

THE NEW VALUE FRONTIER



Tooling solutions | **Automotive**

Tooling solutions for

Automotive

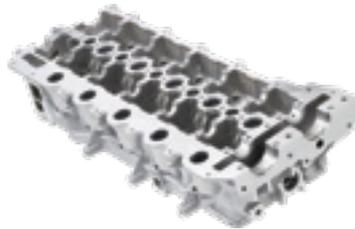


Providing optimal tooling solutions for automotive industry



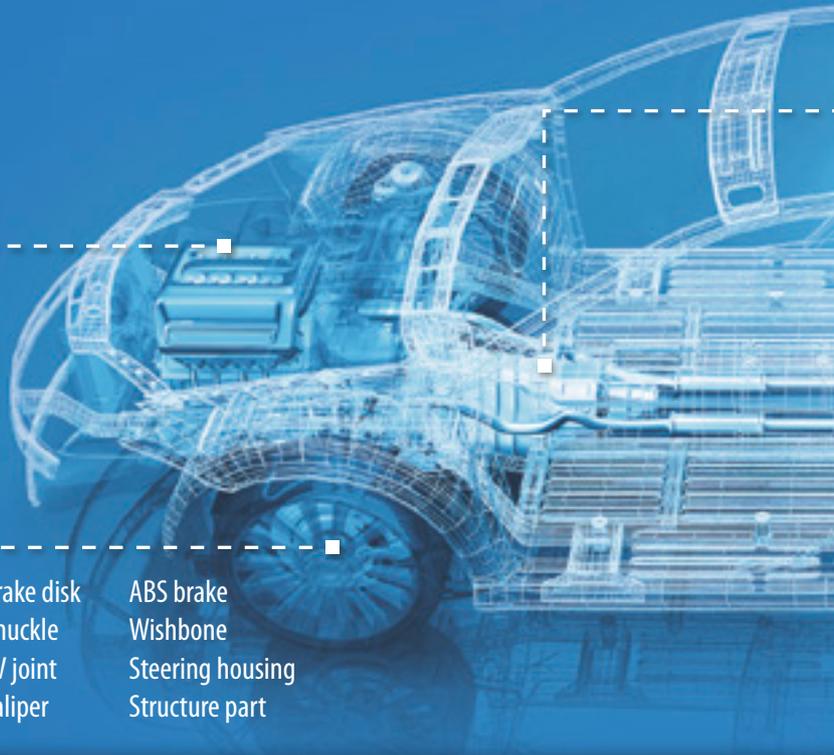
AUTOMOTIVE

TOOLING SOLUTIONS



Engine

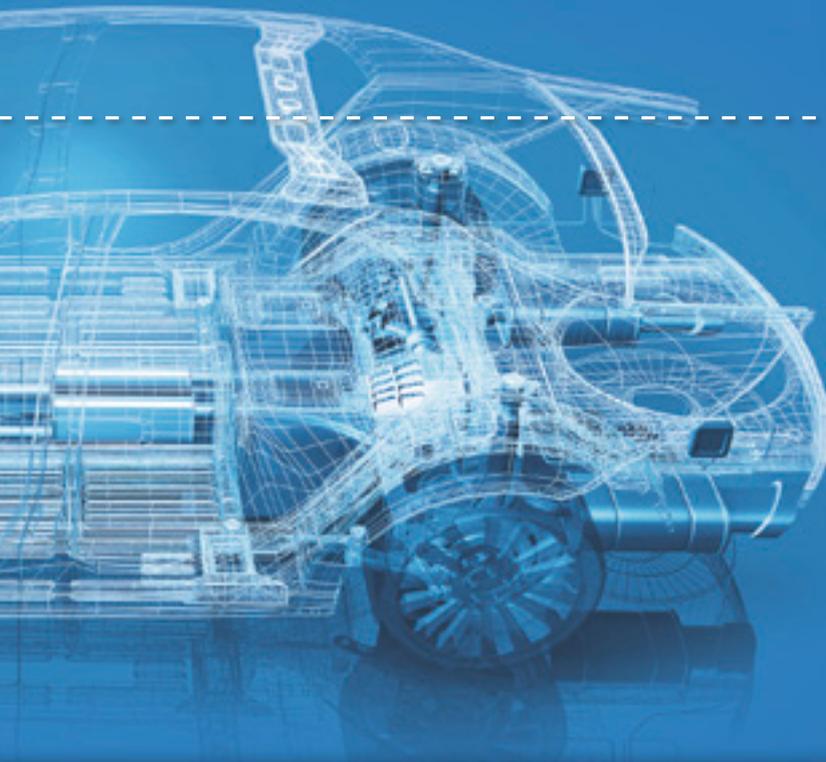
- Crankcase
- Cylinder head
- Crankshaft
- Camshaft
- Connecting rod
- Piston head



