

ASPX

VIBRATION CONTROL PROVIDES HIGH EFFICIENCY
MACHINING OF TITANIUM ALLOYS

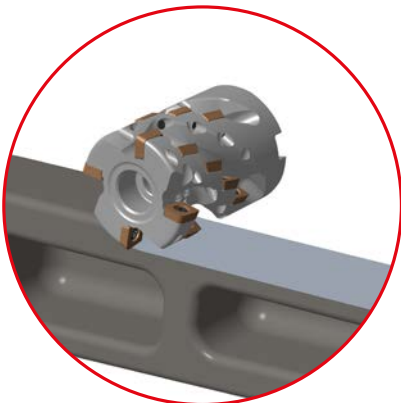
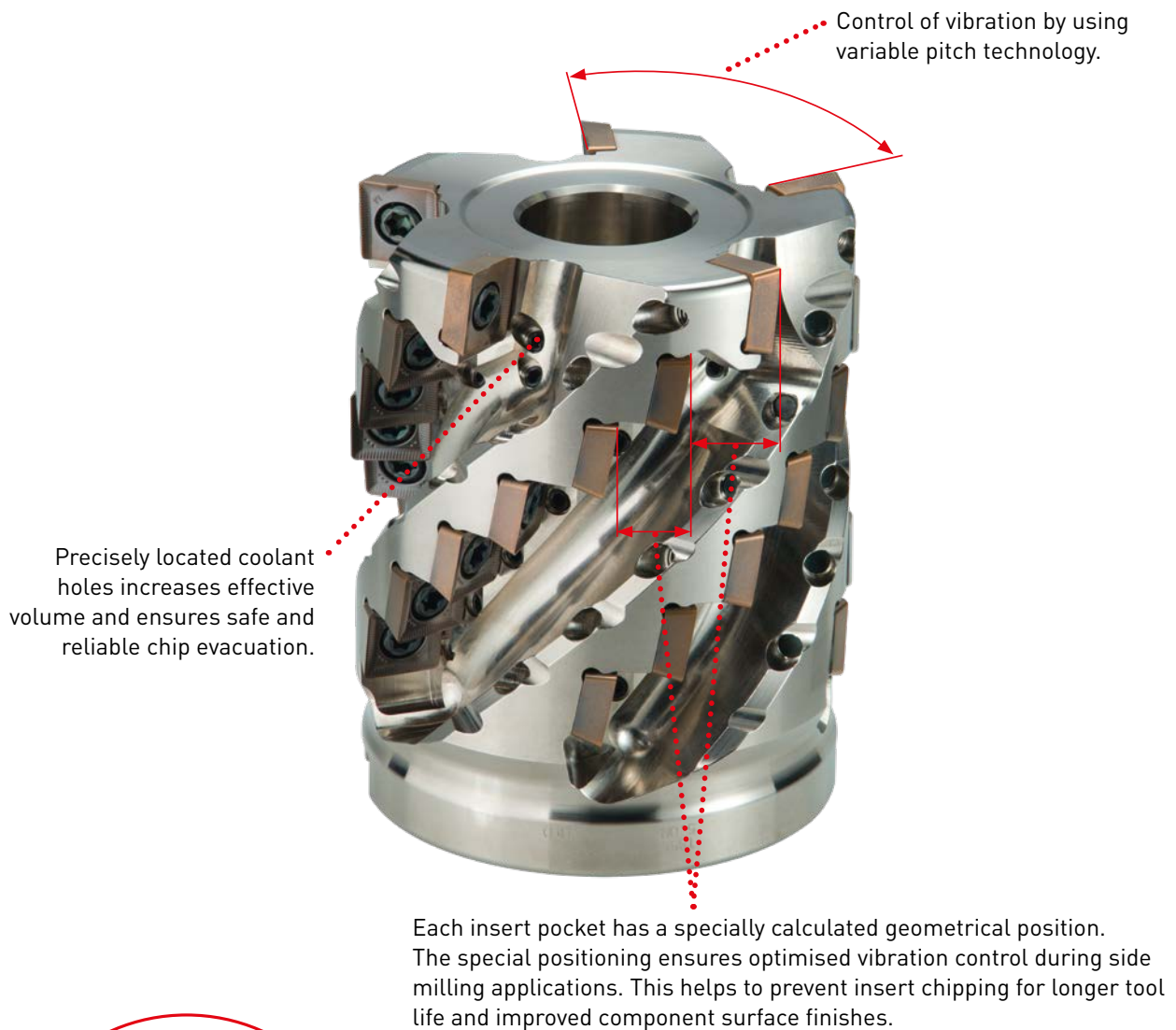


ASPX

FEATURING VIBRATION CONTROL PLUS LOW CUTTING RESISTANCE FOR STABLE, HIGH-EFFICIENCY MACHINING

SUPPRESSION OF REGENERATIVE CHATTER

ASPX leads the latest machining theory by adopting irregular flutes and optimally placed inserts to drastically reduce vibration.



