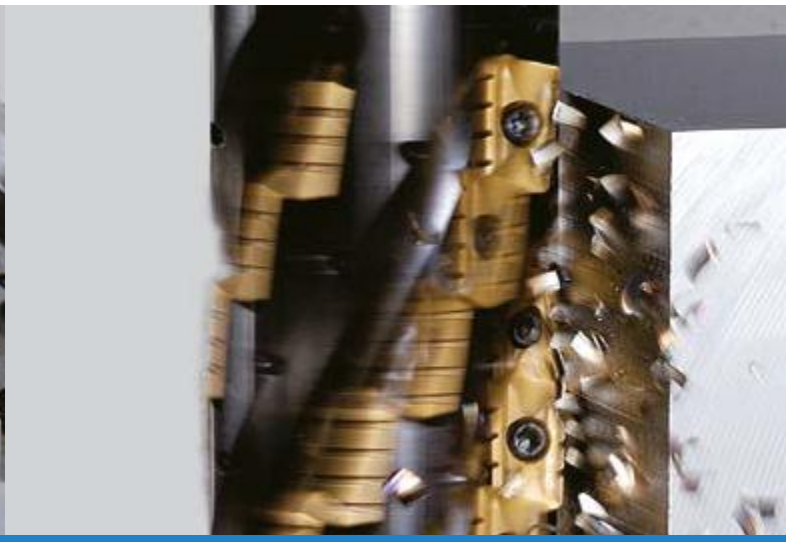
THE NEW VALUE FRONTIER

KYOCERA

High efficiency end mills and face mills | **MEC Series**

MEC Series

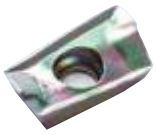


Low cutting force, reduced chattering and high efficiency machining

Large lineup for various applications

New PDL025 grade for machining aluminum

Fine pitch end mills & face mills lineup expansion



NEW DLC coating (PDL025)

NEW Fine pitch end mills & face mills

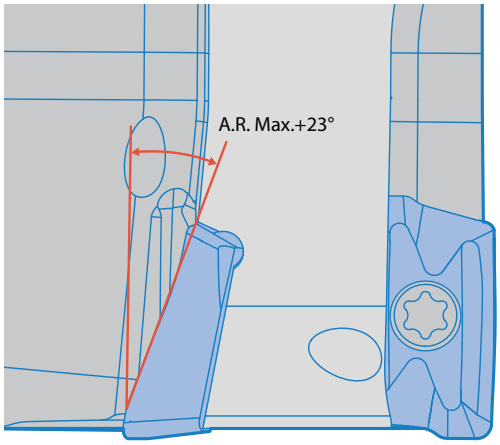
High efficiency end mills and face mills

MEC

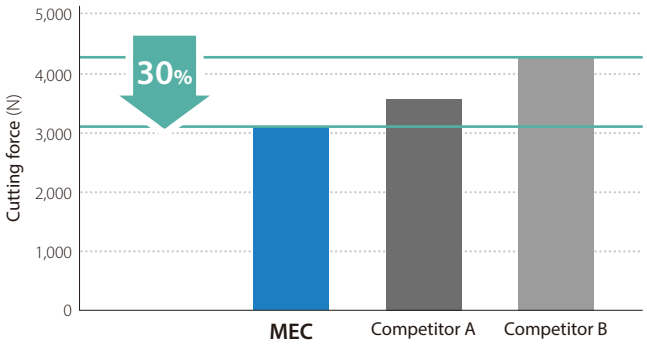
Excellent surface finish with low cutting forces. New grades and cutters for various applications PDL025 DLC coated carbides for aluminum machining

1 Low cutting force and sharp cutting performance

Low cutting forces with helical cutting edge design



Cutting force fomparison (In-house evaluation)

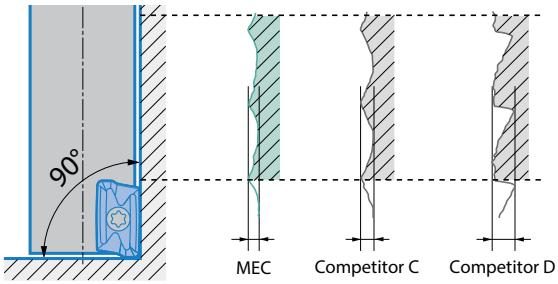


Cutting conditions: Vc = 100 m/min, fz = 0.2 mm/t, ap × ae = 9 × 10 mm, dry, Cutter dia. Dc = ø20
Workpiece : C50

2 Smooth surface of shoulder wall

Smoother shoulder wall finish with multiple passes

Shoulder wall surface comparison (In-house evaluation)



Cutting conditions: Vc = 120 m/min, fz = 0.1 mm/t, ap × ae = 5 × 10 mm, dry, cutter dia. Dc = ø20
Workpiece : C50

3 Large tooling lineup

Introducing fine pitch end mills & face mills high efficiency shouldering

End mill

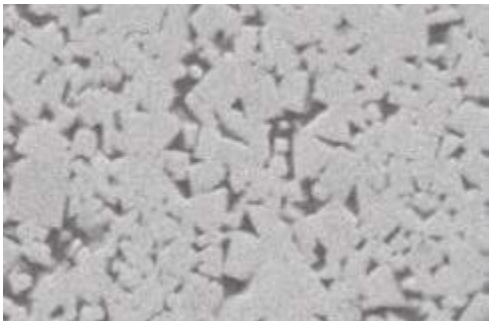
Face mill

MEGACOAT NANO **PR1535**

Stable machining is realized by a combination of tough substrate with limited chipping and special coating featuring high heat resistance. Features high performance in cutting general steel, mold steel and materials that are difficult to cut.

1 Toughening by a new cobalt mixing ratio (In-house evaluation)

High toughness carbide base material



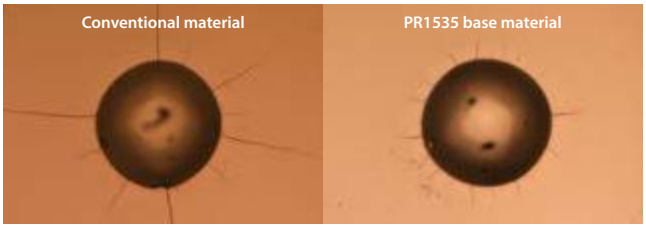
23% Fracture toughness

2 Stability improvement

The coarse grain structure and uniform particle size correspond to improved heat resistance,with conductivity values decreased by 11%. The uniform structure also reduces crack propagation.

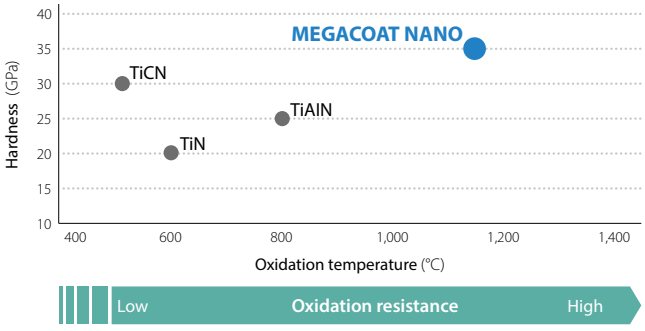
Shock resistance

Cracking comparison by diamond indentor (In-house evaluation)



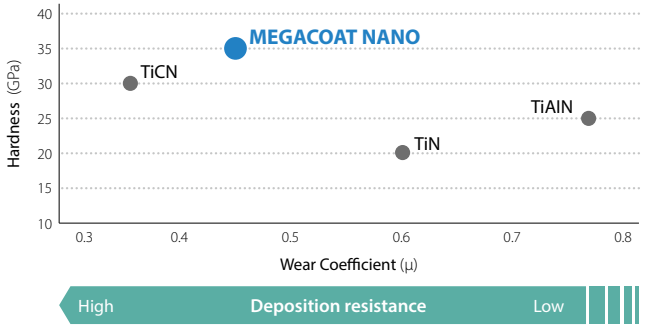
Long cracks　　Short cracks

Coating properties (Abrasion resistance)



Achieve long tool laife with the combination of a tough substrate and a special nano coating layer

Coating properties (Deposition resistance)

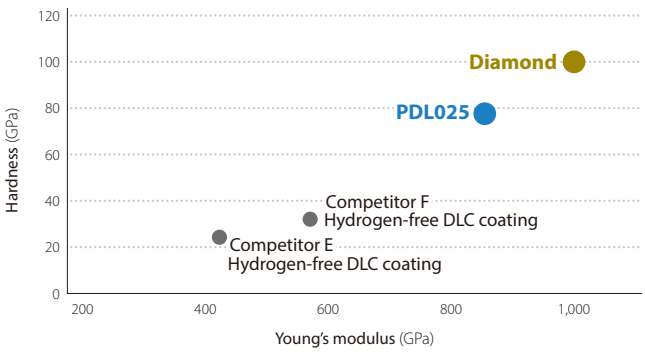


Stable machining with excellent wear resistance

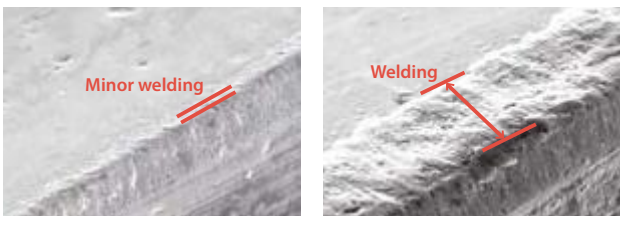
NEW DLC coating **PDL025**

High quality and long tool life for machining aluminum
High hardness with Kyocera's proprietary hydrogen-free DLC coating

Coating properties



Welding resistance comparison (In-house evaluation)



PDL025　　Competitor G

Cutting conditions: Vc = 800 m/min, fz = 0.1 mm/t, ap × ae = 3 × 5 mm, dry
Cutter dia. Dc = ø25 mm　Workpiece : AlMg2.5　Cutting length: 57 m

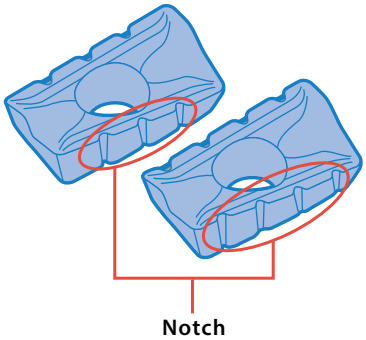
High efficiency end mill

MECH

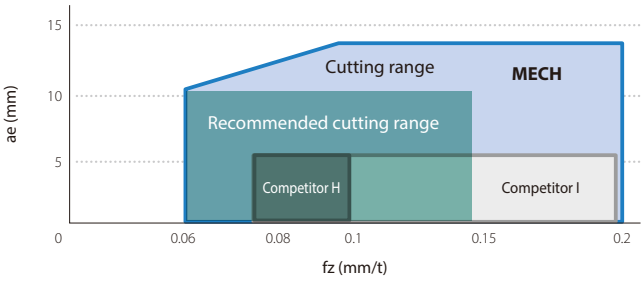
Notched inserts reduce chattering, break chips into small pieces
Improved chip evacuation
High efficiency heavy machining with large ap

1 Low cutting force due to notched inserts for heavy machining

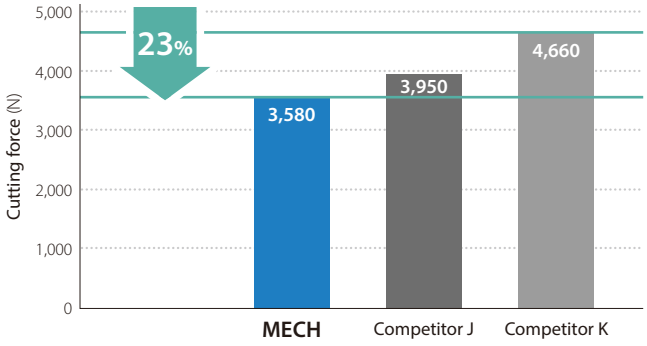
Notched inserts reduce cutting force,
lower cutting force and reduce chattering



Application range comparison (In-house evaluation)

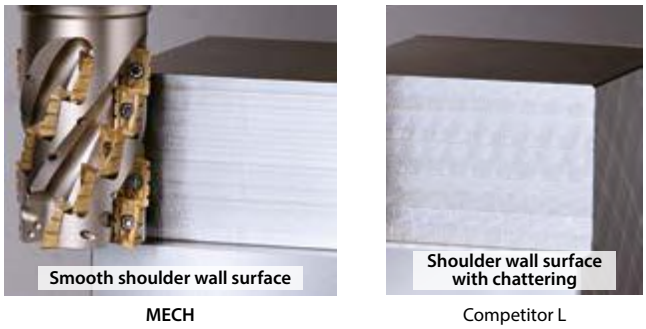


Cutting force comparison (In-house evaluation)



Cutting conditions: Vc = 120 m/min, fz = 0.1 mm/t, ap × ae = 40 × 10 mm, dry
MECH032-S32-11-5-4T Workpiece : C50

Surface wall comparison (In-house evaluation)

