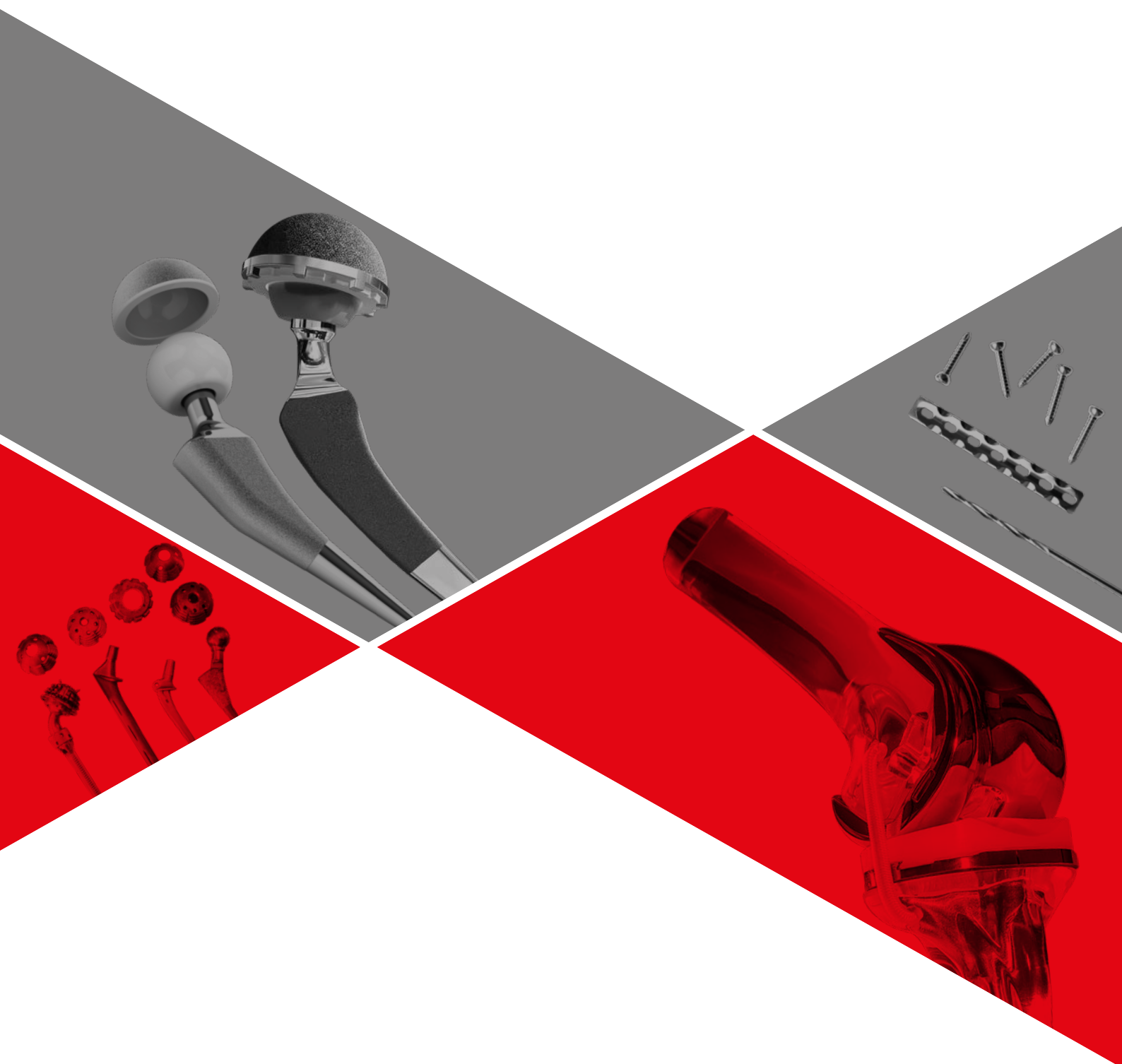

TOOLS FOR MEDICAL INDUSTRY APPLICATIONS





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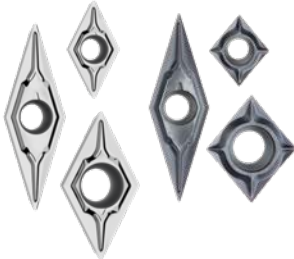



CUTTING TOOL FAMILY

FOR MEDICAL APPLICATIONS



CUTTING TOOL FAMILY

FOR DIFFICULT TO CUT MATERIALS

	GY			VQ SERIES			MMS		
Product brochure:	B140			B197			B180		
Titanium alloy	⊙			⊙			⊙		
CoCr		○			⊙			○	
Stainless steel			⊙			○			⊙
									
	iMX			MP9000 / MT9000			DLE		
Product brochure:	B200			B214			B223		
Titanium alloy	⊙			⊙			⊙		
CoCr		○			○			○	
Stainless steel			⊙			⊙			⊙
									
	MINI-MVS								
Product brochure:	B239								
Titanium alloy	⊙								
CoCr		○							
Stainless steel			○						
									

KNEE SYSTEM





iMX-SERIES FOR ROUGHING

8



VQ SERIES FOR PRE-FINISHING

9



VQ SERIES FOR FINISHING

10



VQ SERIES FOR ROUGHING

11



KNEE SYSTEM

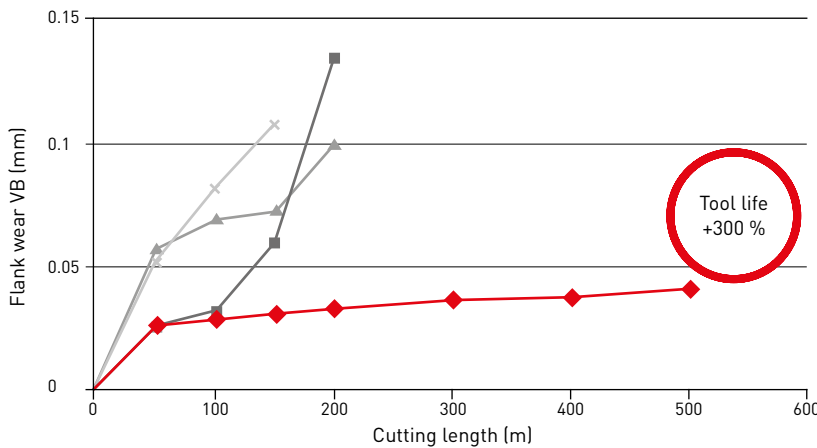
iMX FOR ROUGHING

M

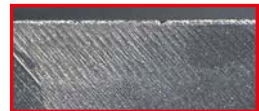
- End mill system that combines the advantages of solid and indexable end mills.
- 4-flute irregular pitch controls vibration and achieves stable machining.
- Reduced flank wear with internal coolant.



