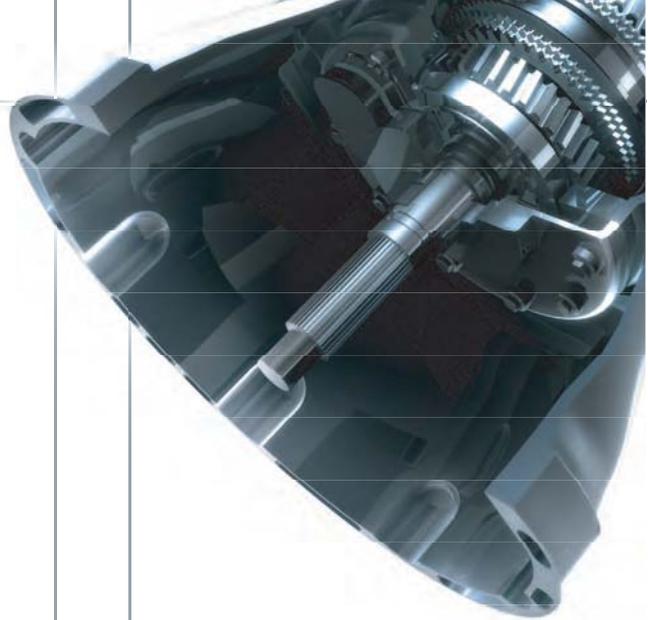
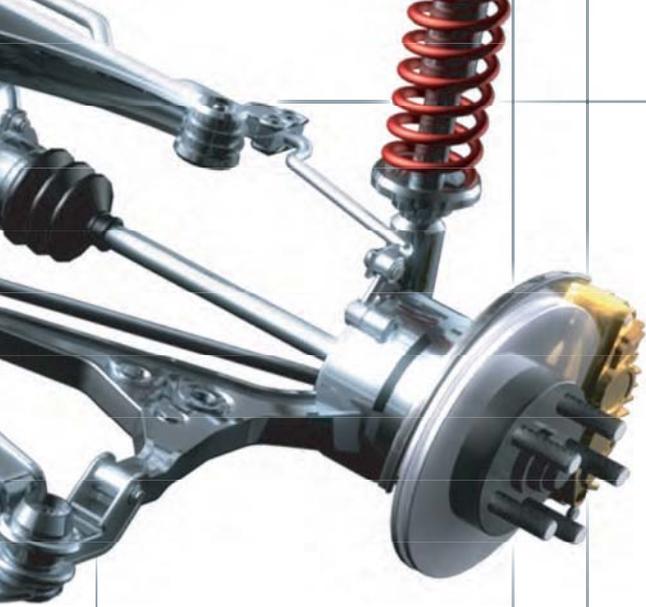


# **AUTOMOTIVE INDUSTRY**

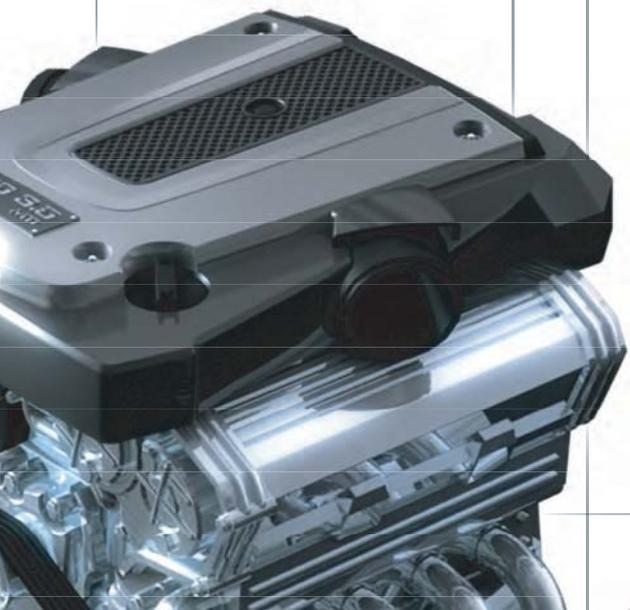




True partnership



Customised design



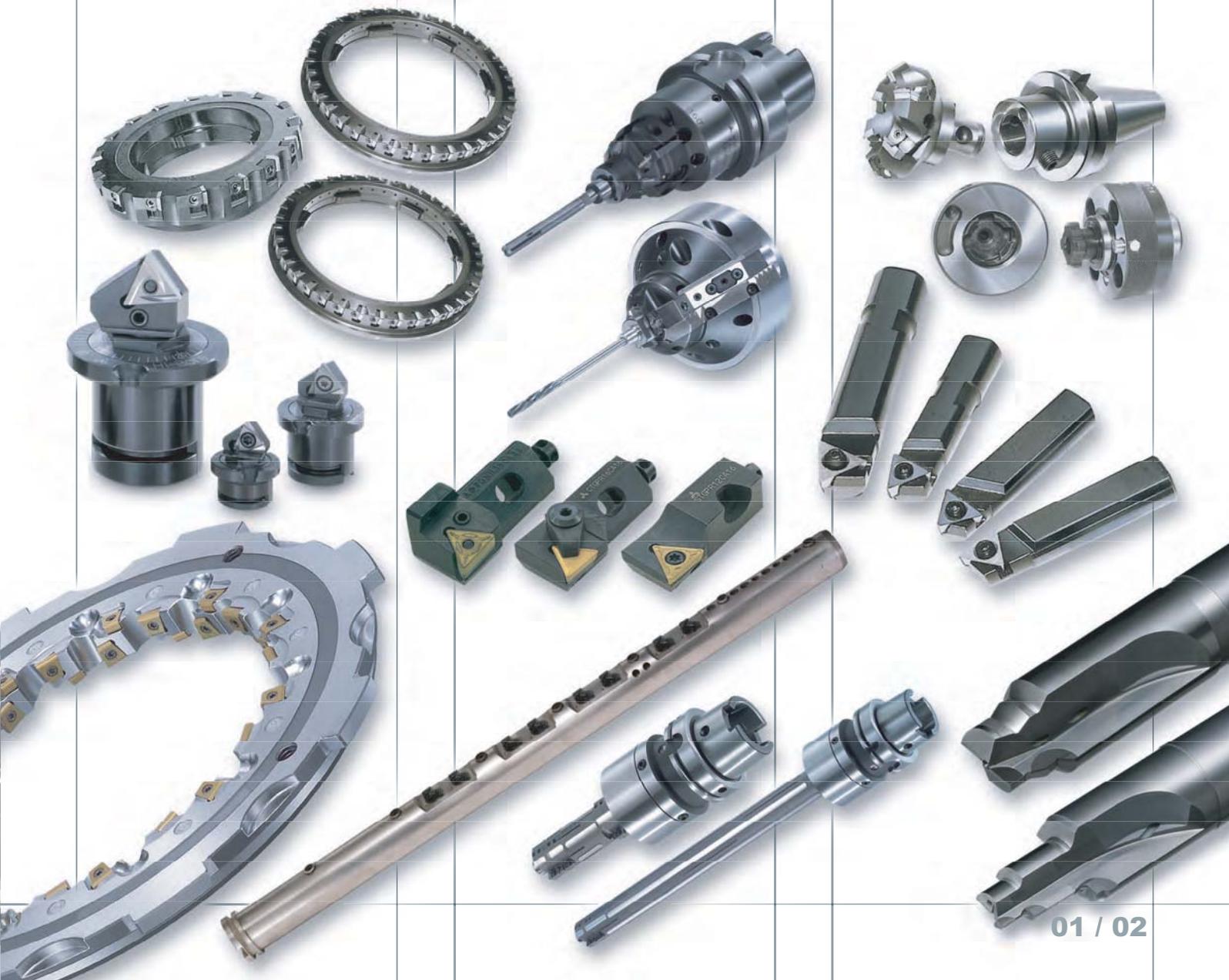
There is a long history regarding the development and design of Automobiles leading back to over a 100 years.

Since the origins,  
there has been an extensive advance in concept,  
new features and performance.

The present day automotive industry has grown into a huge industry reaching for further developments and prospects.

Mitsubishi Materials offers a wide range of cutting edge technological products that meet the ever demanding requirements from the Automotive Industry.

Mitsubishi Materials also offers materials that are frequently used in the Automotive Industry therefore making it possible to also supply the cutting tools that are required to machine these particular materials.



