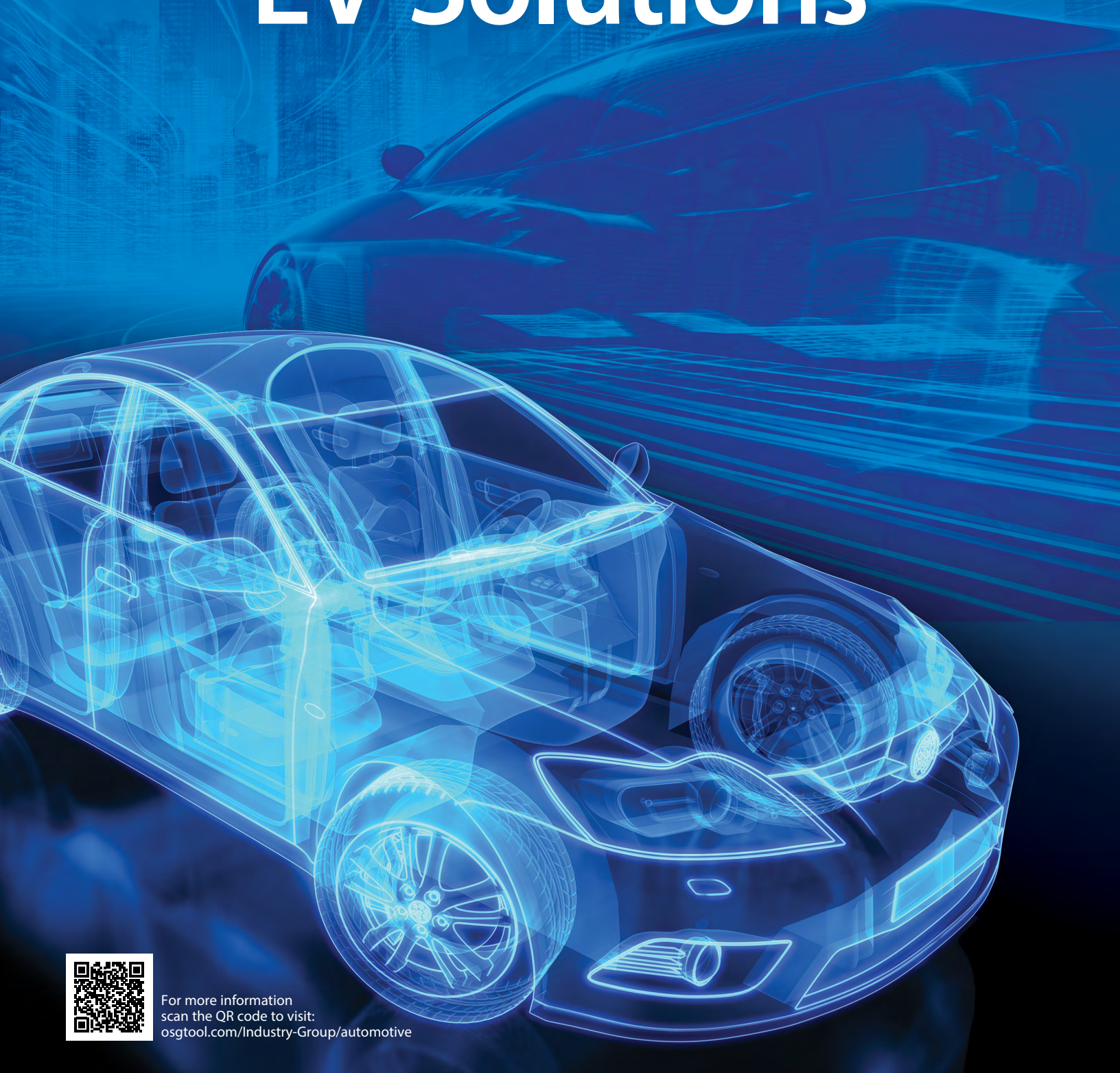




OSG's Solutions for the Electric Vehicle Industry

Vol 1

EV Solutions



For more information
scan the QR code to visit:
osgtool.com/Industry-Group/automotive

Featured EV Solutions



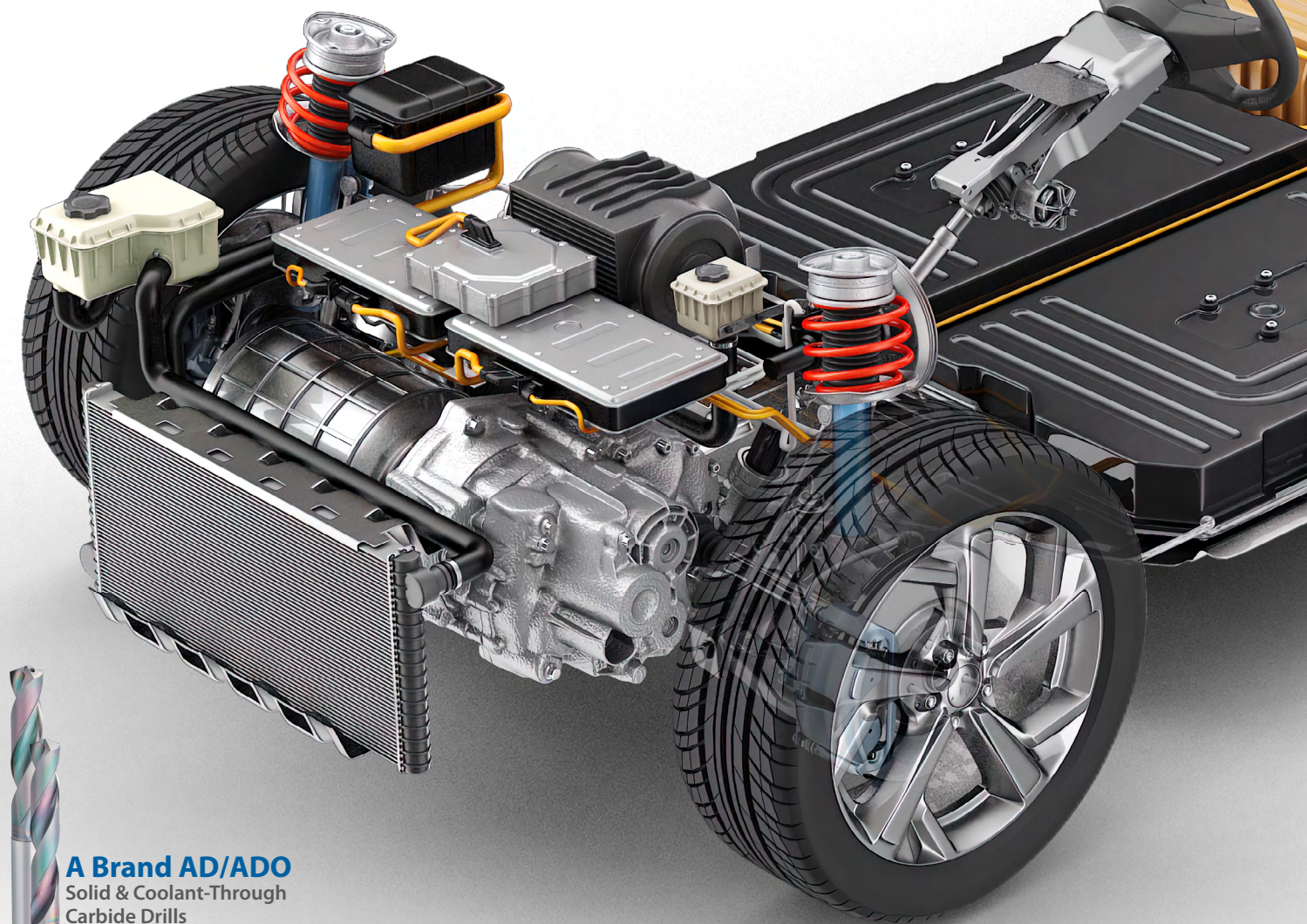
A Brand AE-VMS
Anti-Vibration Carbide
End Mills