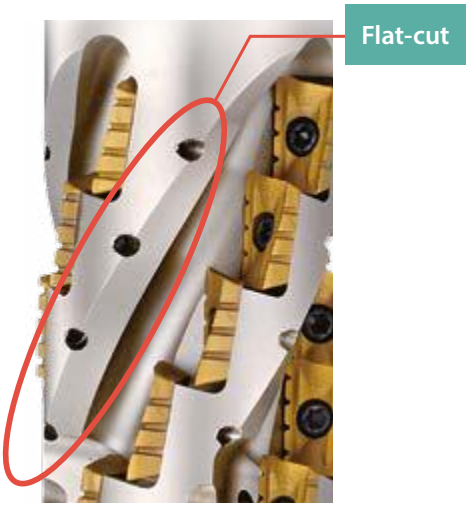


MECH Competitor L

Cutting conditions: Vc = 120 m/min, fz = 0.12 mm/t, ap × ae = 40 × 7 mm, dry
MECH032-S32-11-5-4T Workpiece : C50

2 Improved chip evacuation

Notched insert breaks chips into small pieces
Flat-cut flute provides excellent chip evacuation



Chips comparison (In-house evaluation)

MECH

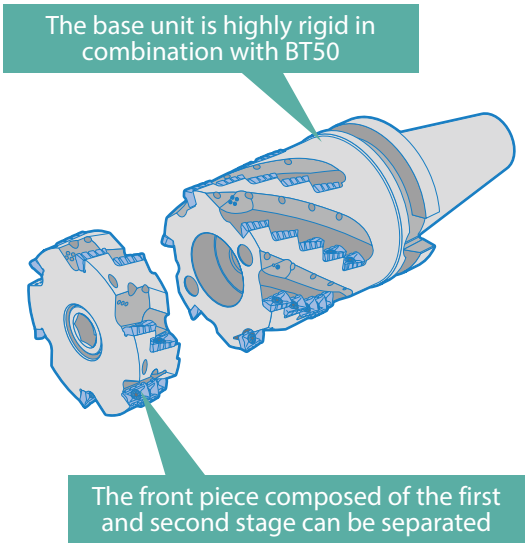
Competitor M

Cutting Conditions: Vc = 120 m/min, fz = 0.12 mm/t, ap × ae = 40 × 10 mm, dry
MECH032-S32-11-5-4T Workpiece : 17Cr3

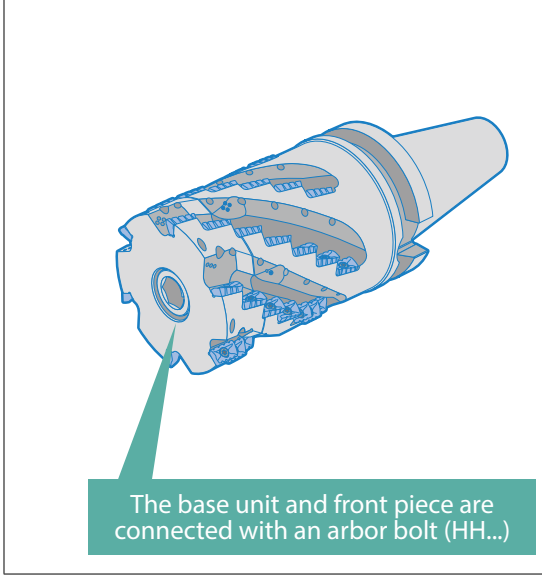
3 MECH interchangeable head minimizes tooling costs

If head is damaged, it can be replaced
Minimizing tooling costs

Separate view

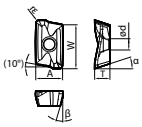
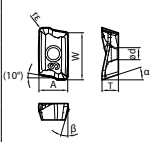
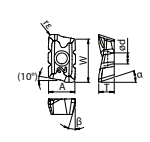
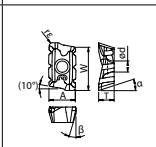
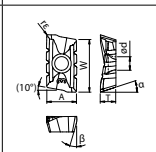
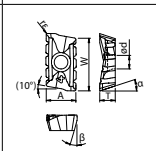


Assembled view



Applicable inserts

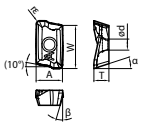
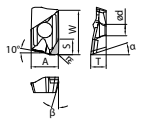
Usage classification			Cermet	CVD coated carbide	MEGACOAT NANO	MEGACOAT			PVD coated carbide	Ref. page for applicable toolholders
★ : Roughing / 1st choice ☆ : Roughing / 2nd choice ■ : Finishing / 1st choice □ : Finishing / 2nd choice (In case hardness is under 45HRC)	P	Carbon steel / Alloy steel	■			★	★		☆	
		Mold steel	■			★	★		☆	
	M	Austenitic stainless steel			★	☆	☆		☆	
		Martensitic stainless steel		★	☆					
		Precipitation hardened stainless steel			★					
	K	Gray cast iron						★		
		Nodular cast iron						★		
	N	Non ferrous metals								
	S	Heat resistant alloy (Ni-base)		★	☆	★	★			
		Titanium alloy			★			★		
	H	Hard materials				□			□	

Insert Handed insert shows right-hand		Description		Dimension (mm)					Angle			Cermet	CVD coated carbide	MEGACOAT NANO	MEGACOAT			PVD coated carbide	Ref. page for applicable toolholders
				A	T	ød	W (X)	rε (Z)	α	β	γ	TN100M	CA6535	PR1535	PR1225	PR1230	PR1210	PR830	
		BDMT	110302ER-JT	6.3	3.0	2.8	11.0	0.2	18°	15°	—		●	●	●		●	●	P7 P8
			110304ER-JT					0.4					●	●	●		●	●	
			110308ER-JT					0.8					●	●	●		●	●	
		BDMT	11T302ER-JT	6.7	3.8	2.8	11.0	0.2	18°	13°	—		●	●	●		●	●	P7 P8
			11T304ER-JT					0.4				●	●	●	●		●	●	
			11T308ER-JT					0.8				●	●	●	●		●	●	
			11T312ER-JT					1.2					●	●	●		●	●	
			11T316ER-JT					1.6					●	●	●		●	●	
			11T320ER-JT					2.0					●	●	●		●	●	
			11T324ER-JT					2.4					●	●	●		●	●	
			11T331ER-JT					3.1					●	●	●		●	●	
		BDMT	170404ER-JT	9.6	4.9	4.4	17.0	0.4	18°	13°	—		●	●	●		●	●	P9 P10
			170408ER-JT					0.8				●	●	●	●		●	●	
			170412ER-JT					1.2					●	●	●		●	●	
			170416ER-JT					1.6					●	●	●		●	●	
			170420ER-JT					2.0					●	●	●		●	●	
			170424ER-JT					2.4					●	●	●		●	●	
			170431ER-JT					3.1					●	●	●		●	●	
			170440ER-JT					4.0					●	●	●		●	●	
 Stainless steel / Low cutting force		BDMT	110302ER-JS	6.3	3.0	2.8	11.0	0.2	18°	15°	—		●	●	●			●	P7 P8
			110304ER-JS					0.4					●	●	●			●	
			110308ER-JS					0.8					●	●	●			●	
		BDMT	11T302ER-JS	6.7	3.8	2.8	11.0	0.2	18°	13°	—		●	●	●			●	P7 P8 P9 P10
			11T304ER-JS					0.4					●	●	●			●	
			11T308ER-JS					0.8					●	●	●			●	
		BDMT	170404ER-JS	9.6	4.9	4.4	17.0	0.4	18°	13°	—		●	●	●			●	
			170408ER-JS					0.8					●	●	●			●	
 2-Notched		BDMT	11T308ER-N2	6.7	3.8	2.8	11.0	0.8	18°	13°	—			●	●	●	●	●	P19 P20 P21 P22
 3-Notched		BDMT	11T308ER-N3	6.7	3.8	2.8	11.0	0.8	18°	13°	—			●	●	●	●	●	
 3-Notched		BDMT	170408ER-N3	9.6	4.9	4.4	17.0	0.8	18°	13°	—			●	●	●	●	●	
 4-Notched		BDMT	170408ER-N4	9.6	4.9	4.4	17.0	0.8	18°	13°	—			●	●	●	●	●	

Inserts are sold in 10 piece boxes
● : Available

Applicable inserts

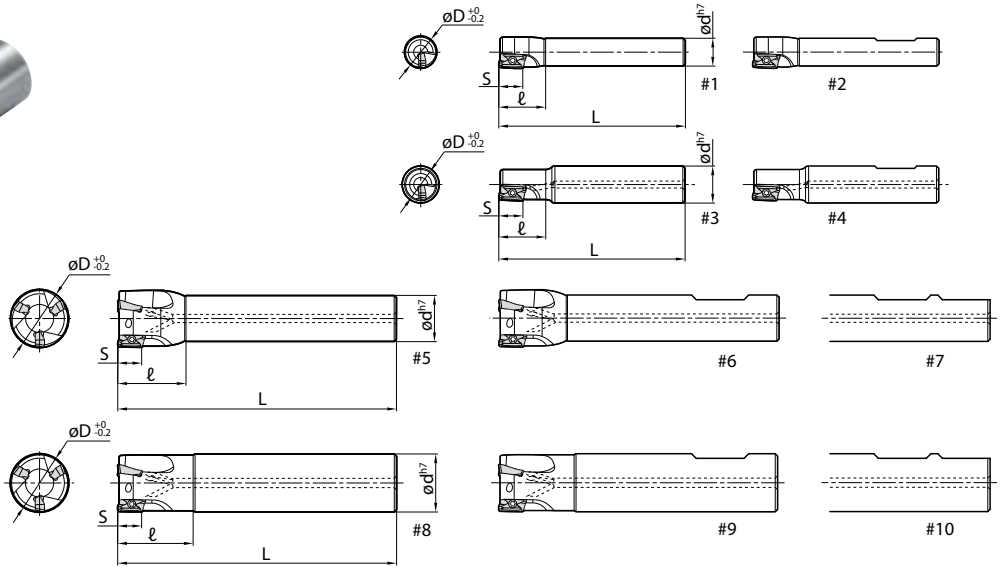
Usage classification								Ref. page for t oolholder
★: Roughing / 1st choice ☆: Roughing / 2nd choice ■: Finishing / 1st choice □: Finishing / 2nd choice (In case hardness is under 45HRC)	P	Carbon steel / Alloy steel						
		Mold steel						
	M	Austenitic stainless steel						
		Martensitic stainless steel						
		Precipitation hardened stainless steel						
	K	Gray cast iron						
		Nodular cast iron						
	N	Non ferrous metals	★	☆	□	■		
	S	Heat resistant alloy (Ni-base)						
		Titanium alloy		☆	□	■		
	H	Hard materials						

Insert Handed insert shows right-hand		Description		Dimension (mm)						Angle			DLC coated carbide	Carbide	PCD		Ref. page for t oolholder
				A	T	ød	W (X)	rε (Z)	S	α	β	γ	PDL025	GW25	KPD001	KPD230	
		BDGT	11T302FR-JA	6.7	3.8	2.8	11.0	0.2	—	18°	13°	—	●	●			P7 P8 P9 P10
			11T304FR-JA					0.4					●	●			
			11T308FR-JA					0.8					●	●			
		BDGT	170404FR-JA	9.6	4.9	4.4	17.0	0.4	—	18°	13°	—	●	●			
			170408FR-JA					0.8					●	●			
			170420FR-JA					2.0					●	●			
			170431FR-JA					3.1					●	●			
		BDMT	11T302FR	6.7	3.8	2.8	11.0	0.2	3.6	18°	13°	—			●	●	
			11T304FR					0.4							●	●	
		BDMT	170402FR	9.6	4.9	4.4	17.0	0.2	4.4	18°	13°	—			●	●	
			170404FR					0.4							●	●	

Inserts are sold in 10 piece boxes
PCD inserts are sold in 1 piece boxes
●: Available

Toolholder and applicable insert

Toolholder	Applicable insert					Remarks
MEC·····11	BDMT 1103◯◯ER-JT	BDMT 1103◯◯ER-JS	—	—	—	Using notched insert (····N2/N3/N4) is not recommended.
MEC·····11T MEC··R-11	BDMT 11T3◯◯ER-JT	BDMT 11T3◯◯ER-JS	BDGT 11T3◯◯FR-JA	BDMT 11T3◯◯FR	—	
MEC·····17 MEC··R-17	BDMT 1704◯◯ER-JT	BDMT 1704◯◯ER-JS	BDGT 1704◯◯FR-JA	BDMT 1704◯◯FR	—	
MECH···11	BDMT 11T3◯◯ER-JT	BDMT 11T3◯◯ER-JS	BDGT 11T3◯◯ER-JA	—	BDMT11T308ER-N2 BDMT11T308ER-N3	Notched insert (····N2/N3/N4) is 1st recommendation.
MECH···17	BDMT 1704◯◯ER-JT	BDMT 1704◯◯ER-JS	BDGT 1704◯◯FR-JA	—	BDMT170408ER-N3 BDMT170408ER-N4	