# AUTOMOTIVE

## CATEGORY **ENGINE PARTS**

<b>CYLINDER HEAD TOOLING</b>	<b>05</b>
<b>CYLINDER BLOCK TOOLING</b>	<b>07</b>
<b>CRANK SHAFT TOOLING</b>	<b>09</b>
<b>CAM SHAFT TOOLING</b>	<b>10</b>
<b>CON ROD TOOLING</b>	<b>10</b>

## CATEGORY **TRANSMISSION PARTS**

<b>TRANSMISSION CASE TOOLING</b>	<b>12</b>
<b>VALVE BODY TOOLING</b>	<b>12</b>
<b>STATOR TOOLING</b>	<b>12</b>
<b>OUTPUT SHAFT TOOLING</b>	<b>13</b>
<b>CVT PULLEY TOOLING</b>	<b>13</b>
<b>GEAR TOOLING</b>	<b>14</b>
<b>TORQUE CONVERTER COVER TOOLING</b>	<b>15</b>

## CATEGORY **AXLE PARTS**

<b>KNUCKLE ARM TOOLING</b>	<b>17</b>
<b>HUB TOOLING</b>	<b>17</b>
<b>DRIVE SHAFT &amp; CVJ TOOLING</b>	<b>17</b>

## CATEGORY **BRAKE PARTS**

<b>DISC BRAKE CALIPER TOOLING</b>	<b>18</b>
<b>DISC TOOLING</b>	<b>18</b>

## CATEGORY **ELECTRICAL PARTS**

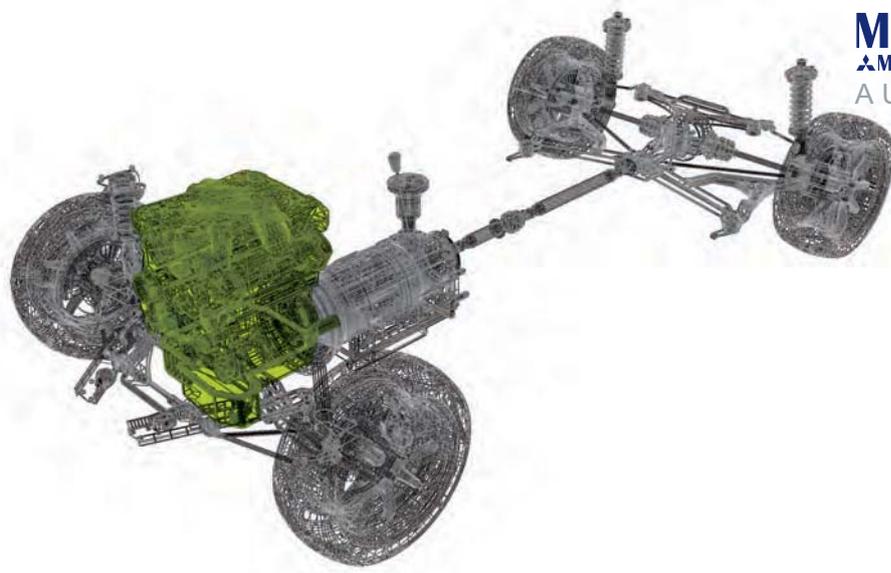
<b>COMMON RAIL &amp; INJECTOR TOOLING</b>	<b>20</b>
<b>ABS TOOLING</b>	<b>20</b>
<b>MOTOR TOOLING</b>	<b>20</b>

## CATEGORY **DIE AND MOULD**

<b>CRANK SHAFT MOULD TOOLING</b>	<b>21</b>
<b>CON ROD MOULD TOOLING</b>	<b>21</b>
<b>SIDE PANEL MOULD TOOLING</b>	<b>21</b>

## CATEGORY **NEWS**

<b>GENERAL, SPECIAL, PRODUCT</b>	<b>22</b>
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CATEGORY **ENGINE PARTS**

