

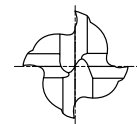


UNCOATED **E9938** SERIES
TiAlN based COATED **GA938** SERIES

HSS-PM, 4 FLUTE SHORT LENGTH

- HSS-PM, 4 SCHNEIDEN KURZ
- FRAISES HSS-PM, 4 DENTS, SÉRIE COURTE
- 4 TAGLIANTI, 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
P.662~663

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	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						○	○	○													

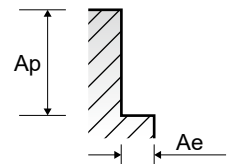
E9938 , E9A31 SERIES

4 FLUTE - SIDE CUTTING

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

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		
P	1	Non-alloy steel	0.1D	1.5D	Vc	40	40	45	45	50	55	50	50	55	55	55	55	55	50	55	
					fz	0.007	0.014	0.021	0.026	0.032	0.043	0.061	0.069	0.071	0.07	0.07	0.079	0.092	0.085		
					RPM	6366	4244	3581	2865	2653	2188	1592	1326	1251	1094	973	875	723	700		
	2		0.1D	1.5D	Vc	35	40	40	40	45	45	45	45	50	45	50	45	45	45		
					fz	0.007	0.013	0.02	0.025	0.029	0.042	0.059	0.063	0.065	0.074	0.074	0.081	0.078	0.083		
					RPM	5570	4244	3183	2546	2387	1790	1432	1194	1137	895	884	716	651	573		
	3-4		0.1D	1.5D	Vc	25	30	30	30	35	35	35	35	35	35	35	35	30	35		
					fz	0.007	0.013	0.02	0.024	0.028	0.041	0.053	0.064	0.069	0.075	0.079	0.081	0.087	0.081		
					RPM	3979	3183	2387	1910	1857	1393	1114	928	796	696	619	557	434	446		
	5		0.1D	1.5D	Vc	20	20	20	20	25	25	20	25	25	25	25	25	20	20		
					fz	0.007	0.014	0.02	0.024	0.029	0.042	0.058	0.063	0.066	0.075	0.07	0.076	0.078	0.085		
RPM		3183			2122	1592	1273	1326	995	637	663	568	497	442	398	289	255				
6	0.1D	1.5D	Vc	35	40	40	40	45	45	45	45	50	45	50	45	45	45				
			fz	0.007	0.013	0.02	0.025	0.029	0.042	0.059	0.063	0.065	0.074	0.074	0.081	0.078	0.083				
			RPM	5570	4244	3183	2546	2387	1790	1432	1194	1137	895	884	716	651	573				
7	0.1D	1.5D	Vc	25	30	30	30	35	35	35	35	35	35	35	30	35					
			fz	0.007	0.013	0.02	0.024	0.028	0.041	0.053	0.064	0.069	0.075	0.079	0.081	0.087	0.081				
			RPM	3979	3183	2387	1910	1857	1393	1114	928	796	696	619	557	434	446				
8	0.1D	1.5D	Vc	20	20	20	20	25	25	20	25	25	25	25	20	20					
			fz	0.007	0.014	0.02	0.024	0.029	0.042	0.058	0.063	0.066	0.075	0.07	0.076	0.078	0.085				
			RPM	3183	2122	1592	1273	1326	995	637	663	568	497	442	398	289	255				
9	0.1D	1.5D	Vc	15	15	15	20	20	20	20	20	20	20	20	20	20	20				
			fz	0.006	0.012	0.018	0.022	0.028	0.038	0.052	0.058	0.061	0.067	0.07	0.071	0.074	0.083				
			RPM	2387	1592	1194	1273	1061	796	637	531	455	398	354	318	289	255				
10	0.1D	High alloyed steel, and tool steel	Vc	35	40	40	40	45	45	45	45	50	45	50	45	45	45				
			fz	0.007	0.013	0.02	0.025	0.029	0.042	0.059	0.063	0.065	0.074	0.074	0.081	0.078	0.083				
			RPM	5570	4244	3183	2546	2387	1790	1432	1194	1137	895	884	716	651	573				
11.1	0.1D		1.5D	Vc	20	20	20	20	25	25	20	25	25	25	25	20	20				
				fz	0.007	0.014	0.02	0.024	0.029	0.042	0.058	0.063	0.066	0.075	0.07	0.076	0.078	0.085			
				RPM	3183	2122	1592	1273	1326	995	637	663	568	497	442	398	289	255			
K	15-20		Grey cast iron Nodular cast iron Malleable cast iron	0.1D	1.5D	Vc	35	40	40	40	45	45	45	45	50	45	50	45	45	45	
						fz	0.007	0.013	0.02	0.025	0.029	0.042	0.059	0.063	0.065	0.074	0.074	0.081	0.078	0.083	
						RPM	5570	4244	3183	2546	2387	1790	1432	1194	1137	895	884	716	651	573	
						FEED	156	221	255	255	277	301	338	301	296	265	262	232	203	190	

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



SELECTION GUIDE



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	640	641	642	643

HSS-PM

TANK-POWER END MILLS

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



Please visit
globalyg1.com/mat
for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : P 654

	SHORT LENGTH	LONG LENGTH	SHORT LENGTH	LONG LENGTH
	TiAlN based	TiAlN based	TiAlN based	TiAlN based
P	◎	◎	◎	◎
M	◎	◎	◎	◎
K	◎	◎	◎	◎
N	○	○	○	○
S	○	○	○	○
H	○	○	○	○

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

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
644	645	646	647	648	649	650	651	652	653
STUB LENGTH	SHORT LENGTH	SHORT LENGTH	LONG LENGTH	SHORT LENGTH	LONG LENGTH	SHORT LENGTH	SHORT LENGTH	LONG LENGTH	WITH NECK
TiAlN based	TiAlN based	TiAlN based	TiAlN based	X-Coating	X-Coating	X-Coating	X-Coating	X-Coating	X-Coating



⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	1
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