

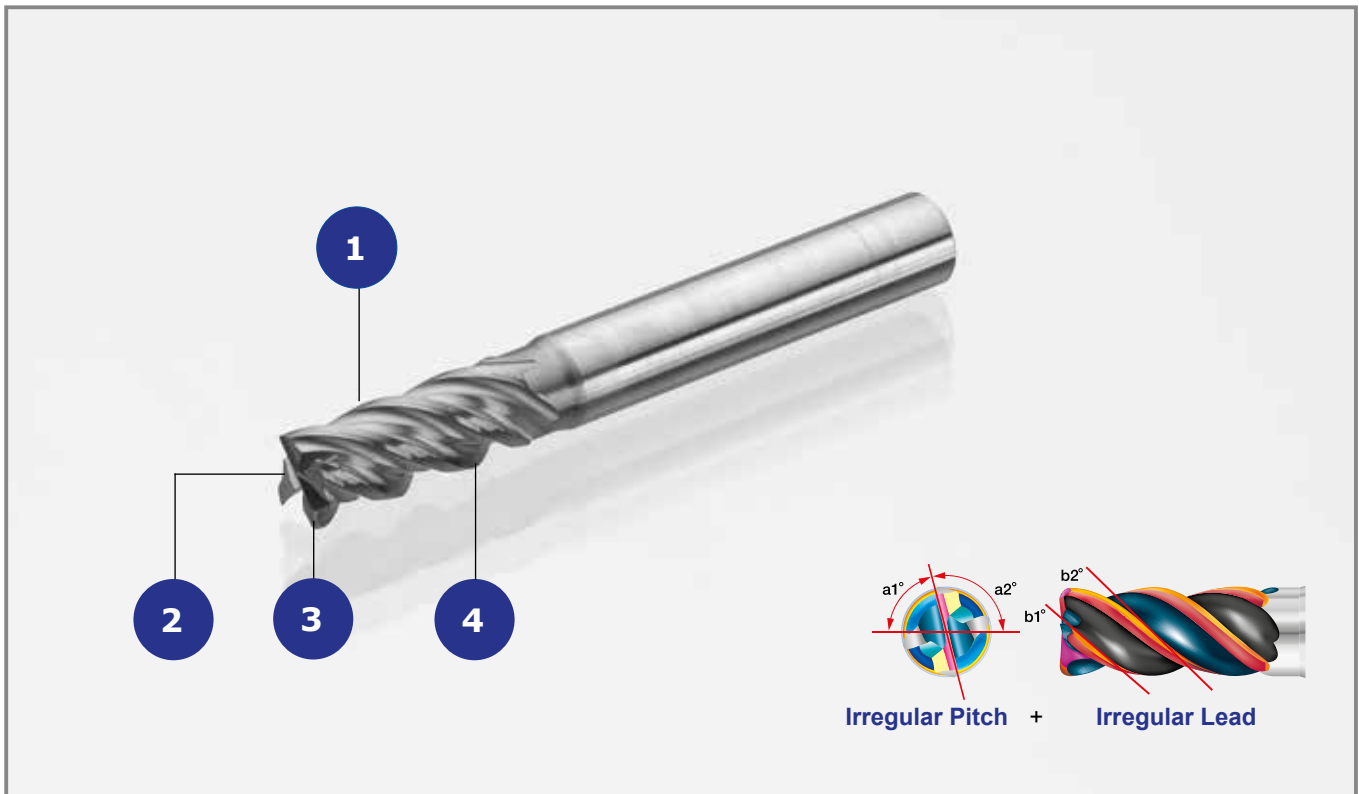
# EPMP - High Efficiency Endmill

for Steel Machining

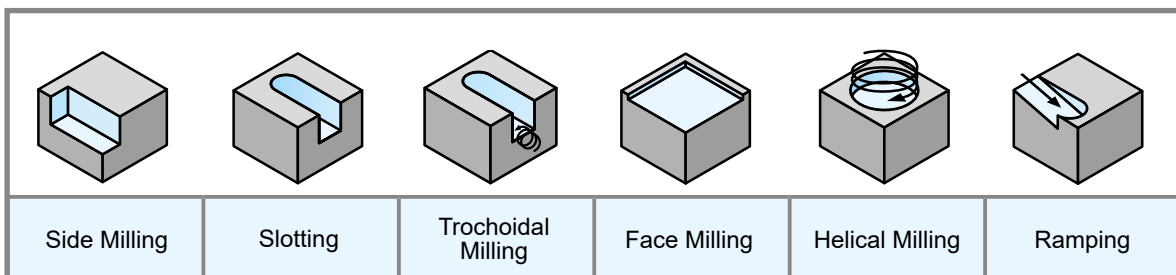


# EPMP - Solid Carbide Endmill

## ■ Features




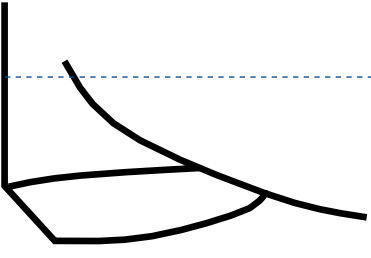
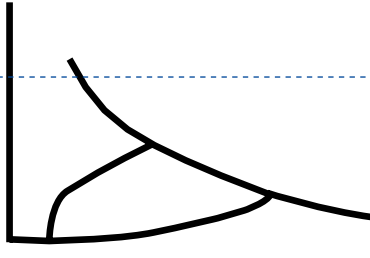
- 1** The optimised flute geometry ensures reliable chip removal.
- 2** Anti-vibration design - the irregular pitch and irregular lead of the mill prevent vibrations.
- 3** Stable cutting corner increases process reliability and productivity. Enhanced cutting edge stability due to double relief angle.
- 4** The Power-Mill coating and a newly developed carbide substrate ensure high wear protection with long tool life.



# EPMP - Solid Carbide Endmill

## ■ Corner Geometry

Increased fracture resistance due to enhanced cutting edge stability.

	Chamfer	Flat land type
		
	<b>EPMP5</b>	<b>EPMP4</b>

## ■ Endmills - Stock Situation

EPMP 4000	Cat. No.	Stock
	EPMP4030U2.5CECP300	●