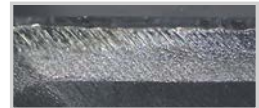
EDGE CONDITION



iMX-S4HV
(Cutting length 150 m)



Conventional A
(Cutting length 100 m)



Conventional B
(Cutting length 100 m)

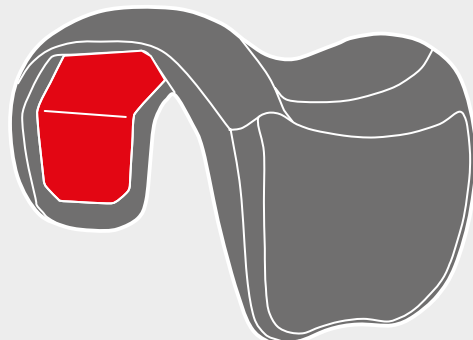


Conventional C
(Cutting length 100 m)



Tool life
+300 %

Tool	iMX16S4HV1801 (DC = 18 mm)
Material	1.4305
Vc (m/min)	100
Vf (mm/min)	720
ap (mm)	18
ae (mm)	1.5
Coolant	Emulsion
Machine	Machining centre



For more information...

B200

www.mhg-mediastore.net

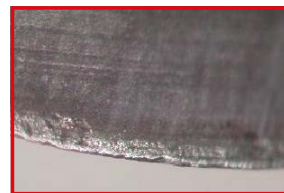
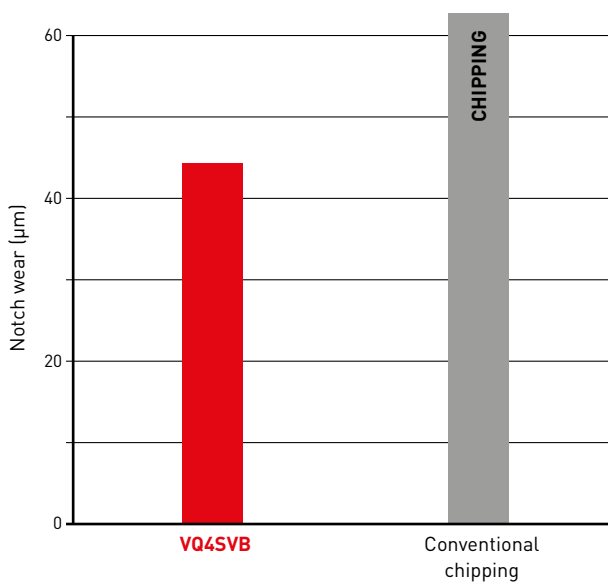


KNEE SYSTEM

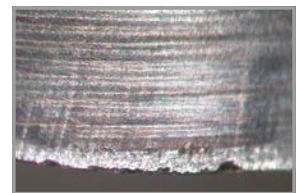
VQ SERIES FOR PRE-FINISHING

S

- Lower back-force due to optimization of the helix angle.
- High performance cutting of HRSA materials.
- Reduced flank wear due to ZERO- μ Surface cutting edge preparation.
- Variable pitch for reduced vibration.

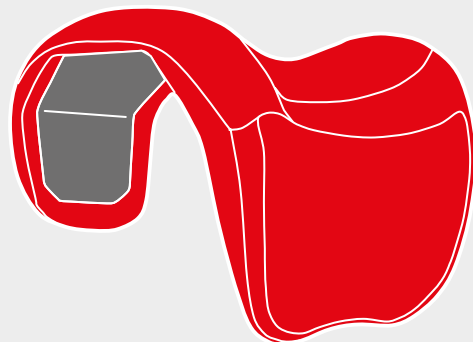


VQ4SVB



Conventional

Tool	VQ4SVBR0500 (Ø10 mm)
Material	Co-Cr
Vc (m/min)	100
Vf (mm/min)	900
ap (mm)	3.0
ae (mm)	0.2
Coolant	Emulsion
Machine	Machining centre



For more information...

B197

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KNEE SYSTEM

VQ SERIES FOR FINISHING

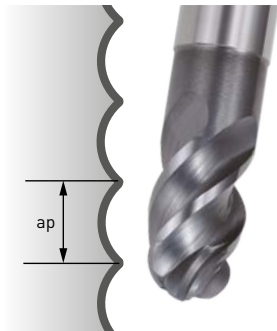
S

- 3-flute end cutting edge geometry improves chip evacuation.
- 6-flute, irregular pitch peripheral cutting edges prevent chattering.
- Tangential form radius enables highly efficient machining with larger pick feed.

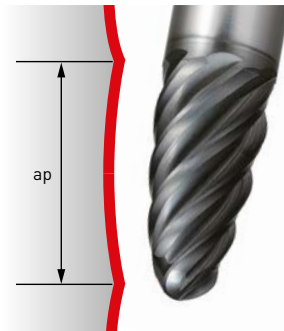


LARGER PICK FEED REDUCES THE NUMBER OF TOOL PASSES AND CONTRIBUTES TO A LONGER TOOL LIFE.

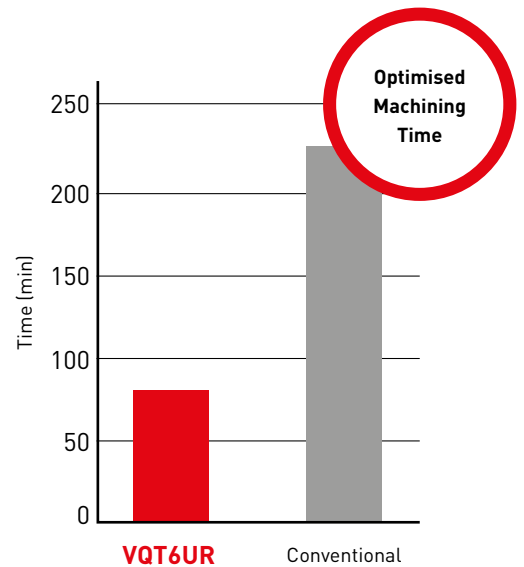
Ball Nose End Mill



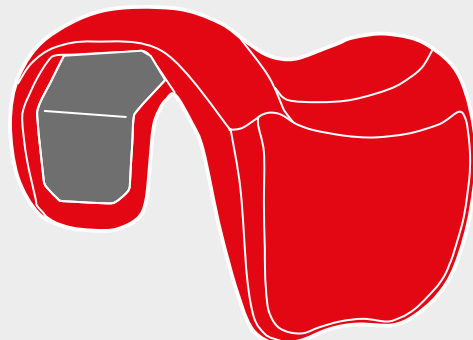
VQT6UR



Compared with ball nose end mills, a conical taper barrel end mill has a larger radius that allows a greater axial depth of cut (ap). This design promotes highly efficient machining by utilising a larger pick feed.



Tool	VQT6URR020R085S10 (DC= 10 mm)
Material	Ti-6Al-4V
Vc (m/min)	80
Vf (mm/min)	458
ap (mm)	4.0
ae (mm)	0.3
Tilt Angle	8°
Coolant	Emulsion
Machine	Machining Centre



For more information...

