed roughing milling.
- ▶ Designed to machine carbon steels, alloyed steels, stainless steels.
- ▶ YG-1's new developed TANK-POWER Coating suitable for high speed cutting.
- ▶ up to $\varnothing 20$: center cut, over $\varnothing 20$: non center cut

- ▶ Geeignet zum HSC - Schrupp - Fräsen.
- ▶ Geeignet zum Fräsen von Stahl, legiertem Stahl und rostfreier Stahl.
- ▶ Neuentwickelte Beschichtung für Hochgeschwindigkeitsfräsen.
- ▶ Bis $D \leq 20\text{mm}$: mit Zentrumschnitt, über $D < 20\text{mm}$: Ohne Zentrumschnitt.



up to $\varnothing 9$ $\varnothing 10 \sim \varnothing 20$ over $\varnothing 20$

Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute
UNCOATED	TANK-POWER COATED	js12	h6			
E9A33060	GAA33060	6.0	6	13	57	3
E9A33070	GAA33070	7.0	10	16	66	3
E9A33080	GAA33080	8.0	10	19	69	3
E9A33090	GAA33090	9.0	10	19	69	3
E9A33100	GAA33100	10.0	10	22	72	4
E9A33120	GAA33120	12.0	12	26	83	4
E9A33140	GAA33140	14.0	12	26	83	4
E9A33160	GAA33160	16.0	16	32	92	4
E9A33180	GAA33180	18.0	16	32	92	4
E9A33200	GAA33200	20.0	20	38	104	4
E9A33220	GAA33220	22.0	20	38	104	5
E9A33250	GAA33250	25.0	25	45	121	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

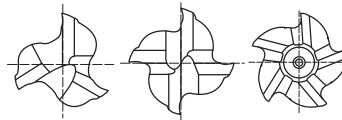
Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		High Hardened Steels	Copper	Graphite	Cast Iron	Aluminum	Stainless Steels	Titanium	Inconel	Acrylic	CFRP
~HB225	HB225~325	HRc30~40	HRc40~45	HRc45~55	HRc55~70									
◎	◎	○				○		◎		◎				



FLAT SHANK
SEITLICHE MITNAHMEFLÄCHEN
FLAT SHANK
SEITLICHE MITNAHMEFLÄCHEN

PREMIUM HSS-PM, MULTI FLUTE LONG LENGTH ROUGHING - COARSE
PREMIUM HSS-PM, MULTI SCHNEIDEN LANG SCHRUPFRÄSER - GROB

- ▶ Suitable for high-feed roughing milling.
- ▶ Designed to machine carbon steels, alloyed steels, stainless steels.
- ▶ YG-1's new developed TANK-POWER Coating suitable for high speed cutting.
- ▶ up to Ø20 : center cut, over Ø20 : non center cut
- ▶ Geeignet zum HSC - Schrump - Fräsen.
- ▶ Geeignet zum Fräsen von Stahl, legiertem Stahl und rostfreier Stahl.
- ▶ Neuentwickelte Beschichtung für Hochgeschwindigkeitsfräsen.
- ▶ Bis D<=20mm : mit Zentrumschnitt, über D<=20mm : Ohne Zentrumschnitt.



up to Ø9 Ø10 ~ Ø20 over Ø20



Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute
UNCOATED	TANK-POWER COATED	js12	h6			
E9A34060	GAA34060	6.0	6	24	68	3
E9A34070	GAA34070	7.0	10	30	80	3
E9A34080	GAA34080	8.0	10	38	88	3
E9A34090	GAA34090	9.0	10	38	88	3
E9A34100	GAA34100	10.0	10	45	95	4
E9A34120	GAA34120	12.0	12	53	110	4
E9A34140	GAA34140	14.0	12	53	110	4
E9A34160	GAA34160	16.0	16	63	123	4
E9A34180	GAA34180	18.0	16	63	123	4
E9A34200	GAA34200	20.0	20	75	141	4
E9A34220	GAA34220	22.0	20	75	141	5
E9A34250	GAA34250	25.0	25	90	166	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	0 -6	0 -8	0 -9	0 -11	0 -13	0 -16

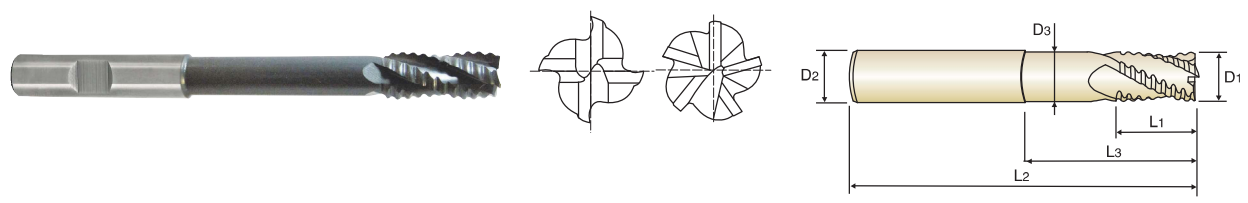
Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		High Hardened Steels	Copper	Graphite	Cast Iron	Aluminum	Stainless Steels	Titanium	Inconel	Acrylic	CFRP
~HB225	HB225~325	HRC30~40	HRc40~45	HRc45~55	HRc55~70									
◎	◎	○				○		◎		◎				

◎ : Excellent ○ : Good

PREMIUM HSS-PM, MULTI FLUTE ROUGHING WITH NECK - COARSE
PREMIUM HSS-PM, MULTI SCHNEIDEN SCHRUPFRÄSER MIT ABGESETZTEM SCHAFTTETL - GROB

- ▶ High chip removal and minimizing breakages of cutting edges.
- ▶ Design to machine carbon steels, alloyed steels, stainless steels.
- ▶ YG-1's new developed TANK-POWER Coating suitable for high speed cutting.

- ▶ Schnelle Spanabfuhr und Minimierung von Schneidkantenausbrüchen
- ▶ Geeignet zum Fräsen von Stahl, legiertem Stahl und rostfreier Stahl.
- ▶ Neuentwickelte Beschichtung für Hochgeschwindigkeitsfräsen.