	EPMP4040U2.5CECP300	●
	EPMP4050U2.5CECP300	●
	EPMP4060U2.5CECP300	●
	EPMP4080U2.5CECP300	●
	EPMP4100U2.5CECP300	●
	EPMP4120U2.5CECP300	●
	EPMP4120U2.5WCECP300	●
	EPMP4160U2.5CECP300	●
	EPMP4160U2.5WCECP300	●
	EPMP4200U2.5CECP300	●
	EPMP4200U2.5WCECP300	●

EPMP 5000	Cat. No.	Stock
	EPMP5060U3BCTECP300	●
	EPMP5060U3BWCTECP300	●
	EPMP5080U3BCTECP300	●
	EPMP5080U3BWCTECP300	●
	EPMP5100U3BCTECP300	●
	EPMP5100U3BWCTECP300	●
	EPMP5120U3BCTECP300	●
	EPMP5120U3BWCTECP300	●
	EPMP5160U3BCTECP300	●
	EPMP5160U3BWCTECP300	●
	EPMP5200U3BCTECP300	●
	EPMP5200U3BWCTECP300	●

## ■ Identification Details

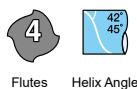
EPMP	4	100	U2.5	(W)C	ECP300
Endmill series	Flute	Diameter	U: Underneck type 2.5: Length of cutting edge, 2,5 x DC	W: Weldon C: Cutting edge, sharp	Grade

EPMP	5	100	U3	B(W)CT	ECP300
Endmill series	Flute	Diameter	U: Underneck type 3: Length of cutting edge, 3,0 x DC	B: Chip breaker W: Weldon shank CT: Corner with K-land	Grade

