

THE NEW VALUE FRONTIER



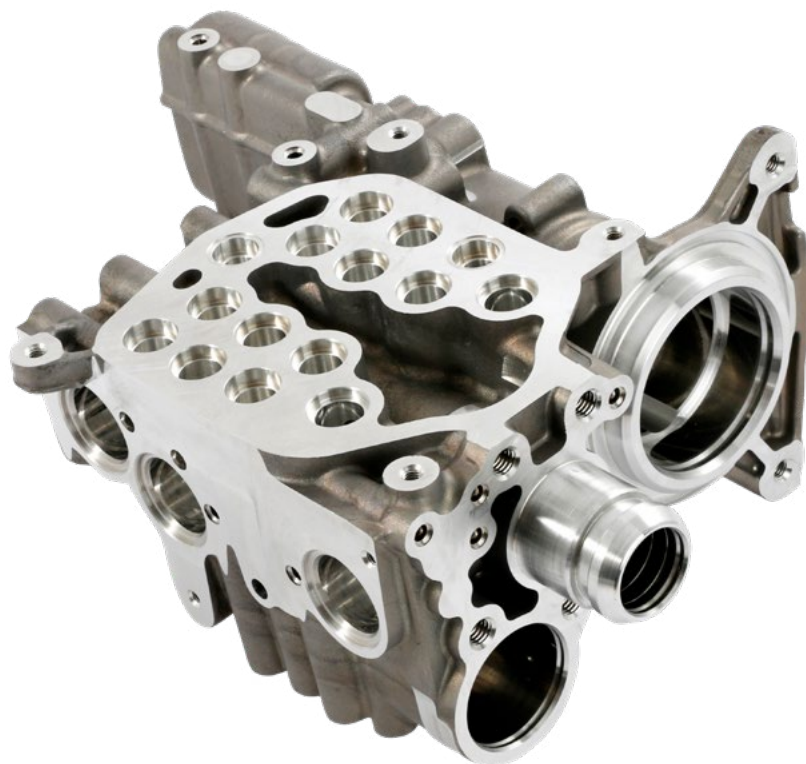
Tooling solutions | **Automotive**

Tooling solutions for

Automotive



Providing optimal tooling solutions for automotive industry



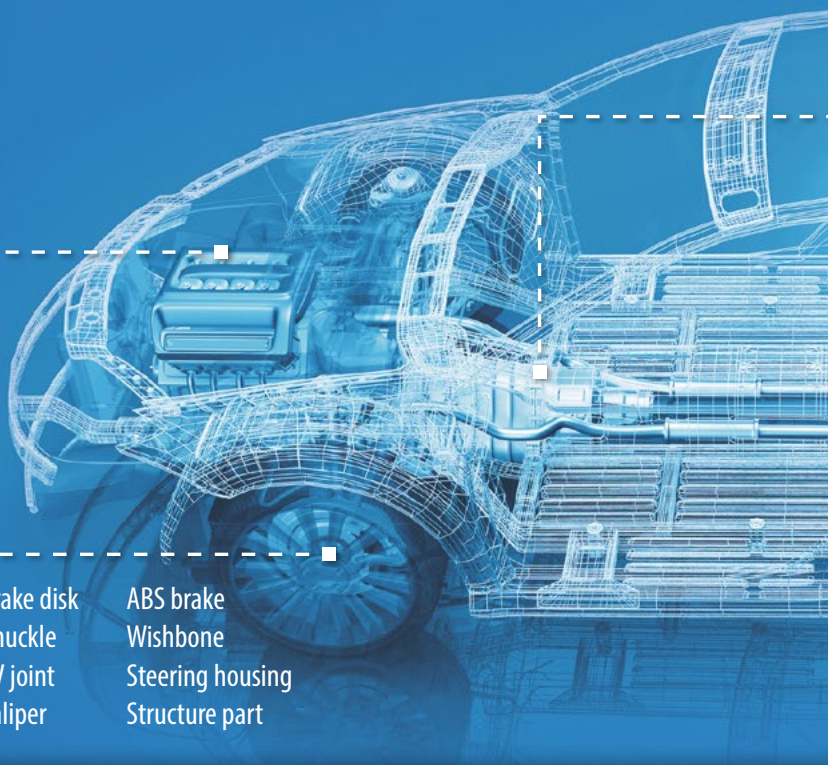
AUTOMOTIVE

TOOLING SOLUTIONS



Engine

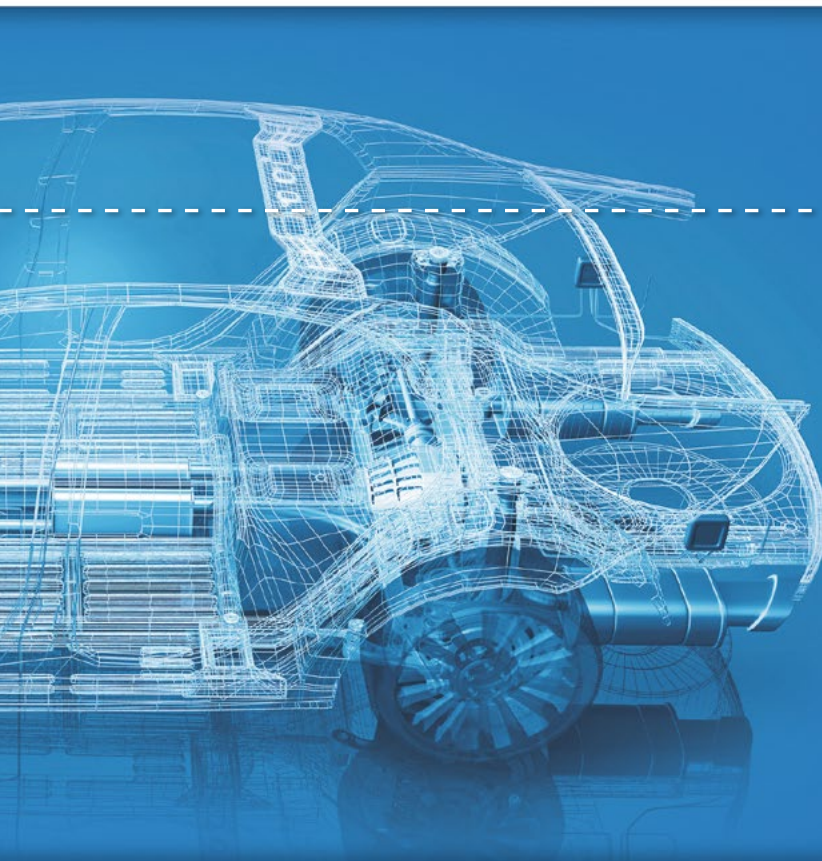
Crankcase
Cylinder head
Crankshaft
Camshaft
Connecting rod
Piston head



Brake disk
Knuckle
CV joint
Caliper
ABS brake
Wishbone
Steering housing
Structure part

Driving system





- Valve body
- Synchronizer gear
- Main shaft
- CVT pulley
- Gearbox housing

Transmission



CRANKCASE

Cast iron / Aluminum

MFK

Multi-Edge cutter for cast iron

- 10 usable cutting edges per insert
- Tough edge with low cutting forces
- New CVD grade CA420M for long tool life
- PR1510 MEGACOAT NANO PVD insert grade for cast iron
- KS6050 & CS7050 silicon nitride ceramic for high speed machining



MFPN

High-efficiency face mill

- Economical double-sided 10-edge inserts
- Low cutting force with excellent fracture resistance
- PR1510 MEGACOAT NANO insert grade for cast iron
- MFPN45: 45°, IC 12 type
- MFPN66: 66°, IC 09 type



MFPN66
IC 09 type



MFPN45
IC 12 type

MFPN / custom made

High-efficiency face mill

- Double-edge position to suppress fractures
- Unique chipbreaker design improves chip evacuation
- Long tool life with PR15-series MEGACOAT NANO carbide inserts



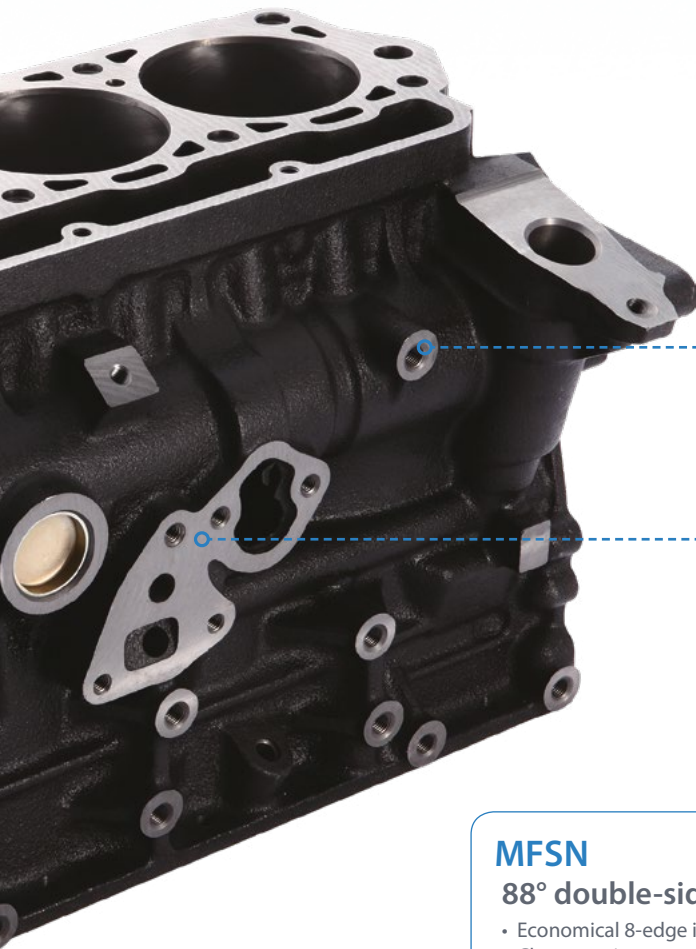
DRA MagicDrill

High efficiency modular drill

- Optimal web thickness limits deflection
- Fine chip breaking and smooth deep hole drilling
- Easy insert replacement
- PR1525 MEGACOAT NANO insert grade for cast iron
- High speed & high feed drilling
- 1.5xD - 12xD



