



Leading Through Innovation

HSS-PM

TANK-POWER END MILLS

TANK - POWER HSS-PM - Fräser

- High Toughness for Stainless Steels, Carbon steels and Alloy Steels
- Hohe Zähigkeit, für rostfreie Stähle, Kohlenstoffstähle und legierte Stähle

SELECTION GUIDE

HSS

HSS



SERIES	E9940 GA940	E9A32 GAA32	E9936 GA936	E9A29 GAA29
FLUTE	2	2	2	2
HELIX ANGLE	30°	30°	30°	30°
CUTTING EDGE SHAPE	BALL NOSE	BALL NOSE	SQUARE	SQUARE
SIZE MIN	R0.5	R1.0	D1.0	D1.0
SIZE MAX	R12.5	R12.5	D25.0	D25.0
PAGE	C674	C675	C676	C677

E9942 GA942	E9A30 GAA30	E9938 GA938	E9A31 GAA31	E9941 GA941	E9A35 GAA35	E9A26 GAA26	E9A33 GAA33	E9A34 GAA34	E9E43 GAE43
3	3	4	4	Multi Flute	Multi Flute	Multi Flute	Multi Flute	Multi Flute	Multi Flute
30°	30°	30°	30°	30°	30°	45°	30°	30°	30°
SQUARE	SQUARE	SQUARE	SQUARE	ROUGHING	ROUGHING	ROUGHING	ROUGHING	ROUGHING	ROUGHING
D1.0	D1.0	D1.0	D2.0	D6.0	D6.0	D4.0	D6.0	D6.0	D10.0
D25.0	D25.0	D25.0	D25.0	D25.0	D25.0	D25.0	D25.0	D25.0	D25.0
C678	C679	C680	C681	C682	C683	C684	C685	C686	C687
STUB LENGTH	SHORT LENGTH	SHORT LENGTH	LONG LENGTH	SHORT LENGTH	LONG LENGTH	SHORT LENGTH	SHORT LENGTH	LONG LENGTH	WITH NECK
TiAIN	TiAIN	TiAIN	TiAIN	X- Coating	X- Coating	X- Coating	X- Coating	X- Coating	X- Coating

HSS-PM
TANK-POWER
END MILLS

High Toughness, for Stainless Steels, Carbon steels, Alloy Steels For General Application, Rough & Finish



◎ : Excellent ○ : Good

Recommended cutting conditions : p. C688



ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment	HB	HRc	E9940 GA940	E9A32 GAA32	E9936 GA936	E9A29 GAA29
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		Ferritic	130		◎	◎	◎	◎
20	Malleable cast iron	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	Non Metallic Materials	CuSn, lead-free copper and electrolytic copper	100		○	○	○	○
	29		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	550	55				

◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	1
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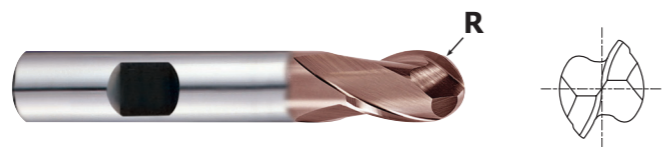


UNCOATED **E9940** SERIES
 TiAIN COATED **GA940** SERIES

HSS-PM, 2 FLUTE SHORT LENGTH BALL NOSE

● HSS-PM, 2 SCHNEIDEN KURZ STIRNRADIUS
 ○ FRAISES HSS-PM, 2 DENTS À BOUT HÉMISPHERIQUE, SÉRIE COURTE
 ○ 2 TAGLIENTI, SERIE CORTA, HSS-PM, SEMISFERICA

- ▶ 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.



HSS PM DIN 327 2 30° ±0.02
 UNCOATED TiAIN
 p.C688~C689

Recommended ToolHolder	Flat Shank	Plain Shank
END MILL HOLDER	POWER MILLING CHUCK	
	ER COLLET CHUCK	SK SLIM CHUCK

Unit : mm

EDP No.	Radius of Ball Nose		Mill Diameter	Shank Diameter	Length of Cut	Overall Length	
	UNCOATED	TiAIN					
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

◎ : Excellent ○ : Good

ISO Material Description	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	38	10	29	32	38	15	35	15	23	10	10	26	3	25	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend						○	○	○													



UNCOATED **E9A32** SERIES
 TiAIN COATED **GAA32** SERIES

HSS-PM, 2 FLUTE LONG LENGTH BALL NOSE

● HSS-PM, 2 SCHNEIDEN LANG STIRNRADIUS
 ○ FRAISES HSS-PM, 2 DENTS À BOUT HÉMISPHERIQUE, SÉRIE LONGUE
 ○ 2 TAGLIENTI, SERIE LUNGA, HSS-PM, SEMISFERICA

- ▶ 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.



HSS PM DIN 1889 2 30° ±0.02
 UNCOATED TiAIN
 p.C688~C689

Recommended ToolHolder	Flat Shank	Plain Shank
END MILL HOLDER	POWER MILLING CHUCK	
	ER COLLET CHUCK	SK SLIM CHUCK

Unit : mm

EDP No.	Radius of Ball Nose		Mill Diameter	Shank Diameter	Length of Cut	Overall Length	
	UNCOATED	TiAIN					
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

ISO Material Description	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	38	10	29	32	38	15	35	15	23	10	10	26	3	25	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend						○	○	○													

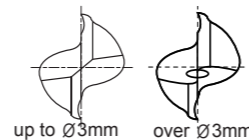


UNCOATED **E9936** SERIES
TiAIN COATED **GA936** SERIES

HSS-PM, 2 FLUTE SHORT LENGTH

- HSS-PM, 2 SCHNEIDEN KURZ
- FRAISES HSS-PM, 2 DENTS, SÉRIE COURTE
- 2 TAGLIENTI, SERIE CORTA, HSS-PM

- ▶ 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.



p.C690~C691

Recommended ToolHolder	Flat Shank	Plain Shank
	END MILL HOLDER	POWER MILLING CHUCK
		ER COLLET CHUCK
		SK SLIM CHUCK

Unit : mm

EDP No.	Mill Diameter		Shank Diameter		Length of Cut	Overall Length
	UNCOATED	TiAIN	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

	Tolerance range in μ m				
	Nominal-Diameter in mm				
	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 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

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	35	38	40	42	45	48	50	52	54	56	58	60	62	64	66	68
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

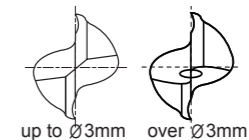


UNCOATED **E9A29** SERIES
TiAIN COATED **GAA29** SERIES

HSS-PM, 2 FLUTE LONG LENGTH

- HSS-PM, 2 SCHNEIDEN LANG
- FRAISES HSS-PM, 2 DENTS, SÉRIE LONGUE
- 2 TAGLIENTI, SERIE LUNGA, HSS-PM

- ▶ Designed to machine carbon steels, alloyed steels, stainless steels.
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- ▶ Geeignet für Hochgeschwindigkeitsfräsen von schwer zu zerspanenden Materialien.
- ▶ Neuentwickelte Beschichtung für Hochgeschwindigkeitsfräsen.



