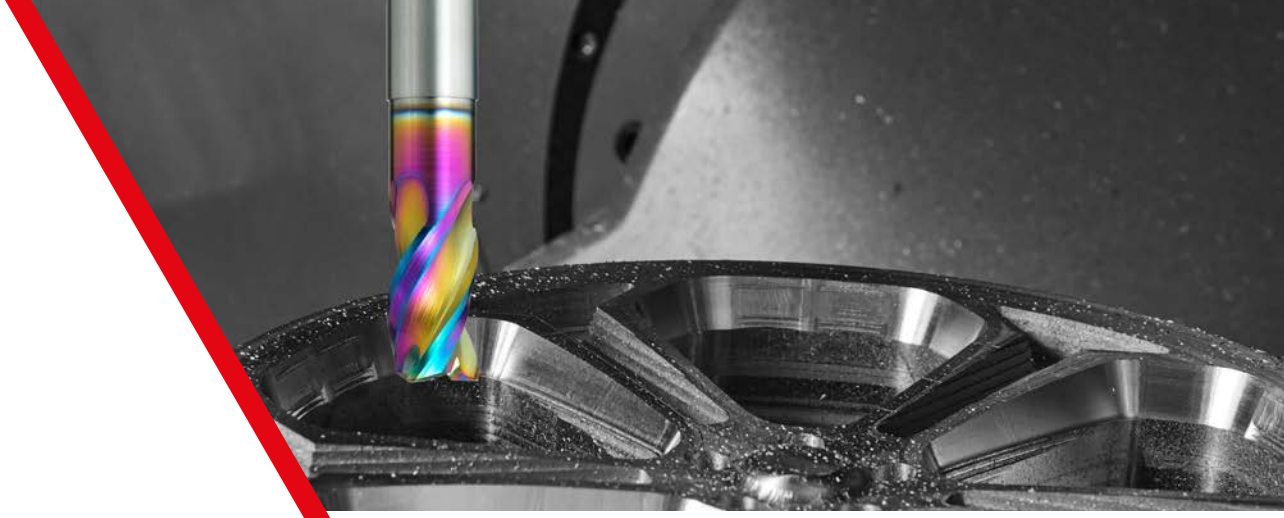

DIA EDGE

MITSUBISHI MATERIALS

PRODUCT HIGHLIGHTS

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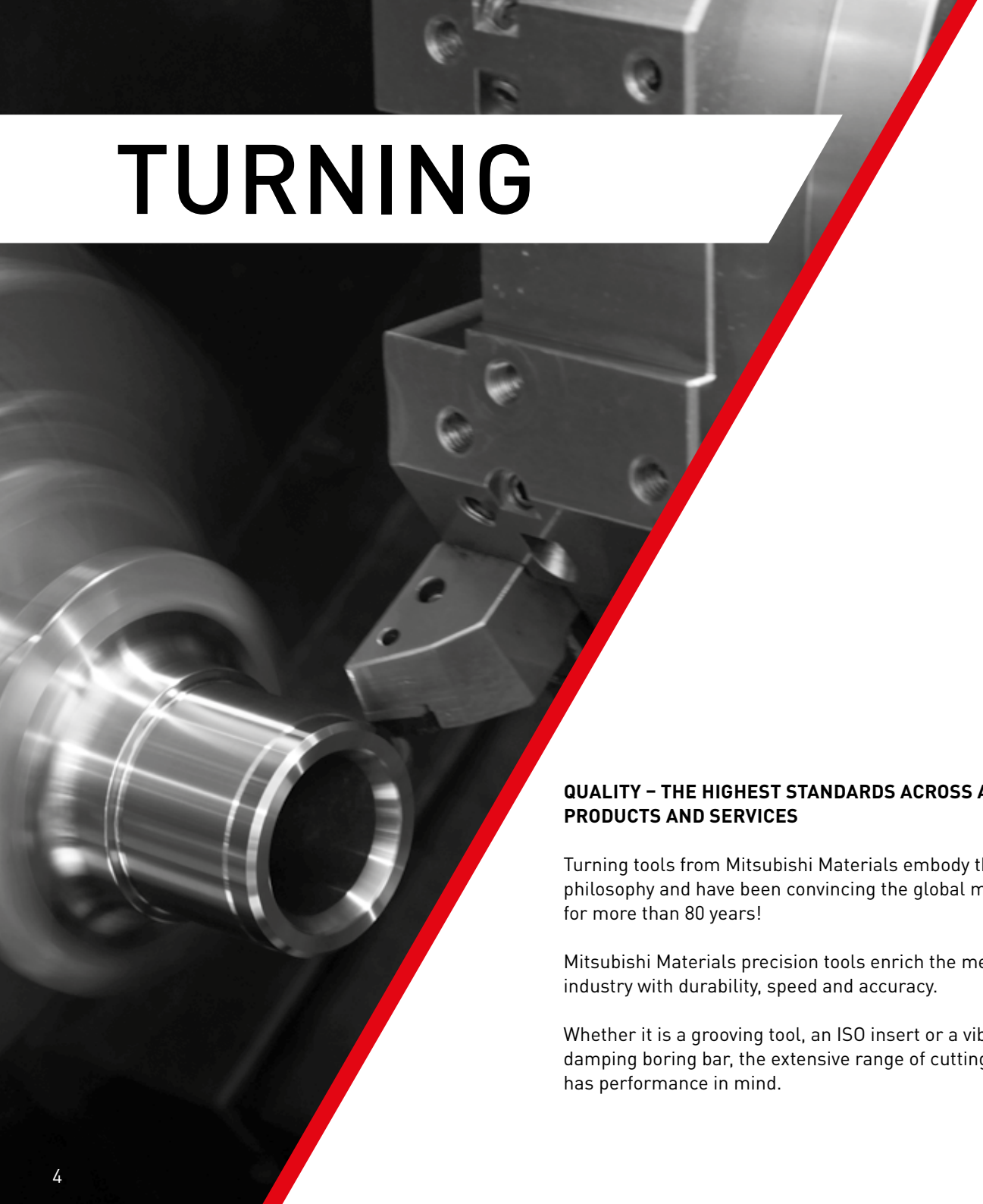


TURNING

QUALITY – THE HIGHEST STANDARDS ACROSS ALL PRODUCTS AND SERVICES

Turning tools from Mitsubishi Materials embody this philosophy and have been convincing the global market for more than 80 years!

Mitsubishi Materials precision tools enrich the metalworking industry with durability, speed and accuracy.

Whether it is a grooving tool, an ISO insert or a vibration damping boring bar, the extensive range of cutting tools has performance in mind.

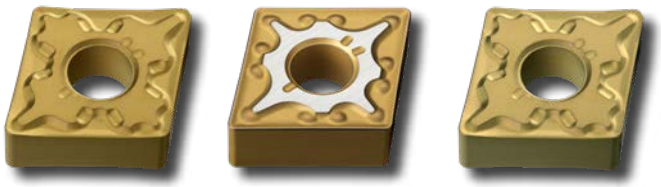
MC6115/MC6125/ MC6135

BRINGING THE ULTIMATE HIGH SPEED CUTTING PERFORMANCE

The CVD coated MC6115, MC6125 and the new MC6135 grade are the first recommendations for steel turning and are suitable for a wide range of continuous through to strong interrupted machining applications. By improving the existing technology, wear, fracture resistance and cutting edge stability have all been dramatically increased.

Machine tools have become more powerful and robust. To meet the demand of higher cutting speeds that the new machines are capable of, and to improve their machining efficiency, the MC6100 series of grades have been developed.

Also for use on conventional applications, MC6115, MC6125 and the new MC6135, the latest CVD coated grades have been developed for turning steels at high speeds by providing improved cutting edge stability.