A Brand AE-TL-N
DLC Coated End Mills for
Non-Ferrous Materials



**A Brand AT-2
R-SPEC**
Advanced Performance
End-Cutting Thread Mill for
Non-ferrous Materials



A Brand AD/ADO
Solid & Coolant-Through
Carbide Drills



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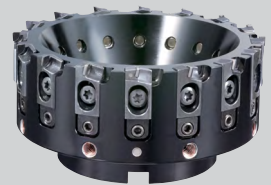
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FACE MILLING



PHOENIX® PFAL Finish Cutter for Aluminum

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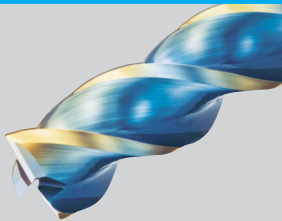




Motor Housing

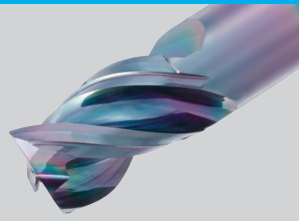
The drive motor is a primary component in EV. The housing is comprised of cast aluminum and requires various machining operations from milling, drilling and threading. OSG's tooling for the motor housing offers a complete package.

END MILLING



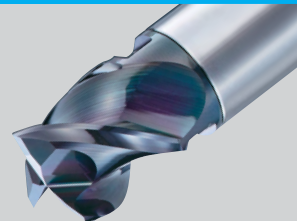
A Brand AE-TL-N DLC Coated End Mills for Non-Ferrous Materials

Advanced performance DLC coated carbide end mills for non-ferrous materials. With excellent cutting sharpness, they are able to suppress burrs to achieve excellent surface finish and are extremely effective for non-ferrous materials such as aluminum alloys that require welding resistance and lubricity.



A Brand AE-VTS-N DLC Coated End Mills for Non-Ferrous Materials

DLC coated carbide end mills for non-ferrous materials suitable for a wide variety of applications with high efficiency and quality. Its DLC-IGUSS coating further improves tool life with excellent welding resistance and lubricity, which is effective in the machining of non-ferrous materials such as aluminum alloys.

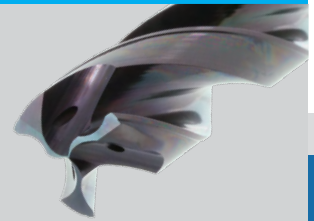


PHOENIX® **PXM-PXAL** DLC Coated Exchangeable Head End Mill Series for Non-Ferrous Materials

PHOENIX PXAL is a DLC-coated exchangeable head end mill series for large-diameter milling with superior surface quality in non-ferrous materials. An abundant lineup including square, corner radius, and reduced shank types accommodate a wide range of applications.



DRILLING

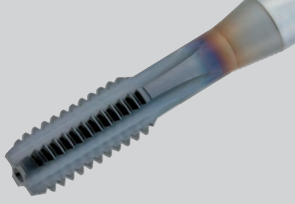


TRA-HO High Feed 3-Flute Carbide Drills for Aluminum

The Special TRA-HO drills are special order drills designed for increased productivity in aluminum with excellent hole positioning.

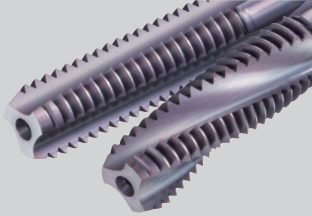


THREADING



EXOTAP® DC
Premium Threading
Solution for Aluminum
Castings

EXOTAP® DC taps feature the combination of ultra-strong rake with our VC10 powdered metal substrate, making this tap the absolute best solution for threading ductile castings.



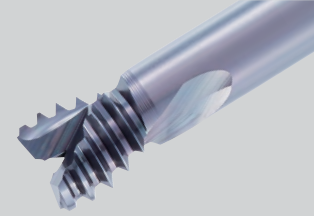
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HY-PRO® NRT
Performance Form Taps for
Materials <32 HRC

HY-PRO NRT is a comprehensive series of form taps suitable for efficient, high speed tapping with long tool life in non-ferrous alloys and steels up to 32 HRC.



A Brand AT-2 R-SPEC
Advanced Performance
End-Cutting Thread Mill for
Non-ferrous Materials

AT-2 R-SPEC is engineered to dramatically reduce machining time in non-ferrous metal applications such as aluminum alloy by its continuous helical cutting ability, which combines drilling and threading into a single process.



REAMING

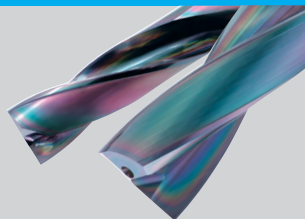


PCD Reamer
Polycrystalline Diamond
Reamers

Polycrystalline Diamond (PCD) reamers are designed for superior machining accuracy and surface finish in holemaking operations. OSG has the expertise & capability to design & manufacture custom reamer solutions to meet the demands of any holemaking application.