B197

www.mhg-mediastore.net

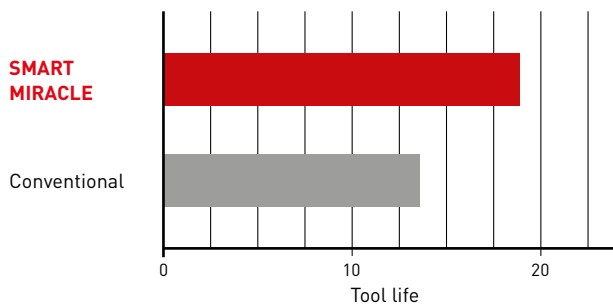


KNEE SYSTEM

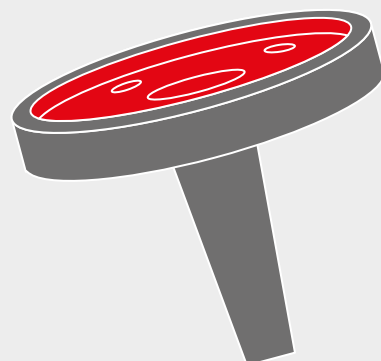
VQ SERIES FOR ROUGHING

S

- The titanium alloy has low thermal conductivity and tends to concentrate heat on the cutting edge. Therefore it is important to remove heat from the cutting edge efficiently and to evacuate chips smoothly.
- SMART MIRACLE has excellent heat and wear resistance, enabling high-speed and high-feed machining.



Tool	VQMHRBD0600R050 (DC=6 mm)
Material	Ti-6Al-4V
Vc (m/min)	80
Vf (mm/min)	635
Coolant	Emulsion
Machine	5-axis machining centre



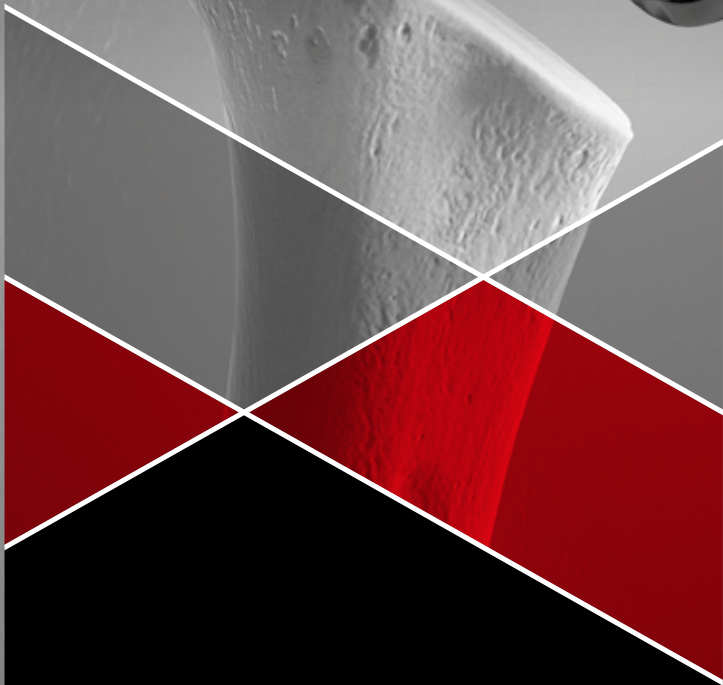
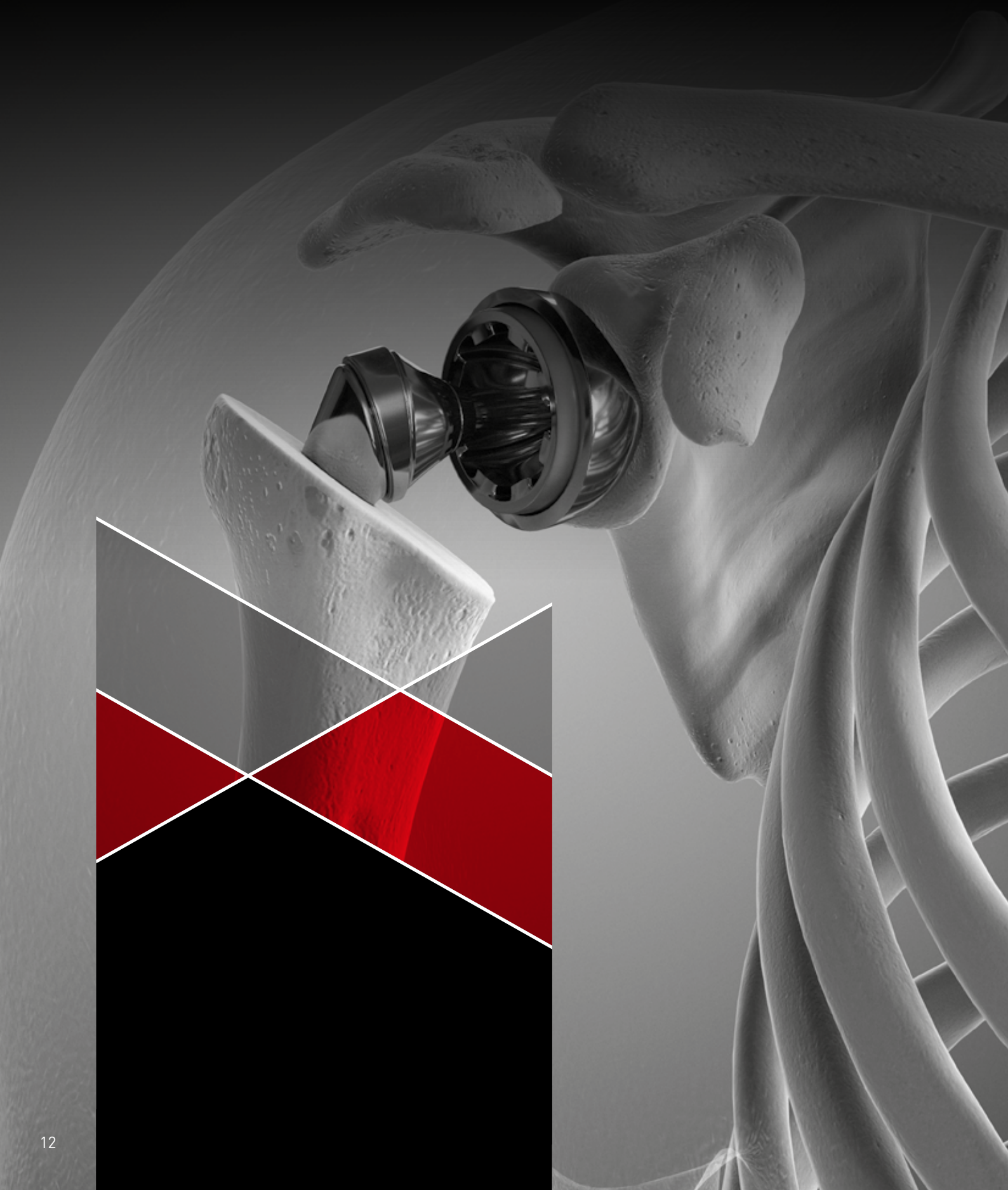
For more information...

