

EPMS - High Efficiency Endmill Type

Radius Endmills for Exotic Alloys



EPMS Type

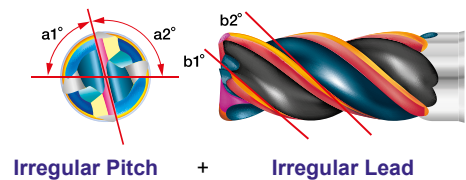
■ Features



- Solid endmill EPMS-Series (European Performance Mill) for high-performance milling applications
- Higher efficiency and tool life due to new technology of latest developed carbide substrate and coating combined with the new optimized tool design
- Available with 4/5/6 and 9 flutes, different diameters and edge radii
- Excellent performance in machining of exotic alloys like Ti-alloys, super alloys and heat resistant steels
- Suitable for Titanium structure parts for airplane
- Anti-vibration design for reliable and efficient machining in a wide application range

Anti-Vibration design

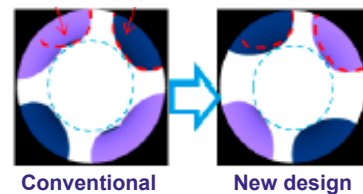
Reduce the vibration dramatically, especially for poor clamping and thin wall work geometry, increase the parts accuracy and parts surface quality for customers.



Optimized flute geometry

Smooth chip evacuation and high rigidity are realized to ensure stable and efficient milling process.

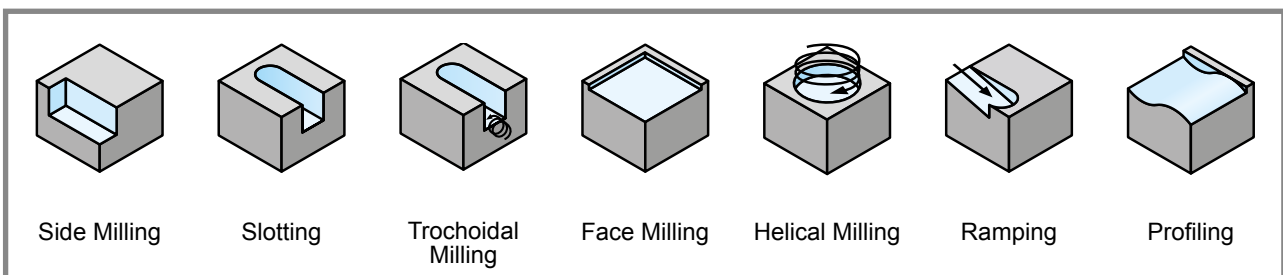
Effect range of chip evacuation



■ Comparison with other Milling Cutters

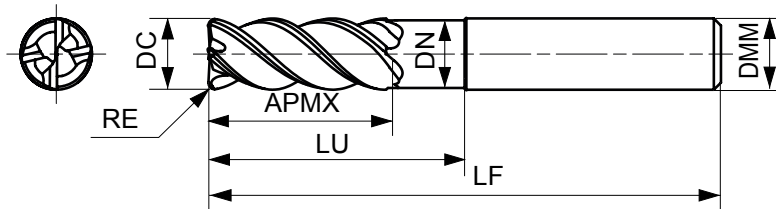
Description	Coating	Diameter	Peripheral Rake	Peripheral Relief	Helix Angle	Core Diameter	No. Edge	Radius Tolerance
GSXVL4000-R	GSX (TiAlCrN)	1–25	3–5	16	40/43	0,6D	4	-0,01/0,01
SSEHVL4000-R	GS Hard (TiAlCrSiCN)	4,5–25	5–7	17	42/45	0,65D	4	-0,01/0,01
EPMS4000-R	TiAlSiN	10–26	5–7	14	42/45	0,7D	4	-0,01/0,01

■ Suitable Applications



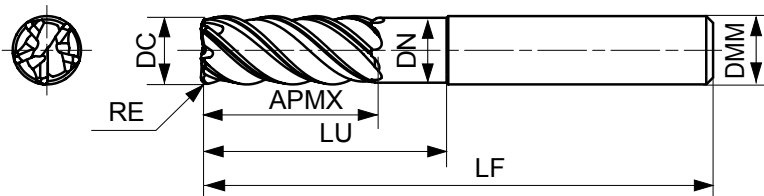
Body

EPMS 4000 Type (Shank DIN 6535 HA)



Cat. No.	Stock	DC	RE	APMX	LU	DN	LF	DMM
EPMS 4100U2.5R10	●	10	1,0	25	32	9,5	72	10
4100U2.5R30	●	10	3,0	25	32	9,5	72	10
EPMS 4120U2.5R10	●	12	1,0	30	38	11,5	83	12
4120U2.5R30	●	12	3,0	30	38	11,5	83	12
4120U2.5R40	●	12	4,0	30	38	11,5	83	12
EPMS 4160U2.5R30	●	16	3,0	40	50	15,5	100	16
4160U2.5R40	●	16	4,0	40	50	15,5	100	16