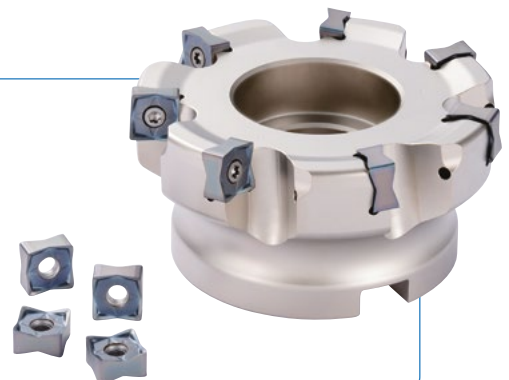
*KM insert
for cast iron*



MFSN

88° double-sided 4-edge milling cutter

- Economical 8-edge inserts
- Chatter resistant – medium to roughing operations
- PR1510 MEGACOAT NANO insert grade for cast iron



CRANKCASE

Cast iron / Aluminum

UM customized carbide tools

Intelligent tooling solutions

- High performance / High productivity
- Preformed carbide with internal coolant for optimum lubrication
- Short delivery time
- Various type of coating



Reverse side of block

MEC

High efficiency milling cutter

- Low cutting force and reduced chattering
- PR1210 for cast iron
- JA chipbreaker and PDL025 DLC coated inserts for aluminum
- KPD230/KPD001 PCD inserts for aluminum



MEW

90° double-sided 4-edge milling cutter

- Economical 4-edge inserts
- Improved durability and insert installation accuracy
- PR1510 MEGACOAT NANO insert grade for cast iron
- PDL025 DLC coated inserts for aluminum



MFAH

Milling cutter for finishing aluminum

- Easily adjustable edge height for highly efficient machining
- Steel body and light-weight hybrid body design with internal coolant
- Choose from 3 different cutting edge designs
- Unique KPD001 PCD inserts for aluminum



MFWN

90° double-sided 6-edge milling cutter

- Sharp cutting with low cutting forces
- Resistant to chattering and applicable to long overhang
- PR1510 for cast iron
- PDL025 DLC coated inserts for aluminum



ORION

High performance drills

- Excellent hole accuracy with a low cutting force design
- Optimized cutting edge with 3xD and 5xD drilling capabilities
- Increased positional accuracy and excellent pilot hole drill



HYDROS

Coolant fed deep drills

- Double margin for smooth hole wall finish
- Point design for excellent hole accuracy
- Up to 15xD drilling capabilities
- Diameters 1.00 mm – 12.00 mm



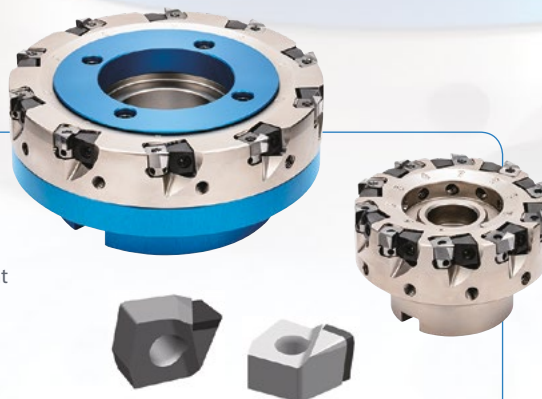
CYLINDER HEAD

Aluminum / Cast iron

MFAH

Milling cutter for finishing aluminum

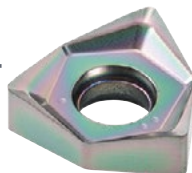
- Easily adjustable edge height for highly efficient machining
- Steel body and light-weight hybrid body design with internal coolant
- Choose from 3 different cutting edge designs
- Unique KPD001 PCD inserts for aluminum



MFWN

90° double-sided 6-edge milling cutter

- Sharp cutting with low cutting forces
- Resistant to chattering and applicable to long overhang
- PR1510 for cast iron
- PDL025 DLC coated inserts for aluminum



PDL025 inserts
for aluminum

UM Dandia™ PCD one shot drills

Injection / spark plug

- From full material to finish hole with one tool in H7 / H8 tolerance
- Perfect straightness and position
- Optimum roundness and surface quality



MFK

Multi-Edge cutter for cast iron

- 10 usable cutting edges per insert
- Tough edge with low cutting forces
- New CVD grade CA420M for long tool life in cast iron
- PR1510 MEGACOAT NANO PVD insert grade for cast iron
- KS6050 & CS7050 silicon nitride ceramic for high speed machining



MEW

90° double-sided 4-edge milling cutter

- Economical 4-edge inserts
- Improved durability and insert installation accuracy
- PR1510 MEGACOAT NANO insert grade for cast iron
- PDL025 DLC coated inserts for aluminum



PDL025 inserts
for aluminum

UM Dandia™ PCD multi mill

Roughing of cam bore

- Superior feed rates and excellent tool life
- Coolant supply to each tip
- Available as monoblock type or with cylindrical shank



UM Dandia™ chip free PCD tool

Water plug hole

- Chip free machining due to customized design for optimum chip evacuation
- No chips left in part - no extra cleaning process



CYLINDER HEAD

Aluminum / Cast iron

UM DANDIA™ PCD HELI-DRILL

"One-shot" solution at mounting hole

- PCD spiral-fluted drill on solid carbide tool body with full PCD drill point
- Increase capacity on an existing production line by reducing cycle time



Valve guide and seat

- Combined tool for seat and guide machining
- Smart solution for seat machining - easy to change / adjust
- Optimum roundness and position



UM Dandia™ PCD combination tool

Valve parent metal finishing

- PCD combination reamer in adjustable UM DANDIA™ toolholder
- The reamer has negative spiral and cutting geometry
- All chips are blown forward by the internal coolant
- There are additional coolant outlets to the guide pads



UM Dandia™ PCD stepreamer

Valve seat roughing and throat form

Combining reamer and profile geometry on the PCD inserts, this multi-purpose PCD tool is able to cut three different difficult features in one PCD tool.



MEC

High efficiency milling cutter

- Low cutting force and reduced chattering
- PR1210 for cast iron
- JA chipbreaker and PDL025 DLC coated inserts for aluminum
- KPD230/KPD001 PCD inserts for aluminum



PDL025 inserts
for aluminum

CRANKSHAFT

Steel / Cast iron

CCX

New CVD coated cermet for steel turning

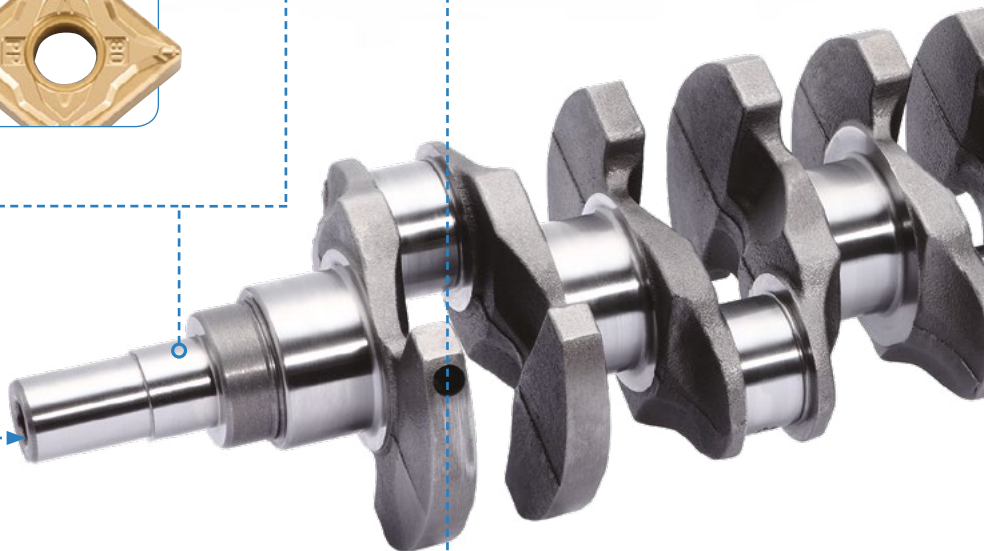
- Unique cermet base material with thick CVD coating
- Excellent wear resistance provides long tool life for low carbon steel, general steel and cast iron machining
- Excellent surface finish
- Vc max. 800 m/min



CA025P

New CVD coated carbide for steel turning

- Long tool life and stable machining
- Various chipbreakers available for steel machining
- Special substrate and tough coating layer for high wear and fracture resistance



DRA MagicDrill

High efficiency modular drill

- Optimal web thickness limits deflection
- Fine chip breaking and smooth deep hole drilling
- Easy insert replacement
- PR1535 MEGACOAT NANO insert grade for steel
- High speed & high feed drilling
- 1.5xD - 12xD



CAMSHAFT

Steel / Cast iron

KGD

Grooving / Cut-Off

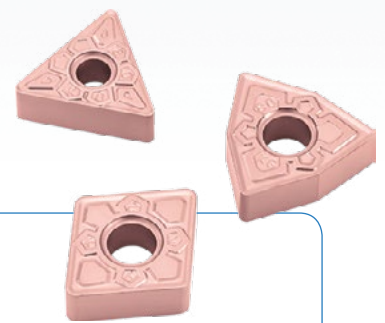
- Excellent chip control
- Wide tooling lineup for multiple applications
- MEGACOAT coating technology for long tool life
- Edge tolerance of ± 0.03 mm (edge width 2, 3 and 4 mm)



CA3 series

Cast iron turning

- Micro TiCN coating provides excellent wear results
- Improved coating adhesion prevents chipping for stable machining
- KG chipbreaker for continuous to interruption
- KH chipbreaker for interruption to heavy interruption
- KQ chipbreaker for sharpness



HYDROS

Coolant fed deep drills

- Double margin for smooth hole wall finish
- Point design for excellent hole accuracy
- Up to 15xD drilling capabilities
- Diameters 1.00 mm – 12.00 mm