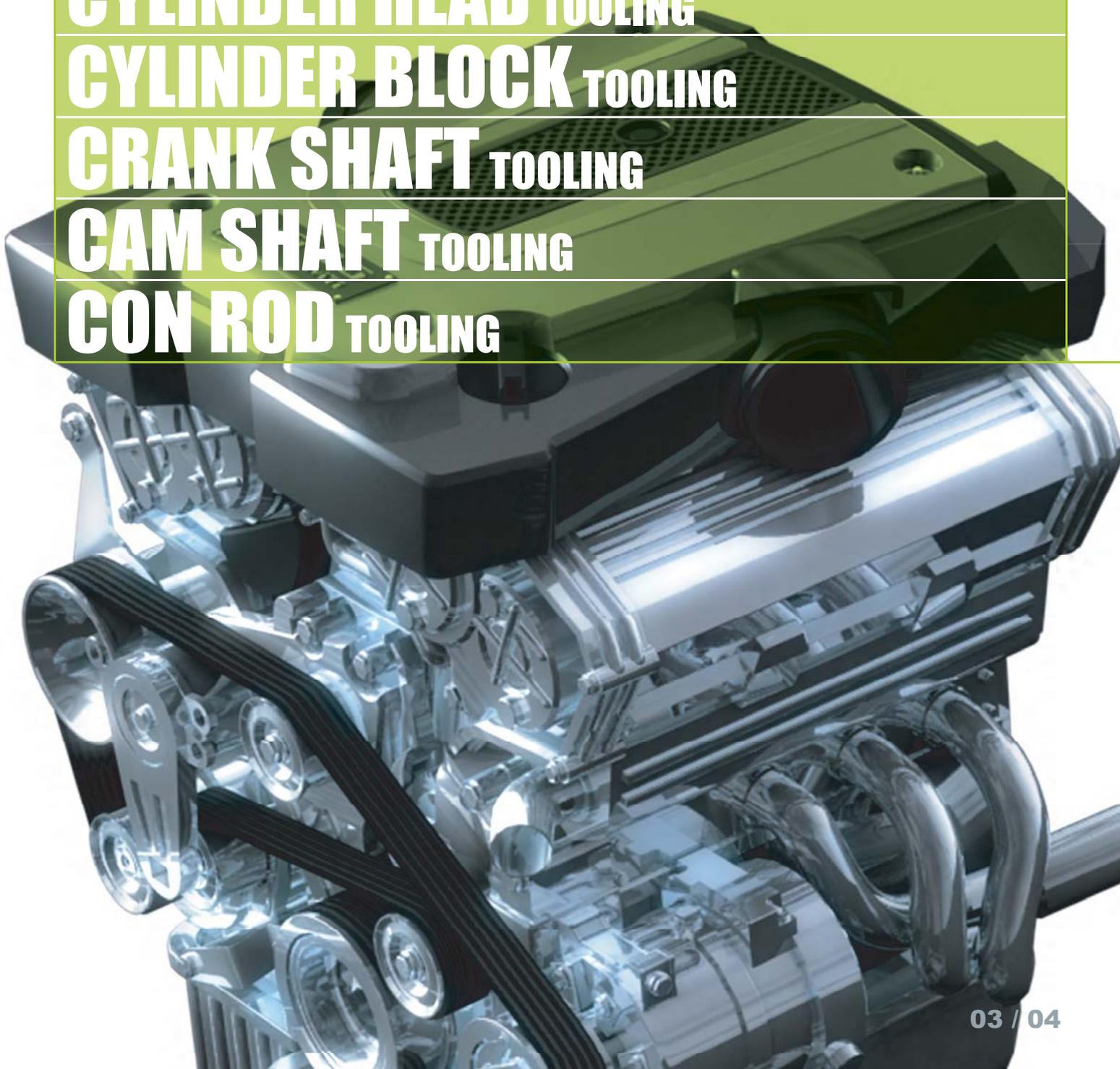
**CYLINDER HEAD** TOOLING

**CYLINDER BLOCK** TOOLING

**CRANK SHAFT** TOOLING

**CAM SHAFT** TOOLING

**CON ROD** TOOLING



# CATEGORY ENGINE PARTS

## CYLINDER HEAD TOOLING

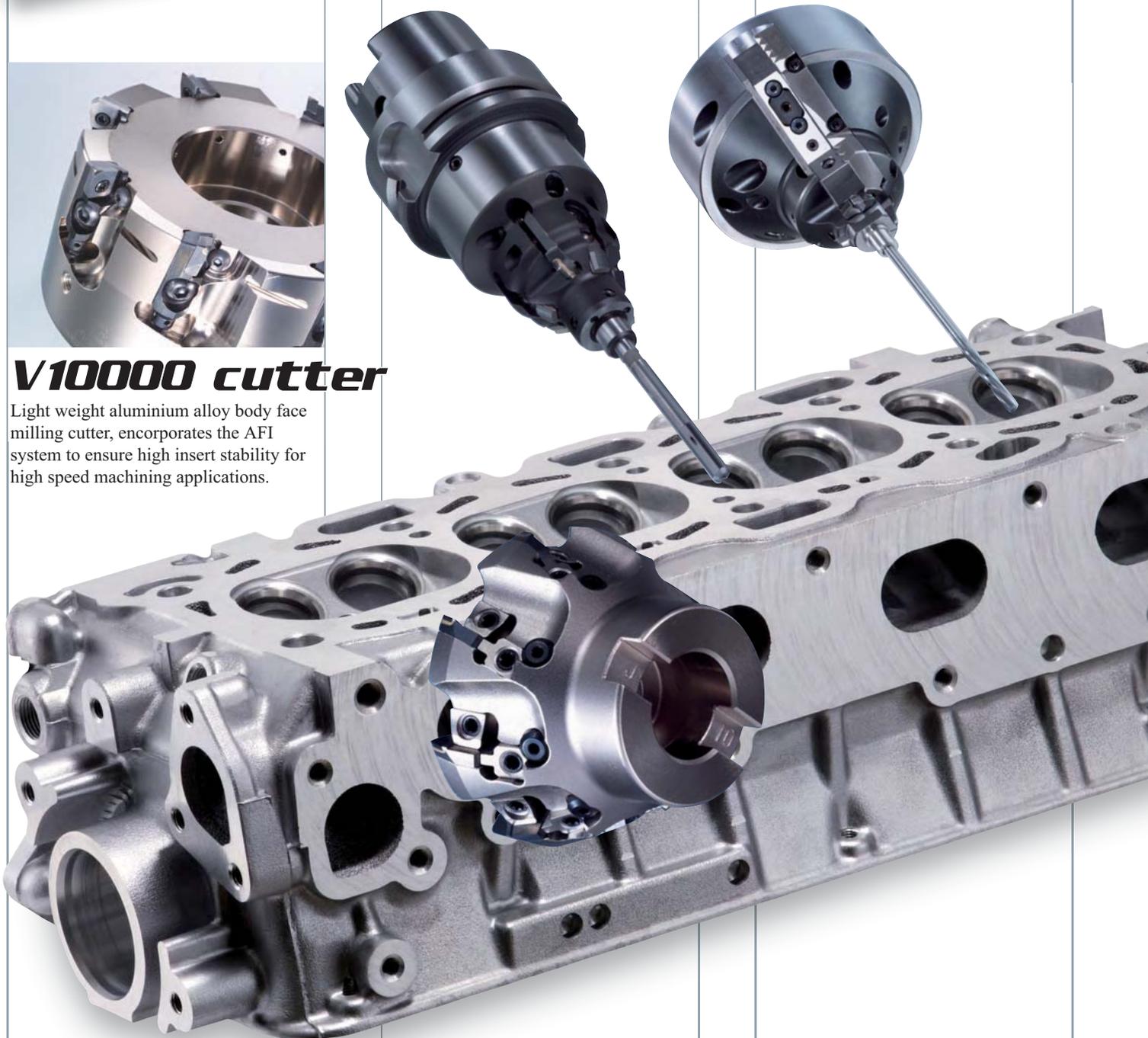
### *Insert reamer*

Employs carbide guide pads that improves the self guiding properties leading to an overall improvement in hole roundness.



### *V10000 cutter*

Light weight aluminium alloy body face milling cutter, incorporates the AFI system to ensure high insert stability for high speed machining applications.



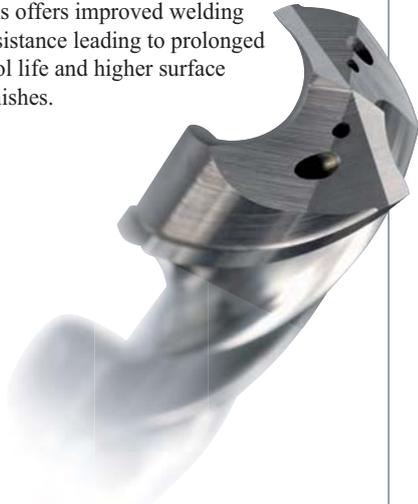
## **VP10RT**

Specifically designed for use with sintered materials.  
 Economical approach with performance equal to that of CBN.



## **MNS drill**

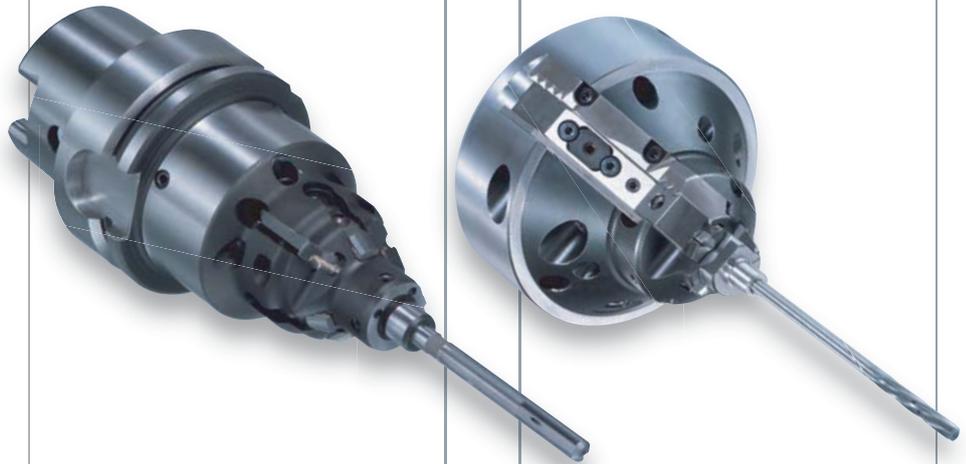
Employs 4 through coolant holes. Therefore when drilling aluminium alloys this offers improved welding resistance leading to prolonged tool life and higher surface finishes.



## **MAE/MAS drills**

MAE/MAS drills have a double margin, offering finished holes that do not require a reaming process.

Suitable for high speed machining of aluminium and cast irons.



## **Valve finishing tool** (Valve seat face and the stem guide hole)

### **Plunge type** (for machining centres) (Valve seat face)

Provides high accuracy machining of the seat and stem hole resulting in extremely high quality cylinder heads.

### **Traverse type** (for special machines) (Valve seat face)

Employs a unique sliding device that provides high accuracy machining of the seat and stem hole resulting in extremely high quality cylinder heads.

## **Solid carbide gun reamer** (Stem guide hole)

Solid carbide shank offering improved roundness, straightness and prolonged tool life.

U flute design to ensure effective coolant flow to improve chip disposal leading to higher surface finishes.



## **"Zero" run out cutter, QM7000**

A face milling tool that has a user friendly cutting edge height adjustment device to ensure minimum cutting edge run out. Can be used with the QM7000 arbor. High dynamic balance making it suitable for high speed machining applications.



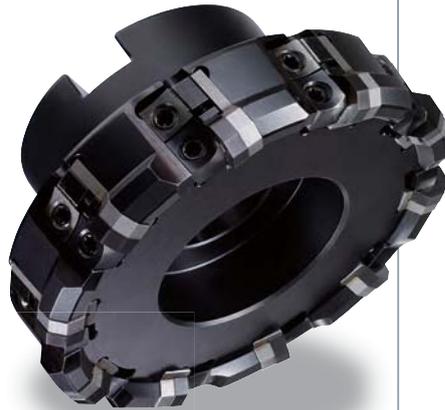
# CATEGORY ENGINE PARTS

## CYLINDER BLOCK TOOLING



### ***Line boring bar (Crank shaft hole)***

Employs unique micro-boring unit devices that ensure that high dimensional accuracies can be achieved.



### ***Face milling cutter for solid CBN inserts***

Solid CBN (MBS140) face milling cutter for machining of cast irons. Suitable for both rough and finish machining of cast irons.



### ***"Zero" run out cutter, QM7000***

A face milling tool that has a user friendly cutting edge height adjustment device to ensure minimum cutting edge run out. Can be used with the QM7000 arbor. High dynamic balance making it suitable for high speed machining applications.



### ***MWS-DB/ MSL drills (Extra long type)***

Non step drilling of holes 10~30D possible. Therefore offering high efficiency machining. Possible to convert from special gun drill machines to general purpose machining centres, leading to high machining flexibility and performance.

FINISHING Carbide inserts



FINISHING CBN inserts



ROUGHING Carbide inserts



## ***Cylinder bore boring cutters (Roughing & Finishing)***

The roughing boring tool uses a combination of a tool grade, that offers high speed & feed machining, and a suitable chip breaker, for reduced cutting resistance, so as to achieve improved machining efficiencies.

The finishing tool uses CBN inserts that can provide high wear resistance properties that lead to an increase in overall machining dimensions. The finishing tool also employs a diameter adjustment function ensuring that high machining accuracies can be achieved.

## ***Light weight/ Quick change face milling cutters (Head locating face)***

Quick change cutter.

A face milling cutter designed to be as light as possible so as to reduce the machine down time during tool changes.