- 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



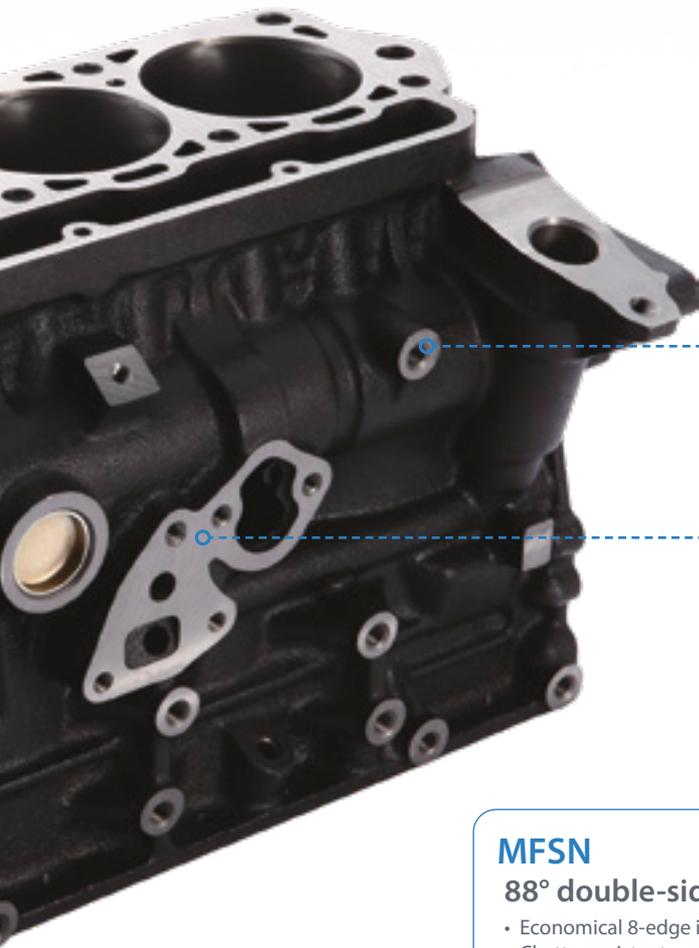
DRA MagicDrill

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



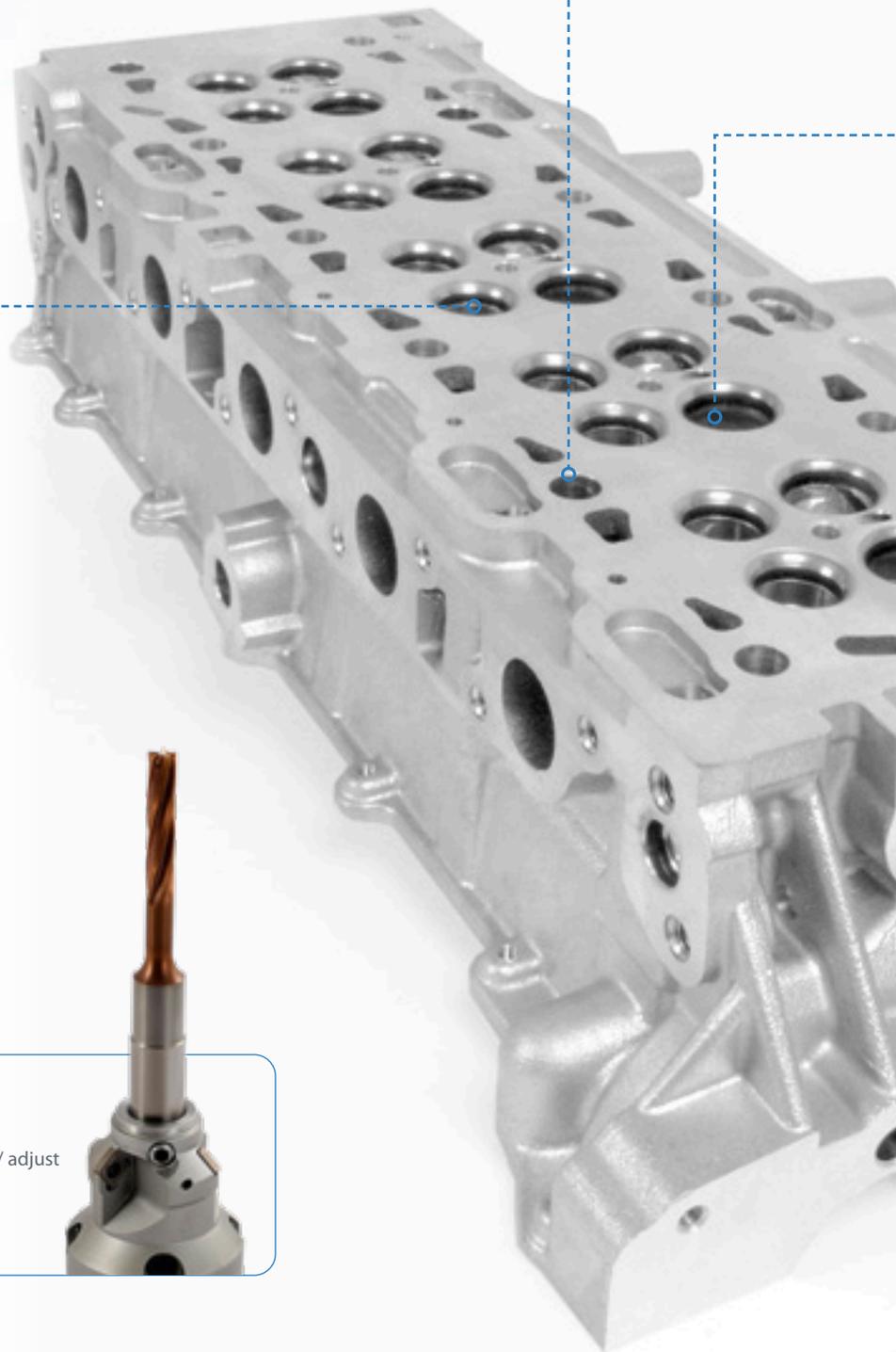
CYLINDER HEAD

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

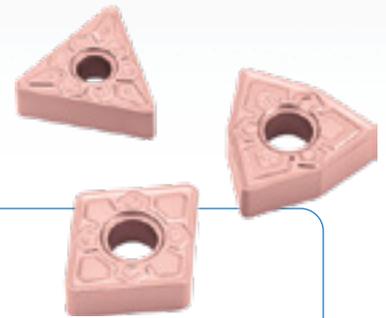
- Excellent chip control
- Wide tooling lineup for multiple applications
- MEGACOAT coating technology for long tool life
- Edge tolerance of ± 0.03 mm (edge width 2, 3 and 4 mm)



