KYOCERA

MECHT

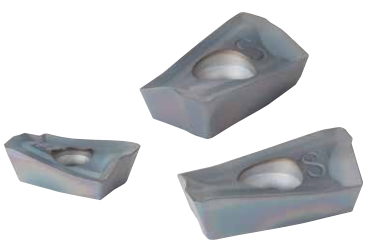
Helical End Mill for Titanium Alloy Machining

New Helical End Mill Design Added to the MECH Product Line

Unique Design for Stable Titanium Alloy Milling

- **Insert combination for increased stability**
- **Special holder design for increased reliability**
- **Coolant holes for Excellent chip evacuation**

Longer Tool Life with Low-resistance JS Chipbreaker and Tough PVD Coating Technology



MECHT

Helical End Mill for Titanium Alloy Machining

Insert Size Combination Improves Roughing Capabilities

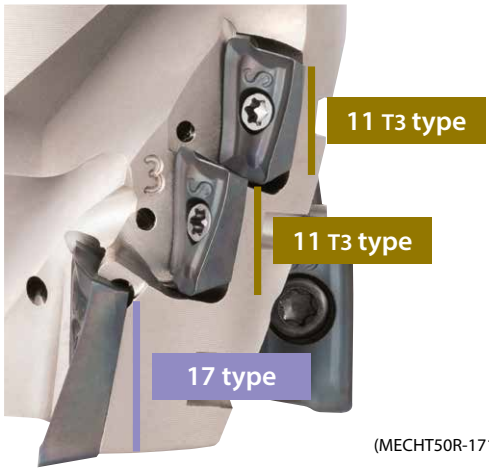
Improved Coolant Hole Maintains Stable Machining and Long Tool Life

1 Developed to Reduce Chattering and Chip Recutting Issues

Unique Insert Combination

Larger bottom inserts are positioned to handle larger cutting forces (excluding ø32mm)

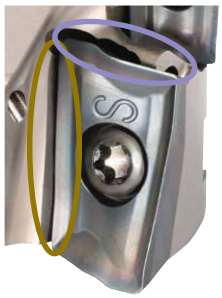
Increased fracture resistance for stable machining



(MECHT50R-1711 type)

New Design for Higher Reliability

Bottom inserts are held in place by double-faced contacts



Holding Surface 1

Wide Holding Surface

Holding Surface 2

Additional Hold in the Axial Direction

Bore Dia.

Larger bore diameter improves fastening power and reduces chattering

ø50mm Cutter with a ø27mm Bore (Conventional Bore : ø22mm)

Toolholder Hardness Hardened 15% more than conventional holders

Toolholder Spec Custom ordering available (Custom number of inserts and stages)

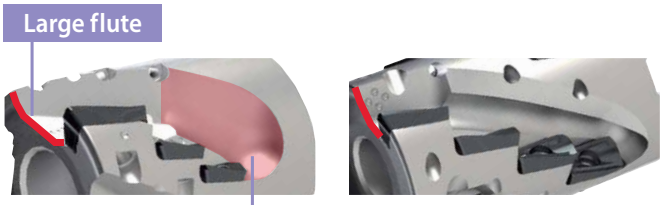
Excellent Chip Evacuation

New flute design

Large, smooth flutes prevent chip clogging

MECHT (ø50mm-4T 3 Stages)

Conventional (ø50mm-4T 4 Stages)



All inserts have coolant holes

Optimized hole diameter controls flow amount and pressure

Smooth chip evacuation as well as superior cooling of the cutting edge

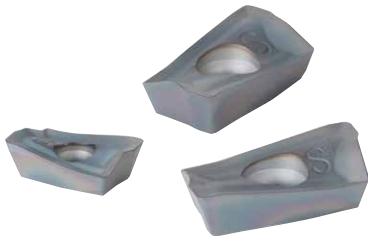
2 Longer Tool Life with Low-resistance JS Chipbreaker and Tough PVD Coating

Low Cutting Force **JS Chipbreaker**

Heat at the cutting edge is suppressed due to sharp cutting performance extending tool life

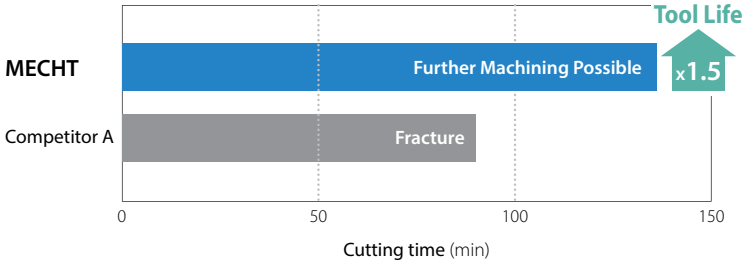
Greater Toughness **PR1535**

Fracture resistant with a tough substrate and high heat-resistant MEGACOAT NANO coating technology



Tool Life Comparison (Internal Evaluation)

MECHT showed good cutting edge condition with 50% longer tool life than competitor B.