## ***Pelican double clamp tool holder***

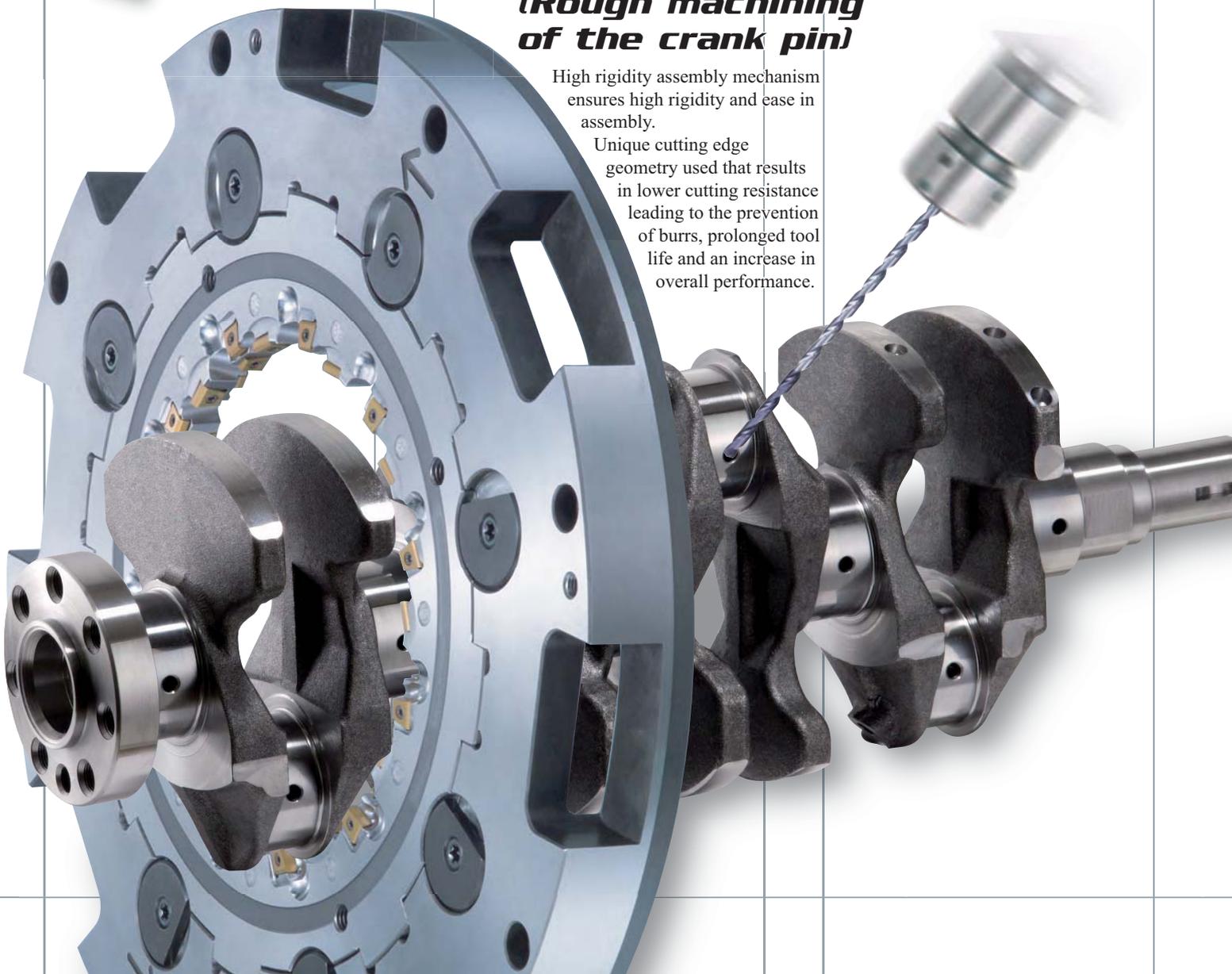
The combination of the high insert clamping rigidity and the overall strength of the pelican holder itself results in effective machining even under heavy interrupted or high feed machining with large tool overhangs.



## ***Pin milling cutter (Rough machining of the crank pin)***

High rigidity assembly mechanism ensures high rigidity and ease in assembly.

Unique cutting edge geometry used that results in lower cutting resistance leading to the prevention of burrs, prolonged tool life and an increase in overall performance.



CATEGORY **ENGINE PARTS**

**CAM SHAFT TOOLING**

**CON ROD TOOLING**



**UE6110**

(CVD coated grade for machining of steels)

A revolutionary tool grade offering both high crater and flank wear resistance that leads to higher machining stability and tool life management.



**MWE/  
 MWS  
 step drills**

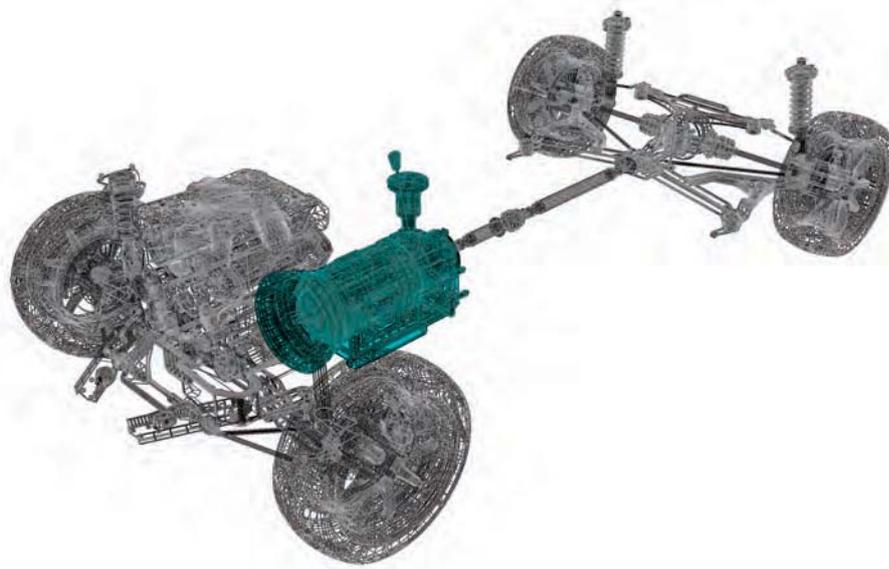
The MWE/MWS drills can be used to reduce the number of machining operations therefore reducing machining time and cost while maintaining high hole accuracies.



**MWS-DB/MSL drills  
 (Extra long type)**

Non step drilling of holes 10~30D possible. Therefore offering high efficiency machining.

Possible to convert from special gun drill machines to general purpose machining centres, leading to high machining flexibility and performance.



CATEGORY **TRANSMISSION PARTS**

**TRANSMISSION CASE** TOOLING

**VALVE BODY** TOOLING

**STATOR** TOOLING

**OUTPUT SHAFT** TOOLING

**CVT PULLEY** TOOLING

**GEAR** TOOLING

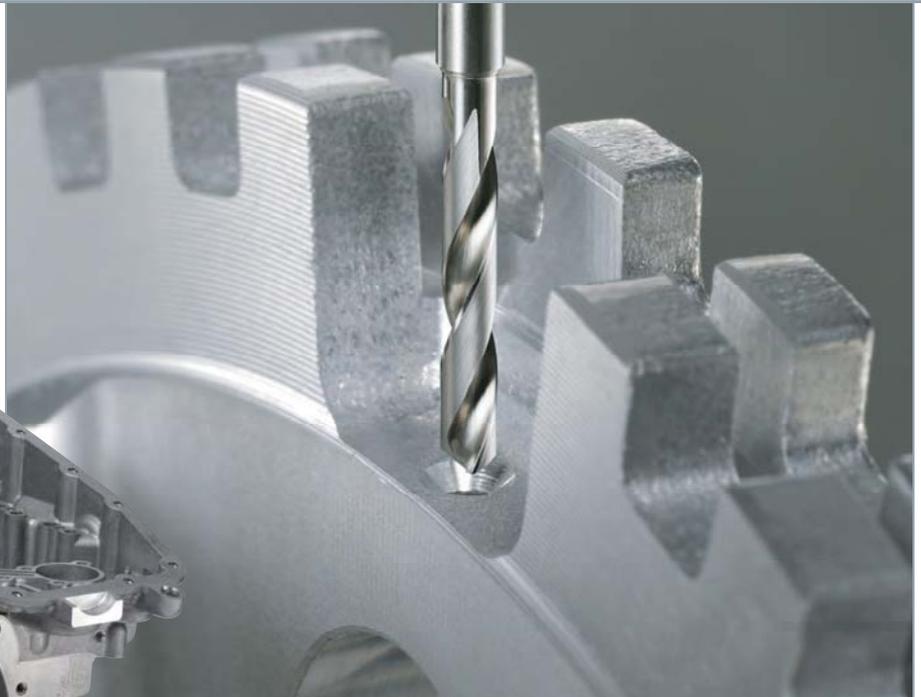
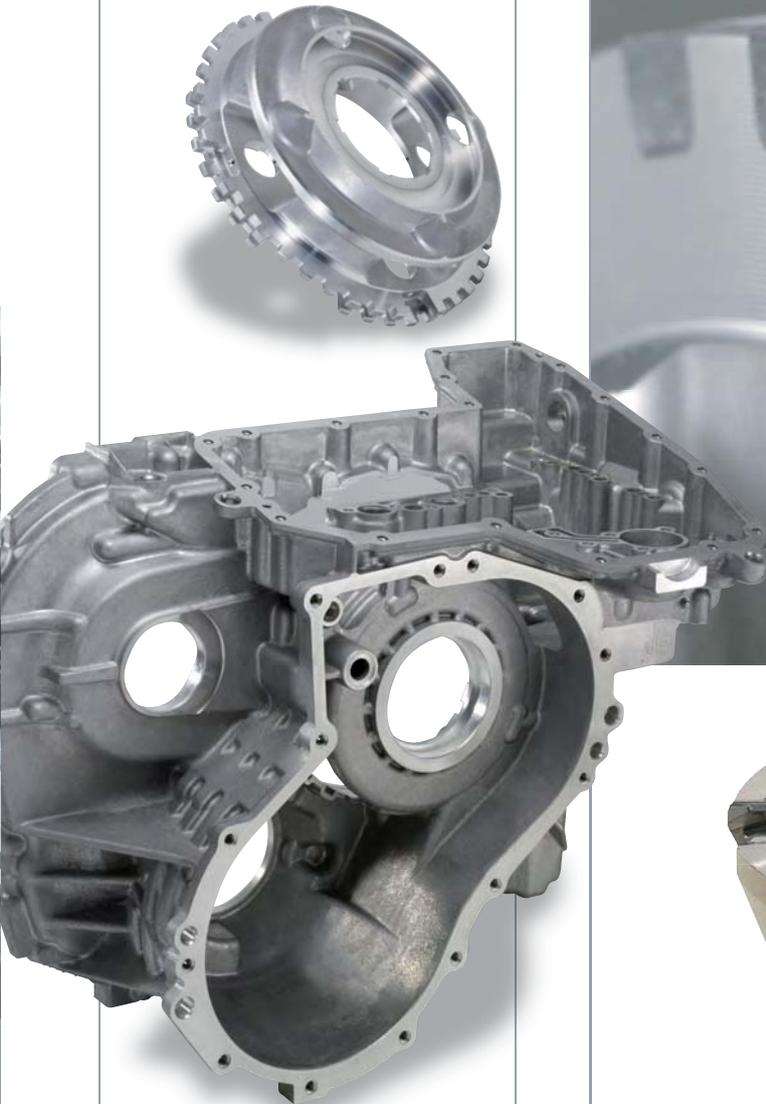
**TORQUE CONVERTER COVER** TOOLING