YPM COARSE 4&5 30° DIN 1835B P.1164, 1165

Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	No. of Flute
UNCOATED	TANK-POWER COATED	D1(js12)	D2(h6)	L1	L3	L2	D3	
E9E43100	GAE43100	10.0	10	22	69	110	8.5	4
E9E43120	GAE43120	12.0	12	26	78	125	10.5	4
E9E43160	GAE43160	16.0	16	32	87	138	14	4
E9E43200	GAE43200	20.0	20	38	108	160	18	4
E9E43250	GAE43250	25.0	25	45	155	216	23	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	0 -6	0 -8	0 -9	0 -11	0 -13	0 -16

◎ : 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									
◎	◎	○				○		◎		◎				

- CBN END MILLS
- i-Xmill END MILLS
- i-HS mill END MILLS
- X5070 END MILLS
- 4G MILL END MILLS
- X-SPEED ROUGHER END MILLS
- X-POWER END MILLS
- JET-POWER END MILLS
- TN MILL END MILLS
- V7 Mill END MILLS
- ALU-POWER END MILLS
- CRX S END MILLS
- D-POWER GRAPHITE END MILLS
- D-POWER CFRP END MILLS
- ROUTERS
- K-2 CARBIDE END MILLS
- GENERAL CARBIDE END MILLS
- TANK-POWER END MILLS
- GENERAL HSS END MILLS
- MILLING CUTTERS
- TECHNICAL DATA

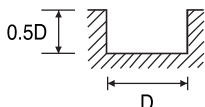


PREMIUM HSS-PM, 2 FLUTE - SLOTTING
PREMIUM HSS-PM, 2 SCHNEIDEN - NUTENFRÄSEN

GA936, GAA29 SERIES

MATERIAL	STRUCTURAL STEELS CARBON STEELS				STRUCTURAL STEELS CARBON STEELS CAST IRONS				CARBON STEELS ALLOY STEELS TOOL STEELS			
HARDNESS					~ HRC20				HRc20 ~ HRc30			
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
2.0	7000	115	45	0.008	5900	90	35	0.008	4900	80	30	0.008
3.0	5000	160	45	0.016	4100	135	40	0.016	3350	115	30	0.017
4.0	4300	230	55	0.027	3600	175	45	0.024	3150	160	40	0.025
5.0	3900	255	60	0.033	3250	200	50	0.031	2600	185	40	0.036
6.0	3500	265	65	0.038	2900	210	55	0.036	2300	190	45	0.041
8.0	2600	275	65	0.053	2200	240	55	0.055	1800	200	45	0.056
10.0	2100	300	65	0.071	1800	265	55	0.074	1450	230	45	0.079
12.0	1800	275	70	0.076	1450	240	55	0.083	1150	210	45	0.091
14.0	1600	265	70	0.083	1250	210	55	0.084	1000	195	45	0.098
16.0	1350	265	70	0.098	1150	195	60	0.085	890	180	45	0.101
18.0	1150	240	65	0.104	950	195	55	0.103	790	160	45	0.101
20.0	950	220	60	0.116	780	165	50	0.106	700	150	45	0.107
22.0	840	185	60	0.110	710	150	50	0.106	600	125	40	0.104
25.0	750	155	60	0.103	630	140	50	0.111	490	115	40	0.117

MATERIAL	PREHARDENED STEELS ALLOY STEELS TOOL STEELS				ALLOY STEELS TOOL STEELS AUSTENITIC STAINLESS STEELS			
HARDNESS	HRc30 ~ HRc35				HRc35 ~ HRc40			
STRENGTH	1000 ~ 1100N/mm ²				1100 ~ 1300N/mm ²			
DIAMETER	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz
2.0	3150	65	20	0.010	2000	40	15	0.010
3.0	2300	80	20	0.017	1800	62	15	0.017
4.0	2000	92	25	0.023	1600	75	20	0.023
5.0	1700	102	25	0.030	1350	75	20	0.028
6.0	1450	110	25	0.038	1150	85	20	0.037
8.0	1150	115	30	0.050	890	85	20	0.048
10.0	900	125	30	0.069	700	102	20	0.073
12.0	740	115	30	0.078	580	85	20	0.073
14.0	630	110	30	0.087	500	80	20	0.080
16.0	560	102	30	0.091	440	80	20	0.091
18.0	500	100	30	0.100	400	75	25	0.094
20.0	440	92	30	0.105	360	70	25	0.097
22.0	400	80	30	0.100	320	55	20	0.086
25.0	360	75	30	0.104	250	52	20	0.104



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

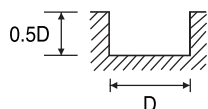
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FEED = mm/min.
Vc = m/min.
fz = mm/t

PREMIUM HSS-PM, 2 FLUTE - SLOTTING
PREMIUM HSS-PM, 2 SCHNEIDEN - NUTENFRÄSEN

E9936, E9A29 SERIES

MATERIAL	STRUCTURAL STEELS CARBON STEELS				STRUCTURAL STEELS CARBON STEELS CAST IRONS				CARBON STEELS ALLOY STEELS TOOL STEELS			
HARDNESS					~ HRC20				HRC20 ~ HRC30			
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
2.0	4800	70	30	0.007	4000	55	25	0.007	3300	50	20	0.008
3.0	3300	100	30	0.015	2800	85	25	0.015	2200	75	20	0.017
4.0	2900	140	35	0.024	2400	110	30	0.023	2100	100	25	0.024
5.0	2600	160	40	0.031	2200	125	35	0.028	1800	115	30	0.032
6.0	2300	160	45	0.035	2000	135	40	0.034	1600	120	30	0.038
8.0	1800	170	45	0.047	1500	150	40	0.050	1200	125	30	0.052
10.0	1400	180	45	0.064	1200	165	40	0.069	1000	140	30	0.070
12.0	1200	170	45	0.071	1000	150	40	0.075	800	130	30	0.081
14.0	1100	160	50	0.073	850	140	35	0.082	680	120	30	0.088
16.0	900	160	45	0.089	750	135	40	0.090	600	110	30	0.092
18.0	800	150	45	0.094	640	120	35	0.094	530	100	30	0.094
20.0	640	130	40	0.102	540	100	35	0.093	480	95	30	0.099
22.0	570	110	40	0.096	480	90	35	0.094	400	75	30	0.094
25.0	510	95	40	0.093	430	85	35	0.099	340	70	25	0.103

