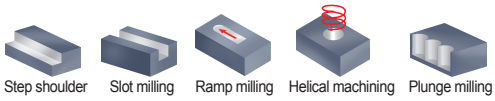
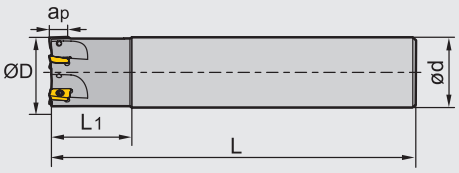
Square shoulder milling tools

Kr:90°



EMP01 P M K S N

Straight shank



Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Weight (kg)
			ØD	ød	L	L_1	a_{pmax}		
EMP01 Straight shank	**-010-G10-AP07-02C(25/85)**	△	10	10	85	25	6.0	2	0.043
	-010-G10-AP07-02C(25/120)	△	10	10	120	25	6.0	2	0.063
	-012-G12-AP07-02C(25/85)	△	12	12	85	25	6.0	2	0.061
	-012-G12-AP07-02C(25/120)	△	12	12	120	25	6.0	2	0.089
	-014-G16-AP07-03C(25/85)	△	14	16	85	25	6.0	3	0.104
	-014-G16-AP07-03C(25/120)	△	14	16	120	25	6.0	3	0.153
	-016-G16-AP07-03C(25/85)	△	16	16	85	25	6.0	3	0.112
	-016-G16-AP07-03C(25/120)	△	16	16	120	25	6.0	3	0.162
	-012-G16-AP11-01	▲	12	16	85	25	10.5	1	0.1
	-016-G16-AP11-02	▲	16	16	90	25	10.5	2	0.1
	-016-G16-AP11-02C(25/85)	△	16	16	85	25	10.5	2	0.108
	-016-G16-AP11-02C(25/120)	△	16	16	120	25	10.5	2	0.16
	-016-G16-AP11-02C(25/180)	△	16	16	180	25	10.5	2	0.248
	-020-G16-AP11-03C(25/85)	△	20	16	85	25	10.5	3	0.121
	-020-G20-AP11-02	▲	20	20	100	30	10.5	2	0.2
	-020-G20-AP11-02C(30/100)	△	20	20	100	30	10.5	2	0.18
	-020-G20-AP11-02C(30/150)	△	20	20	150	30	10.5	2	0.312
	-020-G20-AP11-02C(30/200)	△	20	20	200	30	10.5	2	0.401
	-020-G20-AP11-03C(30/100)	△	20	20	100	30	10.5	3	0.2
	-020-G20-AP11-03C(30/150)	△	20	20	150	30	10.5	3	0.357
	-020-G20-AP11-03C(30/200)	△	20	20	200	30	10.5	3	0.424
	-025-G25-AP11-03	▲	25	25	115	35	10.5	3	0.4
	-025-G25-AP11-03C(35/115)	△	25	25	115	35	10.5	3	0.357
	-025-G25-AP11-03C(35/170)	△	25	25	170	35	10.5	3	0.577
	-025-G25-AP11-03C(35/220)	△	25	25	220	35	10.5	3	0.758
	-025-G25-AP11-04C(35/115)	△	25	25	115	35	10.5	4	0.376
	-025-G25-AP11-04C(35/170)	△	25	25	170	35	10.5	4	0.575
	-025-G25-AP11-04C(35/220)	△	25	25	220	35	10.5	4	0.686

▲Stock available △Make-to-order

EMP01-010-G10-AP07-02C(25/85)