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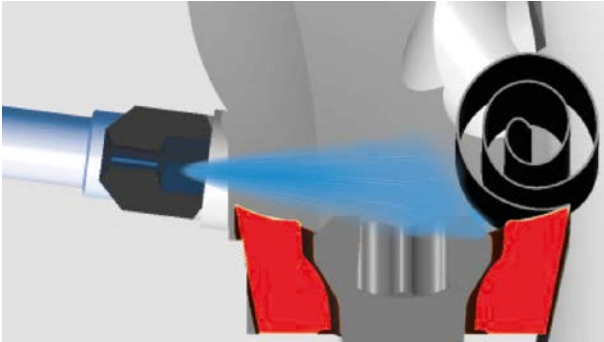
Conventional – Chatter marks

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IMPROVED CHIP DISCHARGE

Coolant applied to the rake face of the cutting edge enables highly efficient chip discharge.

Coolant nozzle



Coolant discharge position



Ideal chip shapes.

REDUCED CUTTING RESISTANCE

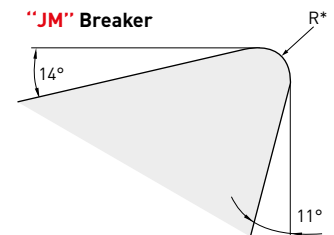
A large rake angle and edge honing that is ideal for titanium machining enhances the low cutting resistance and provides strength to avoid fracturing.



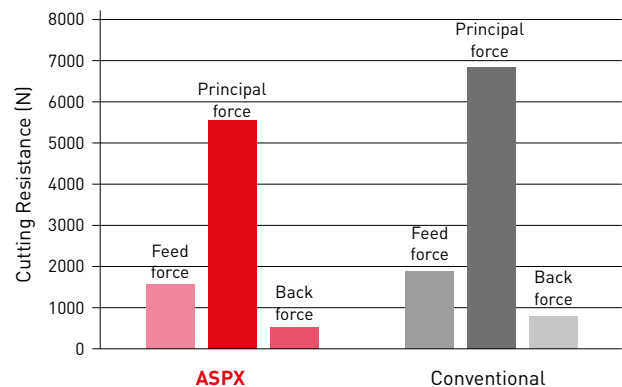
Bottom face insert



Peripheral edge insert



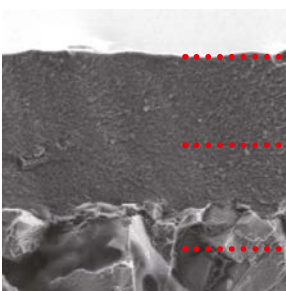
Material	Ti-6Al-4V
DC (mm)	80
Vc (m/min)	60
fz (mm/t.)	0.15
ap (mm)	30
ae (mm)	23.3



PVD COATED GRADE FOR DIFFICULT-TO-CUT MATERIALS

NEW MP9140

The combination of a tough cemented carbide material to withstand fracturing, plus a smooth coating with excellent welding resistance, provides stable processing with long tool life.



..... Smooth surface provides excellent welding resistance.

..... The high Al-rich AlTiN coating succeeds in dramatically improving wear and heat resistance.

..... Special tough cemented carbide substrate.

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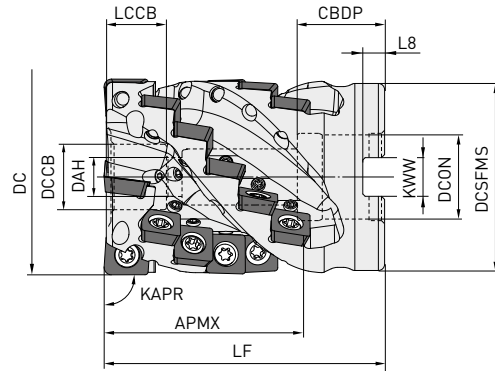


FOR DEEP SHOULDER MILLING OF TITANIUM AND HEAT RESISTANT ALLOYS

S



KAPR: 90°



Right hand tool holder only.