Toolholder dimensions

Description			Availability	No. of inserts	Dimension (mm)					Rake angle		Coolant hole	Drawing	Spare parts		Max. revolution (min^{-1})
					øD	ød	L	ℓ	S	A.R. (MAX.)	R.R.			Clamp screw	Wrench	
Cylindrical	Standard shank	MEC 10-S10-11	●	1	10	10	80	17	10	+10°	-24°	No	#1	SB-2545TR	DTM-8	54,800
		10-S16-11	●			16						Yes	#3			
		12-S10-11	●		12	10		20		+12°	-21°	No	#1			50,800
		12-S12-11	●			12										
		12-S16-11	●			16						Yes	#3			
		13-S12-11	●		13	12					-19°	No	#1			49,200
		14-S12-11	●		14											47,700
		14-S16-11	●			16						Yes	#3			
		MEC 16-S12-11T	●	2	16	12	100	23	10	+18°	-14°	No	#1	SB-2555TRG	DTM-8	43,750
		17-S16-11T	●		17	16					-13°	Yes	#5			43,500
		18-S16-11T	●		18					+19°						43,000
		19-S16-11T	●	3	19		110	26		+20°	-10°					42,000
		20-S16-11T	●		20											41,000
		21-S20-11T	●		21	20					-9°					40,300
		22-S20-11T	●		22					+21°	-10°					39,600
		24-S20-11T	●		24		120	29								38,200
		25-S20-11T	●		25											37,500
		25-S20-11T-4	●	4												
		28-S25-11T	●	3	28	25	130	32		+22°	-9°					35,800
		30-S25-11T	●	4	30					+23°						34,800
		32-S25-11T	●		32											33,900
		32-S25-11T-5	●	5												
		40-S32-11T	●		40	32	150	50			-8°					30,000
		50-S32-11T	●		50						-7°					22,500
	Same shank size	MEC 16-S16-11T	●	2	16	16	100	30	10	+18°	-14°	Yes	#8	SB-2555TRG	DTM-8	43,750
		20-S20-11T	●	3	20	20	110			+20°	-10°					41,000
		25-S25-11T	●		25	25	120	32		+21°						37,500
		25-S25-11T-4	●	4												
		32-S32-11T	●		32	32	130	40		+23°	-9°					33,900
		32-S32-11T-5	●	5												
	Long shank	MEC 20-S18-170-11T	●	2	20	18	170	30	10	+20°	-10°	Yes	#5	SB-2555TRG	DTM-8	41,000
		20-S20-140-11T	●			20	140	60					#8			
		20-S20-170-11T	●				170									
		22-S20-170-11T	●		22			30		+21°			#5			39,600
		25-S23-210-11T	●		25	23	210	32								37,500
		25-S25-160-11T	●			25	160	60					#8			
		25-S25-210-11T	●				210									
		28-S25-210-11T	●		28			32		+22°	-9°		#5			35,800
		32-S30-250-11T	●		32	30	250	40		+23°						33,900
		32-S32-200-11T	●			32	200	65					#8			
		32-S32-250-11T	●				250									
		35-S32-250-11T	●		35			40					#5			32,600
		40-S32-240-11T	●		40		240	65			-8°					30,000

Coat anti-seize compound (P-37) thinly on portion of taper and thread when insert is fixed.

● : Available

Caution with max. revolution
When running an end mill or a cutter at the maximum revolution, the insert or cutter may be damaged by centrifugal force. For more details, see "warning" on page P13.

Toolholder dimensions

		Description		Availability	No. of inserts	Dimension (mm)					Rake angle		Coolant hole	Drawing	Spare parts		Max. revolution (min^{-1})
						øD	ød	L	ℓ	S	A.R. (MAX.)	R.R.			Clamp screw	Wrench	
																	
Cylindrical	Long shank	MEC	20-S20-150-11T-3	●	3	20	20	150	60	10	+20°	-10°	Yes	#8	SB-2555TRG	DTM-8	41,000
			25-S25-170-11T-3	●		25	25	170			+21°						37,500
			25-S25-170-11T-4	●	4												
			30-S25-180-11T-3	●	3	30		180	32		+23°	-9°		#5			34,800
			32-S32-200-11T-3	●		32	32	200	65					#8			33,900
			32-S32-200-11T-4	●	4												
			32-S32-200-11T-5	●	5												
	Standard shank	MEC	25-S20-17	●	2	25	20	120	36	15.7	+16°	-11°	Yes	#5	SB-4070TRN	DTM-15	35,000
			32-S25-17	●	3	32	25	130	40		+17°	-7°					30,000
			40-S32-17	●	4	40	32	150	50		+19°						25,000
			50-S32-17	●		50											17,000
	Same shank	MEC	25-S25-17	●	2	25	25	120	36	15.7	+16°	-11°	Yes	#8	SB-4070TRN	DTM-15	35,000
			32-S32-17	●	3	32	32	130	40		+17°	-7°					30,000
	Long shank	MEC	25-S25-160-17	●	2	25	25	160	60	15.7	+16°	-11°	Yes	#8	SB-4070TRN	DTM-15	35,000
			25-S25-210-17	●				210									
			28-S25-210-17	●		28			36					#5			32,500
			32-S32-200-17	●		32	32	200	65		+17°	-7°		#8			30,000
			32-S32-250-17	●				250									
			35-S32-250-17	●		35			40					#5			27,700
			40-S32-240-17	●		40		240	65		+19°						25,000
		MEC	32-S32-250-17-3	●	3	32	32	250	65	15.7	+17°	-7°	Yes	#8	SB-4070TRN	DTM-15	30,000
			40-S32-250-17-3	●		40					+19°			#5			25,000
			40-S32-250-17-4	●	4												
			50-S42-250-17-4	●		50	42		64			-6°					17,000
Weldon	Standard shank	MEC	10-W10-1103	●	1	10	10	60	17	10	+10°	-24°	No	#2	SB-2545TR	DTM-8	54,800
			10-W16-1103-H	●			16	68					Yes	#4			
			12-W10-1103	●		12	10	60	20		+12°	-21°	No	#2			50,800
			12-W16-1103-H	●			16	68					Yes	#4			
			14-W12-1103	●		14	12				+12°	-19°	No	#2			47,700
			14-W16-1103-H	●			16						Yes	#4			
		MEC	16-W12-11T3	●	2	16	12	68	23	10	+18°	-14°	No	#2	SB-2555TRG	DTM-8	43,750
			18-W16-11T3-H	●		18	16				+19°	-13°	Yes	#6			43,000
			20-W16-11T3-H	●	3	20			25		+20°	-10°					41,000
			22-W20-11T3-H	●		22	20	81	26		+21°						39,600
			25-W20-11T3-H	●		25			29								37,500
			28-W25-11T3-H	●		28	25	88			+22°	-9°		#7			35,800
			30-W25-11T3-H	●	4	30			32		+23°						34,800
			32-W25-11T3-H	●		32											33,900
			40-W32-11T3-H	●	5	40	32	110	50			-8°					30,000
	Same shank size	MEC	16-W16-11T3-H	●	2	16	16	68	25	10	+18°	-14°	Yes	#9	SB-2555TRG	DTM-8	43,750
			20-W20-11T3-H	●	3	20	20	81	30		+20°	-10°					41,000
			25-W25-11T3-H	●		25	25	88	32		+21°			#10			37,500
			32-W32-11T3-H	●	4	32	32	100	40		+23°	-9°					33,900
	Standard shank	MEC	25-W20-1704-H	●	2	25	20	86	36	15.7	+16°	-11°	Yes	#6	SB-4070TRN	DTM-15	35,000
			32-W25-1704-H	●	3	32	25	92			+17°	-7°		#7			30,000
			40-W32-1704-H	●	4	40	32	110	50		+19°						25,000
	Same shank size	MEC	25-W25-1704-H	●	2	25	25	92	36	15.7	+16°	-11°	Yes	#10	SB-4070TRN	DTM-15	35,000
			32-W32-1704-H	●	3	32	32	100	40		+17°	-7°					30,000

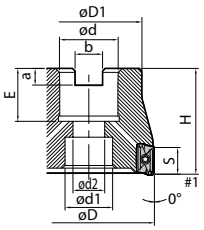
Coat anti-seize compound (P-37) thinly on portion of taper and thread when insert is fixed.

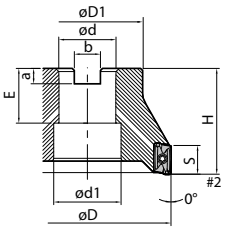
● : Available

Applicable inserts

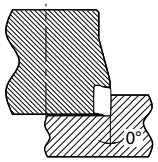
Description	Applicable inserts ➡ P5, P6			Applicable inserts ➡ P6
				
MEC·····11 MEC·····1103	BDMT 1103◯◯ER-JT	BDMT 1103◯◯ER-JS	—	—
MEC·····11T MEC·····11T03	BDMT 11T3◯◯ER-JT	BDMT 11T3◯◯ER-JS	BDGT 11T3◯◯FR-JA	BDMT 11T3◯◯FR
MEC·····17 MEC·····1704	BDMT 1704◯◯ER-JT	BDMT 1704◯◯ER-JS	BDGT 1704◯◯FR-JA	BDMT 1704◯◯FR

Recommended cutting conditions ➡ P13





Rake angle
11 type A.R.(MAX.): +23° R.R. : -7°
17 type A.R.(MAX.): +19° R.R. : -7°



Toolholder dimensions

Description			Availability	No. of inserts	Dimension (mm)									Coolant hole	Drawing	Weight (Kg)	Spare parts		Max. revolution (min^{-1})
					øD	ød	ød1	ød2	H	E	a	b	S				Clamp screw	Wrench	
Coarse pitch	MEC	040R-11-5T-M	●	5	40	16	14	8.5	40	20	5.6	8.5	10	Yes	#1	0.3	SB-2555TRG	DTM-8	30,000
		050R-11-5T-M	●		50	22	18	12		22	6.3	10.4				0.4			22,500
		063R-11-6T-M	●	6	63											0.6			20,500
		080R-11-7T-M	●	7	80	27	20	14	50	26	7	12.4				0.9			18,500
		100R-11-9T-MN	●	9	100	32	26	17.6	55		8	14.4				1.6			17,000
		125R-11-11T-M	●	11	125	40	45	32	63	33	9.5	16.4				3.1			15,000
		160R-11-14T-M	●	14	160		68	-						No	#2	4.5			13,900
Fine pitch	MEC	032R-11-5T-M	●	5	32	16	11.5	8.5	35	20	5.6	8.4	10	Yes	#1	0.1	SB-2555TRG	DTM-8	33,900
		040R-11-6T-M	●	6	40		14		40							0.2			30,000
		080R-11-10T-M	●	10	80	27	20	14	50	26.5	7	12.4				0.9			18,500
		100R-11-11T-M	●	11	100	32	26	17.6	55	34	8	14.4				1.7			17,000
Coarse pitch	MEC	040R-17-4T-M	●	4	40	16	14	8.5	40	20	5.6	8.5	15.7	Yes	#1	0.3	SB-4070TRN	DTM-15	25,000
		050R-17-4T-M	●		50	22	18	12		22	6.3	10.4				0.4			17,000
		063R-17-5T-M	●	5	63											0.6			14,500
		080R-17-6T-M	●	6	80	27	20	14	50	26	7	12.4				1.0			12,000
		100R-17-7T-MN	●	7	100	32	26	17.6	55		8	14.4				1.8			10,500
		125R-17-9T-M	●	9	125	40	45	32	63	33	9.5	16.4				3.1			8,900
		160R-17-12T-M	●	12	160		68	-						No	#2	4.5			7,400

Coat anti-seize compound (P-37) thinly on portion of taper and thread when insert is fixed.

Caution with max. revolution
When running an end mill or a cutter at the maximum revolution, the insert or cutter may be damaged by centrifugal force. For more details, see "warning" on page P13.

●: Available
Recommended cutting conditions ➡ P13

When using center-through air/coolant/mist

If center through air (coolant, mist) is used, please use appropriate arbor and clamp with arbor bolt (Table 1).

MEC's surface finish when shouldering with multiple passes

In order to obtain smoothly finished shoulder wall by multiple passes of MEC milling cutter, please keep ap less than 0.217" (5.5 mm) for 11T3 type insert and also keep ap less than 0.354" (9 mm) for 1704 type insert.

Table 1

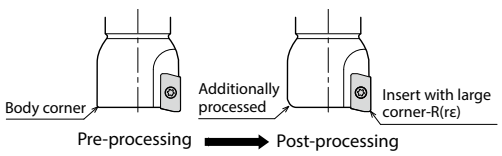
Description	Arbor clamp bolt (attachment)	Wrench
MEC040R・・・・-M	HH8 × 25H	LW-5 (Double width 5 mm)
MEC050R・・・・-M MEC063R・・・・-M	HH10 × 30H	LW-6 (Double width 6 mm)
MEC080R・・・・-M	HH12 × 35H	LW-8 (Double width 8 mm)
MEC100R・・・・-N MEC100R・・・・-M	HH16 × 52H	LW-12 (Double width 12 mm)
MEC125R・・・・-M	HF20 × 53H	LW-14 (Double width 14 mm)
MEC160R・・・・-M	HF24 × 60H	LW-17 (Double width 17 mm)

Wrench is not included. Please purchase separately.

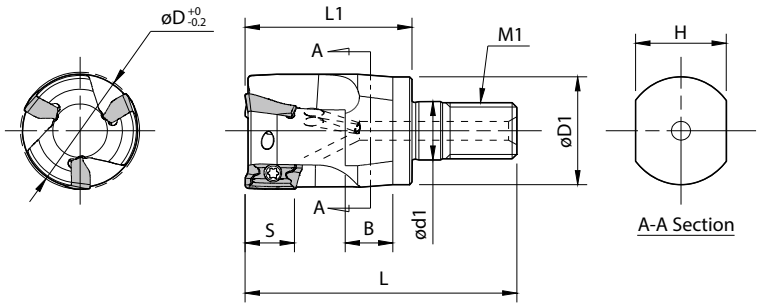
When using inserts with corner-R(rε)1.6 or larger, additional modifications of the cutter body will be necessary. Ref. to the chart below for the recommended modifications. If corner-radius is 1.2 mm, additional processing is not needed.

