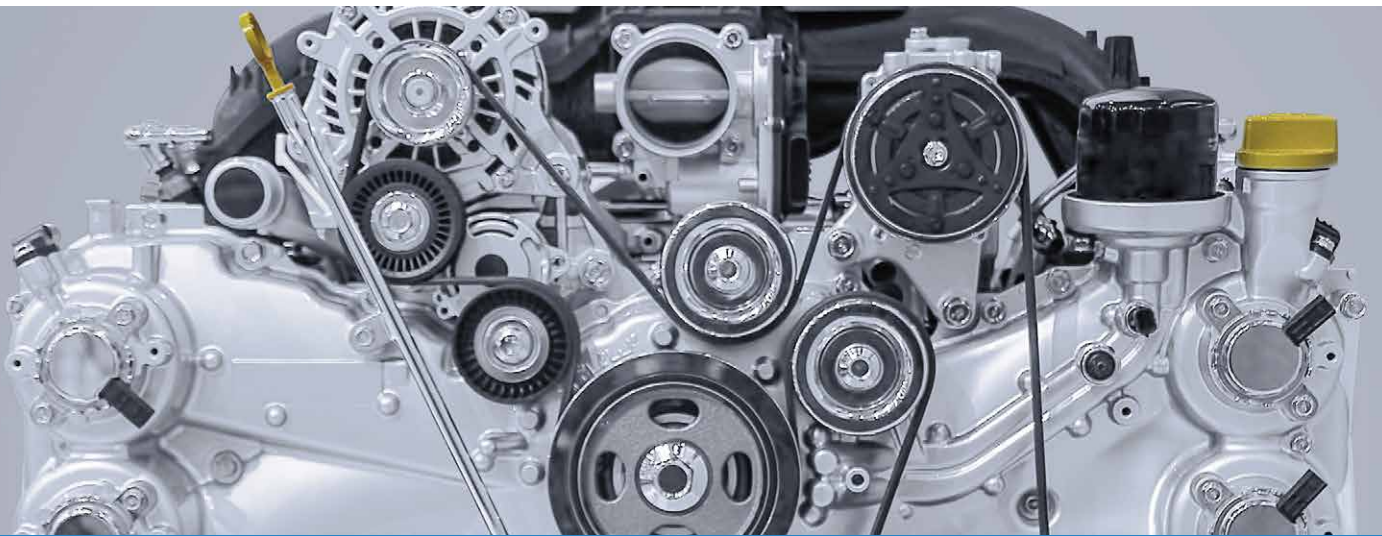


Automotive

Tooling Solutions



Providing Optimal Tooling Solutions for Automotive Machining

- Crankcase
- Cylinder Heads
- Crankshafts
- Camshafts
- Connecting Rods
- Turbo Housing
- Valve Bodies
- Synchronizer Gears
- Main Shafts
- CVT Pulleys
- Knuckles
- Brake Disks & Calipers
- Differential Housing
- CV Joints
- Ball Studs

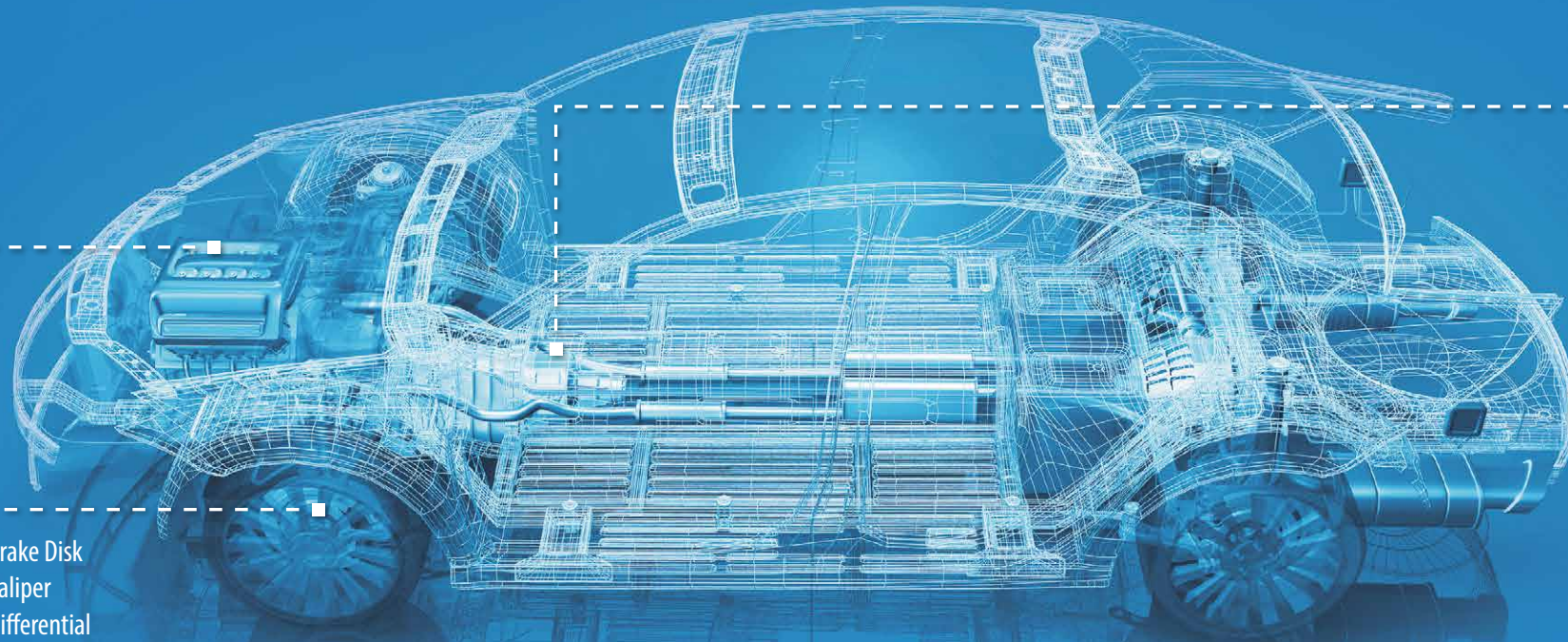
AUTOMOTIVE

TOOLING SOLUTIONS



Engine

- Crankcase
- Cylinder Head
- Crankshaft
- Camshaft
- Connecting Rod
- Piston Head
- Turbo Housing



