

THE NEW VALUE FRONTIER

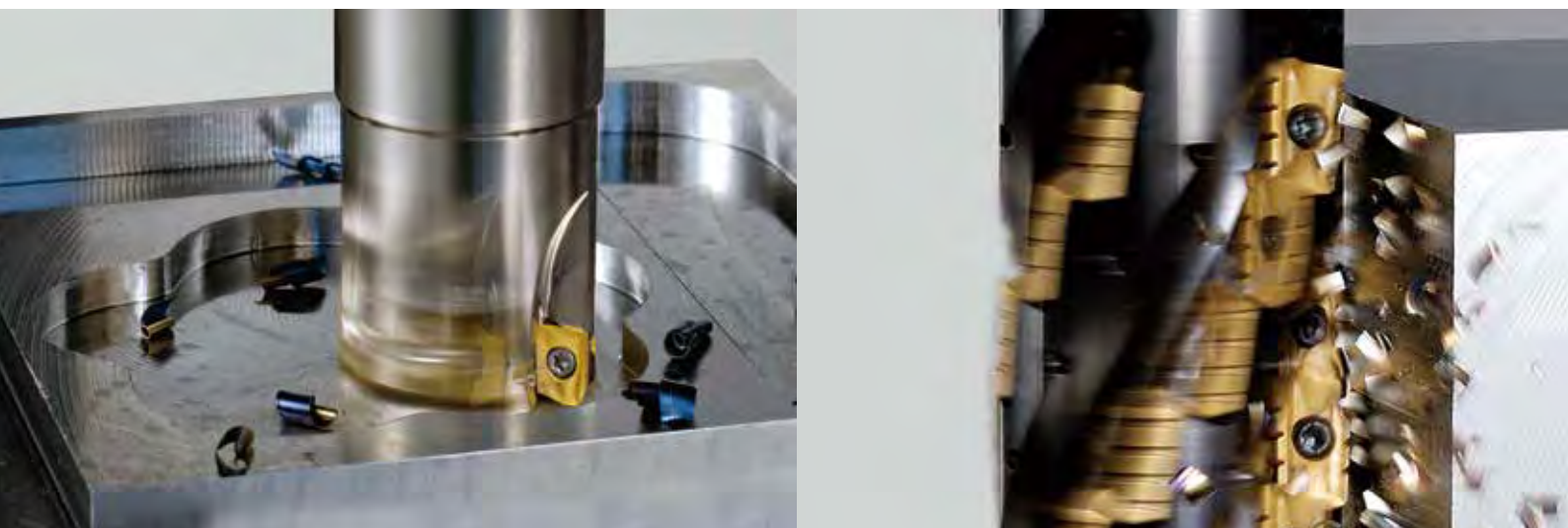


High Efficiency End Mills and
Face Mills

MEC Series

High Efficiency End Mills and Face Mills

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



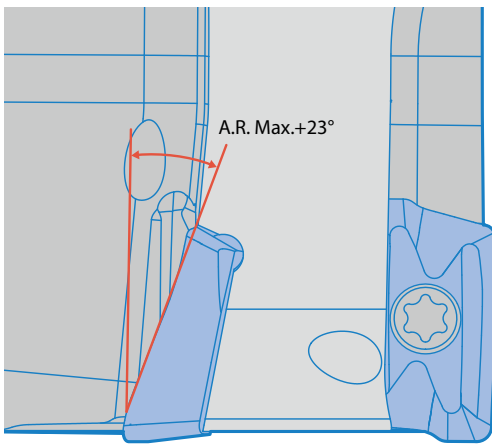
High Efficiency End Mills and Face Mills

MEC

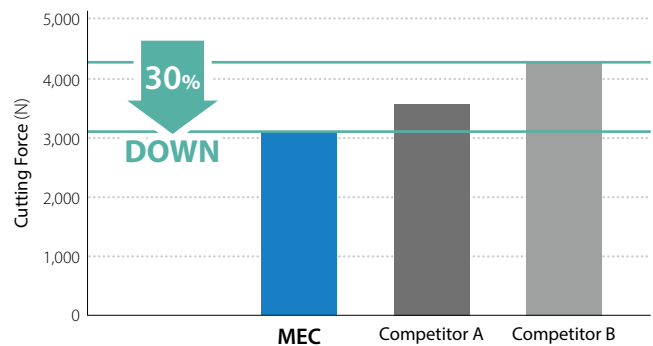
Excellent Surface Finish with Low Cutting Forces. New Grades and Cutters for Various Applications
PDL025 DLC Coated Carbides for Aluminum Machining

1 Low Cutting Force and Sharp Cutting Performance

Low Cutting Forces with Helical Cutting Edge Design



Cutting Force Comparison (In-house Evaluation)

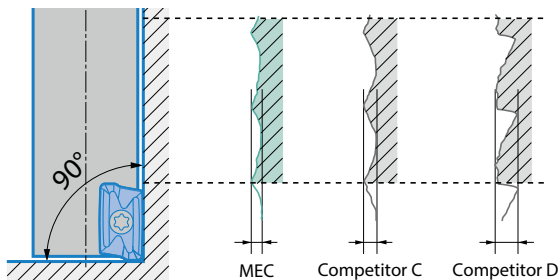


Cutting Conditions : $V_c = 100$ m/min, $f_z = 0.2$ mm/t, $a_p \times a_e = 9 \times 10$ mm, Dry, Cutter Dia. $D_c = \varnothing 20$
Workpiece : S50C

2 Smooth surface of shoulder wall

Smoother shoulder wall finish with multiple passes

Shoulder Wall Surface Comparison (In-house Evaluation)



Cutting Conditions : $V_c = 120$ m/min, $f_z = 0.1$ mm/t, $a_p \times a_e = 5 \times 10$ mm, Dry, Cutter Dia. $D_c = \varnothing 20$
Workpiece : S50C

3 Large Tooling Lineup

Introducing Fine Pitch End Mills & Face Mills
High Efficiency Shouldering

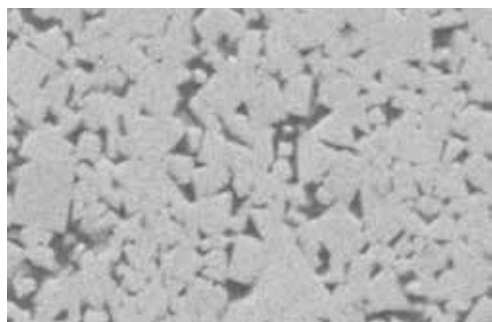


MEGACOAT NANO PR1535

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



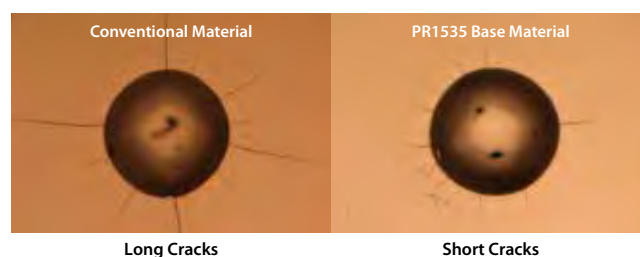
UP
23%
Fracture Toughness

2 Stability Improvement

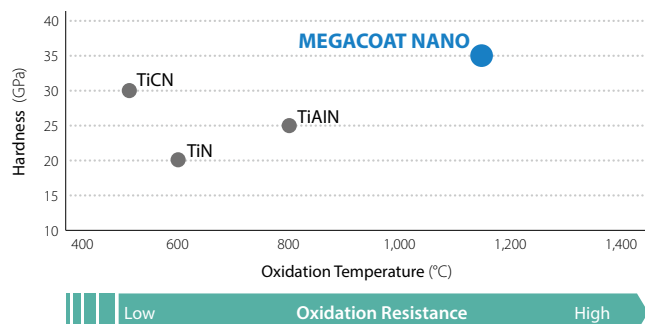
The coarse grain structure and uniform particle size correspond to improved heat resistance, with conductivity values decreased by 11%. The uniform structure also reduces crack propagation.

UP
Shock Resistance

Cracking Comparison by Diamond Indentor (In-house Evaluation)

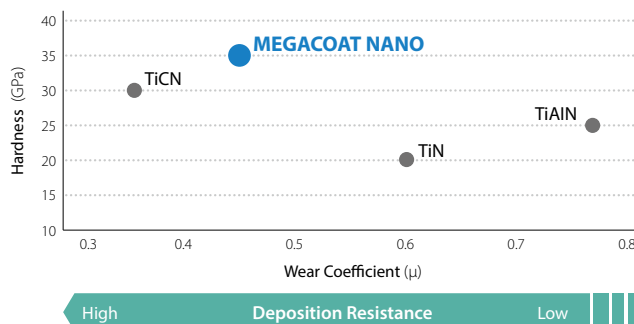


Coating Properties (Abrasion Resistance)



Achieve long tool life with the combination of a tough substrate and a special Nano coating layer

Coating Properties (Deposition Resistance)

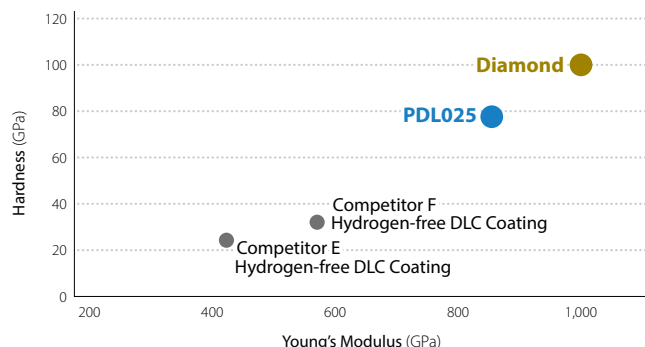


Stable Machining with Excellent Wear Resistance

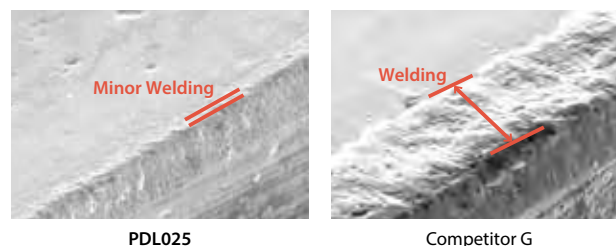
NEW DLC Coating PDL025

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)



Cutting Conditions : Vc = 800 m/min, fz = 0.1 mm/t, ap x ae = 3 x 5 mm, Dry
Cutter Dia. Dc = ø25 mm Workpiece : A5052 Cutting Length : 57 m

High Efficiency End Mill

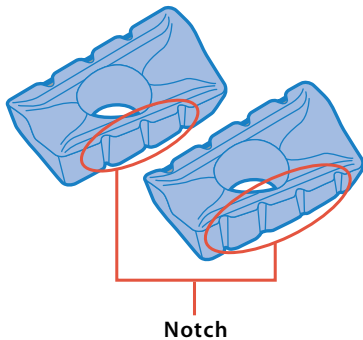
MECH

Notched Inserts Reduce Chattering, Break Chips into Small Pieces, and Improved Chip Evacuation
High Efficiency Heavy Machining with Large a_p