B197

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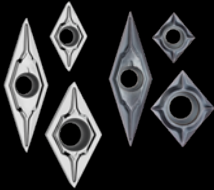
SHOULDER SYSTEM





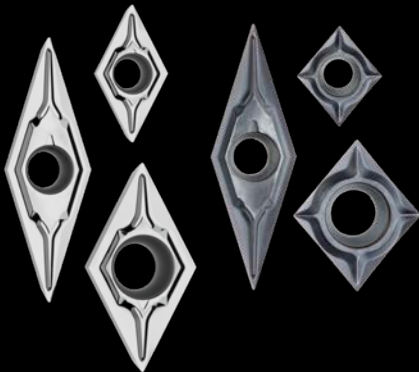
**GY GROOVING TOOLS
FOR ROUGHING**

14



MP9000 SERIES FOR FINISHING

15



SHOULDER SYSTEM

GY GROOVING TOOLS FOR ROUGHING

S

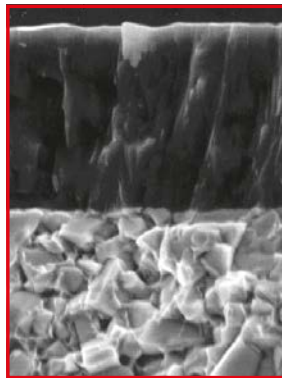
- When machining Ni based alloys, a sharp, strong edge is vital to reduce cutting resistance and overall heat generation.
- GY grooving tools employ a number of geometries that offer sharp edges to increase tool life.



After 25 min machining



VB: 0.122 mm



VP10RT

MIRACLE®
coating

Carbide substrate
(HRA92.0)

Tool	GY2M0300F020N-MM VP10RT (CW=3 mm)
Material	Ti-6Al-4V
Vc (m/min)	45
f (mm/rev.)	0.04
ap (mm)	28
Coolant	Emulsion
Machine	CNC lathe



For more information...

B140

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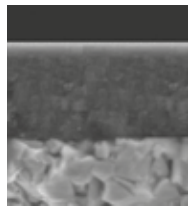
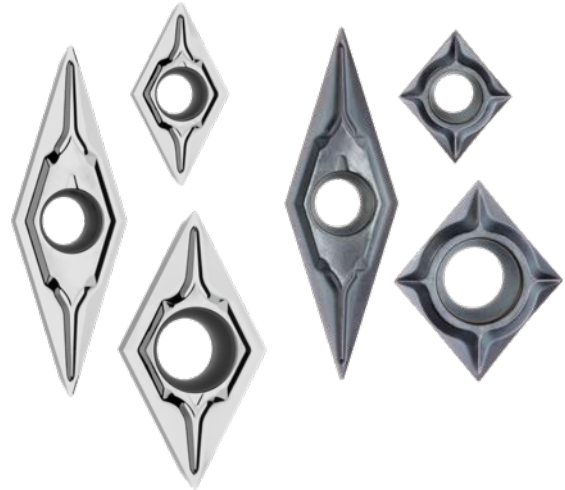


SHOULDER SYSTEM

MP9000 SERIES FOR FINISHING

M

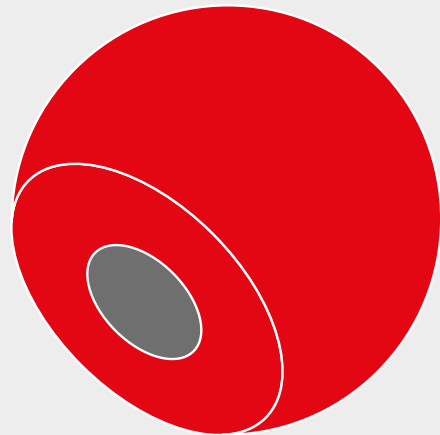
- Al-rich (Al, Ti)N single layer coating provides high hardness for long tool life.
- Maintains cutting edge stability even at high depths of cut that exceed the corner radius value.



..... High Al-rich (Al,Ti)N single layer coating technology

..... Special cemented carbide substrate

Tool	VC GT110304M-LS MP9005
Material	1.4305
Vc (m/min)	150
f (mm/rev.)	0.1
ap (mm)	0.3
Coolant	Emulsion
Machine	CNC lathe



For more information...

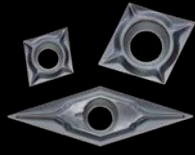
B214

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HIP SYSTEM





..... **MP9000 SERIES FOR FINISHING** **18**



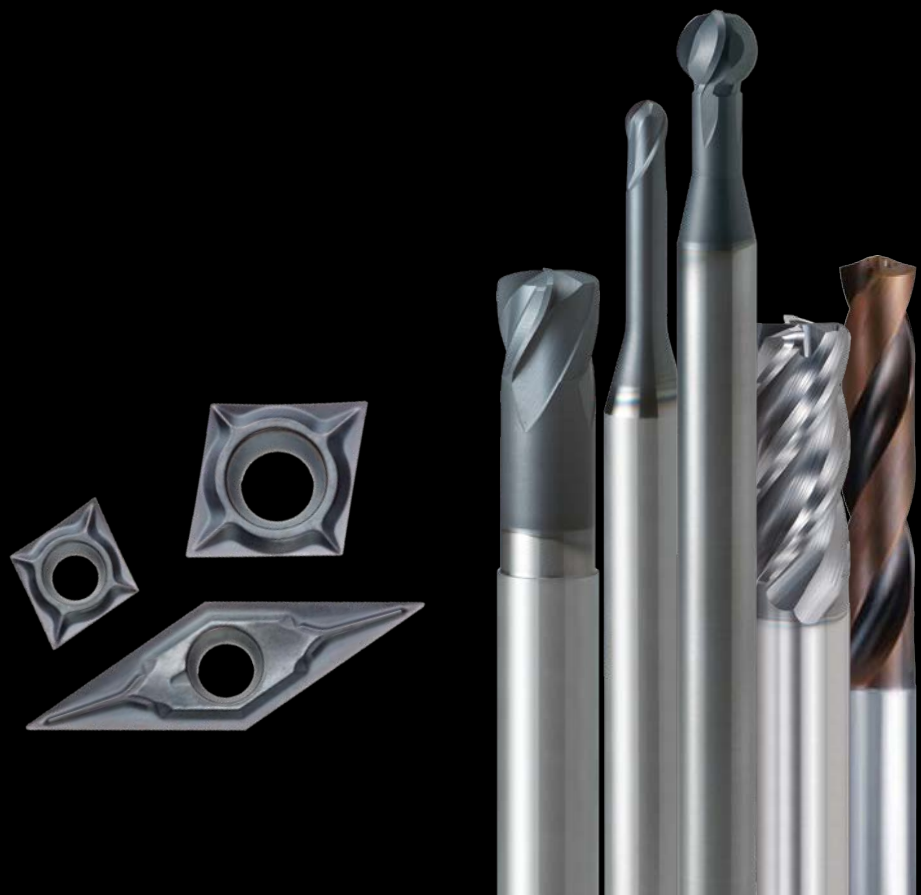
..... **VQ SERIES FOR FINISHING** **19**