MATERIAL	PREHARDENED STEELS ALLOY STEELS TOOL STEELS				ALLOY STEELS TOOL STEELS AUSTENITIC STAINLESS STEELS			
HARDNESS	HRC30 ~ HRC35				HRC35 ~ HRC40			
STRENGTH	1000 ~ 1100N/mm ²				1100 ~ 1300N/mm ²			
DIAMETER	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz
2.0	2100	40	15	0.010	1300	25	10	0.010
3.0	1600	50	15	0.016	1200	40	10	0.017
4.0	1300	60	15	0.023	1050	45	15	0.021
5.0	1100	65	15	0.030	900	45	15	0.025
6.0	1000	65	20	0.033	750	55	15	0.037
8.0	750	70	20	0.047	600	55	15	0.046
10.0	600	80	20	0.067	480	65	15	0.068
12.0	500	70	20	0.070	400	55	15	0.069
14.0	430	65	20	0.076	340	50	15	0.074
16.0	380	65	20	0.086	300	50	15	0.083
18.0	340	55	20	0.081	270	45	15	0.083
20.0	300	55	20	0.092	240	40	15	0.083
22.0	270	50	20	0.093	210	35	15	0.083
25.0	240	45	20	0.094	175	30	15	0.086



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



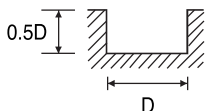
RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDKONDITIONEN

PREMIUM HSS-PM, 3 FLUTE - SLOTTING
PREMIUM HSS-PM, 3 SCHNEIDEN - NUTENFRÄSEN

GA942, GAA30 SERIES

MATERIAL	STRUCTURAL STEELS CARBON STEELS				STRUCTURAL STEELS CARBON STEELS CAST IRONS				CARBON STEELS ALLOY STEELS TOOL STEELS			
HARDNESS					~ HRC20				HRC20 ~ HRC30			
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
2.0	6500	70	40	0.004	5500	55	35	0.003	4800	45	30	0.003
3.0	4600	102	45	0.007	3900	85	35	0.007	3350	52	30	0.005
4.0	4300	140	55	0.011	3600	115	45	0.011	3000	80	40	0.009
5.0	3800	160	60	0.014	3200	130	50	0.014	2600	92	40	0.012
6.0	3350	230	65	0.023	2800	190	55	0.023	2300	140	45	0.020
8.0	2600	240	65	0.031	2200	210	55	0.032	1800	150	45	0.028
10.0	100	250	5	0.833	1800	210	55	0.039	1400	160	45	0.038
12.0	1800	275	70	0.051	1450	230	55	0.053	1200	170	45	0.047
14.0	1600	250	70	0.052	1350	220	60	0.054	1000	160	45	0.053
16.0	1350	240	70	0.059	1150	210	60	0.061	890	150	45	0.056
18.0	1150	240	65	0.070	890	190	50	0.071	790	150	45	0.063
20.0	950	230	60	0.081	790	190	50	0.080	700	140	45	0.067
22.0	840	230	60	0.091	730	195	50	0.089	600	150	40	0.083
25.0	750	240	60	0.107	630	210	50	0.111	490	160	40	0.109

MATERIAL	PREHARDENED STEELS ALLOY STEELS TOOL STEELS				ALLOY STEELS TOOL STEELS AUSTENITIC STAINLESS STEELS			
HARDNESS	HRC30 ~ HRC35				HRC35 ~ HRC40			
STRENGTH	1000 ~ 1100N/mm ²				1100 ~ 1300N/mm ²			
DIAMETER	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz
2.0	3000	35	20	0.004	1900	28	10	0.005
3.0	2200	45	20	0.007	1800	45	15	0.008
4.0	1900	52	25	0.009	1500	55	20	0.012
5.0	1700	62	25	0.012	1300	55	20	0.014
6.0	1450	92	25	0.021	1100	75	20	0.023
8.0	1150	102	30	0.030	890	85	20	0.032
10.0	890	115	30	0.043	680	92	20	0.045
12.0	740	115	30	0.052	580	92	20	0.053
14.0	660	110	30	0.056	500	85	20	0.057
16.0	560	102	30	0.061	440	85	20	0.064
18.0	500	95	30	0.063	400	80	25	0.067
20.0	440	92	30	0.070	360	80	25	0.074
22.0	400	95	30	0.079	315	85	20	0.090
25.0	360	102	30	0.094	250	85	20	0.113



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

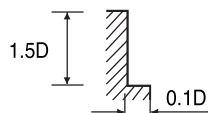
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FEED = mm/min.
Vc = m/min.
fz = mm/t

PREMIUM HSS-PM, 3 FLUTE - SIDE CUTTING
PREMIUM HSS-PM, 3 SCHNEIDEN - SEITENFRÄSEN

GA942, GAA30 SERIES

MATERIAL	STRUCTURAL STEELS CARBON STEELS				STRUCTURAL STEELS CARBON STEELS CAST IRONS				CARBON STEELS ALLOY STEELS TOOL STEELS			
HARDNESS					~ HRC20				HRC20 ~ HRC30			
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
2.0	8200	100	50	0.004	6800	80	45	0.004	5500	65	35	0.004
3.0	5800	145	55	0.008	4800	120	45	0.008	3800	75	35	0.007
4.0	5200	185	65	0.012	4400	155	55	0.012	3500	110	45	0.010
5.0	4700	210	75	0.015	4000	175	65	0.015	2900	125	45	0.014
6.0	4200	300	80	0.024	3600	250	70	0.023	2600	190	50	0.024
8.0	3200	330	80	0.034	2600	270	65	0.035	2000	200	50	0.033
10.0	2500	350	80	0.047	2100	290	65	0.046	1600	210	50	0.044
12.0	2100	350	80	0.056	1800	300	70	0.056	1400	230	55	0.055
14.0	1800	350	80	0.065	1500	285	65	0.063	1150	210	50	0.061
16.0	1600	330	80	0.069	1300	275	65	0.071	1000	200	50	0.067
18.0	1350	310	75	0.077	1150	265	65	0.077	890	195	50	0.073
20.0	1250	300	80	0.080	1050	255	65	0.081	780	190	50	0.081
22.0	1150	310	80	0.090	950	265	65	0.093	740	195	50	0.088
25.0	1000	330	80	0.110	840	275	65	0.109	630	210	50	0.111

MATERIAL	PREHARDENED STEELS ALLOY STEELS TOOL STEELS				ALLOY STEELS TOOL STEELS AUSTENITIC STAINLESS STEELS			
HARDNESS	HRC30 ~ HRC35				HRC35 ~ HRC40			
STRENGTH	1000 ~ 1100N/mm ²				1100 ~ 1300N/mm ²			
DIAMETER	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz
2.0	3800	50	25	0.004	2400	40	15	0.006
3.0	2700	65	25	0.008	2200	65	20	0.010
4.0	2300	75	30	0.011	1900	75	25	0.013
5.0	2000	85	30	0.014	1700	75	25	0.015
6.0	1800	125	35	0.023	1500	100	30	0.022
8.0	1300	140	35	0.036	1100	115	30	0.035
10.0	1000	150	30	0.050	890	125	30	0.047
12.0	900	150	35	0.056	740	125	30	0.056
14.0	780	140	35	0.060	630	120	30	0.063
16.0	660	140	35	0.071	550	115	30	0.070
18.0	580	130	35	0.075	500	110	30	0.073
20.0	520	125	35	0.080	440	110	30	0.083
22.0	470	130	30	0.092	400	110	30	0.092
25.0	420	135	35	0.107	360	120	30	0.111