Insert Corner-R(rε)	Additional modifications of the cutter body corner
1.6	R1.0
2.0	
2.4	R1.2
3.1	R1.6
4.0	R2.5

* R shape is recommended for additional processing to the body corner.
When applying chamfer shaped additional processing, do not cut away too much.



MEC Screw on type



Toolholder dimensions

Description		Availability	No. of inserts	Dimension (mm)									Rake angle		Coolant hole	Applicable inserts ➡P5, P6	Max. revolution (min^{-1})
				øD	øD1	ød1	L	L1	M1	H	B	S	A.R. (MAX.)	R.R.			
MEC	16-M08-11T-2T	●	2	16	14.7	8.5	43	25	M8 × P1.25	12	8	10	+18°	-14°	Yes	BDMT11T3 BDGT11T3	43,750
	20-M10-11T-2T	●		20	18.7	10.5	49	30	M10 × P1.5	15	9		+20°	-10°			41,000
	20-M10-11T-3T	●	3														
	25-M12-11T-3T	●		25	23	12.5	57	35	M12 × P1.75	19	10		+21°				37,500
	32-M16-11T-4T	●	4	32	30	17	63	40	M16 × P2.0	24	12		+23°	-9°			33,900
MEC	25-M12-17-2T	●	2	25	23	12.5	57	35	M12 × P1.75	19	10	15.7	+16°	-11°	Yes	BDMT1704 BDGT1704	35,000
	32-M16-17-3T	●	3	32	30	17	63	40	M16 × P2.0	24	12		+17°	-7°			30,000

Caution with max. revolution

When running an end mill or a cutter at the maximum revolution, the insert or cutter may be damaged by centrifugal force. For more details, see "warning" on page P13.

●: Available

Spare Parts

Description		Spare parts		
		Clamp screw	Wrench	Anti-seize compound
				
MEC	16-M08-11T-2T	SB-2555TRG	DTM-8	P-37
	20-M10-11T-2T			
	20-M10-11T-3T			
	25-M12-11T-3T	For insert screw recommended torque 1.2 N • m		
	32-M16-11T-4T			
MEC	25-M12-17-2T	SB-4070TRN	DTM-15	P-37
	32-M16-17-3T	For insert screw recommended torque 3.5 N • m		

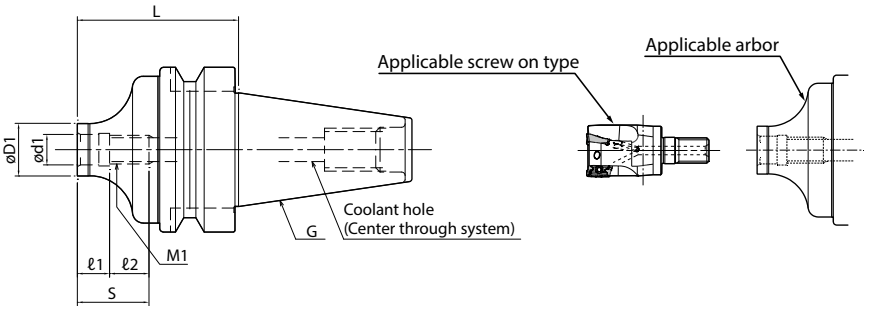
Coat anti-seize compound (P-37) thinly on portion of taper and thread when insert is fixed.

Identification system for screw on type

MEC - **16** - **M08** - **11T** - **2T**

- MEC: Series
- 16: Cutting dia.
- M08: Thread size
- 11T: Insert size
- 2T: No. of inserts

BT arbor (For screw on type / two face contact)

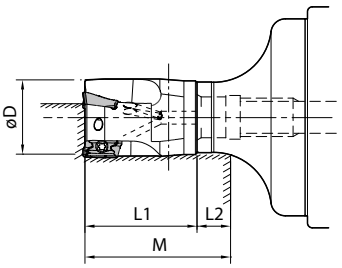


Arbor dimensions

Description		Availability	Dimension (mm)							Coolant hole	Arbor (Double-face clamping)	Screw on type (Head) ➡ P10
			L	øD1	ød1	S	ℓ1	ℓ2	M1		G	
BT30K-	M08-45	●	45	14.7	8.5	20	9	11	M8 × P1.25	Yes	BT30	MEC16-M08··
	M10-45	●		18.7	10.5	21		12	M10 × P1.5			MEC20-M10··
	M12-45	●		23	12.5	24		15	M12 × P1.75			MEC25-M12··
BT40K-	M08-55	●	55	14.7	8.5	20	9	11	M8 × P1.25	Yes	BT40	MEC16-M08··
	M10-60	●	60	18.7	10.5	21		12	M10 × P1.5			MEC20-M10··
	M12-55	●	55	23	12.5	24		15	M12 × P1.75			MEC25-M12··
	M16-65	●	65	30	17	25		16	M16 × P2.0			MEC32-M16··

● : Available

Effective depth of assembled tool



Arbor description		Applicable screw on type			Effective depth of assembled tool (mm)	
		Description	Cutting dia. (mm)	Dimension (mm)	M	L2
			øD	L1		
BT30K-	M08-45	MEC16-M08··	ø16	25	31.8	6.8
	M10-45	MEC20-M10··	ø20	30	36.8	
	M12-45	MEC25-M12··	ø25	35	42.8	7.8
BT40K-	M08-55	MEC16-M08··	ø16	25	31.7	6.7
	M10-60	MEC20-M10··	ø20	30	38.7	8.7
	M12-55	MEC25-M12··	ø25	35	44.6	9.6
	M16-65	MEC32-M16··	ø32	40	51.2	11.2

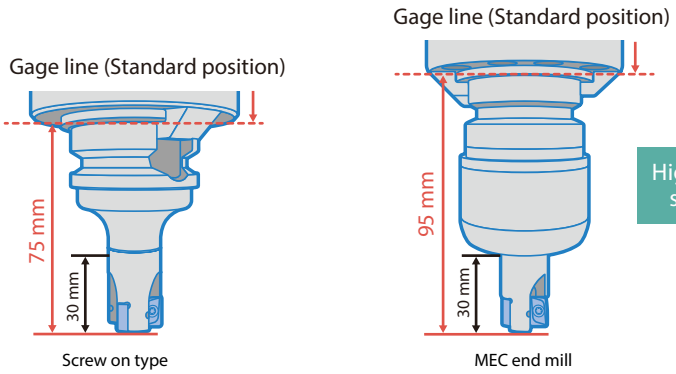
Arbor identification system

BT30 Arbor size — **K** Two-Face clamping spindle — **M08** Thread size — **45** Length

Advantages of screw on type

Low gage line reduces chattering

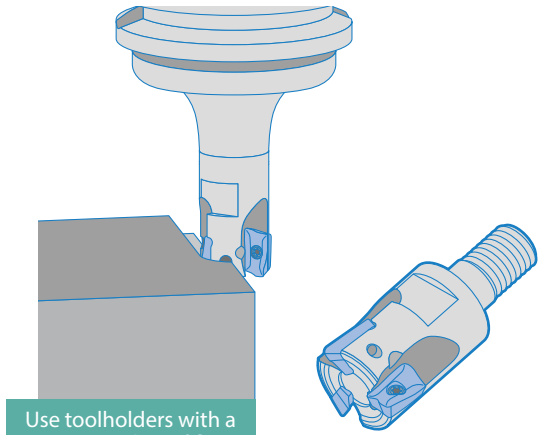
Though the overhang length is the same (30 mm), MEC screw on type has a shorter distance from the cutting edge to the gage line compared to other MEC end mills.



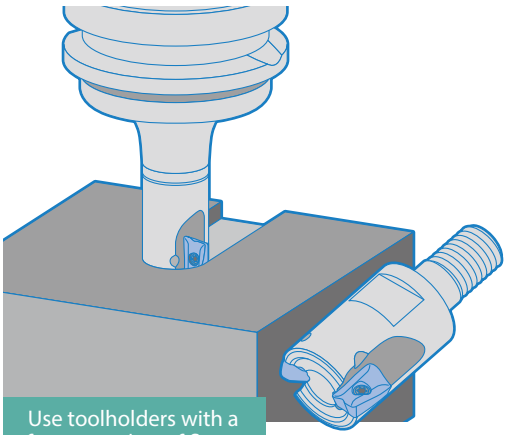
High efficiency and high quality machining in small machining centers (BT30/BT40, etc.).

Toolholders with a greater number of flutes vs. toolholders with a fewer number of flutes.

Shouldering

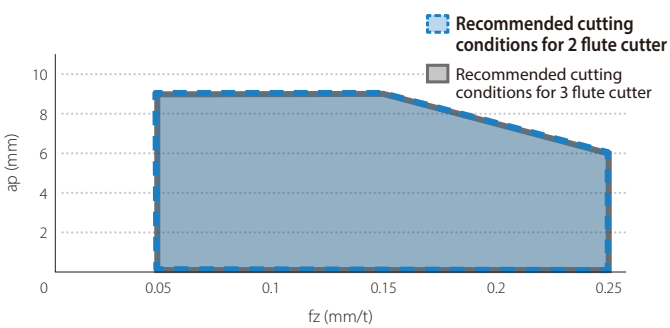


Slotting

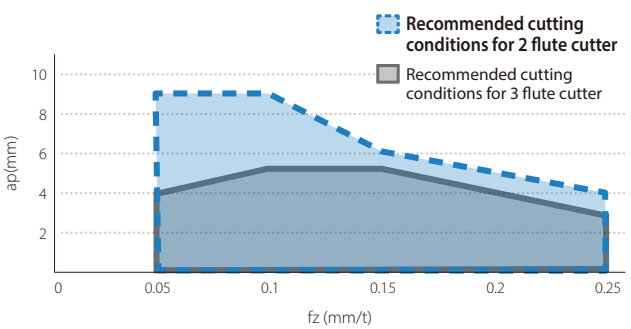


MEC screw on type recommended cutting conditions

Shouldering



Slotting



When shouldering, use cutters with a greater number of flutes for higher efficiency and higher feed rates.
When slotting use cutters with a fewer number of flutes to lower cutting forces.

MEC | Recommended cutting conditions ★1st recommendation ☆2nd recommendation

JT chipbreaker

Workpiece material	fz (mm/t)		Recommended insert grades (Vc m/min)					
	Holder		Cermet	MEGACOAT NANO	MEGACOAT		PVD coated carbide	CVD coated carbide
	MEC10~MEC19	MEC20~MEC40 MEC032R~MEC160R	TN100M	PR1535	PR1225	PR1210	PR830	CA6535
Carbon steel	0.06 – **0.1** – 0.15	0.08 – **0.15** – 0.25	☆ 120 – **160** – 200	☆ 120 – **180** – 250	★ 120 – **180** – 250	—	☆ 120 – **160** – 200	—
Alloy steel	0.06 – **0.1** – 0.12	0.08 – **0.15** – 0.2	☆ 100 – **140** – 180	☆ 100 – **160** – 220	★ 100 – **160** – 220	—	☆ 100 – **140** – 180	—
Mold steel	0.06 – **0.08** – 0.1	0.08 – **0.12** – 0.2	☆ 80 – **120** – 150	☆ 80 – **140** – 180	★ 80 – **140** – 180	—	☆ 80 – **120** – 150	—
Austenitic stainless steel	0.06 – **0.08** – 0.1	0.08 – **0.12** – 0.15	—	☆ 100 – **160** – 200	☆ 100 – **160** – 200	—	☆ 100 – **140** – 180	—
Martensitic stainless steel	0.06 – **0.08** – 0.1	0.08 – **0.12** – 0.2	—	☆ 150 – **200** – 250	—	—	—	★ 180 – **240** – 300
Precipitation hardened stainless steel	0.06 – **0.08** – 0.1	0.08 – **0.12** – 0.2	—	★ 90 – **120** – 150	—	—	—	—
Gray cast iron	0.06 – **0.1** – 0.15	0.08 – **0.18** – 0.25	—	—	—	★ 120 – **180** – 250	—	—
Nodular cast iron	0.06 – **0.08** – 0.1	0.08 – **0.15** – 0.2	—	—	—	★ 100 – **150** – 200	—	—
Ni-base heat resistant alloy	0.06 – **0.08** – 0.1	0.08 – **0.12** – 0.15	—	★ 20 – **30** – 50	—	—	—	☆ 20 – **30** – 50
Titanium alloy	0.06 – **0.08** – 0.1	0.08 – **0.15** – 0.2	—	☆ 40 – **60** – 80	—	☆ 30 – **50** – 70	—	—

Cutting with coolant is recommended for Ni-base heat resistant alloy and titanium alloy.