- Valve Body
- Synchronizer Gear
- Main Shaft
- CVT Pulley

Driving System

- Brake Disk
- Caliper
- Differential
- Knuckle
- CV Joint

Transmission



CRANKCASE

Cast Iron / Aluminum



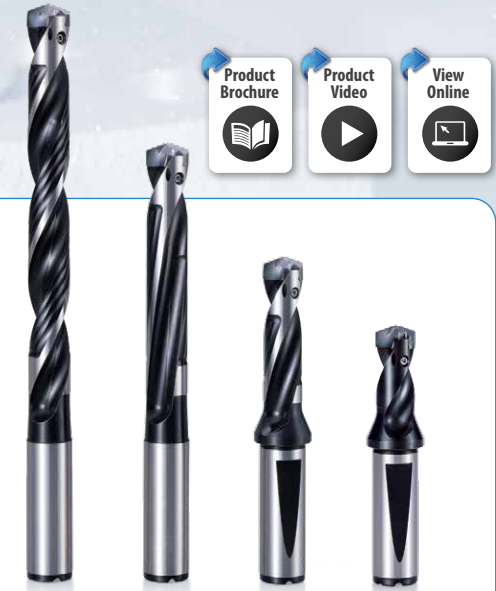
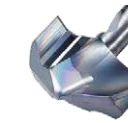
MFK Multi-Edge Cutter for Cast Iron

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



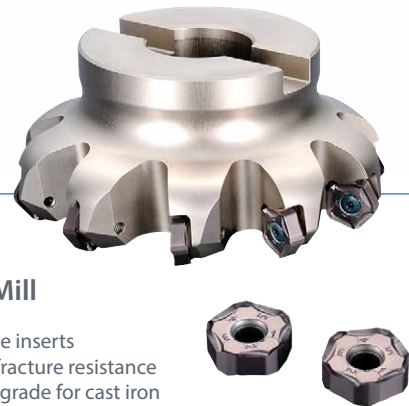
DRA Magic Drill High Efficiency Modular Drill

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



MFPN 45° 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



M-FOUR (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



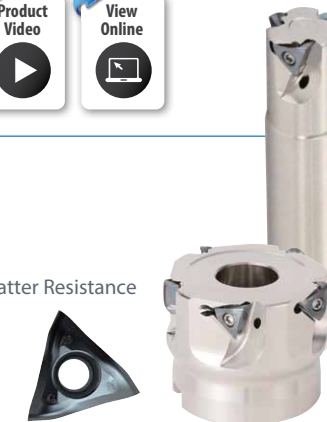
MFPN (Custom-Made) 45° High-Efficiency Face Mill

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



M-THREE (MEV) 90° Triangular Insert Milling Cutter

- Low Cutting Forces and Higher Rigidity for Excellent Chatter Resistance
- Longer Insert and Holder Tool Life
- Can be Used in Shouldering, Slotting, and Ramping



CRANKCASE (Continued)

Cast Iron / Aluminum

Custom Tools Mounting Hole Making



MFAH Milling Cutter for Finishing Aluminum

- Easily adjustable blade runout 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



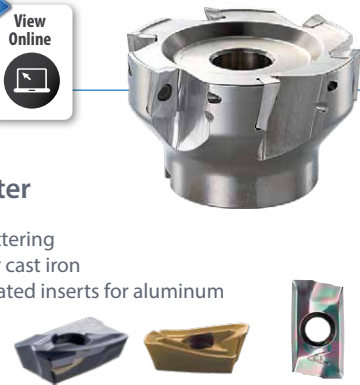
M-SIX (MFWN) 90° Double-Sided 6-Edge Milling Cutter

- 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



MEC High Efficiency Milling Cutter

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



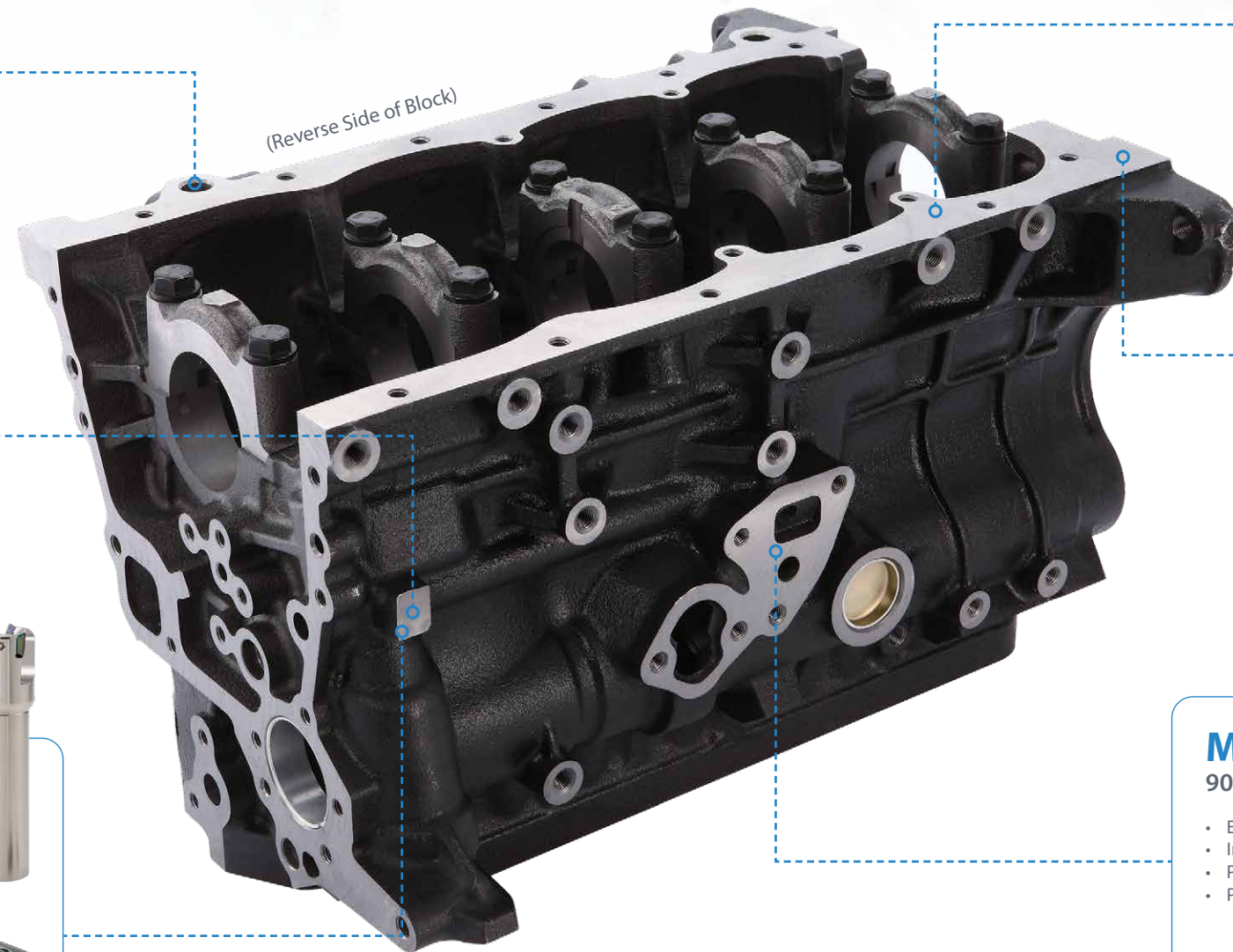
MEAS High Efficiency Milling Cutters for Aluminum Machining