CATEGORY **TRANSMISSION PARTS**

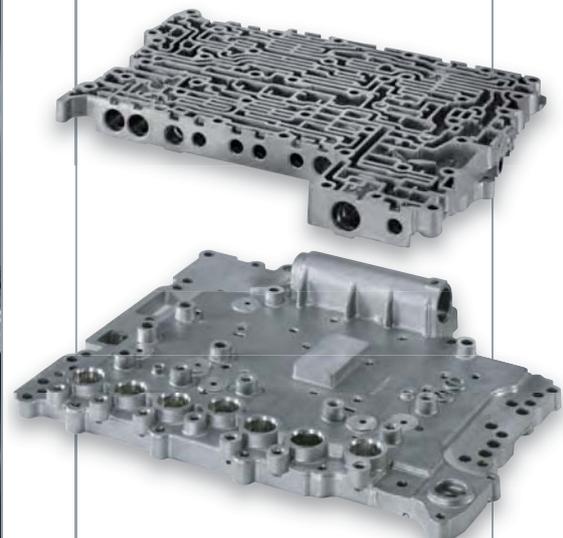
**TRANSMISSION CASE TOOLING**  
**STATOR TOOLING**

**VALVE BODY TOOLING**



**NF10000**  
***cutter***

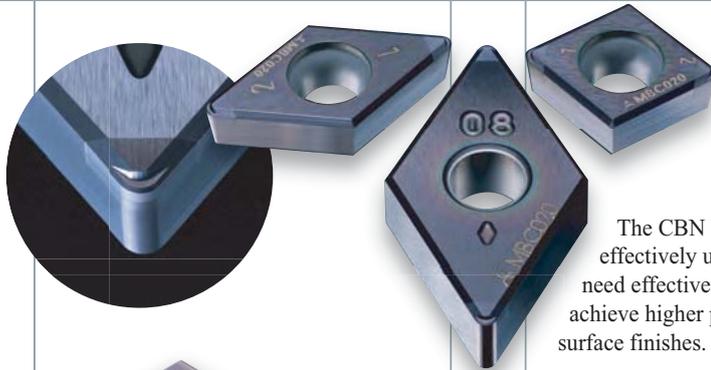
The minor cutting edge is made into a radius, therefore ensuring that high surface finishes can be achieved. Incorporates the AFI system to ensure high insert stability for high speed machining applications.



# CATEGORY TRANSMISSION PARTS

## OUTPUT SHAFT TOOLING

## CVT PULLEY TOOLING



### **CBN breaker insert**

The CBN breaker insert can be effectively used for applications that need effective chip control so as to achieve higher productivity and higher surface finishes.



### **CBN wiper insert**

A CBN insert that has a wiper edge designed in between the straight cutting edge and the nose radius. High feed machining without influencing the surface finish is possible. It is possible to reduce the machining time and increase overall productivity.



### **UE6110**

(CVD coated grade for machining of steels)

A revolutionary tool grade offering both high crater and flank wear resistance that leads to higher machining stability and tool life management.



### **MBC020**

(Coated CBN tool grade for machining of hardened materials)

MBC020 is a tool grade that can be used for continuous through to interrupted machining.

An extensive range of edge preparations are available to suit various machining applications.



### **MBC010**

(Coated CBN tool grade for machining of hardened materials)

A high grade that enables high speed machining of hardened steels. Cutting speeds of over 300m/min are possible leading to an increase in overall machining efficiency.

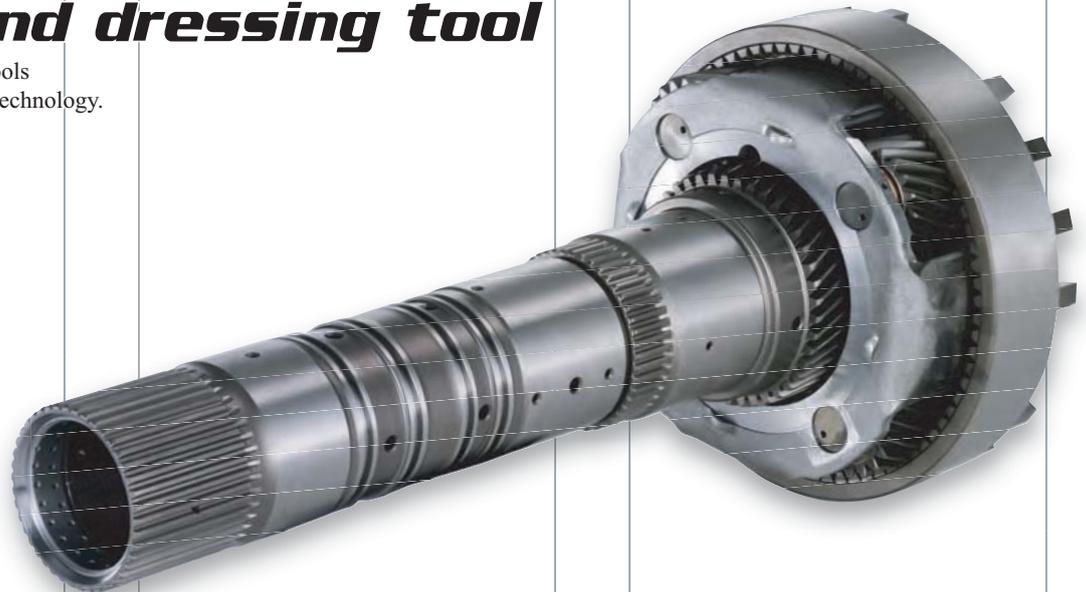


# CATEGORY TRANSMISSION PARTS

## GEAR TOOLING

### ***TRG diamond dressing tool***

A new range of diamond dressing tools incorporating the latest machining technology.



### ***MWE/MWS drills (Small size)***

Wavy cutting edge and a unique flute geometry provides effective chip disposal leading to lower cutting resistance and prolonged tool life.



### ***Shaving cutter***

High speed, high performance and longer tool life can be achieved using the surface treated STH shaving cutter and the irregular land type shaving cutter.

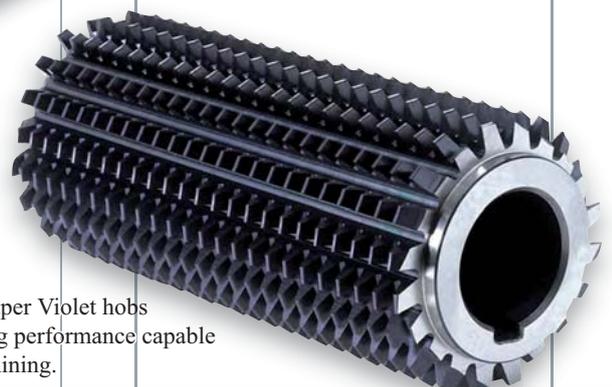
### ***Broach***

Mono-bloc helical broach offering high machining accuracies and lower running costs.