JS chipbreaker

Workpiece material	fz (mm/t)		Insert grades (Cutting speed Vc m/min)			
	Holder		MEGACOAT NANO	MEGACOAT	PVD coated carbide	CVD coated carbide
	MEC10~MEC19	MEC20~MEC40 MEC032R~MEC160R	PR1535	PR1225	PR830	CA6535
Stainless steel	0.06 – **0.1** – 0.12	0.08 – **0.15** – 0.18	☆ 120 – **180** – 250	★ 120 – **180** – 250	☆ 120 – **160** – 200	—
Carbon steel	0.06 – **0.08** – 0.1	0.08 – **0.12** – 0.15	☆ 100 – **160** – 220	★ 100 – **160** – 220	☆ 100 – **140** – 180	—
Mold steel	0.06 – **0.08** – 0.1	0.08 – **0.1** – 0.12	☆ 80 – **140** – 180	★ 80 – **140** – 180	☆ 80 – **120** – 150	—
Austenitic stainless steel	0.06 – **0.08** – 0.1	0.08 – **0.1** – 0.12	★ 100 – **160** – 200	☆ 100 – **160** – 200	☆ 100 – **140** – 180	—
Martensitic stainless steel	0.06 – **0.08** – 0.1	0.08 – **0.1** – 0.12	☆ 150 – **200** – 250	—	—	★ 180 – **240** – 300
Precipitation hardened stainless steel	0.06 – **0.08** – 0.1	0.08 – **0.1** – 0.12	☆ 90 – **120** – 150	—	—	—
Ni-base heat resistant alloy	0.06 – **0.08** – 0.1	0.08 – **0.1** – 0.12	★ 20 – **30** – 50	—	—	☆ 20 – **30** – 50
Titanium Alloy	0.06 – **0.08** – 0.1	0.08 – **0.1** – 0.12	☆ 40 – **60** – 80	—	—	—

Cutting with coolant is recommended for Ni-base heat resistant alloy and titanium alloy.

JA chipbreaker

Workpiece material	fz (mm/t)	Insert grades (Cutting speed: Vc m/min)	
		DLC coated carbide	Carbide
		PDL025	GW25
Aluminium alloys (Si 13% or below)	0.05 – 0.3	200 – 1,000	200 – 800
Aluminium alloys (Si 13% or above)	0.05 – 0.2	200 – 300	200 – 300

PCD

Workpiece material	fz (mm/t)	Insert Grades (Cutting speed: Vc m/min)
		PCD
		KPD230 (KPD001)
Aluminium alloys (Si 13% or below)	0.05 – 0.2	500 – 1,500
Aluminium alloys (Si 13% or above)	0.05 – 0.15	300 – 1,000

Warning **Please observe below precautions fully. Failure to observe the precautions may cause serious damage to human body.**

Warning about max. revolution indicated on main body

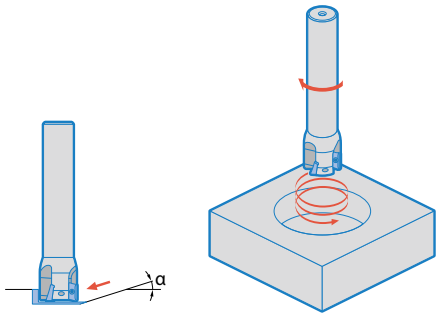
1. When running the end mill and the face mill at revolutions exceeding the maximum revolution limit, the inserts or toolholder may be damaged due to the centrifugal force.
2. For actual practical revolution, please set within recommended cutting condition.
3. When using at a higher revolution (over 10,000 min^{-1}), refer to the table to adjust the balance of MEC and suitable arbor.

Max. revolution (min^{-1})	Balance quality grade G ISO 1940-1 / 8821 (JIS B0905)
~20,000	G16
~30,000	G6.3
30,000~	G2.5

Ramping, helical milling and vertical milling

Ramping, helical milling

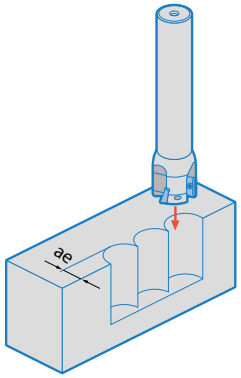
- Ramping angle should be under α°
- For plunge depth per revolution when helical milling, see the cutting performance data of each tool. Use compressed air during machining.



Cutting dia.	Applicable insert	Max. ramping angle (α°)
ø16 – ø18	BDMT11T3 type BDGT11T3 type	3°
ø19 – ø21		5°
ø22 – ø25		2.5°
ø28 – ø32		1.5°
ø40		0.7°
ø50 over		Not recommended
ø25	BDMT1704 type BDGT1704 type	8°
ø32		5°
ø40		2.5°
ø50 over		Not recommended

BDMT1103 inserts are not recommended for slant milling or helical milling.

Vertical milling



Cutting dia.	Applicable insert	Max. W.O.C. (ae)
ø16 – ø19	BDMT11T3 type BDGT11T3 type	1.5 mm
ø20 – ø160	BDMT11T3 type BDGT11T3 type	5 mm
ø25 – ø160	BDMT1704 type BDGT1704 type	8 mm

BDMT1103 inserts are not recommended for vertical milling.

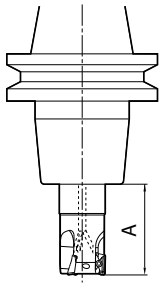
Guidance of minimum cutting dia by helical machining

MEC	Holder dia.	ø16	ø18	ø20	ø22	ø25	ø28	ø30	ø32	ø40	ø50
BD_T11T3 type	Guidance of minimum cutting dia by helical machining.	ø21	ø25	ø29	ø33	ø39	ø45	ø49	ø53	ø69	Helical machining is not recommended.
	Guidance of minimum cutting dia in case of flatting bottom after helical machining.	ø28	ø32	ø36	ø40	ø46	ø52	ø56	ø60	ø76	

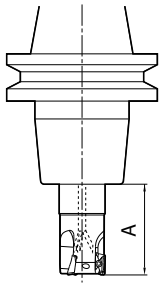
MEC	Holder dia.	ø25	ø32	ø40	ø50
BD_T1704 type	Guidance of minimum cutting dia by helical machining.	ø34	ø48	ø64	Helical machining is not recommended.
	Guidance of minimum cutting dia in case of flatting bottom after helical machining.	ø46	ø60	ø76	

Cutting performance of MEC end mill (JT chipbreaker)

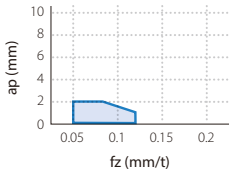
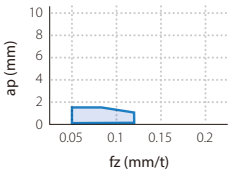
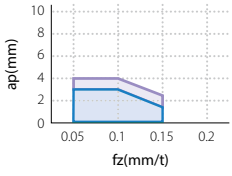
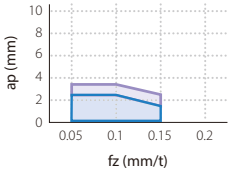
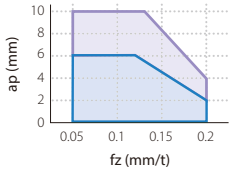
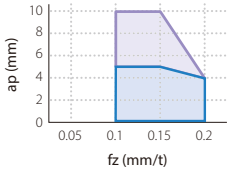
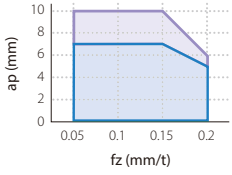
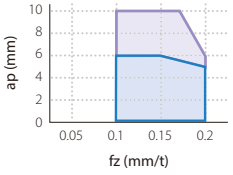
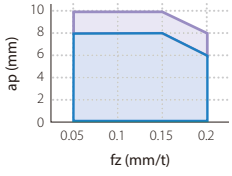
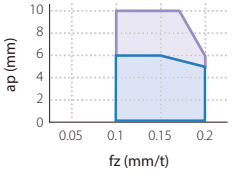
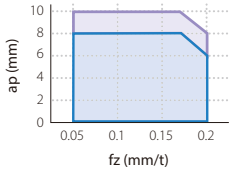
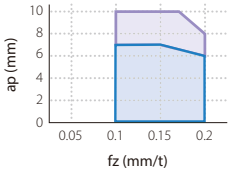
① Cutting edge length 10 mm (Standard/Same size shank)

Cutting dia.	Description	Overhang length A (mm)		Shape
ø10	MEC10-S10-11	17	—	
ø12	MEC12-S16-11	20	30	
ø16	MEC16-S16-11T	30	45	
ø20	MEC20-S20-11T	30	45	
ø25	MEC25-S25-11T	32	48	
ø32	MEC32-S32-11T	40	60	

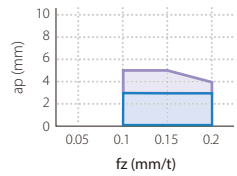
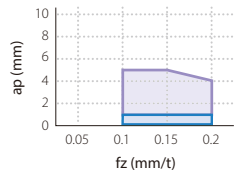
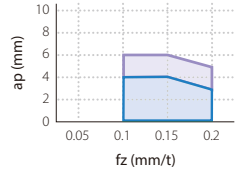
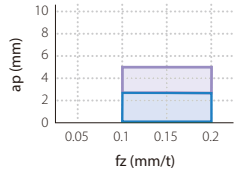
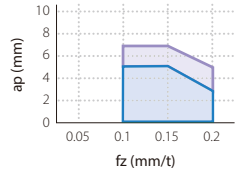
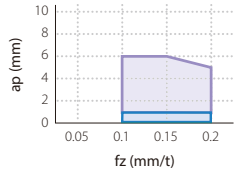
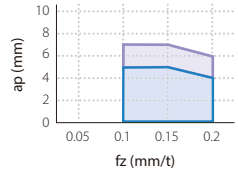
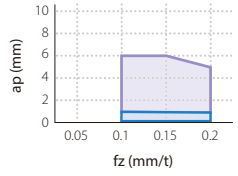
② Cutting edge length 10 mm (Long shank)

Cutting dia.	Description	Overhang length A (mm)		Shape
ø20 Long shank	MEC20-S20-140-11T	60	90	
ø25 Long shank	MEC25-S25-160-11T	60	100	
ø32 Long shank	MEC32-S32-200-11T	100	130	
ø40 Long shank	MEC40-S32-240-11T	100	130	

Vc = 120 m/min Workpiece: C50

Description	Shouldering (Cutting width ae = øD/2)	Slotting Ramping and helical milling
MEC10-S10-11		
MEC12-S16-11		
MEC16-S16-11T		
MEC20-S20-11T		
MEC25-S25-11T		
MEC32-S32-11T		

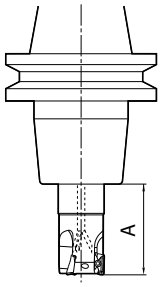
Vc = 120 m/min Workpiece: C50

Description	Shouldering (Cutting width ae = øD/2)	Slotting Ramping and helical milling
MEC20 -S20-140-11T Long shank		
MEC25 -S25-160-11T Long shank		
MEC32 -S32-200-11T Long shank		
MEC40 -S32-240-11T Long shank		

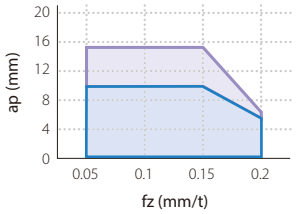
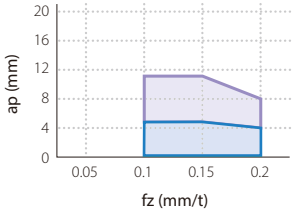
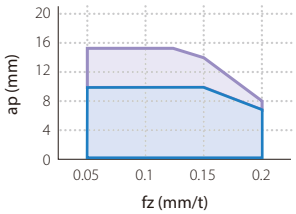
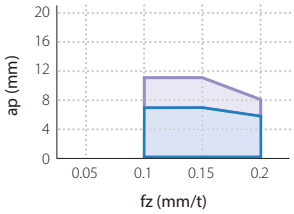
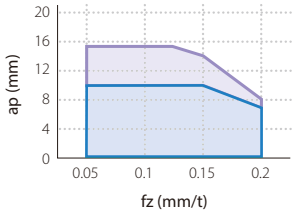
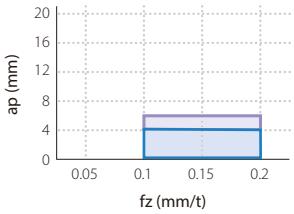
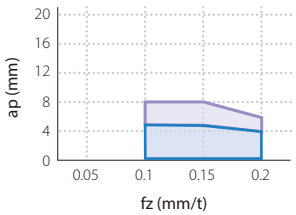
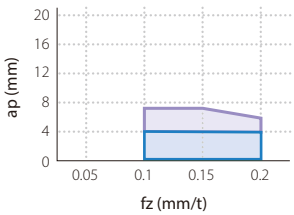
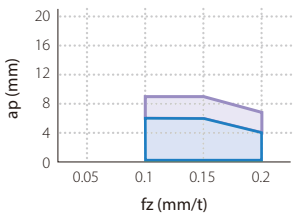
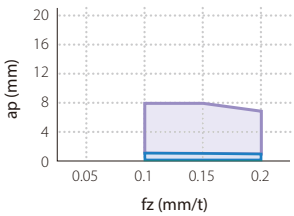
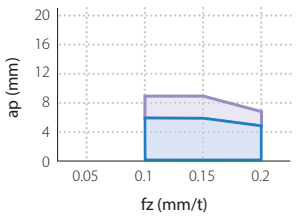
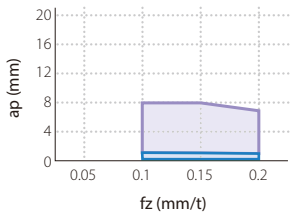
③ Cutting edge length 15.7 mm

Cutting dia.	Description	Overhang length A (mm)	
ø25	MEC25-S25-17	36	54
ø32	MEC32-S32-17	40	60
ø40	MEC40-S32-17	50	75
ø25 Long shank	MEC25-S25-160-17	60	100
ø32 Long shank	MEC32-S32-200-17	100	130
ø40 Long shank	MEC40-S32-240-17	100	130

