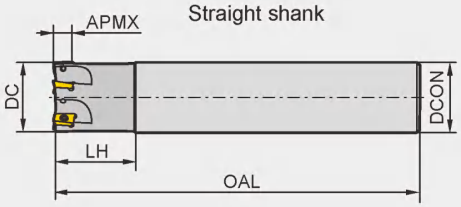
Square shoulder milling tools

KAPR:90°

EMP01 P M K S N

Straight shank



Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Weight (kg)
			DC	DCON	OAL	LH	APMX		
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

Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Weight (kg)
			DC	DCON	OAL	LH	APMX		
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

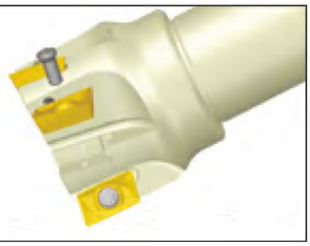
▲Stock available △Make-to-order

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

Effective cutting depth/Overall length

Spare parts

Diameter DC	Inserts	Screw	Wrench
			
Ø10-Ø16	APKT07	I60M1.8×4	WT05IP
Ø12-Ø32	APKT11	I60M2.5×6.5T	WT08IP
Ø25-Ø63	APKT16	I60M4×8.4	WT15IP

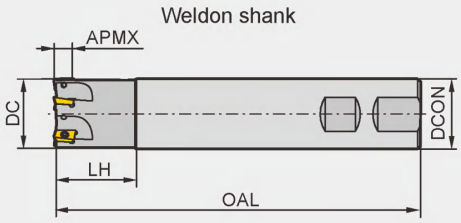


Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Square shoulder milling tools

KAPR:90°

EMP01 P M K S N



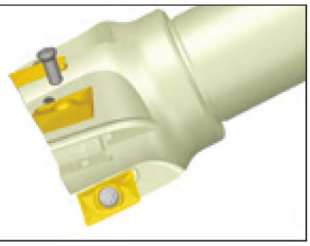
Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Weight (kg)
			DC	DCON	OAL	LH	APMX		
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 DC	Inserts	Screw	Wrench
			
Ø12-Ø32	APKT11	I60M2.5×6.5T	WT08IP
Ø25-Ø63	APKT16	I60M4×8.4	WT15IP

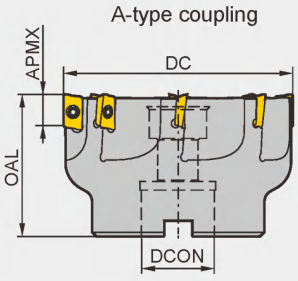


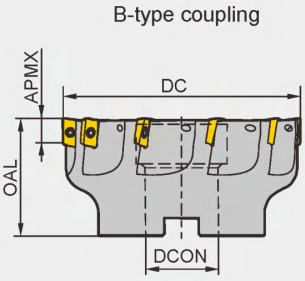
Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Square shoulder milling tools

KAPR:90°

EMP02 P M K S N





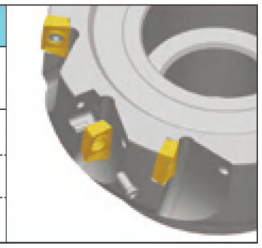
Specification of tools

Type		Stock	Basic dimensions(mm)				Number of teeth Z	Type of coupling	Weight (kg)
			DC	DCON	OAL	APMX			
EMP02	-050-A22-AP11-06	▲	50	22	40	10.5	6	A	0.3
	-063-A22-AP11-08	▲	63	22	40	10.5	8	A	0.6
	-080-A27-AP11-08	▲	80	27	50	10.5	8	A	1.2
	-100-B32-AP11-10	▲	100	32	50	10.5	10	B	1.7
	-050-A22-AP16-05	▲	50	22	40	15.5	5	A	0.3
	-063-A22-AP16-06	▲	63	22	40	15.5	6	A	0.5
	-080-A27-AP16-07	▲	80	27	50	15.5	7	A	1.1
	-100-B32-AP16-08	▲	100	32	50	15.5	8	B	1.6
	-125-B40-AP16-10	▲	125	40	63	15.5	10	B	3.2
	-160-B40-AP16-10	▲	160	40	63	15.5	10	B	6.3

▲Stock available △Make-to-order

Spare parts

Diameter DC	Inserts	Screw	Wrench
			
Ø50-Ø100	AP11	I60M2.5×6.5T	WT08IS
Ø50-Ø160	AP16	I60M4×10	WT15IS



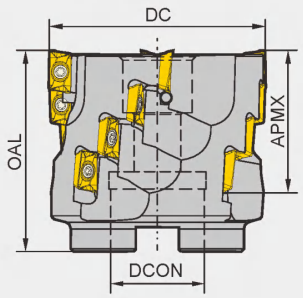
Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Square shoulder milling tools

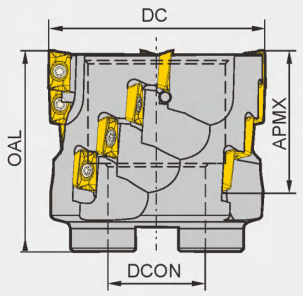
KAPR:90°

EMP03 P M K S N

A-type coupling



B-type coupling



Specification of tools

Type		Stock	Basic dimensions(mm)				Number of teeth z	Number of inserts	Type of coupling	Weight (kg)
			DC	DCON	OAL	APMX				
EMP03	-050-A22-AP11-04	▲	50	22	58	39	4	16	A	0.5
	-063-A27-AP11-04	▲	63	27	58	39	4	16	A	0.9
	-080-B32-AP11-05	▲	80	32	63	39	5	20	B	1.3
	-100-B40-AP11-06	▲	100	40	63	39	6	24	B	2.0
	-040x43-A16-AP16-02	△	40	16	63	43	2	6	A	0.4
	-050x43-A22-AP16-03	△	50	22	63	43	3	9	A	0.6
	-063x57-A27-AP16-04	△	63	27	80	57	4	16	A	1.2
	-080x57-A32-AP16-04	△	80	32	80	57	4	16	A	2.1

▲Stock available △Make-to-order

Spare parts

Diameter DC	Inserts	Screw	Wrench
			
Ø50-Ø63	APKT11	I60M2.5×6.5T	WT08IP
Ø80-Ø100			WT08IS
Ø40-Ø63	APKT16	I60M4×10	WT15IP
Ø80			WT15IS

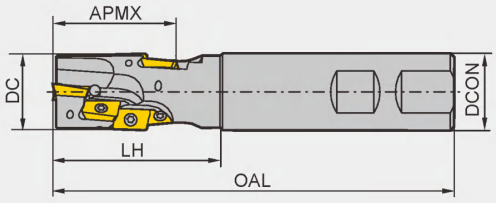
Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Square shoulder milling tools

KAPR:90°

EMP04 P M K S N

Weldon shank



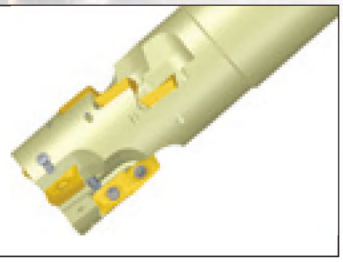
Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth z	Number of inserts	Weight (kg)
			DC	DCON	OAL	LH	APMX			
EMP04	-020-XP20-AP11-01	▲	20	20	120	45	29.4	1	3	0.3
	-025-XP25-AP11-02	▲	25	25	130	55	38.9	2	8	0.4
	-032-XP32-AP11-02	▲	32	32	140	65	48.5	2	10	0.7
	-040-XP40-AP11-02	▲	40	40	150	75	58.0	2	14	1.3
	040x57-XP40-AP16-02	△	40	40	150	75	57	2	8	1.3
	050x57-XP50-AP16-03	△	50	50	160	75	57	3	12	2.1

▲Stock available △Make-to-order

Spare parts

Diameter DC	Inserts	Screw	Wrench
			
Ø20-Ø40	APKT11	I60M2.5×6.5T	WT08IP
Ø40-Ø50	APKT16	I60M4×10	WT15IP



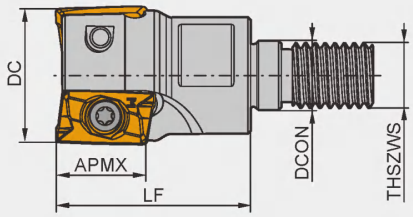
Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Square shoulder milling tools

KAPR:90°

QCH-*APKT*M*Series

P M K S N



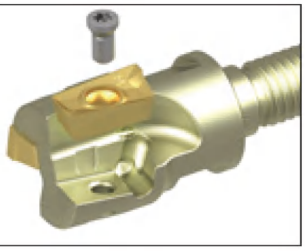
Specification of tools

Type		Stock	Basic dimensions(mm)					Applicable inserts	Number of teeth Z	Weight (kg)
			DC	DCON	LF	APMX	THSZWS			
QCH	-16-APKT07-M8-03	▲	16	8.5	25	6	8	APKT0702□□-□□	3	0.030
	-20-APKT07-M10-04	▲	20	10.5	30	6	10		4	0.060
	-16-APKT11-M8-02	▲	16	8.5	28	10.5	8	APKT11T3□□-□□	2	0.026
	-20-APKT11-M10-03	▲	20	10.5	30	10.5	10		3	0.050
	-22-APKT11-M10-03	▲	22	10.5	35	10.5	10		3	0.065
	-25-APKT11-M12-04	▲	25	12.5	35	10.5	12		4	0.100
	-28-APKT11-M12-04	▲	28	12.5	40	10.5	12		4	0.120
	-32-APKT11-M16-05	▲	32	17	45	10.5	16		5	0.219
	-40-APKT11-M16-06	▲	40	17	42	10.5	16		6	0.270
	-25-APKT16-M12-02	▲	25	12.5	35	15.5	12	APKT1604□□-□□	2	0.081
	-28-APKT16-M12-02	▲	28	12.5	40	15.5	12		2	0.120
	-32-APKT16-M16-02	▲	32	17	45	15.5	16		2	0.210
	-32-APKT16-M16-03	▲	32	17	45	15.5	16		3	0.189
	-40-APKT16-M16-03	▲	40	17	45	15.5	16		3	0.235
	-40-APKT16-M16-04	▲	40	17	45	15.5	16		4	0.225