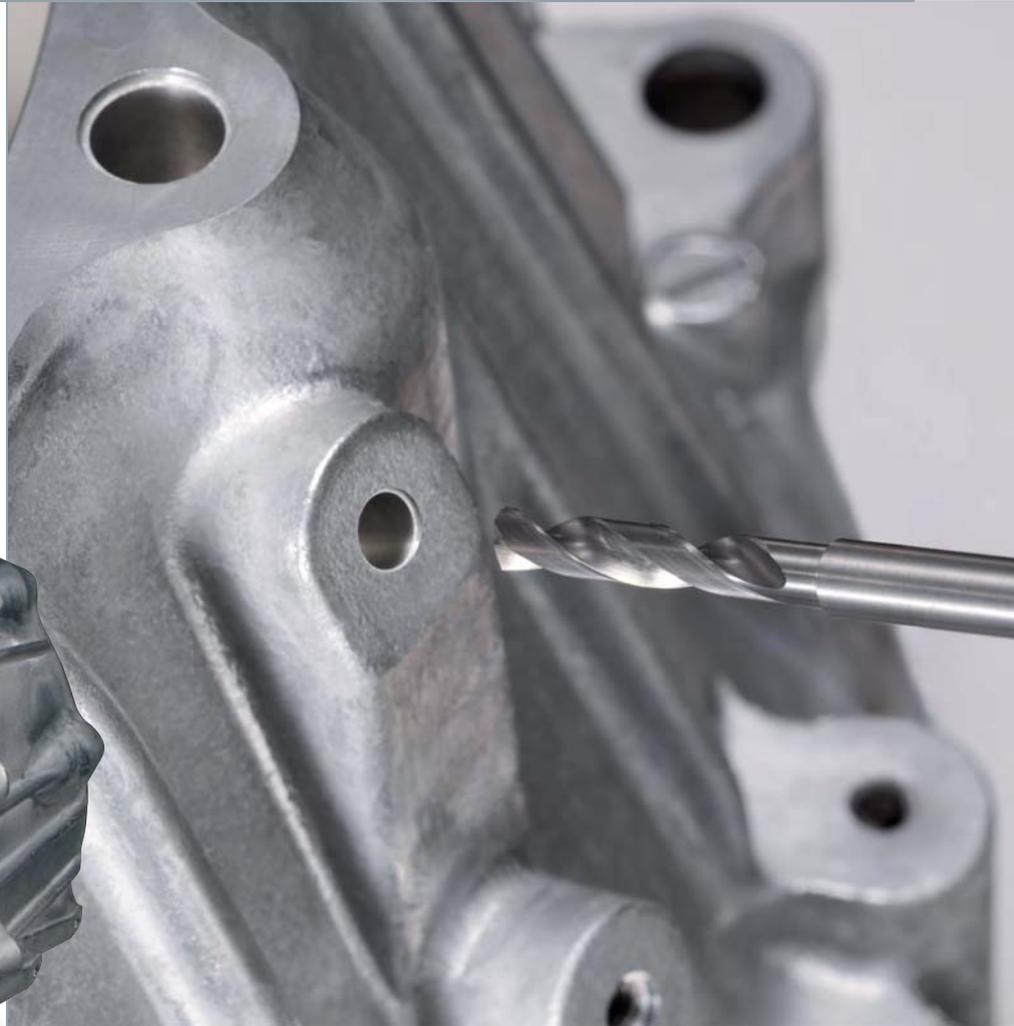
### ***Hob***

Carbide Miracle hobs. (Al,Ti)N coated and Super Violet hobs for increased machining performance capable of high speed dry machining.



# CATEGORY **TRANSMISSION PARTS**

## **TORQUE CONVERTER COVER** TOOLING



### ***AZ chip breaker***

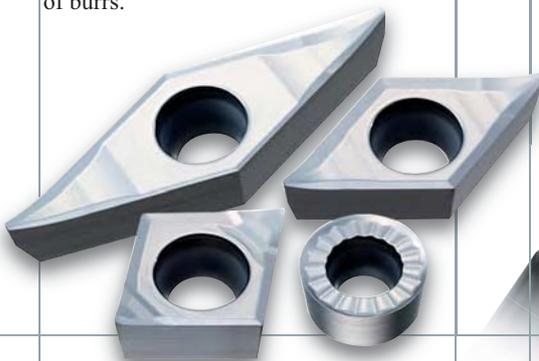
The AZ chip breaker employs a unique chip breaker, high rake that results in smooth chip control, improved welding resistance, and prevents the development of burrs.

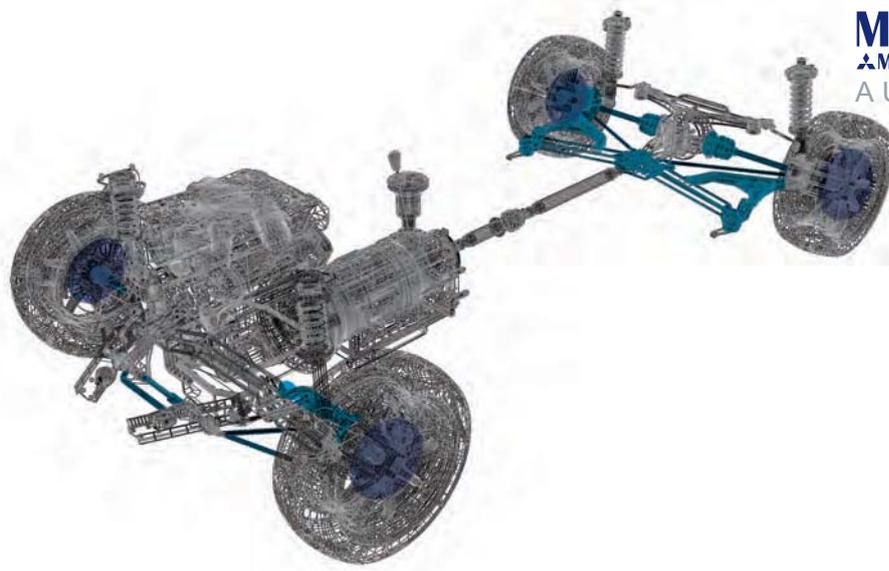
### ***Multiple PCD reamer***

The use of a multiple reamer enables a reduction in machining operations resulting in improvements in productivity and tool management.

### ***MNS drill***

Employs 4 through coolant holes. Therefore when drilling aluminium alloys this offers improved welding resistance leading to prolonged tool life and higher surface finishes.





CATEGORY **AXLE PARTS**

**KNUCKLE ARM** TOOLING

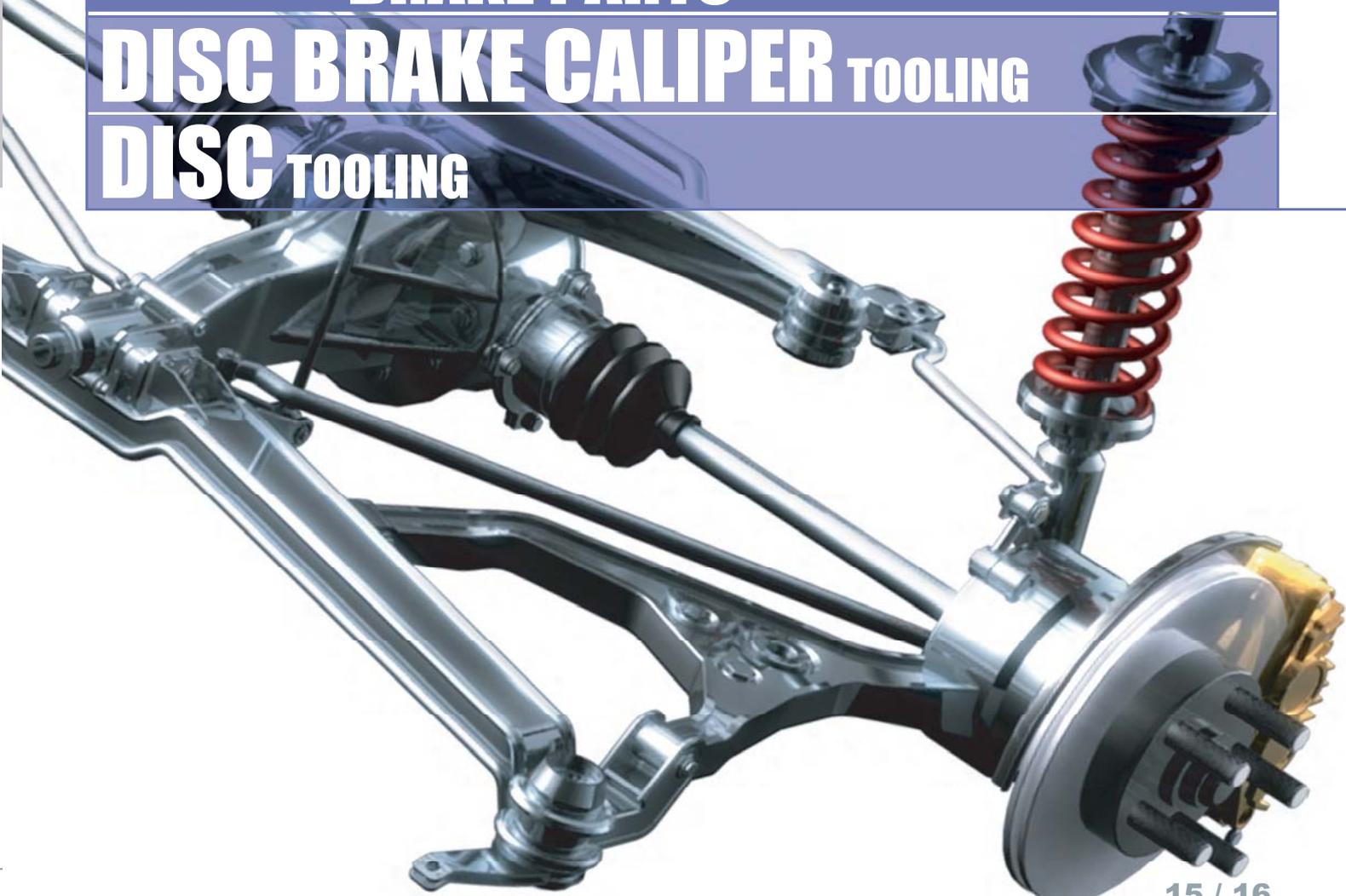
**HUB** TOOLING

**DRIVE SHAFT & CVJ** TOOLING

CATEGORY **BRAKE PARTS**

**DISC BRAKE CALIPER** TOOLING

**DISC** TOOLING



# CATEGORY **AXLE PARTS**

**KNUCKLE ARM** TOOLING

**HUB** TOOLING

**DRIVE SHAFT & CVJ** TOOLING

## **UE6000** **series**

(CVD coated grade  
for machining of steels)

A revolutionary tool grade offering both high crater and flank wear resistance that leads to higher machining stability and tool life management.