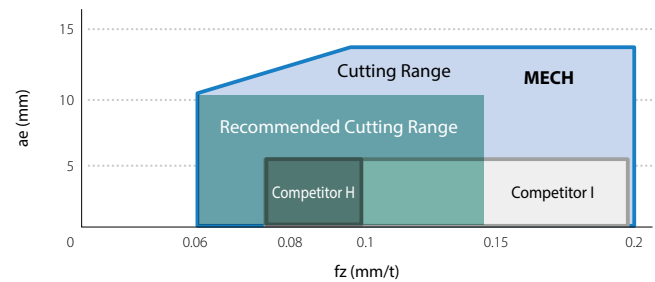
1

Low Cutting Force due to Notched Inserts are Good for Heavy Machining

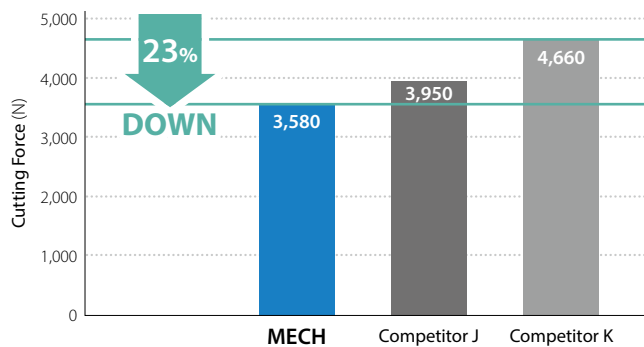
Notched Inserts Reduce Cutting Force
Lower Cutting Force and Reduced Chattering



Application Range Comparison (In-house Evaluation)

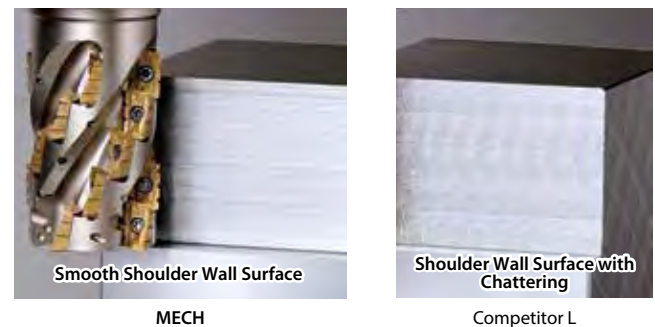


Cutting Force Comparison (In-house Evaluation)



Cutting Conditions : $V_c = 120$ m/min, $f_z = 0.1$ mm/t, $a_p \times a_e = 40 \times 10$ mm, Dry
MECH032-S32-11-5-4T Workpiece : S50C

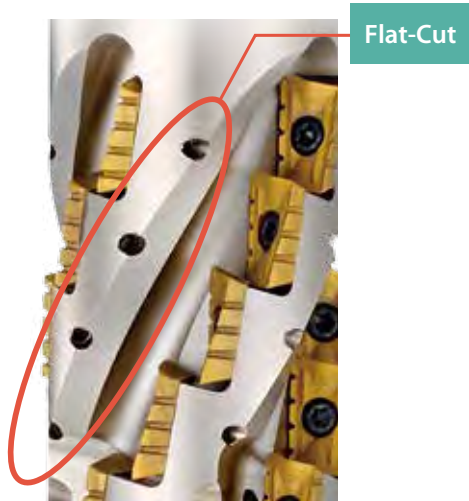
Surface Wall Comparison (In-house Evaluation)



Cutting Conditions : $V_c = 120$ m/min, $f_z = 0.12$ mm/t, $a_p \times a_e = 40 \times 7$ mm, Dry
MECH032-S32-11-5-4T Workpiece : S50C

2 Improved Chip Evacuation

Notched Insert Breaks Chips into Small Pieces
Flat-Cut Flute Provides Excellent Chip Evacuation



Chips Comparison (In-house Evaluation)



MECH

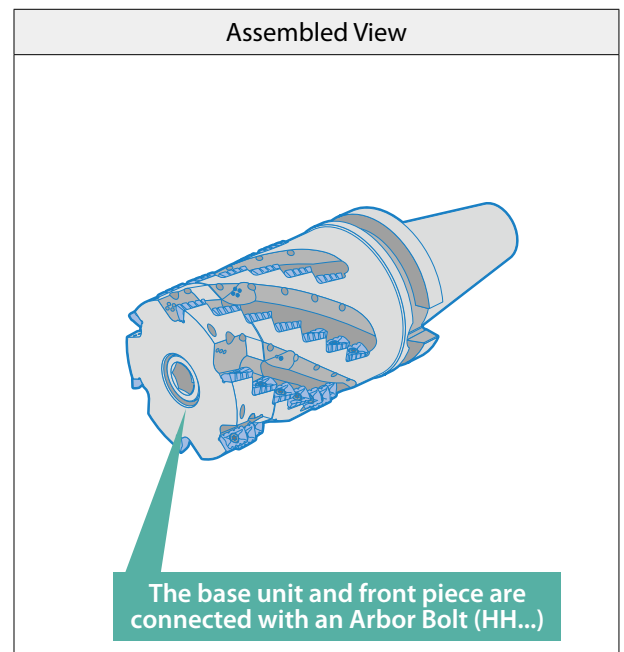
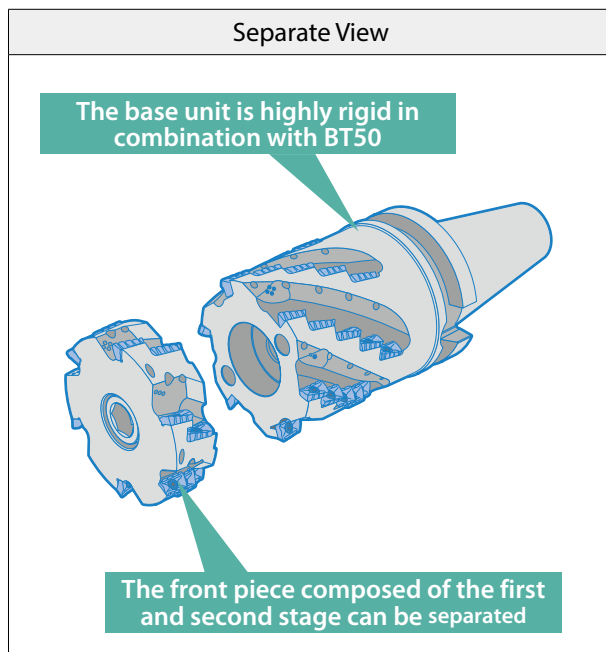


Competitor M

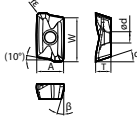
Cutting Conditions : $V_c = 120$ m/min, $f_z = 0.12$ mm/t, $a_p \times a_e = 40 \times 10$ mm, Dry
MECH032-S32-11-5-4T Workpiece : SS400

3 MECH Interchangeable Head Minimizes Tooling Costs

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



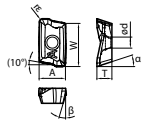
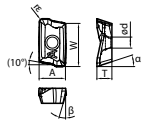
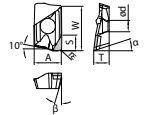
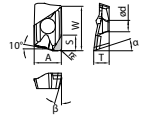
Applicable Inserts

Usage Classification		P	Carbon Steel / Alloy Steel		■			★	★		☆	Ref. Page for Applicable Toolholders						
			Mold Steel		■			★	★		☆							
★ : Roughing / 1st Choice ☆ : Roughing / 2nd Choice ■ : Finishing / 1st Choice □ : Finishing / 2nd Choice (In case hardness is under 45HRC)		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		Description		Dimension (mm)				Angle			Cermet	CVD Coated Carbide	MEGACOAT NANO	MEGACOAT			PVD Coated Carbide	
				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 P9 P10
		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°	—	●	●	●	●		●	●	
		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°	—		●	●	●			●
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
		11T304ER-JS					0.4					●	●	●			●	
		11T308ER-JS					0.8					●	●	●			●	
BDMT	170404ER-JS	9.6	4.9	4.4	17.0	0.4	18°	13°	—		●	●	●			●	P10	
	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

● : Stock Std.

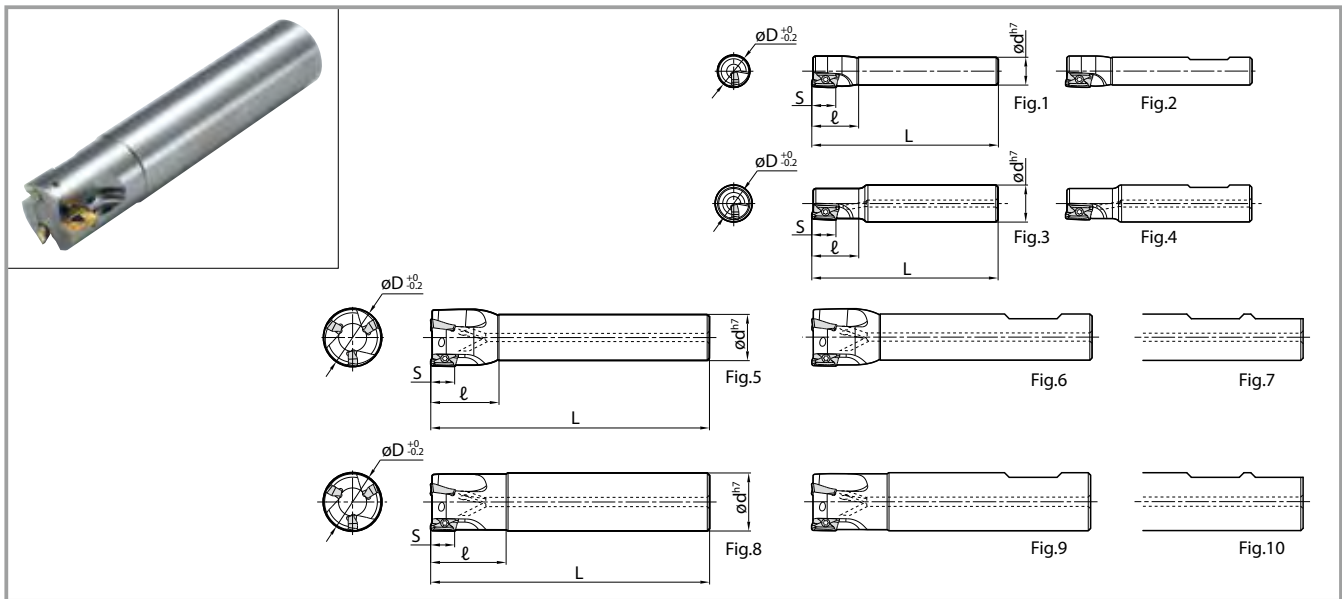
Applicable Inserts

Usage Classification		★ : Roughing / 1st Choice ☆ : Roughing / 2nd Choice ■ : Finishing / 1st Choice □ : Finishing / 2nd Choice (In case hardness is under 45HRC)	P	Carbon Steel / Alloy Steel						Ref. Page for Toolholder					
				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		Description	Dimension (mm)					Angle			DLC Coated Carbide	Carbide	PCD		
Handed Insert shows Right-hand			A	T	ød	W (X)	rε (Z)	S	α	β	γ	PD025	GW25	KPD001	KPD230
 	 	BDGT 11T302FR-JA	6.7	3.8	2.8	11.0	0.2	—	18°	13°	—	●	●		
		11T304FR-JA					0.4					●	●		
		11T308FR-JA					0.8					●	●		
		BDGT 170404FR-JA	9.6	4.9	4.4	17.0	0.4	—	18°	13°	—	●	●		
							0.8					●	●		
							2.0					●	●		
							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°	—			●	●
							0.4							●	●

Inserts are sold in 10 piece boxes
 PCD Inserts are sold in 1 piece boxes
 ● : Stock Std.