COUNTERBORING

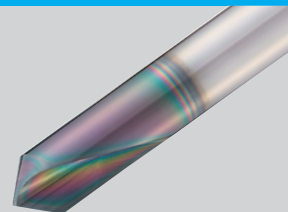


A Brand ADF/ADFO
Solid Carbide & Coolant
Through Flat Drills

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CHAMFERING



A Brand AD-LDS
Advanced Performance
Spot Drills

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PHOENIX® PLDS
Indexable Centering and
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HOLDER



SYNCHROMASTER Tap Holder

Synchronized Tap Holder
Designed to Maximize
Performance

Synchronized tap holder
designed to maximize tap
performance and tool life.
Ideal for high production
environments.



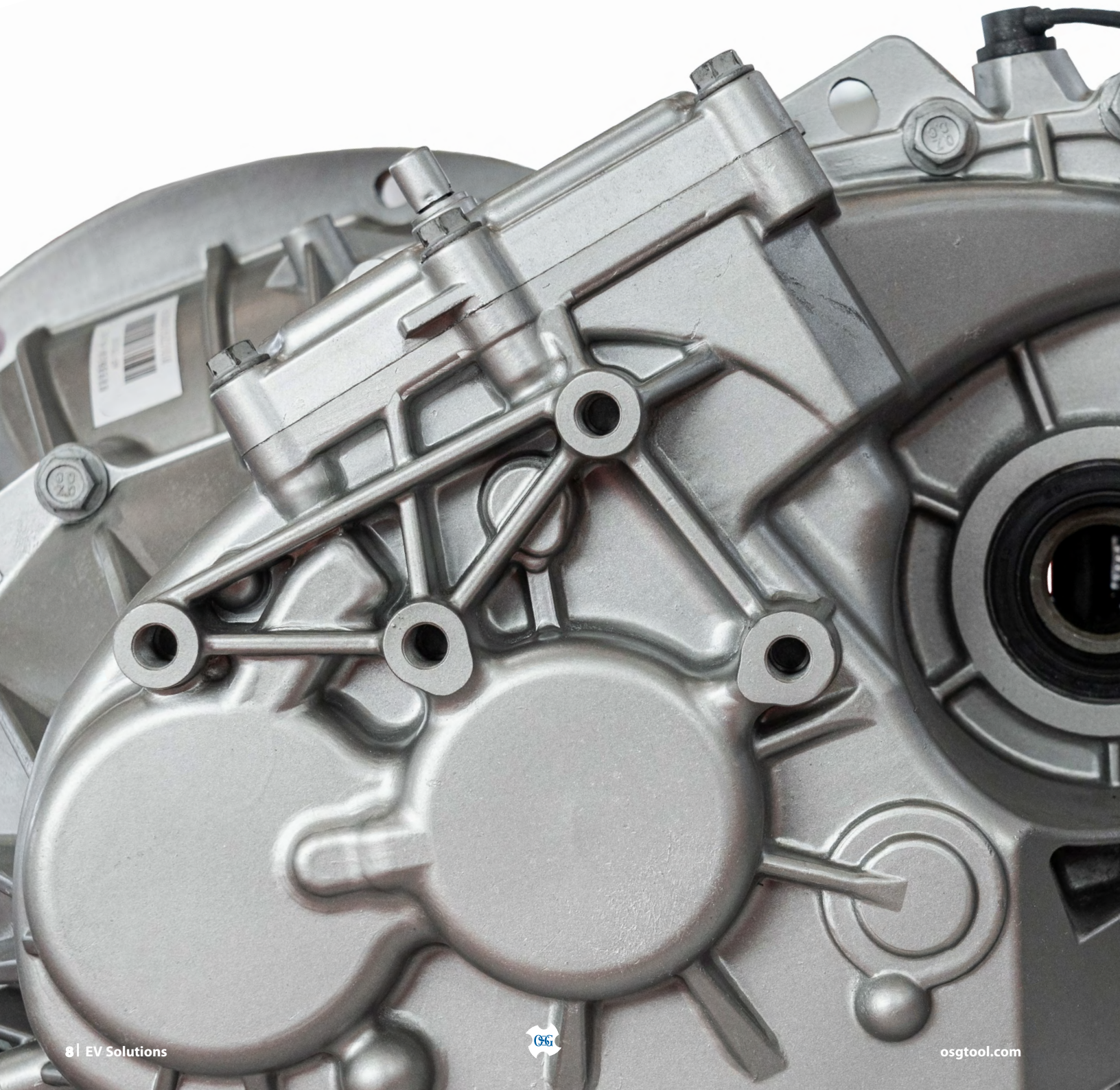
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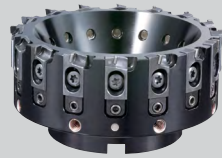
Cases & Covers

Various cases and covers are necessary in electric vehicle components. These components are typically cast aluminum that require machining operations such as face milling, drilling and tapping. OSG's product offering covers the demand for a wide variety of part design.





FACE MILLING



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END MILLING



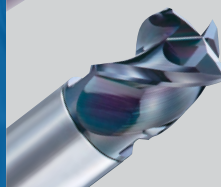
A Brand AE-TL-N DLC Coated End Mills for Non-Ferrous Materials

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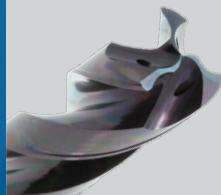


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DRILLING



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REAMING

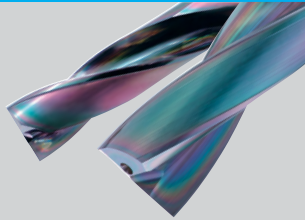


PCD Reamer Polycrystalline Diamond Reamers

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COUNTERBORING



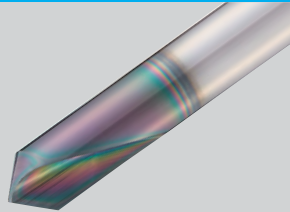
A Brand ADF/ ADFO

Solid Carbide & Coolant Through Flat Drills

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CHAMFERING



A Brand AD-LDS

Advanced Performance Spot Drills

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PHOENIX® PLDS

Indexable Centering and Chamfering Cutter

PHOENIX® PLDS is a versatile series of indexable tools for spot drilling, countersinking & chamfering.



HOLDER



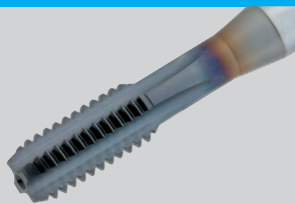
SYNCHROMASTER Tap Holder

Synchronized Tap Holder Designed to Maximize Performance

Synchronized tap holder designed to maximize tap performance and tool life. Ideal for high production environments.