DCX	Set bolt	Geometry
Ø50	HSC10070	
Ø63	HSC12070	
Ø80	HSC16080	

SHELL TYPE

Order number	Stock	APMX	DC	DCON	LF	WT	ZNF	ZNP	Bottom face	Peripheral
ASPX4-050A03A054RA15	●	54	50	22	85	0.6	3	15	JPGX1404PPER-JM	SPGX1204100PPER-JM
ASPX4-063A04A064RA24	●	64	63	27	90	1.0	4	24		
ASPX4-080A05A075RA35	●	75	80	32	100	2.0	5	35		

1. With coolant hole: Shell type should be combined with a through coolant arbor.








MOUNTING DIMENSIONS

Order number	CBDP	DAH	DCCB	DCSFMS	KWW	LCCB	L8
ASPX4-050A03A054RA15	21	10.5	17	47	10.4	14	6.3
ASPX4-063A04A064RA24	28	12.5	21	60	12.4	19	7
ASPX4-080A05A075RA35	28	16.5	27	76	14.4	20	8

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SPARE PARTS


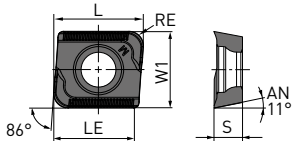

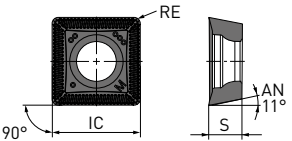
Tool holder type						
	Clamp screw	Seal washer	Wrench	Coolant nozzle	Number	Anti-seize lubricant
ASPX4-050A	TS55	W10-S1	TKY25D	HSD04004H08	18	MK1KS
ASPX4-063A	TS55	W12-S1	TKY25D	HSD04004H08	28	MK1KS
ASPX4-080A	TS55	W16-S1	TKY25D	HSD04004H08	40	MK1KS

* Clamp torque (N • m): TS55 = 5.0

	≤ 1 Mpa (≤ 20 l/min)	Standard	≥ 5 Mpa (≥ 30 l/min)	≥ 7 Mpa (≥ 50 l/min)	To plug a coolant hole
Nozzle Dia	ø 0.6 mm	ø 0.8 mm	ø 1.2 mm	ø 1.6 mm	
Order number	HSD04004H06	HSD04004H08	HSD04004H12	HSD04004H16	HSS04004

- Coolant nozzles are available with varying diameters for adjusting coolant pressure.
Select the correct nozzle according to the specification.
- Use HSS04004 (JIS B 1177 flat point M4x4 screw, clamp torque 1.5 Nm) to plug the coolant hole.

INSERTS

S	Heat-resistant alloy, Titanium alloy		C			Cutting conditions: ●: Stable cutting ●: General cutting ✖: Unstable cutting Honing : E: Round							
Order number	Class	Edge	MP9140			L	RE	LE	S	IC	W1	Shape	Geometry
Bottom face													
JPGX1404080PPER-JM	G	E	●			15.12	0.8	13.4	4.8	-	12.7	 	2 Corner
JPGX1404120PPER-JM	G	E	●			15.06	1.2	13.3	4.8	-	12.7		
JPGX1404160PPER-JM	G	E	●			15.00	1.6	13.3	4.8	-	12.7		
JPGX1404240PPER-JM	G	E	●			14.88	2.4	13.2	4.8	-	12.7		
JPGX1404320PPER-JM	G	E	●			14.72	3.2	13.1	4.8	-	12.7		
JPGX1404400PPER-JM	G	E	●			14.64	4.0	13.0	4.8	-	12.7		
JPGX1404500PPER-JM	G	E	●			14.49	5.0	13.0	4.8	-	12.7		
JPGX1404635PPER-JM	G	E	●			14.29	6.35	12.9	4.8	-	12.7		
Peripheral													
SPGX1204100PPER-JM	G	E	●			-	1.0	-	4.8	12.7	-	 	4 Corner

NEW

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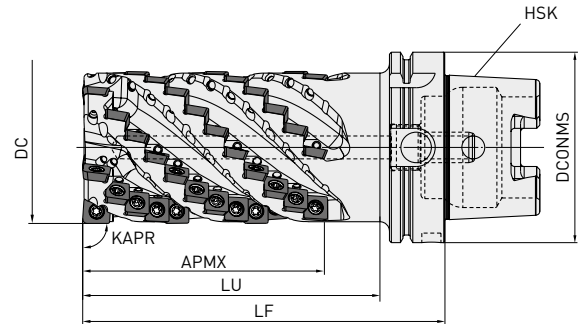


FOR DEEP SHOULDER MILLING OF TITANIUM AND HEAT RESISTANT ALLOYS

S





KAPR: 90°







*The standard type is right-handed (R) only.
The HSK shank type has a built-in central coolant pipe.*