BENEFITS

- Longer and stable tool life
- Reliable production process
- Higher productivity
- Lower cost per part
- Easy wear recognition

P

PRODUCT RANGE

- CVD coated grades: MC6115, MC6125, MC6135

Geometries

- Negative: CNMG, CNMM, DNMG, DNMM, DNMX, RNMG, SNMG, SNMM, VNMG, WNMG, TNMG, TNMM, TNMX
- Chipbreaker: FP, FV, LP, MP, M, VMW, RR, SW, SVX
- Positive: CCMH, CCMT, CPMH, DCMT, DCMX, RCMT, RCMX, SCMT, SPMN, SPMR, TBMT, TCMT, TCMX, TPMH, TPMN, TPMR, TPMX, VBMT, VCMT, WBMT, WCMT, WPMT, XCMT
- Chipbreaker: FH, FP, FS, FY, GH, HL, HM, HR, HV, HX, HZ, LP, MA, MH, MP, MS, MW, RP, SH, SW, SY

APPLICATIONS

- General steel turning operations
- Roughing and finishing
- High speed cutting

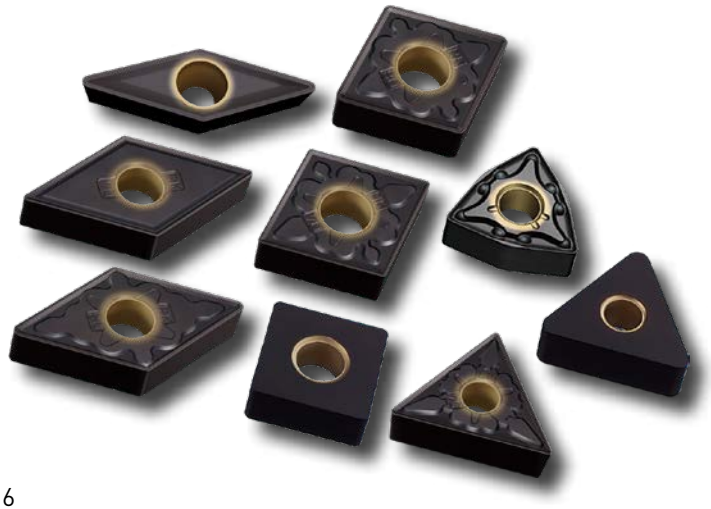
FEATURES

- High fracture and wear resistance
- Improved coating adhesion with Super-Tough-Grip-Technology
- Improved crystal growth coating process with Super-Nano-Texture-Technology
- High resistance to peeling
- Gold coated outer layer for easy edge identification

MC5105/MC5115/ MC5125

CVD COATED GRADES FOR CAST IRON TURNING

The process of casting iron enables complex geometries to be formed in the component that is produced.
Different types of cast irons produce different chips when machined and can cause various types of damage to an insert. The complex shapes produced in castings also creates challenges because contact with the workpiece can suddenly change from continuous to interrupted cutting.
In response to these challenges, Mitsubishi Materials has created the MC5100 Series that are able to successfully machine all types of cast irons and component geometries.



BENEFITS

- High wear resistance
- Excellent fracture resistance
- Durability
- Stability
- Versatility
- Abrasion resistance

K

PRODUCT RANGE

- Grades: MC5105, MC5115, MC5125

Geometries

- Negative: CNMA, CNMG, CNMM, DNMA, DNMG, DNMM, SNMA, SNMA, SNMN, TNMA, TNMG, TNMN, VNMA, VNMG, WNMA, WNMG, DNMX, TNMX
- Positive: CCMT, CCMW, DCMT, DCMW, RCMX, SCMT, SCMW, TCMT, TCMW, TPMH, VBMT, VBMW, VCMT, VCMW, WPMT
- Breaker: GH, GK, LK, STD, MA, MH, MK, MP, MV, RK, SH
- Wiper: MW, SW

APPLICATIONS

- Continous, medium and interrupted cutting
- MC5105 for high speed cutting of gray cast iron
- MC5125 first recommended grade for ductile cast iron
- MC5125 for heavy interrupted cutting of ductile cast iron

FEATURES

- Super nano-texture technology
- High hardness carbide base material
- Thickest Al_2O_3 coating layer
- New adhesion layer for Improved peeling resistance
- Intermediate layer microstructure for stability
- TiCN layer for heavy interrupted cutting

MV9005

CVD COATED TURNING GRADE FOR MACHINING HEAT RESISTANT SUPER ALLOYS

For machining Ni based heat-resistant alloys for the aviation industry, coated inserts are widely used in the medium finishing area where the tool life for machining large parts with only one corner is required.

The MV9005 grade incorporates a newly developed Al-Rich coating technology. It combines a high Al content ratio with a high hardness (Al,Ti)N film, which greatly improves the resistance to oxidation, plus in addition to its hardness, it also provides extremely high wear resistance even during high-speed machining of heat resistant super alloys.

BENEFITS

- High oxidation resistance
- High grade hardness
- High wear resistance
- High Speed machinability

S

PRODUCT RANGE

Geometries

- Negative: CNMG. DNMG, SNMG, TNMG, VNMG
- Positive: RCMT, RCMX
- Breaker: LS, MS, MA, RS

APPLICATIONS

- High speed continous cutting
- Finishing of aerospaceparts

FEATURES

- Resistance to edge build-up
- High speed machining of heat resistant nickel superalloys
- Resistance to plastic deformation
- Excellent fracture resistance for stable machining

MP9015 / 9025
MT9005 / 9015

ISO TURNING INSERTS FOR DIFFICULT-TO-CUT MATERIALS

The MP9000 / MT9000 turning insert grades have been developed for difficult-to-cut materials.

The 9000 series are divided into 2 types – coated (MP) and uncoated (MT). All inserts are ground and available in different geometries. The latest technologies of the coated grades (MP) provide improved fracture and wear resistance. The uncoated grades (MT) with polished, sharp cutting edges provide long tool life when machining titanium alloys.

BENEFITS
- Improved wear resistance
- Excellent burr control
- Stable production process

S

PRODUCT RANGE
- PVD coated grades: MP9005, MP9015, MP9025
- Uncoated grades: MT9005, MT9015

Geometries
- Negative: CNMG, DNMG, SNMG, TNMG, VNMG, WNMG, CNGG, DNGG
- Positive: CCGT, CCMT, DCGT, DCGR, DCMT, RCMT, SCMT, TCMT, VBMT, VCGT, VCMT, WCGX

Chipbreaker
- Positive, sintered FS, LS, LS-P, MS, FS-P RS, MA, MS, STD, MJ

APPLICATIONS
- Finish cutting
- Medium cutting
- Titanium
- Ni-Alloys

MINUS RADIUS TOLERANCE

FEATURES
- Corner radius with minus tolerance
- Sintered and ground inserts
- Coated and uncoated (polished) grades
- (Al,Ti)N-monolayer-coating

MS6015

PVD COATED GRADE FOR TURNING LOW CARBON STEEL

The new MS6015 gains high marks for innovation due to the combination of the special carbide substrate and the new PVD coating. Ideal for machining precision components from low carbon steels. Reduced built-up edge and low wear guarantees minimal component tolerance deviations.