※ The FEED, in long & long reach types, should be reduced by around 50%

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

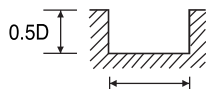


PREMIUM HSS-PM, 3 FLUTE - SLOTTING
PREMIUM HSS-PM, 3 SCHNEIDEN - NUTENFRÄSEN

E9942, E9A30 SERIES

MATERIAL	STRUCTURAL STEELS CARBON STEELS				STRUCTURAL STEELS CARBON STEELS CAST IRONS				CARBON STEELS ALLOY STEELS TOOL STEELS			
HARDNESS					~ HRC20				HRC20 ~ HRC30			
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
2.0	4400	45	30	0.003	3700	35	25	0.003	3300	30	20	0.003
3.0	3150	65	30	0.007	2650	55	25	0.007	3200	30	30	0.003
4.0	2900	85	35	0.010	2400	70	30	0.010	2100	50	25	0.008
5.0	2600	100	40	0.013	2150	80	35	0.012	1800	55	30	0.010
6.0	2300	145	45	0.021	1900	120	35	0.021	1600	85	30	0.018
8.0	1800	150	45	0.028	1500	130	40	0.029	1200	95	30	0.026
10.0	1400	155	45	0.037	1200	130	40	0.036	960	100	30	0.035
12.0	1200	170	45	0.047	1000	145	40	0.048	820	105	30	0.043
14.0	1070	155	45	0.048	930	135	40	0.048	680	100	30	0.049
16.0	930	150	45	0.054	780	130	40	0.056	610	95	30	0.052
18.0	780	150	45	0.064	610	120	35	0.066	530	95	30	0.060
20.0	640	145	40	0.076	530	120	35	0.075	480	85	30	0.059
22.0	570	145	40	0.085	500	120	35	0.080	410	95	30	0.077
25.0	520	150	40	0.096	430	130	35	0.101	340	100	25	0.098

MATERIAL	PREHARDENED STEELS ALLOY STEELS TOOL STEELS				ALLOY STEELS TOOL STEELS AUSTENITIC STAINLESS STEELS			
HARDNESS	HRC30 ~ HRC35				HRC35 ~ HRC40			
STRENGTH	1000 ~ 1100N/mm ²				1100 ~ 1300N/mm ²			
DIAMETER	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz
2.0	2100	20	15	0.003	1300	18	10	0.005
3.0	1500	30	15	0.007	1200	28	10	0.008
4.0	1300	35	15	0.009	1000	35	15	0.012
5.0	1100	40	15	0.012	890	35	15	0.013
6.0	1000	55	20	0.018	750	45	15	0.020
8.0	780	65	20	0.028	610	55	15	0.030
10.0	610	70	20	0.038	460	58	15	0.042
12.0	500	70	20	0.047	395	58	15	0.049
14.0	450	65	20	0.048	345	55	15	0.053
16.0	380	65	20	0.057	300	55	15	0.061
18.0	350	60	20	0.057	270	50	15	0.062
20.0	300	55	20	0.061	245	50	15	0.068
22.0	270	60	20	0.074	215	55	15	0.085
25.0	240	65	20	0.090	170	55	15	0.108



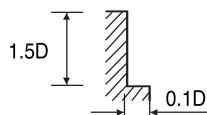
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FEED = mm/min.
Vc = m/min.
fz = mm/t

PREMIUM HSS-PM, 3 FLUTE - SIDE CUTTING
PREMIUM HSS-PM, 3 SCHNEIDEN - SEITENFRÄSEN

E9942, E9A30 SERIES

MATERIAL	STRUCTURAL STEELS CARBON STEELS				STRUCTURAL STEELS CARBON STEELS CAST IRONS				CARBON STEELS ALLOY STEELS TOOL STEELS			
HARDNESS					~ HRC20				HRC20 ~ HRC30			
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
2.0	5600	60	35	0.004	4600	50	30	0.004	3700	40	25	0.004
3.0	3900	90	35	0.008	3300	75	30	0.008	1600	45	15	0.009
4.0	3600	115	45	0.011	3000	95	40	0.011	2400	68	30	0.009
5.0	3200	130	50	0.014	2700	110	40	0.014	2000	80	30	0.013
6.0	2800	190	55	0.023	2400	155	45	0.022	1800	120	35	0.022
8.0	2100	210	55	0.033	1800	170	45	0.031	1350	125	35	0.031
10.0	1700	210	55	0.041	1400	180	45	0.043	1100	130	35	0.039
12.0	1400	220	55	0.052	1200	185	45	0.051	930	145	35	0.052
14.0	1200	215	55	0.060	1000	180	45	0.060	780	130	35	0.056
16.0	1100	210	55	0.064	890	170	45	0.064	680	125	35	0.061
18.0	930	195	55	0.070	790	165	45	0.070	610	120	35	0.066
20.0	860	185	55	0.072	720	155	45	0.072	540	120	35	0.074
22.0	790	195	55	0.082	650	165	45	0.085	500	120	35	0.080
25.0	680	210	55	0.103	580	170	45	0.098	430	130	35	0.101

MATERIAL	PREHARDENED STEELS ALLOY STEELS TOOL STEELS				ALLOY STEELS TOOL STEELS AUSTENITIC STAINLESS STEELS			
HARDNESS	HRC30 ~ HRC35				HRC35 ~ HRC40			
STRENGTH	1000 ~ 1100N/mm ²				1100 ~ 1300N/mm ²			
DIAMETER	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz
2.0	2600	32	15	0.004	1600	25	10	0.005
3.0	1800	40	15	0.007	1500	40	15	0.009
4.0	1600	45	20	0.009	1300	45	15	0.012
5.0	1400	55	20	0.013	1100	45	15	0.014
6.0	1200	80	25	0.022	1000	65	20	0.022
8.0	890	85	20	0.032	710	70	20	0.033
10.0	710	95	20	0.045	610	80	20	0.044
12.0	610	95	25	0.052	500	80	20	0.053
14.0	540	90	25	0.056	430	75	20	0.058
16.0	440	85	20	0.064	370	70	20	0.063
18.0	390	80	20	0.068	340	68	20	0.067
20.0	360	80	25	0.074	300	68	20	0.076
22.0	320	80	20	0.083	270	68	20	0.084
25.0	290	85	25	0.098	240	75	20	0.104