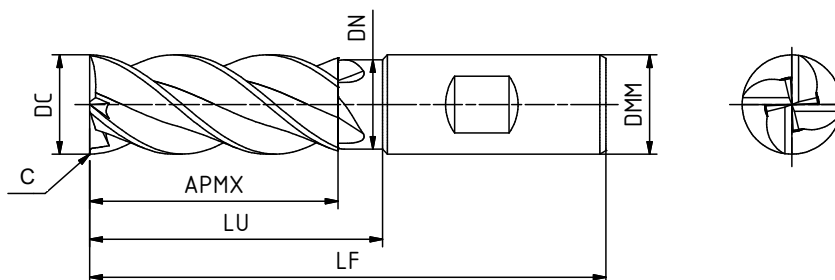
# EPMP - Solid Carbide Endmill

## Endmill Types

### EPMP 4000



Flutes Helix Angle



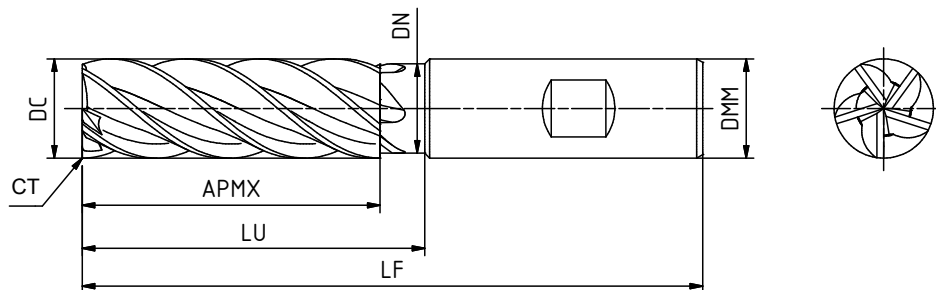
EPMP 4120U2.5CECP300 (Shank DIN6535HA)  
 EPMP 4120U2.5WCECP300 (Shank DIN6535HB)  
 Cutting edge diameter tolerance (0/-0,04)

Cat. No.	DC	APMX	LU	DN	LF	DMM	Flute	Weldon	Chipbreaker
EPMP4030U2.5CECP300	3	7,5	9	2,87	50	6	4		
EPMP4040U2.5CECP300	4	10	12	3,69	50	6	4		
EPMP4050U2.5CECP300	5	12,5	15	4,59	57	6	4		
EPMP4060U2.5CECP300	6	15	18	5,5	57	6	4		
EPMP4080U2.5CECP300	8	20	24	7,3	63	8	4		
EPMP4100U2.5CECP300	10	25	30	9,1	72	10	4		
EPMP4120U2.5CECP300	12	30	36	11	83	12	4		
EPMP4120U2.5WCECP300	12	30	36	11	83	12	4	x	
EPMP4160U2.5CECP300	16	40	48	14,5	92	16	4		
EPMP4160U2.5WCECP300	16	40	48	14,5	92	16	4	x	
EPMP4200U2.5CECP300	20	50	60	18	104	20	4		
EPMP4200U2.5WCECP300	20	50	60	18	104	20	4	x	

### EPMP 5000



Flutes Helix Angle



EPMP5120U3BCTECP300  
 (Shank: DIN6535HA  
 Chamfer CT = 0,2 x 45°)  
 EPMP5120U3WBCTECP300  
 (Shank: DIN6535HB  
 Chamfer CT = 0,2 x 45°)  
 Cutting edge diameter tolerance (0/-0,04)