THREADING



EXOTAP® DC

Premium Threading Solution for Aluminum Castings

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A Brand A-CHT & A-CSF

Advanced Performance Carbide Coolant-Through Taps

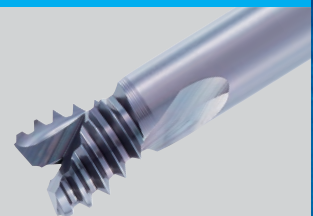
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HY-PRO® NRT

Performance Form Taps for Materials <32 HRC

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A Brand AT-2 R-SPEC

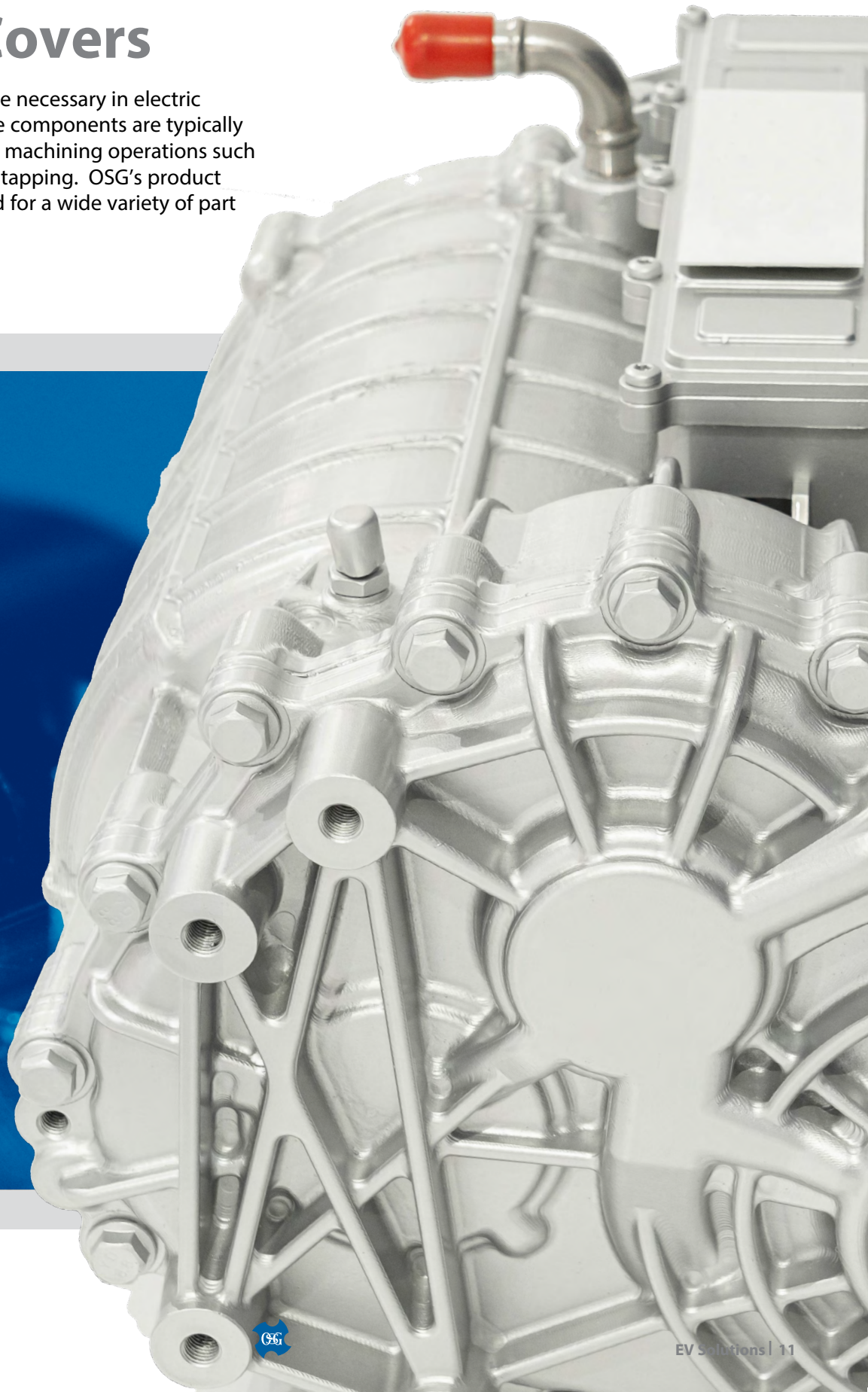
Advanced Performance End-Cutting Thread Mill for Non-ferrous Materials

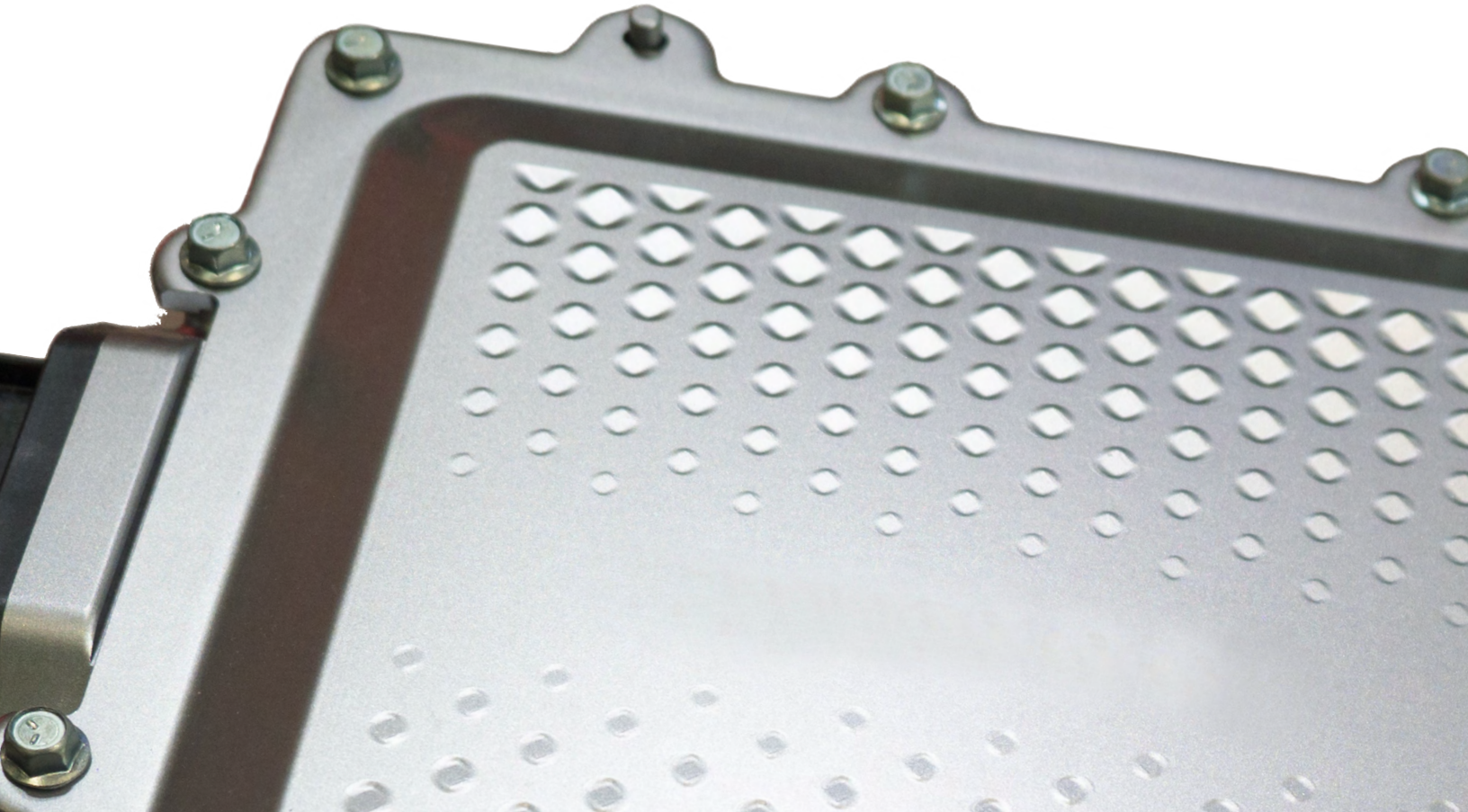
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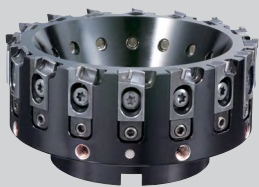
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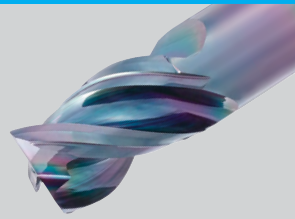