p.C690~C691

Recommended ToolHolder	Flat Shank	Plain Shank
	END MILL HOLDER	POWER MILLING CHUCK
		ER COLLET CHUCK
		SK SLIM CHUCK

Unit : mm

EDP No.	Mill Diameter		Shank Diameter		Length of Cut	Overall Length
	UNCOATED	TiAIN	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

	Tolerance range in μ m				
	Nominal-Diameter in mm				
	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 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

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	35	38	40	42	45	48	50	52	54	56	58	60	62	64	66	68
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎



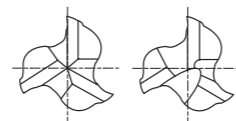
UNCOATED **E9942** SERIES
TiAIN COATED **GA942** SERIES

HSS-PM, 3 FLUTE STUB LENGTH

- HSS-PM, 3 SCHNEIDEN EXTRA KURZ
- FRAISES HSS-PM, 3 DENTS, SÉRIE EXTRA-COURTE
- 3 TAGLIENTI, SERIE EXTRA CORTA, HSS-PM

- ▶ 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



Recommended ToolHolder	Flat Shank	Plain Shank
	END MILL HOLDER	POWER MILLING CHUCK
		ER COLLET CHUCK
		SK SLIM CHUCK

Unit : mm

EDP No.	Mill Diameter		Shank Diameter	Length of Cut	Overall Length
	UNCOATED	TiAIN			
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

	Tolerance range in µm				
	Nominal-Diameter in mm				
	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 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

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel		Stainless steel		Grey cast iron	Nodular cast iron		Malleable cast iron		
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	35	38	40	42	45	48	50	52	54	56	58	60	62	64	66	68
HB	125	190	250	270	300	325	350	380	410	440	470	500	530	560	590	620	650	680	710	740
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎



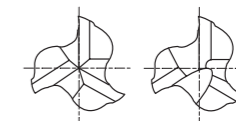
UNCOATED **E9A30** SERIES
TiAIN COATED **GAA30** SERIES

HSS-PM, 3 FLUTE SHORT LENGTH

- HSS-PM, 3 SCHNEIDEN KURZ
- FRAISES HSS-PM, 3 DENTS, SÉRIE COURTE
- 3 TAGLIENTI, SERIE CORTA, HSS-PM

- ▶ 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



Recommended ToolHolder	Flat Shank	Plain Shank
	END MILL HOLDER	POWER MILLING CHUCK
		ER COLLET CHUCK
		SK SLIM CHUCK

Unit : mm

EDP No.	Mill Diameter		Shank Diameter	Length of Cut	Overall Length
	UNCOATED	TiAIN			
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

	Tolerance range in µm				
	Nominal-Diameter in mm				
	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 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

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel		Stainless steel		Grey cast iron	Nodular cast iron		Malleable cast iron		
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	35	38	40	42	45	48	50	52	54	56	58	60	62	64	66	68
HB	125	190	250	270	300	325	350	380	410	440	470	500	530	560	590	620	650	680	710	740
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎



UNCOATED **E9938** SERIES
TiAIN COATED **GA938** SERIES

HSS-PM, 4 FLUTE SHORT LENGTH

- HSS-PM, 4 SCHNEIDEN KURZ
- FRAISES HSS-PM, 4 DENTS, SÉRIE COURTE
- 4 TAGLIENTI, SERIE CORTA, HSS-PM

- ▶ 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.



HSS PM DIN 844 4 30°

DIN 1835B UNCOATED TiAIN p.C696~C697

Recommended ToolHolder	Flat Shank	Plain Shank
	END MILL HOLDER	POWER MILLING CHUCK
		ER COLLET CHUCK
		SK SLIM CHUCK

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
E9938010	1.0	6	3	49
E9938020	2.0	6	7	51
E9938030	3.0	6	8	52
E9938040	4.0	6	11	55
E9938050	5.0	6	13	57
E9938060	6.0	6	13	57
E9938070	7.0	10	16	66
E9938080	8.0	10	19	69
E9938090	9.0	10	19	69
E9938100	10.0	10	22	72
E9938120	12.0	12	26	83
E9938140	14.0	12	26	83
E9938160	16.0	16	32	92
E9938180	18.0	16	32	92
E9938200	20.0	20	38	104
E9938220	22.0	20	38	104
E9938250	25.0	25	45	121

▶ Mill Diameter 1mm: Center match end teeth

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

◎ : Excellent ○ : Good

ISO Material Description	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel		Stainless steel		Grey cast iron	Nodular cast iron		Malleable cast iron		
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials			Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34	55	60	42	42	55	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend						○	○	○													



UNCOATED **E9A31** SERIES
TiAIN COATED **GAA31** SERIES

HSS-PM, 4 FLUTE LONG LENGTH

- HSS-PM, 4 SCHNEIDEN LANG
- FRAISES HSS-PM, 4 DENTS, SÉRIE LONGUE
- 4 TAGLIENTI, SERIE LUNGA, HSS-PM

- ▶ 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.



HSS PM DIN 844 4 30°

DIN 1835B UNCOATED TiAIN p.C696~C697

Recommended ToolHolder	Flat Shank	Plain Shank
	END MILL HOLDER	POWER MILLING CHUCK
		ER COLLET CHUCK
		SK SLIM CHUCK

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
E9A31020	2.0	6	10	54
E9A31030	3.0	6	12	56
E9A31040	4.0	6	19	63
E9A31050	5.0	6	24	68
E9A31060	6.0	6	24	68
E9A31070	7.0	10	30	80
E9A31080	8.0	10	38	88
E9A31090	9.0	10	38	88
E9A31100	10.0	10	45	95
E9A31120	12.0	12	53	110
E9A31140	14.0	12	53	110
E9A31160	16.0	16	63	123
E9A31180	18.0	16	63	123
E9A31200	20.0	20	75	141
E9A31220	22.0	20	75	141
E9A31250	25.0	25	90	166

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

◎ : Excellent ○ : Good

ISO Material Description	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel		Stainless steel		Grey cast iron	Nodular cast iron		Malleable cast iron		
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO Material Description	N					S					H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials			Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34	55	60	42	42	55	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend						○	○	○													



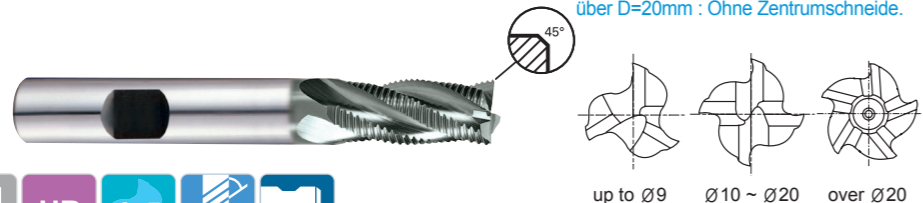
UNCOATED **E9941** SERIES
X-COATING **GA941** SERIES

HSS-PM, MULTI FLUTE SHORT LENGTH ROUGHING - FINE

- HSS-PM, MULTI SCHNEIDEN KURZ SCHRUPPFRÄSER - FEIN
- FRAISES HSS-PM, MULTI-DENTS RAVAGEUSE - PAS FINS, SÉRIE COURTE
- MULTI TAGL., PER SGROSSATURA, SERIE CORTA, BOMBATO FINE - HSS PM

- ▶ 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 bearbeitete Oberflächen.
- ▶ Neuentwickelte Beschichtung für Hochgeschwindigkeitsfräsen.
- ▶ Bis D=20mm : Mit Zentrumschneide, über D=20mm : Ohne Zentrumschneide.