- Grooved Insert Pockets Provide Secure Clamping to Ensure Stable, High Speed Machining
- Sharp Cutting Edge with Low Cutting Force Design
- Simultaneous 3-axis with a Max. Ramping Angle of 20° (Ø1.000")
- Kyocera's Proprietary Hydrogen-free DLC Coated PDL025 Inserts



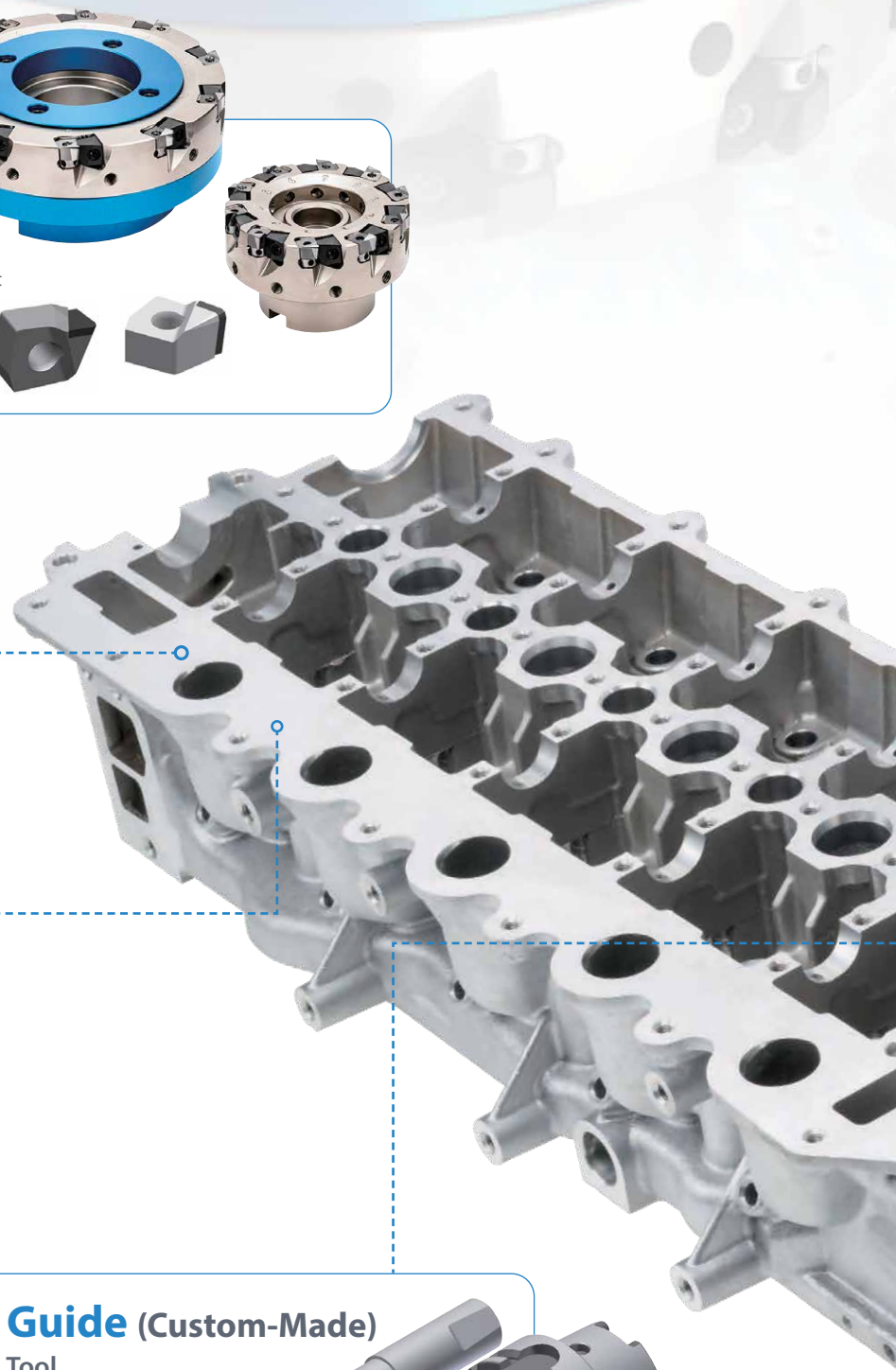
M-FOUR (MEW) 90° Double-Sided 4-Edge Milling Cutter

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



CYLINDER HEAD

Aluminum / Cast Iron



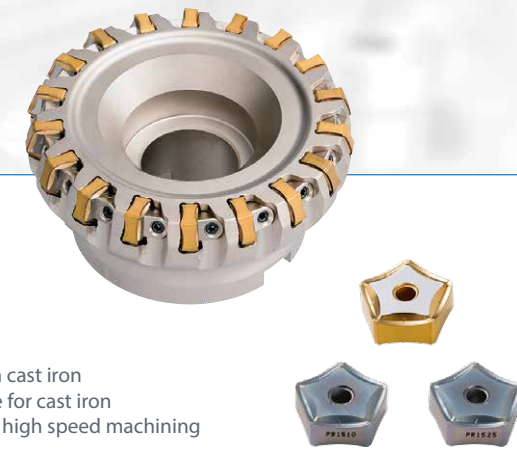
MFAH Milling Cutter for Finishing Aluminum