Cutting Edge after Machining 50 min

Cutting Conditions : Vc = 130 sfm, D.O.C. × ae = 1.692" × 0.787", fz = 0.0047 ipt, ø50mm (5 Flutes), Wet (External and internal coolant) Workpiece : Ti-6Al-4V Machine : T50

Slotting Titanium Alloy (Internal Evaluation)

D.O.C. = 0.787" (0.4 x DC)

Stable Machining without Chip Clogging or Chattering

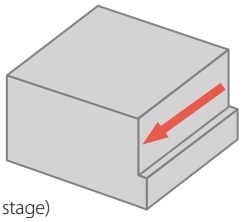
Cutting Conditions : Vc = 130 sfm, D.O.C. × ae = 0.787" × 1.97" (Slotting), fz = 0.003 ipt
ø50mm (5 Flutes), Wet (External and internal coolant) Workpiece : Ti-6Al-4V Machine : BT50

Case Study

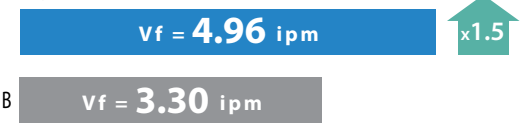
Aerospace Part Ti-6Al-4V

Vc = 180 sfm (n = 350 rpm)
D.O.C. × ae = 0.94" × 0.63"
fz = 0.004 ipt (Vf = 4.96 ipm)
Wet (Internal coolant)

MECHT50R-1711-3-4T-M
BDMT170408ER-JS PR1535 (first stage)
BDMT11T308ER-JS PR1535 (second and third stage)



Cutting Efficiency



MECHT showed good chip evacuation and stable machining even with increasing feed rate. Machining efficiency was 50% better that of the competitor with equivalent tool life.

(User evaluation)

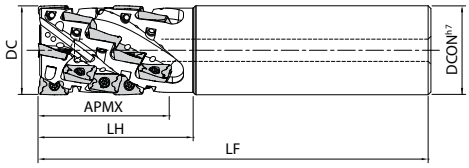
Recommended Cutting Conditions

Workpiece	Applications	Depth of Cut (in)		fz (ipt)	Recommended Insert Grade (Vc : sfm)
					MEGACOAT NANO
		D.O.C.	ae		PR1535
Titanium Alloy (Ti-6Al-4V)	Shouldering	~Length of Cut (APMX)	~0.5 DC	0.004 ~ **0.005** ~ 0.006	100 ~ **130** ~ 200
	Slotting	~0.5 DC	1 DC	0.002 ~ **0.003** ~ 0.004	100 ~ **130** ~ 160

MECHT

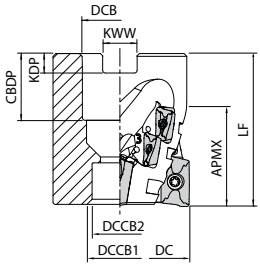
End Mill

Fig.1



Shell Mill

Fig.2



Rake Angle			
Part Number		A.R. (MAX.)	R.R.
MECHT32...-11-		+23°	-9°
MECHT50...-1711-	1st Stage	+19°	-7°
	2nd Stage or Higher	+23°	-6°
MECHT63...-17-		+19°	-7°
MECHT80...-17-			

End Mill Dimensions

Part Number	Stock	No. of Flutes	No. of Stages	No. of Inserts	Dimensions (mm)					Drawing	Spare Parts		Applicable Inserts	
					DC	DCON	LF	LH	APMX		Clamp Screw	Wrench	1st Stage	2nd Stage or Higher
MECHT 32-S32-11-5-4T	●	4	5	20	32	32	140	55	46	Fig.1	SB-2555TRG	DTM-8	BDMT11T3**	*1 BDMT11T308**

Shell Mill Dimensions

Part Number	Stock	No. of Flutes	No. of Stages	No. of Inserts	Dimensions (mm)									Drawing	Spare Parts			Applicable Inserts	
					DC	DCB	$DCCB_1$	$DCCB_2$	LF	CBDP	KDP	KWW	APMX		Clamp Screw	Wrench	Arbor Bolt	1st Stage	2nd Stage or Higher
MECHT 50R-1711-3-4T-M	●	4	3	12	50	27	20	14	55	24	7	12.4	34	Fig.2	SB-2555TRG	DTM-8	HH12X40	BDMT1704**	*1 BDMT11T308**
50R-1711-4-5T-M	●	5	4	20					65				43		SB-4070TRN	DTM-15	HH12X50		
MECHT 63R-17-4-5T-M	●	5	4	20	63	27	20	14	80	24	7	12.4	60		SB-4070TRN	DTM-15	HH12X65		*1 BDMT170408**
80R-17-4-6T-M	●	6	4	24	80	32	26	17		28	8	14.4					HH16X65		

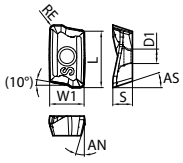
*1. Use inserts with Corner R of 0.8 or less for the 2nd or higher stages

● : Standard Stock

Machining with coolant is recommended (Internal coolant pressure 1.5 MPa or higher)

Coat anti-seize compound (P-37) thinly on the taper and the thread of the clamp screw when mounting inserts.

Applicable Inserts

Insert (Right-Hand Shown)		Part Number	D imensions (mm)					Angle		MEGACOAT NANO
			W1	S	D1	L	RE	AS	AN	PR1535
 Low Cutting Force		BDMT 11T302ER-JS	6.7	3.8	2.8	11.0	0.2	18°	13°	●
		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			●

General JT chipbreaker and notched insert (only if holder has an even number of inserts) can also be used.
For more information, please contact your Kyocera sales representative.

● : Standard Stock

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KYOCERA Precision Tools

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