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		Stock	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	●	10	10		17		+10°	-24°	No	Fig.1	SB-2545TR	DTM-8	54,800
		10-S16-11	●	10	16						Yes	Fig.3			
		12-S10-11	●	12	10						No	Fig.1			50,800
		12-S12-11	●	12	12						Yes	Fig.3			49,200
		12-S16-11	●	12	16						No	Fig.1			47,700
		13-S12-11	●	13	12						Yes	Fig.3			
		14-S12-11	●	14	12						No	Fig.1			
		14-S16-11	●	14	16						Yes	Fig.3			
		MEC 16-S12-11T	●	16	12						No	Fig.1	SB-2555TRG	DTM-8	43,750
		17-S16-11T	●	17	16						Yes	Fig.5			43,500
		18-S16-11T	●	18	16						No	Fig.1			43,000
		19-S16-11T	●	19	16						Yes	Fig.3			42,000
		20-S16-11T	●	20	16						No	Fig.1			41,000
		21-S20-11T	●	21	20						Yes	Fig.3			40,300
		22-S20-11T	●	22	20						No	Fig.1			39,600
		24-S20-11T	●	24	20						Yes	Fig.3			38,200
		25-S20-11T	●	25	20						No	Fig.1			37,500
		25-S20-11T-4	●	25	20						Yes	Fig.5			35,800
		28-S25-11T	●	28	25						No	Fig.1			34,800
		30-S25-11T	●	30	25						Yes	Fig.3			33,900
		32-S25-11T	●	32	25						No	Fig.1			30,000
		32-S25-11T-5	●	32	25						Yes	Fig.5			22,500
		40-S32-11T	●	40	32						No	Fig.1			43,750
		50-S32-11T	●	50	32						Yes	Fig.3			41,000
	Same Shank Size	MEC 16-S16-11T	●	16	16	100	30		+18°	-14°	No	Fig.1	SB-2555TRG	DTM-8	43,750
		20-S20-11T	●	20	20	110	30		+20°	-10°	Yes	Fig.8			41,000
		25-S25-11T	●	25	25	120	32		+21°	-10°	No	Fig.1			37,500
		25-S25-11T-4	●	25	25	120	32		+21°	-10°	Yes	Fig.8			33,900
		32-S32-11T	●	32	32	130	40		+23°	-9°	No	Fig.1			
	Long Shank	MEC 20-S18-170-11T	●	20	18	170	30		+20°	-10°	No	Fig.5	SB-2555TRG	DTM-8	41,000
		20-S20-140-11T	●	20	20	140	60		+20°	-10°	Yes	Fig.8			39,600
		20-S20-170-11T	●	20	20	170	30		+20°	-10°	No	Fig.1			37,500
		22-S20-170-11T	●	22	20	170	30		+20°	-10°	Yes	Fig.5			35,800
		25-S23-210-11T	●	25	23	210	32		+21°	-10°	No	Fig.1			33,900
		25-S25-160-11T	●	25	25	160	60		+21°	-10°	Yes	Fig.8			32,600
		25-S25-210-11T	●	25	25	210	32		+21°	-10°	No	Fig.1			30,000
		28-S25-210-11T	●	28	25	210	32		+21°	-10°	Yes	Fig.5			
		32-S30-250-11T	●	32	30	250	40		+22°	-9°	No	Fig.1			
		32-S32-200-11T	●	32	32	200	65		+22°	-9°	Yes	Fig.8			
		32-S32-250-11T	●	32	32	250	65		+22°	-9°	No	Fig.1			
		35-S32-250-11T	●	35	32	250	40		+23°	-9°	Yes	Fig.5			
		40-S32-250-11T	●	40	32	250	40		+23°	-9°	No	Fig.1			
		40-S32-240-11T	●	40	32	240	65		+23°	-9°	Yes	Fig.5			
		40-S32-240-11T	●	40	32	240	65		+23°	-9°	No	Fig.1			

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

● : Stock Std.

Caution with Max. Revolution

When running an endmill 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				Stock	No. of Inserts	Dimension (mm)					Rake Angle		Coolant Hole	Drawing	Spare Parts		Max. Revolution (min ⁻¹)								
															Clamp Screw	Wrench									
																									
Cylindrical	Long Shank	MEC 20-S20-150-11T-3	●	3	20	20	150	60	10	+20°	-10°	Yes	Fig.8	SB-2555TRG	DTM-8	41,000									
		25-S25-170-11T-3	●	4	25	25	170			+21°	-10°					37,500									
		25-S25-170-11T-4	●	4	25	25	170			+21°	-10°					37,500									
		30-S25-180-11T-3	●	3	30	30	180			32	+23°		-9°			Fig.5	34,800								
		32-S32-200-11T-3	●	4	32	32	200			65							33,900								
		32-S32-200-11T-4	●	4	32	32	200			65							Fig.8	33,900							
	32-S32-200-11T-5	●	5	32	32	200	65																		
	Same Shank	MEC 25-S20-17	●	2	25	20	120	36	15.7	+16°	-11°	Yes	Fig.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°	-7°					25,000									
		50-S32-17	●	5	50	32	150	50		+19°	-7°					17,000									
		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	Fig.8	SB-4070TRN	DTM-15	35,000									
		25-S25-210-17	●		25	25	210	36					Fig.5			32,500									
		28-S25-210-17	●		28	28	210	36					Fig.8			30,000									
		32-S32-200-17	●		32	32	200	65					Fig.8			27,700									
		32-S32-250-17	●		32	32	250	40		+19°	-7°		Fig.5			25,000									
		35-S32-250-17	●		35	35	250	40																	
40-S32-240-17		●	40		40	240	65																		
MEC 32-S32-250-17-3		●	3		32	32	250	65					+17°			-7°	Fig.8	30,000							
40-S32-250-17-3		●	4	40	40	250	15.7	+19°	-7°	Yes	Fig.5	SB-4070TRN	DTM-15	25,000											
40-S32-250-17-4		●		40	40	250								64	-6°	17,000									
50-S42-250-17-4		●		50	42	250								64	-6°	17,000									
Weldon		Standard Shank	MEC 10-W10-1103	MTD	1	10	10	60	17	10	+10°	-24°	No	Fig.2	SB-2545TR	DTM-8	54,800								
	10-W16-1103-H		MTD	10		16	68	17	+10°					-24°			Fig.4	50,800							
	12-W10-1103		MTD	12		10	60	20	+12°					-21°			No	Fig.2	Yes	Fig.4	No	Fig.2	Yes	Fig.4	47,700
	12-W16-1103-H		MTD	12		16	68	20									+12°	-21°		Fig.2		47,700			
	14-W12-1103		MTD	14		12	68	20									+12°	-19°		Fig.2		47,700			
	14-W16-1103-H		MTD	14		16	68	20									+12°	-19°		Fig.4		47,700			
	MEC 16-W12-11T3		MTD	2	16	12	68	23	10	+18°	-14°	No	Fig.2	SB-2555TRG	DTM-8	43,750									
	18-W16-11T3-H		MTD	18	16	68	25	+19°		-13°	Fig.6					43,000									
	20-W16-11T3-H		MTD	20	16	68	25	+20°		-10°						41,000									
	22-W20-11T3-H		MTD	3	22	20	81	26		+21°						-10°	Yes	Fig.7	39,600						
	25-W20-11T3-H		MTD		25	20	81	26			+22°		-9°						37,500						
	28-W25-11T3-H		MTD		28	25	88	32			+23°		-8°						35,800						
	30-W25-11T3-H		MTD	4	30	25	88	32		+23°	-9°		Yes			Fig.7	34,800								
	32-W25-11T3-H		MTD		32	25	88	32									-8°	33,900							
	40-W32-11T3-H		MTD		5	40	32	110									50			30,000					
	Same Shank Size	MEC 16-W16-11T3-H	MTD	2	16	16	68	25	10	+18°	-14°	Yes	Fig.9	SB-2555TRG	DTM-8	43,750									
		20-W20-11T3-H	MTD	3	20	20	81	30		+20°	-10°		Fig.10			41,000									
		25-W25-11T3-H	MTD	4	25	25	88	32		+21°	-9°					37,500									
		32-W32-11T3-H	MTD	4	32	32	100	40		+23°	-9°					33,900									
	Standard Shank	MEC 25-W20-1704-H	MTD	2	25	20	86	36	15.7	+16°	-11°	Yes	Fig.6	SB-4070TRN	DTM-15	35,000									
		32-W25-1704-H	MTD	3	32	25	92	36		+17°	-7°		Fig.7			30,000									
		40-W32-1704-H	MTD	4	40	32	110	50		+19°	-7°					25,000									
		MEC 25-W25-1704-H	MTD	2	25	25	92	36	15.7	+16°	-11°	Yes	Fig.10	SB-4070TRN	DTM-15	35,000									
	32-W32-1704-H	MTD	3	32	32	100	40	+17°		-7°	30,000														

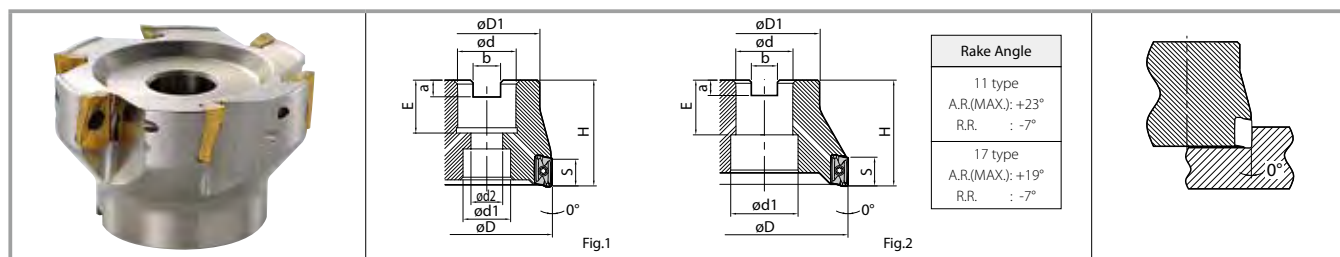
Coat Anti-seize Compound (P-37) thinly on portion of taper and thread when insert is fixed.