HSS PM, DIN 844, HR, 3-5, 30°, DIN 1835B, UNCOATED, X Coating, p.C698~C699

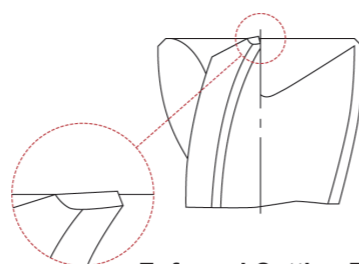
Recommended ToolHolder	Flat Shank	Plain Shank
	END MILL HOLDER	POWER MILLING CHUCK
		ER COLLET CHUCK SK SLIM CHUCK

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute	Chamfer
E9941060	6.0	6	13	57	3	0.18
E9941070	7.0	10	16	66	3	0.18
E9941080	8.0	10	19	69	3	0.18
E9941090	9.0	10	19	69	3	0.18
E9941100	10.0	10	22	72	4	0.18
E9941120	12.0	12	26	83	4	0.18
E9941140	14.0	12	26	83	4	0.25
E9941160	16.0	16	32	92	4	0.25
E9941180	18.0	16	32	92	4	0.25
E9941200	20.0	20	38	104	4	0.25
E9941220	22.0	20	38	104	5	0.36
E9941250	25.0	25	45	121	5	0.36

Tolerances according to DIN 7160 & 7161

	Tolerance range in μm					
	Nominal-Diameter in mm					
	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30	over 30 to 50
js12	± 50	± 60	± 75	± 90	± 105	± 125
h6	0 -6	0 -8	0 -9	0 -11	0 -13	0 -16



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel		Stainless steel		Grey cast iron	Nodular cast iron		Malleable cast iron		
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	35	38	42	45	48	52	55	58	62	65	68	72	75	78	82	85
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎



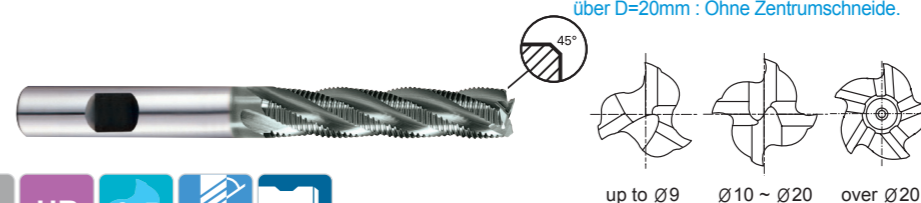
UNCOATED **E9A35** SERIES
X-COATING **GAA35** SERIES

HSS-PM, MULTI FLUTE LONG LENGTH ROUGHING - FINE

- HSS-PM, MULTI SCHNEIDEN LANG SCHRUPPFRÄSER - FEIN
- FRAISES HSS-PM, MULTI-DENTS RAVAGEUSE - PAS FINS, SÉRIE LONGUE
- MULTI TAGL., PER SGROSSATURA, SERIE LUNGA, BOMBATO FINE - HSS PM

- ▶ 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 bearbeitete Oberflächen.
- ▶ Neuentwickelte Beschichtung für Hochgeschwindigkeitsfräsen.
- ▶ Bis D=20mm : Mit Zentrumschneide, über D=20mm : Ohne Zentrumschneide.



HSS PM, DIN 844, HR, 3-5, 30°, DIN 1835B, UNCOATED, X Coating, p.C698~C699

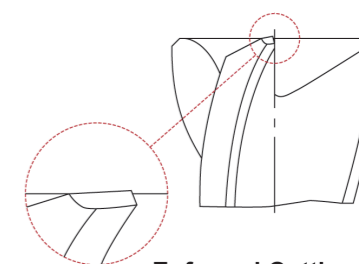
Recommended ToolHolder	Flat Shank	Plain Shank
	END MILL HOLDER	POWER MILLING CHUCK
		ER COLLET CHUCK SK SLIM CHUCK

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute	Chamfer
E9A35060	6.0	6	24	68	3	0.18
E9A35070	7.0	10	30	80	3	0.18
E9A35080	8.0	10	38	88	3	0.18
E9A35090	9.0	10	38	88	3	0.18
E9A35100	10.0	10	45	95	4	0.18
E9A35120	12.0	12	53	110	4	0.18
E9A35140	14.0	12	53	110	4	0.25
E9A35160	16.0	16	63	123	4	0.25
E9A35180	18.0	16	63	123	4	0.25
E9A35200	20.0	20	75	141	4	0.25
E9A35220	22.0	20	75	141	5	0.36
E9A35250	25.0	25	90	166	5	0.36

Tolerances according to DIN 7160 & 7161

	Tolerance range in μm					
	Nominal-Diameter in mm					
	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30	over 30 to 50
js12	± 50	± 60	± 75	± 90	± 105	± 125
h6	0 -6	0 -8	0 -9	0 -11	0 -13	0 -16



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel		Stainless steel		Grey cast iron	Nodular cast iron		Malleable cast iron		
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	35	38	42	45	48	52	55	58	62	65	68	72	75	78	82	85
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

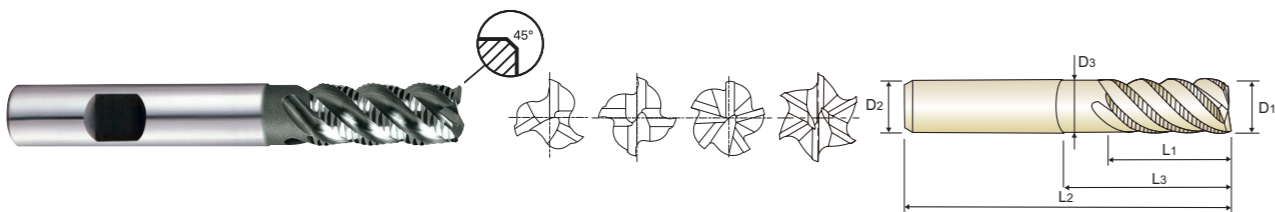


UNCOATED **E9A26** SERIES
X-COATING **GAA26** SERIES

HSS-PM, MULTI FLUTE 45°HELIX SHORT LENGTH ROUGHING - FINE

- HSS-PM, MULTI SCHNEIDEN 45°RECHTSSPIRALE KURZ SCHRUPFRÄSER - FEIN
- FRAISES HSS-PM, MULTI-DENTS RAVAGEUSE HÉLICE À 45° - PAS FINS, SÉRIE COURTE
- MULTI TAGL., ELICA 45°, PER SGROS., SERIE CORTA, BOMBATO FINE - HSS PM

- ▶ 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.