CONNECTING ROD

Steel / Powdered metal

DRA MagicDrill

High efficiency modular drill

- Optimal web thickness limits deflection
- Fine chip breaking and smooth deep hole drilling
- Easy insert replacement
- PR1535 MEGACOAT NANO insert grade for steel
- High speed & high feed drilling
- 1.5xD - 12xD



MFWN

90° double-sided 6-edge milling cutter

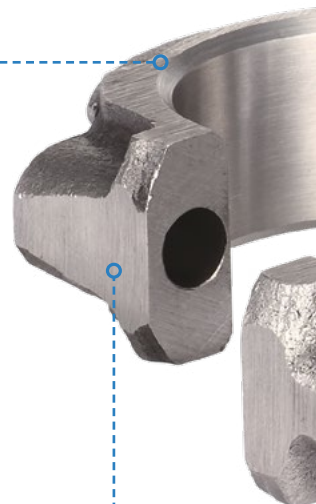
- Sharp cutting with low cutting forces
- Resistant to chattering and applicable to long overhang
- PDL025 DLC coated inserts for aluminum



MEW

90° double-sided 4-edge milling cutter

- Economical 4-edge inserts
- Improved durability and insert installation accuracy
- PR1525 MEGACOAT NANO inserts for steel



MSTA

Slot mill

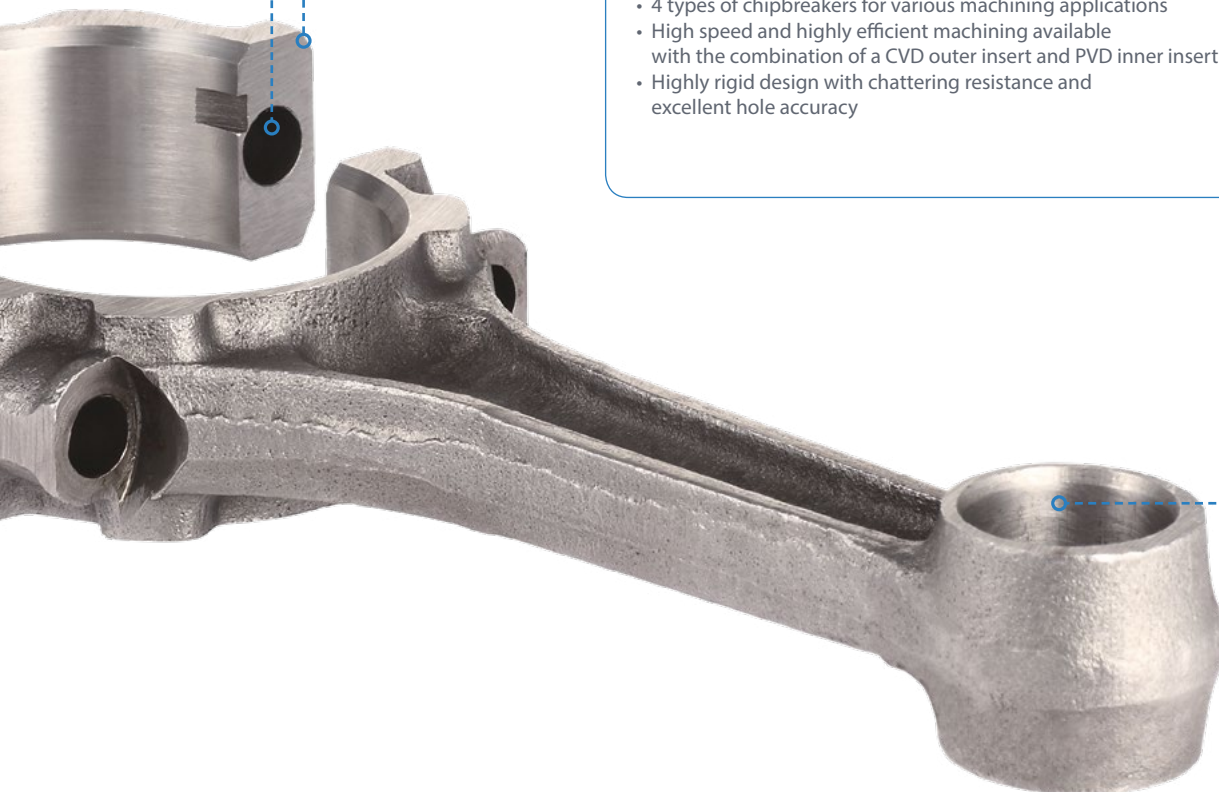
- Self-clamping insert system
- 1.6 mm, 2.25 mm, 3.05 mm, and 4.05 mm slot widths
- Easy insert replacement



DRV MagicDrill

High efficiency drill

- 2D to 6D maximum deep-hole drilling lineup
- 4 types of chipbreakers for various machining applications
- High speed and highly efficient machining available with the combination of a CVD outer insert and PVD inner insert
- Highly rigid design with chattering resistance and excellent hole accuracy



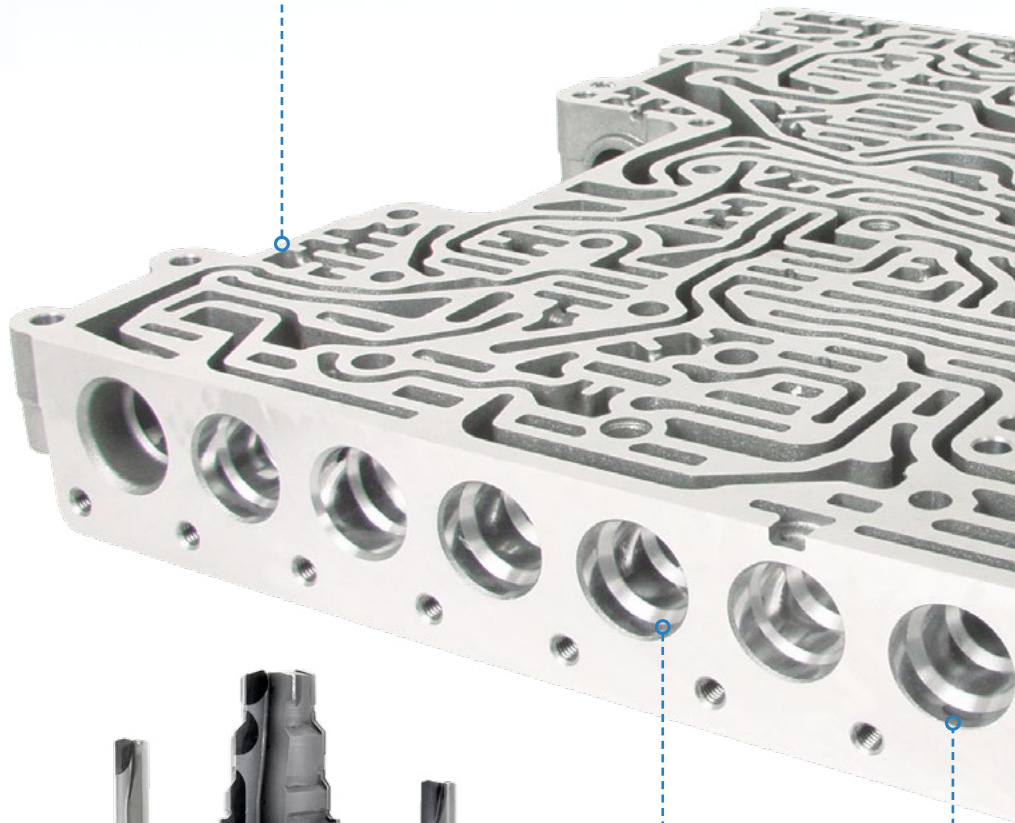
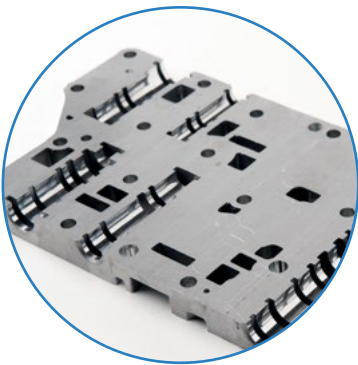
VALVE BODY

Aluminum

MFAH

Milling cutter for finishing aluminum

- Easily adjustable edge height for highly efficient machining
- Steel body and light-weight hybrid body design with internal coolant
- Choose from 3 different cutting edge designs
- Unique KPD001 PCD inserts for aluminum



UM Dandia™ PCD reamer

Cartridge bores / valve bores

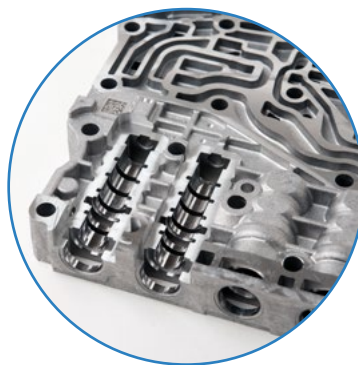
- One-shot cartridge bore in H7 / H8 tolerance
- Semi finish valve bore reamers with drill point
- Highest rigidity
- Can be used in combination with UM Dandia™ PCD finish reamer as 2 shot solution



UM Dandia™ PCD multi flute reamer

Valve bore

- Finishing tool (2 shoot strategy possible)
- Extreme high feed rate
- Highest hole quality, best roundness and surface



UM Dandia™ PCD heli reamer

Solenoid, valve bores

- UM Dandia™ guidepad system
- Easy handling due to fixed PCD cutting edge
- Can be used in combination with Kyocera processing tool as a 2 shot solution
- High process reliability