Effective cutting depth/Overall length

Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Weight (kg)
			ØD	ød	L	L_1	apmax		
EMP01 Straight shank	**-030-G25-AP11-04C(35/115)**	△	30	25	115	35	10.5	4	0.411
	-030-G25-AP11-04C(35/170)	△	30	25	170	35	10.5	4	0.61
	-030-G25-AP11-04C(35/220)	△	30	25	220	35	10.5	4	0.791
	-032-G32-AP11-04	▲	32	32	125	40	10.5	4	0.7
	-032-G32-AP11-04C(45/125)	△	32	32	125	45	10.5	4	0.673
	-032-G32-AP11-04C(45/190)	△	32	32	190	45	10.5	4	1.057
	-032-G32-AP11-04C(45/260)	△	32	32	260	45	10.5	4	1.47
	-032-G32-AP11-05C(45/125)	△	32	32	125	45	10.5	5	0.71
	-032-G32-AP11-05C(45/190)	△	32	32	190	45	10.5	5	1.054
	-032-G32-AP11-05C(45/260)	△	32	32	260	45	10.5	5	1.53
	-025-G25-AP16-02	▲	25	25	115	35	15.5	2	0.4
	-025-G25-AP16-02C(35/115)	△	25	25	115	35	15.5	2	0.374
	-025-G25-AP16-02C(35/170)	△	25	25	170	35	15.5	2	0.496
	-025-G25-AP16-02C(35/220)	△	25	25	220	35	15.5	2	0.658
	-030-G25-AP16-02C(35/115)	△	30	25	115	35	15.5	2	0.521
	-030-G25-AP16-02C(35/170)	△	30	25	170	35	15.5	2	0.632
	-030-G25-AP16-02C(35/220)	△	30	25	220	35	15.5	2	0.78
	-032-G32-AP16-03	▲	32	32	125	40	15.5	3	0.7
	-032-G32-AP16-03C(45/125)	△	32	32	125	45	15.5	3	0.607
	-032-G32-AP16-03C(45/190)	△	32	32	190	45	15.5	3	0.976
	-032-G32-AP16-03C(45/260)	△	32	32	260	45	15.5	3	1.374
	-040-G32-AP16-04	▲	40	32	130	42	15.5	4	0.8
	-040-G32-AP16-04C(45/125)	△	40	32	125	45	15.5	4	0.716
	-040-G32-AP16-04C(45/190)	△	40	32	190	45	15.5	4	1.085
	-040-G32-AP16-04C(45/260)	△	40	32	260	45	15.5	4	1.483
	-050-G32-AP16-05	▲	50	32	135	45	15.5	5	1.0
	-050-G32-AP16-05C(45/125)	△	50	32	125	45	15.5	5	0.825
	-050-G32-AP16-05C(45/190)	△	50	32	190	45	15.5	5	1.195
	-050-G32-AP16-05C(45/260)	△	50	32	260	45	15.5	5	1.592
	-063-G32-AP16-06	▲	63	32	135	45	15.5	6	1.4

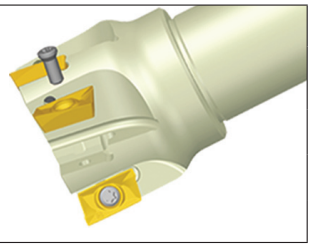
▲Stock available △Make-to-order

EMP01-010-G10-AP07-02C(25/85)

Effective cutting depth/Overall length

Spare parts

Diameter ØD	Inserts	Screw	Wrench	
Ø10-Ø16	AP07	I60M1.8×4	WT05IP	--
Ø12-Ø32	AP11	I60M2.5×6.5T	WT08IP	--
Ø25-Ø63	AP16	I60M4×8.4	--	WT15IS



Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Square shoulder milling tools

Kr:90°


Step shoulder

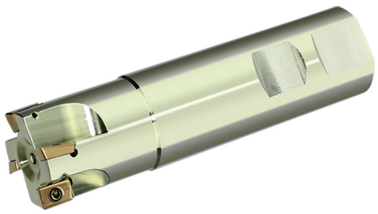

Slot milling


Ramp milling

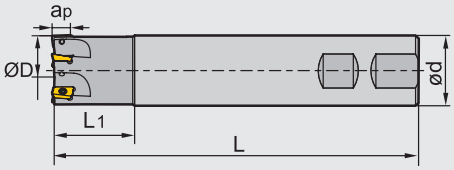

Helical machining


Plunge milling

EMP01 P M K S N



Weldon shank



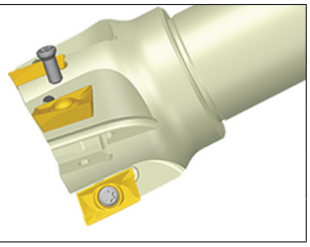
Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Weight (kg)
			ØD	ød	L	L1	apmax		
EMP01 Weldon shank	**-012-XP16-AP11-01**	▲	12	16	85	25	10.5	1	0.1
	-016-XP16-AP11-02	▲	16	16	90	25	10.5	2	0.1
	-020-XP20-AP11-02	▲	20	20	100	30	10.5	2	0.2
	-025-XP25-AP11-03	▲	25	25	115	35	10.5	3	0.4
	-032-XP32-AP11-04	▲	32	32	125	40	10.5	4	0.7
	-025-XP25-AP16-02	▲	25	25	115	35	15.5	2	0.4
	-032-XP32-AP16-03	▲	32	32	125	40	15.5	3	0.7
	-040-XP32-AP16-04	▲	40	32	130	42	15.5	4	0.8
	-050-XP32-AP16-05	▲	50	32	135	45	15.5	5	1.0
	-063-XP32-AP16-06	▲	63	32	135	45	15.5	6	1.4