HSS PM DIN 844 HR 3-6 45° DIN 1835B
UNCOATED X Coating p.C700~C701

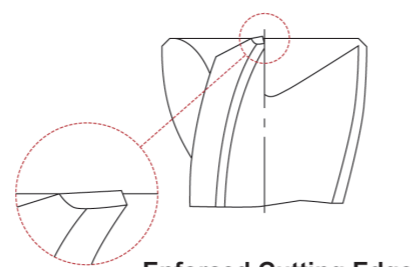
Recommended ToolHolder	Flat Shank	Plain Shank
	END MILL HOLDER	POWER MILLING CHUCK
		ER COLLET CHUCK SK SLIM CHUCK

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	No. of Flute	Chamfer	
									UNCOATED
E9A26040	GAA26040	4.0	6	11	-	57	-	3	0.1
E9A26050	GAA26050	5.0	6	13	-	57	-	4	0.13
E9A26060	GAA26060	6.0	6	13	-	57	-	4	0.15
E9A26070	GAA26070	7.0	10	16	-	66	-	4	0.15
E9A26080	GAA26080	8.0	10	19	-	69	-	4	0.18
E9A26090	GAA26090	9.0	10	19	-	69	-	4	0.18
E9A26100	GAA26100	10.0	10	22	31	72	9.5	4	0.20
E9A26120	GAA26120	12.0	12	26	37	83	11.5	4	0.20
E9A26140	GAA26140	14.0	12	26	-	83	-	5	0.20
E9A26160	GAA26160	16.0	16	32	44	92	15	5	0.20
E9A26180	GAA26180	18.0	16	32	-	92	-	6	0.20
E9A26200	GAA26200	20.0	20	38	54	104	19	6	0.20
E9A26250	GAA26250	25.0	25	45	63	121	24	6	0.20

Tolerances according to DIN 7160 & 7161

	Tolerance range in μm					
	Nominal-Diameter in mm					
	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30	over 30 to 50
js12	± 50	± 60	± 75	± 90	± 105	± 125
h6	0 -6	0 -8	0 -9	0 -11	0 -13	0 -16



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO Material Description	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	35	38	40	42	45	48	50	52	54	56	58	60	62	64	66	68
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

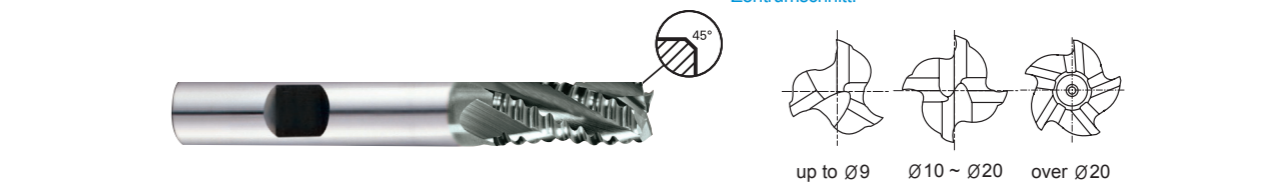


UNCOATED **E9A33** SERIES
X-COATING **GAA33** SERIES

HSS-PM, MULTI FLUTE SHORT LENGTH ROUGHING - COARSE

- HSS-PM, MULTI SCHNEIDEN KURZ SCHRUPFRÄSER - GROB
- FRAISES HSS-PM, MULTI-DENTS RAVAGEUSE - PAS GROSSIERS, SÉRIE COURTE
- MULTI TAGL., PER SGROS., SERIE CORTA, BOMBATO GROSSO - HSS PM

- ▶ 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 $\phi 20$: center cut, over $\phi 20$: 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.



HSS PM DIN 844 NR 3-5 30° DIN 1835B
UNCOATED X Coating p.C698~C699

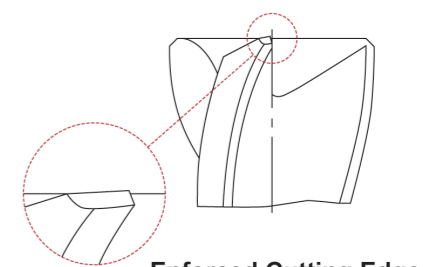
Recommended ToolHolder	Flat Shank	Plain Shank
	END MILL HOLDER	POWER MILLING CHUCK
		ER COLLET CHUCK SK SLIM CHUCK

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute	Chamfer	
							UNCOATED
E9A33060	GAA33060	6.0	6	13	57	3	0.25
E9A33070	GAA33070	7.0	10	16	66	3	0.25
E9A33080	GAA33080	8.0	10	19	69	3	0.25
E9A33090	GAA33090	9.0	10	19	69	3	0.36
E9A33100	GAA33100	10.0	10	22	72	4	0.36
E9A33120	GAA33120	12.0	12	26	83	4	0.5
E9A33140	GAA33140	14.0	12	26	83	4	0.55
E9A33160	GAA33160	16.0	16	32	92	4	0.55
E9A33180	GAA33180	18.0	16	32	92	4	0.55
E9A33200	GAA33200	20.0	20	38	104	4	0.55
E9A33220	GAA33220	22.0	20	38	104	5	0.55
E9A33250	GAA33250	25.0	25	45	121	5	0.55

Tolerances according to DIN 7160 & 7161

	Tolerance range in μm					
	Nominal-Diameter in mm					
	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30	over 30 to 50
js12	± 50	± 60	± 75	± 90	± 105	± 125
h6	0 -6	0 -8	0 -9	0 -11	0 -13	0 -16



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO Material Description	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	35	38	40	42	45	48	50	52	54	56	58	60	62	64	66	68
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

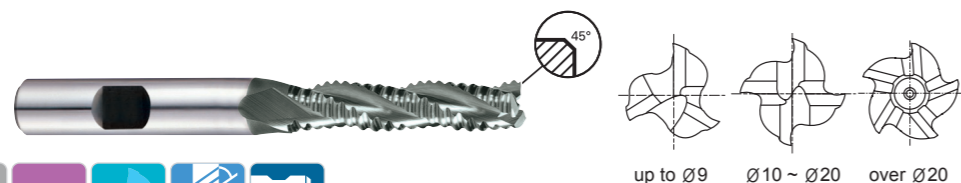


UNCOATED **E9A34** SERIES
X-COATING **GAA34** SERIES

HSS-PM, MULTI FLUTE LONG LENGTH ROUGHING - COARSE

- HSS-PM, MULTI SCHNEIDEN LANG SCHRUPFRÄSER - GROB
- FRAISES HSS-PM, MULTI-DENTS RAVAGEUSE - PAS GROSSIERS, SÉRIE LONGUE
- MULTI TAGL., PER SGROSSATURA, SERIE LUNGA, BOMBATO GROSSO - HSS PM

- ▶ 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.