Shape



Vc = 120 m/min Workpiece: C50

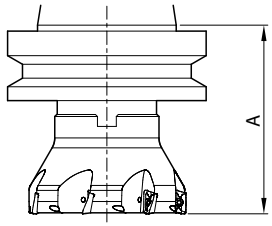
Description	Shouldering (Cutting width ae = øD/2)	Slotting Ramping and helical milling
MEC25-S25-17		
MEC32-S32-17		
MEC40-S32-17		
MEC25-S25-160-17 Long shank		
MEC32-S32-200-17 Long shank		
MEC40-S32-240-17 Long shank		

Cutting performance of MEC milling cutter (JT chipbreaker)

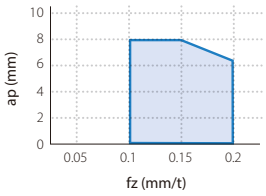
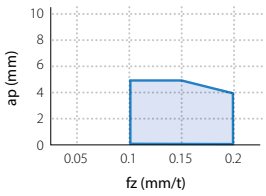
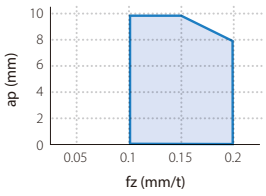
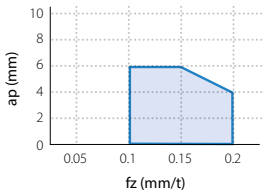
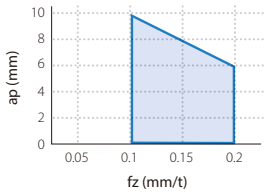
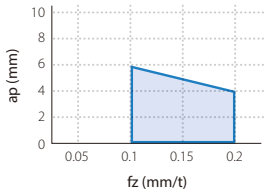
Cutting edge length 10 mm

Cutting dia.	Description	Overhang length A (mm)
ø40	MEC040R-11-5T-M	115
ø50	MEC050R-11-◯T-M	100
ø63	MEC063R-11-◯T	95
	MEC063R-11-◯T-M	
ø80	MEC080R-11-◯T	95
ø100	MEC100R-11-9TN	108
ø125	MEC125R-11-11T	
ø160	MEC160R-11-14T	

Shape



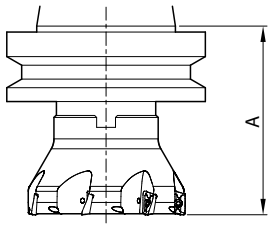
Vc = 120 m/min Workpiece: C50

Description	Shouldering (Cutting width ae = øD/2)	Slotting
MEC040R -11-5T-M		
MEC050R -11-◯T-M ~ MEC100R -11-9TN		
MEC125R -11-11T MEC160R -11-14T		

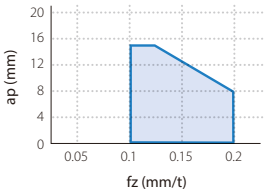
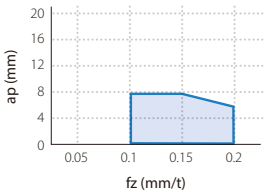
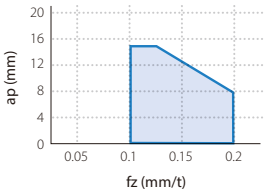
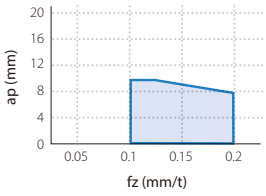
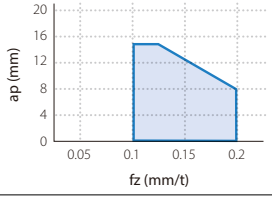
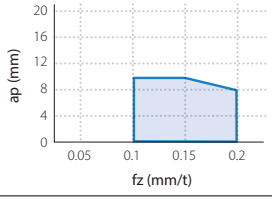
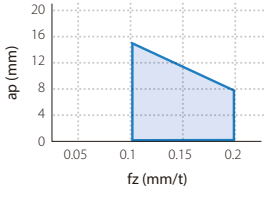
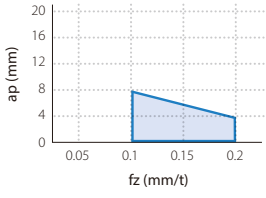
Cutting edge length 15.7 mm

Cutting dia.	Description	Overhang Length A (mm)
ø40	MEC040R-17-4T-M	115
ø50	MEC050R-17-◯T-M	100
ø63	MEC063R-17-◯T	95
	MEC063R-17-◯T-M	
ø80	MEC080R-17-◯T	95
ø100	MEC100R-17-◯TN	108
ø125	MEC125R-17-9T	
ø160	MEC160R-17-12T	

Shape



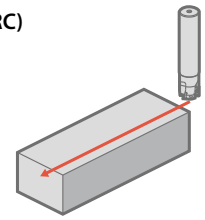
Vc = 120 m/min Workpiece: C50

Description	Shouldering (Cutting width ae = øD/2)	Slotting
MEC040R -17-4T-M		
MEC050R -17-◯T-M		
MEC063R -17-◯T(-M) ~ MEC100R -17-◯TN		
MEC125R -17-9T MEC160R -17-12T		

MEC case studies

Pre-hardened tool steel (54-56 HRC)

Test piece (54 - 56HRC)
Vc = 50 m/min (n = 800 min^{-1})
fz = 0.125 mm/t (Vf = 300 mm/min)
ap × ae = 2 × 14 mm
Dry
MEC20-S20-11T (3 teeth)
BDMT11T308ER-JT (PR830)



Metal removal volume

MEC **71.3 cm³** (continuable) x24

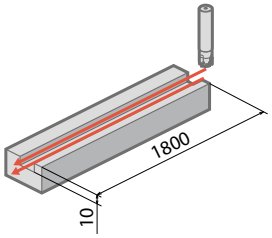
Competitor N (End mill) **2.9 cm³** (chipping)

Competitor N (ø25: 2 teeth) caused chipping after 10 minutes machining with the conditions of Vc = 40 m/min, fz = 0.075 mm/t, ap x ae = 2 × 3 mm, and it was noisy. Also, higher feed rate was not possible because it would cause breakage. MEC maintained a good edge condition even after 10 minutes and was still available for further machining.

(User evaluation)

17Cr3

Plate
Vc = 88 m/min (n = 1,400 min^{-1})
fz = 0.12 mm/t (Vf = 500 mm/min)
ap = 5 mm × 2 passes
Dry
MEC20-S20-11T (3 teeth)
BDMT11T308ER-JT (PR830)



Number of workpieces

MEC **23 pcs/edge** x2

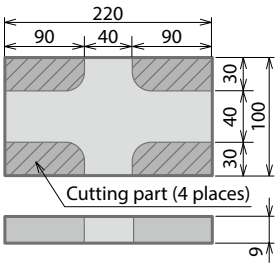
Competitor O (End mill) **10~11 pcs/edge**

MEC doubled competitor O's tool life under the same machining conditions.

(User evaluation)

X5CrNi1810

Plate
Vc = 125 m/min (n = 1,600 min^{-1})
fz = 0.1 mm/t (Vf = 320 mm/min)
ap = 9.0 mm
Dry
MEC25-S25-17 (2 teeth)
BDMT170408ER-JT (PR830)



Number of workpieces

MEC **4 pcs/edge or over** x4

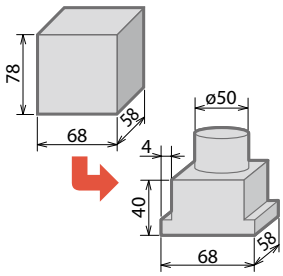
Competitor P (End mill) **Under 1 pc/edge**

Competitor M showed higher cutting forces and caused cracking to the cutting edge. MEC produced 4 pcs/edge without cracking.

(User evaluation)

Hot tool steel

Mold
Vc = 130 m/min (n = 1,040 min^{-1})
fz = 0.18 mm/t (Vf = 936 mm/min)
ap × ae = 3 × 5
(depends on machined part)
Dry (with air)
MEC40-S32-11T (5 teeth)
BDMT11T308ER-JT (PR830)



Cutting time

MEC **2 hours (Less wear/can continue)** Same or more

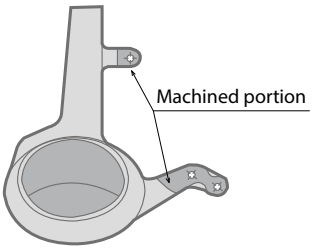
Competitor Q (End mill) **2 hours (Cracking/cannot continue)**

MEC tool life was better than Competitor Q. MEC's wear was less and able to machine further. Competitor mill had 6 teeth and its table feed rate was 936 mm/min. (fz = 0.15 mm/t).

(User evaluation)

20CrMo4

Knuckle steering
Vc = 150 m/min (n = 1,200 min^{-1})
fz = 0.1 mm/t (Vf = 478 mm/min)
ap = 0.5 - 5 mm (Shouldering)
Dry
MEC40-S32-17 (4 teeth)
BDMT170408ER-JT (PR830)



Number of workpieces

MEC **150 pcs/edge** x3

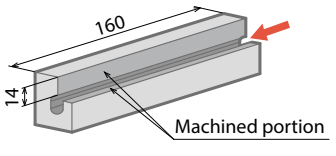
Competitor R (End mill) **40 pcs/edge**

MEC surface finish was better than the competitor end mill R and the tool life was over 3 times longer.

(User evaluation)

Ni-base heat resistant alloy

Turbine part
Vc = 15 m/min (n = 120 min^{-1})
fz = 0.08 mm/t (Vf = 38 mm/min)
ap = 0.5 mm
Wet
MEC040R-17-4T-M (4 teeth)
BDMT170408ER-JS PR1025



Number of workpieces

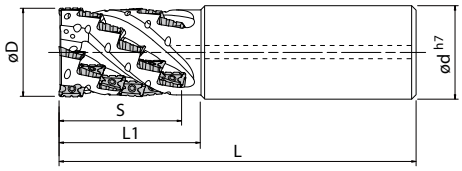
MEC **9 pcs/edge** x9

Competitor S (End mill) **Less than 1 pc/edge**

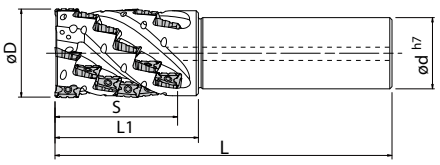
Competitor S was not able to successfully machine one piece, but the MEC produced 9 pieces with good surface finishes.

(User evaluation)

MECH end mill with cylindrical shank (With coolant hole for bottom insert)



#1



#2

Toolholder dimensions

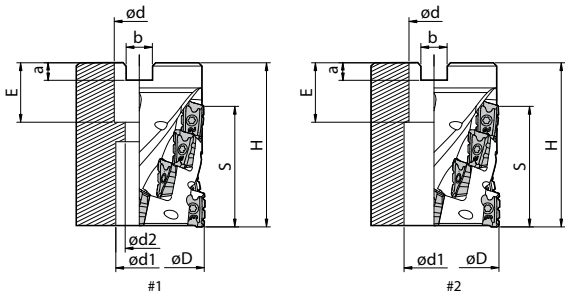
Description		Availability	No. of flutes	No. of stages	No. of inserts	Dimension (mm)					Rake angle		Drawing	Spare parts			Applicable inserts ➡ P5
						øD	ød	L	L1	S	A.R. (MAX.)	R.R.		Insert screw	Wrench	Anti-seize compound	
MECH	025-S25-11-4-2T	●	2	4	8	25	25	120	46	37	+21°	-10°	#1	SB-2555TRG	DTM-8	P-37	BDMT11T308ER-N2 BDMT11T308ER-N3
	032-S32-11-5-2T	●		5	10	32	32	140	55	46		-9°					
	032-S32-11-5-4T	●	4		20												
	040-S32-11-6-4T	●		6	24	40		150	64	55	+23°	-8°	#2				
	040-S42-11-6-4T	●					42	160					#1				
	050-S42-11-7-4T	●		7	28	50		172	75	64		-7°	#2				
	050-S42-11-7-6T	●	6		42												
MECH	040-S32-17-4-2T	●	2	4	8	40	32	160	73	59	+19°	-7°	#2	SB-4070TRN	DTM-15	P-37	BDMT170408ER-N3 BDMT170408ER-N4
	040-S42-17-4-2T	●					42	170					#1				
	050-S42-17-5-4T	●	4	5	20	50		185	88	74		-6°	#2				

Coat anti-seize compound (MP-1) thinly on clamp screw when insert is fixed.