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

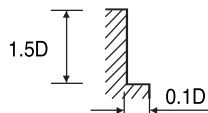


PREMIUM HSS-PM, 4 FLUTE - SIDE CUTTING
PREMIUM HSS-PM, 4 SCHNEIDEN - SEITENFRÄSEN

GA938, GAA31 SERIES

MATERIAL	STRUCTURAL STEELS CARBON STEELS				STRUCTURAL STEELS CARBON STEELS CAST IRONS				CARBON STEELS ALLOY STEELS TOOL STEELS			
HARDNESS					~ HRC20				HRC20 ~ HRC30			
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
2.0	9200	290	60	0.008	8400	240	55	0.007	6100	170	40	0.007
3.0	6600	410	60	0.016	6000	350	55	0.015	4400	250	40	0.014
4.0	5300	480	65	0.023	4700	400	60	0.021	3600	300	45	0.021
5.0	4400	510	70	0.029	4000	420	65	0.026	2900	320	45	0.028
6.0	3900	540	75	0.035	3600	450	70	0.031	2600	330	50	0.032
8.0	3100	570	80	0.046	2600	480	65	0.046	2000	370	50	0.046
10.0	2300	630	70	0.068	2100	530	65	0.063	1600	380	50	0.059
12.0	2000	570	75	0.071	1800	480	70	0.067	1400	370	55	0.066
14.0	1800	550	80	0.076	1600	460	70	0.072	1100	350	50	0.080
16.0	1600	510	80	0.080	1400	430	70	0.077	1000	340	50	0.085
18.0	1500	460	85	0.077	1250	400	70	0.080	890	310	50	0.087
20.0	1250	440	80	0.088	1050	370	65	0.088	780	275	50	0.088
22.0	1050	410	75	0.098	950	320	65	0.084	680	255	45	0.094
25.0	1000	370	80	0.093	840	305	65	0.091	630	230	50	0.091

MATERIAL	PREHARDENED STEELS ALLOY STEELS TOOL STEELS				ALLOY STEELS TOOL STEELS AUSTENITIC STAINLESS STEELS			
HARDNESS	HRC30 ~ HRC35				HRC35 ~ HRC40			
STRENGTH	1000 ~ 1100N/mm ²				1100 ~ 1300N/mm ²			
DIAMETER	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz
2.0	4100	125	25	0.008	3300	85	20	0.006
3.0	2700	180	25	0.017	2400	125	25	0.013
4.0	2300	200	30	0.022	2000	150	25	0.019
5.0	2000	220	30	0.028	1700	160	25	0.024
6.0	1800	230	35	0.032	1450	180	25	0.031
8.0	1400	240	35	0.043	1150	185	30	0.040
10.0	1000	265	30	0.066	890	200	30	0.056
12.0	890	240	35	0.067	720	185	25	0.064
14.0	790	230	35	0.073	630	170	30	0.067
16.0	680	220	35	0.081	550	165	30	0.075
18.0	630	195	35	0.077	500	150	30	0.075
20.0	530	175	35	0.083	440	140	30	0.080
22.0	470	160	30	0.085	400	130	30	0.081
25.0	420	150	35	0.089	360	125	30	0.087



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

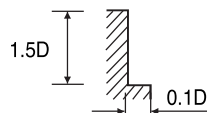
RPM = rev./min.
FEED = mm/min.
Vc = m/min.
fz = mm/t

PREMIUM HSS-PM, 4 FLUTE - SIDE CUTTING
PREMIUM HSS-PM, 4 SCHNEIDEN - SEITENFRÄSEN

E9938, E9A31 SERIES

MATERIAL	STRUCTURAL STEELS CARBON STEELS				STRUCTURAL STEELS CARBON STEELS CAST IRONS				CARBON STEELS ALLOY STEELS TOOL STEELS			
HARDNESS					~ HRC20				HRC20 ~ HRC30			
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
2.0	6300	180	40	0.007	5700	150	35	0.007	4000	110	25	0.007
3.0	4500	260	40	0.014	4000	210	40	0.013	3000	155	30	0.013
4.0	3600	300	45	0.021	3200	250	40	0.020	2400	190	30	0.020
5.0	3000	310	45	0.026	2700	265	40	0.025	2000	195	30	0.024
6.0	2600	330	50	0.032	2400	275	45	0.029	1800	205	35	0.028
8.0	2100	360	55	0.043	1800	300	45	0.042	1400	230	35	0.041
10.0	1600	390	50	0.061	1400	330	45	0.059	1100	235	35	0.053
12.0	1300	360	50	0.069	1200	300	45	0.063	900	230	35	0.064
14.0	1200	340	55	0.071	1100	285	50	0.065	780	215	35	0.069
16.0	1100	310	55	0.070	900	265	45	0.074	680	205	35	0.075
18.0	1000	280	55	0.070	850	250	50	0.074	600	190	35	0.079
20.0	850	270	55	0.079	710	230	45	0.081	540	175	35	0.081
22.0	710	260	50	0.092	640	200	45	0.078	460	160	30	0.087
25.0	680	230	55	0.085	570	190	45	0.083	430	140	35	0.081

MATERIAL	PREHARDENED STEELS ALLOY STEELS TOOL STEELS				ALLOY STEELS TOOL STEELS AUSTENITIC STAINLESS STEELS			
HARDNESS	HRC30 ~ HRC35				HRC35 ~ HRC40			
STRENGTH	1000 ~ 1100N/mm ²				1100 ~ 1300N/mm ²			
DIAMETER	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz
2.0	2800	75	20	0.007	2300	55	15	0.006
3.0	2000	110	20	0.014	1650	80	15	0.012
4.0	1600	125	20	0.020	1350	95	15	0.018
5.0	1400	135	20	0.024	1125	100	20	0.022
6.0	1200	140	25	0.029	975	110	20	0.028
8.0	900	150	25	0.042	750	115	20	0.038
10.0	710	165	20	0.058	600	125	20	0.052
12.0	600	150	25	0.063	495	115	20	0.058
14.0	530	140	25	0.066	430	105	20	0.061
16.0	450	135	25	0.075	375	100	20	0.067
18.0	430	120	25	0.070	340	95	20	0.070
20.0	360	110	25	0.076	300	85	20	0.071
22.0	320	100	20	0.078	270	80	20	0.074
25.0	280	95	20	0.085	240	80	20	0.083



