

THE NEW VALUE FRONTIER



Helical end mill for
titanium alloy machining

MECHT

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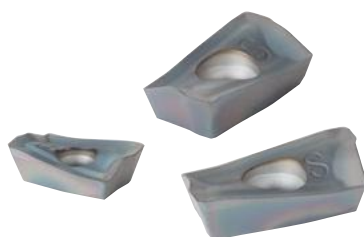


New helical end mill design added to the MECH product line

Unique design for stable titanium alloy milling

- Insert size combination for increased stability
- Special holder design for increased reliability
- Excellent chip evacuation

Longer tool Life with low-resistance JS chipbreaker and tough PVD coating technology



Helical end mill for titanium alloy machining

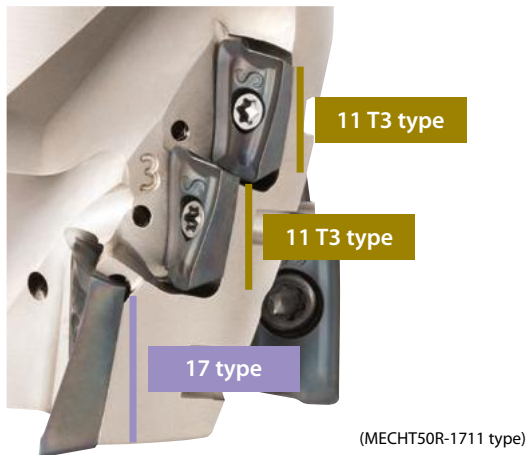
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Insert size combination improves roughing capabilities
Maintains stable machining and long tool life

1 Developed to reduce chattering and chip recutting issues

Unique insert combination

The larger bottom inserts are positioned to handle larger cutting forces (excluding $\phi 32$)
Stable machining with improved fracture resistance



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
 $\phi 50$ mm cutter with a $\phi 27$ mm bore (conventional bore: $\phi 22$ mm)

Toolholder hardness Hardened 15% more than conventional holders

Toolholder spec Custom ordering available
Custom number of inserts and stages

Excellent chip evacuation

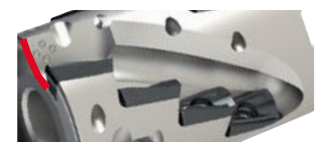
New flute design

Large, smooth flutes prevent chip clogging

MECHT ($\phi 50$ -4T 3 stages)

Conventional ($\phi 50$ -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



Chips example

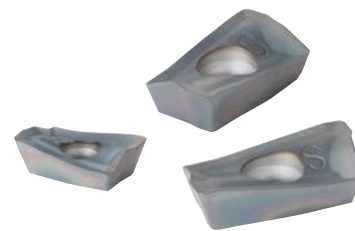
2 Longer tool life with low-resistance JS chipbreaker and tough PVD coating

Low cutting force JS chipbreaker

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

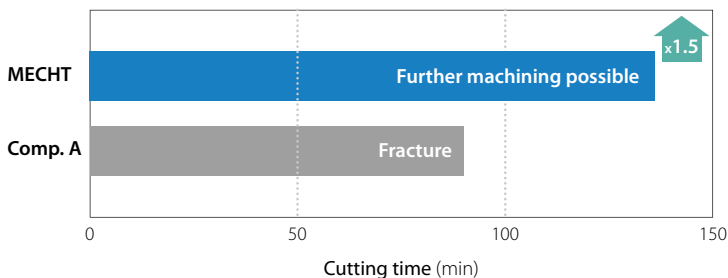
Greater toughness PR1535

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, and tool life was 50% longer than competitor B.



Cutting edge after machining 50 min



Cutting conditions: $V_c = 40$ m/min, $ap \times ae = 43 \times 20$ mm, $f_z = 0.12$ mm/t, $\phi 50$ (5 Flutes), wet (external and internal coolant), workpiece: Ti6Al4V Machine: BT50

Slotting titanium alloy (internal evaluation)

$ap = 20$ mm (0.4xDC)

Stable machining without chip clogging or chattering

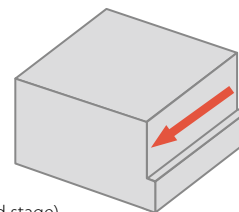


Cutting conditions: $V_c = 40$ m/min, $ap \times ae = 20 \times 50$ mm (Slotting), $f_z = 0.08$ mm/t $\phi 50$ (5 Flutes), wet (external and internal coolant), workpiece: Ti6Al4V Machine: BT50