● : Stock Std.
MTD : Made to order

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



Toolholder Dimensions

Description				Stock	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							
Metric	Coarse pitch	MEC	040R-11-5T-M	●	5	40	16	14	8.5	40	20	5.6	8.5	10	Yes	Fig.1	0.3	SB-2555TRG	DTM-8	30,000	
			050R-11-5T-M	●	5	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		7	12.4				0.9			18,500	
			100R-11-9T-MN	●	9	100	32	26	17.6	55	26	8	14.4				1.6			17,000	
			125R-11-11T-M	●	11	125		45	32								3.1			15,000	
			160R-11-14T-M	●	14	160	40	68	-	63	33	9.5	16.4				4.5			13,900	
	Fine pitch	MEC	032R-11-5T-M	●	5	32		11.5	8.5	35	20	5.6	8.4	10	Yes	Fig.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	Fig.1	0.3	SB-4070TRN	DTM-15	25,000	
			050R-17-4T-M	●		50							0.4				17,000				
			063R-17-5T-M	●	5	63	22	18	12		22	6.3	10.4				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		45	32				3.1	8,900								
160R-17-12T-M			●	12	160	40	68	-	63	33	9.5	16.4	4.5				7,400				
Bore Dia. Inch spec	Coarse pitch	MEC	063R-11-6T	●	6	63							10	Yes	Fig.1	0.8	SB-2555TRG	DTM-8	20,500		
			080R-11-7T	●	7	80	25.4	20	14	50	26	6				9.5			1.0	18,500	
			100R-11-9TN	●	9	100	31.75	26	17.6		32	8				12.7			1.8	17,000	
			125R-11-11T	●	11	125	38.1	45	32	63	38					15.9			3.4	15,000	
			160R-11-14T	●	14	160	50.8	70	-		47	10				19.1			4.4	13,900	
	Fine pitch	MEC	063R-11-8T	●	8	63							10	Yes	Fig.1	0.8	SB-2555TRG	DTM-8	20,500		
			080R-11-10T	●	10	80	25.4	20	14	50	26	6				9.5			1.0	18,500	
	Coarse pitch	MEC	063R-17-5T	●	5	63								15.7	Yes	Fig.1	0.8	SB-4070TRN	DTM-15	14,500	
			080R-17-6T	●	6	80	25.4	20	14	50	26	6	9.5				1.0			12,000	
			100R-17-7TN	●	7	100	31.75	26	17.6		32	8	12.7				1.8			10,500	
			125R-17-9T	●	9	125	38.1	45	32	63	38		15.9				3.4			8,900	
			160R-17-12T	●	12	160	50.8	70	-		47	10	19.1				4.5			7,400	
	Fine pitch	MEC	063R-17-6T	●	6	63								15.7	Yes	Fig.1	0.8	SB-4070TRN	DTM-15	14,500	
			080R-17-8T	●	8	80	25.4	20	14	50	26	6	9.5				1.0			12,000	
			100R-17-9TN	●	9	100	31.75	26	17.6	63	32	8	12.7				1.8			10,500	

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

Caution with Max. Revolution

When running an endmill 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.

● : Stock Std.

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. (Table1)

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 0.017" (0.43mm) for 11T3 type insert and also keep ap less than 0.0354" (0.9mm) for 1704 type insert.

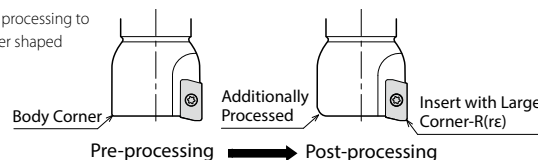
Description	Arbor clamp bolt (Attachment)	Wrench
MEC040R-11-5T-M	HH8 × 25H	LW-5(Double width 5mm)
MEC050R-11-5T-M	HH10 × 30H	LW-6(Double width 6mm)
MEC063R-11-6T-M	HH12 × 35H	LW-8(Double width 8mm)
MEC080R-11-7T-M	HH16 × 52H	LW-12(Double width 12mm)
MEC100R-11-9T-MN	HF20 × 53H	LW-14(Double width 14mm)
MEC125R-17-9T-M	HF24 × 60H	LW-17(Double width 17mm)

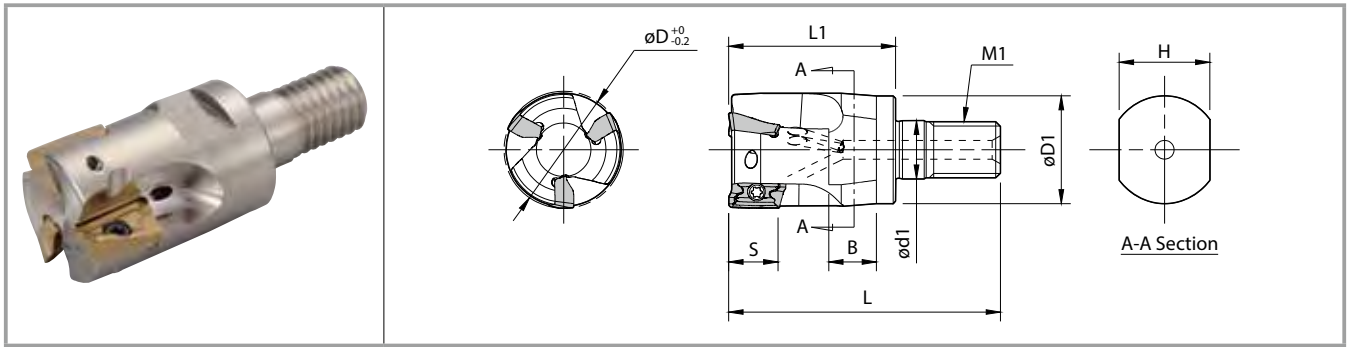
Wrench is not included. Please purchase separately.

When using inserts with corner-R(re)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 1.2mm, additional processing is not needed.

Insert Corner-R(re)	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.





Dimensions

Description		Stock	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	●		3	20	18.7	10.5	49	30	M10 × P1.5	15		9	+20°			-10°
	20-M10-11T-3T	●	25		23	12.5	57	35	M12 × P1.75	19	10		+21°	-10°			37,500
	25-M12-11T-3T	●	4		32	30	17	63	40	M16 × P2.0	24		12	+23°			-9°
	32-M16-11T-4T	●		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 endmill 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.

● : Stock Std.

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			
	32-M16-11T-4T			
For Insert Screw Recommended torque1.2N • m				
MEC	25-M12-17-2T	SB-4070TRN	DTM-15	P-37
	32-M16-17-3T	For Insert Screw Recommended torque3.5N • m		

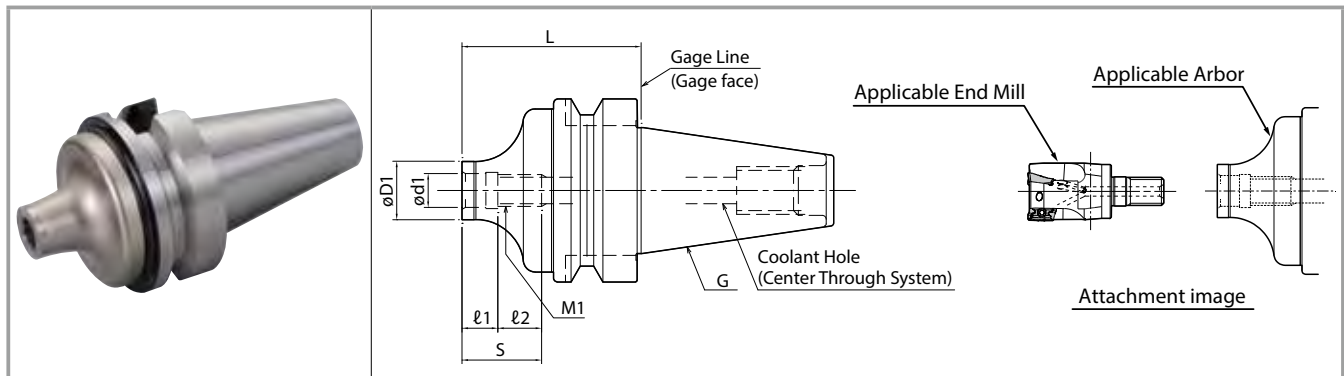
Coat Anti-seize Compound (P-37) thinly on portion of taper and thread when insert is fixed.

Modular Endmill Head Identification System

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

Series Cutting Dia. Thread Dia.Tolerance Insert Size No. of Inserts

BT Arbor (for exchangeable head/two face contact)



Dimensions

Description	Stock	Dimension (mm)							Coolant Hole	Arbor (Double-face clamping)	Applicable End Mill (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..
	●		18.7	10.5	21		12	M10 × P1.5			MEC20-M10..
	●		23	12.5	24		15	M12 × P1.75			MEC25-M12..
BT40K- M08-55 M10-60 M12-55 M16-65	●	55	14.7	8.5	20	9	11	M8 × P1.25	Yes	BT40	MEC16-M08..
	●	60	18.7	10.5	21		12	M10 × P1.5			MEC20-M10..
	●	55	23	12.5	24		15	M12 × P1.75			MEC25-M12..
	●	65	30	17	25		16	M16 × P2.0			MEC32-M16..

● : Stock Std.

Actual Endmill depth

Arbor Description		Applicable Endmill (Head)			Actual Endmill depth (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

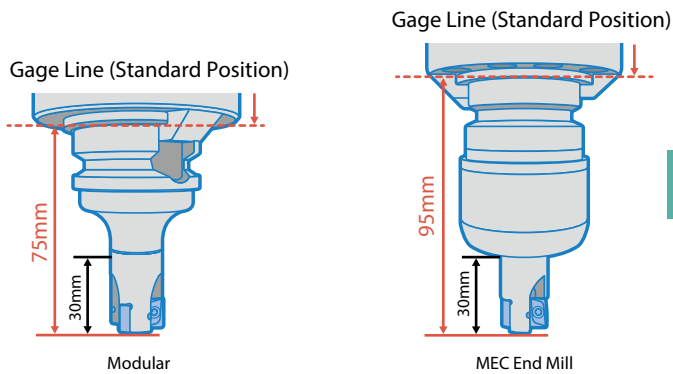
Arbor Identification System

BT30 **K** - **M08** - **45**
 Arbor Size Two-Face Clamping Spindle Thread Size for Clamping Length from the Gage

Modular MEC Advantages (Mounted on BT Arbor)

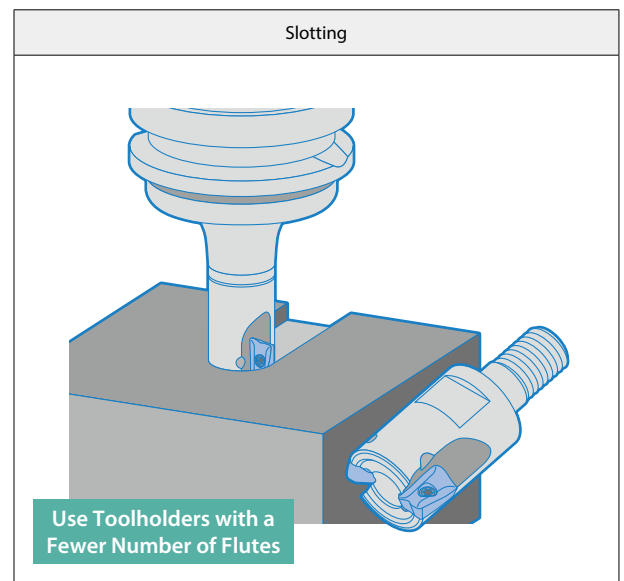
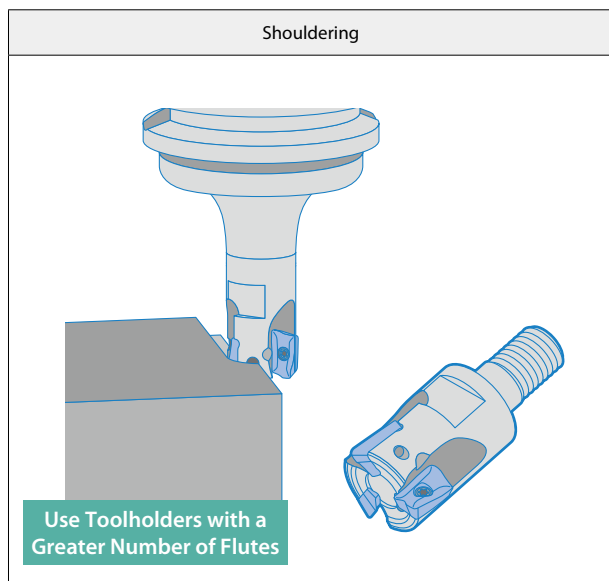
Low Gage Line Reduces Chattering

Though the overhang length is the same (30mm), MEC Modular has a shorter distance from the cutting edge to the gage line compared to other MEC End Mills.