BENEFITS

- High wear resistance
- Excellent welding resistance
- Top quality workpieces
- Maintains component tolerances
- Minus tolerance on the corner radius
- Higher production process security

P

PRODUCT RANGE

- Grade: MS6015

Geometries:

- Positive: CCGH, CCGT, DCGT, DCMT, TCGT, BTAT, BTBT, CTAT, CTBT
- Negative TNGG
- Breaker: SS, SN & SMG, R-B, MR-B, RR-B, RR, RN-B, LN-B
- Positive, ground inserts with radius: 0.1, 0.05, 0.08, 0.2 & 0.4 mm

APPLICATIONS

- Finish cutting
- Light cutting
- Medium cutting
- Swiss lathe machining

FEATURES

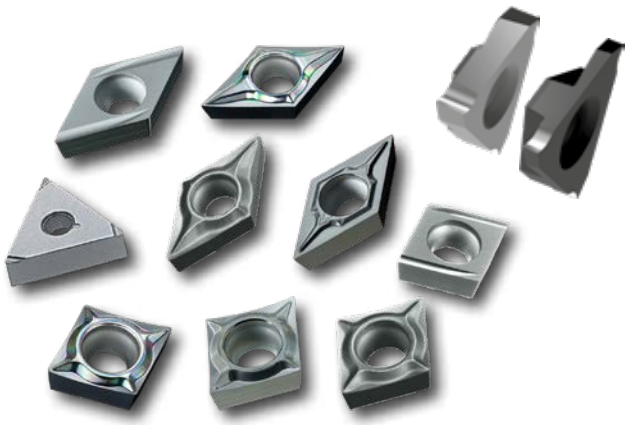
- Corner radius with minus tolerance
- High precision due to parallel chipbreakers
- High accuracy maintained over the whole tool life

MS7025

PVD COATED GRADE FOR HIGH PRECISION AND SMALL PARTS MACHINING OF STAINLESS STEEL MATERIALS

The MS7025 PVD coated carbide grade is suitable for low feed machining of small, high-precision parts. The dense Nano-multi-layer coating suppresses damage that tends to occur during low feed machining and dramatically improves chip welding and wear resistance.

The market demand for improvement in machining accuracy is increasing because of the miniaturization of parts.
The machining of workpiece materials where the speed and feed cannot be increased is growing, especially the cases when machining with small automatic lathes where a low feed area is the main target. This creates demand for tools that are capable of achieving these machining parameters.



BENEFITS

- Excellent surface quality at low cutting speeds < 100 m/min
- Resistant to wear and fracturing
- Tighter dimensional tolerances
- No chip welding at low cutting speeds and feeds

M

PRODUCT RANGE

- PVD coated grade: MS7025

Geometries

- Positive: CCGT, DCGT, VCGT, GTBT, GTCT
- Chipbreaker: FS-P, LS-P, R/L-SN

APPLICATIONS

- For stainless materials
- Swiss type lathe machining
- Small parts machining
- For complex workpieces
- High precision

FEATURES

- New Nano-multi-layer coating technology
- Choice of cutting edge geometries
- High lubrication coating layer

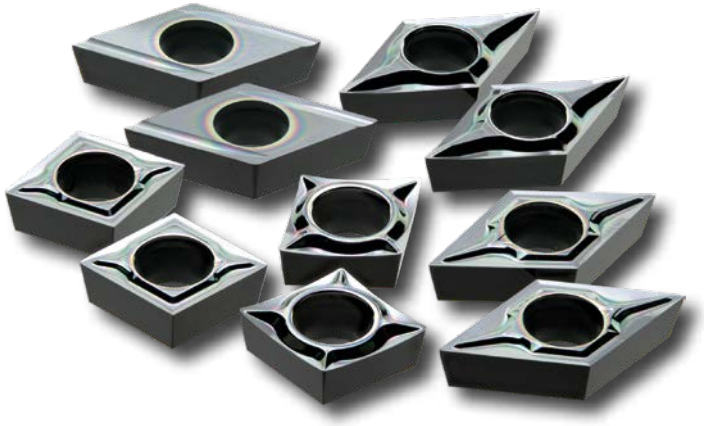
MS9025

PVD COATED GRADE FOR HIGH PRECISION AND SMALL PARTS MACHINING IN DIFFICULT-TO-CUT MATERIALS

Improved cutting edge delivers next generation small parts machining.

The PVD coated MS9025 grade has improved thermal conductivity by optimising the grain size and reducing the boundary contact between the carbide particles.
This optimisation reduces the temperature of the cutting edge during machining.

The even surface of the coating has been achieved by first making the carbide substrate smooth, then by promoting straight growth of the coating crystals. This leads to excellent welding resistance. The high Al-rich (Al,Ti)N single layer coating provides stabilization of the high hardness phase and succeeds in dramatically improving wear, crater and welding resistance.



BENEFITS

- Excellent welding resistance
- High flank & crater wear resistance
- Resistant to fracturing & chipping
- Reduced cutting edge temperature
- Short chips created due to vibration technology
- Better surface finishes
- Reduced production costs

M S

PRODUCT RANGE

- PVD coated grade: MS9025

Geometries

- Positive: CCGT, CCGT, DCGT, DCGT, VBGT, VPGT
- Chipbreaker: FS-P, R-SRF, LS-P, R-SN

APPLICATIONS

- Finish & light turning operations
- High precision machining
- Swiss type lathe machining
- For difficult-to-cut materials
- Avoids the formation of long chips

FEATURES

- Straight crystal growth of the coating
- Smooth carbide and coating surface
- Improved thermal conductivity
- Optimized carbide grain size
- New technology – Controlled vibration of the cutting tool

MICRO MINI BORING BAR

FOR HIGH PRECISION SMALL PARTS MACHINING

Ideal for small-diameter boring of steels and stainless steel.
Economical, solid shank type with two cutting edges.
A cutting edge on each end provides reduced tooling costs.

Multi Purpose Boring Bar
The multi-functionality of the Micro-Mini twin enables a wide application range that covers boring, grooving and threading and is available with or without a chipbreaker.

BENEFITS
- High precision
- Economical
- Dual cutting edges
- Small diameter capability
- Versatile

P M K S N

PRODUCT RANGE
- Grades: MS7025/MS9025/VP Grade/TF15

APPLICATIONS
- Internal machining
- Internal copying
- Internal grooving
- Internal threading
- Precison machining

FEATURES
- Various grades for machining a wide range of materials
- High precision geometries
- Grades ideal for small tools machining
- With and without chipbreaker
- Machining diameter 2.2 mm – 8.2 mm
- Double ended cutting edges
- Multi purpose use boring bar

GW

GROOVING SYSTEM WITH INTERNAL COOLANT SUPPLY

The GW grooving system offers efficient and precise parting-off. Significantly improved tool life and easy insert installation ensures obvious benefits. The innovative insert clamping ensures a firm and stable fit of the insert without loss of performance. The GW series also features internal coolant holes.

BENEFITS

- Improved tool life
- Excellent chip control
- Easy to use
- High productivity

P M K S

PRODUCT RANGE

- Block & blade: 26 mm, 32 mm
- Groove widths: 2 – 5 mm
- Grooving grades: MY5015 , VP10RT, VP20RT, VP30RT
- Blank insert: Cutting width from 3.2 mm – 6.4 mm in RT9010 & RT9020
- With and without internal coolant holes

APPLICATIONS

- Parting off (≤ Ø 120 mm)
- Deep grooving

FEATURES

- Easy handling
- Safe and easy installation of the blade and inserts

BC8210/BC8220

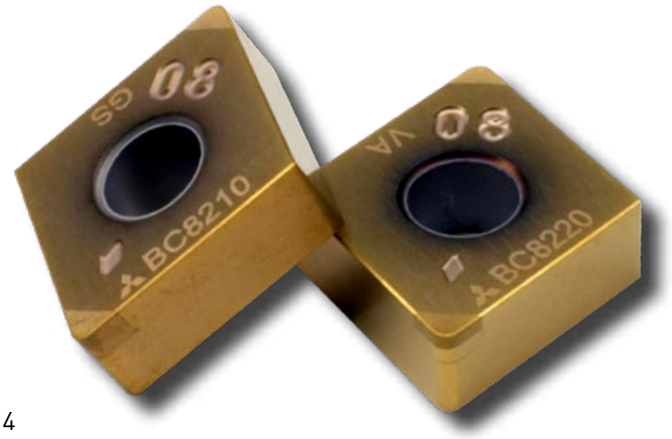
THE NEXT GENERATION OF COATED PCBN GRADES FOR MACHINING HARDENED STEELS

BC8210 and BC8220 are the newest, innovative PCBN grades for turning hard materials in continuous, light and medium interrupted cutting applications.