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

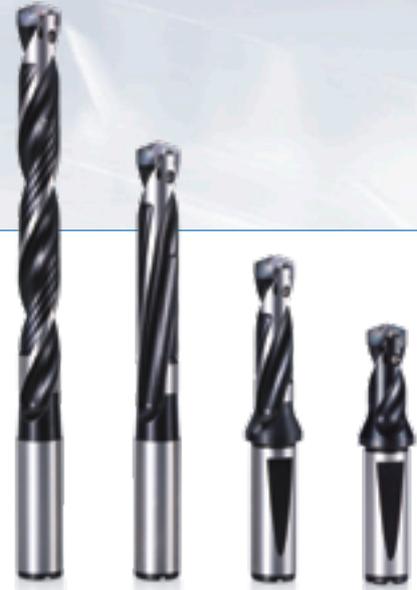


CONNECTING ROD

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



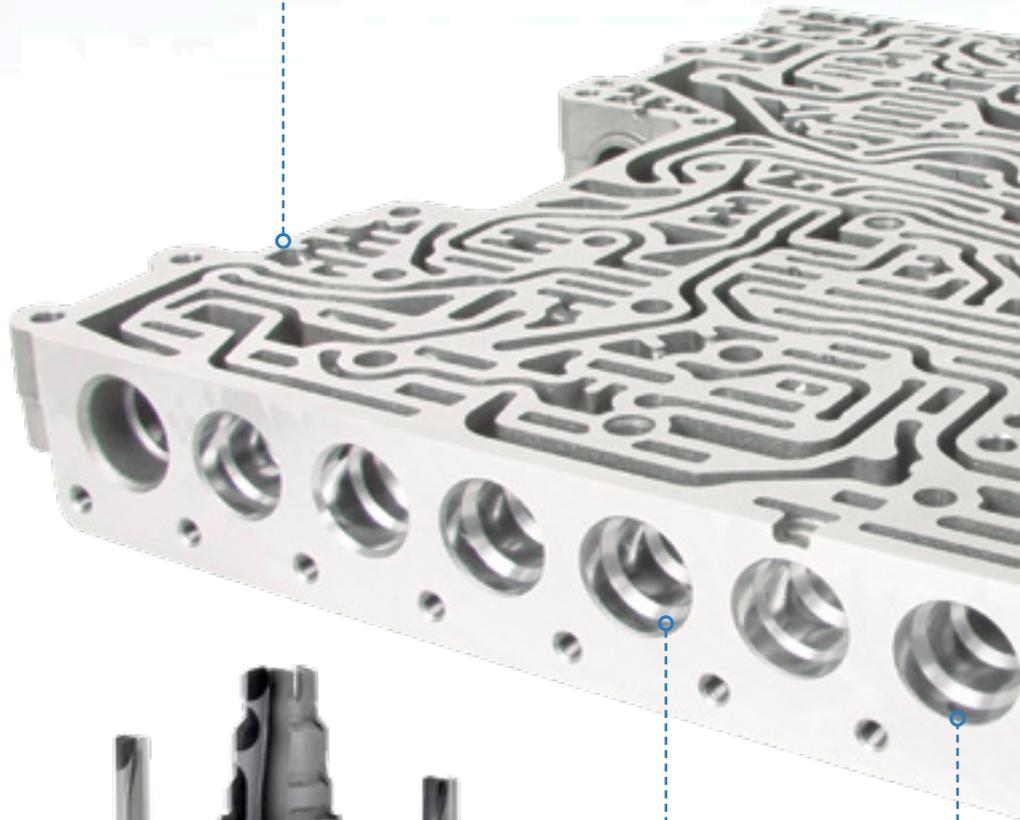
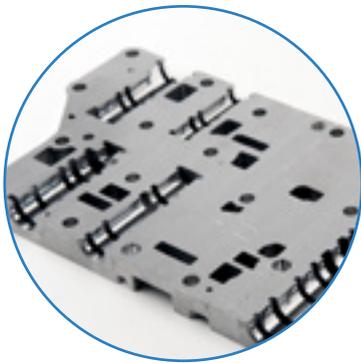
VALVE BODY

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

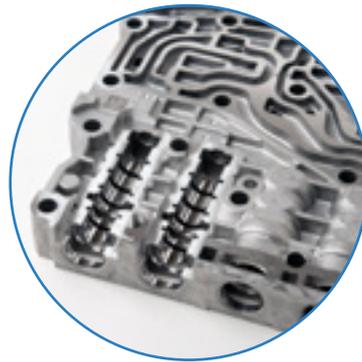
Cartridge bores / valve bores

- 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 shot 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