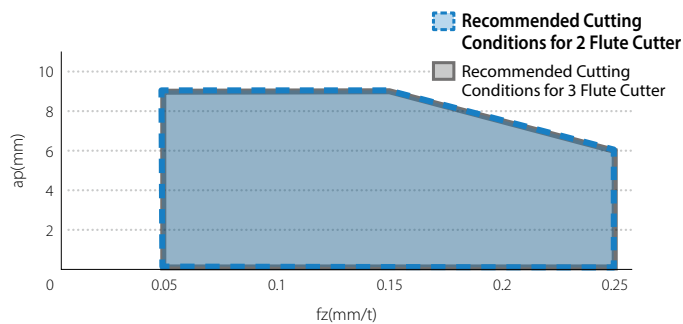
High efficiency and high quality machining in small machining centers (BT30/BT40, etc.).

Toolholders with a Greater Number of Flutes vs. Toolholders with a Fewer Number of Flutes

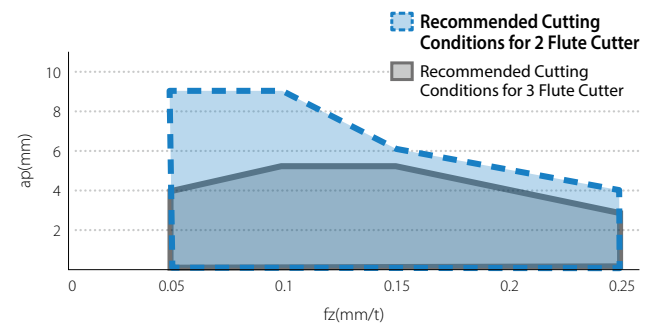


MEC Modular Recommended Cutting Conditions

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 amage to human body.

Warning about Max. Revolution indicated on main body

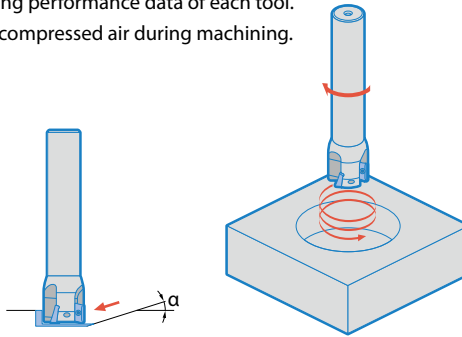
- When running the endmill and the face mill at revolutions exceeding the maximum revolution limit, the inserts or toolholder may be damaged due to the centrifugal force.
- For actual practical revolution, please set within recommended cutting condition.
- When using at a higher revolution (over 10,000min⁻¹), 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

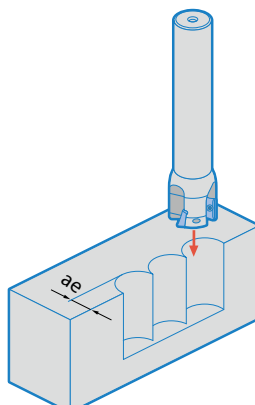
- Ramping Angle should be Under α°
- For plunge depth per revolution when helical milling, see the cutting performance data of each tool.
Use compressed air during machining.



Cutting Dia.	Applicable Insert	Max.Ramping Angle(α°)
$\phi 16 - \phi 18$	BDMT11T3 type BDGT11T3 type	3°
$\phi 19 - \phi 21$		5°
$\phi 22 - \phi 25$		2.5°
$\phi 28 - \phi 32$		1.5°
$\phi 40$		0.7°
$\phi 50$ over		Not recommended
$\phi 25$	BDMT1704 type BDGT1704 type	8°
$\phi 32$		5°
$\phi 40$		2.5°
$\phi 50$ 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)
$\phi 16 - \phi 19$	BDMT11T3 type BDGT11T3 type	1.5 mm
$\phi 20 - \phi 160$	BDMT11T3 type BDGT11T3 type	5 mm
$\phi 25 - \phi 160$	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.	$\phi 16$	$\phi 18$	$\phi 20$	$\phi 22$	$\phi 25$	$\phi 28$	$\phi 30$	$\phi 32$	$\phi 40$	$\phi 50$
BD_T11T3 type	Guidance of minimum cutting dia by helical machining.	$\phi 21$	$\phi 25$	$\phi 29$	$\phi 33$	$\phi 39$	$\phi 45$	$\phi 49$	$\phi 53$	$\phi 69$	Helical machining is not recommended.
	Guidance of minimum cutting dia in case of flatting bottom after helical machining.	$\phi 28$	$\phi 32$	$\phi 36$	$\phi 40$	$\phi 46$	$\phi 52$	$\phi 56$	$\phi 60$	$\phi 76$	

MEC	Holder Dia.	$\phi 25$	$\phi 32$	$\phi 40$	$\phi 50$
BD_T1704 type	Guidance of minimum cutting dia by helical machining.	$\phi 34$	$\phi 48$	$\phi 64$	Helical machining is not recommended.
	Guidance of minimum cutting dia in case of flatting bottom after helical machining.	$\phi 46$	$\phi 60$	$\phi 76$	

Cutting Performance of MEC Endmill (JT Chipbreaker)

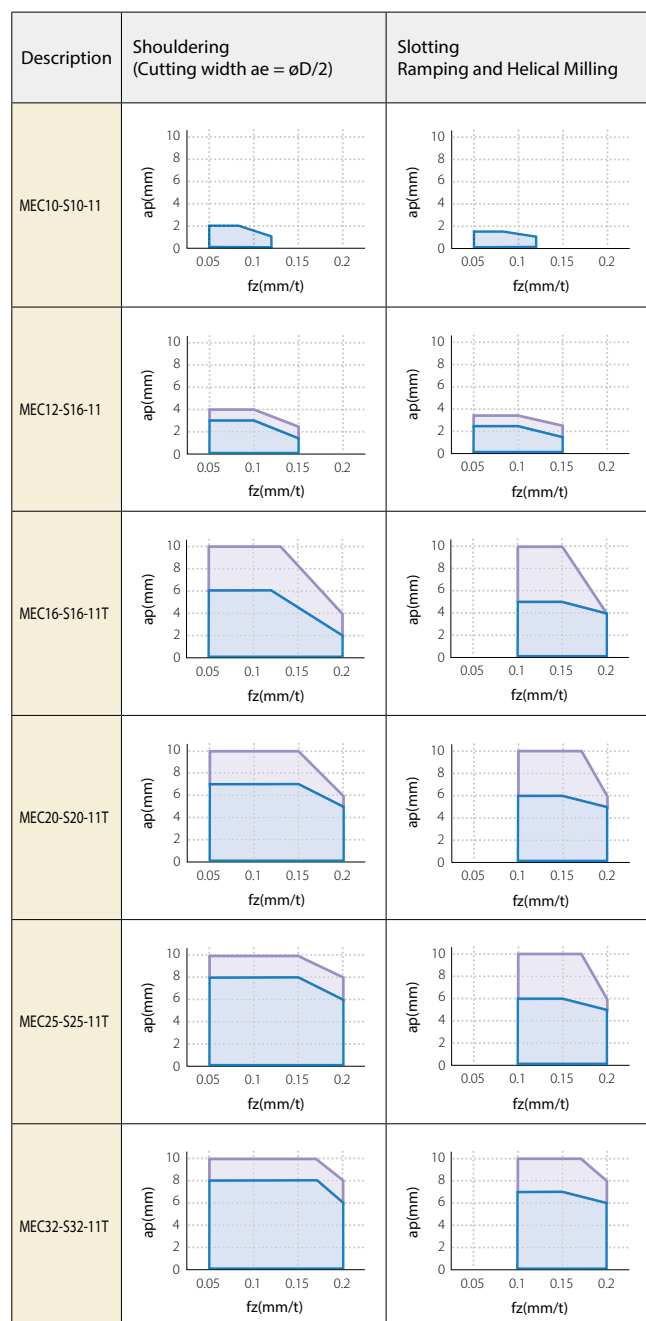
① Cutting Edge Length 10mm (Standard/Same Size Shank)

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	

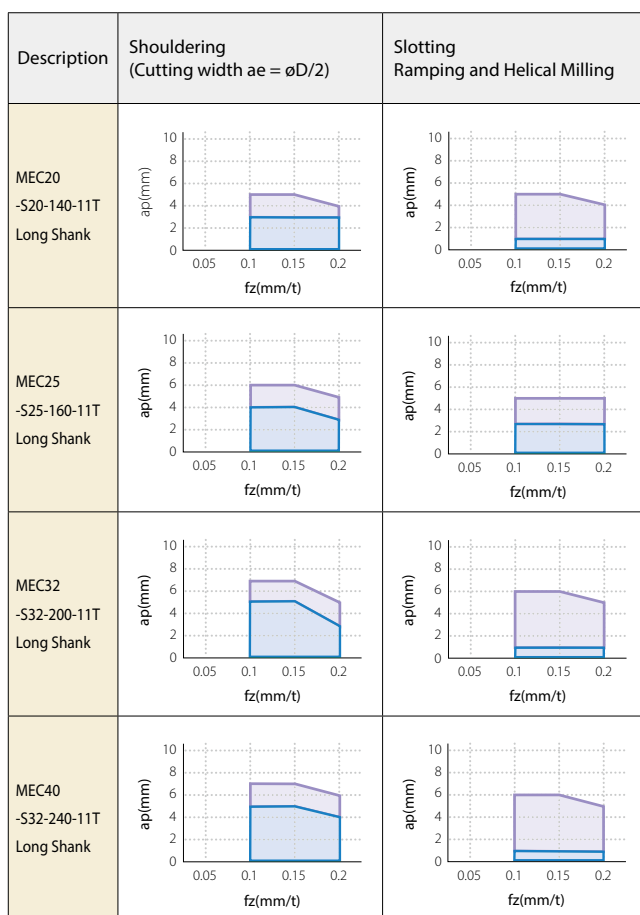
② Cutting Edge Length 10mm (Long Shank)

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=120m/min Work Material : S50C]