The new BC8220 and BC8210 grades exhibit excellent flank and crater wear resistance. Together with increased chipping resistance this provides a more stable machining proces and enables long tool life over a wide range of high speed applications.

The new BR chipbreaker in combination with BC8220 was developed to provide the advantage of improved chip control during high depth of cut machining.

The gold coated outer layer makes it easier for wear detection and easily defines used cutting edges.



BENEFITS

- Easy wear recognition with the gold outer layer
- Reduced flank wear and good surface finishes
- High resistance to peeling
- Excellent chipping, fracture and cater wear resistance
- Higher depths of cut with the new BR chipbreaker

H

PRODUCT RANGE

- PVD coated grades: BC8220, BC8210

Geometries

- Negative: CNGA, CNGM, DNGA, DNGM, SNGA, TNGA, VNGA, WNGA
- Positive: CCGT, CCGW, CPGB, DCGW, DCGT, TPGB, VBGW, VCGW
- Honing types: FS, GA, GH, GS, TA, TH, TS, VA
- Breaker: BF, BM, BR
- Wiper: WS, WS2JR, WS2JL

APPLICATIONS

- General hard turning applications
- Continuous, light and medium interrupted cutting
- High speed machining
- New BR chipbreaker for improved chip control for larger depths of cut up to 1 mm and for hard-soft layer turning.

FEATURES

- Gold coated outer layer
- High adhesion strength between substrate and coating
- New Ultra Micro Grain heat-resistant binder
- The BR breaker's positive rake angle and breaker wall is highly effective at breaking chips
- Super multi-layer ceramic PVD coating

MB8100

UNCOATED PCBN TURNING INSERT SERIES FOR HARDENED MATERIALS

The uncoated PCBN series MB8100 provides solutions for machining of high hardened steels, ideal for light and high speed general applications through to interrupted cutting. A stable tool life, dimensional accuracy and high quality component surface finishes are enabled.

BENEFITS

- Increased reliability over a wide range of different applications
- Wear and fracture resistance is greatly improved on continuous and interrupted applications

H

PRODUCT RANGE

- Types: Single and double sided, positive and negative ISO inserts
- Honing types: FS, GA, TA, TH
- Grades: MB8110, MB8120, MB8130
- Geometries: CNGA, DNGA, TNGA, VNGA, WNGA, CCGW, CPGB, CPGW, DCGW, TCGW, TPGB, VBGW, VCGW

APPLICATIONS

- General cutting
- Continuous cutting
- Interrupted cutting

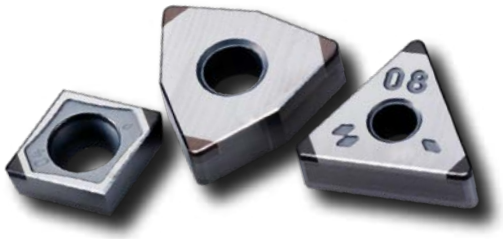
FEATURES

- Non coated PCBN grades with Ultra Micro-particle binder technology

MB4120

PCBN GRADE FOR SINTERED ALLOYS AND CAST IRON

Excellent fracture resistance and stable cutting to improve productivity when machining sintered alloys and cast iron.



BENEFITS

- Reduced burr formation
- Long tool life
- Stable machining
- Accurate dimensional control
- High precision

K

PRODUCT RANGE

- Insert shapes: Single sided positive & negative ISO geometries
- Honing types: Wide range of edge preparations are available for continuous and interrupted cutting FS, GS, SE, SF, TS
- Shapes: CNGA, DNGA, SNGA, TNGA, VNGA, WNGA, CCGW, CPGB, CPGW, DCGW, TCGW, TPGB, VBGW

APPLICATIONS

- Precision machining
- High-speed turning
- Roughing and finishing
- Unstable machining, heavy interrupted cutting

FEATURES

- High toughness and fracture resistance
- Wide range of edge honing types available
- Sharp edge, round and chamfer honing
- Increased wear resistance
- Fine CBN particles provide high strength

BC5110

COATED PCBN GRADE FOR GREY CAST IRON

Excellent wear resistance when turning grey cast irons at low cutting speeds. Provides fine surface finishes on low rigidity workpieces.

BENEFITS

- Stable long tool life compared to uncoated grades
- Reduced flank wear
- Good surface finishes
- Useable at lower cutting speeds
- High peeling resistance
- Excellent crater and notch wear resistance

K

PRODUCT RANGE

Geometries

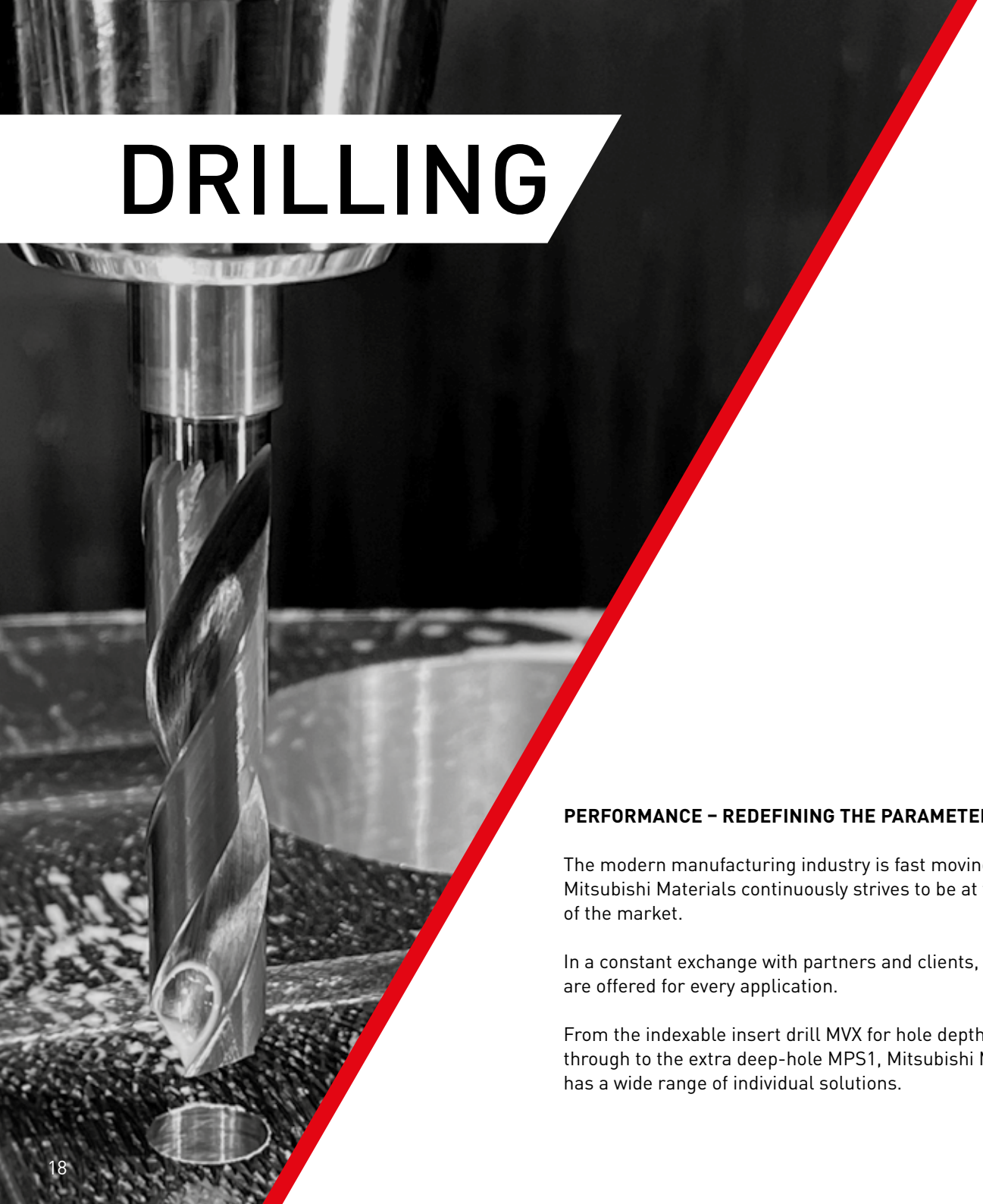
- Negative: CNGA, DNGA, SNGA, TNGA, VNGA
- Positive: CCGW, DCGW, TCGW, TPGB, VBGW
- Honing types: FS, GS

APPLICATIONS

- For general applications
- For continuous cutting of grey cast iron
- For lower cutting speeds and low rigidity workpieces

FEATURES

- Excellent wear resistant coating
- Fine CBN grain substrate
- Hard ceramic coating layer
- Improved bonding strength of the coating to the PCBN substrate
- High chipping and peeling resistance



DRILLING

PERFORMANCE – REDEFINING THE PARAMETERS

The modern manufacturing industry is fast moving, therefore Mitsubishi Materials continuously strives to be at the forefront of the market.