▲Stock available △Make-to-order

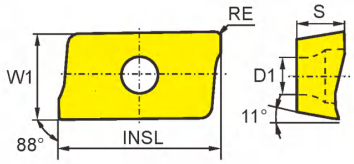
Spare parts

Diameter DC	Inserts	Insert screw	Wrench
			
Ø16-Ø20	APKT07	I60M1.8×4	WT05IP
Ø16-Ø40	APKT11	I60M2.5×5.5	WT07IP
Ø25-Ø40	APKT16	I60M4×8.4	WT15IP



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Selection of inserts



Good working condition Normal working condition Bad working condition

Workpiece material		
P	Steel	😃 😃 · · · 😃 😃 😊 ☹ · · 😊 😊 · ·
M	Stainless steel	😃 😃 · · · 😃 😃 😃 ☹ · · 😊 😊 · ·
K	Cast iron	· · 😃 😃 ☹ 😊 · · · · · · · · ☹
N	Non-ferrous metal	· · · · · · · · · · · · · 😃 ☹
S	Heat resistant alloy, Ti alloy	· · · · · 😊 😃 😃 😃 · 😃 ☹ · · · ·

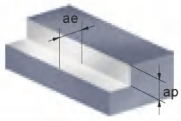
Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating							Cermet		Cemented carbide	
		INSL	W1	S	D1	RE	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	APKT11T304-APL	12.24	6.6	3.6	2.8	0.4									★					○		
	APKT11T308-APL	12.24	6.6	3.6	2.8	0.8	★	★	★						★			○				
	APKT160408-APL	17.877	9.33	5.76	4.4	0.8	★	★	★						★			○				
	APKT160420-APL	17.877	9.33	5.76	4.4	2.0									★							
	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									★							
	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	●								★		●	●				
	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	Finishing	Medium, semi-finishing	Light,semi-finishing
P	-APF	-APM	-APL
M	-APF	-APM	-APL
S	-APF	-APM	-APL
K	-APF	-APM	-APL
N	-ALH		

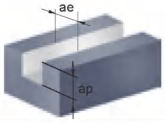
1 Square shoulder milling



Recommended cutting parameters (D: Diameter)

Workpiece material		Hardness HB	Insert grade	Cutting parameters				
				V (m/min)	f (mm/z)			a_e(mm)
					-APF	-APM	-APL	
P	Low-carbon steel, Soft steel	⩽180	YBC302	320 (240-400)	0.1 (0.08-0.2)	--	0.1 (0.08-0.2)	⩽0.5D
			YB9320	320 (200-400)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.1 (0.08-0.2)	
			YBM253	300 (320-350)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.1 (0.08-0.2)	
	High-carbon steel, Alloy steel	180-280	YBC302	280 (210-380)	0.1 (0.08-0.2)	--	0.1 (0.08-0.2)	⩽0.5D
			YB9320	280 (180-350)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.1 (0.08-0.2)	
			YBM253	260 (150-380)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.1 (0.08-0.2)	
	Alloy tool steel	280-350	YBC302	260 (180-350)	0.1 (0.08-0.2)	--	0.1 (0.08-0.2)	⩽0.5D
			YB9320	260 (160-330)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.1 (0.08-0.2)	
			YBM253	220 (150-280)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.1 (0.08-0.2)	
M	Stainless steel	⩽270	YB9320	200 (110-300)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.1 (0.08-0.2)	⩽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)	0.1 (0.08-0.2)	⩽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)	0.1 (0.08-0.2)	⩽0.5D
			YBS303	100 (60-120)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.1 (0.08-0.2)	⩽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



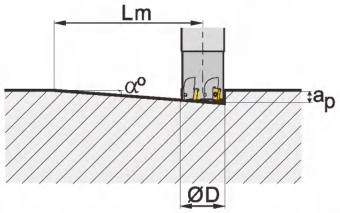
Recommended cutting parameters (D: Diameter)

Workpiece material		Hardness HB	Insert grade	Cutting parameters				
				V (m/min)	f (mm/z)			a_e(mm)
					-APF	-APM	-APL	
P	Low-carbon steel, Soft steel	⩽180	YBC302	190 (170-250)	0.1 (0.08-0.15)	--	0.1 (0.08-0.15)	D
			YB9320	190 (140-250)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.1 (0.08-0.15)	
			YBM253	150 (130-210)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.1 (0.08-0.15)	
	High-carbon steel, Alloy steel	180-280	YBC302	170 (150-220)	0.1 (0.08-0.15)	--	0.1 (0.08-0.15)	D
			YB9320	170 (130-250)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.1 (0.08-0.15)	
			YBM253	140 (110-200)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.1 (0.08-0.15)	
	Alloy tool steel	280-350	YBC302	150 (130-210)	0.1 (0.08-0.15)	--	0.1 (0.08-0.15)	D
			YB9320	150 (110-240)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.1 (0.08-0.15)	
			YBM253	130 (110-180)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.1 (0.08-0.15)	
M	Stainless steel	⩽270	YB9320	120 (80-190)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.1 (0.08-0.15)	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)	0.1 (0.08-0.15)	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)	0.1 (0.08-0.15)	D
			YBS303	60 (45-110)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.1 (0.08-0.15)	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

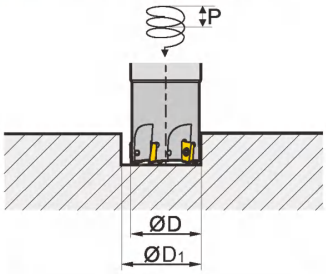
Recommended cutting parameters (D: Diameter)

● 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

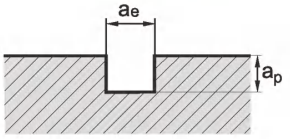
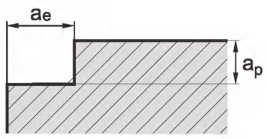
Insert specification/grade: APKT160408-APM/YB9320

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.

Recommended cutting parameters

Slot milling	Square shoulder milling	Deep square shoulder milling
		
a_e=D，a_p≤0.5D	a_e≤0.5D，a_p≤1.2D	a_e≤0.2D，a_p<Cutting length of insert

Workpiece material		Hardness HB	Insert grade	Cutting parameters			
				Square shoulder milling			
				V (m/min)	f (mm/z)		
					-APF	-APM	-APL
P	Low-carbon steel, Soft steel	≤180	YBC302	270 (240-350)	0.1 (0.08-0.2)	--	0.1 (0.08-0.2)
			YB9320	220 (200-360)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.1 (0.08-0.2)
			YBM253	270 (180-300)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.1 (0.08-0.2)
	High-carbon steel, Alloy steel	180-280	YBC302	240 (210-320)	0.1 (0.08-0.2)	--	0.1 (0.08-0.2)
			YB9320	240 (180-360)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.1 (0.08-0.2)
			YBM253	200 (160-280)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.1 (0.08-0.2)
	Alloy tool steel	280-350	YBC302	220 (180-300)	0.1 (0.08-0.2)	--	0.1 (0.08-0.2)
			YB9320	220 (160-340)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.1 (0.08-0.2)
			YBM253	180 (150-250)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.1 (0.08-0.2)
M	Stainless steel	≤270	YB9320	150 (110-270)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.1 (0.08-0.2)
			YBM253	140 (100-250)			
K	Cast iron	180-250	YB9320	150 (100-200)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.1 (0.08-0.2)
			YBD152	180 (120-300)	--	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)	0.1 (0.08-0.2)
			YBS303	100 (60-120)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	0.1 (0.08-0.2)
N					-ALH		
	Aluminium alloy	--	YD101	300-	0.2 (0.08-0.4)		
			YD201	300-	0.2 (0.08-0.4)		