EPMS 5000 Type (Shank DIN 6535 HA)



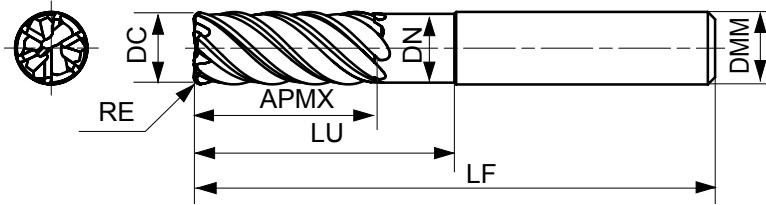
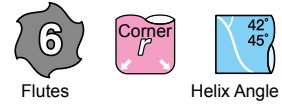
Cat. No.	Stock	DC	RE	APMX	LU	DN	LF	DMM
EPMS 5100U2.5R025	●	10	0,25	25	32	9,5	72	10
5100U2.5R15	●	10	1,5	25	32	9,5	72	10
5100U2.5R25	●	10	2,5	25	32	9,5	72	10
EPMS 5120U2.5R025	●	12	0,25	30	38	11,5	83	12
5120U2.5R05	●	12	0,5	30	38	11,5	83	12
5120U2.5R15	●	12	1,5	30	38	11,5	83	12
5120U2.5R20	●	12	2,0	30	38	11,5	83	12
5120U2.5R25	●	12	2,5	30	38	11,5	83	12
EPMS 5160U2.5R30	●	16	3,0	40	50	15,5	100	16
5160U2.5R40	●	16	4,0	40	50	15,5	100	16
EPMS 5200U2.5R30	●	20	3,0	50	62	19,5	125	20
5200U2.5R40	●	20	4,0	50	62	19,5	125	20

Grade: ECS300 ● Euro stock

EPMS Type

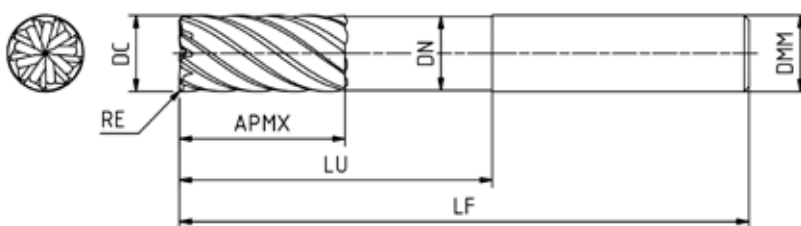
■ Body

EPMS 6000 Type (Shank DIN 6535 HA)



Cat. No.	Stock	DC	RE	APMX	LU	DN	LF	DMM
EPMS 6100U2.5R10	●	10	1,0	25	32	9,5	72	10
6100U2.5R30	●	10	3,0	25	32	9,5	72	10
EPMS 6120U2.5R10	●	12	1,0	30	38	11,5	83	12
6120U2.5R30	●	12	3,0	30	38	11,5	83	12
6120U2.5R40	●	12	4,0	30	38	11,5	83	12
EPMS 6160U2.5R15	●	16	1,5	40	50	15,5	100	16
6160U2.5R30	●	16	3,0	40	50	15,5	100	16
6160U2.5R40	●	16	4,0	40	50	15,5	100	16
EPMS 6200U2.5R30	●	20	3,0	50	62	19,5	125	20
6200U2.5R40	●	20	4,0	50	62	19,5	125	20

EPMS 9000 Type U (Shank DIN 6535 HA)

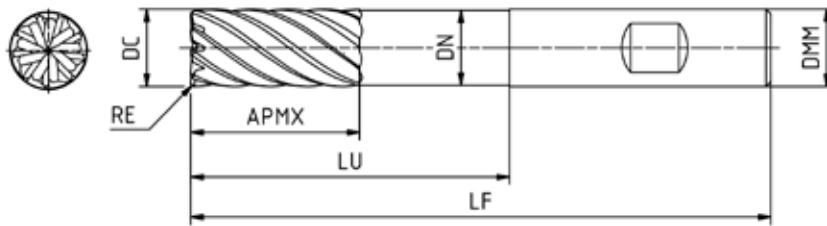


Cat. No.	Stock	DC	RE	APMX	LU	DN	LF	DMM
EPMS 9120U2.5R05	●	12	0,5	30	38	11,5	83	12
9120U2.5R10	●	12	1,0	30	38	11,5	83	12
EPMS 9160U2.2R10	●	16	1,0	35	66	15,5	120	16
9160U2.2R20	●	16	2,0	35	66	15,5	120	16
9160U2.2R30	●	16	3,0	35	66	15,5	120	16