..... **MMS FOR DRILLING** **20**



..... **VQ SERIES FOR FINISHING** **21**



HIP SYSTEM

MT9000 SERIES FOR FINISHING

S

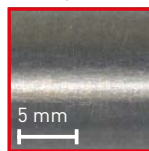
- New cemented carbide grade provides a sharp cutting edge and also displays excellent wear and fracture resistance.
- High quality carbide for finishing difficult to cut materials.
- Polished inserts help to prevent built-up edges.



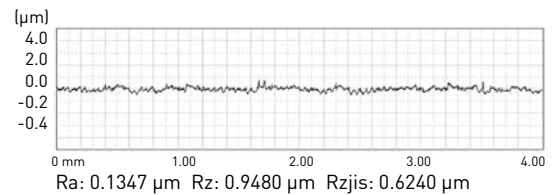
TITANIUM ALLOY, COMPARISON OF SURFACE FINISH

Material	Ti-6Al-6V (325 HB)
Insert	CNMG120408-LS
Vc (m/min)	70
f (mm/rev.)	0.05
ap (mm)	0.25
Cutting mode	Wet cutting

Glossy surface

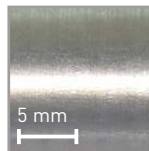


MT9015 - LS

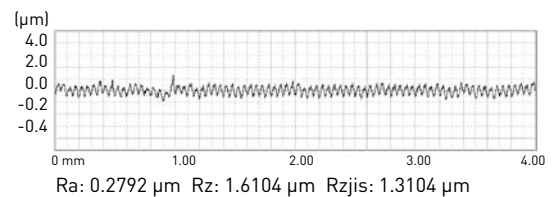


Excellent surface finish

White turbidity



Conventional



Tool	CNMG120408-LS MT9015
Material	Ti-6Al-4V
Vc (m/min)	70
f (mm/rev.)	0.05
ap (mm)	0.25
Coolant	Emulsion
Machine	CNC lathe



For more information...

B214

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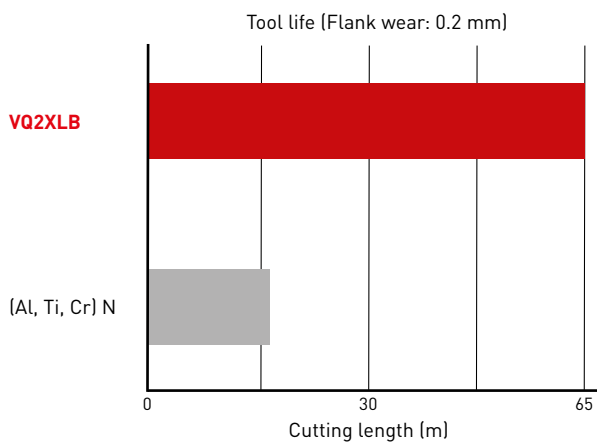


HIP SYSTEM

VQ SERIES FOR FINISHING

S

- Cutting edge geometry with excellent chipping resistance.
- SMART MIRACLE coating providing better wear resistance when machining difficult-to-cut materials.

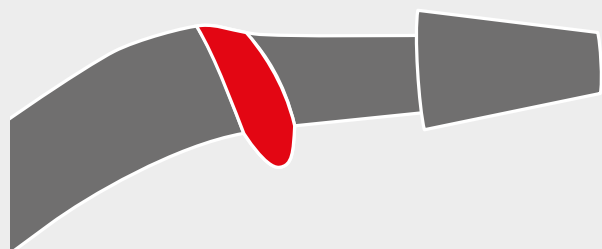


Edge condition (Flank wear)



[Cutting length 40 m]

Tool	VQFDRBD0600N180 (DC=6 mm)
Material	Ti-6Al-4V
Vc (m/min)	140
fz (mm/rev.)	0.08
ap (mm)	0.3
ae (mm)	0.8
Coolant	Emulsion
Machine	5-axis machining centre



For more information...

B197

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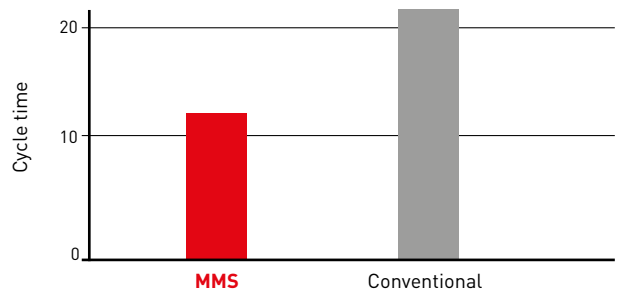
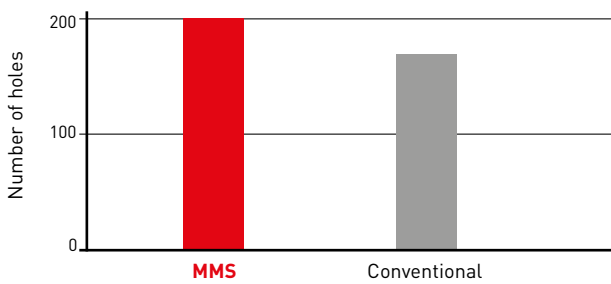


HIP SYSTEM

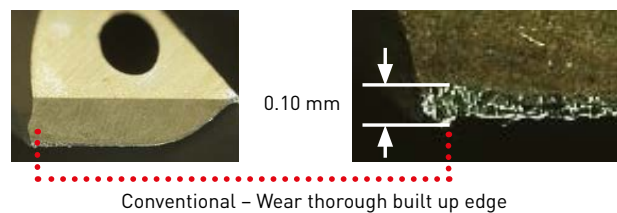
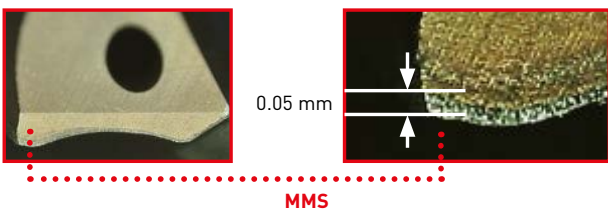
MMS FOR DRILLING

S

- MMS drills offer longer tool life and can be used on stainless steels, titanium and Co-Cr alloys.
- Use of internal through coolant holes improves cooling and chip discharge.