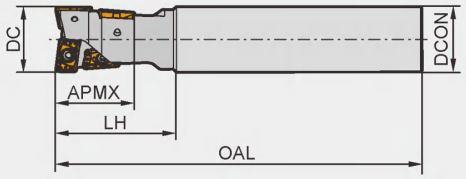
Workpiece material		Hardness HB	Insert grade	Cutting parameters			
				Slot milling、Deep square shoulder milling			
				V (m/min)	f (mm/z)		
					-APF	-APM	-APL
P	Low-carbon steel, Soft steel	≤180	YBC302	270 (240-350)	0.1 (0.08-0.15)	--	0.1 (0.08-0.15)
			YB9320	270 (200-360)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.1 (0.08-0.15)
			YBM253	220 (180-300)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.1 (0.08-0.15)
	High-carbon steel, Alloy steel	180-280	YBC302	240 (210-320)	0.1 (0.08-0.15)	--	0.1 (0.08-0.15)
			YB9320	240 (180-360)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.1 (0.08-0.15)
			YBM253	200 (160-280)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.1 (0.08-0.15)
	Alloy tool steel	280-350	YBC302	220 (180-300)	0.1 (0.08-0.15)	--	0.1 (0.08-0.15)
			YB9320	220 (160-340)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.1 (0.08-0.15)
			YBM253	180 (150-250)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.1 (0.08-0.15)
M	Stainless steel	≤270	YB9320	150 (110-270)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.1 (0.08-0.15)
			YBM253	140 (100-250)			
K	Cast iron	180-250	YB9320	150 (100-200)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.1 (0.08-0.15)
			YBD152	180 (120-300)	--	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)	0.1 (0.08-0.15)
			YBS303	60 (45-110)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	0.1 (0.08-0.15)
N					-ALH		
	Aluminium alloy	--	YD101	300-	0.2 (0.08-0.3)		
			YD201	300-	0.2 (0.08-0.3)		

Square shoulder milling tools

KAPR:90°

EMP05 P M K

Standardized edge



Specification of tools

Type		Stock	Basic dimensions(mm)					Insert quantities			
			DC	DCON	LH	OAL	APMX	End teeth	Quantity	Peripheral	Quantity
EMP05	-016-G16-AD08-C	▲	16	16	33	120	19	ADKT080308L-GM	1	ADKT090308R-GM	3
	-020-G20-AD10-C	▲	20	20	35	130	23	ADKT100308L-GM	1	ADKT100308R-GM	3
	-025-G25-AD12-C	▲	25	25	45	140	29	ADKT12T308L-GM	1	ADKT12T308R-GM	3
	-032-G32-AD15-C	▲	32	32	50	150	34	ADKT160508L-GM	1	ADKT150508R-GM	3
	-040-G32-AD12-C	▲	40	32	55	160	40	ADKT12T308L-GM	2	ADKT12T308R-GM	4
	-050-G40-AD15-C	▲	50	40	70	170	50	ADKT160508L-GM	2	ADKT150508R-GM	4

▲Stock available △Make-to-order

Spare parts

Diameter DC	Inserts	Screw	Wrench
			
Ø16	ADKT-GM	I60M2.2×5.5	WT07IP
Ø20		I60M2.5×6.5T	WT08IP
Ø25		I60M3×7	WT09IP
Ø32		I43M4×8	WT15S
Ø40		I60M3×7	WT09IP
Ø50		I43M4×8	WT15S

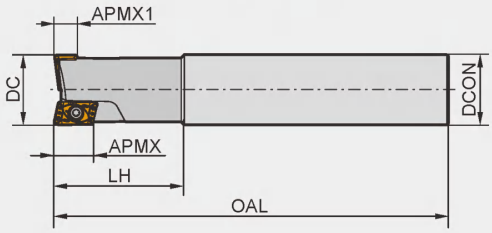
Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Square shoulder milling tools

KAPR:90°

EMP05 P M K

short flutes



Specification of tools

Type		Stock	Basic dimensions(mm)						Insert quantities			
			DC	DCON	LH	OAL	APMX	APMX1	End teeth	Quantity	Peripheral	Quantity
EMP05	**-S016-G16-AD08-C**	▲	16	16	33	120	8.5	4.5	ADKT080308L-GM	1	ADKT090308R-GM	1
	-S017-G16-AD08-C	▲	17									
	-S020-G20-AD10-C	▲	20	20	35	130	9.5	5.5	ADKT100308L-GM	1	ADKT100308R-GM	1
	-S021-G20-AD10-C	▲	21									
	-S025-G25-AD12-C	▲	25	25	45	140	12.5	7	ADKT12T308L-GM	1	ADKT12T308R-GM	1
	-S026-G25-AD12-C	▲	26									
	-S032-G32-AD15-C	▲	32	32	50	150	14.5	8.5	ADKT160508L-GM	1	ADKT150508R-GM	1
	-S040-G32-AD12-C	▲	40	32	55	160	12.5	7	ADKT12T308L-GM	2	ADKT12T308R-GM	1
	-S050-G40-AD15-C	▲	50	40	70	170	14.5	8.5	ADKT160508L-GM	2	ADKT150508R-GM	1

▲Stock available △Make-to-order

Spare parts

Diameter DC	Inserts	Screw	Wrench
			
Ø16	ADKT-GM	I60M2.2X5.5	WT07IP
Ø17			
Ø20		I60M2.5X6.5T	WT08IP
Ø21			
Ø25		I60M3X7	WT09IP
Ø26			
Ø32		I43M4X8	WT15S
Ø40		I60M3X7	WT09IP
Ø50		I43M4X8	WT15S

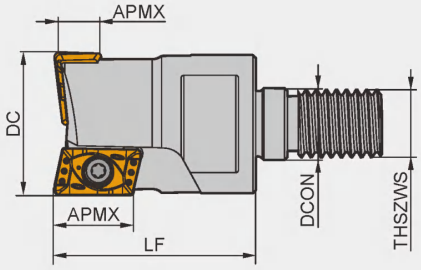
Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Square shoulder milling tools

KAPR:90°

QCH-*AD*M*Series

P M K



Specification of tools

Type		Stock	Basic dimensions(mm)						Insert quantities				Weight (kg)
			DC	THSZWS	DCON	LF	APMX	APMX1	End teeth	Quantity	Peripheral	Quantity	
QCH	-16-AD08-M08-C	▲	16	M8	8.5	28	8.5	4.5	ADKT080308L-GM	1	ADKT090308R-GM	1	0.027
	-17-AD08-M08-C	▲	17	M8	8.5	28	8.5	4.5	ADKT080308L-GM	1	ADKT090308R-GM	1	0.029
	-20-AD10-M10-C	▲	20	M10	10.5	30	9.5	5.5	ADKT100308L-GM	1	ADKT100308R-GM	1	0.053
	-21-AD10-M10-C	▲	21	M10	10.5	30	9.5	5.5	ADKT100308L-GM	1	ADKT100308R-GM	1	0.055
	-25-AD12-M12-C	▲	25	M12	12.5	35	12.5	7	ADKT12T308L-GM	1	ADKT12T308R-GM	1	0.087
	-26-AD12-M12-C	▲	26	M12	12.5	35	12.5	7	ADKT12T308L-GM	1	ADKT12T308R-GM	1	0.095
	-32-AD15-M16-C	▲	32	M16	17	43	14.5	8.5	ADKT160508L-GM	1	ADKT150508R-GM	1	0.19
	-33-AD15-M16-C	▲	33	M16	17	43	14.5	8.5	ADKT160508L-GM	1	ADKT150508R-GM	1	0.2
	-40-AD12-M16-C	▲	40	M16	17	45	12.5	7	ADKT12T308L-GM	2	ADKT12T308R-GM	1	0.25

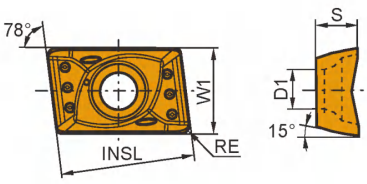
▲Stock available △Make-to-order

Spare parts

Diameter DC	Inserts	Screw	Wrench
			
Ø16-17	ADKT-GM	I60M2.2×5.5	WT07IP
Ø20-21		I60M2.5×6.5T	WT08IP
Ø25-26		I60M3×7	WT09IP
Ø32-33		I43M4×8	WT15S
Ø40		I60M3×7	WT09IP

Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Selection of inserts



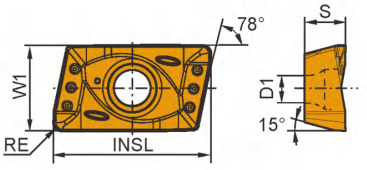
Good working condition Normal working condition Bad working condition

Workpiece material		YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
P	Steel	😐	😐					😐	😐	😊	☹			😊	😊		
M	Stainless steel	😐	😐					😐	😐	😐	☹			😊	😊		
K	Cast iron			😐	😐	☹	😊										☹
N	Non-ferrous metal															😐	☹
S	Heat resistant alloy, Ti alloy						😊	😐	😐	😐		😐	☹				

Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating							Cermet		Cemented carbide	
		INSL	W1	S	D1	RE	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	**ADKT080308L-GM**	7.96	5.33	3	2.4	0.5									★							
	ADKT100308L-GM	10	6.44	3.2	2.8	0.5									★							
	ADKT12T308L-GM	12.44	8	3.9	3.5	0.5									★							
	ADKT160508L-GM	16	9.62	5	4.4	0.5									★							

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

Selection of inserts



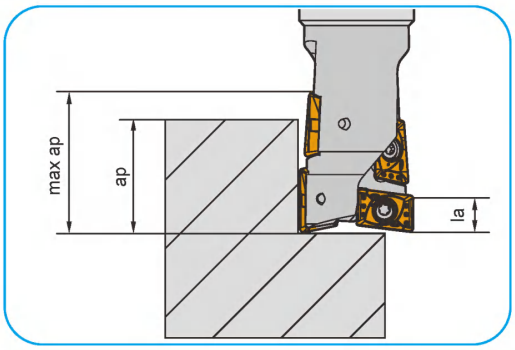
Good working condition Normal working condition Bad working condition