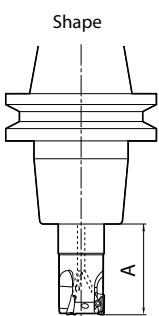


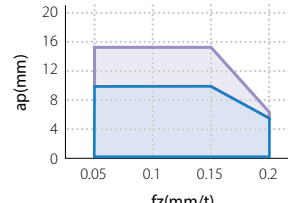
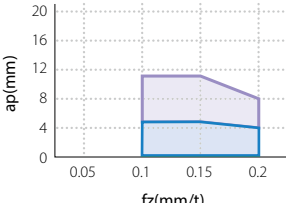
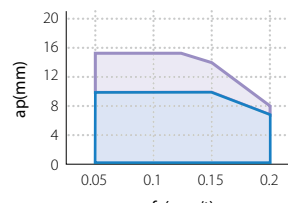
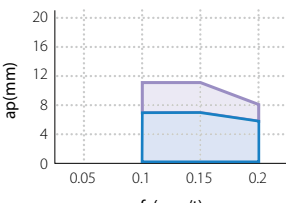
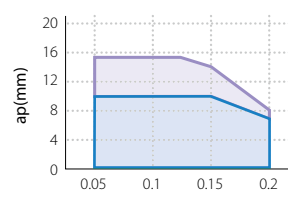
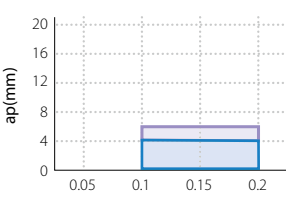
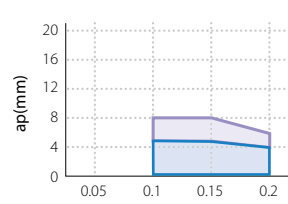
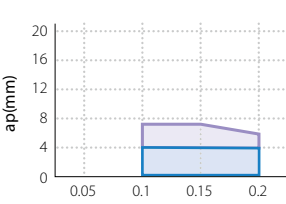
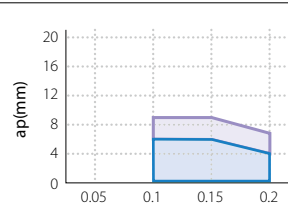
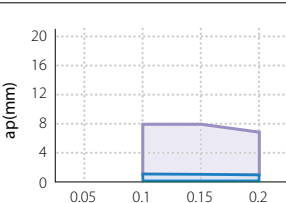
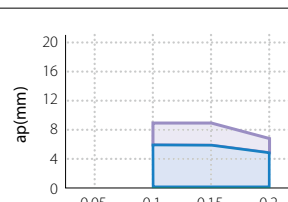
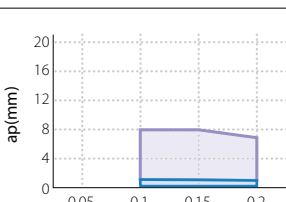
[Vc=120m/min Work Material : S50C]



③ Cutting Edge Length 15.7mm

[Vc=120m/min Work Material : S50C]

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 			

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		

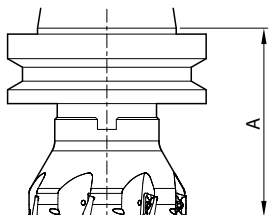
Cutting Performance of MEC Milling Cutter (JT Chipbreaker)

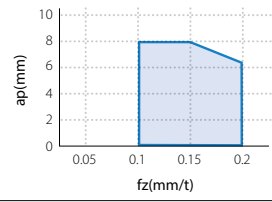
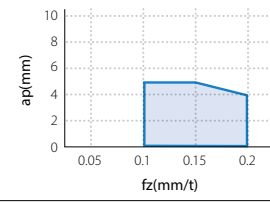
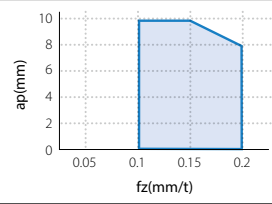
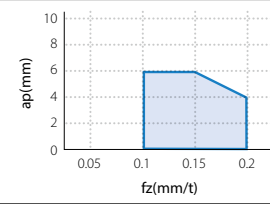
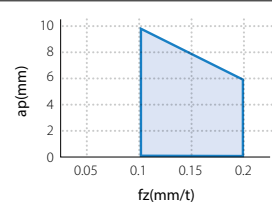
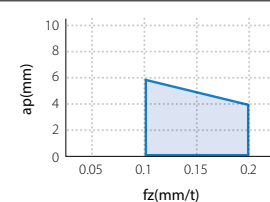
Cutting Edge Length 10mm

[Vc=120m/min Work Material : S50C]

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



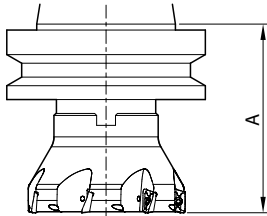
Description	Shouldering (Cutting width ae = øD/2)	Slotting
MEC040R -11-5T-M		
MEC050R -11-○T-M } MEC100R -11-9TN		
MEC125R -11-11T MEC160R -11-14T		

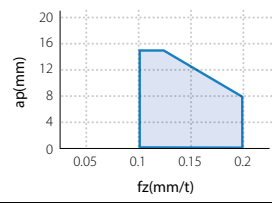
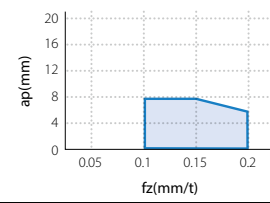
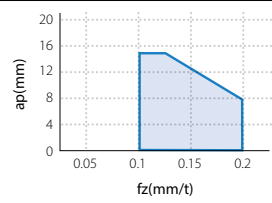
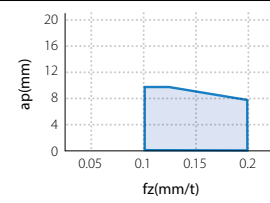
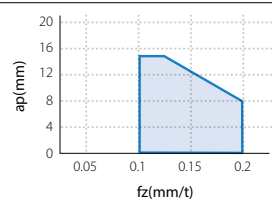
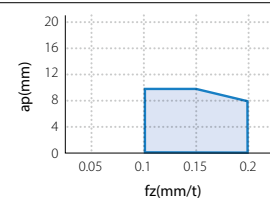
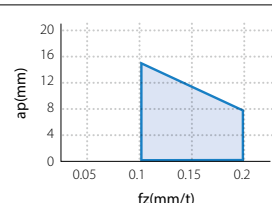
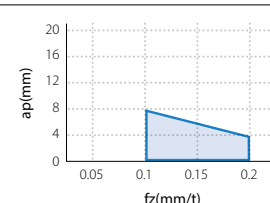
Cutting Edge Length 15.7mm

[Vc=120m/min Work Material : S50C]

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

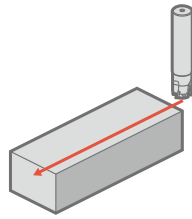


Description	Shouldering (Cutting width ae = øD/2)	Slotting
MEC040R -17-4T-M		
MEC050R -17-○T-M		
MEC063R -17-○T(-M) } MEC100R -17-○TN		
MEC125R -17-9T MEC160R -17-12T		

MEC Case Studies

RC55(Prehardened Tool Steel)

Test Piece (54 - 56HRC)
 $V_c = 50 \text{ m/min}$ ($n = 800 \text{ min}^{-1}$)
 $f_z = 0.125 \text{ mm/t}$ ($V_f = 300 \text{ mm/min}$)
 $ap \times ae = 2 \times 14 \text{ mm}$
 Dry
 MEC20-S20-11T (3 Teeth)
 BDMT11T308ER-JT (PR830)



Metal Removal Volume

MEC

71.3 cm³ (continuable)

Tool Life

24 Times

Competitor N
 (Endmill)

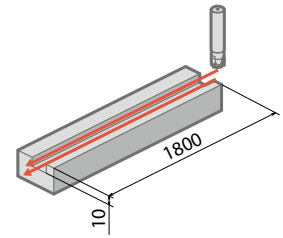
2.9 cm³ (Chipping)

Competitor N ($\phi 25 : 2$ Teeth) caused chipping after 10 minutes machining with the conditions of $V_c=40\text{m/min}$, $f_z=0.075\text{mm/t}$, $ap \times ae=2 \times 3\text{mm}$, 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)

SS400

Plate
 $V_c = 88 \text{ m/min}$ ($n = 1,400 \text{ min}^{-1}$)
 $f_z = 0.12 \text{ mm/t}$ ($V_f = 500 \text{ mm/min}$)
 $ap = 5 \text{ mm} \times 2$ Passes
 Dry
 MEC20-S20-11T (3 Teeth)
 BDMT11T308ER-JT (PR830)



Number of Workpieces

MEC

23 pcs/edge

Tool Life

2 Times

Competitor O
 (Endmill)

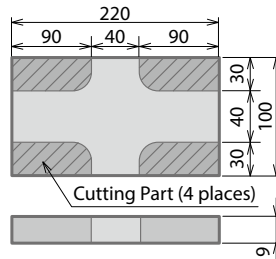
10~11 pcs/edge

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

(User Evaluation)

SUS304

Plate
 $V_c = 125 \text{ m/min}$ ($n = 1,600 \text{ min}^{-1}$)
 $f_z = 0.1 \text{ mm/t}$ ($V_f = 320 \text{ mm/min}$)
 $ap = 9.0 \text{ mm}$
 Dry
 MEC25-S25-17 (2 Teeth)
 BDMT170408ER-JT (PR830)



Number of Workpieces

MEC

4 pcs/edge or over

Tool Life

4 Times

Competitor P
 (Endmill)

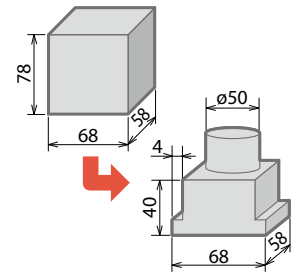
Under 1 pc/edge

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
 $V_c = 130 \text{ m/min}$ ($n = 1,040 \text{ min}^{-1}$)
 $f_z = 0.18 \text{ mm/t}$ ($V_f = 936 \text{ mm/min}$)
 $ap \times ae = 3 \times 5$
 (depends on machined part)
 Dry (with air)
 MEC40-S32-11T (5 teeth)
 BDMT11T308ER-JT (PR830)



Cutting Time

MEC

2 Hours (Less Wear/Can Continue)

Tool Life

Same or More

Competitor Q
 (Endmill)

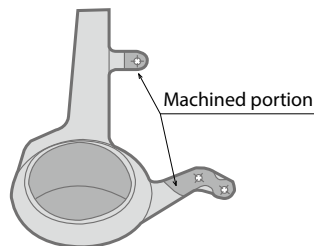
2 Hours (Cracking/Cannot Continue)

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 936mm/min. ($f_z=0.15\text{mm/t}$)

(User Evaluation)

SCM420

Knuckle Steering
 $V_c = 150 \text{ m/min}$ ($n = 1,200 \text{ min}^{-1}$)
 $f_z = 0.1 \text{ mm/t}$ ($V_f = 478 \text{ mm/min}$)
 $ap = 0.5 - 5 \text{ mm}$ (Shouldering)
 Dry
 MEC40-S32-17 (4 teeth)
 BDMT170408ER-JT (PR830)



Number of Workpieces

MEC

150 pcs/edge

Tool Life

3 Times

Competitor R
 (Endmill)

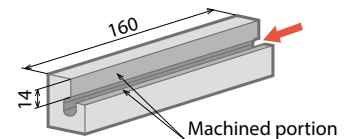
40 pcs/edge

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
 $V_c = 15 \text{ m/min}$ ($n = 120 \text{ min}^{-1}$)
 $f_z = 0.08 \text{ mm/t}$ ($V_f = 38 \text{ mm/min}$)
 $ap = 0.5 \text{ mm}$
 Wet
 MEC040R-17-4T-M (4 teeth)
 BDMT170408ER-JS PR1025