HSS PM, DIN 844, NR, 3-5, 30°, DIN 1835B, UNCOATED, X Coating, p.C698~C699

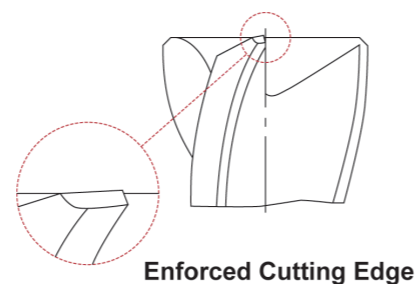
Recommended ToolHolder	Flat Shank	Plain Shank
	END MILL HOLDER	POWER MILLING CHUCK
		ER COLLET CHUCK
		SK SLIM CHUCK

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute	Chamfer	
							UNCOATED
E9A34060	GAA34060	6.0	6	24	68	3	0.25
E9A34070	GAA34070	7.0	10	30	80	3	0.25
E9A34080	GAA34080	8.0	10	38	88	3	0.25
E9A34090	GAA34090	9.0	10	38	88	3	0.36
E9A34100	GAA34100	10.0	10	45	95	4	0.36
E9A34120	GAA34120	12.0	12	53	110	4	0.5
E9A34140	GAA34140	14.0	12	53	110	4	0.55
E9A34160	GAA34160	16.0	16	63	123	4	0.55
E9A34180	GAA34180	18.0	16	63	123	4	0.55
E9A34200	GAA34200	20.0	20	75	141	4	0.55
E9A34220	GAA34220	22.0	20	75	141	5	0.55
E9A34250	GAA34250	25.0	25	90	166	5	0.55

Tolerances according to DIN 7160 & 7161

	Tolerance range in μm					
	Nominal-Diameter in mm					
	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30	over 30 to 50
js12	± 50	± 60	± 75	± 90	± 105	± 125
h6	0 -6	0 -8	0 -9	0 -11	0 -13	0 -16



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO Material Description	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel		Stainless steel		Grey cast iron	Nodular cast iron		Malleable cast iron		
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	38	42	48	52	58	62	68	72	78	82	88	92	98	102	108	112
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

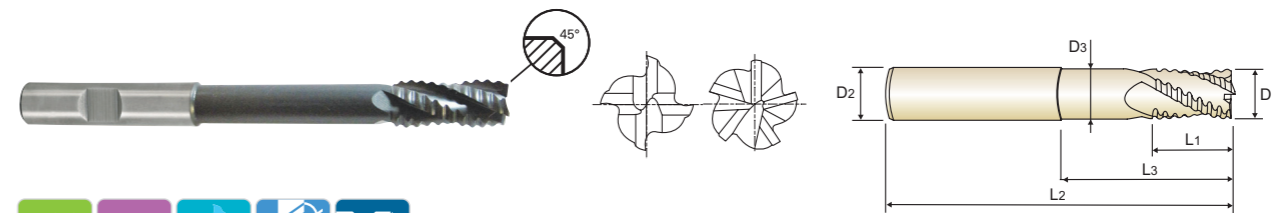


UNCOATED **E9E43** SERIES
X-COATING **GAE43** SERIES

HSS-PM, 4&5 FLUTE ROUGHING WITH NECK - COARSE

- HSS-PM, 4&5 SCHNEIDEN SCHRUPFRÄSER mit ABGESETZTEM SCHAFTTETL - GROB
- FRAISES HSS-PM, 4&5-DENTS RAVAGEUSE AVEC DÉGAGEMENT - PAS GROSSIERS
- 4&5 TAGL., PER SGROSSATURA, SCARICATA - HSS PM

- ▶ 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.



HSS PM, NR, 4&5, 30°, DIN 1835B, UNCOATED, X Coating, p.C702~C703

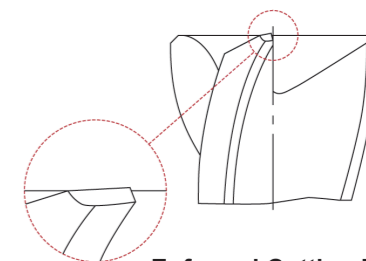
Recommended ToolHolder	Flat Shank	Plain Shank
	END MILL HOLDER	POWER MILLING CHUCK
		ER COLLET CHUCK
		SK SLIM CHUCK

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	No. of Flute	Chamfer	
									UNCOATED
E9E43100	GAE43100	10.0	10	22	69	110	8.5	4	0.34
E9E43120	GAE43120	12.0	12	26	78	125	10.5	4	0.50
E9E43160	GAE43160	16.0	16	32	87	138	14	4	0.55
E9E43200	GAE43200	20.0	20	38	108	160	18	5	0.55
E9E43250	GAE43250	25.0	25	45	155	216	23	5	0.55

Tolerances according to DIN 7160 & 7161

	Tolerance range in μm					
	Nominal-Diameter in mm					
	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30	over 30 to 50
js12	± 50	± 60	± 75	± 90	± 105	± 125
h6	0 -6	0 -8	0 -9	0 -11	0 -13	0 -16



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO Material Description	P										M				K					
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel		Stainless steel		Grey cast iron	Nodular cast iron		Malleable cast iron		
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc	13	25	28	32	38	42	48	52	58	62	68	72	78	82	88	92	98	102	108	112
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

TANK-POWER
END MILLS

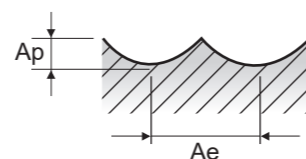
RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

GA940 , GAA32 SERIES 2 FLUTE BALL NOSE

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

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)									
						3.0	4.0	6.0	8.0	10.0	12.0	16.0	20.0	25.0	
P	1	Non-alloy steel	0.5D	0.2D	Vc	70	75	85	85	85	85	85	85	85	75
					fz	0.023	0.036	0.055	0.079	0.109	0.115	0.141	0.156	0.163	
					RPM	7427	5968	4509	3382	2706	2255	1691	1353	955	
					FEED	342	430	496	534	590	519	477	422	311	
	2		Vc	55	60	65	65	65	70	65	65	60			
			fz	0.02	0.031	0.046	0.067	0.095	0.097	0.123	0.14	0.142			
			RPM	5836	4775	3448	2586	2069	1857	1293	1035	764			
			FEED	233	296	317	347	393	360	318	290	217			
	3-4		Vc	35	40	45	45	45	45	45	45	35			
			fz	0.016	0.027	0.039	0.056	0.082	0.083	0.101	0.11	0.122			
			RPM	3714	3183	2387	1790	1432	1194	895	716	446			
FEED		119	172	186	201	235	198	181	158	109					
5	Vc	20	20	25	20	20	20	20	25	20					
	fz	0.014	0.023	0.035	0.048	0.075	0.073	0.091	0.097	0.104					
	RPM	2122	1592	1326	796	637	531	398	398	255					
	FEED	59	73	93	76	95	77	72	77	53					
6	Vc	55	60	65	65	65	70	65	65	60					
	fz	0.02	0.031	0.046	0.067	0.095	0.097	0.123	0.14	0.142					
	RPM	5836	4775	3448	2586	2069	1857	1293	1035	764					
	FEED	233	296	317	347	393	360	318	290	217					
7	Vc	35	40	45	45	45	45	45	45	35					
	fz	0.016	0.027	0.039	0.056	0.082	0.083	0.101	0.11	0.122					
	RPM	3714	3183	2387	1790	1432	1194	895	716	446					
	FEED	119	172	186	201	235	198	181	158	109					
8-9	Vc	20	20	25	20	20	20	20	25	20					
	fz	0.014	0.023	0.035	0.048	0.075	0.073	0.091	0.097	0.104					
	RPM	2122	1592	1326	796	637	531	398	398	255					
	FEED	59	73	93	76	95	77	72	77	53					
10	Vc	55	60	65	65	65	70	65	65	60					
	fz	0.02	0.031	0.046	0.067	0.095	0.097	0.123	0.14	0.142					
	RPM	5836	4775	3448	2586	2069	1857	1293	1035	764					
	FEED	233	296	317	347	393	360	318	290	217					
11.1	Vc	20	20	25	20	20	20	20	25	20					
	fz	0.014	0.023	0.035	0.048	0.075	0.073	0.091	0.097	0.104					
	RPM	2122	1592	1326	796	637	531	398	398	255					
	FEED	59	73	93	76	95	77	72	77	53					
M 14.1	Vc	20	20	25	25	25	25	25	25	20					
	fz	0.014	0.023	0.036	0.048	0.073	0.074	0.092	0.1	0.1					
	RPM	2122	1592	1326	995	796	663	497	398	255					
	FEED	59	73	95	95	116	98	92	80	51					
K 15-20	Vc	55	60	65	65	65	70	65	65	60					
	fz	0.02	0.031	0.046	0.067	0.095	0.097	0.123	0.14	0.142					
	RPM	5836	4775	3448	2586	2069	1857	1293	1035	764					
	FEED	233	296	317	347	393	360	318	290	217					