Cat. No.	DC	APMX	LU	DN	LF	DMM	Flute	Weldon	Chipbreaker
EPMP5060U3BCTECP300	6	18	21	5,5	60	6	5		x
EPMP5060U3BWCTECP300	6	18	21	5,5	60	6	5	x	x
EPMP5080U3BCTECP300	8	24	28	7,3	67	8	5		x
EPMP5080U3BWCTECP300	8	24	28	7,3	67	8	5	x	x
EPMP5100U3BCTECP300	10	30	35	9,1	78	10	5		x
EPMP5100U3BWCTECP300	10	30	35	9,1	78	10	5	x	x
EPMP5120U3BCTECP300	12	36	42	11	90	12	5		x
EPMP5120U3BWCTECP300	12	36	42	11	90	12	5	x	x
EPMP5160U3BCTECP300	16	48	56	14,5	110	16	5		x
EPMP5160U3BWCTECP300	16	48	56	14,5	110	16	5	x	x
EPMP5200U3BCTECP300	20	60	70	18	125	20	5		x
EPMP5200U3BWCTECP300	20	60	70	18	125	20	5	x	x

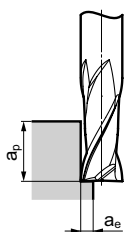
# EPMP - Solid Carbide Endmill

## Recommended Cutting Conditions

### EPMP Z4 - Side Milling

Work Material	Parameter		Diameter (mm)								
			3	4	5	6	8	10	12	16	20
Carbon Steel Cast Iron (-250HB)	$V_c$ Range	(m/min)	150 - <b>200</b> - 280								
	$v_c$	(m/min)	200	200	200	200	200	200	200	200	200
	$n$	( $\text{min}^{-1}$ )	21.200	15.900	12.700	10.600	8.000	6.400	5.300	4.000	3.200
	$f_z$	(mm/t)	0,039	0,055	0,072	0,088	0,116	0,132	0,143	0,165	0,198
	$v_f$	(mm/min)	3260	3500	3630	3730	3700	3380	3030	2640	2530
	$a_p$	(mm)	6	8	10	12	16	20	24	32	40
	$a_e$	(mm)	0,36	0,48	0,6	0,72	0,96	1,2	1,44	1,92	2,4
Alloy Steel (25-35HRC)	$V_c$ Range	(m/min)	100 - <b>170</b> - 250								
	$v_c$	(m/min)	170	170	170	170	170	170	170	170	170
	$n$	( $\text{min}^{-1}$ )	18.000	13.500	10.800	9.000	6.800	5.400	4.500	3.400	2.700
	$f_z$	(mm/t)	0,035	0,050	0,064	0,079	0,104	0,119	0,129	0,149	0,178
	$v_f$	(mm/min)	2490	2670	2780	2850	2830	2570	2320	2020	1920
	$a_p$	(mm)	6	8	10	12	16	20	24	32	40
	$a_e$	(mm)	0,3	0,4	0,5	0,6	0,8	1	1,2	1,6	2
Prehardened Steel Alloy Steel (35-45HRC)	$V_c$ Range	(m/min)	85 - <b>130</b> - 180								
	$v_c$	(m/min)	130	130	130	130	130	130	130	130	130
	$n$	( $\text{min}^{-1}$ )	13.800	10.400	8.300	6.900	5.200	4.100	3.500	2.600	2.100
	$f_z$	(mm/t)	0,027	0,039	0,050	0,062	0,081	0,092	0,100	0,116	0,139
	$v_f$	(mm/min)	1490	1600	1660	1700	1680	1520	1400	1200	1160
	$a_p$	(mm)	4,5	6	7,5	9	12	15	18	24	30
	$a_e$	(mm)	0,3	0,4	0,5	0,6	0,8	1	1,2	1,6	2
Stainless Steel	$V_c$ Range	(m/min)	55 - <b>75</b> - 120								
	$v_c$	(m/min)	75	75	75	75	75	75	75	75	75
	$n$	( $\text{min}^{-1}$ )	8.000	6.000	4.800	4.000	3.000	2.400	2.000	1.500	1.200
	$f_z$	(mm/t)	0,027	0,031	0,040	0,049	0,065	0,074	0,080	0,092	0,111
	$v_f$	(mm/min)	860	740	770	790	780	710	640	550	530
	$a_p$	(mm)	6	8	10	12	16	20	24	32	40
	$a_e$	(mm)	0,27	0,36	0,45	0,54	0,72	0,9	1,08	1,44	1,8