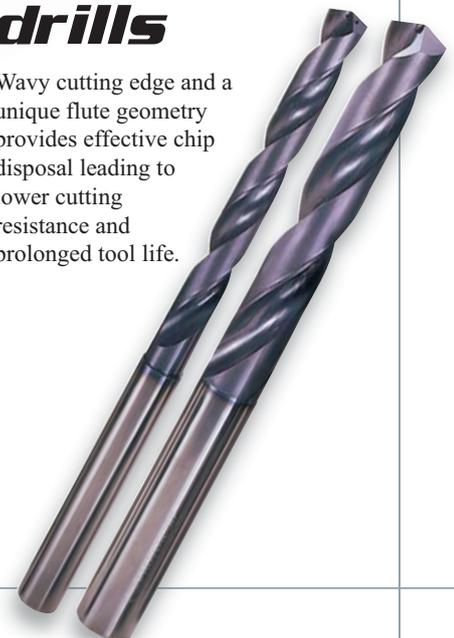
## **MHE** **hub drill**

A uniquely designed drill that offers high performance machining of hub bolt holes. The design of the drill ensures excellent chip disposal properties and machining accuracies.



## **MWE/MWS** **drills**

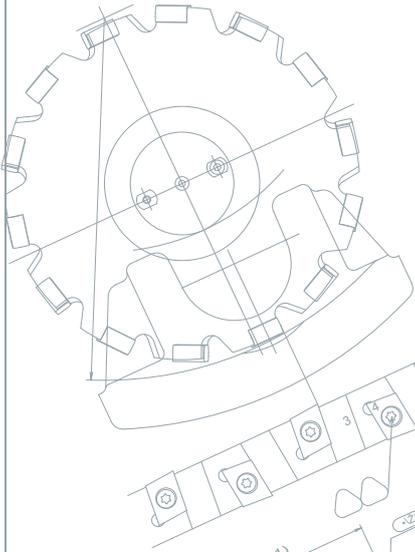
Wavy cutting edge and a unique flute geometry provides effective chip disposal leading to lower cutting resistance and prolonged tool life.



CATEGORY **BRAKE PARTS**

**DISC BRAKE CALIPER TOOLING** **DISC TOOLING**

**Side cutter  
 and  
 Customised  
 cutter**



**UC5100  
 series**

(CVD coated grade for machining of cast irons)

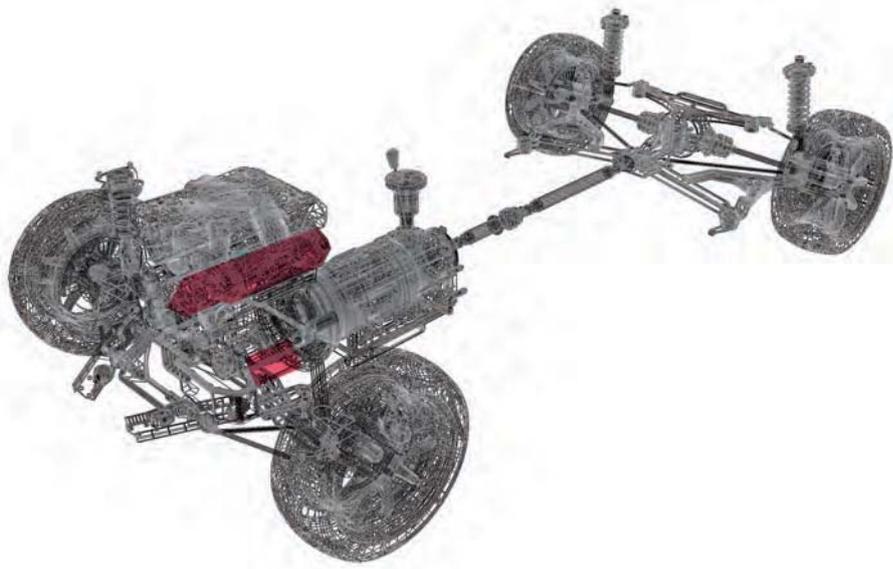
CVD, coated grade that uses a special process to ensure the surface of the insert is very smooth. This leads to excellent welding resistance, prolonged tool life and improved surface finishes.



**MBS140 Solid  
 CBN insert**

Insert is manufactured from 100% CBN, therefore there are no limitations regarding depth of cut. This leads to higher machining efficiency and performance. High fracture resistance properties leading to high speed and efficiency machining.





CATEGORY **ELECTRICAL PARTS**

**COMMON RAIL & INJECTOR** TOOLING

**ABS** TOOLING

**MOTOR** TOOLING



CATEGORY **ELECTRICAL PARTS**

**COMMON RAIL & INJECTOR TOOLING** **ABS TOOLING**  
**MOTOR TOOLING**

***MNS drill***

Employs 4 through coolant holes. Therefore when drilling aluminium alloys this offers improved welding resistance leading to prolonged tool life and higher surface finishes.



***Multiple PCD reamer***

The use of a multiple reamer enables a reduction in machining operations resulting in improvements in productivity and tool management.



***MGS drill***  
***(Solid carbide gun drill)***

High run out accuracies making it possible to carry out stable deep hole drilling even on general machines.



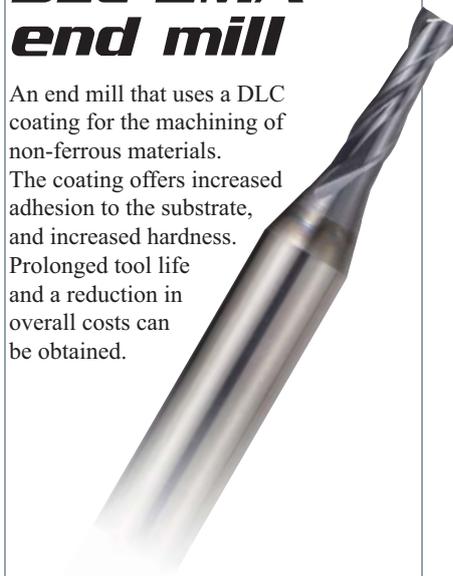
***MSE miniature drill***

The MSE miniature drill uses a tough substrate in combination with miracle coating. A unique flute geometry ensures effective chip control leading to longer tool life.



***DLC-2MA end mill***

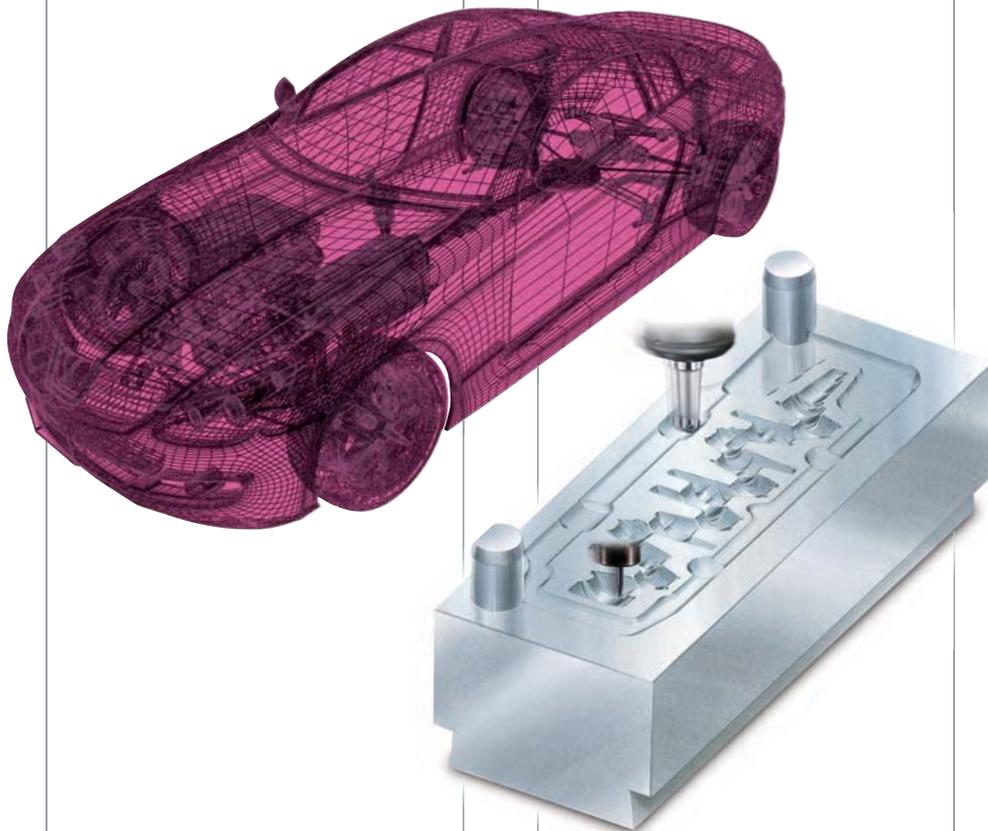
An end mill that uses a DLC coating for the machining of non-ferrous materials. The coating offers increased adhesion to the substrate, and increased hardness. Prolonged tool life and a reduction in overall costs can be obtained.



***Double margin drill***

Wavy cutting edge and a unique flute geometry provides effective chip disposal. The drill has 4 margins that ensure high hole accuracies and roundness. When the drill exits the hole problems can tend to occur but the double margin can provide stable machining and prolonged tool life.





## **AJX cutter**

The AJX high feed radius cutter is capable of feed rates that are up to 5 times higher than conventional tools therefore enabling high efficiency machining and an overall reduction in machining time.



## **SRF ball end mill**

The SRF is a finishing ball end mill.