- Easily adjustable blade runout 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



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

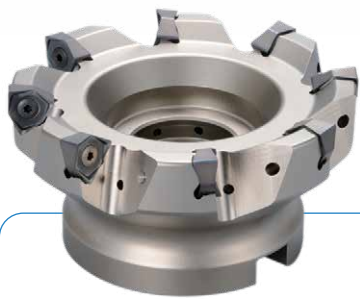


M-SIX (MFWN) 90° Double-Sided 6-Edge Milling Cutter

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



PDL025 Inserts for Aluminum



M-FOUR (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

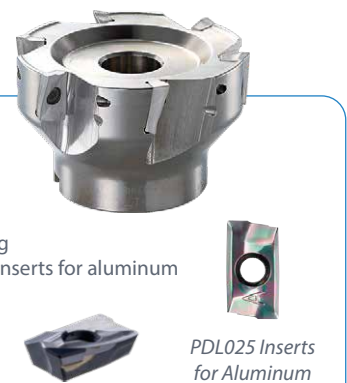


PDL025 Inserts for Aluminum



MEC High Efficiency Milling Cutter

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



PDL025 Inserts for Aluminum

Valve Seat Guide (Custom-Made)

PCD Combination Tool
Left-handed Helix Valve Guide Reamer



CRANKSHAFT

Steel / Cast Iron



CA025P / CA5 Series 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
- Wide range of positive and negative inserts to choose from



KGD Grooving / Cut-Off

- Excellent chip control
- Large tooling lineup for multiple applications
- MEGACOAT coating technology for long tool life
- Edge tolerance of $\pm 0.03\text{mm}$ (edge with 2, 3, 4mm)



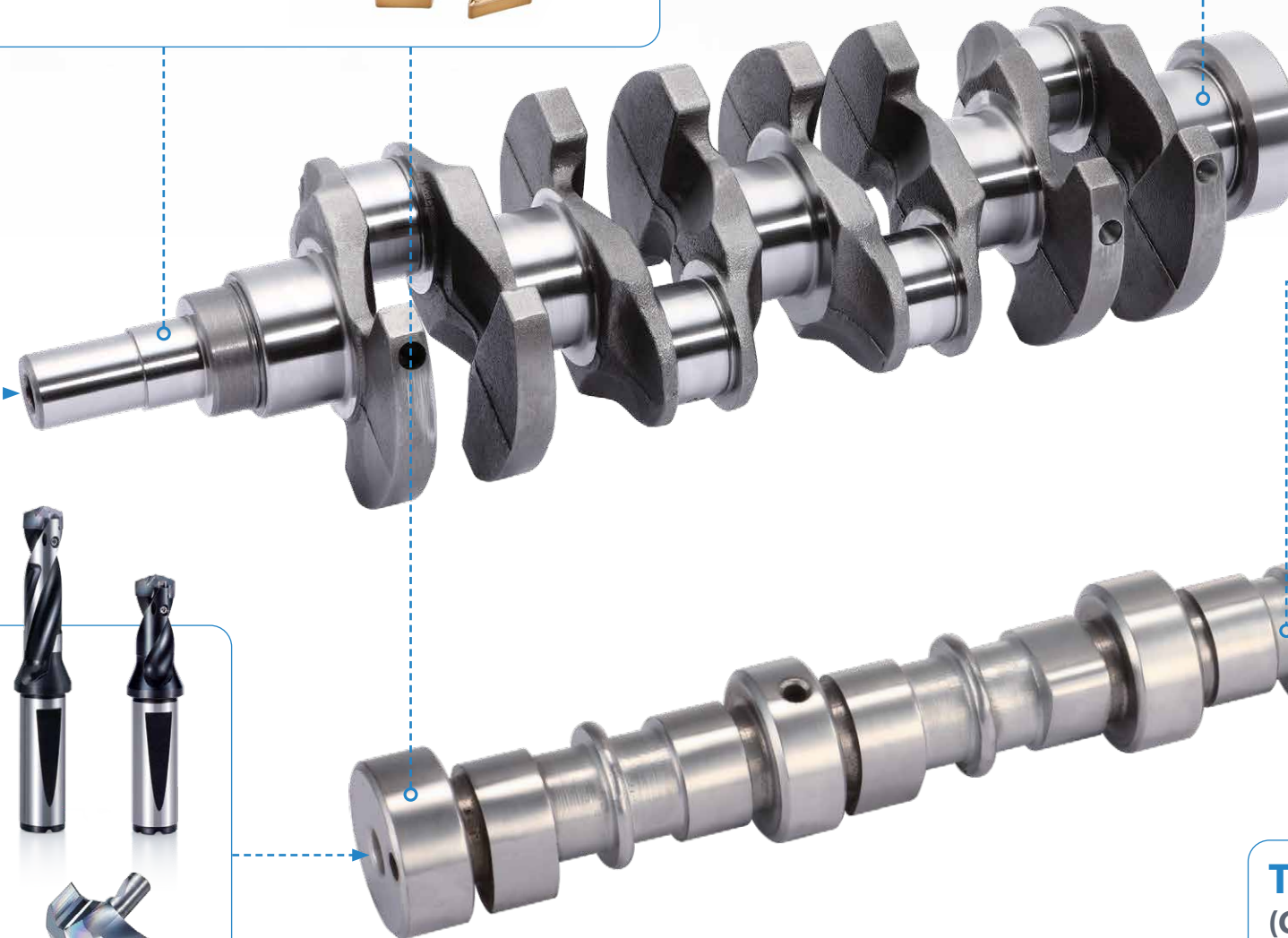
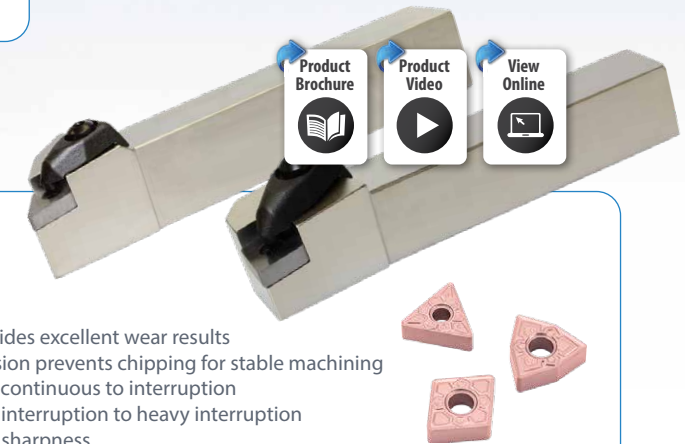
CAMSHAFT