Workpiece material		YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
P	Steel	😐	😐					😐	😐	😊	☹			😊	😊		
M	Stainless steel	😐	😐					😐	😐	😐	☹			😊	😊		
K	Cast iron			😐	😐	☹	😊										☹
N	Non-ferrous metal															😐	☹
S	Heat resistant alloy, Ti alloy						😊	😐	😐	😐		😐	☹				

Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating							Cermet		Cemented carbide	
		INSL	W1	S	D1	RE	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	**ADKT090308R-GM**	10	5	2.8	2.4	0.8									★							
	ADKT100308R-GM	11.65	6.04	3.5	2.8	0.8									★							
	ADKT12T308R-GM	15	8.16	3.9	3.54	0.8									★							
	ADKT150508R-GM	17.05	8.81	4.95	4.5	0.8									★							

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

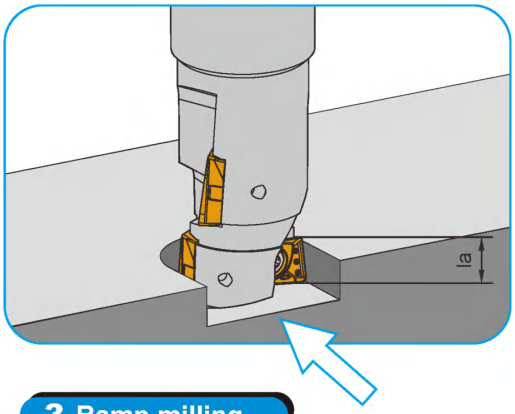
1 Square shoulder milling



- When the cutting depth is less than la, both the left and right inserts are involved in cutting
- When the cutting depth is larger than la, the right insert is involved in cutting for exceeding depth beyond la
- Generally, as the cutting depth increases, it is necessary to reduce the tool speed appropriately and feed rate
- The longer the overhang of the shank, the more likely it is to vibrate during machining. When vibration occurs, please reduce the cutting parameters appropriately until there is no visible vibration.

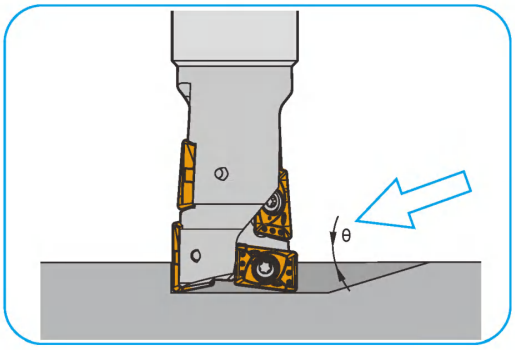
External diameter	L&R double-edge cutting zone la	Recommended cutting depth ap	Maximum cutting depth Max ap
Ø6, Ø17	~4.5	13~16	19
Ø20, Ø21	~5.5	15~18	23
Ø25, Ø26	~7.0	18~24	29
Ø32, Ø33	~8.5	21~28	34
Ø40	~7.0~	21~23	42
Ø50	~8.5~	21~28	50

2 Slot milling



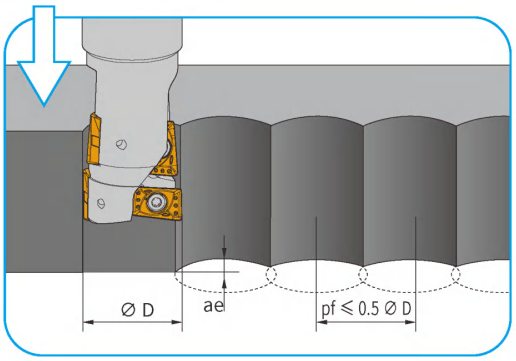
- It is recommended that the cutting depth for slot milling should not exceed la
- It is recommended that the feed for slot milling does not exceed 70% of that for shoulder milling with the same parameters.
- The longer the overhang of the shank, the more likely it is to vibrate during machining. When vibration occurs, please reduce the cutting parameters appropriately until there is no visible vibration

3 Ramp milling



- It is recommended that the ramp angle of normal P materials should not exceed 3° when conducting a ramp milling
- It is recommended that the feed for ramp milling does not exceed 70% of that for shoulder milling with the same parameters
- It is recommended that the ramp angle for P materials with a hardness of more than HRC45 should not exceed 1°
- The longer the overhang of the shank, the more likely it is to vibrate during machining. When vibration occurs, please reduce the cutting parameters appropriately until there is no visible vibration

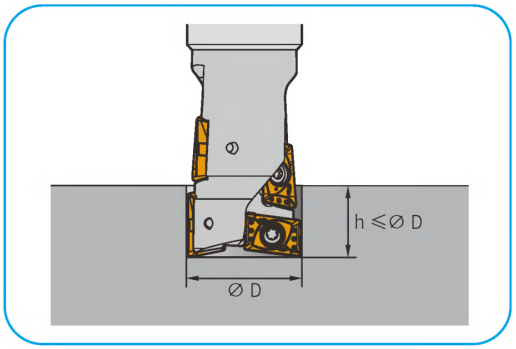
4 Plunging



- It is recommended that the feed of insert for plunging is 1.5-1.8 times that of drilling and milling
- The recommended radial feed ae refer to the following table when the stepover pf ≤ 0.5D

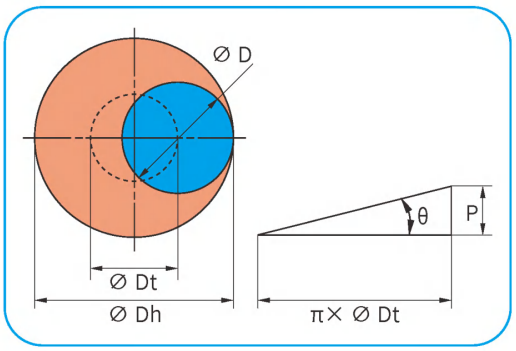
Diameter	Ø16	Ø20	Ø25	Ø32	Ø40	Ø50
Radial cutting depth ae	4.5	6	7.5	8.5	7.5	8.5

5 Drilling and milling



- The drilling depth h should be less than half of the tool diameter ØD. In addition, materials with a hardness over HRC40 should be helical bored
- For chip removal, step feed should be performed
- Blast equipment removes cuts during processing
- Take appropriate safety measures during machining as chips may fly off in unexpected directions

6 Helical interpolation



- Referring to the machining parameters, feed is set 70% value. The outer diameter of helical interpolation milling is 1.2-1.8 times the diameter of the milling tool. The size of the inclination angle refers to the angle range of ramp milling; use compressed air to remove the chips in the hole

Tool centre path: Ø Dt= Ø Dh- Ø Dc

Feed per helix: P=π× Ø Dt×tanθ

1 Drilling and milling

Recommended cutting parameters

The drilling depth h should be less than half of the tool diameter φD. Materials with a hardness over HRC40 should be helical bored

Workpiece material		Hardness HB	Insert grade	Cutting parameters	
				V（m/min）	f（mm/z）
P	Low-carbon steel, Soft steel	≤180	YB9320	180(120-220)	0.2(0.08-0.25)
P	High-carbon steel, Alloy steel	180-280	YB9320	160(130-200)	0.15(0.08-0.2)
P	Alloy tool steel	280-350	YB9320	140(120-180)	0.12(0.05-0.2)
M	Stainless steel	≤270	YB9320	80(50-150)	0.08(0.03-0.15)
K	Cast iron	180-250	YB9320	150(100-220)	0.15(0.08-0.2)

2 Miliing

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Square shoulder milling	
				V（m/min）	f（mm/z）
P	Low-carbon steel, Soft steel	≤180	YB9320	190(140-250)	0.08(0.04-0.15)
P	High-carbon steel, Alloy steel	180-280	YB9320	170(130-250)	0.08(0.04-0.15)
P	Alloy tool steel	280-350	YB9320	150(120-180)	0.08(0.04-0.15)
M	Stainless steel	≤270	YB9320	120(80-190)	0.08(0.04-0.15)
K	Cast iron	180-250	YB9320	120(80-210)	0.08(0.04-0.15)

- 4 available cutting edges and precise 90°square shoulder.
- Double rake angle can effectively reduce cutting force.
- High precision of cutting tool can achieve high quality and efficient roughing.
- The Tangential assembling can change the cutting force of main direction to be borne by the thickness direction to realize the high rigidity of the cutting tool.
- The optimized material of cutter body with high strength and special coating treatment achieves better wear-resistance and longer tool life.

KAPR:90°

A New Generation of Tangential Milling Tool EMP09 Series

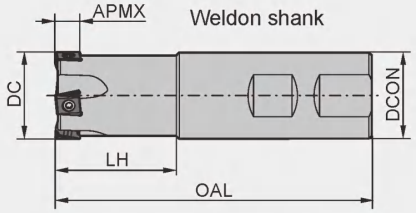
To meet the diverse processing needs and achieve efficient rough machining.

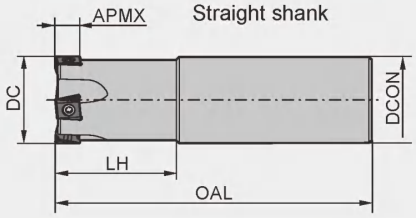
- High strength of tool nose, sharp cutting and good wear resistance.
- The spiral cutting edge stands for a lighter chipbreaker.
- Excellent universal coating materials, super smooth coating technology, no sticky chip and longer life.
- The vertical design makes the carbide has large volume along the direction of the cutting force, so that the feed per tooth is 30% higher than the flat load insert.