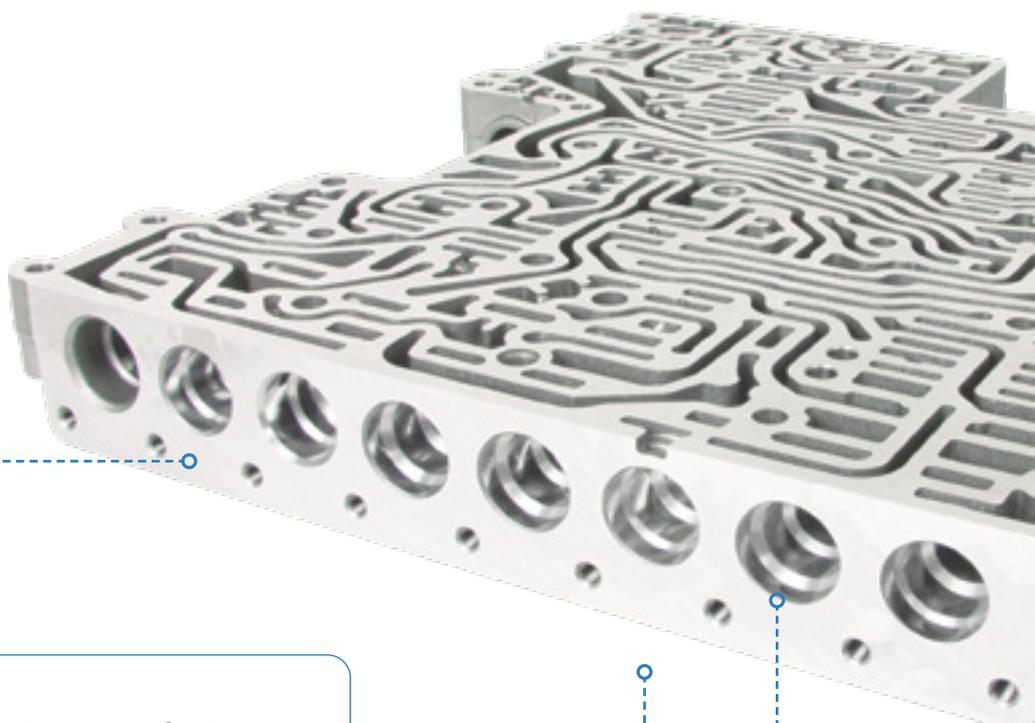
VALVE BODY

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.:



MEW



MEC



MFWN

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



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

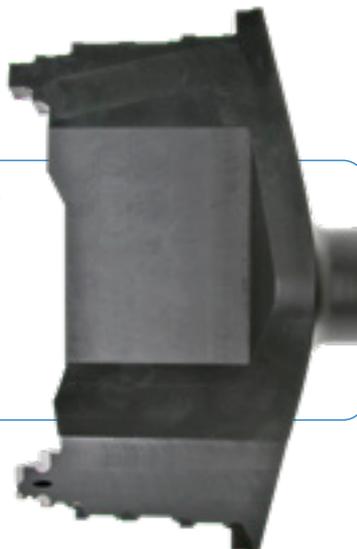
- Serrated insert pocket to resist centrifugal force to ensure stable, high speed machining
- Low cutting force with sharp cutting edge
- True rake angle max. 20°
- PDL025 for aluminum



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

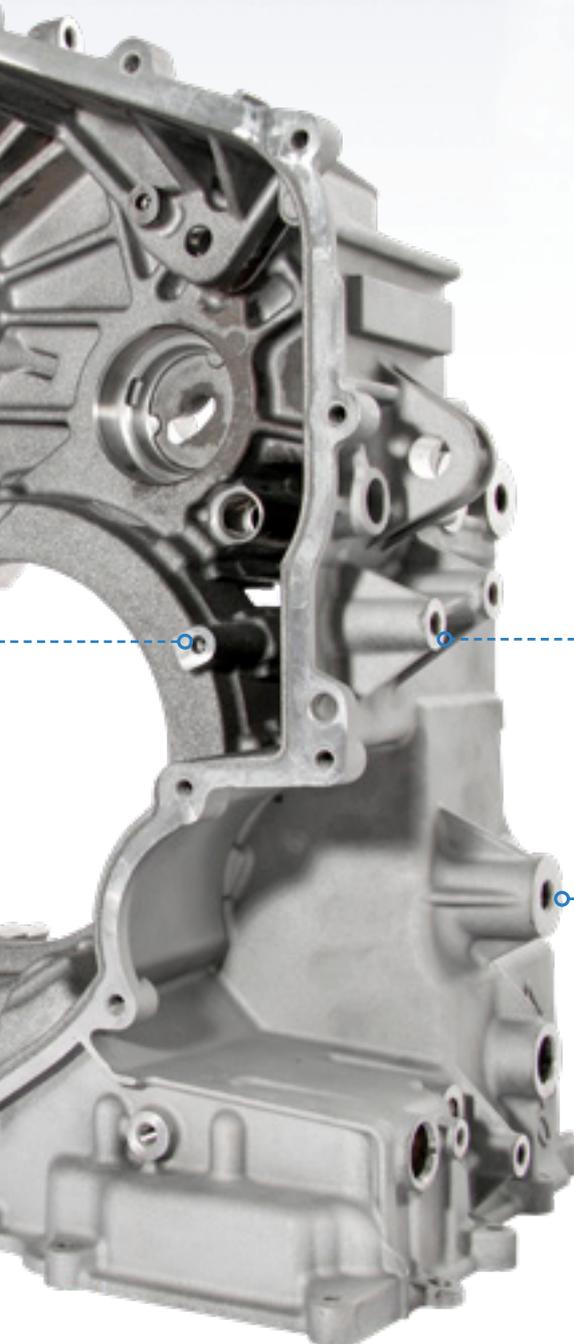
- Low cutting force and reduced chattering
- JA chipbreaker and PDL025 DLC coated inserts for aluminum
- KPD230/KPD001 PCD inserts for aluminum