Grade: ECS300 ● Euro stock

Body

EPMS 9000 Type U (Shank DIN 6535 HB WELDON)



Flutes



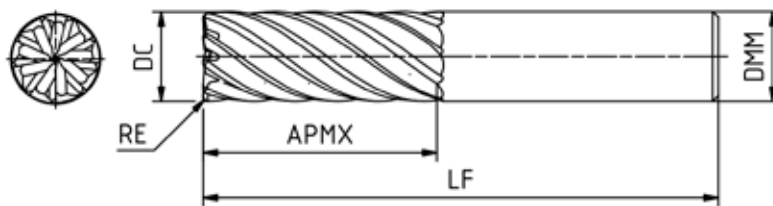
Corner



Helix Angle

Cat. No.	Stock	DC	RE	APMX	LU	DN	LF	DMM
EPMS 9120U2.5WR05	●	12	0,5	30	38	11,5	83	12
9120U2.5WR10	●	12	1,0	30	38	11,5	83	12
EPMS 9160U2.2WR10	●	16	1,0	35	66	15,5	120	16
9160U2.2WR20	●	16	2,0	35	66	15,5	120	16
9160U2.2WR30	●	16	3,0	35	66	15,5	120	16

EPMS 9000 Type S (Shank DIN 6535 HA)



Flutes



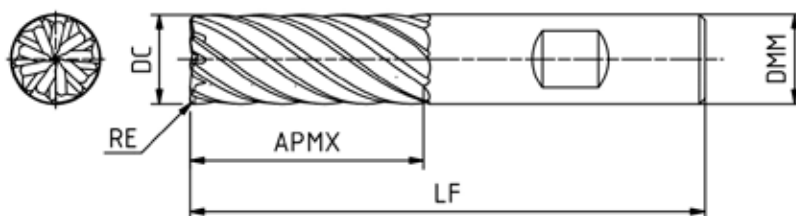
Corner



Helix Angle

Cat. No.	Stock	DC	RE	APMX	LU	DN	LF	DMM
EPMS 9160S2.6R10	●	16	1,0	42	-	-	92	16
9160S2.6R20	●	16	2,0	42	-	-	92	16
9160S2.6R30	●	16	3,0	42	-	-	92	16
EPMS 9160S4.0R10	●	16	1,0	66	-	-	120	16

EPMS 9000 Type S (Shank DIN 6535 HB WELDON)



Flutes



Corner



Helix Angle

Cat. No.	Stock	DC	RE	APMX	LU	DN	LF	DMM
EPMS 9160S2.6WR10	●	16	1,0	42	-	-	92	16
9160S2.6WR20	●	16	2,0	42	-	-	92	16
9160S2.6WR30	●	16	3,0	42	-	-	92	16
EPMS 9160S4.0WR10	●	16	1,0	66	-	-	120	16

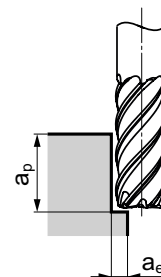
EPMS Type

Cutting Conditions

Side Milling

Work Material		Titanium Alloy, Stainless Steel			
Cond. DC (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)			
		EPMS4000	EPMS5000	EPMS6000	EPMS9000
10,0	3.200	1.280	1.920	3.840	4.320
12,0	2.700	1.080	1.620	3.240	3.645
16,0	2.000	800	1.200	2.400	2.700
20,0	1.600	640	960	1.920	2.160
ae (mm), Standard –Max.		0,2–0,4 DC	0,1–0,3 DC	0,06–0,1 DC	0,05–0,1 DC
ap (mm), Standard –Max.		2,0–2,5 DC			

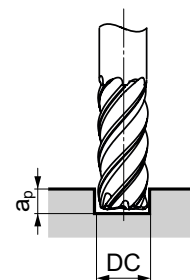
Work Material		Heat-resistant Alloy			
Cond. DC (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)			
		EPMS4000	EPMS5000	EPMS6000	EPMS9000
10,0	1.600	384	640	960	1.296
12,0	1.300	312	520	780	1.053
16,0	1.000	240	400	600	810
20,0	800	192	320	480	648
ae (mm), Standard –Max.		0,2–0,4 DC	0,1–0,3 DC	0,06–0,1 DC	0,05–0,1 DC
ap (mm), Standard –Max.		2,0–2,5 DC			



Slotting

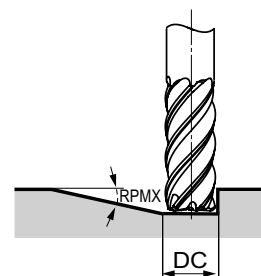
Work Material		Titanium Alloy, Stainless Steel			
Cond. DC (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)			
		EPMS4000	EPMS5000	EPMS6000	EPMS9000
10,0	1.900	460	570	Not recommended	Not recommended
12,0	1.600	380	480		
16,0	1.200	290	360		
20,0	960	230	290		
ap (mm), Standard –Max.		1,0–1,5 DC	0,5–1,0 DC		