Number of Workpieces

MEC

9 pcs/edge

Tool Life

9 Times

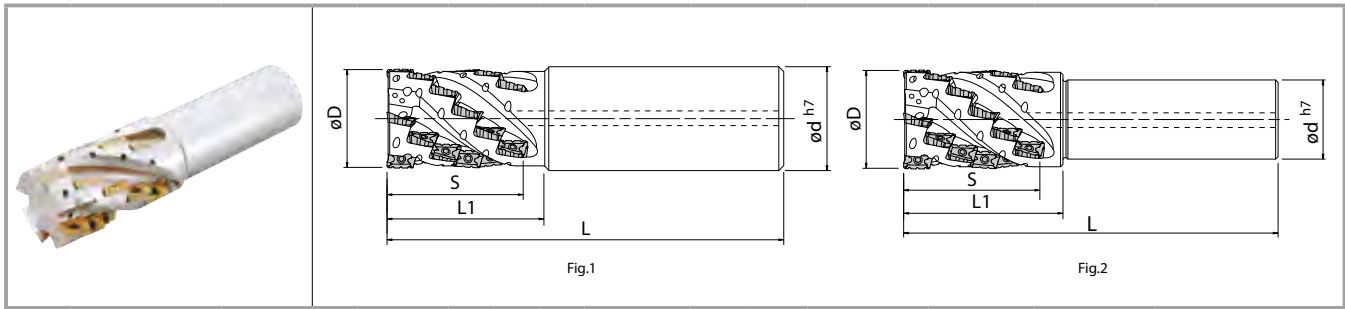
Competitor S
 (Endmill)

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 Endmill with Cylindrical Shank (with coolant hole for bottom insert)



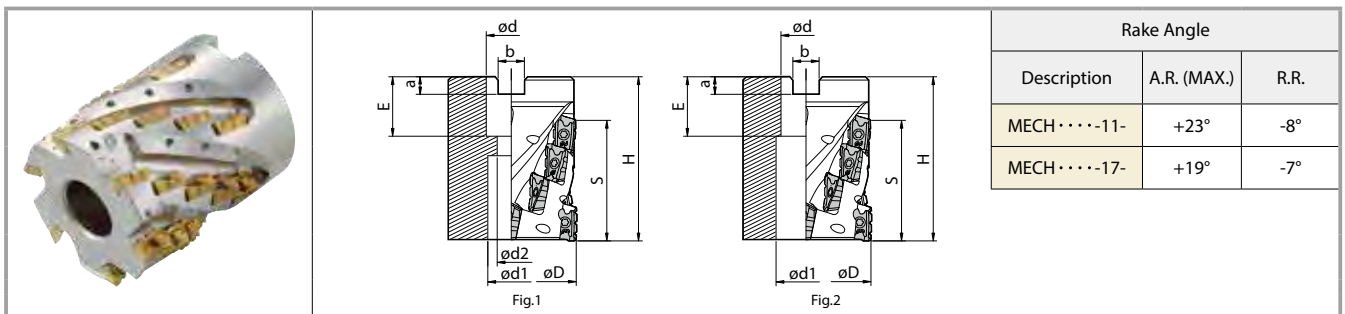
Dimensions (metric-size)

Description	Stock	No. of Flutes	No. of Stages	No. of Inserts	Dimension (mm)					Rake Angle		Insert	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°	Fig.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	6	24	40		150	64	55	+23°	-8°	Fig.2	SB-4070TRN	DTM-15	P-37	BDMT170408ER-N3 BDMT170408ER-N4
040-S32-11-6-4T	●		7	28	50	42	172	75	64		-7°	Fig.2				
040-S42-11-6-4T	●		6	24	40		160			+19°	-7°	Fig.1				
050-S42-11-7-4T	●		7	28	50	42	172	75	64		-7°	Fig.2				
050-S42-11-7-6T	●	6	7	42	50	42	172	75	64							
MECH 040-S32-17-4-2T	●	2	4	8	40	32	160	73	59	+19°	-7°	Fig.2	SB-4070TRN	DTM-15	P-37	BDMT170408ER-N3 BDMT170408ER-N4
040-S42-17-4-2T	●	4	5	20	50	42	170				-6°	Fig.1				
050-S42-17-5-4T	●		5	20	50	42	185	88	74			Fig.2				

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

● : Stock Std.
Recommended Cutting Conditions ➔ P24

MECH Shell Mill (without coolant hole)



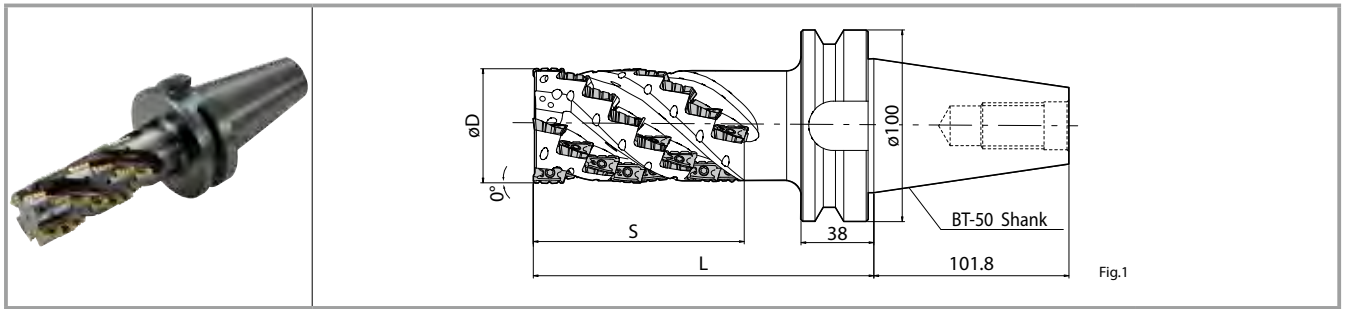
Dimensions

Description	Stock	No. of Flutes	No. of Stages	No. of Inserts	Dimension (mm)					Rake Angle		Insert	Spare Parts			Arbor Bolt ➔ P5
					øD	ød	ø1	ø2	H	A.R. (MAX.)	R.R.		Insert Screw	Wrench	Anti-seize Compound	
MECH 040R-11-4-4T-M	●	4	4	16	40	16	15	9	50	+23°	-8°	Fig.1	SB-2555TRG	DTM-8	P-37	BDMT11T308ER-N2
050R-11-5-6T-M	●	6	5	30	50	22	18	11	63							BDMT11T308ER-N3
MECH 050R-17-2-4T-M	●	4	2	8	50	22	18	11	52	+19°	-7°	Fig.1	SB-4070TRN	DTM-15	P-37	HH10X30
050R-17-4-4T-M	●		4	16	50	22	18	11	78							HH10X40
063R-17-3-4T-M	●	4	3	12	63	27	20	14	70	+19°	-7°	Fig.2	SB-4070TRN	DTM-15	P-37	HH12X35
080R-17-4-6T-M	●	6	4	24	80	32	26	18	85							HH16X45
100R-17-4-6T-M	●	6	4	24	100	40	56	-	85	+19°	-7°	Fig.1	SB-4070TRN	DTM-15	P-37	-
MECH 063R-17-3-4T	●		3	12	63	25.4	20	14	70							HH12X35
080R-17-4-6T	●	6	4	24	80	31.75	26	18	85	+19°	-7°	Fig.2	SB-4070TRN	DTM-15	P-37	HH16X45
100R-17-4-6T	●		4	24	100	38.1	56	-	85							-

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

● : Stock Std.
Recommended Cutting Conditions ➔ P24

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



Dimensions

Description	Stock	No. of Flutes	No. of Stages	No. of Inserts	Dimension (mm)			Rake Angle		Insert	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°	Fig.1	SB-2555TRG	DTM-8	P-37	BDMT11T308ER-N2 BDMT11T308ER-N3
MECH 050R17-7-4T-BT50	●	4	7	28	50	173	104	+19°	-7°		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									

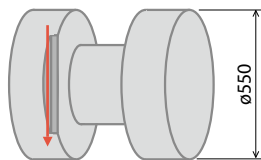
Coat Anti-seize Compound (MP-1) thinly on clamp screw when insert is fixed.

Recommended Cutting Conditions ➡ P24

MECH Case Studies

Ship parts S45C

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

534cc/min

Productivity

4.6
Times

Competitor T

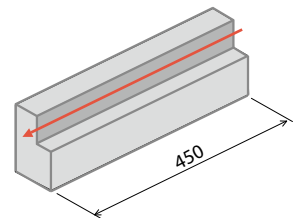
115cc/min

MECH machining efficiency improved 4.6 times that of Competitor T

(User Evaluation)