When machining 30 holes



Tool	MMS0500X5DB DP7020 (DC = 5 mm)
Material	Co-Cr Alloy
Vc (m/min)	30
Vf (mm/min)	97
Coolant	Emulsion
Machine	Machining Centre



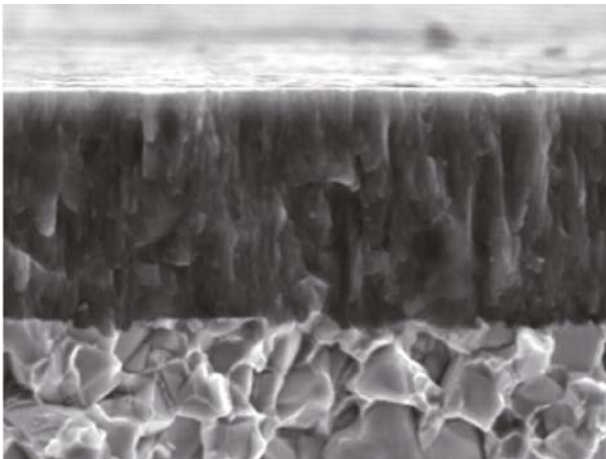
B180

HIP SYSTEM

VQ SERIES FOR FINISHING

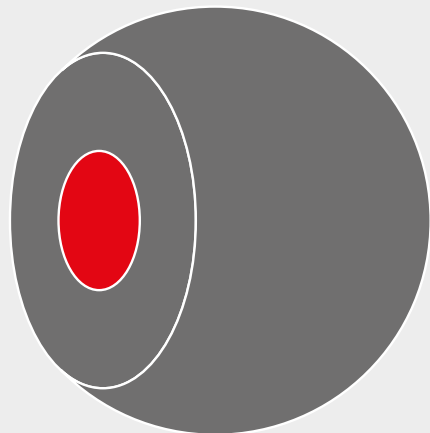
S

- The Titanium alloy has low thermal conductivity and tends to concentrate heat on the the cutting edge
- VQ end mills remove heat from the cutting edge efficiently and evacuate chips smoothly.
- SMART MIRACLE has excellent heat and wear resistance, enabling high-speed and high-feed machining.



..... Newly developed PVD coating for a sharp cutting edge

Tool	VQMHRBD0800R100 (DC = 8 mm)
Material	Titanium alloy
Vc (m/min)	70
vf (mm/min)	555
Hole depth (mm)	15
Coolant	Emulsion
Machine	5-axis machining centre



For more information...

B197

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METAL IMPLANT SYSTEM





MMS FOR DRILLING

24



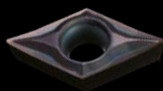
DLE FOR CHAMFERING

25



VQ SERIES FOR PRE-FINISHING

26



VP15TF FOR STAINLESS STEEL

27



MVS FOR DEEP HOLE DRILLING

28



VQ SERIES FOR FINISHING

29



VQ SERIES FOR FINISHING

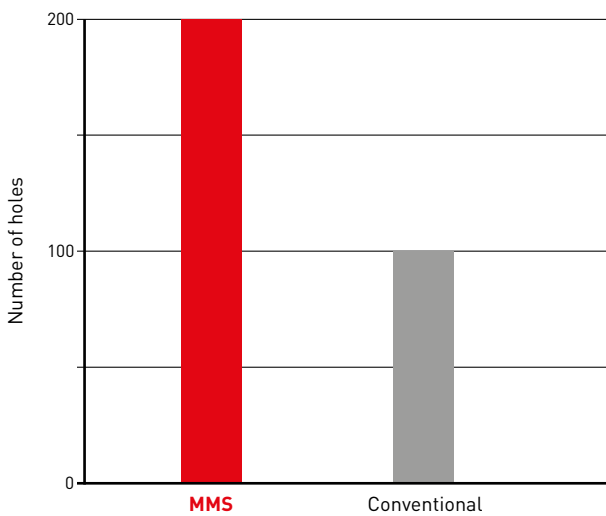
30

BONE PLATES

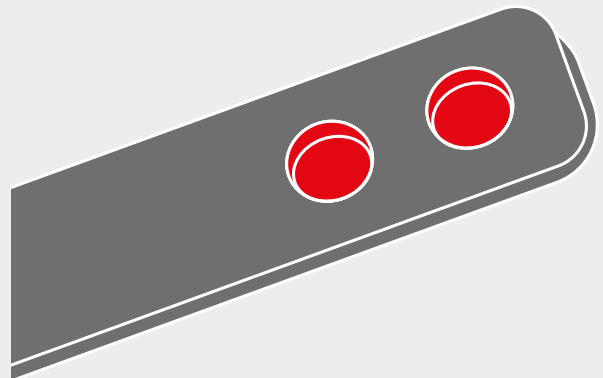
MMS FOR DRILLING

S

- For cutting strength when machining stainless steel to prevent chipping and fracturing on the cutting edge.
- MMS drills employ a suitable cutting edge geometry and coating to provide stable machining conditions.



Tool	MMS0600S-DIN-C DP7020 (DC=6 mm)
Material	Ti-6Al-4V
Vc (m/min)	57
Vf (mm/min)	360
Coolant	Emulsion
Machine	5-axis machining centre



B180

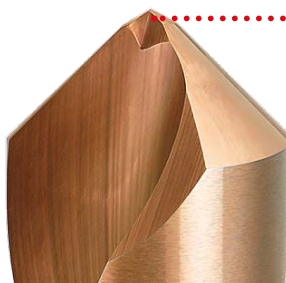
BONE PLATES

DLE FOR CHAMFERING

M

S

- For high quality chamfering.
- Two-step point angle with a straight but strong cutting edge prevents sudden fracturing.
- Coated carbide grade for difficult to cut materials.