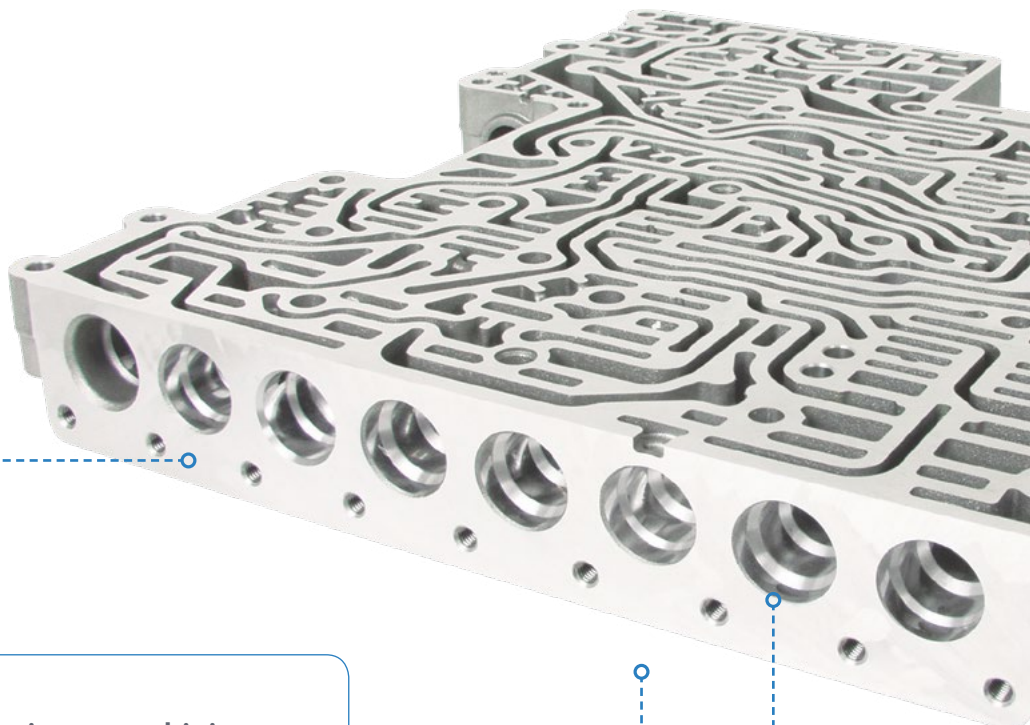
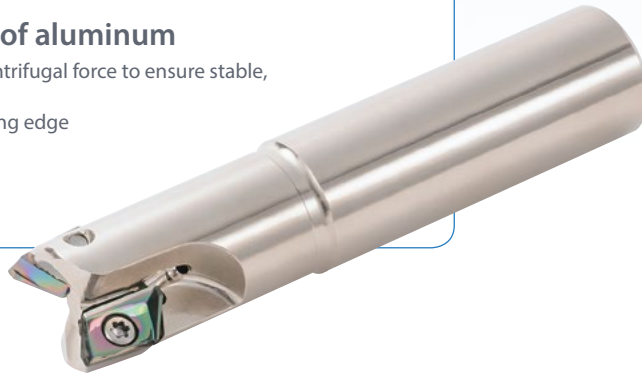
VALVE BODY

Aluminum

MEAS

High speed machining of aluminum

- Serrated insert pocket to resist centrifugal force to ensure stable, high speed machining
- Low cutting force with sharp cutting edge
- True rake angle max. 20°
- PDL025 for aluminum



PDL025

DLC coating for aluminum machining

- Achieves long tool with hardness close to that of diamond
- Excellent surface finish with aluminum welding resistance

PDL025
inserts e. g.:



SYNCHRONIZER GEAR

High carbon steel



KGD

Grooving / Cut-Off

- Excellent chip control
- Wide tooling lineup for multiple applications
- MEGACOAT coating technology for long tool life
- Edge tolerance of ± 0.03 mm (edge width 2, 3 and 4 mm)



KBN05M

Double-sided multi-edge CBN inserts

- MEGACOAT coating technology for CBN
- Continuous (high-speed finishing) to interrupted machining
- Hybrid grain structure for longer tool life
- High thermal conductivity for diffusing heat
- Superior wear and oxidation resistance



UM Dandia™ PCD and solid carbide countersink

Small diameter solenoid and valve bores

PCD-Reamer

- Small diameter (from $\varnothing 3$ H6)
- Reliable and cost-effective
- Highest hole quality, best roundness and surface

Groovingland tool

- Machining of all control edges with only one tool
- Highest geometry accuracy
- Reliable and cost-effective



MAIN SHAFT

High carbon steel

VC chipbreaker

For copying

- Strong edge design
- Excellent chip control
- High productivity machining various shapes and contours



DRA MagicDrill

High efficiency modular drill

- Optimal web thickness limits deflection
- Fine chip breaking and smooth deep hole drilling
- Easy insert replacement
- PR1535 MEGACOAT NANO insert grade for steel
- High speed & high feed drilling
- 1.5xD - 12xD



Oil hole

ORION

High performance drills

- Excellent hole accuracy with a low cutting force design
- Optimized cutting edge with 3xD drilling capabilities
- Increased positional accuracy and excellent pilot hole drill



KGD

Grooving / Cut-Off

- Excellent chip control
- Wide tooling lineup for multiple applications
- MEGACOAT coating technology for long tool life
- Edge tolerance of ± 0.03 mm (edge width 2, 3 and 4 mm)



KGBA

Grooving system

- Smooth chip evacuation with molded chipbreaker
- Smooth chip control with GM chipbreaker
- 3-edge inserts for shallow grooving applications
- PR1215 MEGACOAT for long tool life
- PR1625 MEGACOAT NANO for excellent wear resistance in steel and stainless steel applications



HYDROS

Coolant fed deep drills

- Double margin for smooth hole wall finish
- Point design for excellent hole accuracy
- Up to 15xD drilling capabilities
- Diameters 1.00 mm – 12.00 mm



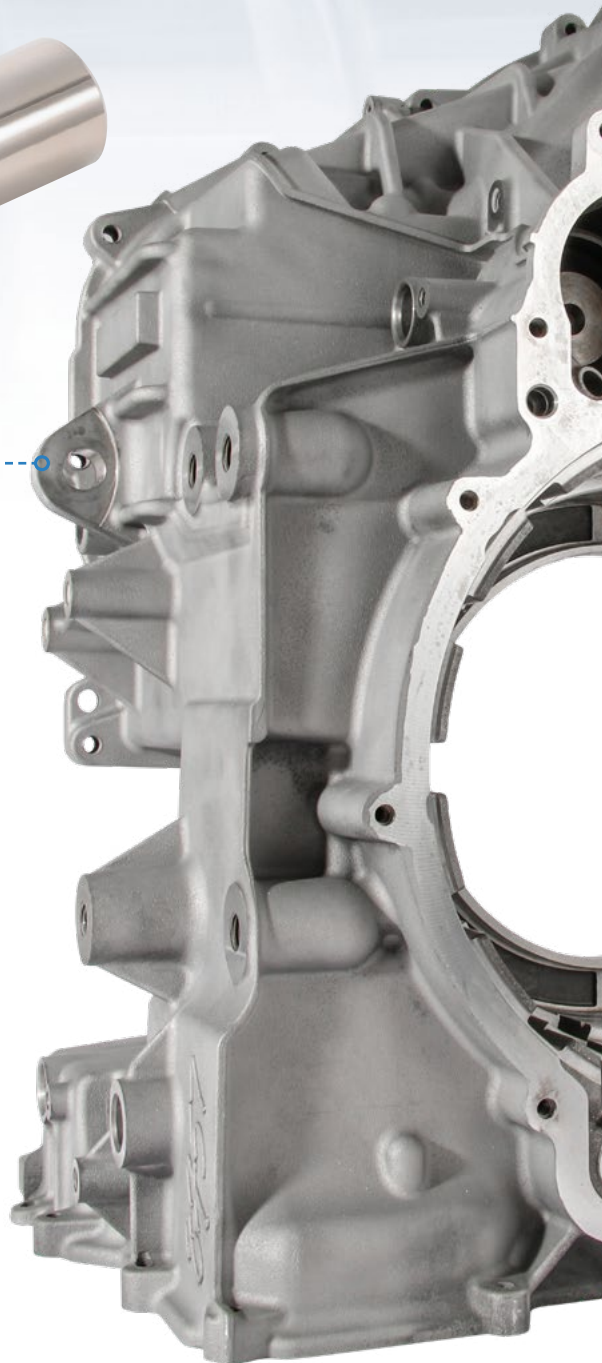
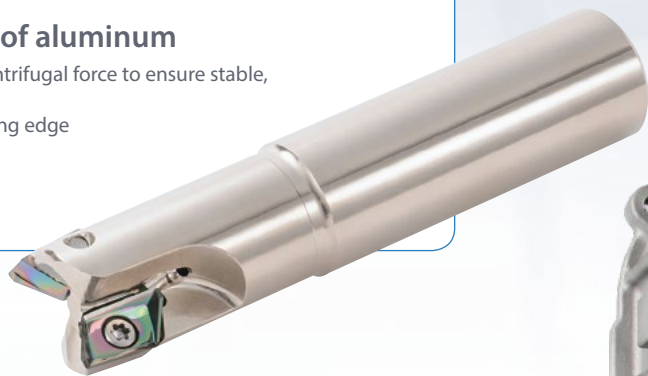
GEARBOX HOUSING

Aluminum

MEAS

High speed machining of aluminum

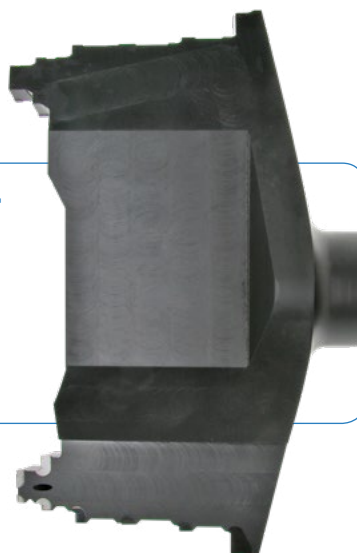
- Serrated insert pocket to resist centrifugal force to ensure stable, high speed machining
- Low cutting force with sharp cutting edge
- True rake angle max. 20°
- PDL025 for aluminum