Work Material		Heat-resistant Alloy			
Cond. DC (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)			
		EPMS4000	EPMS5000	EPMS6000	EPMS9000
10,0	960	230	290	Not recommended	Not recommended
12,0	800	190	240		
16,0	600	140	180		
20,0	480	120	140		
ap (mm), Standard –Max.		0,3–0,5 DC	0,2–0,4 DC		


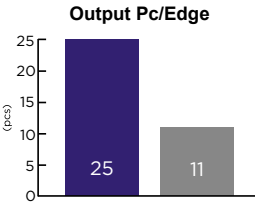
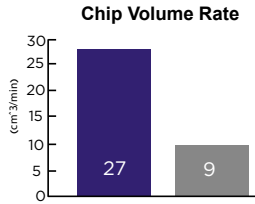


Ramping / Helical Milling


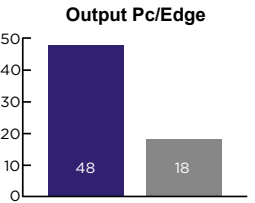
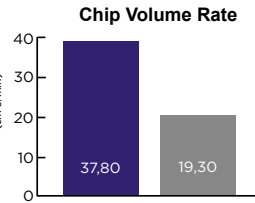
Body Type	EPMS4000	EPMS5000	EPMS6000	EPMS9000
RPMX, Standard –Max.	2,0°–3,0°	2,0°–3,0°	0,5°–2,0°	0,5°–2,0°



Application Examples

Work Piece	Recess Plate	Parameter	Sumitomo	Competitor
Material description	125 Titanium	Cutter Description	EPMS5120U2.5R025	(4 Teeth)
Material Group	-	Approach Angle	-	-
Customer Target	-	Tool Diameter	12	12
		Number of Teeth	5	4
		Insert Geometry	-	-
		Insert Size	-	-
		Chip Breaker	-	-
		Substrate	ECS300	CARBIDE
		RPM $n = [\text{min}^{-1}]$	3184	1000
		Cutting Speed $V_c = [\text{m/min}]$	120	38
		Feed Rate (max) $f_z = [\text{mm/teeth}]$	0,17	0,05
		Feed (average) $v_f = [\text{mm/min}]$	2706	200
		Depth of Cut (max) $a_p = [\text{mm}]$	10,00	10,00
		Width of Cut (max) $a_e = [\text{mm}]$	1,00	4,50
		Chip Volume Rate $Q = [\text{cm}^3/\text{min}]$	27,10	9,00
		Output Pc/Edge [psc]	25,00	11,00
		Tool Life $t_h = [\text{min}]$	1692,14	2236,30
<div style="border: 1px solid black; padding: 5px; display: inline-block;">127% More Tool Life</div>				

● Sumitomo ● competitor

Work Piece	End Plates	Parameter	Sumitomo	Competitor
Material description	1.4112	Cutter Description	EPMS 4000	(4 Teeth)
Material Group	ISO P / Martensitic Steel	Approach Angle	90	90
Customer Target	Increased tool life	Tool Diameter	10	10
		Number of Teeth	4	4
		Insert Geometry	-	-
		Insert Size	-	-
		Chip Breaker	-	-
		Substrate	ECS300	CARBIDE
		RPM $n = [\text{min}^{-1}]$	2865	2400
		Cutting Speed $V_c = [\text{m/min}]$	90	76
		Feed Rate (max) $f_z = [\text{mm/teeth}]$	0,07	0,05
		Feed (average) $v_f = [\text{mm/min}]$	688	500
		Depth of Cut (max) $a_p = [\text{mm}]$	22,00	22,00
		Width of Cut (max) $a_e = [\text{mm}]$	2,50	2,50
		Chip Volume Rate $Q = [\text{cm}^3/\text{min}]$	37,80	19,30
		Output Pc/Edge [psc]	48,00	18,00
		Tool Life $t_h = [\text{min}]$	230,23	237,60
<div style="border: 1px solid black; padding: 5px; display: inline-block;">167% More Tool Life</div>				

● Sumitomo ● competitor

EPMS Type

■ Identification Details

EPMS 4 100 U2.5 R10 ECS300

Series Code	Number of Teeth	Diameter	Neck Type U: Underneck type S: Straigh +L/D 2.5:Length of cutting edge, 2,5 x DC	Other Options* W: Weldon B: Chip Breaker	Corner Radius R10: = 1 mm	Grade
* On request						

Shank diameter tolerance h_5 / Radius tolerance RE: $\pm 0,01$ mm



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