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 precision bore

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



CVT PULLEY

High carbon steel

KGD

Grooving / Cut-Off

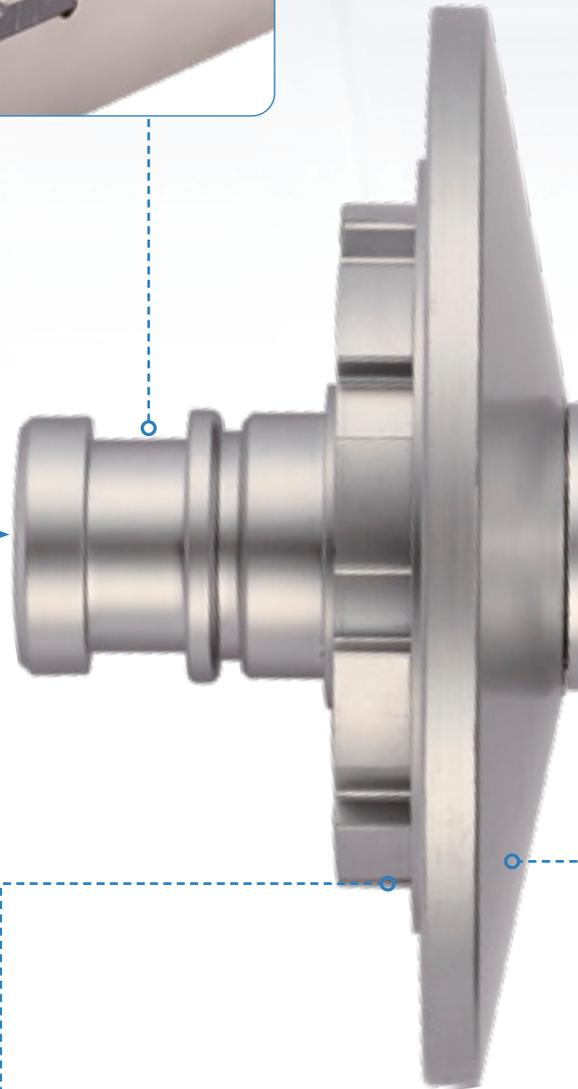
- Excellent chip control
- Wide tooling lineup for multiple applications
- MEGACOAT coating technology for long tool life
- Edge tolerance of ± 0.03 mm (edge width 2, 3 and 4 mm)



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

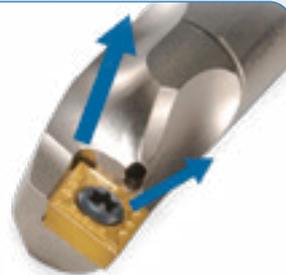
- Superior anti vibration performance due to variable pitch flute design
- Long tool life and smooth surface finish in medium – finishing application
- Superior wear and oxidation resistance with MEGACOAT



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

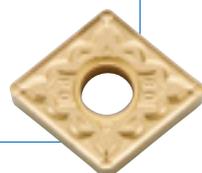
- Unique cermet base material with thick CVD coating
- Excellent wear resistance provides long tool life for low carbon steel, general steel and cast iron machining
- Excellent surface finish
- Vc max. 800 m/min