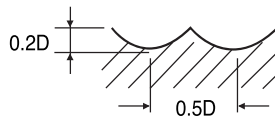
※ The FEED, in long & long reach types, should be reduced by around 50%

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


**PREMIUM HSS-PM, 2 FLUTE BALL NOSE - PROFILING
PREMIUM HSS-PM, 2 SCHNEIDEN STIRNRADIUS - PROFILFRÄSEN**
GA940, GAA32 SERIES

MATERIAL	STRUCTURAL STEELS CARBON STEELS				STRUCTURAL STEELS CARBON STEELS CAST IRONS				CARBON STEELS ALLOY STEELS TOOL STEELS			
	~ 500N/mm ²				500 ~ 800N/mm ²				800 ~ 1000N/mm ²			
HARDNESS					~ HRC20				HRC20 ~ HRC30			
STRENGTH												
DIAMETER	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz
R1.5 × 3.0	7300	340	70	0.023	5800	230	55	0.020	3900	125	35	0.016
R2.0 × 4.0	6000	430	75	0.036	4620	290	60	0.031	3000	160	40	0.027
R3.0 × 6.0	4400	480	85	0.055	3500	320	65	0.046	2300	180	45	0.039
R4.0 × 8.0	3350	530	85	0.079	2600	350	65	0.067	1800	200	45	0.056
R5.0 × 10.0	2750	600	85	0.109	2100	400	65	0.095	1400	230	45	0.082
R6.0 × 12.0	2300	530	85	0.115	1800	350	70	0.097	1200	200	45	0.083
R8.0 × 16.0	1700	480	85	0.141	1300	320	65	0.123	890	180	45	0.101
R10.0 × 20.0	1350	420	85	0.156	1000	280	65	0.140	680	150	45	0.110
R12.5 × 25.0	950	310	75	0.163	740	210	60	0.142	470	115	35	0.122

MATERIAL	PREHARDENED STEELS ALLOY STEELS TOOL STEELS				STAINLESS STEELS			
	HRC30 ~ HRC40							
STRENGTH	1000 ~ 1300N/mm ²							
DIAMETER	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz
R1.5 × 3.0	2000	55	20	0.014	2200	60	20	0.014
R2.0 × 4.0	1600	75	20	0.023	1760	80	20	0.023
R3.0 × 6.0	1200	85	25	0.035	1320	95	25	0.036
R4.0 × 8.0	890	85	20	0.048	980	95	25	0.048
R5.0 × 10.0	680	102	20	0.075	750	110	25	0.073
R6.0 × 12.0	580	85	20	0.073	640	95	25	0.074
R8.0 × 16.0	440	80	20	0.091	490	90	25	0.092
R10.0 × 20.0	360	70	25	0.097	400	80	25	0.100
R12.5 × 25.0	250	52	20	0.104	275	55	20	0.100



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

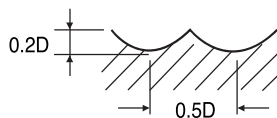
RPM = rev./min.
FEED = mm/min.
Vc = m/min.
fz = mm/t

PREMIUM HSS-PM, 2 FLUTE BALL NOSE - PROFILING
PREMIUM HSS-PM, 2 SCHNEIDEN STIRNRADIUS - PROFILFRÄSEN

E9940, E9A32 SERIES

MATERIAL	STRUCTURAL STEELS CARBON STEELS				STRUCTURAL STEELS CARBON STEELS CAST IRONS				CARBON STEELS ALLOY STEELS TOOL STEELS			
HARDNESS					~ HRc20				HRc20 ~ HRc30			
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
R1.5 × 3.0	5000	210	45	0.021	3900	140	35	0.018	2600	80	25	0.015
R2.0 × 4.0	4000	260	50	0.033	3100	180	40	0.029	2100	100	25	0.024
R3.0 × 6.0	3000	300	55	0.050	2300	200	45	0.043	1600	110	30	0.034
R4.0 × 8.0	2300	330	60	0.072	1800	220	45	0.061	1200	125	30	0.052
R5.0 × 10.0	1800	370	55	0.103	1400	250	45	0.089	1000	140	30	0.070
R6.0 × 12.0	1500	330	55	0.110	1200	220	45	0.092	820	125	30	0.076
R8.0 × 16.0	1100	300	55	0.136	900	200	45	0.111	600	110	30	0.092
R10.0 × 20.0	930	260	60	0.140	710	170	45	0.120	480	95	30	0.099
R12.5 × 25.0	640	190	50	0.148	500	130	40	0.130	340	70	25	0.103

MATERIAL	PREHARDENED STEELS ALLOY STEELS TOOL STEELS				STAINLESS STEELS			
HARDNESS	HRc30 ~ HRc40							
STRENGTH	1000 ~ 1300N/mm ²							
DIAMETER	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz
R1.5 × 3.0	1300	35	10	0.013	1430	40	15	0.014
R2.0 × 4.0	1000	45	15	0.023	1100	55	15	0.025
R3.0 × 6.0	820	55	15	0.034	900	65	15	0.036
R4.0 × 8.0	600	55	15	0.046	660	65	15	0.049
R5.0 × 10.0	480	65	15	0.068	530	80	15	0.075
R6.0 × 12.0	400	55	15	0.069	440	65	15	0.074
R8.0 × 16.0	300	50	15	0.083	330	60	15	0.091
R10.0 × 20.0	240	45	15	0.094	265	55	15	0.104
R12.5 × 25.0	175	30	15	0.086	195	35	15	0.090



※ The FEED, in long & long reach types, should be reduced by around 50%

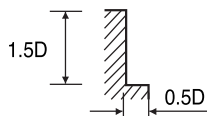
RPM = rev./min.
FEED = mm/min.
Vc = m/min.
fz = mm/t