END MILLING



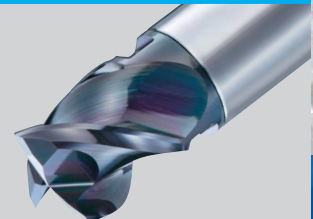
A Brand AE-TL-N
DLC Coated End Mills for Non-Ferrous Materials

Advanced performance DLC coated carbide end mills for non-ferrous materials. With excellent cutting sharpness, they are able to suppress burrs to achieve excellent surface finish and are extremely effective for non-ferrous materials such as aluminum alloys that require welding resistance and lubricity.



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PHOENIX® PXM-PXAL
DLC Coated Exchangeable Head End Mill Series

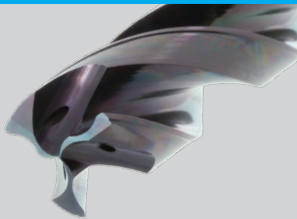
PHOENIX PXAL is a DLC-coated exchangeable head end mill series for large-diameter milling with superior surface quality in non-ferrous materials. An abundant lineup including square, corner radius, and reduced shank types accommodate a wide range of applications.



Inverter

Commonly made from cast and wrought aluminum, the inverter converts high-voltage battery to AC current to drive the motor. Inverter design varies by manufacturer, but all require high precision machining, in some cases the heat sink design is machined. OSG has a wide variety of solutions for the various inverter designs.

DRILLING

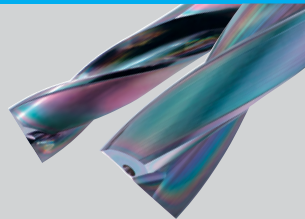


TRA-HO
High Feed 3-Flute Carbide
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COUNTERBORING

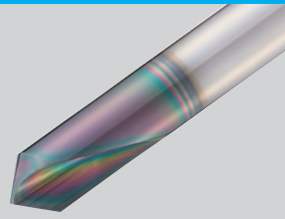


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CHAMFERING



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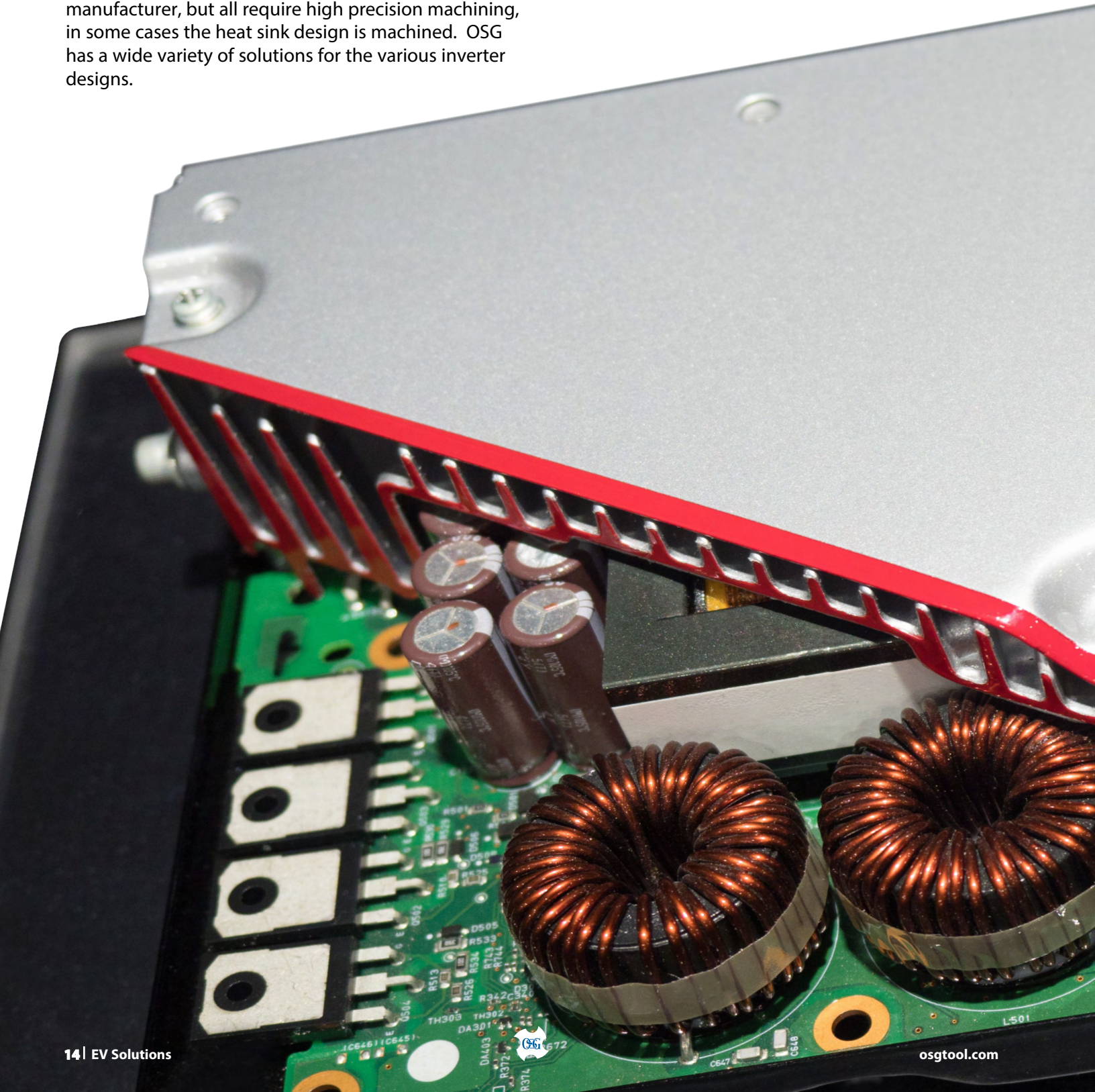
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REAMING