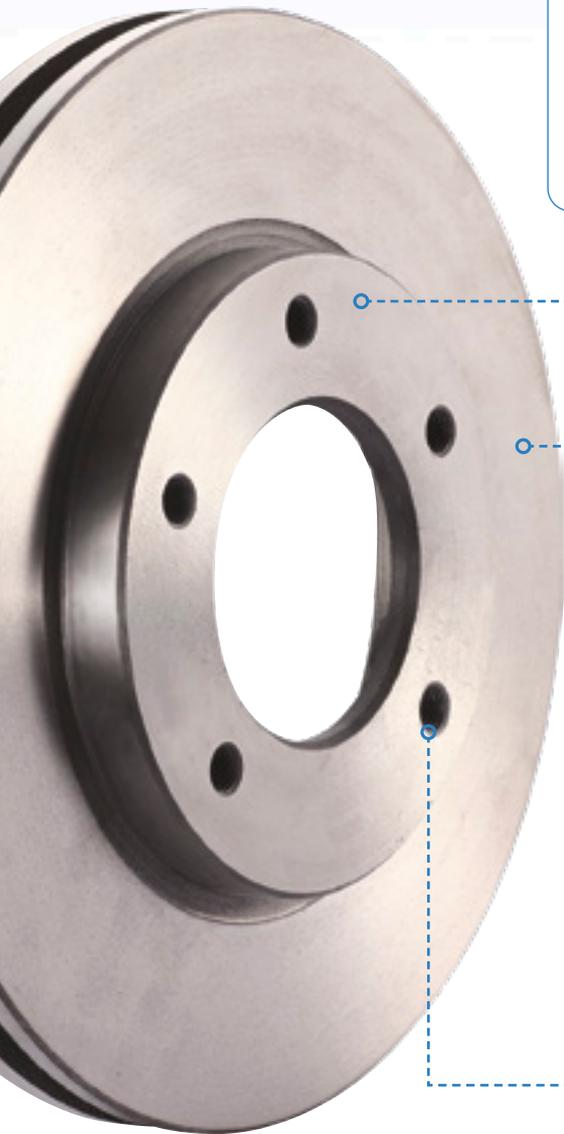


CA025P

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

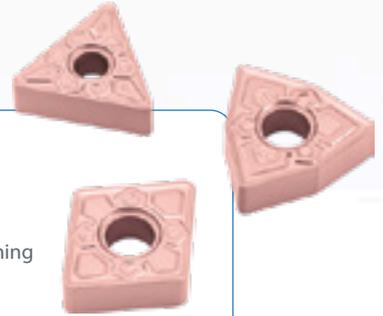




CA3 series

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

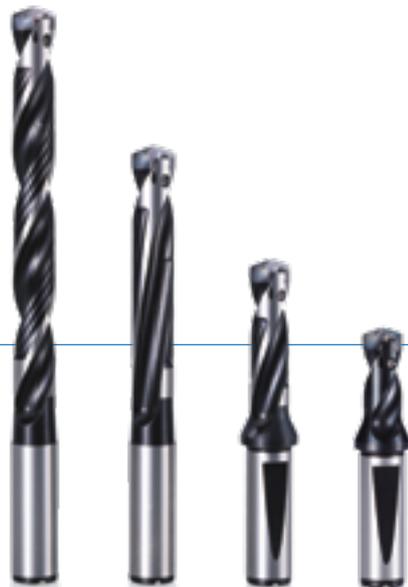
- High speed machining of cast iron
- Thermal shock resistant
- KS6015: Wear resistant machining
- KS6050 for stable roughing and interrupted machining
- CS7050 for finishing and continuous machining



DRA MagicDrill

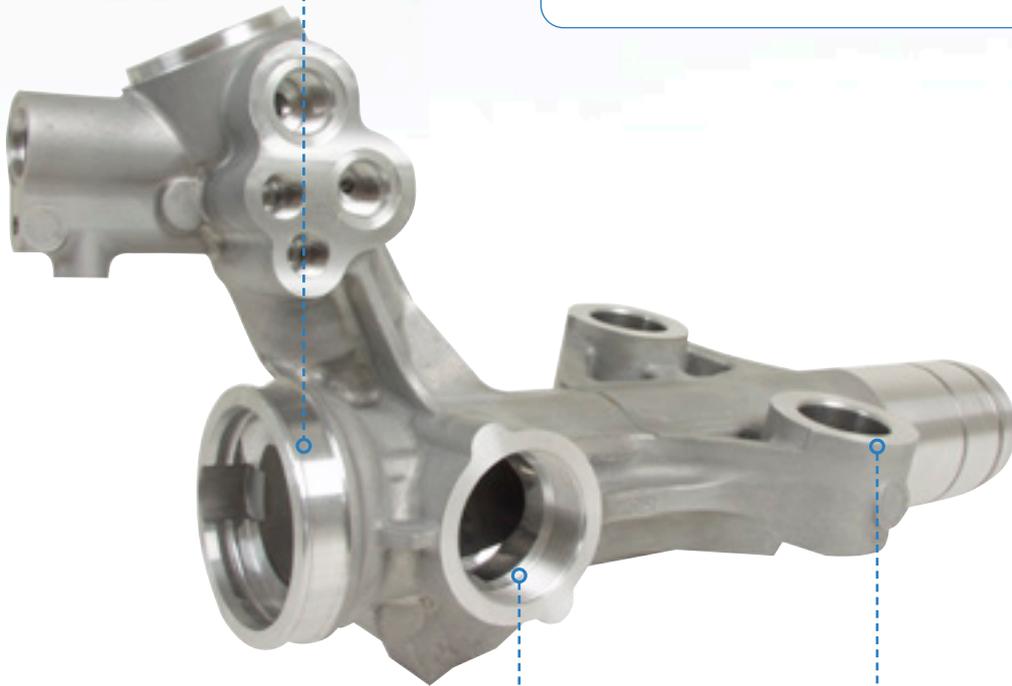
High efficiency modular drill

- 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

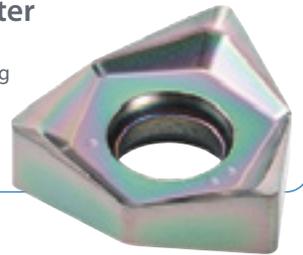
- High performance / High productivity
- Preformed carbide with internal coolant for optimum lubrication
- Short delivery time
- Various type of coating