Steel / Cast Iron



CA3 Series Cast Iron Turning

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



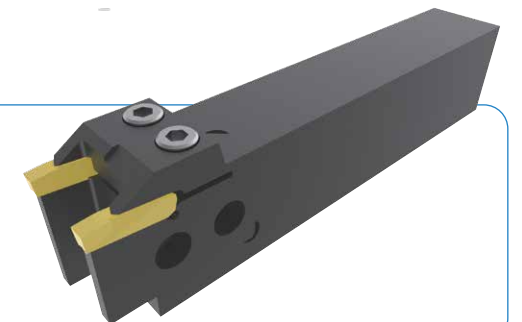
DRA Magic Drill High Efficiency Modular Drill

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



Thrust Bearing with Groove (Custom-Made)

Shorter Cycle Time and High Precision



CONNECTING ROD

Steel / Powdered Metal



DRA Magic Drill

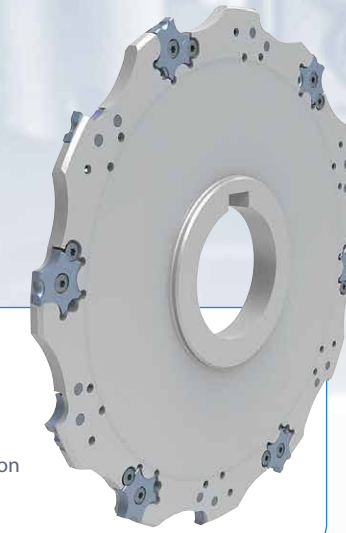
High Efficiency Modular Drill

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



Slot Mills (Custom-Made)

- Low cutting force design prevents burr formation
- Smooth chip evacuation when deep slotting



MFPN

45° 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



M-FOUR (MEW)

90° Double-Sided 4-Edge Milling Cutter

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



DRV Magic Drill

High Speed, High Efficiency Drilling

- High speed capabilities with combination of a CVD outside inserts and PVD inside insert
- Excellent hole accuracy with a rigid design for better chatter resistance



Standard Lineup from 2xD to 6xD



Large End Boring (Custom-Made)

Simultaneous semi-finishing and finishing reduce cycle time



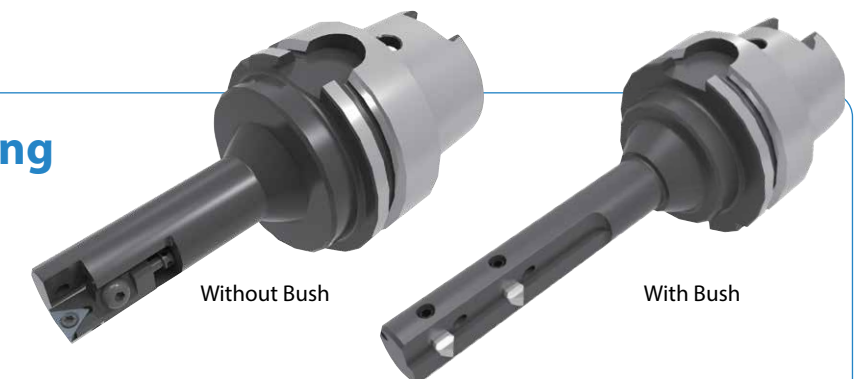
Large End Bore Chamfering (Custom-Made)

Double chamfering contour machining



Small End Finish Boring (Custom-Made)

High Precision Machining with Adjustable Diameter



Without Bush

With Bush



TURBO HOUSING

Cast Iron / Heat-resistant Alloy



MFPN 45° 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



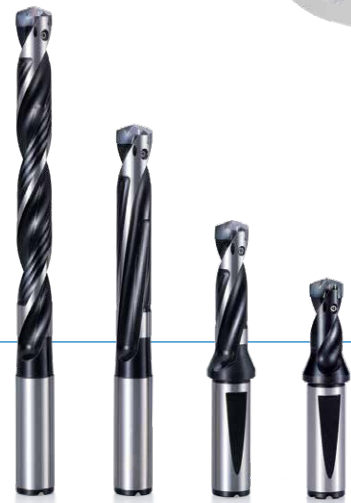
Grooving (Custom-Made)

Specialized design increases rigidity and prevents interference from the workpiece



DRA Magic Drill High Efficiency Modular Drill

- Optimal web thickness limits deflection
- Fine chip breaking and smooth deep hole cutting
- Easy insert replacement
- PR1535 MEGACOAT NANO insert grade for steel
- PR1525 MEGACOAT NANO insert grade for cast iron
- KM Chipbreaker for high-accuracy cast iron drilling



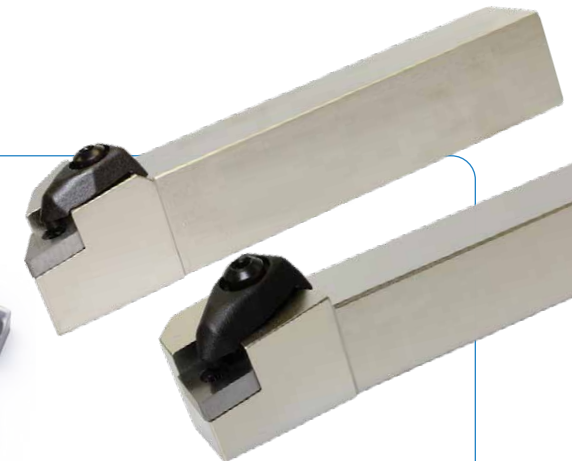
GM Chipbreaker
General Purpose

KM Chipbreaker
Cast Iron



PR005S / PR015S Turning Grades for Heat-resistant Alloy

- Improved thermal properties help to reduce sudden fracture and decrease edge wear
- Improved wear resistance with MEGACOAT HARD coating technology
- Low cutting force and stable machining with newly developed chipbreakers (SQ/SX/SG)