UM Dandia™ PCD Step reamer

Large diameter reamer

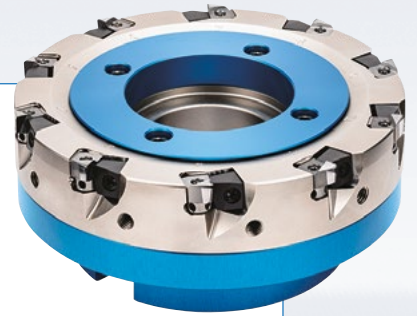
- High coax accuracy
- Easy handling due to fixed PCD cutting edges
- UM Dandia™ cutting edge geometry



MFAH

Milling cutter for finishing aluminum

- Easily adjustable edge height for highly efficient machining
- Steel body and light-weight hybrid body design with internal coolant
- Choose from 3 different cutting edge designs
- Unique KPD001 PCD inserts for aluminum



UM Dandia™ Profile milling cutter

Monoblock

- High geometry accuracy
- Machining of all grooves with only one tool
- Extreme life time



GEARBOX HOUSING

Aluminum

UM Dandia™ PCD profile reamer / cutter

- High profile accuracy
- Reaming and milling with same tool
- High process liability



MEC

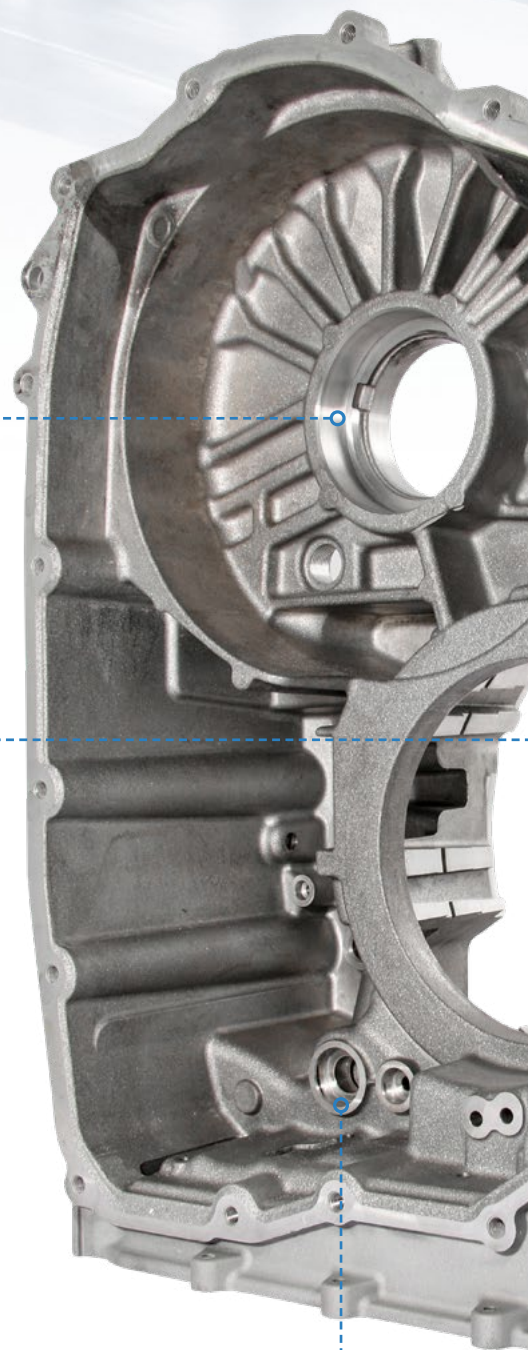
High efficiency milling cutter

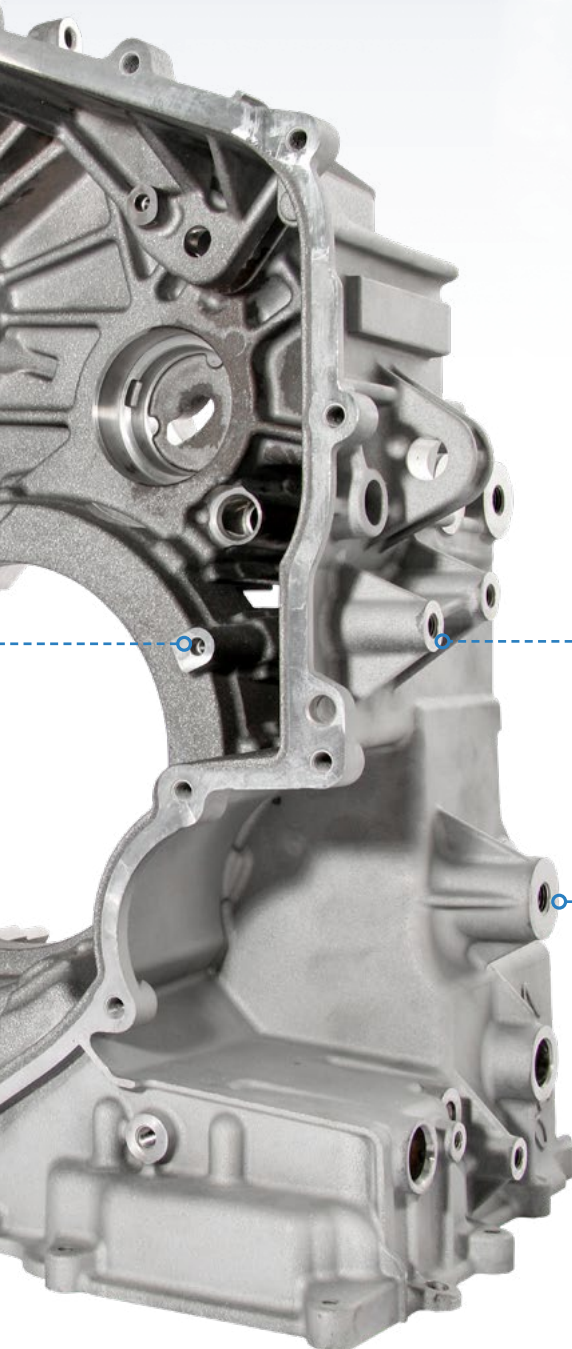
- Low cutting force and reduced chattering
- JA chipbreaker and PDL025 DLC coated inserts for aluminum
- KPD230/KPD001 PCD inserts for aluminum



UM Dandia™ PCD step drill SC drill center point

- High process liability
- Highest rigidity
- Excellent tool life





UM combination tool

Insert toolholder

- Combined tool for drilling and spotface machining
- Easy to change/adjust



UM Dandia™ PCD step reamer

High precession bore

- UM Dandia™ guidepad system
- High process liability
- Highest hole quality



CVT PULLEY

High carbon steel

KGD

Grooving / Cut-Off

- Excellent chip control
- Wide tooling lineup for multiple applications
- MEGACOAT coating technology for long tool life
- Edge tolerance of ± 0.03 mm (edge width 2, 3 and 4 mm)



DRV MagicDrill

High efficiency drill

- 2D to 6D maximum deep-hole drilling lineup
- 4 types of chipbreakers
- High speed and highly efficient machining available with the combination of a CVD outer insert and PVD inner insert
- Highly rigid design with chattering resistance and excellent hole accuracy



PV710/PV720

TN610/TN620

Hybrid cermet for steel turning

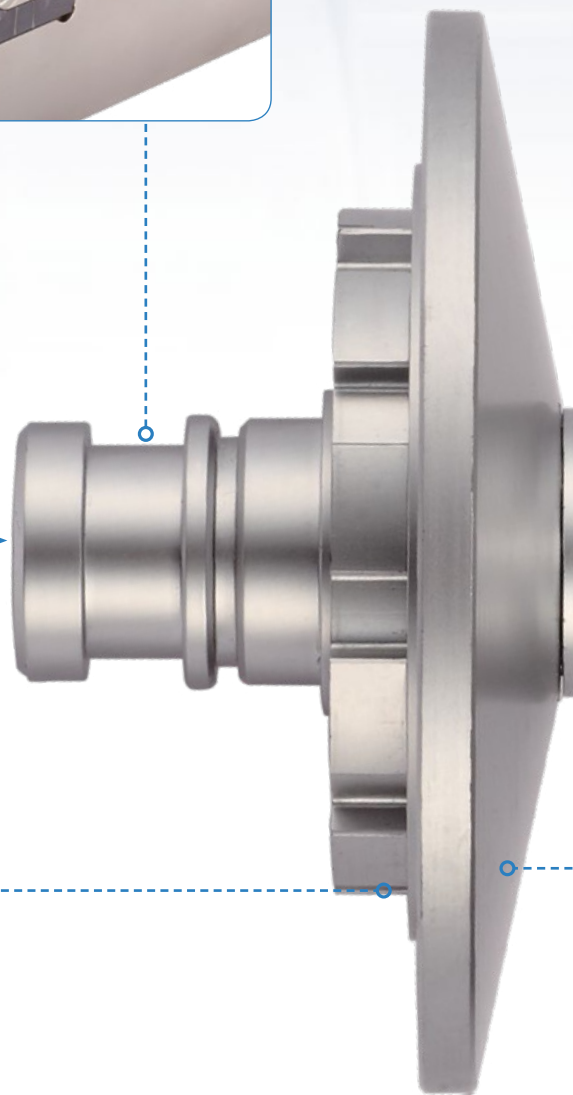
- Excellent surface finish, fracture and wear resistance
- PV710/PV720 ensures longer tool life with MEGACOAT NANO coating technology
- TN610/TN620 are uncoated cermets for more cost efficiency



CA025P

New CVD coated carbide for steel turning

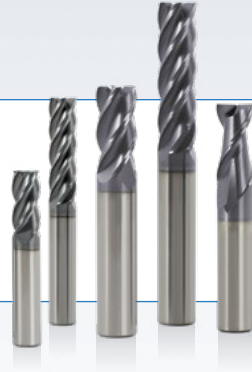
- Long tool life and stable machining
- Various chipbreakers available for steel machining
- Special substrate and tough coating layer for high wear and fracture resistance



Q Series

Variable helix corner radius end mill

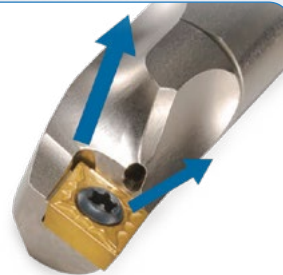
- Superior anti vibration performance due to variable pitch flute design
- Long tool life and smooth surface finish in medium – finishing application
- Superior wear and oxidation resistance with MEGACOAT



Dynamic Bar

Boring / Internal facing

- Maximum structural thickness for high rigidity
- Reduced chatter for stable machining
- Large chip pocket for superior chip evacuation
- High quality surface finish by WP chipbreaker
- Dual chip flow



SIGC

New internal grooving system

- Excellent chip evacuation with double coolant holes
- 8 mm minimum boring diameter
- Firm insert clamping system provides high-precision machining
- MEGACOAT NANO PLUS (PR1725) maintains long tool life and excellent surface finish.