In a constant exchange with partners and clients, solutions are offered for every application.

From the indexable insert drill MVX for hole depths up to 6xD, through to the extra deep-hole MPS1, Mitsubishi Materials has a wide range of individual solutions.

RX1S

EXCHANGEABLE HEAD REAMER

Exchangeable head reamer for efficient and easy reaming of a wide variety of applications.

Simple to change head with high runout accuracy. Optimum head design to suit coolant flow. Helical geometry for through hole applications. Side coolant holes in the flutes and straight flute geometry for blind holes with centre through coolant hole.

The combination of highly versatile carbide substrate and PVD coating has achieved high precision reaming with a long tool life.

Custom made, optimally designed reaming heads, with different hole tolerance classes, can be manufactured in 1 µm increments, in diameters (DC) 14 mm to 29 mm.

BENEFITS

- High flexibility thanks to a modular concept
- Processing of a wide range of materials
- Easy handling and reliable

P M K S

PRODUCT RANGE

- Diameter: DC Ø 14 – 29 mm
- Through hole and blind hole head
- Length: 3 – 5 x DC

APPLICATIONS

- Reaming of blind and through holes

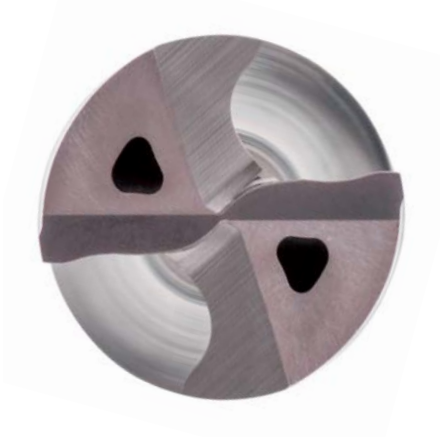
FEATURES

- Targeted internal coolant supply
- Easy changing of reaming heads
- Safe and reliable positioning of the interchangeable heads

MPS1

SOLID CARBIDE DRILLS FOR STANDARD AND DEEP HOLES

MPS1 is the first choice for high cutting speeds and feed rates, and provides excellent wear resistance and long tool life. Accurate pilot drilling paves the way to precise deep holes up to 40 x D. The MPS1 achieves optimum chip removal because of the polished flutes and the double margins ensure high quality hole surface finishes.
In addition, the optimum cutting edge geometry ensures stability and precision.



BENEFITS

- High process stability
- High accuracy
- Efficient chip removal
- Increased coolant volume
- Reduced cutting forces

P M K

PRODUCT RANGE

- Diameter: DC Ø 3 mm – 20 mm
- Length: 3 ~ 40 x DC
- Pilot drill

APPLICATIONS

- General applications
- Deep hole drilling

FEATURES

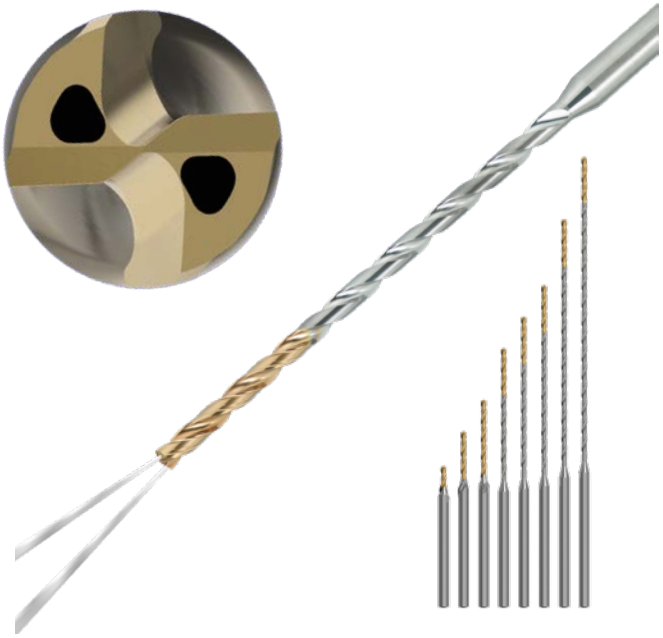
- Optimized geometry with strong cutting edge
- New "Z" point thinning for lower thrust force
- Through coolant holes
- Strong, stable core
- New AlTiCrN-PVD coating

MINI DVAS

SOLID CARBIDE TRISTAR DRILL SERIES FOR FAST, RELIABLE AND ACCURATE DRILLING

Mini DVAS – High efficiency, long tool life, high precision. The DVAS drills can peform at higher feeds and speeds meaning faster drilling cycles.

Straighter holes and improved dimensional accuracy are enabled by using DVAS drills. The tool life exceeds all normal expectations.



BENEFITS

- High process stability
- High accuracy
- Efficient chip removal
- Increased coolant volume
- Reduced cutting force during drilling

P M K S N

PRODUCT RANGE

- Diameter: DC Ø 1 – 2.9 mm
- Length: 2 – 50 L/D
- Double point angle: 139°/141°

APPLICATIONS

- General applications
- Deep hole drilling L/D = 50

FEATURES

- Advanced coolant hole
- New XR point thinning
- Tough and sharp cutting edge design
- New coated grade DP1120
- Unique rigid form

DFAS

SOLID CARBIDE FLAT BOTTOM DRILLS FOR A WIDE RANGE OF APPLICATIONS

The flat lands on the corners provide greater strength and sharpness for a substantial reduction of burrs. The end geometry that combines different radii forms a strong cutting edge and provides excellent chip control.

The multi radius point geometry in combination with the thinned centre point forms ideal chip shapes, thereby dramatically reducing cutting resistance.

The special coolant channels of the TRI-COOLING technology offer significantly increased chip evacuation and ensure stable machining of stainless steels and titanium alloys.

BENEFITS

- High efficiency counter boring on various types of applications achieved with excellent chipping resistance
- Low cutting force provides less burrs
- High precision positional accuracy increases performance

P M K N

PRODUCT RANGE

- Diameter: DC Ø 3 – 14
- Length: 3 x DC

APPLICATIONS

- Spot facing
- Shoulder drilling
- Drilling
- Intersecting holes
- Eccentric and cast holes

FEATURES

- Unique sharp cutting edges
- Excellent chip control
- Point thinning for lower thrust forces
- External coolant

DWAE

PURE FUNCTIONALITY, WIDE CHOICE

The special purpose DWAE drills have been designed from the outset specifically for drilling in the confined spaces of Swiss type and automatic lathes. Several important parameters were set in the design, the most important of these was low cutting resistance to provide reliability and excellent chip control that is necessary to prevent chips wrapping the component and clogging in the confined work spaces.