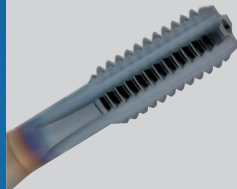
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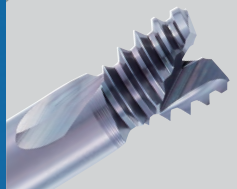
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HOLDER



SYNCHROMASTER Tap Holder

Synchronized Tap Holder Designed to Maximize Performance

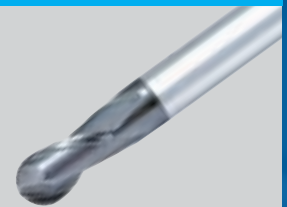
Synchronized tap holder designed to maximize tap performance and tool life. Ideal for high production environments.



Wheels

Wheels are typically constructed from wrought aluminum. Wheel machining requires heavy metal removal via milling as well as holmaking. OSG's wheel machining lineup offers tooling with high metal removal rate capabilities.

END MILLING



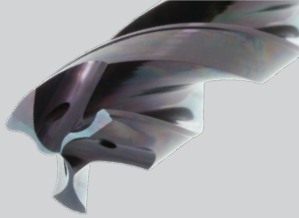
CRN-EBD

CrN Coated End Mills for Non-Ferrous Materials

CRN-EBD is OSG's special order CrN coated carbide ball nose end mill series for aluminum alloys and other non-ferrous materials. The sharp cutting edge and excellent ball radius tolerance enable accurate, high quality machining.



DRILLING



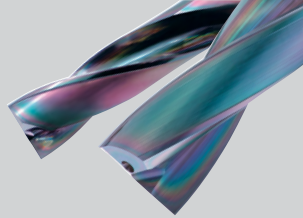
TRA-HO

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COUNTERBORING



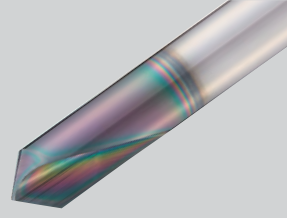
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CHAMFERING



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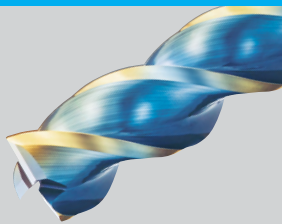
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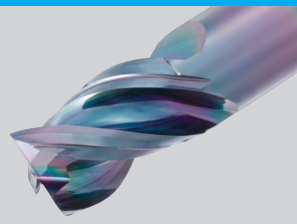
END MILLING



A Brand AE-TL-N

DLC Coated End Mills for Non-Ferrous Materials

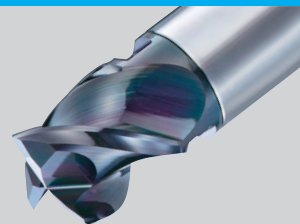
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EXOCARB® AERO Blizzard

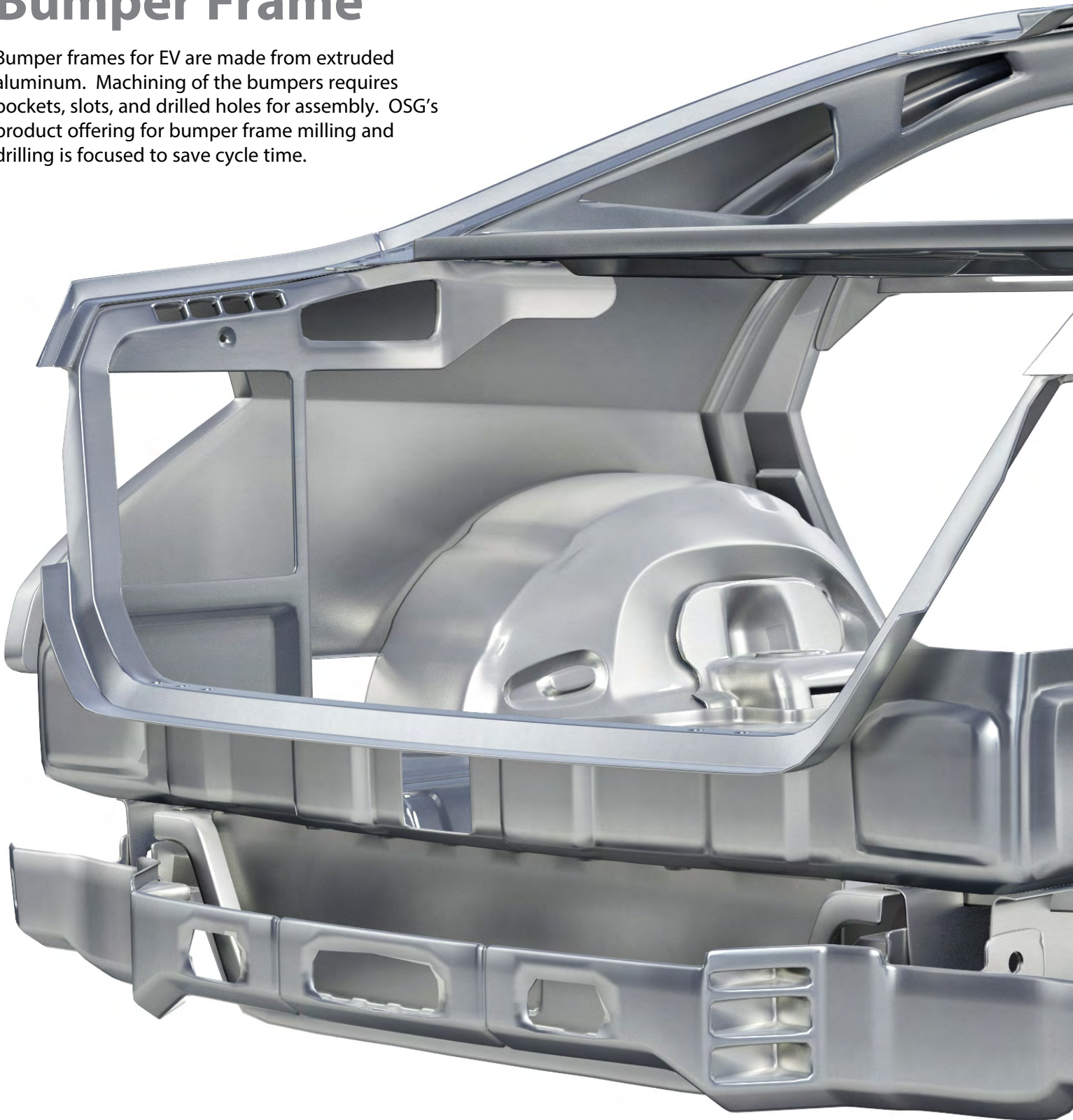
Ball Nose End Mills for Aluminum Applications