(Min - Optimum - Max)



Side Milling

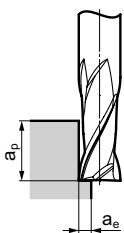
# EPMP - Solid Carbide Endmill

## ■ Recommended Cutting Conditions

### EPMP Z5 - Side Milling

Work Material	Parameter		Diameter (mm)					
			6	8	10	12	16	20
Carbon Steel Cast Iron (-250HB)	$V_c$ Range	(m/min)	150 - <b>200</b> - 280					
	$v_c$	(m/min)	200	200	200	200	200	200
	$n$	( $\text{min}^{-1}$ )	10.600	8.000	6.400	5.300	4.000	3.200
	$f_z$	(mm/t)	0,084	0,110	0,126	0,137	0,158	0,189
	$v_f$	(mm/min)	4450	4410	4030	3620	3150	3020
	$a_p$	(mm)	12	16	20	24	32	40
	$a_e$	(mm)	0,72	0,96	1,2	1,44	1,92	2,4
Alloy Steel (25-35HRC)	$V_c$ Range	(m/min)	100 - <b>170</b> - 250					
	$v_c$	(m/min)	170	170	170	170	170	170
	$n$	( $\text{min}^{-1}$ )	9.000	6.800	5.400	4.500	3.400	2.700
	$f_z$	(mm/t)	0,076	0,099	0,113	0,123	0,142	0,170
	$v_f$	(mm/min)	3400	3370	3060	2760	2410	2300
	$a_p$	(mm)	12	16	20	24	32	40
	$a_e$	(mm)	0,6	0,8	1	1,2	1,6	2
Prehardened Steel Alloy Steel (35-45HRC)	$V_c$ Range	(m/min)	85 - <b>130</b> - 180					
	$v_c$	(m/min)	130	130	130	130	130	130
	$n$	( $\text{min}^{-1}$ )	6.900	5.200	4.100	3.500	2.600	2.100
	$f_z$	(mm/t)	0,059	0,077	0,088	0,096	0,110	0,132
	$v_f$	(mm/min)	2030	2010	1810	1670	1430	1390
	$a_p$	(mm)	9	12	15	18	24	30
	$a_e$	(mm)	0,6	0,8	1	1,2	1,6	2
Stainless Steel	$V_c$ Range	(m/min)	55 - <b>75</b> - 120					
	$v_c$	(m/min)	75	75	75	75	75	75
	$n$	( $\text{min}^{-1}$ )	4.000	3.000	2.400	2.000	1.500	1.200
	$f_z$	(mm/t)	0,050	0,066	0,075	0,081	0,094	0,112
	$v_f$	(mm/min)	1000	980	900	810	700	670
	$a_p$	(mm)	12	16	20	24	32	40
	$a_e$	(mm)	0,54	0,72	0,9	1,08	1,44	1,8

(Min - Optimum - Max)