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



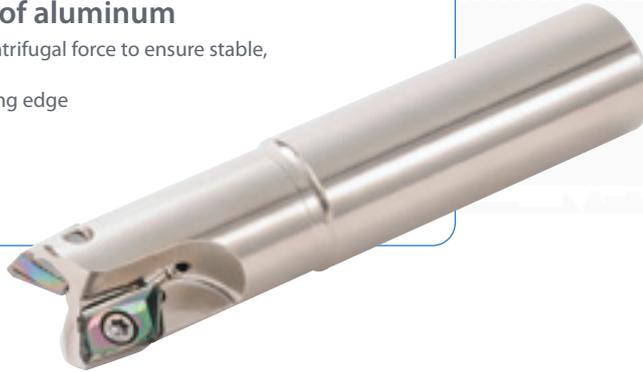
WISHBONE

Aluminum

MEAS

High speed machining of aluminum

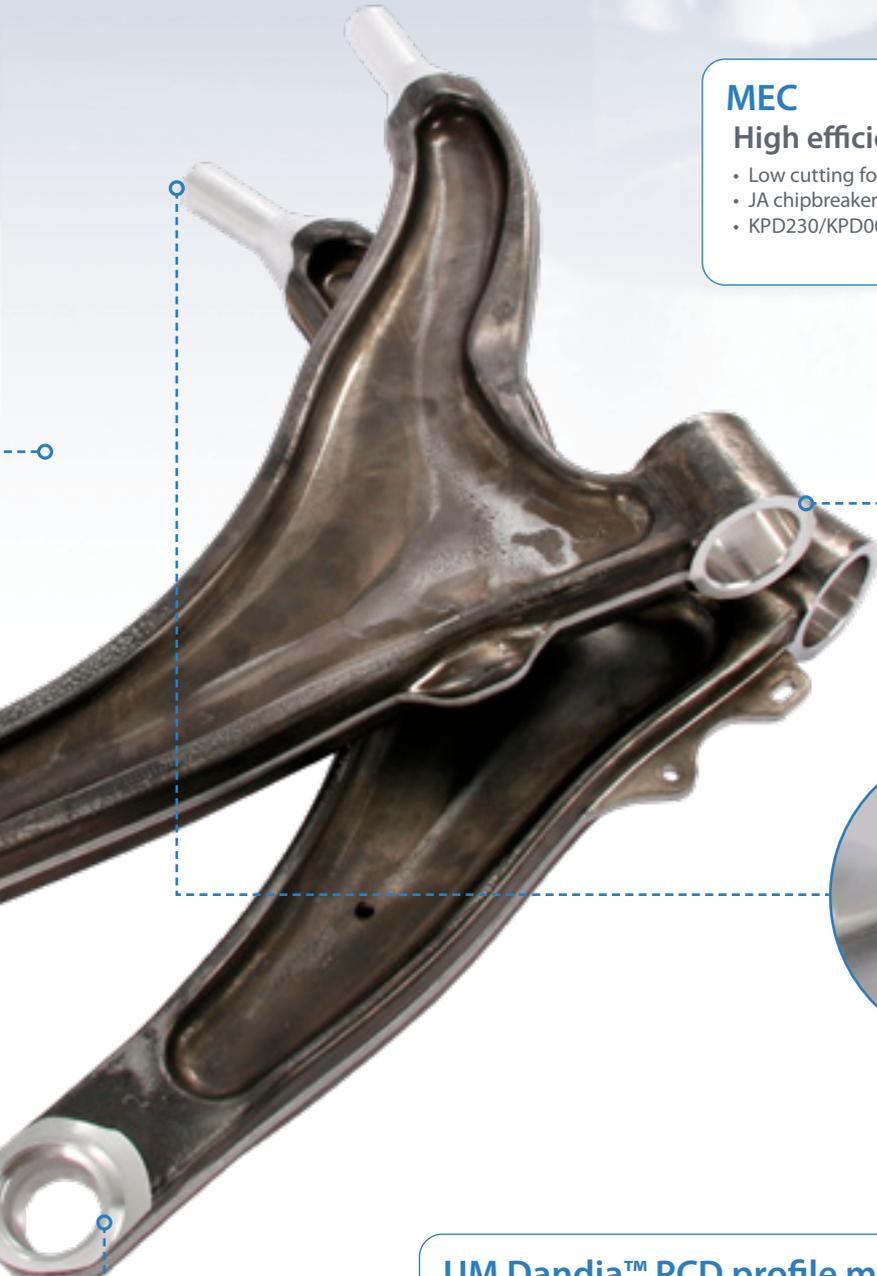
- Serrated insert pocket to resist centrifugal force to ensure stable, high speed machining
- Low cutting force with sharp cutting edge
- True rake angle max. 20°
- PDL025 for aluminum