BENEFITS

- Wavy type cutting edge
- Reduced cutting forces
- Z point thinning and special flutes prevent chip jamming for less downtime
- Short flute lengths

P M K

PRODUCT RANGE

- Diameter: DC Ø 3 – 14 mm
- Length: 2 – 4 L/D
- Double point angle: 140°

APPLICATIONS

- General applications
- Drilling
- Centering

FEATURES

- New cutting edge treatment that achieves both sharpness and durability
- Coated grade DP102A
- Unique flute form for greater rigidity
- Wavy cutting edge
- Z-Point thinning

DLE

MULTI-FUNCTIONAL SPOT DRILL FOR CENTERING AND CHAMFERING

The thinned point geometry promotes smooth chip discharge and provides excellent positional accuracy. The negative geometry of the drill point also offers high cutting edge strength.

A cutting edge with sharpness and high fracture resistance provides stable machining and prevents burrs.

BENEFITS

- Stable machining
- Reduced burrs
- High fracture resistance
- Smooth chip discharge
- High positional accuracy

P M K S N

PRODUCT RANGE

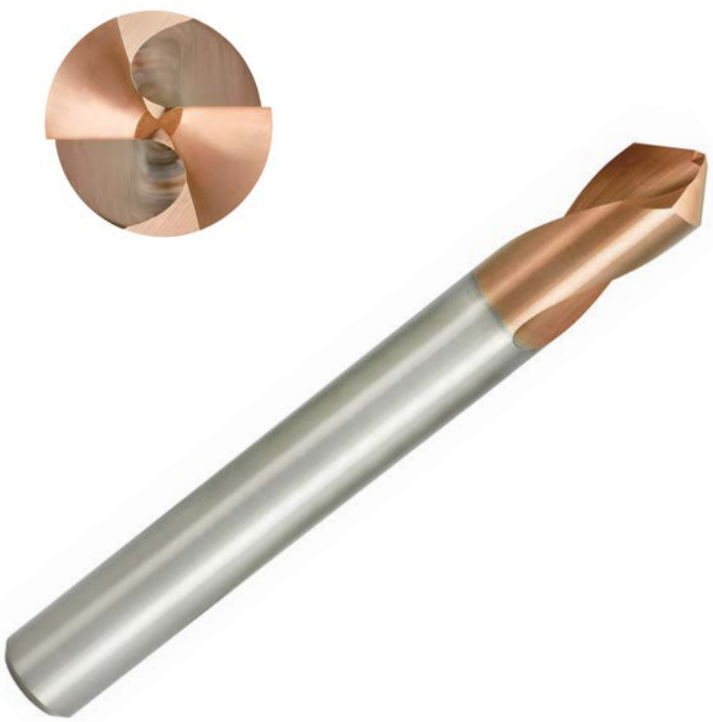
- Diameter: DC Ø 3 – 16 mm
- Double point angle: 120° / 60°
  120° / 90°
  120° / 145°
  120°

APPLICATIONS

- Centering
- Edge chamfering
- Hole chamfering
- V-grooving

FEATURES

- Thinned and negative drill point geometry
- Double angle point
- Excellent sharpness
- High cutting edge strength
- External coolant
- Ideal for Swiss type machines



MINI MFE

ULTRA SMALL SOLID CARBIDE MULTI-FUNCTIONAL FLAT BOTTOM DRILLS

Modern materials and geometries provide the abilility to make high quality, reliable, small tools. Flat lands on the cutting edge provide greater strength and sharpness to reduce burrs. The end geometry that combines different radii forms a strong cutting edge and provides the necessary chip control. This unique geometry also dramatically reduces cutting resistance, thereby adding even more reliability.

BENEFITS

- High efficiency and reliable small end mills.
- Low cutting force redcuces burrs
- High precision positional accuracy increases performance

P M K N

PRODUCT RANGE

- Diameter: DC Ø 0.75 – 2.95 mm
- Length: 2 L/D

APPLICATIONS

- Spot facing
- Shoulder drilling
- Drilling
- Intersecting holes
- Eccentric and cast holes

FEATURES

- Unique sharp cutting edges
- Excellent chip control
- Point thinning for lower thrust forces
- External coolant

DSAS

SOLID CARBIDE DRILL FOR Ni-BASED HRSA MATERIALS

The DSAS drill was developed for HRSA aerospace materials. High productivity is enabled with increased fracture resistance during high feed and speed machining.

BENEFITS

- High hole accuracy
- Process stability
- Increased coolant volume
- Faster chip evacuation
- Low cutting forces
- Reduced burr formation

S

PRODUCT RANGE

- Diameter: DC Ø 3 – 12 mm
- Length: 3 – 5 L/D
- Including inch diameters

APPLICATIONS

- Drilling of HRSA materials mainly used in the aerospace industry

FEATURES

- Small margin that decreases the contact area and reduces work hardening
- Sharp but tough cutting edge that reduces edge chipping
- Through coolant holes to improve cooling, lubricity and chip evacuation
- New substrate and coating to improve wear resistance

MVX

INDEXABLE INSERT DRILL FOR HOLE DEPTHS UP TO 6 x D

The MVX indexable insert drill is gaining in popularity due to its versatility and uniqueness, enabling hole depths up to 6 x D. State-of-the-art technologies ensure a highly rigid tool body and optimized insert properties, which positively effect the cutting edge and help reduce vibration. In addition, the MVX covers a wide range of diameters and lengths and by using two different insert grades for the inner and outer positions, produces excellent surface finishes without the loss of stability.

BENEFITS

- Drilling depths up to 6 x D
- Covers a wide range of applications
- Stability provides reduced vibration
- Excellent hole surface finishes

P M K N H

PRODUCT RANGE

- Diameter: DC Ø 14 – 63 mm
- Length: 2 – 6 x DC
- Chipbreaker: UM, UH, UN, US
- Grades: Various grades for all materials

APPLICATIONS

- Drilling ~ L x DC 6
- Angled hole entrance and exit
- Plunging
- Boring
- Internal and external turning

FEATURES

- Highly rigid, stable tool body
- Optimized insert location
- Economical inserts with 4 cutting edges
- Wiper geometry at the peripheral cutting edge
- Various grades and chipbreakers available

MILLING

INNOVATION – THE KEY TO CONTINUOUS GROWTH

Mitsubishi Materials wide range of milling products provides off the shelf or tailor-made solutions, whether for the automotive, aerospace and medical or general machining industries.

From the smallest cutter in the mini end mill series to the ceramic CE-series, Mitsubishi Materials provides innovative, high quality products.

MV1000

COATED CARBIDE GRADE FOR HIGH SPEED MACHINING

The MV1000 series comprises two new grades.The MV1020 and the MV1030. Both grades have an innovative CVD coating with a high aluminium content and can be used for a wide range of applications, particularly for machining unalloyed and low-alloy steels, stainless steels and nodular cast iron.

MV1020 – Provides high thermal shock resistance during dry and wet machining and for stable machining without thermal cracking at high cutting speeds. Significantly reduced machining times can be achieved.
MV1030 – Enables high reliability, especially when dry machining stainless steels. High oxidation resistance and excellent wear resistance to prevent breakage, chipping and plastic deformation.

BENEFITS

- Excellent tool life when machining at high cutting speeds
- High thermal shock resistance thanks to the new CVD coating technology
- Improved fracture strength thanks to newly developed hard metal substrate

P M K

PRODUCT RANGE

- WWX200/400
- WSX445
- WJX09/14
- WSF406W
- VPX200/300
- AHX440/475
- ASX400/445

APPLICATIONS

- High-speed machining
- Versatile series with different grades for a wide range of applications

FEATURES

- Excellent thermal wear resistance
- Very smooth, homogeneous surface
- Increased fracture resistance

MX3030

NEW CERMET GRADE FOR A WIDER RANGE OF APPLICATIONS

Enables excellent surface finishes even at high efficiency machining conditions.

The MX3030 grade is particularly suitable for the finishing steels, stainless steels, cast iron and ductile cast iron.