● : Available

Recommended cutting conditions ➡ P24

MECH shell mill (Without coolant hole)



#1 #2

Rake angle		
Description	A.R. (MAX.)	R.R.
MECH・・・・-11-	+23°	-8°
MECH・・・・-17-	+19°	-7°

Toolholder dimensions

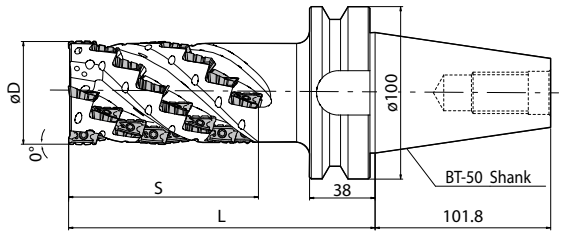
Description		Availability	No. of flutes	No. of stages	No. of inserts	Dimension (mm)									Drawing	Spare parts				Arbor bolt ➡ P5
						øD	ød	ød1	ød2	H	E	a	b	S		Insert screw	Wrench	Anti-seize compound	Applicable inserts	
MECH	040R-11-4-4T-M	●	4	4	16	40	16	15	9	50	19	5.6	8.4	37	#1	SB-2555TRG	DTM-8	P-37	HH8X25	BDMT11T308ER-N2
	050R-11-5-6T-M	●	6	5	30	50	22	18	11	63	21	6.3	10.4	46					HH10X30	BDMT11T308ER-N3
MECH	050R-17-2-4T-M	●	4	2	8	50	22	18	11	52	21	6.3	10.4	30	#1	SB-4070TRN	DTM-15	P-37	HH10X30	BDMT170408ER-N3 BDMT170408ER-N4
	050R-17-4-4T-M	●		4	16					78				59					HH10X40	
	063R-17-3-4T-M	●	4	3	12	63	27	20	14	70	24	7	12.4	45					HH12X35	
	080R-17-4-6T-M	●	6	4	24	80	32	26	18	85	28	8	14.4	59					HH16X45	
	100R-17-4-6T-M	●				100	40	56	-	85	30	9	16.4		#2				-	
MECH	063R-17-3-4T	●	4	3	12	63	25.4	20	14	70	26	6	9.5	45	#1	SB-4070TRN	DTM-15	P-37	HH12X35	
	080R-17-4-6T	●	6	4	24	80	31.75	26	18	85	32	8	12.7	59					HH16X45	
	100R-17-4-6T	●				100	38.1	56	-	85	38	10	15.9		#2				-	

Coat anti-seize compound (MP-1) thinly on clamp screw when insert is fixed.

● : Available

Recommended cutting conditions ➡ P24

MECH-BT50 (Integral arbor type, without coolant hole)



#1

Integral arbor type dimensions

Description		Availability	No. of flutes	No. of stages	No. of inserts	Dimension (mm)			Rake angle		Drawing	Spare parts			Applicable inserts ➡P5
						øD	L	S	A.R. (MAX.)	R.R.		Insert screw	Wrench	Anti-seize compound	
MECH	050R11-8-4T-BT50	●	4	8	32	50	143	73	+23°	-7°		SB-2555TRG	DTM-8	P-37	BDMT11T308ER-N2 BDMT11T308ER-N3
MECH	050R17-7-4T-BT50	●	4	7	28	50	173	104	+19°	-7°	#1	SB-4070TRN	DTM-15	P-37	BDMT170408ER-N3 BDMT170408ER-N4
	063R17-7-4T-BT50	●				63									
	080R17-7-4T-BT50	●				80									
	100R17-7-6T-BT50	●	6		42	100									

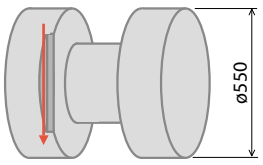
Coat anti-seize compound (MP-1) thinly on clamp screw when insert is fixed.

Recommended cutting conditions ➡P24

MECH case studies

Ship parts C45

Vc = 150 m/min (n = 955 min^{-1})
ap x ae = 70 mm x 10 mm
fz = 0.2 mm/t (Vf = 764 mm/min)
Dry
MECH050-S42-17-5-4T (4 flutes)
BDMT170408ER-N3
BDMT170408ER-N4
(PR830)



Metal removal volume

MECH 534 cc/min x4.6

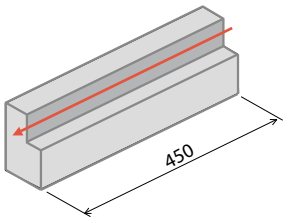
Competitor T 115 cc/min

MECH machining efficiency improved 4.6 times that of Competitor T.

(User evaluation)

Plate 17Cr3

Vc = 150 m/min (n = 955 min^{-1})
ap x ae = 70 mm x 10 mm
fz = 0.2 mm/t (Vf = 760 mm/min)
Dry
MECH050-S42-17-5-4T(4 flutes)
BDMT170408ER-N3
BDMT170408ER-N4
(PR830)



Metal removal volume

MECH 532 cc/min x3.1

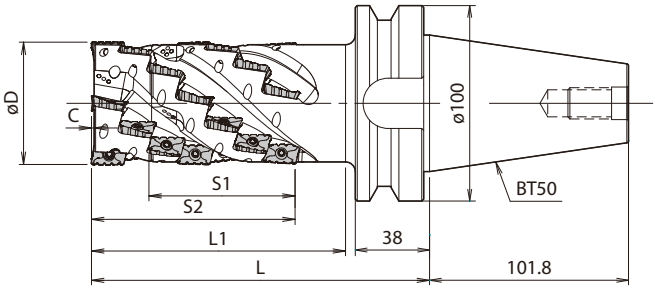
Competitor U 170 cc/min

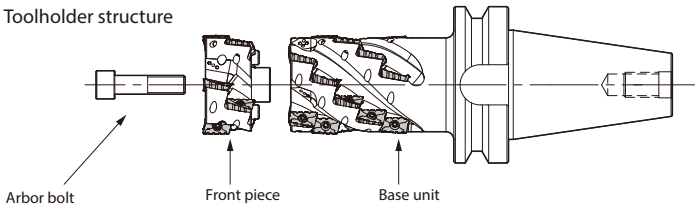
MECH machining efficiency improved 3.1 times that of competitor U and had an excellent wall finish.

(User evaluation)

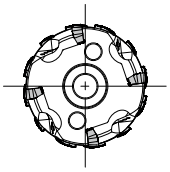
MECH interchangeable head

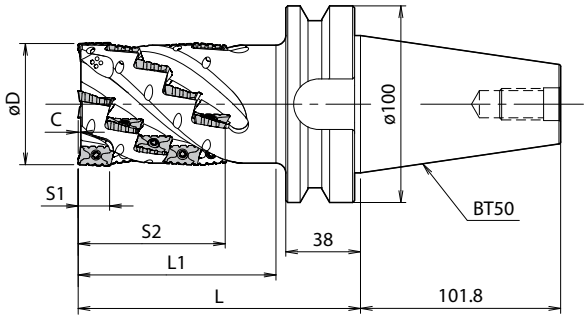
MECH-BT50SA (without coolant hole) arbor integral type (base unit +1 front piece + arbor bolt)





MECH-BT50-A (without coolant hole) base unit





Toolholder dimensions

Description			Availability	No. of flutes	No. of stages	No. of inserts	Dimension (mm)						Rake angle		Weight (kg)
							øD	L	L1	C	S1	S2	A.R.	R.R.	
Arbor integral type	MECH	050R11-4T-BT50SA	MTO	4	8	32	50	143	99	0.7	55	73	+23°	-7°	4.8
		063R17-4T-BT50SA	MTO		7	28	63	173	130	1.3	75	104	+19°	-7°	5.8
		080R17-4T-BT50SA	MTO				80								7.6
		100R17-6T-BT50SA	MTO	6	7	42	100								9.8
Base unit	MECH	050R11-4T-BT50-A	MTO	4	6	24	50	125	81	0.7	10	55	+23°	-7°	4.6
		063R17-4T-BT50-A	MTO		5	20	63	143	100	1.3	16	75	+19°	-7°	5.4
		080R17-4T-BT50-A	MTO				80								6.8
		100R17-6T-BT50-A	MTO	6	5	30	100								8.5

MTO : Made to order

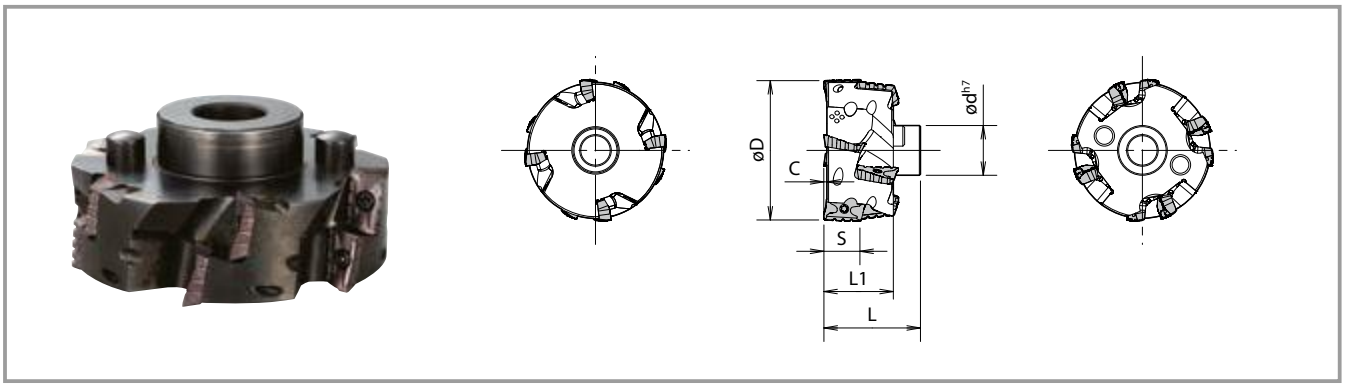
For recommended cutting conditions, see page ➡ P24

Toolholder structure

End mill			Base unit ➡ P21		Front piece (1 pc) ➡ P22		Arbor bolt
MECH	050R11-4T-BT50SA	=	MECH050R11-4T-BT50-A	+	MECH050R11-4T-F	+	HH12X35
	063R17-4T-BT50SA		MECH063R17-4T-BT50-A		MECH063R17-4T-F		HH12X40
	080R17-4T-BT50SA		MECH080R17-4T-BT50-A		MECH080R17-4T-F		HH16X40
	100R17-6T-BT50SA		MECH100R17-6T-BT50-A		MECH100R17-6T-F		HH20X40

MECH interchangeable head

MECH-F (without a coolant hole) front piece



Toolholder dimensions

Description		Availability	No. of flutes	No. of stages	No. of inserts	Dimension (mm)						Rake angle		Weight (kg)
						øD	ød	L	L1	C	S	A.R.	R.R.	
MECH	050R11-4T-F	●	4	2	8	50	22	32	18	0.7	10	+23°	-7°	0.2
	063R17-4T-F	●				63	22	44	30	1.3	16	+19°	-7°	0.4
	080R17-4T-F	●				80	32							0.8
	100R17-6T-F	●	6	2	12	100	45							1.3

●: Available

Applicable inserts

End mill		Base unit	Front piece	Applicable inserts ➡ P5
MECH	050R11-4T-BT50SA	MECH050R11-4T-BT50-A	MECH050R11-4T-F	BDMT11T308ER-N2 BDMT11T308ER-N3
	063R17-4T-BT50SA	MECH063R17-4T-BT50-A	MECH063R17-4T-F	BDMT170408ER-N3 BDMT170408ER-N4
	080R17-4T-BT50SA	MECH080R17-4T-BT50-A	MECH080R17-4T-F	
	100R17-6T-BT50SA	MECH100R17-6T-BT50-A	MECH100R17-6T-F	

For installation of notched insert, ref. page 23.

Spare parts

Description			Spare parts				
			Insert screw	Wrench (for insert screw)	Arbor bolt	Wrench (for arbor Bolt)	Anti-seize compound
							
Arbor integral type (Set)	MECH	050R11-4T-BT50SA	SB-2555TRG	DTM-8	HH12X35	LW-10	P-37
		063R17-4T-BT50SA	SB-4070TRN	DTM-15	HH12X40		
		080R17-4T-BT50SA			HH16X40	LW-14	
		100R17-6T-BT50SA			HH20X40	LW-17	
Base unit	MECH	050R11-4T-BT50-A	SB-2555TRG	DTM-8	HH12X35	LW-10	
		063R17-4T-BT50-A	SB-4070TRN	DTM-15	HH12X40		
		080R17-4T-BT50-A			HH16X40	LW-14	
		100R17-6T-BT50-A			HH20X40	LW-17	
Front piece	MECH	050R11-4T-F	SB-2555TRG	—	—	—	
		063R17-4T-F	SB-4070TRN				
		080R17-4T-F					
		100R17-6T-F					

If you purchased the front piece only, wrench (for insert screw)/arbor bolt and wrench (for arbor bolt) is not included. Coat anti-seize compound (P-37) thinly on clamp screw when insert is fixed.