DOUBLE ANGLE POINT (60°, 90°)

The double point angles ensure strength at the center to prevent sudden fracturing

High strength center

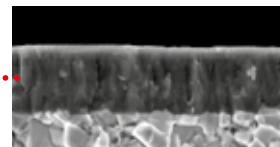
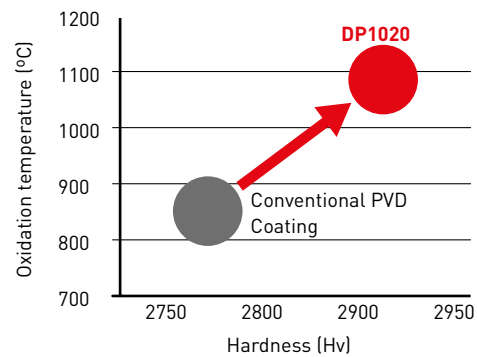


DLE

Prone to fracturing

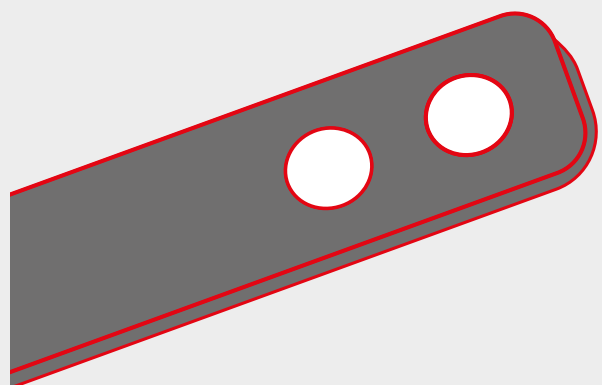


Conventional



With accumulated ALTiCrN based PVD coating

Tool	DLE0600S060P090 DP1020 (DC=6 mm)
Material	Stainless steel
Vc (m/min)	15
f (mm/rev.)	0.06
Coolant	Emulsion
Machine	5-axis machining centre



For more information...

B223

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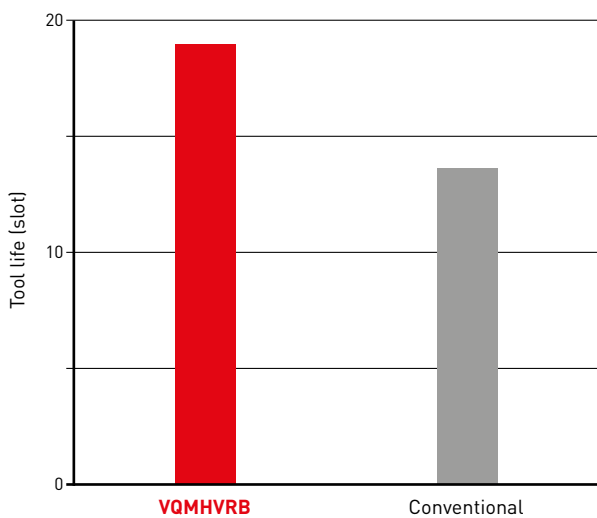
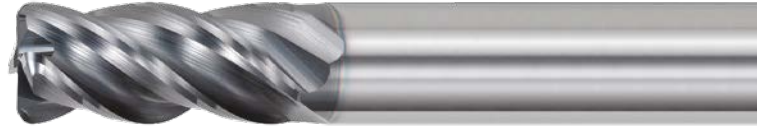


BONE PLATES

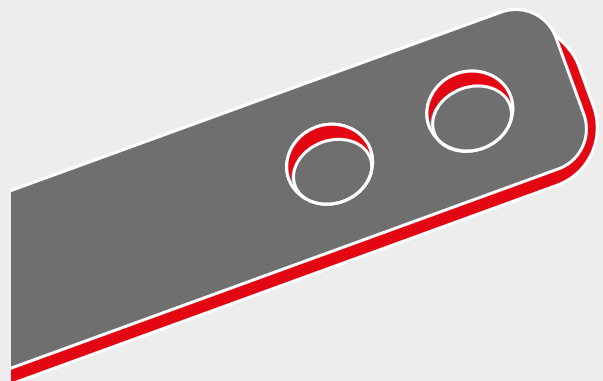
VQ SERIES FOR PRE-FINISHING

S

- For slotting of heat-resistant alloys using an efficient trochoidal milling method.
- SMART MIRACLE has excellent heat and wear resistance that enables high feeds and speeds.



Tool	VQMHVRBD0500R050 (DC=5 mm)
Material	Ti-6Al-4V
Vc (m/min)	110
Vf (mm/min)	1540
ap (mm)	up to 4
ae (mm)	0.35
Coolant	Oil
Machine	5-axis machining centre



Interested in more...

B197

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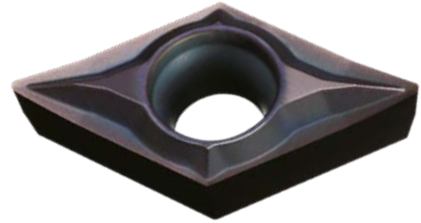


BONE SCREWS

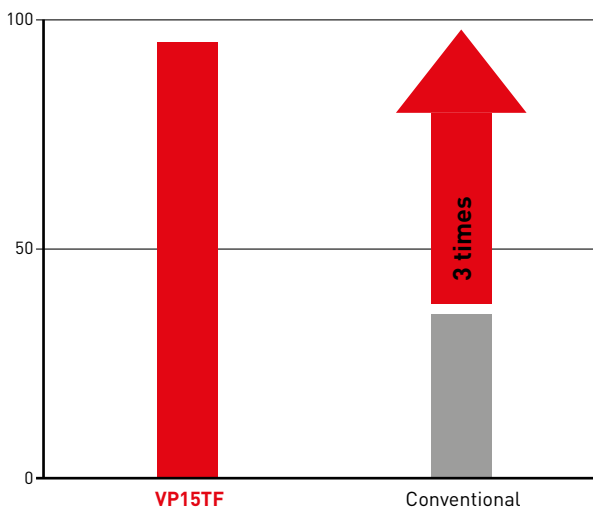
VP15TF FOR STAINLESS STEEL

M

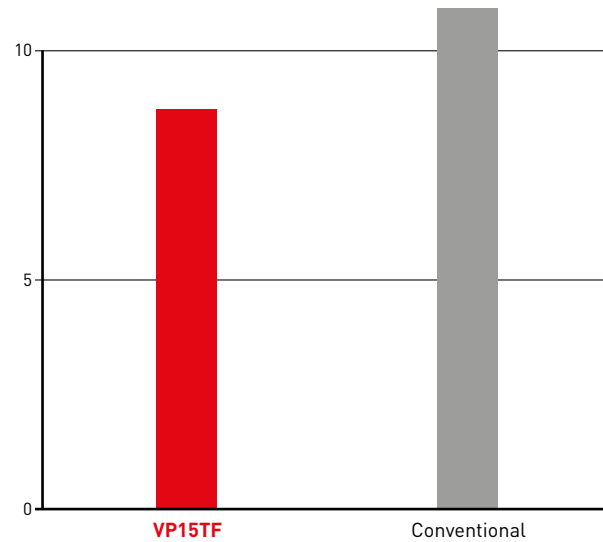
- Good balance of wear and fracture resistance for turning titanium alloy and stainless steel.
- Reduced heat generation with the use of a sharp cutting edge.
- Radius tolerance M 0/-0.02 mm.



Tool life (pieces / corner)



Cycle time (sec.)



