

 **SUMITOMO**

CARBIDE - CBN - DIAMOND

PRE ANNOUNCEMENT

**New**

# EPMP - High Efficiency Endmill

for Steel Machining

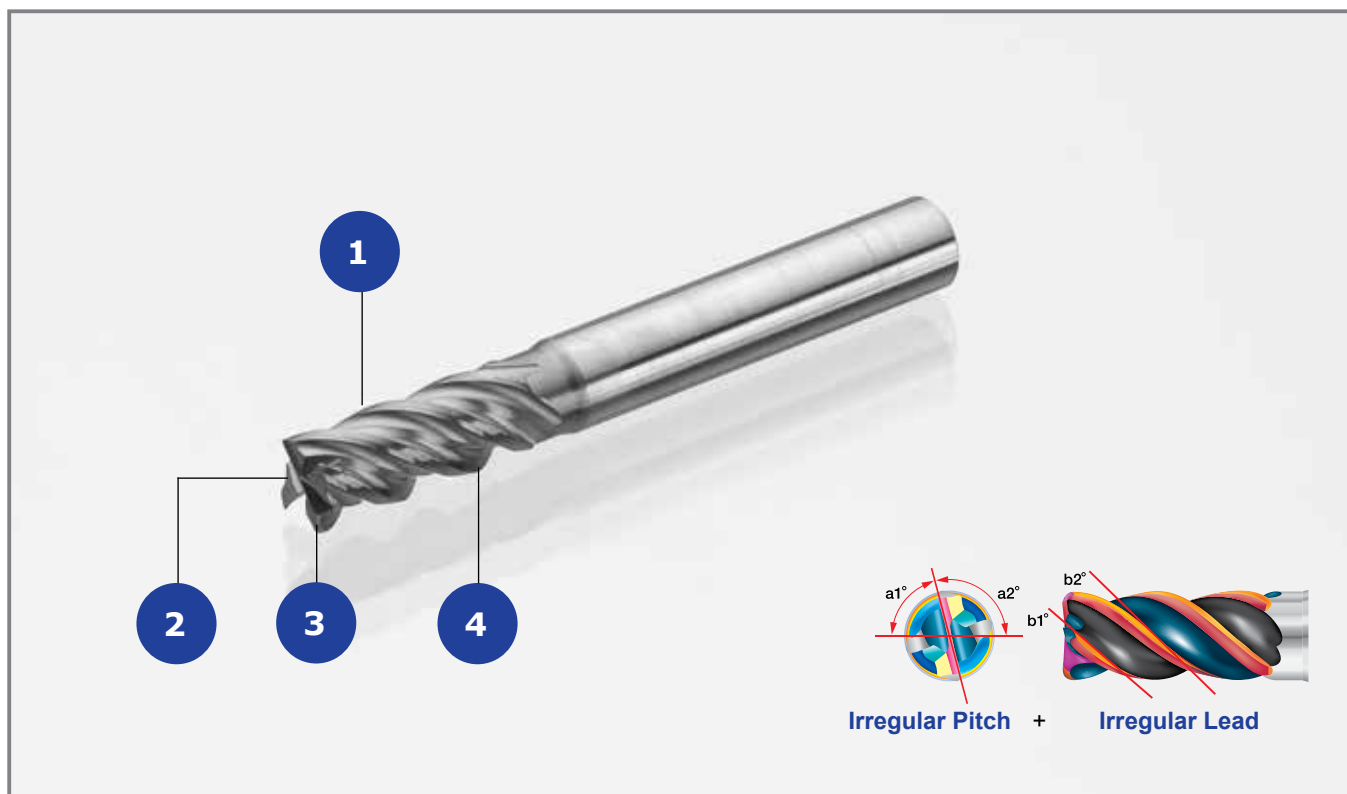


**P M K N S H**

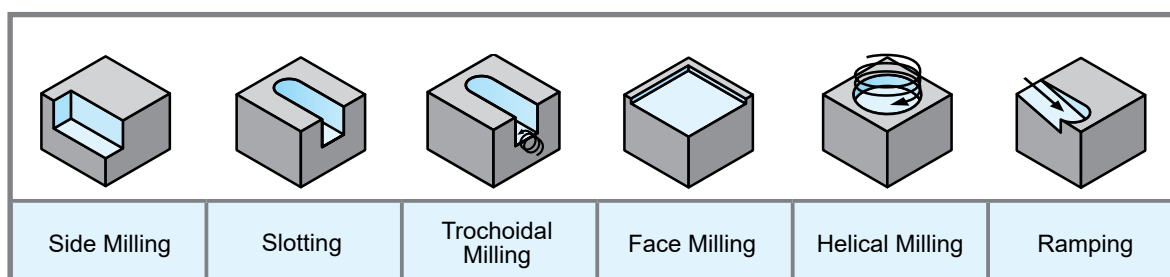
SUMITOMO  
ELECTRIC  
GROUP

# 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 inserts 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.



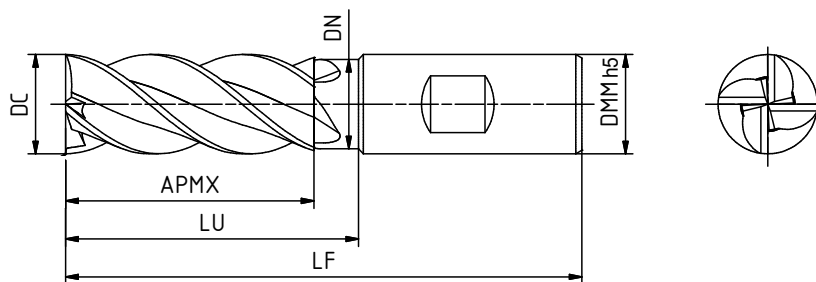
# EPMP - Solid Carbide Endmill

## Endmill Types

### EPMP 4000



Flutes Helix Angle



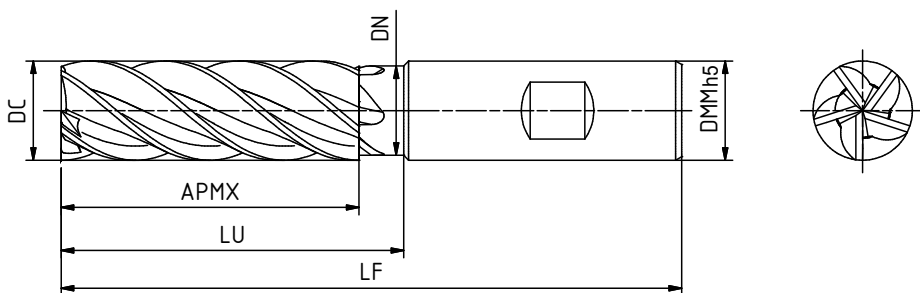
EPMP 4120U2.5CECP300 (Shank DIN6535 HA)  
 EPMP 4120U2.5WCECP300 (Shank DIN6535 HB)  
 Cutting edge diameter tolerance (0/-0,04)

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



EPMP5120U3BCECP300  
 (Shank: DIN6535HA; chipbreaker, Cx45°)  
 EPMP5120U3WBCECP300  
 (Shank: DIN6535HB; chipbreaker, Cx45°)  
 Cutting edge diameter tolerance (0/-0,04)

Cat. No.	DC	APMX	LU	DN	LF	DMM	Flute	Weldon	Chipbreaker
EPMP5060U3BCECP300	6	18	21	5,5	60	6	5		x
EPMP5060U3BWCECP300	6	18	21	5,5	60	6	5	x	x
EPMP5080U3BCECP300	8	24	28	7,3	67	8	5		x
EPMP5080U3BWCECP300	8	24	28	7,3	67	8	5	x	x
EPMP5100U3BCECP300	10	30	35	9,1	78	10	5		x
EPMP5100U3BWCECP300	10	30	35	9,1	78	10	5	x	x