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



TANK-POWER
END MILLS

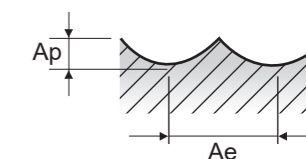
RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

E9940 , E9A32 SERIES 2 FLUTE BALL NOSE

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

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)									
						3.0	4.0	6.0	8.0	10.0	12.0	16.0	20.0	25.0	
P	1	Non-alloy steel	0.5D	0.2D	Vc	45	50	55	60	55	55	55	60	50	
					fz	0.021	0.033	0.05	0.072	0.103	0.11	0.136	0.14	0.148	
					RPM	4775	3979	2918	2387	1751	1459	1094	955	637	
					FEED	201	263	292	344	361	321	298	267	188	
	2		Vc	35	40	45	45	45	45	45	45	40			
			fz	0.018	0.029	0.043	0.061	0.089	0.092	0.111	0.12	0.13			
			RPM	3714	3183	2387	1790	1432	1194	895	716	509			
			FEED	134	185	205	218	255	220	199	172	132			
	3-4		Vc	25	25	30	30	30	30	30	30	25			
			fz	0.015	0.024	0.034	0.052	0.07	0.076	0.092	0.099	0.103			
			RPM	2653	1989	1592	1194	955	796	597	477	318			
FEED		80	95	108	124	134	121	110	95	66					
5	Vc	10	15	15	15	15	15	15	15	15					
	fz	0.013	0.023	0.034	0.046	0.068	0.069	0.083	0.094	0.086					
	RPM	1061	1194	796	597	477	398	298	239	191					
	FEED	28	55	54	55	65	55	50	45	33					
6	Vc	35	40	45	45	45	45	45	45	40					
	fz	0.018	0.029	0.043	0.061	0.089	0.092	0.111	0.12	0.13					
	RPM	3714	3183	2387	1790	1432	1194	895	716	509					
	FEED	134	185	205	218	255	220	199	172	132					
7	Vc	25	25	30	30	30	30	30	30	25					
	fz	0.015	0.024	0.034	0.052	0.07	0.076	0.092	0.099	0.103					
	RPM	2653	1989	1592	1194	955	796	597	477	318					
	FEED	80	95	108	124	134	121	110	95	66					
8-9	Vc	10	15	15	15	15	15	15	15	15					
	fz	0.013	0.023	0.034	0.046	0.068	0.069	0.083	0.094	0.086					
	RPM	1061	1194	796	597	477	398	298	239	191					
	FEED	28	55	54	55	65	55	50	45	33					
10	Vc	35	40	45	45	45	45	45	45	40					
	fz	0.018	0.029	0.043	0.061	0.089	0.092	0.111	0.12	0.13					
	RPM	3714	3183	2387	1790	1432	1194	895	716	509					
	FEED	134	185	205	218	255	220	199	172	132					
11.1	Vc	10	15	15	15	15	15	15	15	15					
	fz	0.013	0.023	0.034	0.046	0.068	0.069	0.083	0.094	0.086					
	RPM	1061	1194	796	597	477	398	298	239	191					
	FEED	28	55	54	55	65	55	50	45	33					
M 14.1	Vc	15	15	15	15	15	15	15	15	15					
	fz	0.014	0.025	0.036	0.049	0.075	0.074	0.091	0.104	0.09					
	RPM	1592	1194	796	597	477	398	298	239	191					
	FEED	45	60	57	58	72	59	54	50	34					
K 15-20	Vc	35	40	45	45	45	45	45	45	40					
	fz	0.018	0.029	0.043	0.061	0.089	0.092	0.111	0.12	0.13					
	RPM	3714	3183	2387	1790	1432	1194	895	716	509					
	FEED	134	185	205	218	255	220	199	172	132					

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



GA936, GAA29 SERIES 2 FLUTE - SLOTTING

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

E9936, E9A29 SERIES 2 FLUTE - SLOTTING

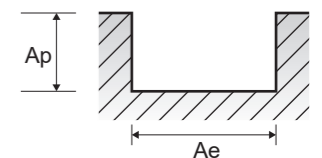
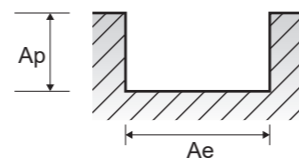
Vc = m/min. fz = mm/tooth RPM = rev./min. FEED = mm/min.

Table with columns: ISO, VDI 3323, Material Description, Ae, Ap, Parameter, Diameter (Ø) (2.0 to 25.0), and cutting parameters (Vc, fz, RPM, FEED) for various materials like Non-alloy steel, Low alloy steel, and High alloyed steel.

Table with columns: ISO, VDI 3323, Material Description, Ae, Ap, Parameter, Diameter (Ø) (2.0 to 25.0), and cutting parameters (Vc, fz, RPM, FEED) for various materials like Non-alloy steel, Low alloy steel, and High alloyed steel.

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

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





RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER



RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

GA942 , GAA30 SERIES 3 FLUTE - SLOTTING

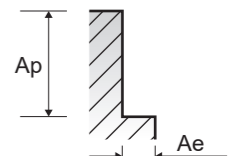
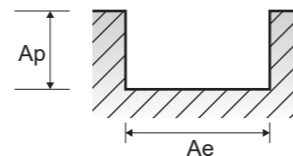
Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

GA942 , GAA30 SERIES 3 FLUTE - SIDE CUTTING

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

Table with columns: ISO, VDI 3323, Material Description, Ae, Ap, Parameter, Diameter (Ø) [2.0, 3.0, 4.0, 5.0, 6.0, 8.0, 10.0, 12.0, 14.0, 16.0, 18.0, 20.0, 22.0, 25.0]. Rows include Non-alloy steel, Low alloy steel, High alloyed steel, and tool steel.

Table with columns: ISO, VDI 3323, Material Description, Ae, Ap, Parameter, Diameter (Ø) [2.0, 3.0, 4.0, 5.0, 6.0, 8.0, 10.0, 12.0, 14.0, 16.0, 18.0, 20.0, 22.0, 25.0]. Rows include Non-alloy steel, Low alloy steel, High alloyed steel, and tool steel.