MECH interchangeable head

Number of inserts installed

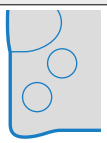
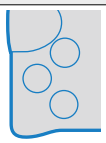
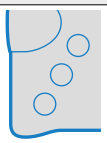
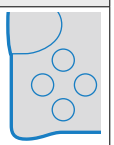
Description		No. of flutes	No. of inserts	No. of inserts			
				BDMT11T308ER-		BDMT170408ER-	
				N2	N3	N3	N4
MECH	025-S25-11-4-2T	2	8	4	4	—	—
	032-S32-11-5-2T		10	5	5		
	032-S32-11-5-4T	4	20	10	10		
	040-S32-11-6-4T		24	12	12		
	040-S42-11-6-4T						
	050-S42-11-7-4T		28	14	14		
	050-S42-11-7-6T	6	42	21	21		
MECH	040-S32-17-4-2T	2	8	—	—	4	4
	040-S42-17-4-2T						
	050-S42-17-5-4T	4	20			10	10
MECH	040R-11-4-4T-M	4	16	8	8	—	—
	050R-11-5-6T-M	6	30	15	15		
MECH	050R-17-2-4T-M	4	8	—	—	4	4
	050R-17-4-4T-M		16			8	8
	063R-17-3-4T-M		12			6	6
	080R-17-4-6T-M	6	24			12	12
	100R-17-4-6T-M						
MECH	063R-17-3-4T	4	12			6	6
	080R-17-4-6T	6	24			12	12
	100R-17-4-6T						
MECH	050R11-8-4T-BT50	4	32	16	16	—	—
	050R17-7-4T-BT50		28	—	—	14	14
	063R17-7-4T-BT50						
	080R17-7-4T-BT50						
	100R17-7-6T-BT50	6	42			21	21

Description		No. of flutes	No. of inserts	No. of inserts			
				BDMT11T308ER-		BDMT170408ER-	
				N2	N3	N3	N4
MECH	050R11-4T-BT50SA	4	32	16	16	—	—
	063R17-4T-BT50SA	4	28	—	—	14	14
	080R17-4T-BT50SA						
	100R17-6T-BT50SA	6	42	—	—	21	21
MECH	050R11-4T-BT50-A	4	24	12	12	—	—
	063R17-4T-BT50-A	4	20	—	—	10	10
	080R17-4T-BT50-A						
	100R17-6T-BT50-A	6	30	—	—	15	15
MECH	050R11-4T-F	4	8	4	4	—	—
	063R17-4T-F	4	8	—	—	4	4
	080R17-4T-F						
	100R17-6T-F	6	12	—	—	6	6

Precautions when installing notched inserts

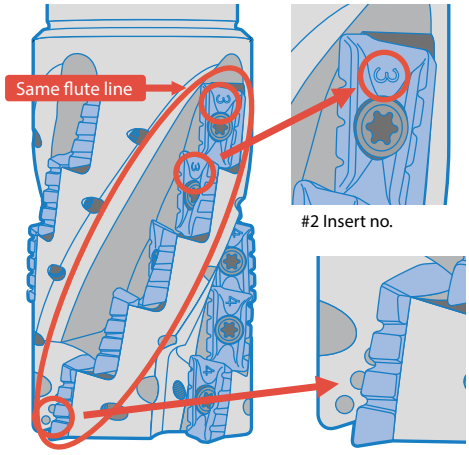
1. Install notched inserts by matching the insert with the number of marks on the holder body.

Insert number and holder marks

Insert size	11 type		17 type	
Insert no.	2	3	3	4
Marks				

Using the cutter with the inserts installed incorrectly will damage the holder.

2. When installing notched inserts in flute line, ensure that the number on the insert is the same as the insert in first stage. Ref. to #1, #2 and #3.



#1 Same flute line

#2 Insert no.

#3 Holder marks

MECH recommended cutting conditions ★: 1st recommendation ☆: 2nd recommendation

Recommended cutting conditions (when using a notched insert)

Workpiece material	fz (mm/t)	Recommended insert grades (Cutting speed Vc m/min)				
		MEGACOAT NANO	MEGACOAT			PVD coated carbide
		PR1535	PR1225	PR1230	PR1210	PR830
Carbon steel	0.08 – 0.1 – 0.15	☆ 120 – 180 – 250	☆ 120 – 180 – 250	★ 120 – 180 – 220	—	☆ 100 – 140 – 180
Alloy steel	0.08 – 0.1 – 0.15	☆ 100 – 160 – 220	☆ 100 – 160 – 220	★ 100 – 160 – 200	—	☆ 100 – 140 – 180
Mold steel	0.08 – 0.1 – 0.15	☆ 80 – 140 – 180	☆ 80 – 140 – 180	★ 80 – 140 – 160	—	☆ 100 – 120 – 150
Gray cast iron	0.08 – 0.15 – 0.18	—	—	—	★ 120 – 180 – 250	—
Nodular cast iron	0.08 – 0.15 – 0.18	—	—	—	★ 100 – 150 – 220	—
* Titanium alloys	0.08 – 0.1 – 0.15	★ 40 – 60 – 80	—	—	☆ 30 – 50 – 70	—

* Cutting with coolant is recommended for titanium alloy.

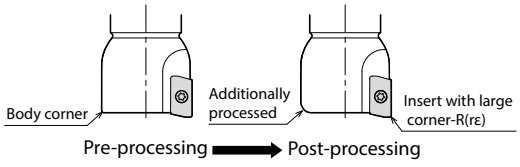
1. The recommended cutting conditions above are for notched inserts.
2. If using an insert without notch, the cutting depth (ap) and width (ae) should be less than 60% of those of a notched insert.

Workpiece material	fz (mm/t)	Recommended insert grades (Cutting Speed Vc m/min)	
		DLC coated carbide	Carbide
		PDL025	GW25
Aluminum alloy (Si 13% or less)	0.05 – 0.3	200 – 1,000	200 – 800
Aluminum alloy (Si 13% or less)	0.05 – 0.2	200 – 300	200 – 300

When using inserts with corner-R (rε) 1.6 or larger, additional modifications of the cutter body will be necessary. Ref. to the table below for the recommended modifications. Additional grind off is not necessary when corner-R is 1.2 mm or less.

Insert corner-R(rε)	Additional processing dimension to body corner (mm)
1.6	R1.0
2.0	
2.4	R1.2
3.1	R1.6
4.0	R2.5

* Round-shaped additional processing is recommended. When applying chamfer shaped additional processing, do not cut away too much.

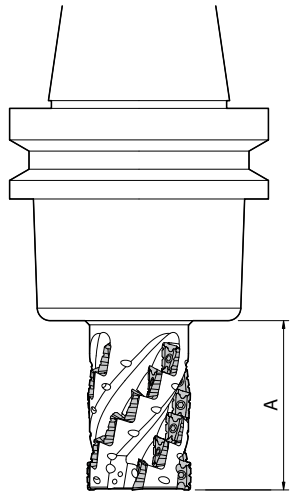


Cutting performance (Used machine: Machining center equivalent to AC15 / 18.5kW)

MECH end mill type

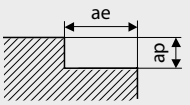
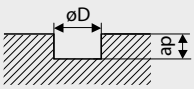
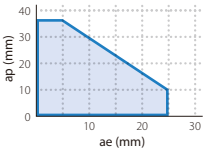
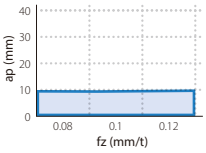
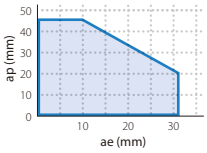
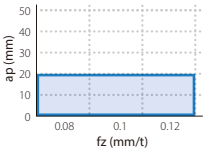
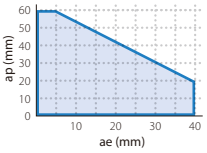
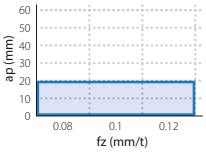
Cutting dia.	Description	Overhang length A (mm)
ø25	MECH025-S25-11-4-2T	48
ø32	MECH032-S32-11-5-2T	57
	MECH032-S32-11-5-4T	
ø40	MECH040-S32-11-6-4T	65
	MECH040-S42-11-6-4T	
ø50	MECH050-S42-11-7-4T	76
	MECH050-S42-11-7-6T	
ø40	MECH040-S32-17-4-2T	74
	MECH040-S42-17-4-2T	
ø50	MECH050-S42-17-5-4T	89

Shape

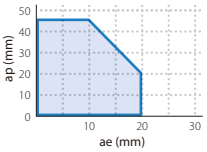
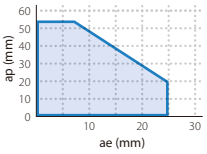
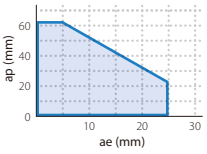
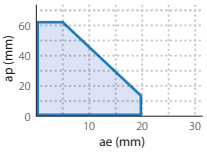
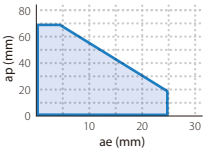


2 flute type

(Workpiece material : C50)

Description	Shouldering	Slotting
		
	Cutting speed: Vc = 100 – 180 m/min Feed: fz = 0.08 – 0.15 mm/t	Cutting speed: Vc = 100 – 120 m/min Feed: fz = 0.08 – 0.12 mm/t
MECH025-S25-11-4-2T		
MECH032-S32-11-5-2T		
MECH040-S32-17-4-2T MECH040-S42-17-4-2T		

4 flute / 6 flute type

MECH032-S32-11-5-4T	
MECH040-S32-11-6-4T MECH040-S42-11-6-4T	
MECH050-S42-11-7-4T	
MECH050-S42-11-7-6T	
MECH050-S42-17-5-4T	

4 flute / 6 flute type are not recommended for slotting.

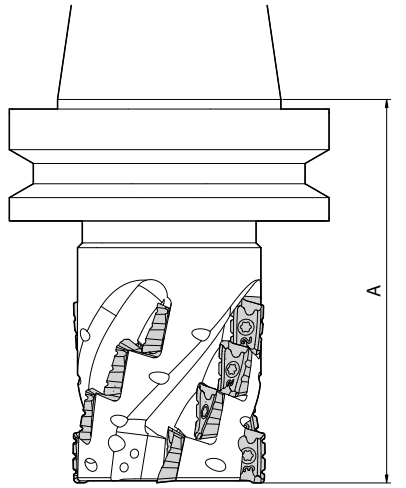
Cutting performance (Used machine: Machining center equivalent to AC15 / 18.5kW)

MECH shell mill type

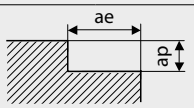
(Workpiece material : C50)

Cutting dia.	Description	Overhang length A (mm)
ø40	MECH040R-11-4-4T-M	125
ø50	MECH050R-11-5-6T-M	123
	MECH050R-17-2-4T-M	112
	MECH050R-17-4-4T-M	138
ø63	MECH063R-17-3-4T-M	115
	MECH063R-17-3-4T	
ø80	MECH080R-17-4-6T-M	130
	MECH080R-17-4-6T	
ø100	MECH100R-17-4-6T-M	130
	MECH100R-17-4-6T	

Shape

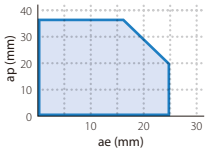


Shouldering

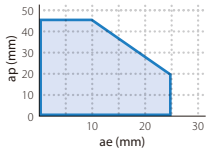


Cutting speed: Vc = 100 – 180 m/min, feed: fz = 0.08 – 0.15 mm/t

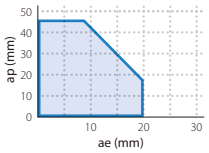
MECH040R -11-4-4T-M



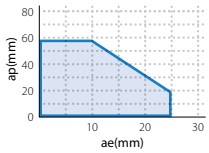
MECH063R -17-3-4T-◯



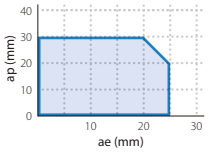
MECH050R -11-5-6T-M



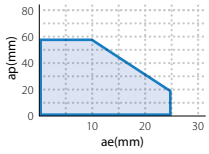
MECH080R -17-4-6T-◯



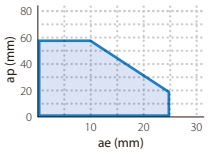
MECH050R -17-2-4T-M



MECH100R -17-4-6T-◯



MECH050R -17-4-4T-M



Slotting is not recommended.

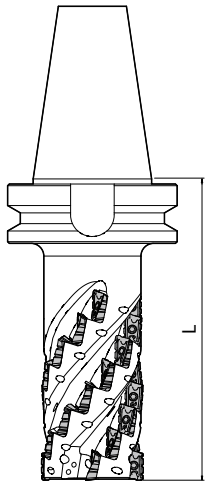
MECH-BT50 (Integral arbor type)

MECH-BT50SA (Replaceable head type / Integral arbor type)

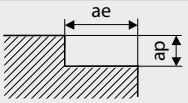
(Workpiece material : C50)

Cutting dia.	Description	Overhang length L (mm)
ø50	MECH050R11-8-4T-BT50	143
	MECH050R11-4T-BT50SA	
	MECH050R17-7-4T-BT50	173
ø63	MECH063R17-7-4T-BT50	
	MECH063R17-4T-BT50SA	
ø80	MECH080R17-7-4T-BT50	
	MECH080R17-4T-BT50SA	
ø100	MECH100R17-7-6T-BT50	
	MECH100R17-6T-BT50SA	

Shape

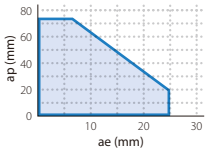


Shouldering

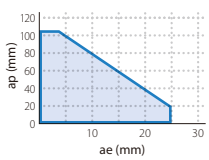


Cutting speed: Vc = 100 – 180 m/min, feed: fz = 0.08 – 0.15 mm/t

MECH050R11 -8-4T-BT50
MECH050R11 -4T-BT50SA



MECH080R17 -7-4T-BT50
MECH080R17 -4T-BT50SA



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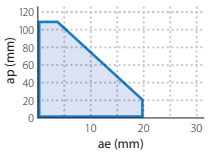
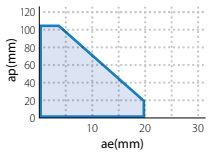
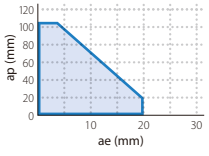


MECH100R17 -7-6T-BT50
MECH100R17 -6T-BT50SA



Slotting is not recommended.

MECH063R17 -7-4T-BT50
MECH063R17 -4T-BT50SA



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