Tool	DCGT11T304M-SMG VP15TF
Material	1.4021
Vc (m/min)	100
f (mm/rev.)	0.08
ap (mm)	1
Coolant	Oil
Machine	Swiss machine

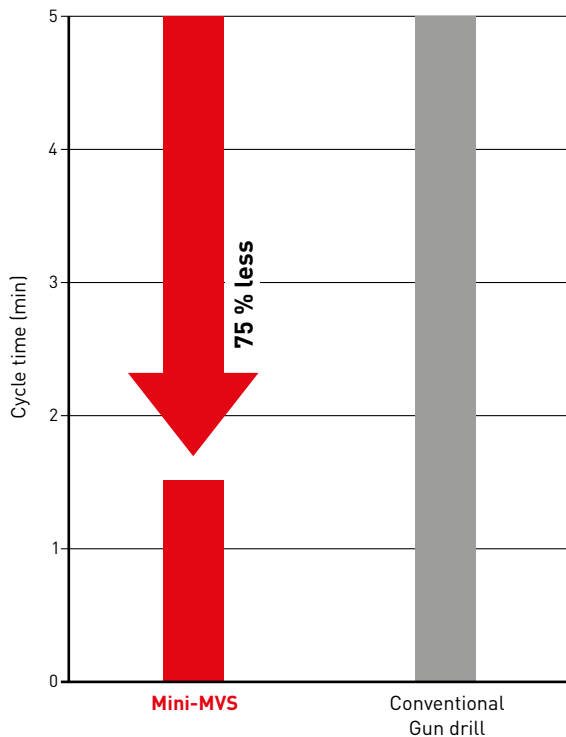


BONE SCREWS

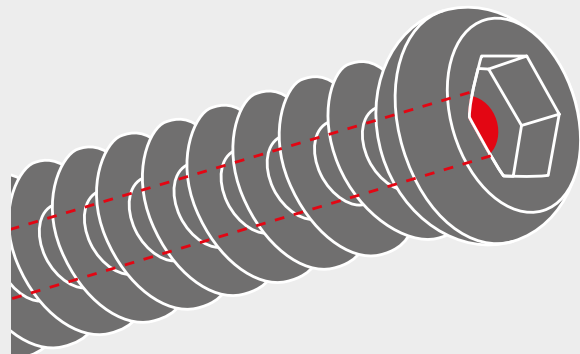
MVS FOR DEEP HOLE DRILLING

S

- Cutting edge retains smoothness and sharpness.
- Excellent weld resistance and low coefficient of friction.
- Improved chip evacuation.
- Tough carbide substrate for greater fracture resistance



Tool	MVS0170X30S030 DP1020 [DC= 1.7 mm]
Material	1.4023
Vc (m/min)	48
f (mm/rev.)	0.04
Drilling depth (mm)	50
Steps (mm)	0.2
Coolant	Oil
Machine	Swiss machine



For more information...

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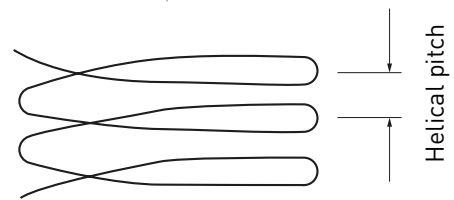
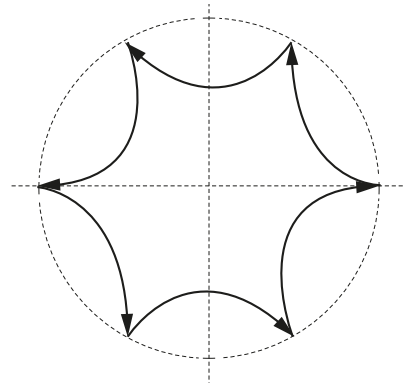
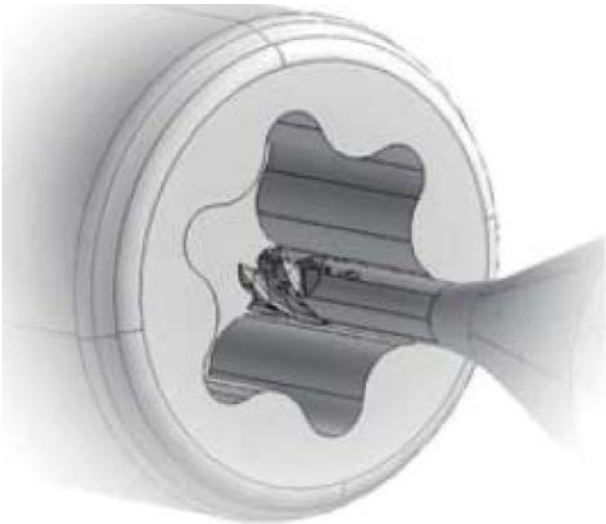


BONE SCREWS

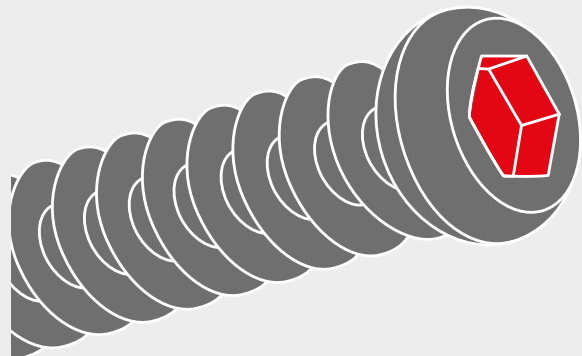
VQ SERIES FOR FINISHING

S

- Short cut length for stable cutting.
- Long neck.
- 4-flute type with effective chip control



Tool	VQXLD0050N025 (DC = 0.5 mm)
Material	Ti-6Al-4V
n (min ⁻¹)	35000
f (mm/min)	300
ap (mm)	0.03
Torx	25
Coolant	Oil
Machine	Swiss machine



For more information...

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SPINE

VQ SERIES FOR FINISHING

S

- SMART MIRACLE coating with high heat resistance enables long tool life and delivers superior vibration resistance for effective machining of difficult-to-cut materials.
- Good surface finish and high efficiency enabled by the use of irregular helix flutes.



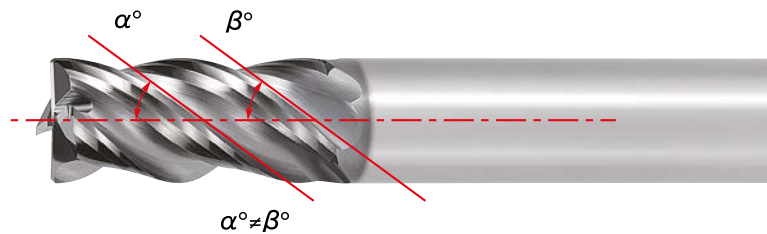
SURFACE COMPARISON



VQMHVRB



Conventional



Tool	VQMHVRBD0600R050 (DC=6 mm)
Material	Titanium alloy
Vc (m/min)	45
f (mm/rev.)	380
ap (mm)	16
ae (mm)	0.2
Coolant	Emulsion
Machine	5-axis machining centre



For more information...

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