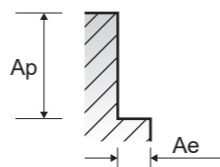
RECOMMENDED CUTTING CONDITIONS EMPFOHLENE SCHNEIDPARAMETER

GA938 , GAA31 SERIES 4 FLUTE - SIDE CUTTING

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

Table with columns for ISO, VDI 3323, Material Description, Ae, Ap, Diameter (Ø), and various cutting parameters (Vc, fz, RPM, FEED) for different diameters (2.0 to 25.0). Rows include Non-alloy steel, Low alloy steel, High alloyed steel, and tool steel.

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



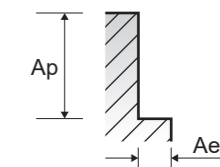
RECOMMENDED CUTTING CONDITIONS EMPFOHLENE SCHNEIDPARAMETER

E9938 , E9A31 SERIES 4 FLUTE - SIDE CUTTING

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

Table with columns for ISO, VDI 3323, Material Description, Ae, Ap, Diameter (Ø), and various cutting parameters (Vc, fz, RPM, FEED) for different diameters (2.0 to 25.0). Rows include Non-alloy steel, Low alloy steel, High alloyed steel, and tool steel.

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

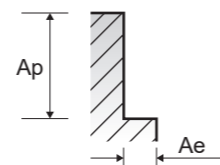


GA941, GAA35, GAA33, GAA34 SERIES MULTI FLUTE ROUGHING - SIDE CUTTING

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

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)											
						6.0	8.0	10.0	12.0	22.0	25.0	18.0	20.0	22.0	25.0		
P	1	Non-alloy steel	0.5D	1.5D	Vc	55	60	60	60	60	60	60	60	60	60	60	60
					fz	0.027	0.04	0.055	0.065	0.074	0.086	0.099	0.111	0.096	0.105		
					RPM	2918	2387	1910	1592	1364	1194	1061	955	868	764		
					FEED	236	286	420	414	404	411	420	424	417	401		
	2		Vc	40	50	45	45	45	50	50	50	45	45				
			fz	0.027	0.04	0.053	0.069	0.079	0.087	0.093	0.109	0.102	0.105				
			RPM	2122	1989	1432	1194	1023	995	884	796	651	573				
			FEED	172	239	304	329	323	346	329	347	332	301				
	3-4		Vc	30	35	35	35	35	35	35	35	30	35				
			fz	0.024	0.038	0.046	0.064	0.076	0.087	0.094	0.108	0.098	0.105				
			RPM	1592	1393	1114	928	796	696	619	557	434	446				
FEED		115	159	205	238	242	242	233	241	213	234						
5	Vc	25	25	30	30	30	30	30	30	30	30						
	fz	0.027	0.04	0.045	0.061	0.071	0.082	0.092	0.102	0.09	0.1						
	RPM	1326	995	955	796	682	597	531	477	434	382						
	FEED	107	119	172	194	194	196	195	195	195	191						
6	Vc	40	50	45	45	45	50	50	50	45	45						
	fz	0.027	0.04	0.053	0.069	0.079	0.087	0.093	0.109	0.102	0.105						
	RPM	2122	1989	1432	1194	1023	995	884	796	651	573						
	FEED	172	239	304	329	323	346	329	347	332	301						
7	Vc	30	35	35	35	35	35	35	35	30	35						
	fz	0.024	0.038	0.046	0.064	0.076	0.087	0.094	0.108	0.098	0.105						
	RPM	1592	1393	1114	928	796	696	619	557	434	446						
	FEED	115	159	205	238	242	242	233	241	213	234						
8-9	Vc	25	25	30	30	30	30	30	30	30	30						
	fz	0.027	0.04	0.045	0.061	0.071	0.082	0.092	0.102	0.09	0.1						
	RPM	1326	995	955	796	682	597	531	477	434	382						
	FEED	107	119	172	194	194	196	195	195	195	191						
10	Vc	40	50	45	45	45	50	50	50	45	45						
	fz	0.027	0.04	0.053	0.069	0.079	0.087	0.093	0.109	0.102	0.105						
	RPM	2122	1989	1432	1194	1023	995	884	796	651	573						
	FEED	172	239	304	329	323	346	329	347	332	301						
11.1	Vc	25	25	30	30	30	30	30	30	30	30						
	fz	0.027	0.04	0.045	0.061	0.071	0.082	0.092	0.102	0.09	0.1						
	RPM	1326	995	955	796	682	597	531	477	434	382						
	FEED	107	119	172	194	194	196	195	195	195	191						
M	14.1	Stainless steel	0.5D	1.5D	Vc	25	30	30	30	30	30	30	30	30	30		
					fz	0.025	0.039	0.045	0.064	0.074	0.085	0.093	0.107	0.095	0.103		
					RPM	1326	1194	955	796	682	597	531	477	434	382		
					FEED	99	140	172	204	202	203	197	204	206	197		
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.5D	1.5D	Vc	40	50	45	45	45	50	50	50	45	45		
					fz	0.027	0.04	0.053	0.069	0.079	0.087	0.093	0.109	0.102	0.105		
					RPM	2122	1989	1432	1194	1023	995	884	796	651	573		
					FEED	172	239	304	329	323	346	329	347	332	301		