EPMP5120U3BCECP300	12	36	42	11	90	12	5		x
EPMP5120U3BWCECP300	12	36	42	11	90	12	5	x	x
EPMP5160U3BCECP300	16	48	56	14,5	110	16	5		x
EPMP5160U3BWCECP300	16	48	56	14,5	110	16	5	x	x
EPMP5200U3BCECP300	20	60	70	18	125	20	5		x
EPMP5200U3BWCECP300	20	60	70	18	125	20	5	x	x

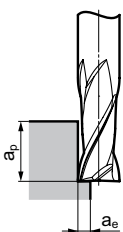
# EPMP - Solid Carbide Endmill

## 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
	$n$	(min <sup>-1</sup> )	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
	$n$	(min <sup>-1</sup> )	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)	70 - <b>120</b> - 160								
	$v_c$	(m/min)	120	120	120	120	120	120	120	120	120
	$n$	(min <sup>-1</sup> )	12.700	9.600	7.600	6.400	4.800	3.800	3.200	2.400	1.900
	$f_z$	(mm/t)	0,027	0,039	0,050	0,062	0,081	0,092	0,100	0,116	0,139
	$v_f$	(mm/min)	1370	1480	1520	1580	1550	1400	1280	1110	1050
	$a_p$	(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)	60 - <b>90</b> - 130								
	$v_c$	(m/min)	90	90	90	90	90	90	90	90	90
	$n$	(min <sup>-1</sup> )	9.600	7.200	5.700	4.800	3.600	2.900	2.400	1.800	1.400
	$f_z$	(mm/t)	0,027	0,039	0,050	0,062	0,081	0,092	0,100	0,116	0,139
	$v_f$	(mm/min)	1030	1110	1140	1180	1160	1070	960	830	780
	$a_p$	(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