Square shoulder milling tools

KAPR:90°

EMP09 P M K S





Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Weight (kg)
			DC	DCON	OAL	LH	APMX		
EMP09 Weldon shank	**-020-XP20-LN08-02C**	▲	20	20	100	25	8.0	2	0.20
	-020-XP20-LN08-03C	▲	20	32	100	25	8.0	3	0.20
	-025-XP25-LN08-03C	▲	25	25	100	32	8.0	3	0.36
	-025-XP25-LN08-04C	▲	25	25	100	32	8.0	4	0.35
	-032-XP32-LN08-04C	▲	32	32	115	40	8.0	4	0.67
	-032-XP32-LN08-05C	▲	32	32	115	40	8.0	5	0.67
	-040-XP40-LN08-05C	▲	40	40	125	40	8.0	5	1.15
	-040-XP40-LN08-06C	▲	40	40	125	40	8.0	6	1.14
	-032-XP32-LN12-03C	▲	32	32	115	40	11.5	3	0.60
	-040-XP40-LN12-03C	▲	40	40	125	40	11.5	3	1.11
	-040-XP40-LN12-04C	▲	40	40	125	40	11.5	4	1.10
Straight shank	**-020-G20-LN08-02C**	▲	20	20	100	25	8.0	2	0.2
	-020-G20-LN08-03C	▲	20	20	100	25	8.0	3	0.2
	-025-G25-LN08-03C	▲	25	25	100	32	8.0	3	0.36
	-025-G25-LN08-04C	▲	25	25	100	32	8.0	4	0.35
	-032-G32-LN08-04C	▲	32	32	115	40	8.0	4	0.67
	-032-G32-LN08-05C	▲	32	32	115	40	8.0	5	0.67
	-040-G40-LN08-05C	▲	40	40	125	40	8.0	5	1.1
	-040-G40-LN08-06C	▲	40	40	125	40	8.0	6	1.1
	-032-G32-LN12-03C	▲	32	32	115	40	11.5	3	0.6
	-040-G40-LN12-03C	▲	40	40	125	40	11.5	3	1.11
	-040-G40-LN12-04C	▲	40	40	125	40	11.5	4	1.10

▲Stock available △Make-to-order

Spare parts

Diameter DC	Inserts	Screw	Wrench
			
Ø20-Ø40	LN□T0804□□-GM/GL	I60M3×7	WT09IP
Ø32-Ø40	LN□T1206□□-GM/GL	I60M4×12	WT15IP

Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Square shoulder milling tools

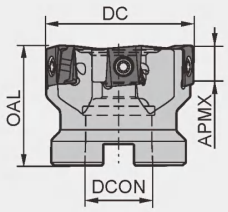
KAPR:90°


Face milling

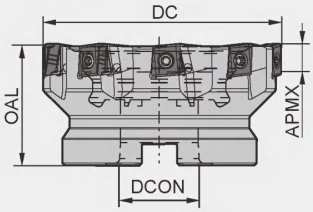

Step shoulder milling

EMP09 P M K S

A-type coupling



B-type coupling



Specification of tools

Type		Stock	Basic dimensions(mm)				Number of teeth Z	Type of coupling	Weight (kg)
			DC	DCON	OAL	APMX			
EMP09	-040-A16-LN08-05C	▲	40	16	40	8.0	5	A	0.21
	-040-A16-LN08-06C	▲	40	16	40	8.0	6	A	0.21
	-050-A22-LN08-06C	▲	50	22	40	8.0	6	A	0.35
	-050-A22-LN08-07C	▲	50	22	40	8.0	7	A	0.35
	-063-A22-LN08-08C	▲	63	22	40	8.0	8	A	0.60
	-063-A22-LN08-10C	▲	63	22	40	8.0	10	A	0.60
	-080-A27-LN08-10C	▲	80	27	50	8.0	10	A	1.26
	-080-A27-LN08-12C	▲	80	27	50	8.0	12	A	1.26
	-040-A16-LN12-03C	▲	40	16	40	11.5	3	A	0.20
	-040-A16-LN12-04C	▲	40	16	40	11.5	4	A	0.19
	-050-A22-LN12-05C	▲	50	22	40	11.5	5	A	0.30
	-050-A22-LN12-06C	▲	50	22	40	11.5	6	A	0.30
	-063-A22-LN12-06C	▲	63	22	40	11.5	6	A	0.54
	-063-A22-LN12-08C	▲	63	22	40	11.5	8	A	0.54
	-080-A27-LN12-07C	▲	80	27	50	11.5	7	A	1.18
	-080-A27-LN12-10C	▲	80	27	50	11.5	10	A	1.18
	-100-B32-LN12-09C	▲	100	32	50	11.5	9	B	1.64
	-100-B32-LN12-13C	▲	100	32	50	11.5	13	B	1.64
	-125-B40-LN12-11C	▲	125	40	63	11.5	11	B	2.74
	-125-B40-LN12-16C	▲	125	40	63	11.5	16	B	2.74

▲Stock available △Make-to-order

Square shoulder milling tools

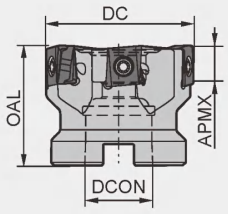
KAPR:90°


Face milling

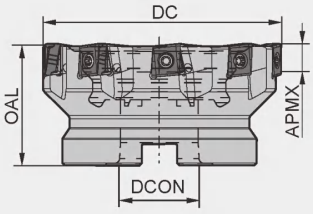

Step shoulder milling

EMP09 P M K S

A-type coupling



B-type coupling



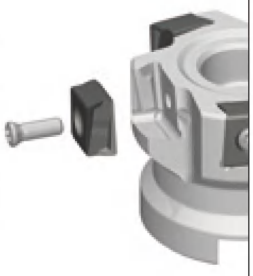
Specification of tools

Type		Stock	Basic dimensions(mm)				Number of teeth Z	Type of coupling	Weight (kg)
			DC	DCON	OAL	APMX			
EMP09	-050-A22-LN16-04C	▲	50	22	40	15	4	A	0.31
	-050-A22-LN16-05C	▲	50	22	40	15	5	A	0.31
	-063-A22-LN16-05C	▲	63	22	40	15	5	A	0.56
	-063-A22-LN16-06C	▲	63	22	40	15	6	A	0.56
	-080-A27-LN16-06C	▲	80	27	50	15	6	A	1.20
	-080-A27-LN16-07C	▲	80	27	50	15	7	A	1.20
	-100-B32-LN16-08C	▲	100	32	50	15	8	B	1.62
	-100-B32-LN16-10C	▲	100	32	50	15	10	B	1.62
	-125-B40-LN16-10C	▲	125	40	63	15	10	B	3.27
	-125-B40-LN16-13C	▲	125	40	63	15	13	B	3.27
	-160-B40-LN16-12C	▲	160	40	63	15	12	B	6.37
	-160-B40-LN16-16C	▲	160	40	63	15	16	B	6.37

▲Stock available △Make-to-order

Spare parts

Diameter DC	Inserts	Screw	Wrench
Ø40~Ø63	LN□T0804□□-GM/GL	I60M3×7	WT09IP
Ø80			WT09IS
Ø40~Ø63	LN□T1206□□-GM/GL	I60M4×12	WT15IP
Ø80~Ø125			WT15IS
Ø50~Ø63	LN□T1607□□-GM/GL	I60M5×13	WT20IP
Ø80~Ø125			WT20IS
Ø160			WT20IT

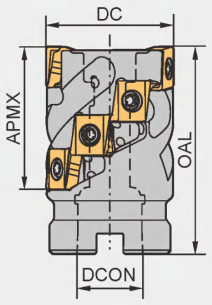


Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Square shoulder milling tools

KAPR:90°

EMP09 P M K S



Specification of tools

Type		Stock	Basic dimensions(mm)				Number of teeth Z	Number of inserts	Weight (kg)
			DC	DCON	OAL	APMX			
EMP09	**-032×38-A16-LN08-03C**	▲	32	16	55	38	3	15	0.15
	-040×38-A16-LN08-04C	▲	40	16	55	38	4	20	0.3
	-040×45-A16-LN08-04C	▲	40	16	65	45	4	24	0.4
	-050×38-A22-LN08-05C	▲	50	22	55	38	5	25	0.5
	-050×45-A22-LN08-05C	▲	50	22	65	45	5	30	0.6
	-040×33-A16-LN12-02C	▲	40	16	55	33	2	6	0.3
	-040×43-A16-LN12-02C	▲	40	16	65	43	2	8	0.34
	-050×33-A16-LN12-03C	▲	50	16	55	33	3	9	0.5
	-050×43-A22-LN12-03C	▲	50	22	70	43	3	12	0.62
	-063×43-A27-LN12-04C	▲	63	27	70	43	4	16	1.03
	-063×53-A27-LN12-04C	▲	63	27	80	53	4	20	1.2
	-080×43-A27-LN12-05C	▲	80	27	70	43	5	20	1.91
	-080×53-A27-LN12-05C	▲	80	27	80	53	5	25	2.1
	-100×63-A27-LN12-06C	▲	100	27	90	63	6	36	3.3