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

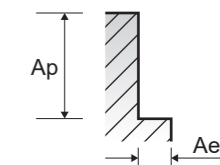


E9941, E9A35, E9A33, E9A34 SERIES MULTI FLUTE ROUGHING - SIDE CUTTING

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

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)										
						6.0	8.0	10.0	12.0	22.0	25.0	18.0	20.0	22.0	25.0	
P	1	Non-alloy steel	0.5D	1.5D	Vc	35	40	40	40	40	40	40	40	40	40	40
					fz	0.018	0.028	0.05	0.059	0.056	0.063	0.061	0.067	0.072	0.08	
					RPM	1857	1592	1273	1061	909	796	707	637	579	509	
					FEED	100	134	255	250	204	201	173	171	208	204	
	2		Vc	30	35	30	30	30	35	30	30	30	30			
			fz	0.018	0.027	0.049	0.063	0.058	0.064	0.056	0.067	0.078	0.081			
			RPM	1592	1393	955	796	682	597	619	477	434	382			
			FEED	86	113	187	201	158	153	139	128	169	155			
	3-4		Vc	20	25	20	25	20	25	25	25	20	20			
			fz	0.017	0.028	0.044	0.058	0.055	0.062	0.057	0.065	0.073	0.08			
			RPM	1061	995	637	663	455	497	442	398	289	255			
FEED		54	84	112	154	100	123	101	103	106	102					
5	Vc	15	20	20	20	20	20	20	20	20	20					
	fz	0.018	0.027	0.042	0.055	0.051	0.059	0.056	0.061	0.068	0.076					
	RPM	796	796	637	531	455	398	354	318	289	255					
	FEED	43	64	107	117	93	94	79	78	98	97					
6	Vc	30	35	30	30	30	35	30	30	30	30					
	fz	0.018	0.027	0.049	0.063	0.058	0.064	0.056	0.067	0.078	0.081					
	RPM	1592	1393	955	796	682	597	619	477	434	382					
	FEED	86	113	187	201	158	153	139	128	169	155					
7	Vc	20	25	20	25	20	25	25	25	20	20					
	fz	0.017	0.028	0.044	0.058	0.055	0.062	0.057	0.065	0.073	0.08					
	RPM	1061	995	637	663	455	497	442	398	289	255					
	FEED	54	84	112	154	100	123	101	103	106	102					
8-9	Vc	15	20	20	20	20	20	20	20	20	20					
	fz	0.018	0.027	0.042	0.055	0.051	0.059	0.056	0.061	0.068	0.076					
	RPM	796	796	637	531	455	398	354	318	289	255					
	FEED	43	64	107	117	93	94	79	78	98	97					
10	Vc	30	35	30	30	30	35	30	30	30	30					
	fz	0.018	0.027	0.049	0.063	0.058	0.064	0.056	0.067	0.078	0.081					
	RPM	1592	1393	955	796	682	597	619	477	434	382					
	FEED	86	113	187	201	158	153	139	128	169	155					
11.1	Vc	15	20	20	20	20	20	20	20	20	20					
	fz	0.018	0.027	0.042	0.055	0.051	0.059	0.056	0.061	0.068	0.076					
	RPM	796	796	637	531	455	398	354	318	289	255					
	FEED	43	64	107	117	93	94	79	78	98	97					
M	14.1	Stainless steel	0.5D	1.5D	Vc	20	20	20	20	20	20	20	20	20		
					fz	0.02	0.03	0.045	0.065	0.06	0.069	0.064	0.073	0.081	0.086	
					RPM	1061	796	637	531	455	398	354	318	289	255	
					FEED	64	72	115	138	109	110	91	93	117	109	
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.5D	1.5D	Vc	30	35	30	30	30	30	35	30	30	30	
					fz	0.018	0.027	0.049	0.063	0.058	0.064	0.056	0.067	0.078	0.081	
					RPM	1592	1393	955	796	682	597	619	477	434	382	
					FEED	86	113	187	201	158	153	139	128	169	155	

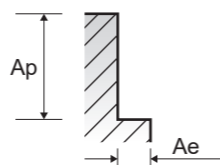
※ The FEED, in long & extra long types, should be reduced by around 50%



E9E43 SERIES MULTI FLUTE ROUGHING - SIDE CUTTING

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

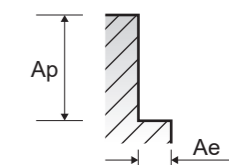
ISO	VDI 3323	Material Description	Ae	Ap	Parameter	10.0	12.0	16.0	20.0	25.0	
						Vc	fz	RPM	FEED	Vc	fz
P	1	Non-alloy steel	0.5D	1.5D	Vc	41	41	41	41	41	
					fz	0.042	0.05	0.067	0.085	0.081	
					RPM	1305	1088	816	653	522	
	FEED		219	218	219	222	211				
	2		Vc	32	32	32	32	32			
			fz	0.041	0.053	0.068	0.086	0.083			
			RPM	1019	849	637	509	407			
	FEED		167	180	173	175	169				
	3-4		Vc	23	23	23	23	23			
			fz	0.037	0.05	0.067	0.083	0.082			
RPM		732	610	458	366	293					
FEED	108	122	123	122	120						
5	Vc	19	19	19	19	19					
	fz	0.035	0.048	0.064	0.079	0.079					
	RPM	605	504	378	302	242					
FEED	85	97	97	96	96						
6	Vc	32	32	32	32	32					
	fz	0.041	0.053	0.068	0.086	0.083					
	RPM	1019	849	637	509	407					
FEED	167	180	173	175	169						
7	Vc	23	23	23	23	23					
	fz	0.037	0.05	0.067	0.083	0.082					
	RPM	732	610	458	366	293					
FEED	108	122	123	122	120						
8	Vc	19	19	19	19	19					
	fz	0.035	0.048	0.064	0.079	0.079					
	RPM	605	504	378	302	242					
FEED	85	97	97	96	96						
9	Vc	19	19	19	19	19					
	fz	0.035	0.048	0.064	0.079	0.079					
	RPM	605	504	378	302	242					
FEED	64	97	97	119	96						
10	Vc	32	32	32	32	32					
	fz	0.041	0.053	0.068	0.086	0.083					
	RPM	1019	849	637	509	407					
FEED	167	180	173	175	169						
11.1	Vc	19	19	19	19	19					
	fz	0.035	0.048	0.064	0.079	0.079					
	RPM	605	504	378	302	242					
FEED	85	97	97	96	96						
M 14.1	Vc	21	21	21	21	21					
	fz	0.038	0.058	0.074	0.095	0.089					
	RPM	668	557	418	334	267					
FEED	102	129	124	127	119						
K 15-20	Vc	32	32	32	32	32					
	fz	0.041	0.053	0.068	0.086	0.083					
	RPM	1019	849	637	509	407					
FEED	167	180	173	175	169						



GAE43 SERIES MULTI FLUTE ROUGHING - SIDE CUTTING

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

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	10.0	12.0	16.0	20.0	25.0	
						Vc	fz	RPM	FEED	Vc	fz
P	1	Non-alloy steel	0.5D	1.5D	Vc	60	60	60	60	60	
					fz	0.047	0.055	0.074	0.094	0.09	
					RPM	1910	1592	1194	955	764	
	FEED		359	350	353	359	344				
	2		Vc	47	47	47	47	47			
			fz	0.045	0.058	0.074	0.092	0.09			
			RPM	1496	1247	935	748	598			
	FEED		269	289	277	275	269				
	3-4		Vc	33	33	33	33	33			
			fz	0.039	0.054	0.074	0.092	0.088			
RPM		1050	875	657	525	420					
FEED	164	189	194	193	185						
5	Vc	28	28	28	28	28					
	fz	0.038	0.052	0.07	0.088	0.086					
	RPM	891	743	557	446	357					
FEED	135	154	156	157	153						
6	Vc	47	47	47	47	47					
	fz	0.045	0.058	0.074	0.092	0.09					
	RPM	1496	1247	935	748	598					
FEED	269	289	277	275	269						
7	Vc	33	33	33	33	33					
	fz	0.039	0.054	0.074	0.092	0.088					
	RPM	1050	875	657	525	420					
FEED	164	189	194	193	185						
8-9	Vc	28	28	28	28	28					
	fz	0.038	0.052	0.07	0.088	0.086					
	RPM	891	743	557	446	357					
FEED	135	154	156	157	153						
10	Vc	47	47	47	47	47					
	fz	0.045	0.058	0.074	0.092	0.09					
	RPM	1496	1247	935	748	598					
FEED	269	289	277	275	269						
11.1	Vc	28	28	28	28	28					
	fz	0.038	0.052	0.07	0.088	0.086					
	RPM	891	743	557	446	357					
FEED	135	154	156	157	153						
M 14.1	Vc	30	30	30	30	30					
	fz	0.038	0.055	0.073	0.091	0.087					
	RPM	955	796	597	477	382					
FEED	145	175	174	174	166						
K 15-20	Vc	47	47	47	47	47					
	fz	0.045	0.058	0.074	0.092	0.09					
	RPM	1496	1247	935	748	598					
FEED	269	289	277	275	269						





Global Cutting Tool Leader **YG-1**



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