



MECHT

Helical End Mill for Titanium Alloy Machining

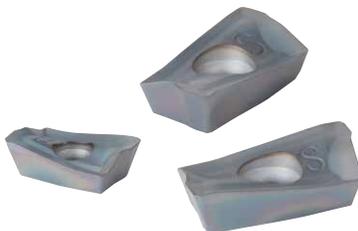


New Helical End Mill Design Added to the MECH Product Line

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



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Helical End Mill for Titanium Alloy Machining

Insert Size Combination Improves Roughing Capabilities

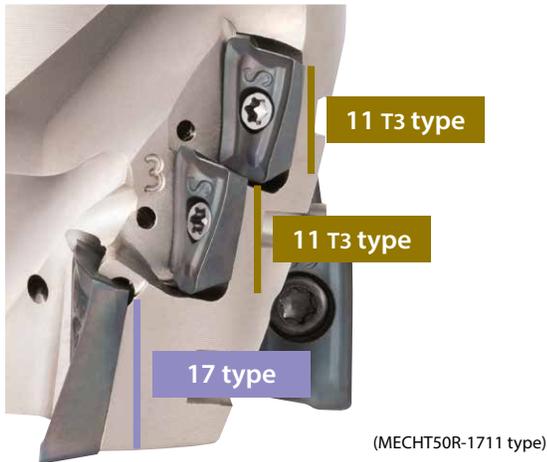
Improved Coolant Hole Maintains Stable Machining and Long Tool Life

1 Developed to Reduce Chattering and Chip Recutting Issues

Unique Insert Combination

Larger bottom inserts are positioned to handle larger cutting forces (excluding $\phi 32\text{mm}$)

Increased fracture resistance for stable machining



New Design for Higher Reliability

Bottom inserts are held in place by double-faced contacts

Holding Surface 1
Wide Holding Surface



Bore Dia.

Larger bore diameter improves fastening power and reduces chattering
 $\phi 50\text{mm}$ Cutter with a $\phi 27\text{mm}$ Bore (Conventional Bore : $\phi 22\text{mm}$)

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 ($\phi 50\text{mm-4T}$ 3 Stages)

Conventional ($\phi 50\text{mm-4T}$ 4 Stages)

Large flute



Smooth design

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



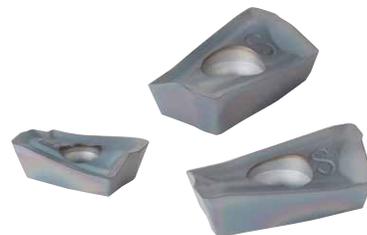
2 Longer Tool Life with Low-resistance JS Chipbreaker and Tough PVD Coating

Low Cutting Force JS Chipbreaker

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

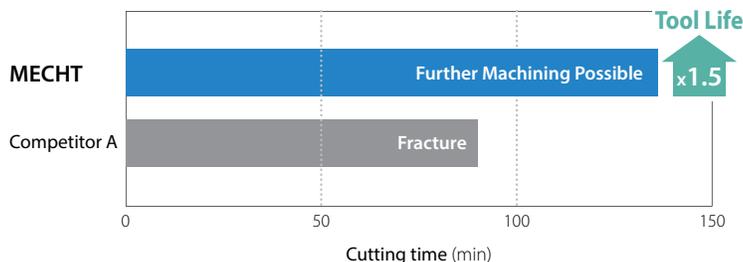
Greater Toughness PR1535

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. x ae = 1.692" x 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. x ae = 0.787" x 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. x ae = 0.94" x 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

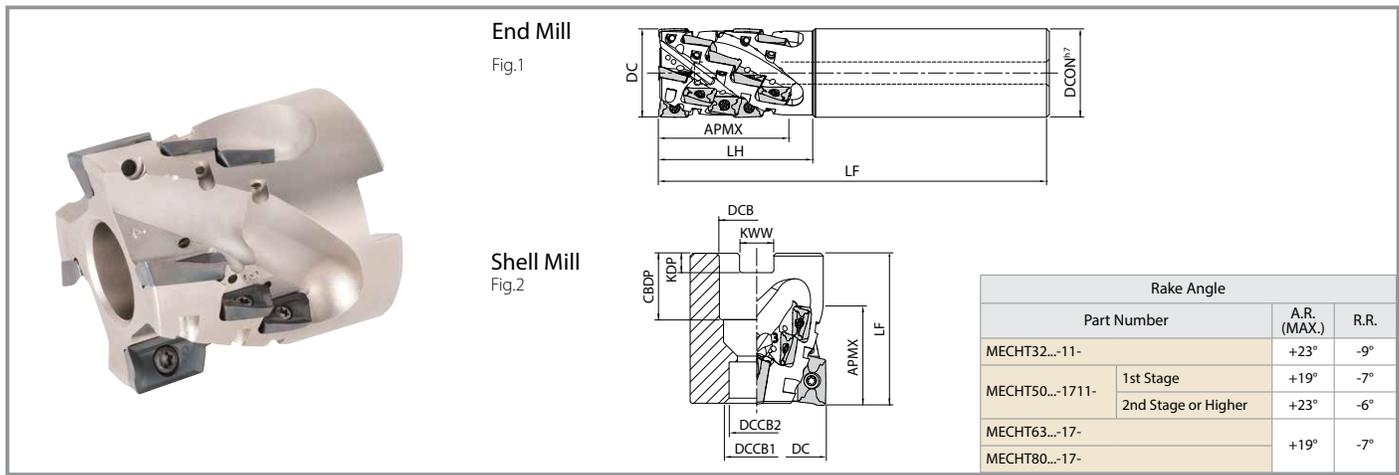
MECHT	Vf = 4.96 ipm	x1.5
Competitor B	Vf = 3.30 ipm	

MECHT showed good chip evacuation and stable machining even with increasing feed rate. Machining efficiency was 50% better than 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)
		D.O.C.	ae		MEGACOAT NANO
					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

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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**	*1BDMT11T308**

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	CDBP	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**	*1BDMT11T308**
50R-1711-4-5T-M	●	5	4	20					65										
MECHT 63R-17-4-5T-M	●	5	4	20	63	27	20	14	80	24	7	12.4	60						
80R-17-4-6T-M	●	6	4	24	80	32	26	17		28	8	14.4		SB-4070TRN	DTM-15	HH12X65		*1BDMT170408**	

*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 dimensions (mm)					Angle		MEGACOAT NANO PR1535
		W1	S	D1	L	RE	AS	AN	
<p>Low Cutting Force</p>	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. ● : Standard Stock
 For more information, please contact your Kyocera sales representative.



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