In contrast to conventional products, this new cermet grade offers higher thermal conductivity and therefore excellent resistance to thermal wear and sudden fractures. Thanks to the special toughness, a significantly improved cutting performance can be achieved with increased cutting depths.

BENEFITS

- Improved fracture resistance
- Increased wear resistance

P M K

PRODUCT RANGE

- WSX445
- ASX400 / 445
- Octacut
- BRP
- CESP, SFSP, CGSP

APPLICATIONS

- Finishing

FEATURES

- Good thermal stability
- Improved oxidation resistance
- Increased fracture resistance

XC5010

THE PROPERTIES OF CERAMICS ENABLE STABLE ROUGH MACHINING OF GGG CAST IRON AT HIGH CUTTING SPEEDS

High Temperature Hardness of Ceramic

The XC5010 ceramic indexable insert is characterised by its exceptional strength and extremely high temperature resistance, even at temperatures above 800 °C. It is therefore particularly suitable for high-speed machining.

Surface-smoothing Al_2O_3 coating suppresses the transmission of cutting heat

By applying an Al_2O_3 coating, which suppresses the transmission of cutting heat to the ceramic substrate, together with a surface smoothing treatment, abnormal wear and adhesion of the workpiece material are suppressed.

BENEFITS

- Efficient high-speed roughing
- MK chipbreaker with low cutting resistance
- FT chipbreaker with excellent cutting edge stability

K

PRODUCT RANGE

- AHX640S/W
- MK chipbreaker
- FT chipbreaker (flat top)

APPLICATIONS

- High-speed roughing of GGG materials

FEATURES

- New SiAlON ceramic substrate
- Smooth Al_2O_3 CVD coating

VQ4MVM

MULTIFUNCTIONAL END MILL WITH A STRONG RAMPING CAPABILITY ON A WIDE RANGE OF MATERIALS

The VQ4MVM milling cutter combines high performance and multifunctionality. In addition to side, full slot, pocket and trochoidal milling, the focus of the VQ4MVM is on process reliable ramping with angles of up to 30° in carbon and alloy steels. It is also ideal for difficult-to-machine materials such as titanium and heat-resistant superalloys.

Compared to conventional start by drilling an approach hole, ramping enables simultaneous multi-axis feed at high speeds and therefore significantly shorter machining times. This method is ideal for machining cavities and pockets.

The multifunctionality and versatility reduces tool inventory.

BENEFITS

- Multi-functional solid carbide end mill
- Excellent chip removal
- Ramp capability up to 30°
- High machining performance

P M S H

PRODUCT RANGE

Conical taper barrel DC Ø 4 – 12 mm

APPLICATIONS

- Slot and shoulder milling
- Roughing, semi-finishing and finishing
- Contour milling
- Ramp milling

FEATURES

- New chip flute geometry for improved chip removal
- High-performance plunge face
- Micro cutting edge concept

VFR4MB

HIGHER EFFICIENCIES FROM INCREASED FEED RATES

Versatile 4 flute design
All 4 cutting edges of the VFR4MB end mill run to the centrefrom the centre. This enables higher table feeds at all machining angles and makes it easier to perform different machining strategies. It provides reliable machining of hardened steels and shorter machining times with consistent quality machined surface finishes.

4-flute geometries can increase efficiency and reduce wear when used for finishing at small depths of cut. Additionally, using a 4-flute geometry is advantageous when machining harder materials at reduced depths of cut.

BENEFITS
- Machining extremely hard materials of up to 70 HRC
- Stable cutting edge design
- High machining performance

H

PRODUCT RANGE
Conical taper barrel DC Ø 1 – 12 mm

APPLICATIONS
- Roughing, semi-finishing and finishing
- Contour milling

FEATURES
- (Al,Cr,Si)N / (AlTiSi)N PVD multilayer coating
- Highly stable curved cutting edge
- Specially adapted carbide substrate

VQ

HIGH PERFORMANCE END MILLS FOR STAINLESS STEELS AND DIFFICULT-TO-CUT MATERIALS

VQ are a high-performance series of carbide end mills. The outstanding performance is achieved through an ideal interaction between modern flute geometries, special carbide substrates and modern coating technology.
In addition to the standard square, corner radius and ball nose types, end mills with chipbreaker flutes in 3/4 x DC lengths for dynamic roughing have now been successfully introduced.

BENEFITS

- High performance end mills focused on HRSA and stainless steel machining
- Drastically reduced vibrations
- Improved tool life on a wide range of materials

P M N S H

PRODUCT RANGE

• Ball nose end mills:	DC	1 – 12 mm
• Corner radius end mills:	DC	1 – 25 mm
• Corner radii:	RE	0.1 – 6.35 mm
• Square end mills:	DC	0.2 – 20 mm
• Various neck lengths:	5 x DC – 12 x DC	

APPLICATION

- Slotting and shoulder milling
- Roughing and finishing
- Contouring

FEATURES

- Uneven pitch
- Variable helical flutes
- Highly efficient coating
- Increased tool life
- Unique flute geometry
- Chipbreaker notch for reduced chip size

VQT

SOLID CARBIDE END MILL SERIES FOCUSED ON TITANIUM ALLOY MACHINING

Thanks to the technological properties, VQT solid carbide end mills achieve maximum performance in the machining of titanium alloys. They are characterized by innovative geometry, efficiency, low cutting resistance and process reliability.

BENEFITS

- Increased process efficiency
- Optimization of the cutting edge geometry with improved chip evacuation

S Ti N

PRODUCT RANGE

Conical taper barrel:	DC Ø	8 – 12 mm
• Corner radii: R1	RE1	2 – 4 mm
• Corner radii: R2	RE2	75 – 100 mm
Corner radius end mills:		
• Diameters:	DC Ø	16 – 25 mm
• Corner radii:	RE	1 – 6 mm

APPLICATIONS

- Slotting and shoulder milling
- Roughing and finishing
- Contouring

FEATURES

- (Al,Cr)N group coating with unique ZERO-μ Surface
- Optimised number of flutes (VQT6UR)
- Centre through coolant hole (VQT5)
- Irregular helix flutes (VQT5)

MS PLUS

SOLID CARBIDE END MILL SERIES FOR GENERAL MACHINING

The MS Plus series is characterized by versatility and reliability. Now expanded with new 3-fluted chamfer cutters Ø 2 – 12 mm.

In addition, the MS Plus series offers corner radius end mills from Ø 0.2 – Ø 20 with corner radii of 0.1 – 5 mm and neck lengths of (2.5 x DC – 12 x DC). Furthermore, ball end mill cutters with radii of 0.05 – 6 mm and neck lengths of up to 20 x DC can be selected.

BENEFITS

- Efficiency and economy for machining various materials
- Hardened steel ⩽ 55 HRC
- Increased tool life
- Optimized vibration control

P M S N H

PRODUCT RANGE

• Ball nose end mills:	DC Ø	0.2 – 12 mm
• Corner radius end mills:	DC Ø	0.2 – 20 mm
• Corner radii:	RE	0.05 – 0.5 mm
• Square corner end mills:	DC Ø	0.2 – 20 mm
• Various neck lengths:	2.5 x DC – 12 x DC	
• Chamfer end mill:	DC Ø	2 – 12 mm

APPLICATIONS

- Slotting and shoulder milling
- Roughing and finishing
- Contouring
- Chamfering

FEATURES

- Versatile end mills for universal machining
- Irregular helix flutes to reduce vibration
- Long tool life on materials up to 55 HRC

WJX09 / 14

SHARPNESS WITH STABILITY FOR HIGH EFFICIENCY MACHINING

WJX series expansion with 09 size inserts, developed for reliability and economy even at high feeds and depths of cut. The economical double-sided inserts also provide the capability for multi-functionality.

Excellent sharpness for reduced cutting noise. The flank shape combines the strength and economy of negative inserts, with the sharpness and multi-functionality of positive inserts whilst also providing long tool life.