HSK SHANK TYPE

Order number	Stock	APMX	DC	ZNF	ZNP	DCONMS	LF	LU	HSK		
	R									Bottom face	Peripheral
ASPX4R0805H100A127SA	●	127	80	5	60	100	190	156	HSK-A100	JPGX1404	OPPER-JM
ASPX4R0805H125A127SA	●	127	80	5	60	125	190	156	HSK-A125	SPGX1204100	PPER-JM

SPARE PARTS

Tool holder type				Number		Number of insert	
	Clamp screw	Wrench	Coolant nozzle		Anti-seize lubricant	JPGX	SPGX
ASPX4R0805H100A	TS55	TKY25D	HSD04004H08	65	MK1KS	5	55
ASPX4R0805H125A	TS55	TKY25D	HSD04004H08	65	MK1KS	5	55

* Clamp torque (N • m): TS55 = 5.0

CUTTING EXAMPLE

TITANIUM ALLOY TI-6AL-4V: ULTRA-HIGH EFFICIENCY MACHINING EXAMPLE

Compared to a conventional tool, productivity has been improved by 30 % and tool life has been doubled.

Tool: Integrated Type HSK-A100

Vc (m/min)	75
fz (mm/t.)	0.12
ap (mm)	80
ae (mm)	25
M.R.R. (cm³/min)	360

Cutting time 35 min/workpiece

Conventional

Vc (m/min)	55
fz (mm/t.)	0.12
ap (mm)	80
ae (mm)	25
M.R.R. (cm³/min)	264

Cutting time 50 min/workpiece



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RECOMMENDED CUTTING CONDITIONS

Material	ae	Vc	fz
S Ti Alloys (Ti-6Al-4V, Ti-6Al-4V-ELI, Ti-10V-2Fe-3Al, Ti-5Al-5V-5Mo-3Cr etc.)	ae < 0.5 DC	60 (50 – 80)	0.12 (0.10 – 0.14)
	0.5 DC < ae < 0.8 DC	50 (40 – 60)	0.10 (0.08 – 0.12)
	ae > 0.8 DC	40 (50 – 60)	0.08 (0.06 – 0.10)

1. The cutting performance depends on machine and clamping rigidity, as well as the supply and pressure of the coolant. Adjust as necessary.
2. Use a machine and spindle size suitable for heavy machining of titanium alloys. (7/24 taper #50 or #60, or high-rigidity HSK-A100 or A125, with an output of 15kW or higher and torque of 500 Nm or higher for a rotation speed of 500 rpm or less).
3. Caution, at high load cutting conditions the output power of the machine spindle may be exceeded.
4. If chatter and vibration or machine overloading occur, it is recommended to reduce the depth of cut (ap).
5. The coolant system combines internal and external lubrication, it is recommended to supply coolant in ample quantities.
6. A gradual roll feed into the workpiece and use of down cutting (climb milling) is recommended. Please refer to page 9.

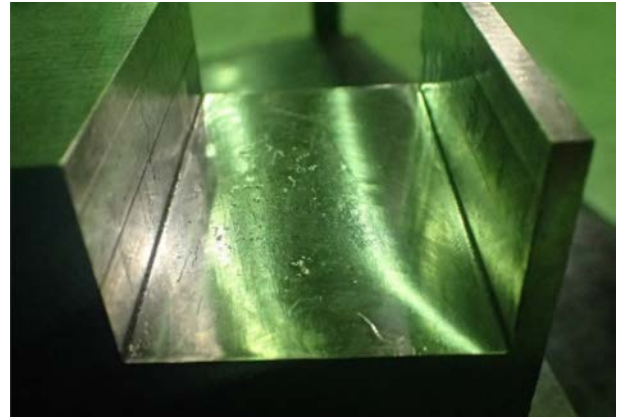
CUTTING PERFORMANCE

HIGH-EFFICIENCY MACHINING OF TI-6AL-4V

Machined surfaces free of chatter marks can be realised to ensure no effects on the finish machining process.