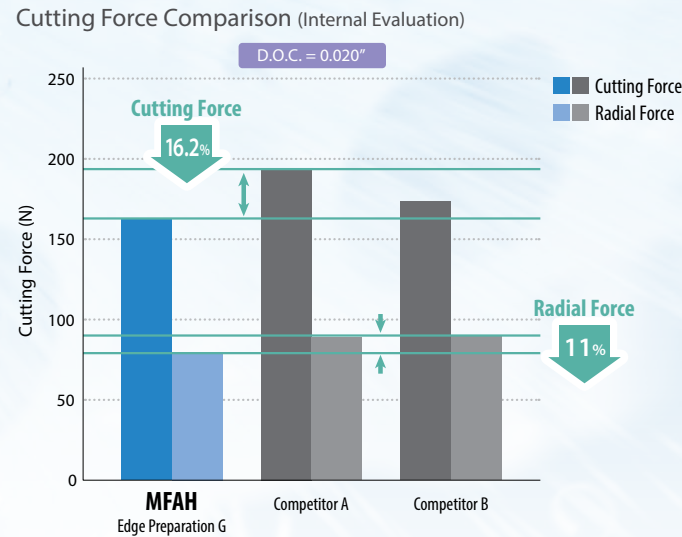
VALVE BODY

Aluminum



MFAH Milling Cutter for Finishing Aluminum

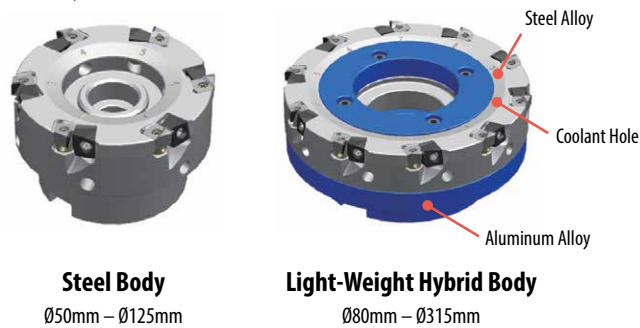
- Easily adjustable blade runout for highly efficient machining
- Steel body and light-weight hybrid body design with internal coolant
- Choose from 3 different cutting edge designs
- Unique KPD001 PCD inserts for aluminum



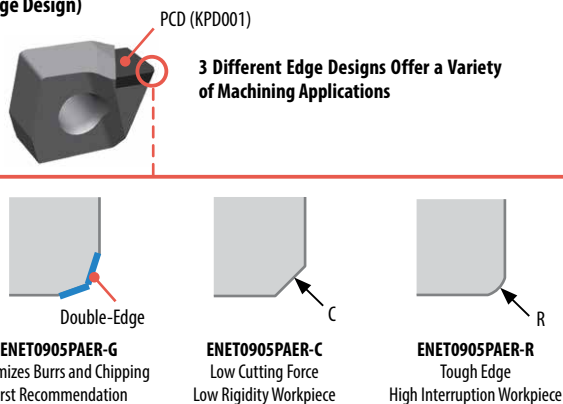
Cutting Conditions: Vc = 8,200 sfm, ae = 2.165", fz = 0.004 ipt Wet, Cutting Dia. Ø80mm
MFAH080R5-10T-SF ENET0905PAER-G KPD001 Workpiece: 383.0 Aluminum

3 Different Edge Designs Offer a Variety of Machining Applications

Cutter Body



Insert (Edge Design)

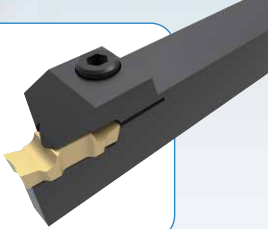


SYNCHRONIZER GEAR

High Carbon Steel

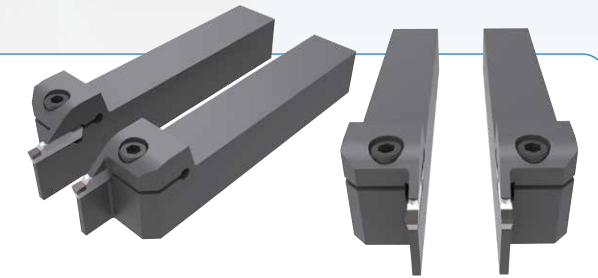
Grooving Holder (Custom-Made) Roughing

Reduces cycle time with special shape for form turning



KGD with KBN05M (Custom-Made) After Heat-Treat / Finishing

MEGACOAT PVD coating for long tool life and stable machining



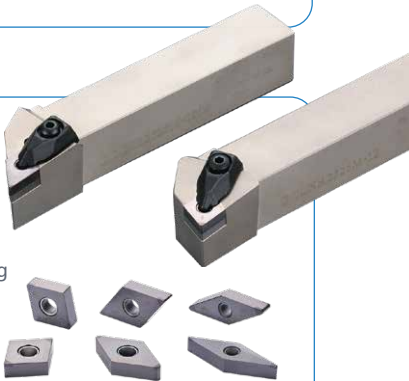
KGD Grooving / Cut-Off

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



KBN05M Double-sided Multi-Edge CBN Inserts

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



MEC High Efficiency Milling Cutter

- Low cutting force and reduced chattering
- KPD001 PCD inserts for aluminum



KPD001 PCD Inserts for Aluminum

MAIN SHAFT

High Carbon Steel



HSK Tooling System



KGD Grooving

- Excellent chip control
- Large tooling lineup for multiple applications
- MEGACOAT coating technology for long tool life
- Edge tolerance of $\pm 0.03\text{mm}$ (edge with 2, 3, 4mm)



Chipbreakers for Shaft Turning

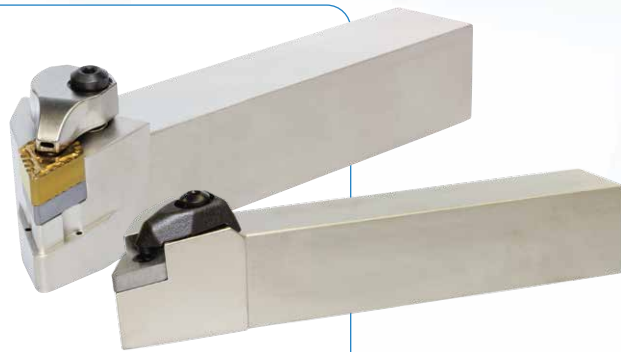
- High productivity chipbreaker designs
- Excellent chip control
- CA5-series CVD coated turning grades for steel