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

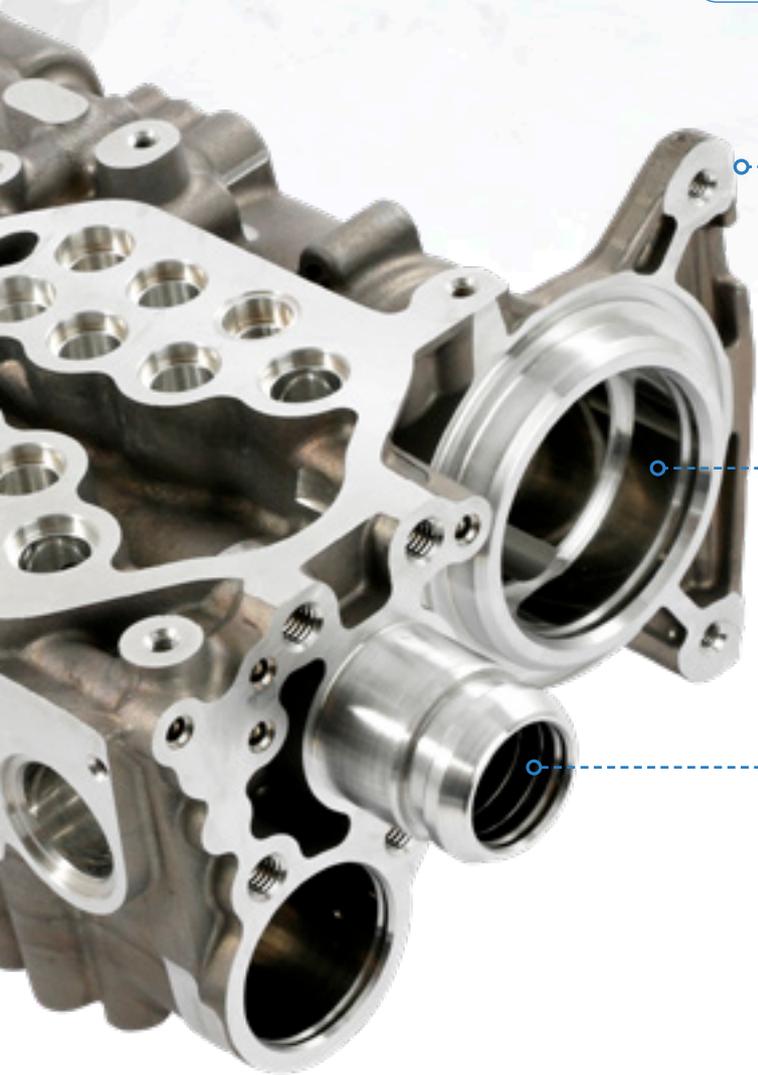
Milling cutter for finishing aluminum

- 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

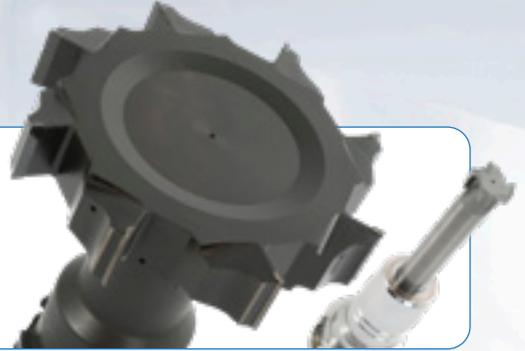


FRAME ELEMENT

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



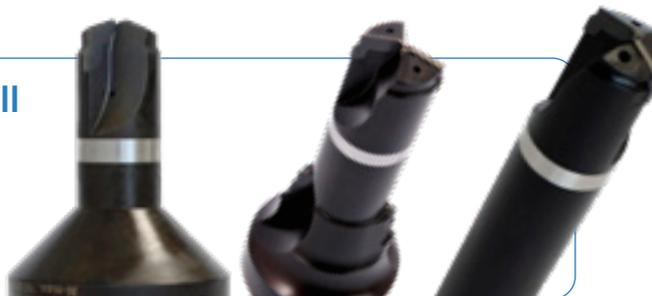
UM Dandia™ PCD multi mill

- 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

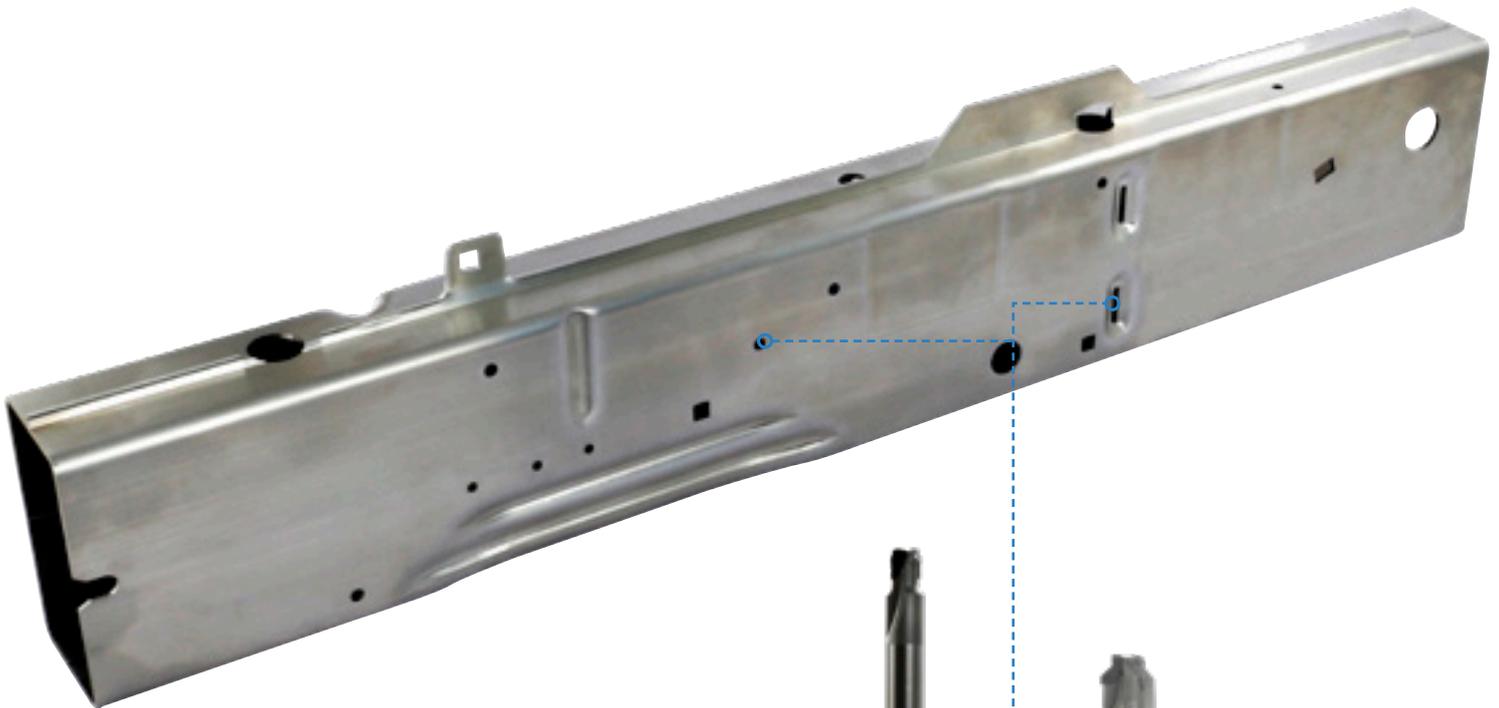
- Indexable drilling insert (ZXMT)
- DLC hydrogen free coated carbide turning insert PDL025
- Excellent tool life



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