Uses a high precision radius insert that offers machining accuracies comparable to a solid end mill.

As the tool is indexable there is no need for regrinding.



## **SRM2 ball end mill**

The SRM2 is capable of rough through to semi finish machining.

The combination of a highly rigid body with high accuracy low resistance inserts enables efficient machining.



## **SPX end mill**

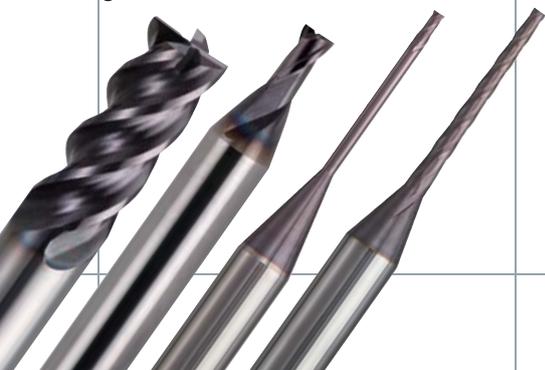
An end mill suitable for rough machining of deep faces.

Uses inserts that have a wavy geometry to reduce the overall cutting resistance and to improve the chip breaking performance.



## **MSTAR end mills**

General purpose end mill. Available in a wide range of sizes and geometries.



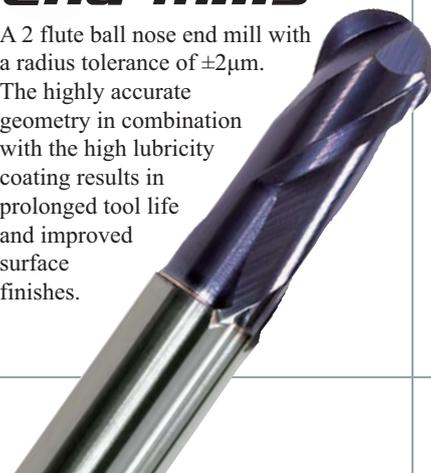
## **IMPACT MIRACLE end mills**

An end mill series that uses Impact Miracle coating. Impact miracle coating offers high hardness and oxidation resistance. Unique cutting edge geometry leads to increased chipping resistance. Suitable for materials up to 60HRC.



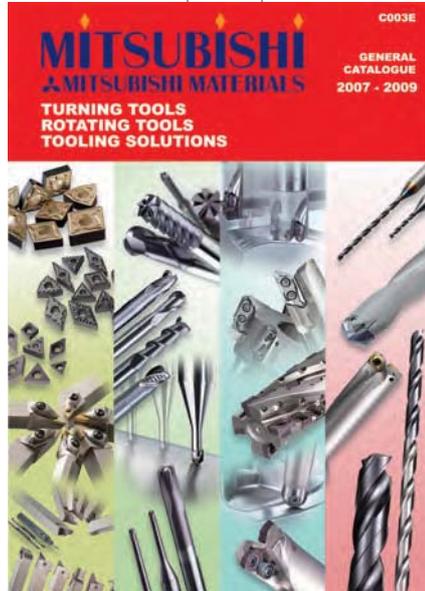
## **MIRACLE NOVA end mills**

A 2 flute ball nose end mill with a radius tolerance of  $\pm 2\mu\text{m}$ . The highly accurate geometry in combination with the high lubricity coating results in prolonged tool life and improved surface finishes.

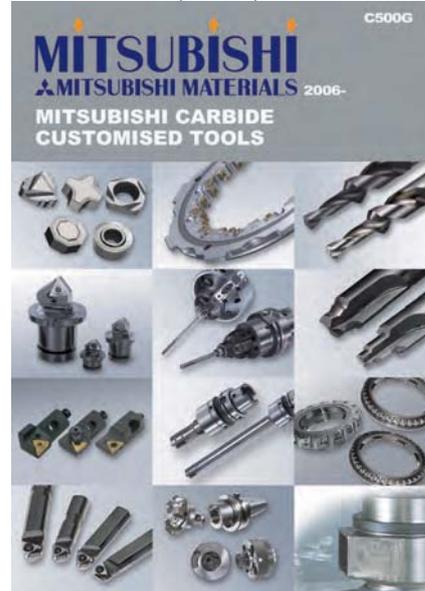


**CATEGORY NEWS**

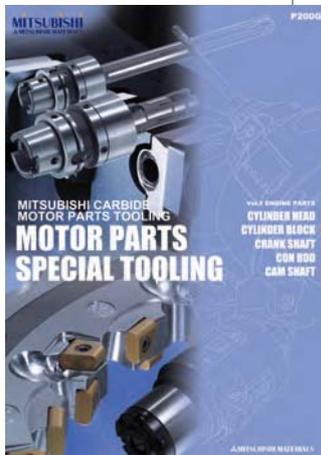
**GENERAL, SPECIAL, PRODUCT**



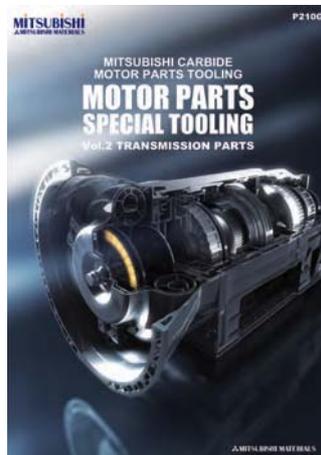
**C003E**



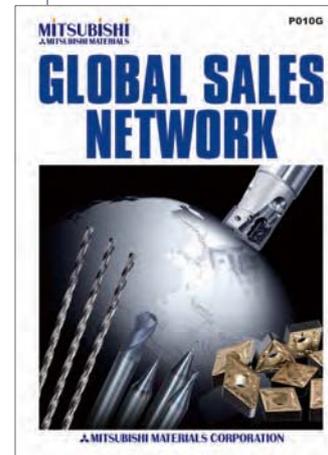
**C500G**



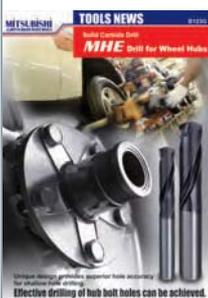
**P200G**



**P210G**



**P010G**



**TOOLS NEWS  
 MHE**



**TOOLS NEWS  
 MICRO-MGS**



**TOOLS NEWS  
 MBC010**



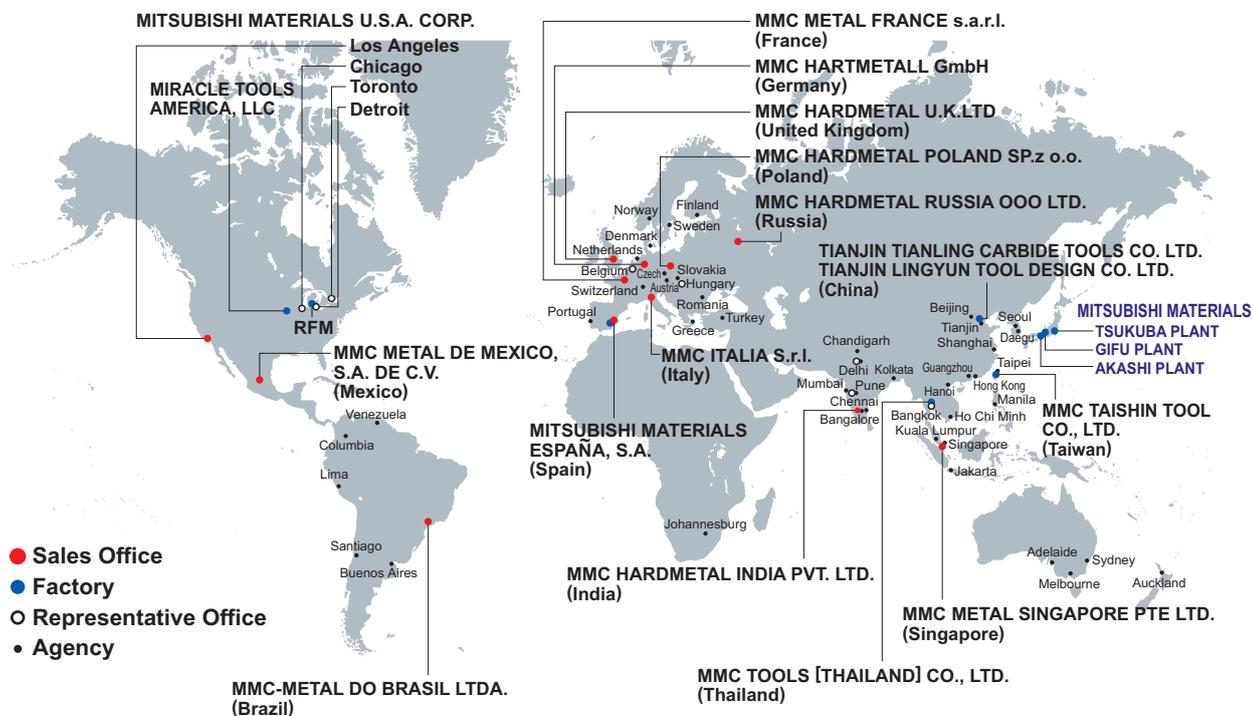
**TOOLS NEWS  
 MBC020**



**TOOLS NEWS  
 UE6110**



**TOOLS NEWS  
 UC5105/UC5115**



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