▲Stock available △Make-to-order

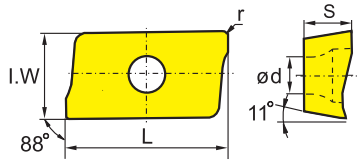
Spare parts

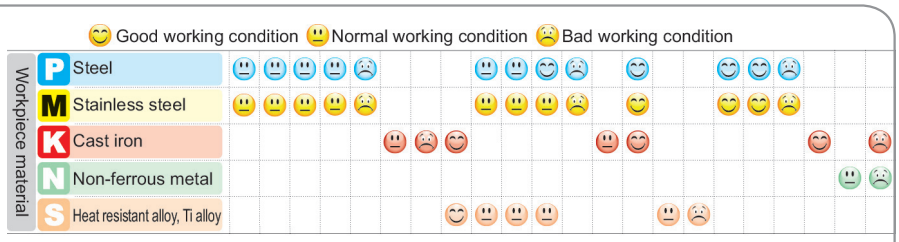
Diameter ØD	Inserts	Screw	Wrench	
				
Ø12-Ø32	AP11	I60M2.5×6.5T	WT08IP	--
Ø25-Ø63	AP16	I60M4×8.4	--	WT15IS



Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Selection of inserts





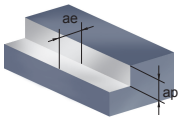
Insert shape	Type	Basic dimensions(mm)					CVD Coating							PVD Coating								Cermet		Cemented carbide			
		L	I.W	S	ød	r	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	APKT070204-APF	7.32	4.34	2.38	2	0.4		●		●							★											
	APKT11T304-APF	12.24	6.6	3.6	2.8	0.4		●		●							★											
	APKT11T308-APF	12.24	6.6	3.6	2.8	0.8		●		●							★				●	●						
	APKT160408-APF	17.877	9.33	5.76	4.4	0.8		●									★				●	●						
	APKT070204-APM	7.32	4.34	2.38	2	0.4				●		●					★											
	APKT11T304-APM	12.24	6.6	3.6	2.8	0.4				●							★											
	APKT11T308-APM	12.24	6.6	3.6	2.8	0.8				●		●					★				●	●						
	APKT11T312-APM	12.24	6.6	3.6	2.8	1.2						●					★											
	APKT11T316-APM	12.24	6.6	3.6	2.8	1.6											★											
	APKT11T320-APM	12.24	6.6	3.6	2.8	2.0				●							★											
	APKT160408-APM	17.877	9.33	5.76	4.4	0.8				●		●					★				●	●						
	APKT160416-APM	17.877	9.33	5.76	4.4	1.6				●		●					★				●							
	APKT160420-APM	17.877	9.33	5.76	4.4	2.0						●					★											
	APKT160424-APM	17.877	9.33	5.76	4.4	2.4											★											
	APKT160430-APM	17.877	9.33	5.76	4.4	3.0											★											
	APKT11T304-ALH	12.24	6.6	3.6	2.8	0.4																				★	★
	APKT11T308-ALH	12.24	6.6	3.6	2.8	0.8																				★	○
	APKT160408-ALH	17.877	9.33	5.76	4.4	0.8																				★	★

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Chipbreaker selection

Classification \ Application	For finishing	For semi-finishing
P	-APF	-APM
M	-APF	-APM
S	-APF	-APM
K	-APF	-APM
N	-ALH	

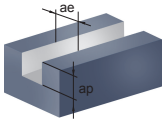
1 Square shoulder milling



Recommended cutting parameters (D: Diameter)

Workpiece material		Hardness HB	Insert grade	Cutting parameters			
				Vc(m/min)	fz(mm/z)		a_e(mm)
					-APF	-APM	
P	Low-carbon steel、Soft steel	⩽180	YBC302	320 (240-400)	0.1 (0.08-0.2)	--	⩽0.5D
			YB9320	320 (200-400)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	
			YBM253	300 (320-350)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	
	High-carbon steel、Alloy steel	180-280	YBC302	280 (210-380)	0.1 (0.08-0.2)	--	⩽0.5D
			YB9320	280 (180-350)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	
			YBM253	260 (150-380)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	
	Alloy tool steel	280-350	YBC302	260 (180-350)	0.1 (0.08-0.2)	--	⩽0.5D
			YB9320	260 (160-330)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	
			YBM253	220 (150-280)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	
M	Stainless steel	⩽270	YB9320	200 (110-300)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	⩽0.5D
			YBM253	180 (150-300)			
K	Cast iron	180-250	YB9320	180 (150-250)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	⩽0.5D
			YBD152	200 (150-250)	--	0.2 (0.1-0.3)	
S	Difficult-to-machine materials	⩽400	YBS203	100 (60-120)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	⩽0.5D
			YBS303	100 (60-120)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	⩽0.5D
N					-ALH		
	Aluminium alloy	--	YD101	300-	0.2 (0.08-0.4)		⩽0.5D
			YD201	300-	0.2 (0.08-0.4)		⩽0.5D

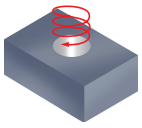
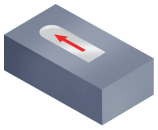
2 Slot milling