Material	Ti-6Al-4V
DC (mm)	50
Vc (m/min)	40
fz (mm/t.)	0.13
ap (mm)	60
ae (mm)	15
M.R.R. (cm³/min)	90



Material	Ti-6Al-4V
DC (mm)	50
Vc (m/min)	40
fz (mm/t.)	0.08
ap (mm)	30
ae (mm)	50
M.R.R. (cm³/min)	92

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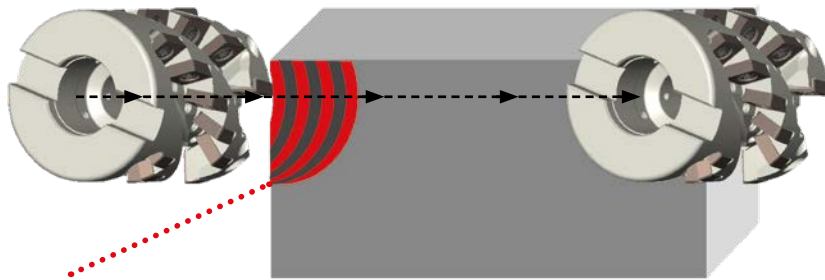
HOW TO USE

POSITIVE EFFECTS OF A ROLL INTO CUTTING APPROACH

The roll into cutting approach can control sharp increases in cutting loads and prevent sudden chipping of inserts that tends to occur at the start of machining.

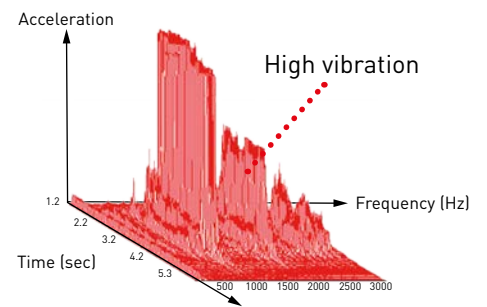
Direct approach method*

Cutting load increases suddenly. High risk of chipping.



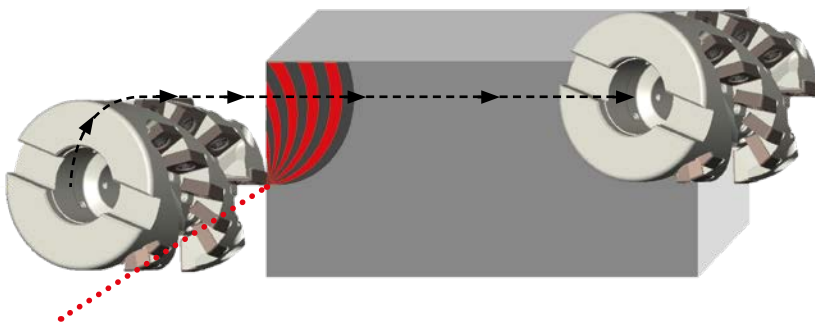
Exit chips are thick.

Image of cutting vibration frequency



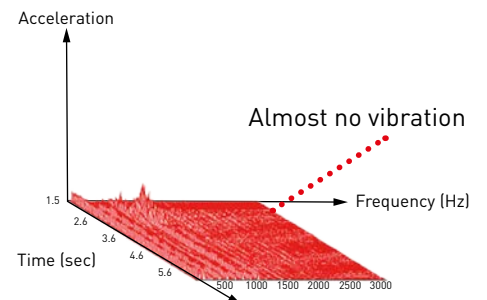
Roll into cutting approach method*

Cutting load increases smoothly.



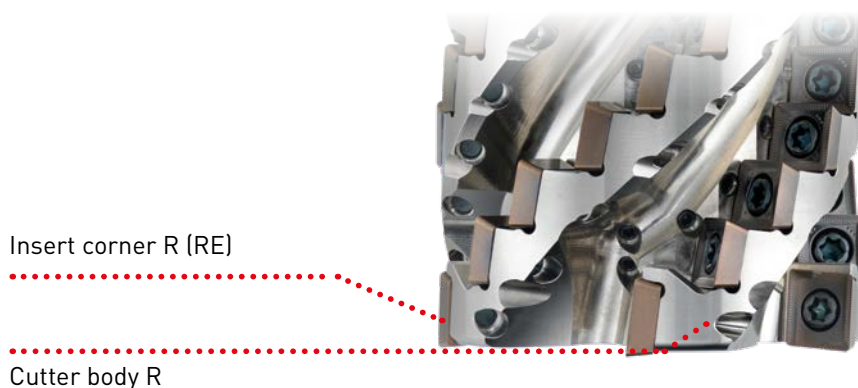
Exit chips have zero thickness.

* Down cutting (climb milling) is recommended.



USE OF INSERTS WITH LARGE CORNER RADII

When using inserts with corner radius $R_E \geq R$ 3.2 mm, please machine the cutter body with a radius form as shown on the table below.



Insert corner R R_E	Cutter body radius R
3.2	3.0
4.0	4.0
5.0	5.0
6.35	6.2

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