▲Stock available △Make-to-order

Spare parts

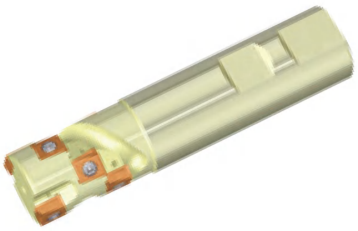
Diameter DC	Inserts	Screw	Wrench	
				
Ø32×38-Ø50×45	LN□T0804□□-GM/GL	I60M3×7	WT09IP	
Ø40×33-Ø63×53	LN□T1206□□-GM/GL	I60M4×12	WT15IP	
Ø80×43-Ø100×63			WT15IS	

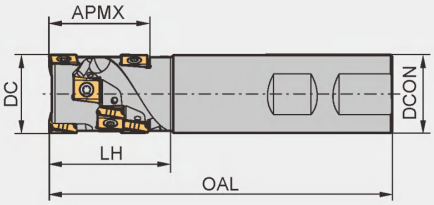
Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Square shoulder milling tools

KAPR:90°

EMP09 P M K S





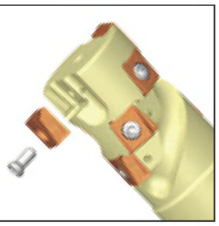
Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Number of inserts	Weight (kg)
			DC	DCON	OAL	LH	APMX			
EMP09	-025×30-XP25-LN08-02C	▲	25	25	100	40	30	2	8	0.31
	-032×38-XP32-LN08-03C	▲	32	32	115	45	38	3	15	0.62
	-040×45-XP32-LN08-04C	▲	40	32	120	55	45	4	24	0.7
	-040×33-XP32-LN12-02C	▲	40	32	115	45	33	2	6	0.7
	-040×43-XP32-LN12-02C	▲	40	32	125	55	43	2	8	0.7
	-050×43-XP40-LN12-03C	▲	50	40	135	55	43	3	12	1.4
	-050×53-XP40-LN12-03C	▲	50	40	145	65	53	3	15	1.5

▲Stock available △Make-to-order

Spare parts

Diameter DC	Inserts	Screw	Wrench
			
Ø25×30-Ø40×45	LN□T0804□□-GM/GL	I60M3×7	WT09IP
Ø40×33-Ø50×53	LN□T1206□□-GM/GL	I60M4×12	WT15IP

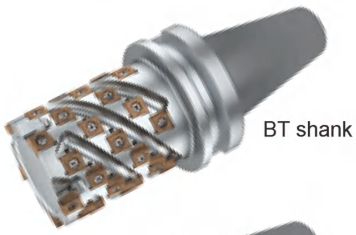


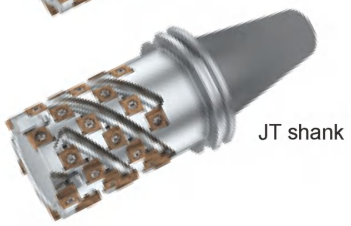
Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Square shoulder milling tools

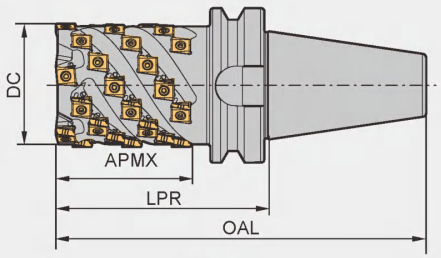
KAPR:90°

EMP09 P M K S

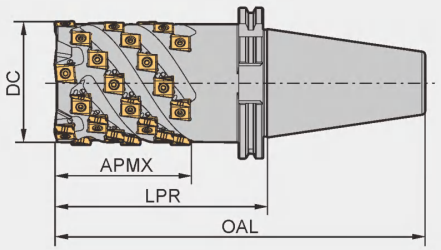




BT shank



JT shank

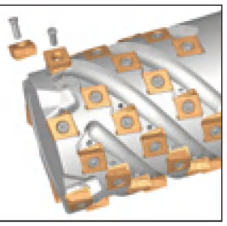


Specification of tools

Type		Stock	Basic dimensions(mm)				Number of teeth Z	Shank type	Number of inserts	Weight (kg)
			DC	APMX	LPR	OAL				
EMP09	-050×63-BT50-LN12-03C	△	50	63	124	225.8	3	BT	18	4.34
	-050×85-BT50-LN12-03C	△	50	85	146	246.8	3	BT	24	4.57
	-050×103-BT50-LN12-03C	△	50	103	164	265.8	3	BT	30	4.89
	-063×85-BT50-LN12-04C	△	63	85	146	246.8	4	BT	32	5.35
	-063×115-BT50-LN12-04C	△	63	115	176	277.8	4	BT	44	6.07
	-080×125-BT50-LN12-05C	△	80	125	186	287.8	5	BT	60	8.25
	-050×103-JT50-LN12-03C	△	50	103	164	265.75	3	JT	30	5.11
	-063×85-JT50-LN12-04C	△	63	85	146	246.75	4	JT	32	4.34
	-063×115-JT50-LN12-04C	△	63	115	176	277.75	4	JT	44	5.46
	-080×125-JT50-LN12-05C	△	80	125	186	287.75	5	JT	60	7.82

▲Stock available △Make-to-order

Spare parts

Diameter DC	Inserts	Screw	Wrench	
				
Ø50×63-Ø63×115	LN□T1206□□-GM/GL	I60M4×12	WT15IP	
Ø80×125			WT15IS	

Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Square shoulder milling tools

KAPR:90°

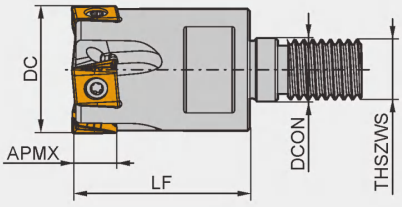

Step shoulder milling


Slot milling


Side milling

QCH-*LN*M*Series

P M K S



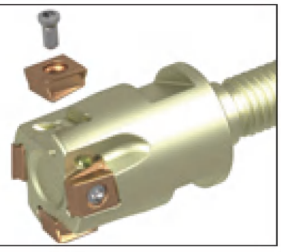
Specification of tools

Type		Stock	Basic dimensions(mm)					Applicable inserts	Number of teeth Z	Weight (kg)
			DC	DCON	LF	APMX	THSZWS			
QCH	-20-LN08-M10-02	△	20	10.5	30	8.0	10	LN□T0804□□-GM/GL	2	0.062
	-20-LN08-M10-03	△	20	10.5	30	8.0	10		3	0.059
	-22-LN08-M10-03	△	22	10.5	35	8.0	10		3	0.075
	-25-LN08-M12-03	△	25	12.5	35	8.0	12		3	0.112
	-25-LN08-M12-04	△	25	12.5	35	8.0	12		4	0.116
	-32-LN08-M16-04	△	32	17	45	8.0	16		4	0.230
	-32-LN08-M16-05	△	32	17	45	8.0	16		5	0.228
	-40-LN08-M16-05	△	40	17	45	8.0	16		5	0.309
	-40-LN08-M16-06	△	40	17	45	8.0	16		6	0.316
	-32-LN12-M16-02	△	32	17	45	11.5	16	LN□T1206□□-GM/GL	2	0.230
	-32-LN12-M16-03	△	32	17	45	11.5	16		3	0.225
	-40-LN12-M16-03	△	40	17	45	11.5	16		3	0.290
	-40-LN12-M16-04	△	40	17	45	11.5	16		4	0.288

▲Stock available △Make-to-order

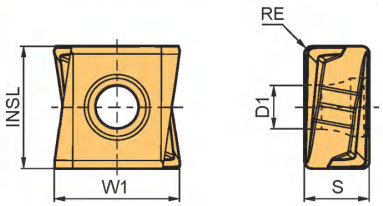
Spare parts

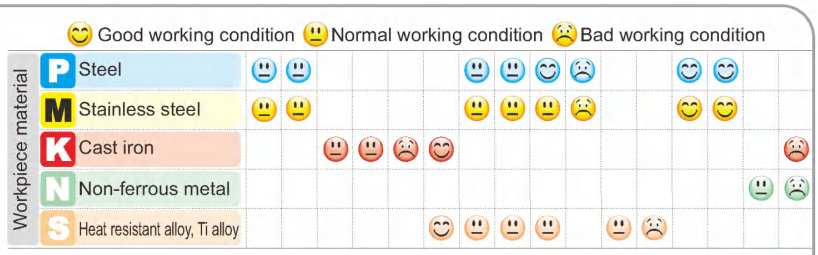
Diameter DC	Inserts	Insert screw	Wrench
Ø20-Ø40	LN□T0804□□-GM/GL	I60M3×7	WT09IP
Ø32-Ø40	LN□T1206□□-GM/GL	I60M4×12	WT15IP