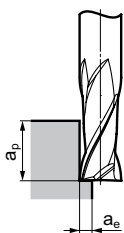
# EPMP - Solid Carbide Endmill

## Recommended Cutting Conditions

### EPMP Z5 - Side Milling

Work Material	Parameter		Diameter (mm)								
			6	8	10	12	16	20	12	16	20
Carbon Steel Cast Iron (-250HB)	$V_c$ Range	(m/min)	150 - 200 - 280								
	$v_c$	(m/min)	200	200	200	200	200	200	200	200	200
	$n$	(min <sup>-1</sup> )	10.600	8.000	6.400	5.300	4.000	3.200	5.300	4.000	3.200
	$f_z$	(mm/t)	0,084	0,110	0,126	0,137	0,158	0,189	0,143	0,165	0,198
	$v_f$	(mm/min)	4450	4410	4030	3620	3150	3020	3030	2640	2530
	$a_p$	(mm)	12	16	20	24	32	40	24	32	40
	$a_e$	(mm)	0,72	0,96	1,2	1,44	1,92	2,4	1,44	1,92	2,4
Alloy Steel (25-35HRC)	$V_c$ Range	(m/min)	100 - 170 - 250								
	$v_c$	(m/min)	170	170	170	170	170	170	170	170	170
	$n$	(min <sup>-1</sup> )	9.000	6.800	5.400	4.500	3.400	2.700	4.500	3.400	2.700
	$f_z$	(mm/t)	0,076	0,099	0,113	0,123	0,142	0,170	0,129	0,149	0,178
	$v_f$	(mm/min)	3400	3370	3060	2760	2410	2300	2320	2020	1920
	$a_p$	(mm)	12	16	20	24	32	40	24	32	40
	$a_e$	(mm)	0,6	0,8	1	1,2	1,6	2	1,2	1,6	2
Prehardened Steel Alloy Steel (35-45HRC)	$V_c$ Range	(m/min)	70 - 120 - 160								
	$v_c$	(m/min)	120	120	120	120	120	120	130	130	130
	$n$	(min <sup>-1</sup> )	6.400	4.800	3.800	3.200	2.400	1.900	3.500	2.600	2.100
	$f_z$	(mm/t)	0,059	0,077	0,088	0,096	0,110	0,132	0,100	0,116	0,139
	$v_f$	(mm/min)	1880	1850	1680	1530	1320	1260	1400	1200	1160
	$a_p$	(mm)	9	12	15	18	24	30	18	24	30
	$a_e$	(mm)	0,6	0,8	1	1,2	1,6	2	1,2	1,6	2
Stainless Steel	$V_c$ Range	(m/min)	60 - 90 - 130								
	$v_c$	(m/min)	90	90	90	90	90	90	90	90	90
	$n$	(min <sup>-1</sup> )	4.800	3.600	2.900	2.400	1.800	1.400	2.400	1.800	1.400
	$f_z$	(mm/t)	0,059	0,077	0,088	0,096	0,110	0,132	0,100	0,116	0,139
	$v_f$	(mm/min)	1410	1390	1280	1150	990	930	960	830	780
	$a_p$	(mm)	12	16	20	24	32	40	24	32	40
	$a_e$	(mm)	0,54	0,72	0,9	1,08	1,44	1,8	1,08	1,44	1,8

(Min - Optimum - Max)



Side Milling

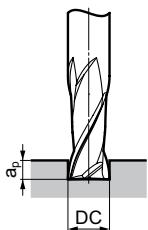
# EPMP - Solid Carbide Endmill

## 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)


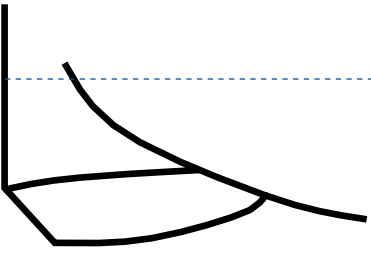
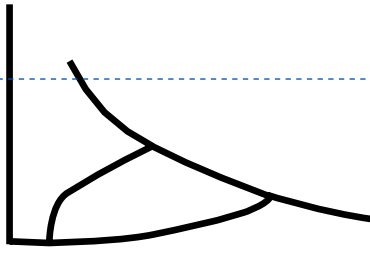


Slot Milling

# EPMP - Solid Carbide Endmill

## Corner Geometry

Increased fracture resistance due to enhanced cutting edge stability.

	Chamfer	Flat land type (C)
		
	EPMP5	EPMP4

## Application Examples



Coolant		Competitor	Sumitomo
	Endmill	Competitor (4 teeth)	EPMP4
	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)	EPMP4060
	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.		



# EPMP - Solid Carbide Endmill



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