Case study

Aerospace part Ti6Al4V

$V_c = 55$ m/min ($n = 350$ min⁻¹)
 $ap \times ae = 24 \times 16$ mm
 $f_z = 0.09$ mm/t ($V_f = 126$ mm/min)
Wet (Internal coolant)



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

Cutting efficiency



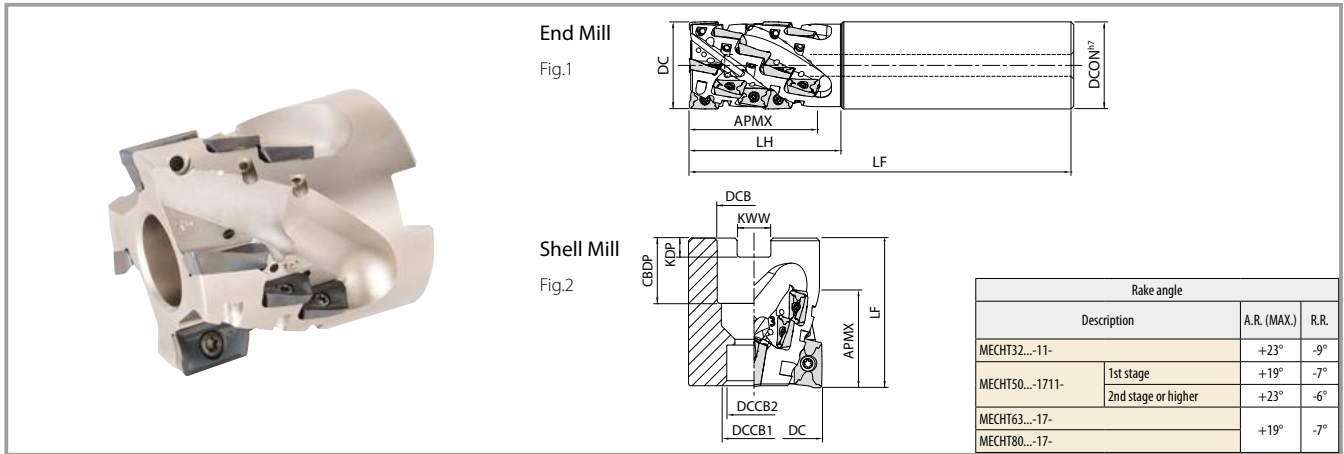
MECHT showed good chip evacuation and stable machining even with increasing feed rate. Machining efficiency was 50% better than that of the competitor with equivalent tool life.

User evaluation

Recommended cutting conditions

Workpiece	Applications	Depth of cut (mm)		f_z (mm/t)	Recommended insert grade (V_c : m/min)
		ap	ae		MEGACOAT NANO
Titanium alloy (Ti6Al4V)	Shouldering	~Length of Cut (APMX)	~0.5DC	0.10 ~ 0.12 ~ 0.16	30 ~ 40 ~ 60
	Slotting	~0.5DC	1DC	0.05 ~ 0.07 ~ 0.09	30 ~ 40 ~ 50

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Toolholder dimensions

End mill

Description	Availability	No. of flutes	No. of stages	No. of inserts	Dimensions (mm)					Shape	Spare parts		Applicable inserts	
					DC	DCON	LF	LH	APMX		Clamp screw	Wrench	1st stage	2nd stage or higher
MECHT 32-532-11-5-4T	●	4	5	20	32	32	140	55	46	Fig.1	SB-2555TRG	DTM-8	BDMT11T3**	*1BDMT11T308**

Shell mill

Description	Availability	No. of flutes	No. of stages	No. of inserts	Dimensions (mm)										Shape	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**		
MECHT 50R-1711-4-5T-M	●	5	4	20					65				43								
MECHT 63R-17-4-5T-M	●	5	4	20	63	27	20	14	80	24	7	12.4	60				SB-4070TRN			DTM-15	HH12X50
MECHT 80R-17-4-6T-M	●	6	4	24	80	32	26	17	80	28	8	14.4	60				SB-4070TRN			DTM-15	HH12X65

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

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

●: Available

Applicable inserts

Shape Handed insert shows right-hand	Description	Dimensions (mm)					Angle		MEGACOAT NANO
		W1	S	D1	L	RE	AS	AN	PR1535
<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.

For more information, please contact your Kyocera sales representative.

●: Available