The EXOCARB® Aero Blizzard® series is part of the OSG premium line of carbide high performance end mills specifically designed for either Aluminum or Copper alloys.



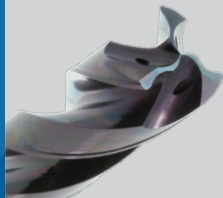
Bumper Frame

Bumper frames for EV are made from extruded aluminum. Machining of the bumpers requires pockets, slots, and drilled holes for assembly. OSG's product offering for bumper frame milling and drilling is focused to save cycle time.





DRILLING



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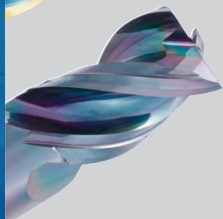
END MILLING



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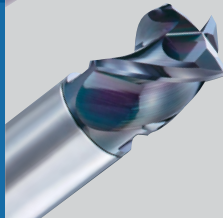
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A Brand AE-VTS-N

DLC Coated End Mills for Non-Ferrous Materials

DLC coated carbide end mills for non-ferrous materials suitable for a wide variety of applications with high efficiency and quality. Its DLC-IGUSS coating further improves tool life with excellent welding resistance and lubricity, which is effective in the machining of non-ferrous materials such as aluminum alloys.



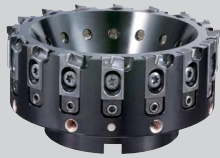
PHOENIX® PXM-PXAL

DLC Coated Exchangeable Head End Mill Series

PHOENIX PXAL is a DLC-coated exchangeable head end mill series for large-diameter milling with superior surface quality in non-ferrous materials. An abundant lineup including square, corner radius, and reduced shank types accommodate a wide range of applications.



FACE MILLING



PHOENIX® PFAL

Finish Cutter for Aluminum

OSG's PHOENIX® PFAL is a PCD finishing cutter designed to produce excellent surface finish in aluminum applications such as face milling electric vehicle motor housings, cases, covers, frames, and other components.



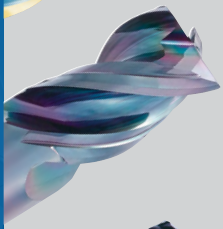
END MILLING



A Brand AE-TL-N

DLC Coated End Mills for Non-Ferrous Materials

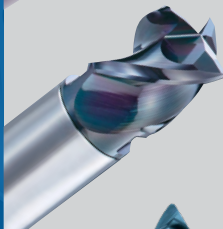
Advanced performance DLC coated carbide end mills for non-ferrous materials. With excellent cutting sharpness, they are able to suppress burrs to achieve excellent surface finish and are extremely effective for non-ferrous materials such as aluminum alloys that require welding resistance and lubricity.



A Brand AE-VTS-N

DLC Coated End Mills for Non-Ferrous Materials

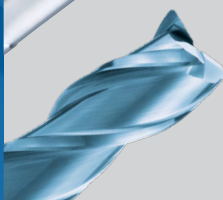
DLC coated carbide end mills for non-ferrous materials suitable for a wide variety of applications with high efficiency and quality. Its DLC-IGUSS coating further improves tool life with excellent welding resistance and lubricity, which is effective in the machining of non-ferrous materials such as aluminum alloys.



PHOENIX® PXM-PXAL

DLC Coated Exchangeable Head End Mill Series

PHOENIX PXAL is a DLC-coated exchangeable head end mill series for large-diameter milling with superior surface quality in non-ferrous materials. An abundant lineup including square, corner radius, and reduced shank types accommodate a wide range of applications.



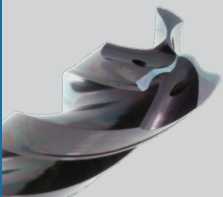
EXOCARB® AERO DLC

High Speed Carbide End Mills for Aluminum Alloy

EXOCARB® AERO DLC coating enables the AERO-DLC to produce a superior surface finish even in high speed machining applications.