Plate SS400

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

532cc/min

Productivity

3.1
Times

Competitor U

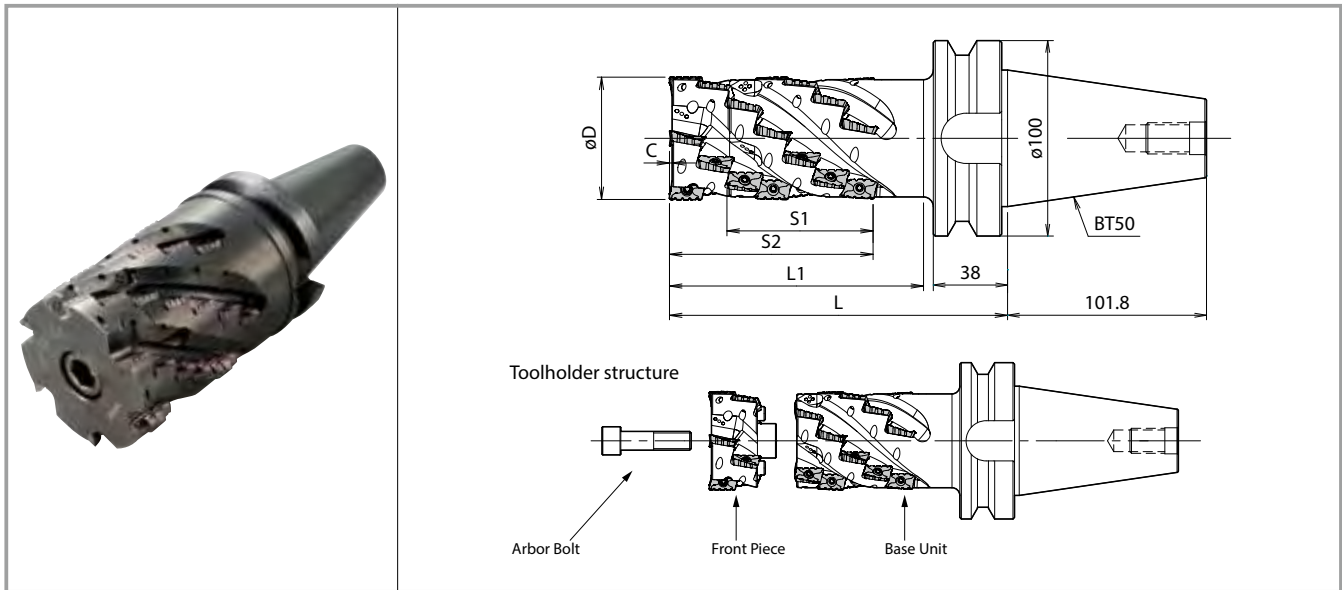
170cc/min

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

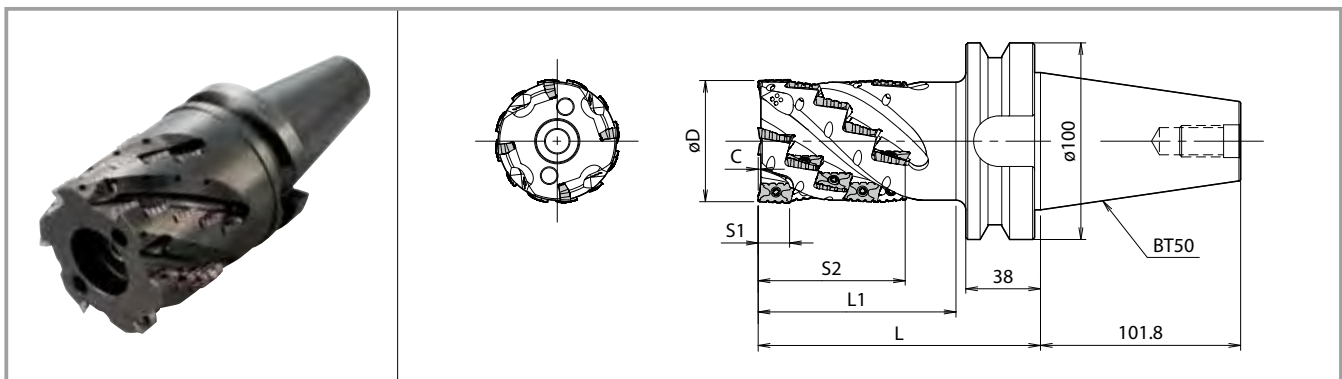
(User Evaluation)

MECH Interchangeable Head

MECH-BT50SA (Without a coolant hole) Arbor Integral Type (Base Unit+1 Front Piece+Arbor Bolt)



MECH-BT50-A (Without a coolant hole) Base Unit



Toolholder Dimensions

	Description	Stock	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	173	130	0.7	55	73	+23°	-7°	4.8
	063R17-4T-BT50SA	MTO		7	28	63								5.8
	080R17-4T-BT50SA	MTO		7	28	80								7.6
	100R17-6T-BT50SA	MTO	6	7	42	100	143	100	1.3	16	75	+19°	-7°	9.8
Base Unit	MECH 050R11-4T-BT50-A	MTO	4	6	24	50								4.6
	063R17-4T-BT50-A	MTO		5	20	63								5.4
	080R17-4T-BT50-A	MTO		5	20	80								6.8
	100R17-6T-BT50-A	MTO	6	5	30	100								8.5

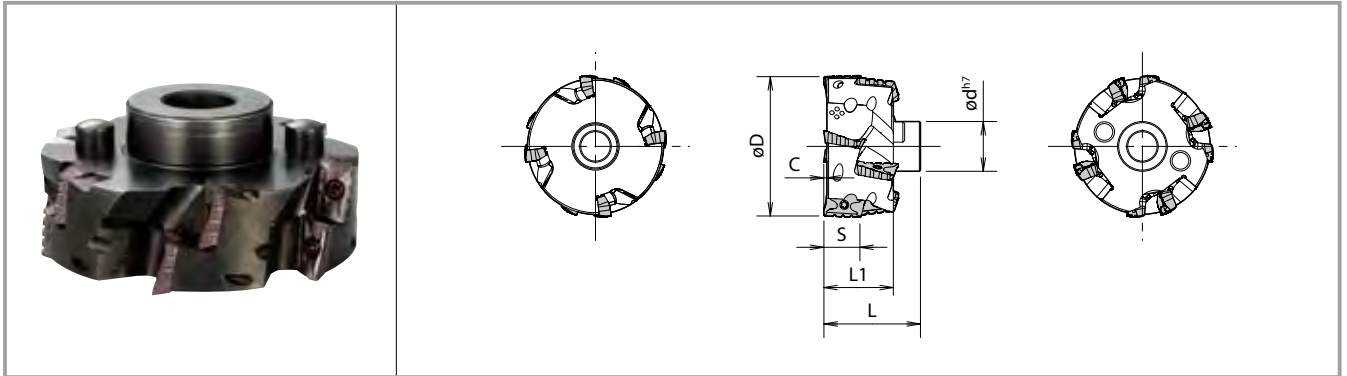
MTO : Made to order
For recommended cutting conditions, see page ➔P24

Toolholder structure

Endmill		Base Unit ➔ P21		Front Piece (1pcs) ➔ 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	Stock	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

● : Stock Std.

Applicable Inserts

Endmill	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

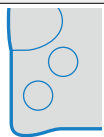
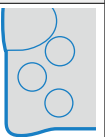
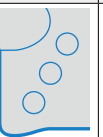
Description	No. of Flutes	No. of Inserts	No. of Inserts			
			BDMT11T308ER-		BDMT170408ER-	
						
MECH 025-S25-11-4-2T	2	8	4	4	—	—
032-S32-11-5-2T		10	5	5		
032-S32-11-5-4T		20	10	10		
040-S32-11-6-4T	4	24	12	12	—	—
040-S42-11-6-4T		28	14	14		
050-S42-11-7-4T	6	42	21	21	—	—
050-S42-11-7-6T		42	21	21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

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

Precautions when installing notched inserts

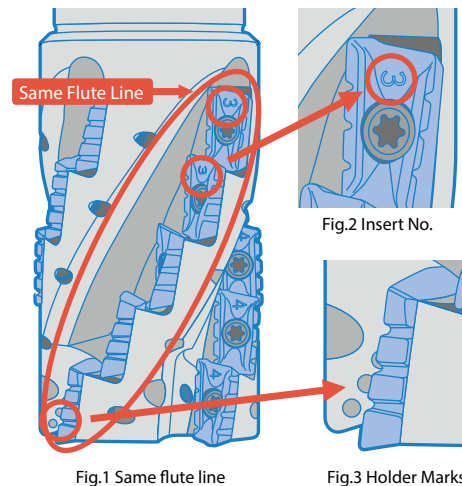
1. Install notched inserts by matching the insert with the number of marks on the holder body.

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 Fig.1, 2 and 3.



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.

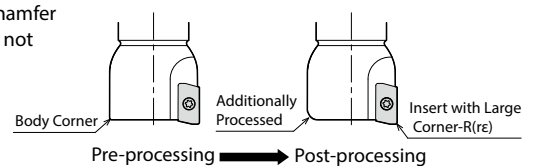
JA Chipbreaker

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 1.2mm 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.

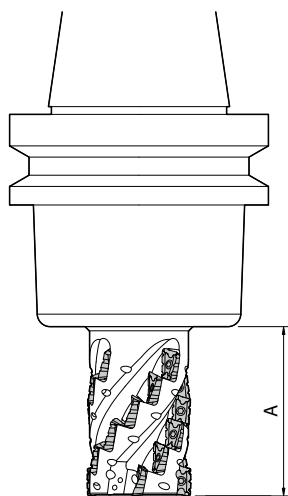


Cutting Performance (Used Machine: Machining center equivalent to AC15 / 18.5kW)

MECH Endmill 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	57
ø40	MECH040-S32-11-6-4T	65
	MECH040-S42-11-6-4T	65
ø50	MECH050-S42-11-7-4T	76
	MECH050-S42-11-7-6T	76
ø40	MECH040-S32-17-4-2T	74
	MECH040-S42-17-4-2T	74
ø50	MECH050-S42-17-5-4T	89

Shape



2 Flute Type

(Workpiece Material: S50C)

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.

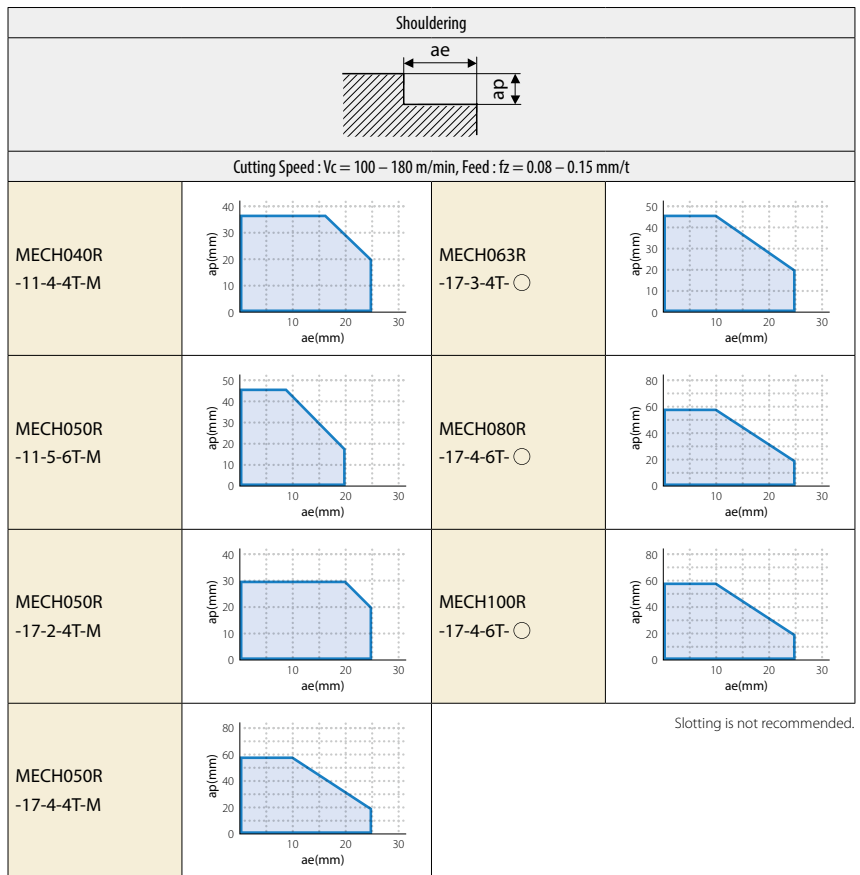
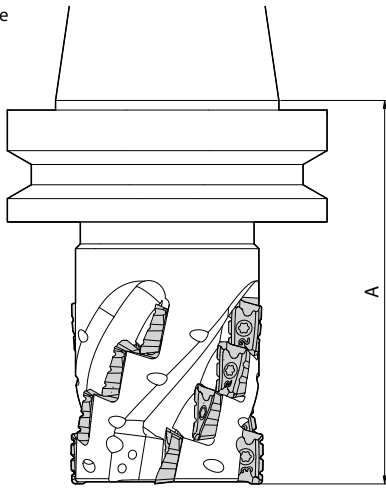
Cutting Performance (Used Machine: Machining center equivalent to AC15 / 18.5kW)

MECH Shell Mill Type

(Workpiece Material : S50C)

Cutting Dia.	Description	Overhang Length A (mm)
ø40	MECH040R-11-4-4T-M	125
	MECH050R-11-5-6T-M	123
ø50	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



MECH-BT50 (Integral Arbor type)

MECH-BT50SA

(Replaceable Head type / Integral Arbor type)

(Workpiece Material : S50C)

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

Shape