BENEFITS

- Highly-reliable clamping system
- High feed radius milling cutter, with strong double-sided inserts
- Exhibits low cutting resistance on workpiece entry
- Maintains stability even during interrupted machining and at large depths of cut

P M K S H

PRODUCT RANGE

		09	14
• Arbor type:	DC Ø	40 – 66 mm	50 – 66 mm
• Shank type:	DC Ø	25 – 40 mm	50 mm
• Screw-in type:	DC Ø	25 – 40 mm	—
• Depth of cut:	APMX	1.2 mm	2 mm

APPLICATIONS

- High feed machining
- Shoulder milling
- Helical milling
- Pocketing
- Ramping

FEATURES

- Stable chip formation with the straight cutting edge
- The wiper edge enables good surface finishes
- The straight cutting edge extends to the maximum depth of cut (APMX)
- The dovetail pocket geometry prevents the insert from lifting
- Feed per tooth ⩽ 2.5 mm

WWX200 / 400

A NEW LEVEL OF VERSATILITY

The WWX series is the latest high performance 90° milling cutter with double-sided trigonal inserts. The precise positioning of the insert ensures a true 90° shoulder milling operation. The specially developed insert with six usable cutting edges ensures cost effectiveness thanks to a special negative geometry that also provides excellent machining reliability whilst maintaining a sharp cutting action.

BENEFITS

- Inserts with the capability to machine up to APMX = 5 mm (WWX200) and 8 mm (WWX400)
- Unique negative insert design with six cutting edges for high productivity machining enables lower costs per component
- Multi-edge, self-locating inserts enable robust and reliable machining

P M K N S H

PRODUCT RANGE WWX200

- Arbor type: DC Ø 40 – 160 mm
- Shank type: DC Ø 25 – 50 mm
- Insert corner radii: 0.4 – 0.8 mm
- Depth of cut: APMX 5 mm

PRODUCT RANGE WWX400

- Arbor type: DC Ø 50 – 250 mm
- Shank type: DC Ø 50 – 80 mm
- Insert corner radii: 0.4 / 0.8 / 1.6 / 2.0 mm
- Depth of cut: APMX 8 mm

APPLICATION

- Face milling
- Shoulder milling
- Helical milling
- Pocketing

FEATURES

- Low cutting force
- Good chip evacuation
- Large variety of grades and breakers available
- Double-sided trigon inserts with 6 cutting edges

VPX200 / 300

TANGENTIAL INSERT CUTTER FOR MULTI-FUNCTIONAL MILLING

The versatile VPX cutter series excels with tangential inserts for general machining. The four sided inserts with innovative geometry, in combination with a smooth cutting effect, creates an even component surface finish that reduces the need for finishing.

BENEFITS

- Stable machining
- 90° precision shoulder milling
- Roughing and finishing
- High performance

P M K S N

PRODUCT RANGE VPX200

• Arbor type:	DC Ø	32 – 63 mm
• Shank type:	DC Ø	16 – 50 mm
• Weldon shank type:	DC Ø	16 – 32 mm
• Screw-in-type:	DC Ø	25 – 40 mm
• Depth of cut:	APMX	8 mm
• Shell type, long cutting edge type:	DC Ø	32 – 50 mm
• Shank type: long cutting edge type:	DC Ø	20 – 32 mm
• Depth of cut:	APMX	14 – 42 mm
• Inserts:	RE	0.2 – 1.6 mm

PRODUCT RANGE VPX300

Arbor type:	DC Ø	40 – 80 mm
• Shank type:	DC Ø	25 – 35 mm
• Weldon shank type:	DC Ø	25 – 32 mm
• Screw-in-type :	DC Ø	25 – 40 mm
• Depth of cut:	APMX	11 mm
• Shell type, long cutting edge type:	DC Ø	40 – 80 mm
• Shank type: long cutting edge type:	DC Ø	40 mm
• Depth of cut:	APMX	21 – 63 mm
• Inserts:	RE	0.2 – 3.2 mm

APPLICATIONS

- General machining
- Face milling / Shoulder milling
- Slotting
- Ramping

FEATURES

- Tangential insert with 4 cutting edges
- Ground inserts
- Highly rigid tool body
- Low cutting force

ISO PSC TOOL HOLDERS

WIDE RANGE PSC HOLDERS & ADAPTORS FOR MULTIPLE OPERATIONS

The new ISO PSC Holder series is taking advantage of the latest technology, materials and geometries.
Due to the wide variety of tools available, this series offers a solution for nearly every application – ranging from multi-purpose, through to turning and profiling tool holders and boring bars.

BENEFITS

- Optimisation of tool life
- Better surface finishes
- Higher process reliability
- Increased productivity

P M K N S H

PRODUCT RANGE

- D-Type Holder
- P-Type Holder
- S-Type Holder
- P-Type Boring Bar
- S-Type Boring Bar
- External and internal threading
- Top clamp holder for ceramic inserts
- Shell mill adaptor
- Screw in type shank
- Boring bar holder
- Colletchuck holder
- Adaptor for square turning tool holder
- Multi-purpose adaptor with radial mounting
- Automatic caps

APPLICATIONS

- External Turning
- Internal Boring
- Facing
- Threading
- Rouging & finishing
- Multitask machining
- Profiling applications
- Milling operations

FEATURES

- Large variety of holders in different insert geometries (positive & negative)
- Wide choice of holders for different applications
- Internal coolant for high efficiency and longer tool life
- Secure insert clamping systems

MPLUS

G80A

PARTING OFF SYSTEM FOR TORNOS MULTI-SPINDLE LATHES

The tools of the G80A series make it possible for the first time to use the proven GY indexable inserts for parting off on Tornos multi-spindle lathes. The widely used Göltenbodt quick-change holders allow for very high precision while also enabling the adjustment of the centre height. Both the modules and the quick-change holders have been specially adapted to the available machine space. This achieves maximum stability, which, together with the targeted internal coolant supply, redefines both tool life and process stability. The narrow parting widths starting from 1.5 mm enable optimal material utilization, which further increases the efficiency of series processes.

BENEFITS

- Precise GWS column guides
- Efficient material utilization through narrow cut-off widths
- High stability and process reliability
- Double-edged cut-off insert
- Targeted internal cooling from top and clearance sides
- Designed specifically for Tornos multi-spindle lathes
- Internal cooling transfer without additional sealing elements

P M K S

PRODUCT RANGE

- Quick-change tooling system
- Modul with internal coolant

APPLICATIONS

- Cut off operation for Tornos multi-spindle lathes

FEATURES

- Stable and reliable grooving applications
- Small insert width for high material utilization
- Adjustable height
- Internal coolant for long tool life
- Wide selection of GY inserts
- Tools especially designed for Tornos multi-spindle lathes lathes

MPLUS

415SD

THE TOOL FOR HIGH FEED MILLING OF TITANIUM MATERIALS

The new 415SD was designed specifically for machining titanium. In addition to cost effectiveness, the main focus was on reliability, especially at high feed rates and large cutting depths when machining titanium. The secure indexable insert clamping with large contact surfaces offers the possibility of high-performance and efficient high-feed machining.
In addition, the milling body with irregular spaced flutes, exact insert location and precise positioning of the coolant nozzles offers stable and safe, high-feed machining at all times.

VORTEILE

- Secure insert positioning for safe and reliable machining
- Irregulr pitch cutting edge distribution reduces vibration, especially in applications with long overhangs.
- FIne tooth pitch and extra-fine tooth pitch enables a highly efficient cutting performance

S

PRODUCT RANGE

- Arbor type: DC Ø 50 – 66 mm

APPLICATIONS

- Face milling
- Shoulder milling
- Helical milling
- Pocket milling
- Roughing

FEATURES

- Low power consumption
- Good chip removal
- Specially designed chipbreakers
- Stable and robust 4-edged inserts for efficient high-feed milling.

DIA EDGE

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