CJ Chipbreaker
High Feed Rate
Finishing-Medium



CQ Chipbreaker
Various D.O.C.
Finishing-Medium



Oil Hole



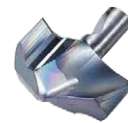
GBA Grooving System

- Smooth chip evacuation with molded chipbreaker
- Large lineup of chipbreakers and insert grades
- Smooth chip control with GM chipbreaker
- 3-edge inserts for shallow grooving applications
- PR1215 MEGACOAT coating technology for long tool life



DRA Magic Drill High Efficiency Modular Drill

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



CVT PULLEY

High Carbon Steel

Product Brochure | Product Video | View Online

VC Chipbreaker

Undercutting / Copying

- Strong edge design
- Excellent chip control
- High productivity machining various shapes and contours
- CA5-series CVD coated turning grades for steel



Product Brochure | Product Video | View Online

KGD

Grooving / Cut-Off

- Excellent chip control
- Large tooling lineup for multiple applications
- MEGACOAT coating technology for long tool life
- Edge tolerance of $\pm 0.03\text{mm}$ (edge with 2, 3, 4mm)



Product Brochure | Product Video | View Online

DRA Magic Drill

High Efficiency Modular Drill

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



Product Brochure | Product Video | View Online

CA025P / CA5 Series

CVD Coated Carbide for Steel Turning

- Long tool life and stable machining
- Various chipbreakers available for steel machining
- New positive wiper inserts WF for finishing and WE for finishing-medium
- Special substrate and tough coating layer for high wear and fracture resistance



Product Brochure | Product Video | View Online

GBA GM Chipbreaker

Grooving

- Economical 3-edge inserts
- Smooth chip evacuation with molded chipbreaker
- Excellent surface finish

Chip Control Comparison (Internal Evaluation)

	0.003	0.004	0.005
GM Chipbreaker			
Conventional Molded Chipbreaker A			

Cutting Conditions : Vc = 660 sfm, Edge Width 0.079" (2.0mm), Grooving Workpiece : 5120 (Ø1.575")

View Online

TQ Chipbreaker

Undercutting / Copying

- Molded chipbreaker for excellent chip control
- Long tool life and excellent thread finish

Chip Control Comparison (Internal Evaluation)

Radial Infeed



Flank Compound Infeed



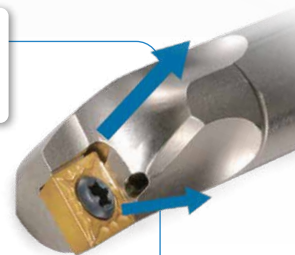
Cutting Conditions : Vc = 490 sfm, D.O.C. = 0.005" (4th pass), L = 0.984", Wet 16ER150ISO type M45 x P1.5 Workpiece : 4131

View Online

Dynamic Bar

Boring / Internal Facing

- Maximum structural thickness for high rigidity
- Reduced chatter for stable machining
- Large chip pocket for superior chip evacuation
- Dual chip flow



View Online

SIGE

Internal Grooving System

- 2 cutting edges per insert
- 8mm minimum cutting diameter
- Internal screw clamp for better chip evacuation
- PR1225 MEGACOAT coating technology for wear resistance



Product Brochure | Product Video | View Online

KBN05M

Double-sided Multi-Edge CBN Inserts

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



KNUCKLE

Steel / Cast Iron



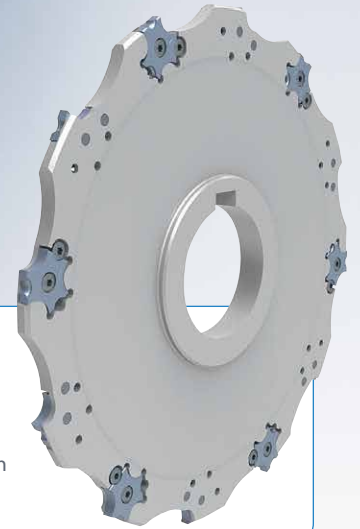
M-SIX (MFWN) 90° Double-Sided 6-Edge Milling Cutter

- Sharp cutting with low cutting forces
- Resistant to chattering and applicable to long overhang
- PR1535 MEGACOAT NANO inserts for titanium
- PR1525 MEGACOAT NANO inserts for steel
- PDL025 DLC coated inserts for aluminum



Slot Mills (Custom-Made)

- Low cutting force design prevents burr formation
- Smooth chip evacuation when deep slotting



M-THREE (MEV) 90° Triangular Insert Milling Cutter

- Low Cutting Forces and Higher Rigidity for Excellent Chatter Resistance
- Longer Insert and Holder Tool Life
- Can be Used in Shouldering, Slotting, and Ramping



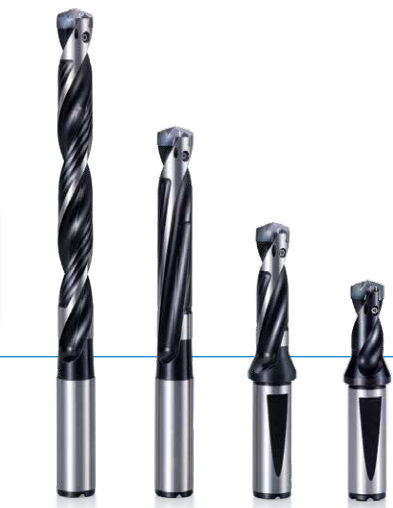
M-FOUR (MEW) 90° Double-Sided 4-Edge Milling Cutter

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



DRA Magic Drill High Efficiency Modular Drill

- Optimal web thickness limits deflection
- Fine chip breaking and smooth deep hole cutting
- Easy insert replacement
- PR1535 MEGACOAT NANO insert grade for steel
- PR1525 MEGACOAT NANO insert grade for cast iron
- KM Chipbreaker for high-accuracy cast iron drilling



BRAKE DISK & CALIPER

Steel / Cast Iron

Integral Grooving Tool (Custom-Made)

Piston Seal Groove

Indexable multi-edge cutter for high efficiency machining



Slot Mills (Custom-Made)