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Selection of inserts





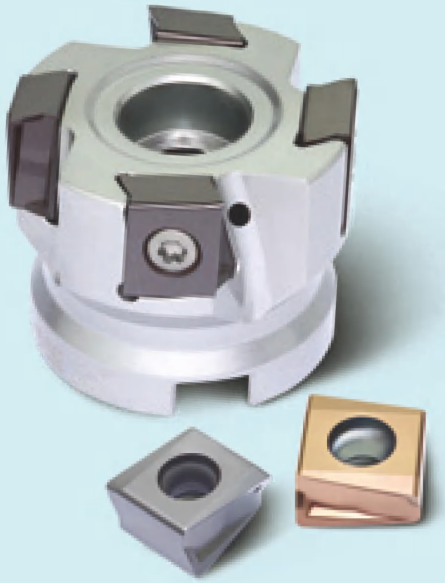
Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating							Cermet		Cemented carbide	
		INSL	W1	S	D1	RE	YBC302	YBM253	YBD152	YBD203	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	LNKT080404PNR-GL	8.75	8.5	4.45	3.4	0.4		★	●		●				★			●				
	LNKT120608PNR-GL	12.7	13	6.75	4.4	0.8		★	●		●				★			●				
	LNKT160708PNR-GL	16.05	15	7.35	5.5	0.8		★	●		●				★			●				
	LNKT080404PNR-GM	8.75	8.5	4.45	3.4	0.4		★	●		●				★			●				
	LNKT080408PNR-GM	8.75	8.5	4.45	3.4	0.8		★	●		●				★							
	LNKT080412PNR-GM	8.75	8.5	4.45	3.4	1.2		★	●		●				★							
	LNKT120608PNR-GM	12.7	13	6.75	4.4	0.8		★	●		●				★			●				
	LNKT120612PNR-GM	12.7	13	6.75	4.4	1.2		★	●		●				★							
	LNKT120616PNR-GM	12.7	13	6.75	4.4	1.6		★	●		●				★							
	LNKT120620PNR-GM	12.7	13	6.75	4.4	2.0		★	●		●				★							
	LNKT120624PNR-GM	12.7	13	6.75	4.4	2.4		★	●		●				★							
	LNKT120632PNR-GM	12.7	13	6.75	4.4	3.2		★	●		●				★							
	LNKT160708PNR-GM	16.05	15	7.35	5.5	0.8		★	●		●				★			●				
	LNKT160712PNR-GM	16.05	15	7.35	5.5	1.2		★	●		●				★							
	LNKT160716PNR-GM	16.05	15	7.35	5.5	1.6		★	●		●				★							
	LNMT080404PNR-GM	8.75	8.5	4.45	3.4	0.4		★	●		●				★							
	LNMT120608PNR-GM	12.7	13	6.75	4.4	0.8		★	●		●				★							
	LNMT160708PNR-GM	16.05	15	7.35	5.5	0.8		★	●		●				★							

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

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters	
				Vc(m/min)	fz(mm/z)
P	Low-carbon steel, Soft steel	≤180	YBM253	260 (160-300)	0.3 (0.1-0.35)
			YB9320	260 (160-300)	0.3 (0.1-0.35)
	High-carbon steel, Alloy steel	180-280	YBM253	240 (160-240)	0.25 (0.1-0.35)
			YB9320	240 (160-240)	0.25 (0.1-0.35)
	Alloy tool steel	280-350	YBM253	200 (120-240)	0.2 (0.1-0.35)
			YB9320	200 (120-240)	0.2 (0.1-0.35)
M	Stainless stee	≤270	YBM253	180 (100-230)	0.15 (0.1-0.3)
			YB9320	160 (100-230)	0.15 (0.1-0.3)
K	Cast iron	180-250	YBD152 YBD252	220 (140-250)	0.2 (0.1-0.3)
				220 (140-250)	0.2 (0.1-0.3)
				220 (140-250)	0.2 (0.1-0.3)
S	Difficult-to-machine materials	≤400	YBS303	100 (60-120)	0.15 (0.1-0.25)

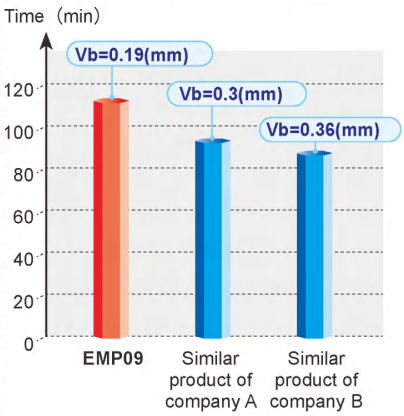
Case for EMP09



●Ultra-long working life

The material of workpiece: 45#
Hardness: 175-190（HB）
Machine tool: Planer-type milling machine
Type of cooling: No cooling
The machining type: Shoulder milling
Toolholder: EMP09-050-A22-LN12-05C
Insert: LNKT120608PNR-GM/YB9320
Cutting parameter: Vc=260m/min, Ap=8mm, Ae=2mm, fz=0.2mm/z

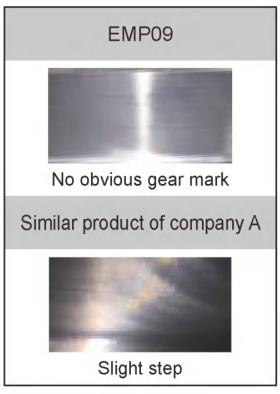
Comparison of tool life



Result:The processing life of LNKT12 (YB9320) is approximately 1.3 times of the similar product of company A and 1.4 times of the similar product of company B, with excellent wear resistance and longer tool life.

●Better surface quality

The material of workpiece: NAK80
Hardness: HRC(33-37)
Machine tool: Planer-type milling machine
Type of cooling: No cooling
The machining type: Shoulder milling
Toolholder: EMP09-050-A22-LN12-05C
Insert: LNKT120608PNR-GM (YB9320)
Similar product of company A
Cutting parameter: Vc=240m/min, Ap=8mm
Ae=2mm, fz=0.2mm/z

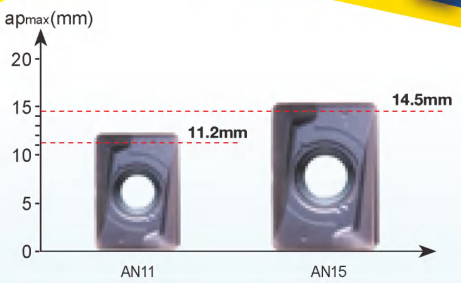


Result: EMP09 series of tangential milling cutter has higher precision and better surface quality, no obvious gear mark, and runout value, which is better than the similar product of company A.

Achieving High Quality 90° Square Shoulder Milling,

EMP13 Square Shoulder Milling Tool Series

KAPR:90°



Cutting edge properly designed with high precision control for high quality 90° square shoulder milling.

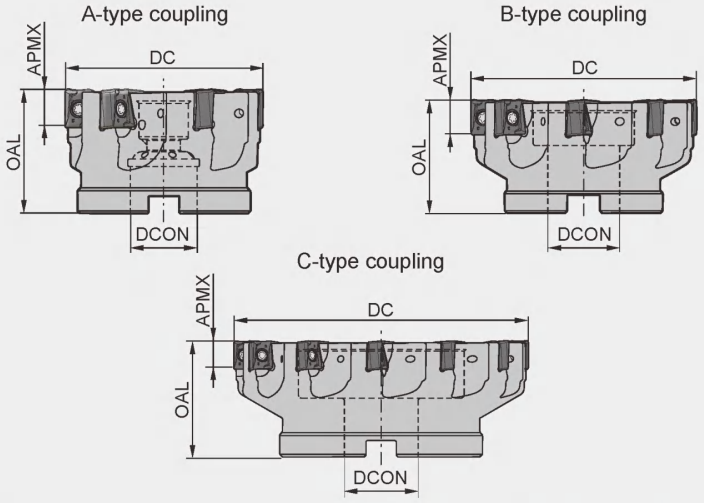
Extra thick insert with double negative cutter can achieve double positive cutting angle, reduce cutting force and greatly improve impact resistance.

-LH geometry with excellent wear resistance, rake face specially treated with mirror effect, good adhesion resistance, ensuring high-efficiency high-stability Aluminium machining.

Square shoulder milling tools

KAPR:90°

EMP13 P M K S N



Specification of tools

Type		Stock	Basic dimensions(mm)				Number of teeth Z	Type of coupling	Weight (kg)
			DC	DCON	OAL	APMX			
EMP13	-050-A22-AN11-06C	▲	50	22	40	11.2	6	A	0.30
	-063-A22-AN11-07C	▲	63	22	40	11.2	7	A	0.49
	-080-A27-AN11-09C	▲	80	27	50	11.2	9	A	1.18
	-100-B32-AN11-12	▲	100	32	50	11.2	12	B	1.46
	-125-B40-AN11-14	▲	125	40	63	11.2	14	B	2.92
	-160-C40-AN11-16	▲	160	40	63	11.2	16	C	4.30
	-050-A22-AN15-04C	▲	50	22	40	14.5	4	A	0.26
	-063-A22-AN15-05C	▲	63	22	40	14.5	5	A	0.53
	-080-A27-AN15-06C	▲	80	27	50	14.5	6	A	1.23
	-100-B32-AN15-08	▲	100	32	50	14.5	8	B	1.52
	-125-B40-AN15-10	▲	125	40	63	14.5	10	B	3.05
	-160-C40-AN15-12	▲	160	40	63	14.5	12	C	4.46