TQ chipbreaker / KTN-JCT

External threading

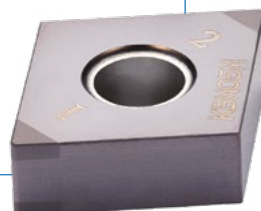
- Stable chip control with asymmetric chipbreaker design, regardless of cutting direction
- Strong edge and low cutting force
- KTN-JCT toolholder provides efficient cooling of the cutting edge, preventing insert from wear
- Prevents chip entanglement by directing the chips downward



KBN05M

Double-sided multi-edge CBN inserts

- MEGACOAT coating technology for CBN
- Continuous (high-speed finishing) to interrupted machining
- Hybrid grain structure for longer tool life
- High thermal conductivity for diffusing heat
- Superior wear and oxidation resistance



KNUCKLE

Steel / Cast iron

MFWN

90° double-sided 6-edge milling cutter

- Sharp cutting with low cutting forces
- Resistant to chattering and applicable to long overhang
- PR1510 MEGACOAT NANO insert grade for cast iron
- PDL025 DLC coated inserts for aluminum



MEW

90° double-sided 4-edge milling cutter

- Economical 4-edge inserts
- Improved durability and insert installation accuracy
- PR1510 for cast iron
- PR1525 MEGACOAT NANO inserts for steel



ORION

High performance drills

- Excellent hole accuracy with a low cutting force design
- Optimized cutting edge with 3xD and 5xD drilling capabilities
- Increased positional accuracy and excellent pilot hole drill



HYDROS

Coolant fed deep drills

- Double margin for smooth hole wall finish
- Point design for excellent hole accuracy
- Up to 15xD drilling capabilities
- Diameters 1.00 mm – 12.00 mm



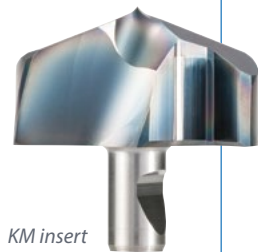
MSTB Slot mill

- Up-right semi-adjustable groove width
- Easy-to-install screw clamp inserts
- Various inserts for multiple applications
- 6.35 mm - 13.69 mm slot widths



DRA MagicDrill High efficiency modular drill

- Optimal web thickness limits deflection
- Fine chip breaking and smooth deep hole boring
- Easy insert replacement
- PR1535 MEGACOAT NANO insert grade for steel
- PR1525 MEGACOAT NANO insert grade for cast iron



*KM insert
for cast iron*



UM customized carbide tools Intelligent tooling solutions

- High performance / High productivity
- Preformed carbide with internal coolant for optimum lubrication
- Short delivery time
- Various type of coating



BRAKE DISK & CV JOINT

Steel / cast iron

KGBA

Grooving system

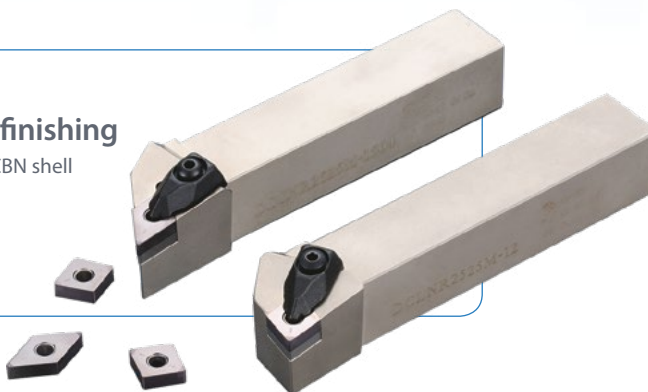
- Smooth chip evacuation with molded chipbreaker
- Smooth chip control with GM chipbreaker
- 3-edge inserts for shallow grooving applications
- PR1215 MEGACOAT for long tool life
- PR1625 MEGACOAT NANO for excellent wear resistance in steel and stainless steel applications



KBN35M

MEGACOAT CBN for heat-treated finishing

- Composite wear resistant CBN core and tough CBN shell
- Heat-resistant MEGACOAT coating technology
- Stable interrupted hardened steel machining
- Exceptional fracture resistance



CCX

New CVD coated cermet for steel turning

- Unique cermet base material with thick CVD coating
- Excellent wear resistance provides long tool life for low carbon steel, general steel and cast iron machining
- Excellent surface finish
- Vc max. 800 m/min

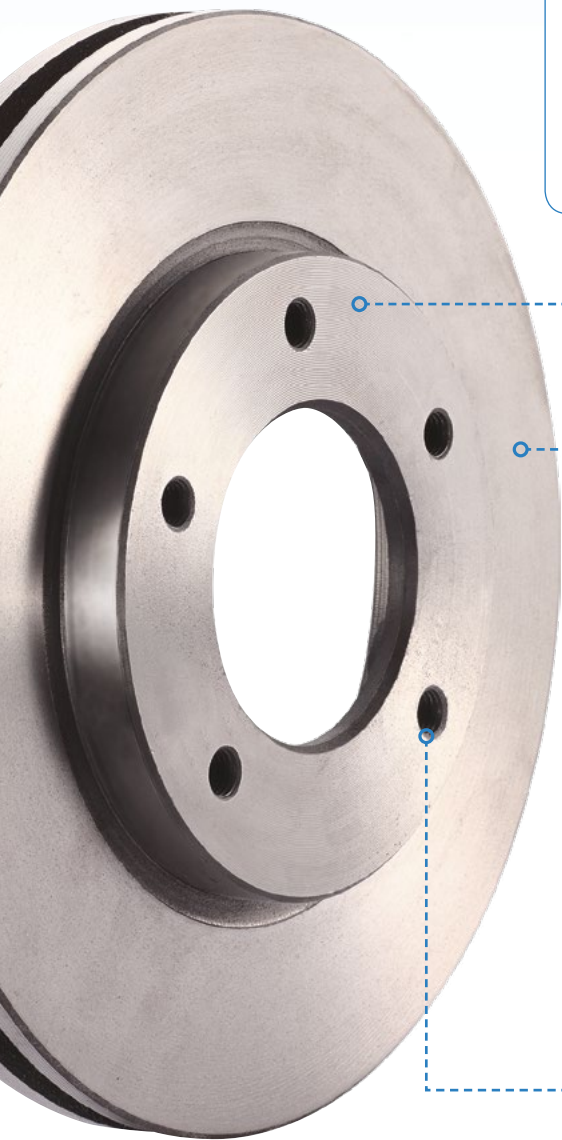


CA025P

New CVD coated carbide for steel turning

- Long tool life and stable machining
- Various chipbreakers available for steel machining
- Special substrate and tough coating layer for high wear and fracture resistance

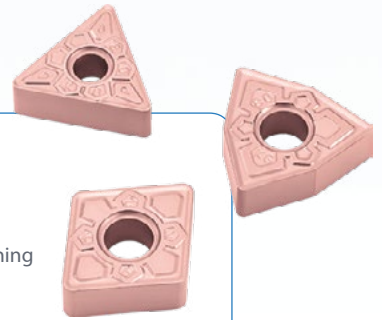




CA3 series

Cast iron turning

- Micro TiCN coating provides excellent wear results
- Improved coating adhesion prevents chipping for stable machining
- KG chipbreaker for continuous to interruption
- KH chipbreaker for interruption to heavy interruption
- KQ chipbreaker for sharpness



KS6015 / KS6050 / CS7050

Silicon nitride ceramic

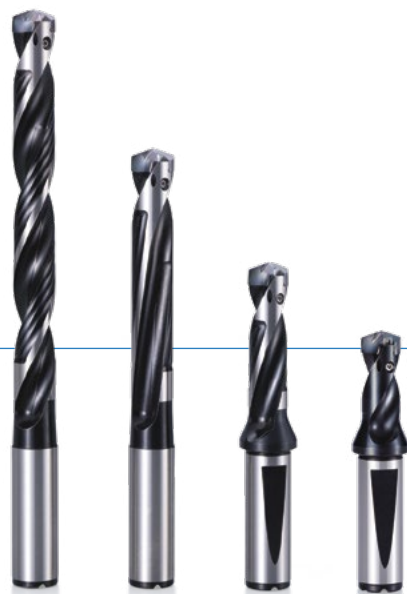
- High speed machining of cast iron
- Thermal shock resistant
- KS6015: Wear resistant machining
- KS6050 for stable roughing and interrupted machining
- CS7050 for finishing and continuous machining