Brake Pad Side

Low cutting force design with alternating cutting edges



Integral Grooving Tool (Custom-Made)

Piston Boot Groove

Economical 3-edge grooving inserts



Internal Turning Tool (Custom-Made)

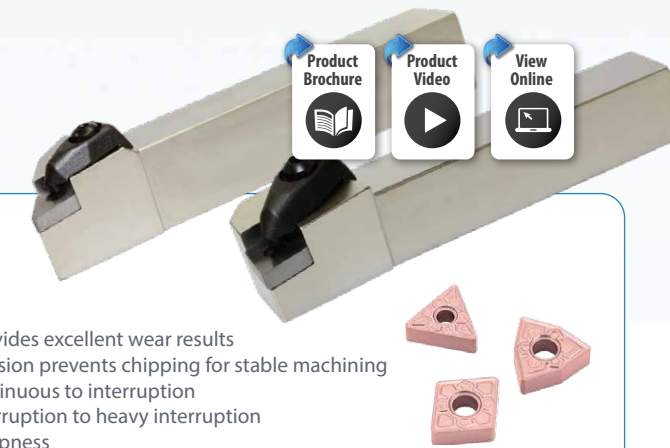
Caliper Bore

Combination indexable holder reduces cycle time



CA3 Series Cast Iron Turning

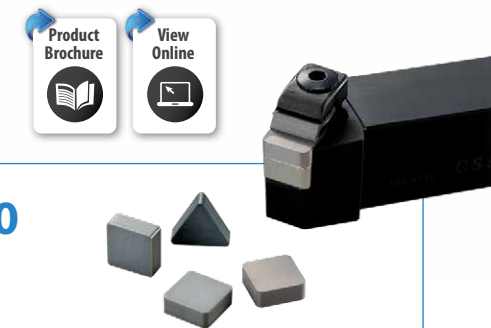
- Micro TiCN coating provides excellent wear results
- Improved coating adhesion prevents chipping for stable machining
- KG chipbreaker for continuous to interruption
- KH chipbreaker for interruption to heavy interruption
- KQ chipbreaker for sharpness



[Product Brochure](#) [Product Video](#) [View Online](#)

KS6050 / CS7050 Silicon Nitride Ceramic

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



[Product Brochure](#) [View Online](#)

DRA Magic Drill

High Efficiency Modular Drill

- Optimal web thickness limits deflection
- Fine chip breaking and smooth deep hole cutting
- Easy insert replacement
- PR1535 MEGACOAT NANO insert grade for steel
- PR1525 MEGACOAT NANO insert grade for cast iron
- KM Chipbreaker for high-accuracy cast iron drilling



GM Chipbreaker General Purpose **KM Chipbreaker** Cast Iron

[Product Brochure](#) [Product Video](#) [View Online](#)

DIFFERENTIAL HOUSING

Cast Iron

CV JOINT

Steel / Cast Iron

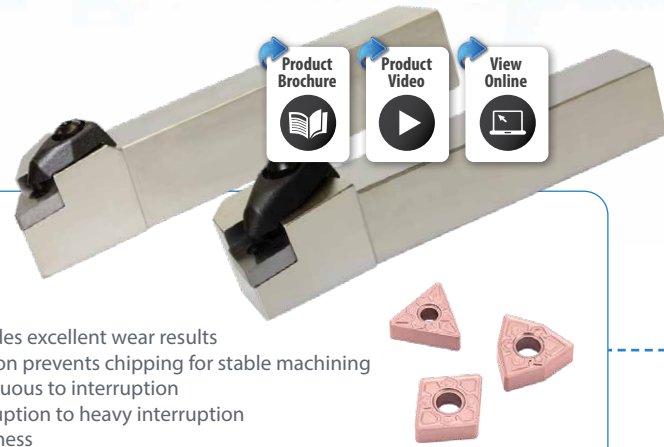
PV7005 External Finishing

Wear resistant MEGACOAT coating technology for cast iron finishing



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



High Coating Adhesion Results in Stable Machining

Rake Face Condition (Internal Evaluation)



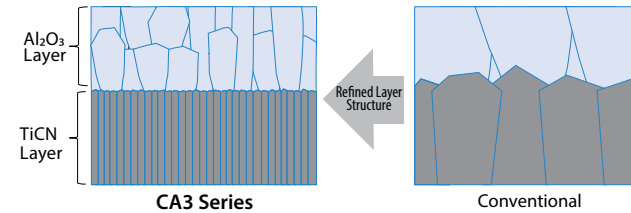
CA3 Series (CA315)

Competitor I

Cutting Conditions : Vc = 490 sfm, D.O.C. = 0.059"
f = 0.012 ipr, Wet, CNMG433 Type, Facing, After Withstanding 3,000 Impacts
Workpiece : 100-70-03 (with 8 Flutes)

Micro TiCN Coating Provides Excellent Wear Resistance

Refined Layer Structure (Pattern diagram)



CA3 Series

Conventional

DRA Magic Drill High Efficiency Modular Drill

- Optimal web thickness limits deflection
- Fine chip breaking and smooth deep hole cutting
- Easy insert replacement
- PR1535 MEGACOAT NANO insert grade for steel
- PR1525 MEGACOAT NANO insert grade for cast iron
- KM Chipbreaker for high-accuracy cast iron drilling



KBN35M MEGACOAT CBN for Heat-Treated Finishing

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



GBA Grooving System

- Smooth chip evacuation with molded chipbreaker
- Large lineup of chipbreakers and insert grades
- Smooth chip control with GM chipbreaker
- 3-edge inserts for shallow grooving applications
- PR1215 MEGACOAT coating technology for long tool life



KBN05M Double-sided Multi-Edge CBN Inserts

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



CA025P / CA5 Series CVD Coated Carbide for Steel Turning

- Long tool life and stable machining
- Various chipbreakers available for steel machining
- New positive wiper inserts WF for finishing and WE for finishing-medium
- Special substrate and tough coating layer for high wear and fracture resistance




BALL STUDS

Steel




[Product Brochure](#)
[Product Video](#)
[View Online](#)




VC Chipbreaker (Handed) for Copying

Stable chip control at large depths of cut



[View Online](#)



VF Chipbreaker for Copying

Effective at small depth of cut
Smooth chip control with low cutting forces

[Product Brochure](#)
[Product Video](#)
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KGD GDM-CM hipbreaker for Copying

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