**PREMIUM HSS-PM, MULTI FLUTE ROUGHING - SIDE CUTTING
PREMIUM HSS-PM, MULTI SCHNEIDEN SCHRUPFRÄSER - SEITENFRÄSEN**

GA941, GAA35, GAA33, GAA34 SERIES

MATERIAL	STRUCTURAL STEELS CARBON STEELS				STRUCTURAL STEELS CARBON STEELS CAST IRONS				CARBON STEELS ALLOY STEELS TOOL STEELS			
HARDNESS					~ HRC20				HRC20 ~ HRC30			
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	2800	230	55	0.027	2200	180	40	0.027	1600	115	30	0.024
8.0	2400	290	60	0.040	1900	230	50	0.040	1400	160	35	0.038
10.0	1900	415	60	0.055	1500	315	45	0.053	1050	195	35	0.046
12.0	1600	415	60	0.065	1200	330	45	0.069	900	230	35	0.064
14.0	1400	415	60	0.074	1050	330	45	0.079	760	230	35	0.076
16.0	1200	415	60	0.086	950	330	50	0.087	660	230	35	0.087
18.0	1050	415	60	0.099	890	330	50	0.093	610	230	35	0.094
20.0	960	425	60	0.111	760	330	50	0.109	530	230	35	0.108
22.0	890	425	60	0.096	650	330	45	0.102	470	230	30	0.098
25.0	790	415	60	0.105	600	315	45	0.105	420	220	35	0.105

MATERIAL	PREHARDENED STEELS ALLOY STEELS TOOL STEELS				STAINLESS STEELS			
HARDNESS	HRC30 ~ HRC40							
STRENGTH	1000 ~ 1300N/mm ²							
DIAMETER	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz
6.0	1300	105	25	0.027	1450	110	25	0.025
8.0	1050	125	25	0.040	1200	140	30	0.039
10.0	890	160	30	0.045	950	170	30	0.045
12.0	740	180	30	0.061	800	205	30	0.064
14.0	630	180	30	0.071	690	205	30	0.074
16.0	550	180	30	0.082	600	205	30	0.085
18.0	490	180	30	0.092	550	205	30	0.093
20.0	440	180	30	0.102	480	205	30	0.107
22.0	400	180	30	0.090	430	205	30	0.095
25.0	360	180	30	0.100	390	200	30	0.103



※ The FEED, in long & long reach types, should be reduced by around 50%

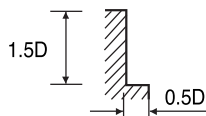
RPM = rev./min.
FEED = mm/min.
Vc = m/min.
fz = mm/t

PREMIUM HSS-PM, MULTI FLUTE ROUGHING - SIDE CUTTING
PREMIUM HSS-PM, MULTI SCHNEIDEN SCHRUPFRÄSER - SEITENFRÄSEN

E9941, E9A35, E9A33, E9A34 SERIES

MATERIAL	STRUCTURAL STEELS CARBON STEELS				STRUCTURAL STEELS CARBON STEELS CAST IRONS				CARBON STEELS ALLOY STEELS TOOL STEELS			
HARDNESS					~ HRC20				HRC20 ~ HRC30			
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	1900	140	35	0.018	1500	110	30	0.018	1050	70	20	0.017
8.0	1600	180	40	0.028	1300	140	35	0.027	900	100	25	0.028
10.0	1300	260	40	0.050	1000	195	30	0.049	710	125	20	0.044
12.0	1100	260	40	0.059	820	205	30	0.063	600	140	25	0.058
14.0	930	260	40	0.056	710	205	30	0.058	510	140	20	0.055
16.0	820	260	40	0.063	640	205	30	0.064	450	140	25	0.062
18.0	710	260	40	0.061	610	205	35	0.056	410	140	25	0.057
20.0	660	265	40	0.067	510	205	30	0.067	360	140	25	0.065
22.0	610	265	40	0.072	440	205	30	0.078	320	140	20	0.073
25.0	540	260	40	0.080	400	195	30	0.081	280	135	20	0.080

MATERIAL	PREHARDENED STEELS ALLOY STEELS TOOL STEELS				STAINLESS STEELS			
HARDNESS	HRC30 ~ HRC40							
STRENGTH	1000 ~ 1300N/mm ²							
DIAMETER	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz
6.0	900	65	15	0.018	1020	80	20	0.020
8.0	740	80	20	0.027	840	100	20	0.030
10.0	600	100	20	0.042	660	120	20	0.045
12.0	500	110	20	0.055	560	145	20	0.065
14.0	430	110	20	0.051	480	145	20	0.060
16.0	370	110	20	0.059	420	145	20	0.069
18.0	330	110	20	0.056	380	145	20	0.064
20.0	300	110	20	0.061	330	145	20	0.073
22.0	270	110	20	0.068	300	145	20	0.081
25.0	240	110	20	0.076	270	140	20	0.086



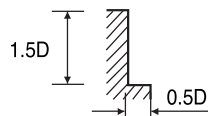
※ The FEED, in long & long reach types, should be reduced by around 50%

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

PREMIUM HSS-PM, MULTI FLUTE ROUGHING - SIDE CUTTING
PREMIUM HSS-PM, MULTI SCHNEIDEN SCHRUPFRÄSER - SEITENFRÄSEN
GAA26 SERIES

MATERIAL	STRUCTURAL STEELS CARBON STEELS				STRUCTURAL STEELS CARBON STEELS CAST IRONS				CARBON STEELS ALLOY STEELS TOOL STEELS			
HARDNESS					~ HRc20				HRc20 ~ HRc30			
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	2800	230	55	0.021	2200	180	40	0.020	1600	115	30	0.018
8.0	2400	290	60	0.030	1900	230	50	0.030	1400	160	35	0.029
10.0	1900	415	60	0.055	1500	315	45	0.053	1050	195	35	0.046
12.0	1600	415	60	0.065	1200	330	45	0.069	900	230	35	0.064
14.0	1400	415	60	0.059	1050	330	45	0.063	760	230	35	0.061
16.0	1200	415	60	0.069	950	330	50	0.069	660	230	35	0.070
18.0	1050	415	60	0.066	890	330	50	0.062	610	230	35	0.063
20.0	960	425	60	0.074	760	330	50	0.072	530	230	35	0.072
22.0	890	425	60	0.080	650	330	45	0.085	470	230	30	0.082
25.0	790	415	60	0.088	600	315	45	0.088	420	220	35	0.087

MATERIAL	PREHARDENED STEELS ALLOY STEELS TOOL STEELS				STAINLESS STEELS			
HARDNESS	HRc30 ~ HRc40							
STRENGTH	1000 ~ 1300N/mm ²							
DIAMETER	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz
6.0	1300	105	25	0.020	1450	110	25	0.019
8.0	1050	125	25	0.030	1200	140	30	0.029
10.0	890	160	30	0.045	950	170	30	0.045
12.0	740	180	30	0.061	800	205	30	0.064
14.0	630	180	30	0.057	690	205	30	0.059
16.0	550	180	30	0.065	600	205	30	0.068
18.0	490	180	30	0.061	550	205	30	0.062
20.0	440	180	30	0.068	480	205	30	0.071
22.0	400	180	30	0.075	430	205	30	0.079
25.0	360	180	30	0.083	390	200	30	0.085