Recommended cutting parameters (D: Diameter)

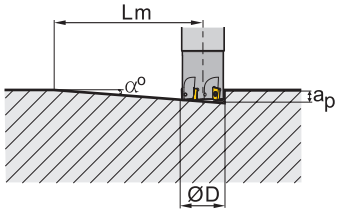
Workpiece material		Hardness HB	Insert grade	Cutting parameters			
				Vc(m/min)	fz(mm/z)		a_e(mm)
					-APF	-APM	
P	Low-carbon steel、Soft steel	⩽180	YBC302	190 (170-250)	0.1 (0.08-0.15)	--	D
			YB9320	190 (140-250)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	
			YBM253	150 (130-210)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	
	High-carbon steel、Alloy steel	180-280	YBC302	170 (150-220)	0.1 (0.08-0.15)	--	D
			YB9320	170 (130-250)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	
			YBM253	140 (110-200)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	
	Alloy tool steel	280-350	YBC302	150 (130-210)	0.1 (0.08-0.15)	--	D
			YB9320	150 (110-240)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	
			YBM253	130 (110-180)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	
M	Stainless steel	⩽270	YB9320	120 (80-190)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	D
			YBM253	100 (80-170)			
K	Cast iron	180-250	YB9320	120 (80-180)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	D
			YBD152	120 (80-210)	--	0.15 (0.1-0.25)	
S	Difficult-to-machine materials	⩽400	YBS203	60 (45-110)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	D
			YBS303	60 (45-110)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	D
N					-ALH		
	Aluminium alloy	--	YD101	300-	0.2 (0.08-0.3)		D
			YD201	300-	0.2 (0.08-0.3)		D

3 Ramp milling, helical interpolation milling

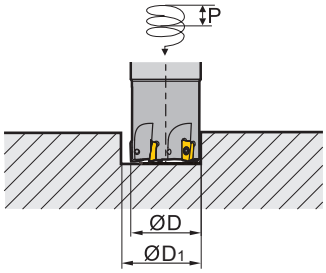
Recommended cutting parameters (D: Diameter)

● Ramp milling



$$L_m = \frac{a_p}{tg\alpha}$$ (α:Maximum ramp angle)

● Helical interpolation milling



$$tg\alpha = \frac{P}{\pi D_1}$$ (α:Helical angle)

Diameter ØD(mm)	APKT Ramp milling, helical interpolation milling (Inserts-7)				
	Ramp milling			Helical interpolation milling	
	Maximum cutting depth	Maximum ramp angle	Minimum length	Minimum diameter	Maximum pitch
	a_p(mm)	α°	Lm(mm)	$ØD_1$(mm)	(mm)
10	6	6	57	12	2.0
12	6	4	85	15	2.0
14	6	3	114	18	2.0
16	6	2.5	137	21	2.0
Diameter ØD(mm)	APKT Ramp milling, helical interpolation milling (Inserts-11)				
	Ramp milling			Helical interpolation milling	
	Maximum cutting depth	Maximum ramp angle	Minimum length	Minimum diameter	Maximum pitch
	a_p(mm)	α°	Lm(mm)	$ØD_1$(mm)	(mm)
16	10.0	10.0	56.7	20.0	2.0
20	10.0	5.0	114.4	28.0	2.0
25	10.0	4.5	127.0	40.0	2.0
30	10.0	3.5	153.0	48.0	2.0
32	10.0	3.0	190.8	56.0	2.0
40	10.0	2.0	286.4	70.0	2.0
Diameter ØD(mm)	APKT Ramp milling, helical interpolation milling (Inserts-16)				
	Ramp milling			Helical interpolation milling	
	Maximum cutting depth	Maximum ramp angle	Minimum length	Minimum diameter	Maximum pitch
	a_p(mm)	α°	Lm(mm)	$ØD_1$(mm)	(mm)
25	15	6	142	32	2.0
30	15	5	171	40	2.0
32	15	4.5	214	45	2.0
40	15	2.5	343	60	2.0
50	15	1.5	572	80	2.0
63	15	1	859	105	2.0

Note: For cutting speed and feed rate per tooth, see square shoulder milling.

Case for EMP01

Machine: Vertical machining center
Diameter：Ø40mm
Operation：Interpolation milling
Insert：APKT160408-APM/YB9320
Workpiece material：P20(HRC 33-36)
Cutting data：
Vc=150m/min
f= 0.2mm/z

Insert specification/grade：APKT160408-APM/YB9320

Tools specification：EMP01-040-XP32-AP16-04

●Comprehensively improve mould cavity machining efficiency

Optimized structure in combination with brand-new "golden drill" coating technique, ZCC·CT products with APM chipbreaker is more suitable for mold cavity machining, greatly improve machining efficiency when compare with competitors similar products.