DRA MagicDrill

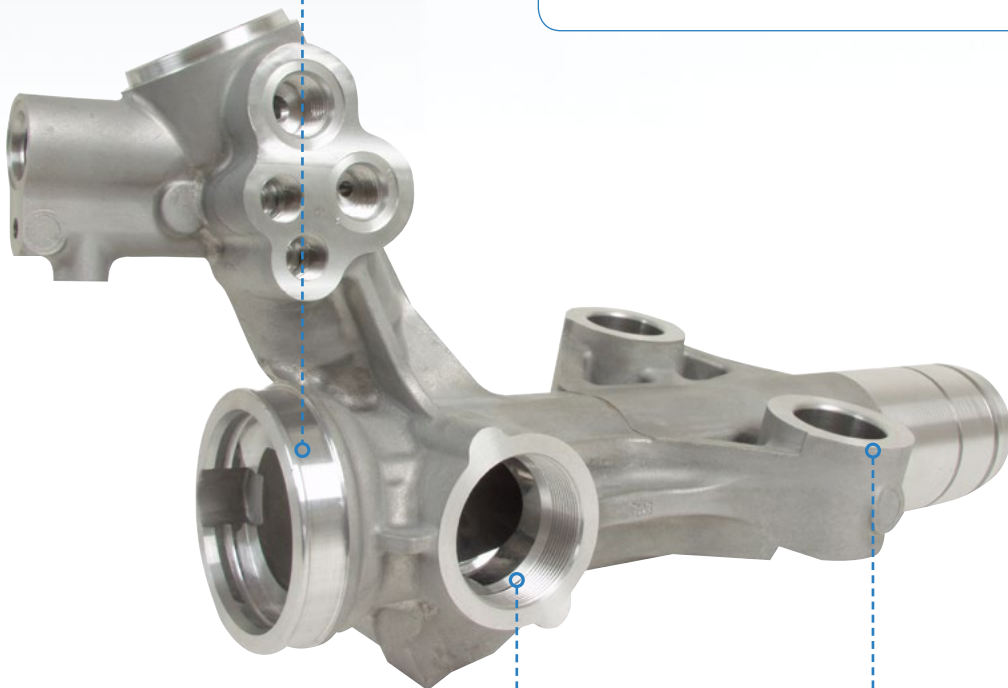
High efficiency modular drill

- Optimal web thickness limits deflection
- Fine chip breaking and smooth deep hole boring
- Easy insert replacement
- PR1535 MEGACOAT NANO insert grade for steel
- PR1525 MEGACOAT NANO insert grade for cast iron
- 3 different insert types to meet various application



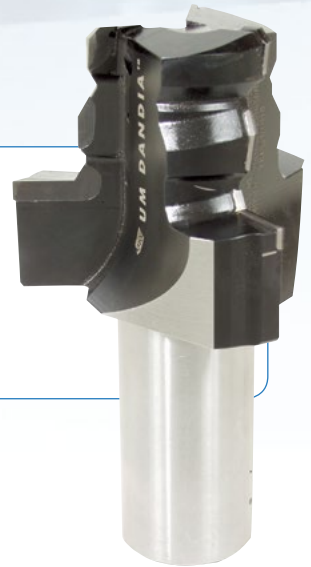
STEERING HOUSING

Aluminum



UM Dandia™ PCD profile reamer / cutter

- High profile accuracy
- Reaming and milling with same tool
- High process liability



UM Dandia™ PCD mill

- Superior feed rates and excellent tool life
- Coolant supply to each tip
- Available as monoblock type or with cylindrical shank



UM Dandia™ PCD step drill SC drill center point

- High process liability
- Highest rigidity
- Excellent tool life



UM customized carbide tools

Intelligent tooling solutions

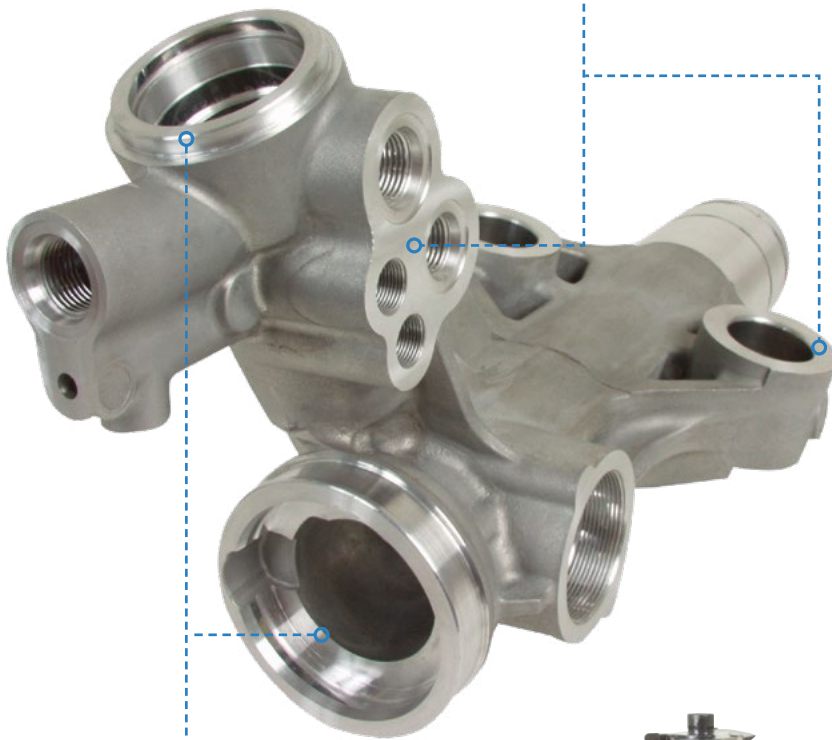
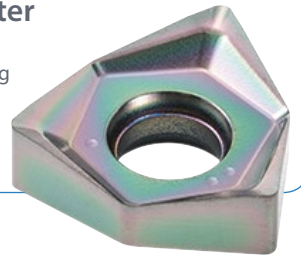
- High performance / High productivity
- Preformed carbide with internal coolant for optimum lubrication
- Short delivery time
- Various type of coating



MFWN

90° double-sided 6-edge milling cutter

- Sharp cutting with low cutting forces
- Resistant to chattering and applicable to long overhang
- PR1510 MEGACOAT NANO insert grade for cast iron
- PDL025 DLC coated inserts for aluminum



UM Dandia™ PCD profile cutter

- High geometry accuracy
- Machining of all grooves with only one tool
- Extreme tool life



WISHBONE

Aluminum

MEAS

High speed machining of aluminum

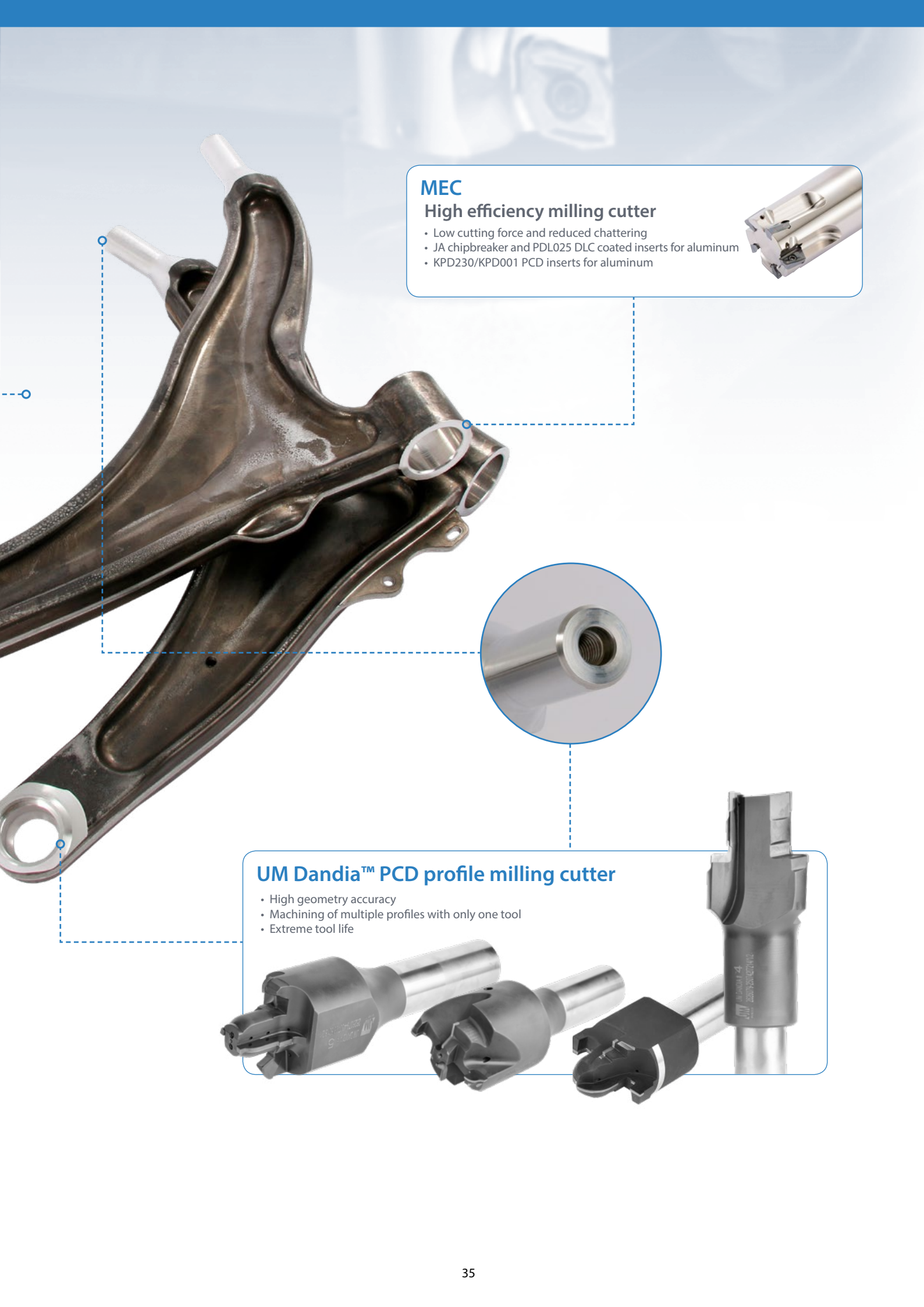
- Serrated insert pocket to resist centrifugal force to ensure stable, high speed machining
- Low cutting force with sharp cutting edge
- True rake angle max. 20°
- PDL025 for aluminum



UM Dandia™ PCD mill back / front mill

- Superior feed rates and excellent tool life
- Coolant supply to each tip
- Available as monoblock type or with cylindrical shank





MEC

High efficiency milling cutter

- Low cutting force and reduced chattering
- JA chipbreaker and PDL025 DLC coated inserts for aluminum
- KPD230/KPD001 PCD inserts for aluminum