▲Stock available △Make-to-order

Spare parts

Diameter DC	Inserts	Insert screw	Wrench
			
Ø50-Ø160	AN□X11□□□□-GM/LH	I60M3×9	WT09IS
Ø50-Ø160	AN□X15□□□□-GM/LH	I60M4×12	WT15IS

Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

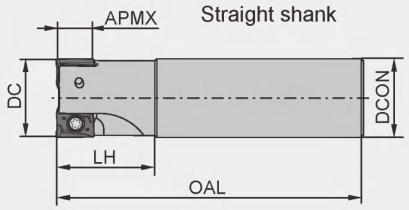
Square shoulder milling tools

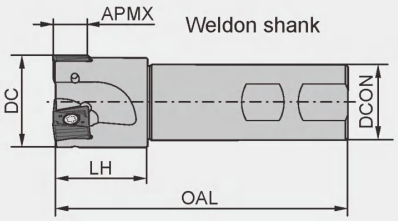
KAPR:90°

EMP13 P M K S N


Straight shank


Weldon shank





Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Weight (kg)
			DC	DCON	OAL	LH	APMX		
EMP13 Weldon shank	**-025-XP25-AN11-02C**	▲	25	25	100	32	11.2	2	0.31
	-032-XP32-AN11-03C	▲	32	32	115	40	11.2	3	0.61
	-040-XP32-AN11-04C	▲	40	32	125	40	11.2	4	0.75
	-032-XP32-AN15-02C	▲	32	32	125	40	14.5	2	0.66
	-040-XP32-AN15-03C	▲	40	32	125	40	14.5	3	0.76
Straight shank	**-025-G25-AN11-02C**	▲	25	25	100	32	11.2	2	0.31
	-032-G32-AN11-03C	▲	32	32	115	40	11.2	3	0.61
	-040-G32-AN11-04C	▲	40	32	125	40	11.2	4	0.75
	-032-G32-AN15-02C	▲	32	32	125	40	14.5	2	0.66
	-040-G32-AN15-03C	▲	40	32	125	40	14.5	3	0.76

▲Stock available △Make-to-order

Spare parts

Diameter DC	Inserts	Insert screw	Wrench
			
Ø25-Ø40	AN□X11□□□□-GM/LH	I60M3×9	WT09IP
Ø32-Ø40	AN□X15□□□□-GM/LH	I60M4×12	WT15IP

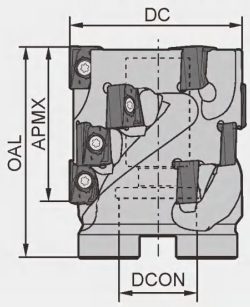
Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

Square shoulder milling tools

KAPR:90°

EMP13 P M K S N

A-type coupling



Specification of tools

Type		Stock	Basic dimensions(mm)				Number of teeth Z	Number of inserts	Type of coupling	Weight (kg)
			DC	DCON	OAL	APMX				
EMP13	-050×43-A22-AN11-03	▲	50	22	60	43	3	12	A	0.52
	-063×65-A27-AN11-04	▲	63	27	80	64	4	24	A	1.15
	-063×53-A27-AN15-03	▲	63	27	75	53	3	12	A	1.14
	-080×56-A32-AN15-04	▲	80	32	75	53	4	16	A	1.82

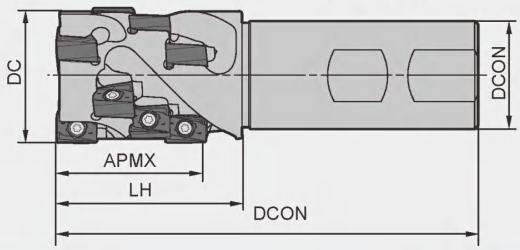
▲Stock available △Make-to-order

Square shoulder milling tools

KAPR:90°

EMP13 P M K S N

Weldon shank



Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Number of inserts	Weight (kg)
			DC	DCON	OAL	LH	APMX			
EMP13	-032×43-XP32-AN11-02	▲	32	32	115	48	43	2	8	0.61
	-040×43-XP32-AN11-03	▲	40	32	125	55	43	3	12	0.79
	-040×40-XP32-AN15-02	▲	40	32	115	55	40	2	6	0.79
	-050×53-XP40-AN15-02	▲	50	40	145	70	53	2	8	1.53

▲Stock available △Make-to-order

Spare parts

Diameter DC	Inserts	Insert screw	Wrench	
				
Ø50-Ø63	AN□X11□□□□-GM/LH	I60M3×9	WT09IP	
Ø63	AN□X15□□□□-GM/LH	I60M4×12	WT15IP	
Ø80			WT15IS	
Diameter DC	Inserts	Insert screw	Wrench	
				
Ø32-Ø40	AN□X11□□□□-GM/LH	I60M3×9	WT09IP	
Ø40-Ø50	AN□X15□□□□-GM/LH	I60M4×12	WT15IP	

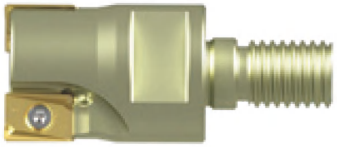
Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

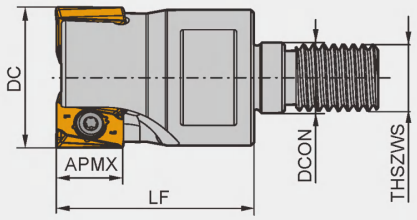
Square shoulder milling tools

KAPR:90°

QCH-*AN*M*Series

P M K S N





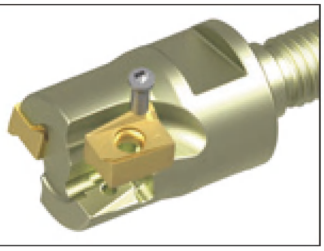
Specification of tools

Type		Stock	Basic dimensions(mm)					Applicable inserts	Number of teeth Z	Weight (kg)
			DC	DCON	LF	APMX	THSZWS			
QCH	-25-AN11-M12-02	△	25	12.5	35	11.2	12	AN□X1105□□-□□	2	0.105
	-32-AN11-M16-03	△	32	17	45	11.2	16		3	0.230
	-40-AN11-M16-04	△	40	17	45	11.2	16		4	0.300
	-32-AN15-M16-02	△	32	17	45	14.5	16	AN□X1506□□-□□	2	0.205
	-40-AN15-M16-03	△	40	17	45	14.5	16		3	0.255

▲Stock available △Make-to-order

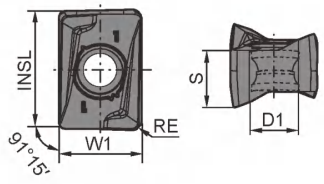
Spare parts

Diameter DC	Inserts	Insert screw	Wrench
			
Ø25-Ø40	AN□X11	I60M3×9	WT09IP
Ø32-Ø40	AN□X15	I60M4×12	WT15IP



Tools code key B26–B27
Grade selection guide B19–B23
Technical data B271–B276

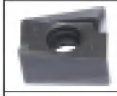
Selection of inserts



Good working condition Normal working condition Bad working condition

Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)					CVD Coating					PVD Coating							Cermet		Cemented carbide	
		INSL	W1	S	D1	RE	YBC302	YBM253	YBD152	YBD203	YBD252	YBG105	YBG202	YBG205	YB9320	YBG302	YBS203	YBS303	YNG151	YNG151C	YD101	YD201
	ANGX110504PNR-GM	11.85	8.4	5.7	3.5	0.4		★	★					★	★							
	ANGX110508PNR-GM	11.85	8.4	5.7	3.5	0.8		★	★					★	★			●				
	ANGX110520PNR-GM	11.85	8.4	5.7	3.5	2.0		★	★		★			★								
	ANGX150608PNR-GM	15.43	11.0	7.3	4.4	0.8		★	★					★	★			●				
	ANGX150616PNR-GM	15.43	11.0	7.3	4.4	1.6		★	★					★	★							
	ANGX150620PNR-GM	15.43	11.0	7.3	4.4	2.0			★		★			★								
	ANMX110508PNR-GM	11.85	8.4	5.7	3.5	0.8		★	★						★			★				
	ANMX150608PNR-GM	15.43	11.0	7.3	4.4	0.8		★	★					★	★							
	ANGX110502PNR-LH	11.85	8.4	5.7	3.5	0.2															★	
	ANGX110504PNR-LH	11.85	8.4	5.7	3.5	0.4															★	
	ANGX150608PNR-LH	15.43	11.0	7.3	4.4	0.8															★	

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

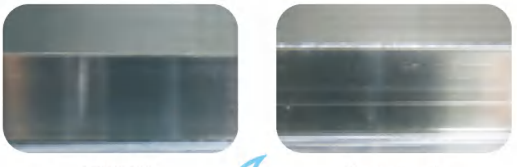
Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters		
				Vc(m/min)	fz(mm/z)	apmax(mm)
P	Low carbon steel	≤180	YBM253 YBG205 YB9320	270(220-350)	0.25(0.1-0.4)	11.2(AN11) 14.5(AN15)
P	Alloy steel	180-350	YBM253 YBG205 YB9320	240(180-320)	0.2(0.1-0.4)	
M	Stainless stee	≤270	YB9320 YBM253	200(110-300) 180(150-300)	0.2(0.1-0.3)	
K	Cast iron	180-260	YBD152 YBD252	270(150-300) 220(120-320)	0.25(0.1-0.4) 0.2(0.1-0.3)	
N	Aluminium alloy	--	YD101	-LH		
				300-	0.2(0.08-0.4)	
S	Difficult-to-machine materials	≤400	YBS303	100(60-120)	0.15(0.1-0.25)	

Case for EMP13

Workpiece material: NAK80(HRC36)
Tool: EMP13-032-G32-AN15-02C
Insert: ANGX150608PNR-GM/YBG205
Cutting data: fz=0.1mm/z,
Vc=220m/min,
ae=10mm,
ap=14.5mm
Cutting condition: Dry cutting

●Surface quality comparison



EMP13 Company A

Surface quality and perpendicularity of workpiece machined by EMP13 is obviously superior to that of company A.