※ The FEED, in long & long reach types, should be reduced by around 50%

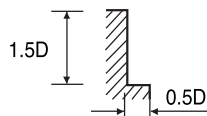
RPM = rev./min.
FEED = mm/min.
Vc = m/min.
fz = mm/t

PREMIUM HSS-PM, MULTI FLUTE ROUGHING - SIDE CUTTING
PREMIUM HSS-PM, MULTI SCHNEIDEN SCHRUPFRÄSER - SEITENFRÄSEN

E9A26 SERIES

MATERIAL	STRUCTURAL STEELS CARBON STEELS				STRUCTURAL STEELS CARBON STEELS CAST IRONS				CARBON STEELS ALLOY STEELS TOOL STEELS			
HARDNESS					~ HRC20				HRC20 ~ HRC30			
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	1900	140	35	0.018	1500	110	30	0.018	1050	70	20	0.017
8.0	1600	180	40	0.028	1300	140	35	0.027	900	100	25	0.028
10.0	1300	260	40	0.050	1000	195	30	0.049	710	125	20	0.044
12.0	1100	260	40	0.059	820	205	30	0.063	600	140	25	0.058
14.0	930	260	40	0.056	710	205	30	0.058	510	140	20	0.055
16.0	820	260	40	0.063	640	205	30	0.064	450	140	25	0.062
18.0	710	260	40	0.061	610	205	35	0.056	410	140	25	0.057
20.0	660	265	40	0.067	510	205	30	0.067	360	140	25	0.065
22.0	610	265	40	0.072	440	205	30	0.078	320	140	20	0.073
25.0	540	260	40	0.080	400	195	30	0.081	280	135	20	0.080

MATERIAL	PREHARDENED STEELS ALLOY STEELS TOOL STEELS				STAINLESS STEELS			
HARDNESS	HRC30 ~ HRC40							
STRENGTH	1000 ~ 1300N/mm ²							
DIAMETER	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz
6.0	900	65	15	0.018	1020	80	20	0.020
8.0	740	80	20	0.027	840	100	20	0.030
10.0	600	100	20	0.042	660	120	20	0.045
12.0	500	110	20	0.055	560	145	20	0.065
14.0	430	110	20	0.051	480	145	20	0.060
16.0	370	110	20	0.059	420	145	20	0.069
18.0	330	110	20	0.056	380	145	20	0.064
20.0	300	110	20	0.061	330	145	20	0.073
22.0	270	110	20	0.068	300	145	20	0.081
25.0	240	110	20	0.076	270	140	20	0.086



※ The FEED, in long & long reach types, should be reduced by around 50%

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



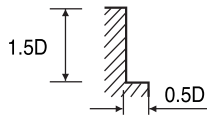
RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDKONDITIONEN

PREMIUM HSS-PM, MULTI FLUTE ROUGHING WITH NECK - SIDE CUTTING
PREMIUM HSS-PM, MULTI SCHNEIDEN SCHRUPFRÄSER mit ABGESETZTEM SCHAFTTETL - SEITENFRÄSEN

E9E43 SERIES

MATERIAL	STRUCTURAL STEELS CARBON STEELS				STRUCTURAL STEELS CARBON STEELS CAST IRONS				CARBON STEELS ALLOY STEELS TOOL STEELS			
HARDNESS					~ HRc20				HRc20 ~ HRc30			
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
10.0	1300	220	41	0.042	1000	165	32	0.041	710	105	23	0.037
12.0	1100	220	41	0.050	820	175	32	0.053	600	120	23	0.050
16.0	820	220	41	0.067	640	175	32	0.068	450	120	23	0.067
20.0	660	225	41	0.085	510	175	32	0.086	360	120	23	0.083
25.0	540	220	41	0.081	400	165	32	0.083	280	115	23	0.082

MATERIAL	PREHARDENED STEELS ALLOY STEELS TOOL STEELS				STAINLESS STEELS			
HARDNESS	HRc30 ~ HRc40							
STRENGTH	1000 ~ 1300N/mm ²							
DIAMETER	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz
10.0	600	85	19	0.035	660	100	21	0.038
12.0	500	95	19	0.048	560	125	21	0.058
16.0	370	95	19	0.064	420	125	21	0.074
20.0	300	95	19	0.079	330	125	21	0.095
25.0	240	95	19	0.079	270	120	21	0.089



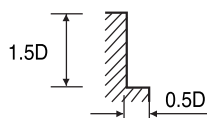
RPM = rev./min.
 FEED = mm/min.
 Vc = m/min.
 fz = mm/t

PREMIUM HSS-PM, MULTI FLUTE ROUGHING WITH NECK - SIDE CUTTING
PREMIUM HSS-PM, MULTI SCHNEIDEN SCHRUPFRÄSER mit ABGESETZTEM SCHAFTTETL - SEITENFRÄSEN

G9E43 SERIES

MATERIAL	STRUCTURAL STEELS CARBON STEELS				STRUCTURAL STEELS CARBON STEELS CAST IRONS				CARBON STEELS ALLOY STEELS TOOL STEELS			
HARDNESS					~ HRc20				HRc20 ~ HRc30			
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
10.0	1900	355	60	0.047	1500	270	47	0.045	1050	165	33	0.039
12.0	1600	355	60	0.055	1200	280	47	0.058	900	195	33	0.054
16.0	1200	355	60	0.074	950	280	47	0.074	660	195	33	0.074
20.0	960	360	60	0.094	760	280	47	0.092	530	195	33	0.092
25.0	790	355	60	0.090	600	270	47	0.090	420	185	33	0.088

MATERIAL	PREHARDENED STEELS ALLOY STEELS TOOL STEELS				STAINLESS STEELS			
HARDNESS	HRc30 ~ HRc40							
STRENGTH	1000 ~ 1300N/mm ²							
DIAMETER	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz
10.0	890	135	28	0.038	950	145	30	0.038
12.0	740	155	28	0.052	800	175	30	0.055
16.0	550	155	28	0.070	600	175	30	0.073
20.0	440	155	28	0.088	480	175	30	0.091
25.0	360	155	28	0.086	390	170	30	0.087



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



Global Cutting Tool Leader **YG-1**