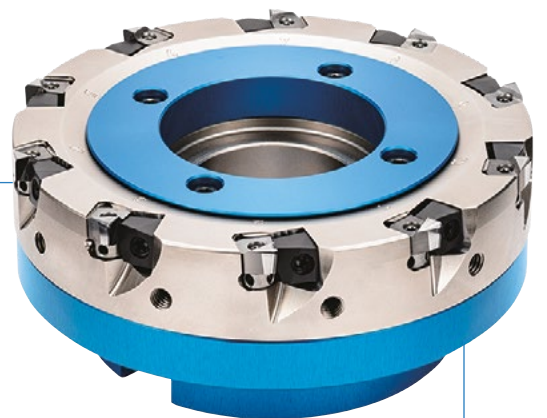
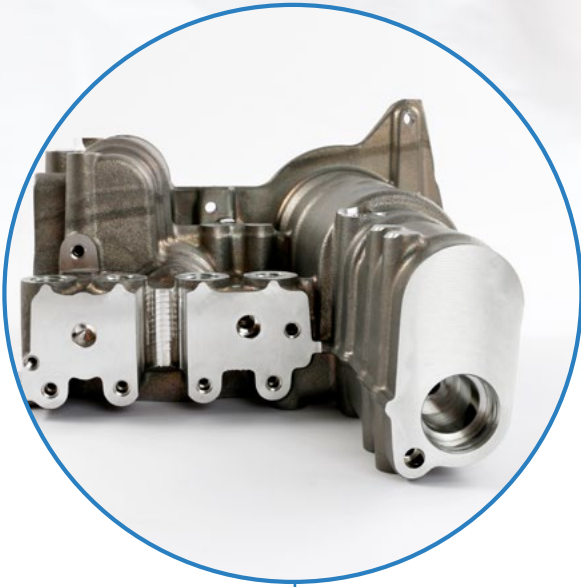
UM Dandia™ PCD profile milling cutter

- High geometry accuracy
- Machining of multiple profiles with only one tool
- Extreme tool life



ABS BRAKE

Aluminum



MFAH

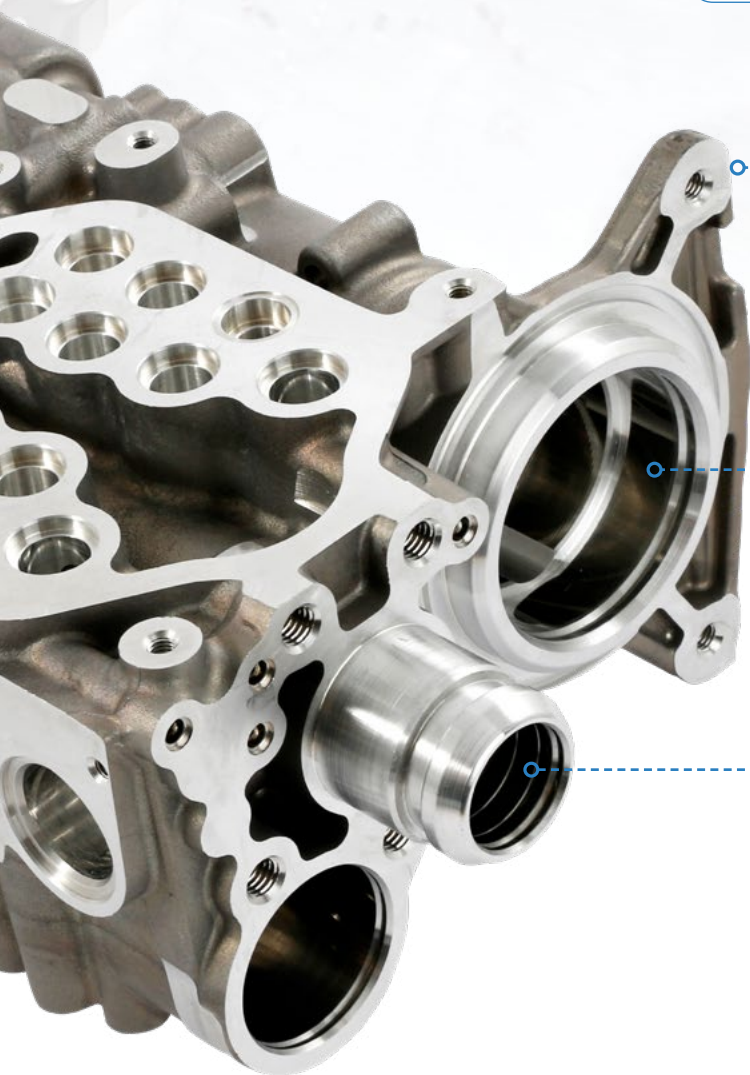
Milling cutter for finishing aluminum

- Easily adjustable edge height for highly efficient machining
- Steel body and light-weight hybrid body design with internal coolant
- Choose from 3 different cutting edge designs
- Unique KPD001 PCD inserts for aluminum

MEC

High efficiency milling cutter

- Low cutting force and reduced chattering
- JA chipbreaker and PDL025 DLC coated inserts for aluminum
- KPD230/KPD001 PCD inserts for aluminum



UM Dandia™ PCD reamer / profile cutter

- High geometry accuracy
- Machining of all grooves / profiles with only one tool
- Extreme tool life

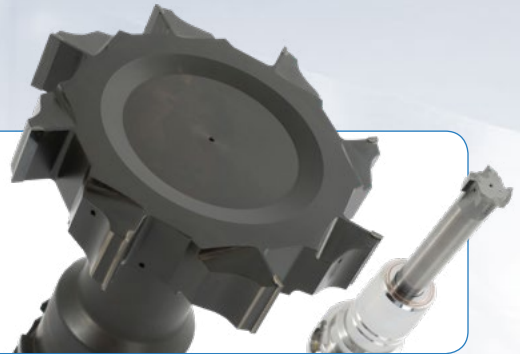


FRAME ELEMENT

Aluminum

UM Dandia™ PCD mill

- Easy handling due to fixed PCD cutting edge
- Coolant supply to each tip
- Available as monoblock type or with cylindrical shank



UM Dandia™ PCD multi mill

- Superior feed rates and excellent tool life
- Coolant supply to each tip
- Available as monoblock type or with cylindrical shank
- Special geometry avoid burrs



UM Dandia™ PCD step drill Monoblock

- Burrless machining
- Short chips breaking
- High process liability
- Excellent tool life



Step drill with multiple indexable inserts

Monoblock

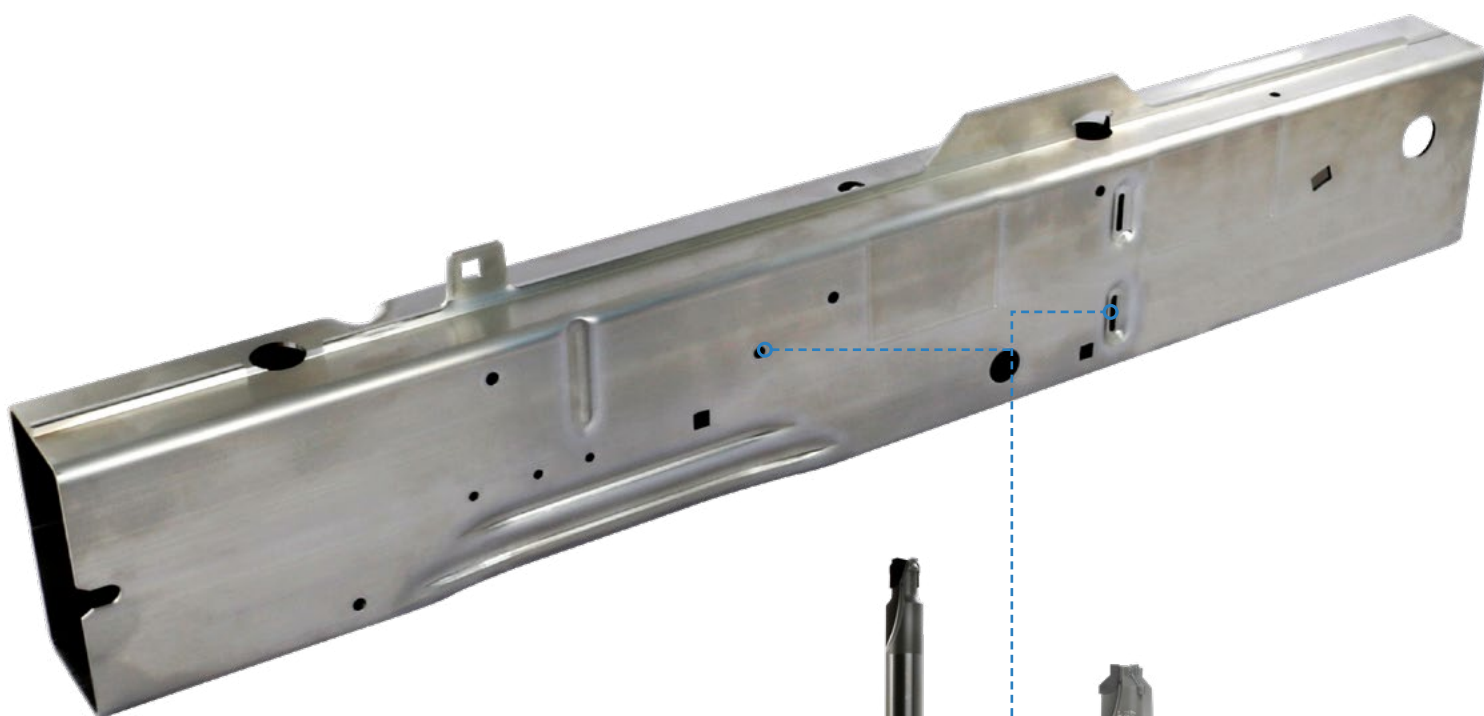
- Indexable drilling insert (ZXMT)
- DLC hydrogen free coated carbide turning insert PDL025
- Excellent tool life



UM Dandia™ PCD drill / mill

Drilling and milling in one tool

- UM Dandia™ cutting edge geometry
- High process liability
- Highest hole quality



UM Dandia™ PCD step reamer

- UM Dandia™ cutting edge geometry
- Superior feed rates and excellent tool life
- Easy handling due to fixed PCD cutting edge



AUTOMOTIVE

TOOLING SOLUTIONS