Side Milling

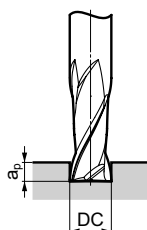
# EPMP - Solid Carbide Endmill

## Recommended Cutting Conditions

### EPMP Z4 - Slot Milling

Work Material	Parameter		Diameter (mm)								
			3	4	5	6	8	10	12	16	20
Carbon Steel Cast Iron (-250HB)	$V_c$ Range	(m/min)	70 - <b>100</b> - 130								
	$v_c$	(m/min)	100	100	100	100	100	100	100	100	100
	$n$	(min <sup>-1</sup> )	10.600	8.000	6.400	5.300	4.000	3.200	2.700	2.000	1.600
	$f_z$	(mm/t)	0,022	0,030	0,038	0,041	0,059	0,073	0,083	0,104	0,115
	$v_f$	(mm/min)	920	960	980	860	940	940	890	840	740
	$a_p$	(mm)	3	4	5	6	8	10	12	16	20
	$a_e$	(mm)	3	4	5	6	8	10	12	16	20
Alloy Steel (25-35HRC)	$V_c$ Range	(m/min)	60 - <b>80</b> - 115								
	$v_c$	(m/min)	80	80	80	80	80	80	80	80	80
	$n$	(min <sup>-1</sup> )	8.500	6.400	5.100	4.200	3.200	2.500	2.100	1.600	1.300
	$f_z$	(mm/t)	0,018	0,025	0,032	0,034	0,049	0,061	0,069	0,087	0,096
	$v_f$	(mm/min)	610	640	650	570	630	610	580	560	500
	$a_p$	(mm)	3	4	5	6	8	10	12	16	20
	$a_e$	(mm)	3	4	5	6	8	10	12	16	20
Prehardened Steel Alloy Steel (35-45HRC)	$V_c$ Range	(m/min)	65 - <b>70</b> - 85								
	$v_c$	(m/min)	70	70	70	70	70	70	70	70	70
	$n$	(min <sup>-1</sup> )	7.400	5.600	4.500	3.700	2.800	2.200	1.900	1.400	1.100
	$f_z$	(mm/t)	0,014	0,020	0,026	0,027	0,039	0,049	0,055	0,070	0,077
	$v_f$	(mm/min)	430	450	460	400	440	430	420	390	340
	$a_p$	(mm)	2,4	3,2	4	4,8	6,4	8	9,6	12,8	16
	$a_e$	(mm)	3	4	5	6	8	10	12	16	20
Stainless Steel	$V_c$ Range	(m/min)	50 - <b>70</b> - 120								
	$v_c$	(m/min)	70	70	70	70	70	70	70	70	70
	$n$	(min <sup>-1</sup> )	5800	4400	3500	2900	2200	1800	1500	1100	900
	$f_z$	(mm/t)	0,014	0,020	0,026	0,027	0,039	0,049	0,055	0,070	0,077
	$v_f$	(mm/min)	230	250	260	260	260	270	240	220	220
	$a_p$	(mm)	3	4	5	6	8	10	12	16	20
	$a_e$	(mm)	3	4	5	6	8	10	12	16	20

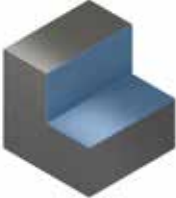
(Min - Optimum - Max)



Slot Milling

# EPMP - Solid Carbide Endmill

## Application Examples

Coolant		Competitor	Sumitomo
		Endmill	Competitor (4 teeth)
Cutting Edges		4	4
Diameter (mm)		8	6
$v_c$ (m/min)		110	130
$n$ (rpm)		4379	6900,2
$f_z$ (mm/t)		0,02	0,04
$v_f$ (mm/min)		350	1104
$a_p$ (mm)		10	10
$a_e$ (mm)		0,2	0,2
$Q$ (cm <sup>3</sup> /min)		0,7	<b>2,2</b>
Machining time (min/part)		0,25	<b>0,1</b>
Tool life (pcs)		300	<b>300</b>
Result		Efficiency increased up to 300%. No vibrations.	



Coolant		Competitor	Sumitomo
		Endmill	Competitor (3 teeth)
Cutting Edges		3	4
Diameter (mm)		6	6
$v_c$ (m/min)		151	170
$n$ (rpm)		8000	9000
$f_z$ (mm/t)		0,029	0,025
$v_f$ (mm/min)		700	900
$a_p$ (mm)		8	8
$a_e$ (mm)		6	6
$Q$ (cm <sup>3</sup> /min)		33,6	<b>43,2</b>
Machining time (min/part)		2	<b>1,6</b>
Tool life (pcs)		80	<b>130</b>
Result		20% increase in efficiency. 60% longer tool life.	



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