DRILLING



TRA-HO

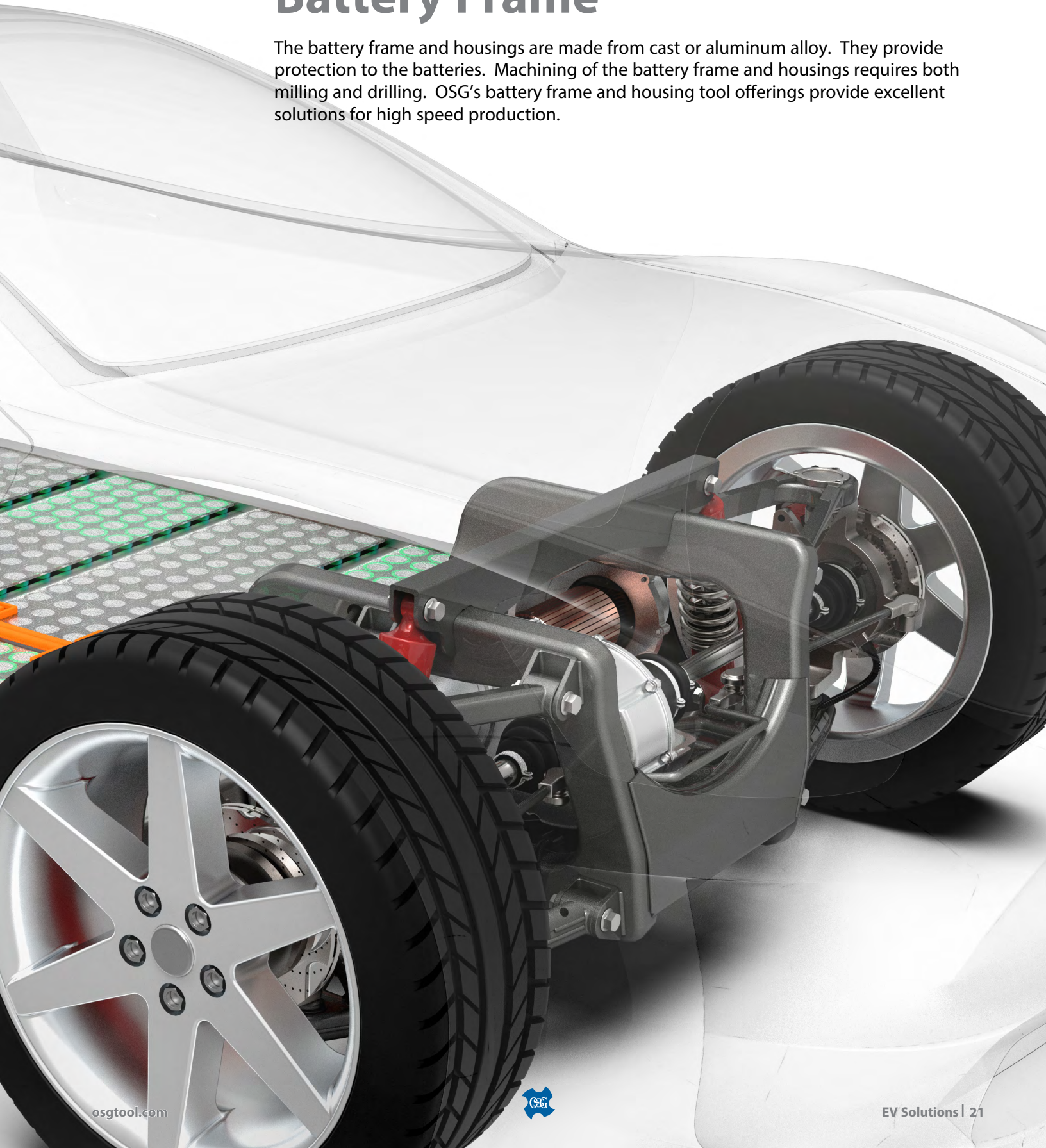
High Feed 3-Flute Carbide Drills for Aluminum

The Special TRA-HO drills are special order drills designed for increased productivity in aluminum with excellent hole positioning.



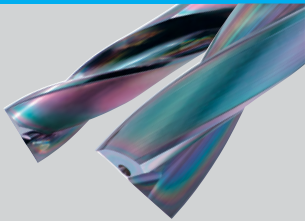
Battery Frame

The battery frame and housings are made from cast or aluminum alloy. They provide protection to the batteries. Machining of the battery frame and housings requires both milling and drilling. OSG's battery frame and housing tool offerings provide excellent solutions for high speed production.





COUNTERBORING



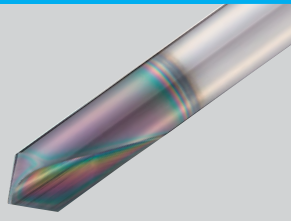
A Brand ADF/ ADFO

Solid Carbide & Coolant
Through Flat Drills

The A Brand ADF & ADFO enable one-step flat bottom drilling to simplify machining time and tool management. Suitable for a wide variety of drilling applications.



CHAMFERING



A Brand AD-LDS

Advanced Performance
Spot Drills

The A Brand AD-LDS increases processing speed for both centering and countersinking. Constructed with extreme toughness, high wear and heat resistance characteristics to ensure stable and consistent tool life.



PHOENIX® PLDS

Indexable Centering and
Chamfering Cutter

PHOENIX® PLDS is a versatile series of indexable tools for spot drilling, countersinking & chamfering.



HOLDER



SYNCHROMASTER Tap Holder

Synchronized Tap Holder
Designed to Maximize
Performance

Synchronized tap holder designed to maximize tap performance and tool life. Ideal for high production environments.

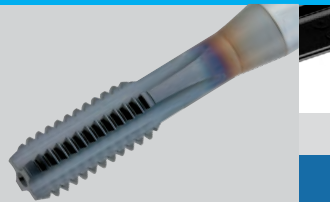




Battery Frame

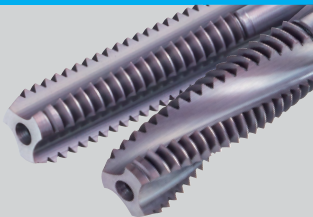
The battery frame and housings are made from cast or aluminum alloy. They provide protection to the batteries. Machining of the battery frame and housings requires both milling and drilling. OSG's battery frame and housing tool offerings provide excellent solutions for high speed production.

THREADING



EXOTAP® DC
Premium Threading
Solution for Aluminum
Castings

EXOTAP® DC taps feature the combination of ultra-strong rake with our VC10 powdered metal substrate, making this tap the absolute best solution for threading ductile castings.



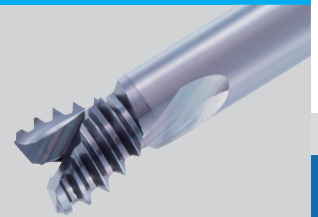
A Brand A-CHT & A-CSF
Advanced Performance
Carbide Coolant-Through
Taps

The A Brand A-CSF and A-CHT offer an ultra-fine grain carbide substrate and a unique flute geometry which excels in cast iron and non-ferrous materials.



HY-PRO® NRT
Performance Form Taps for
Materials <32 HRC

HY-PRO NRT is a comprehensive series of form taps suitable for efficient, high speed tapping with long tool life in non-ferrous alloys and steels up to 32 HRC.

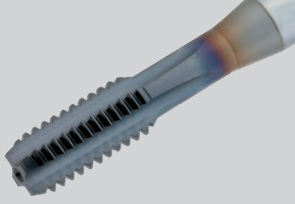


A Brand AT-2 R-SPEC
Advanced Performance
End-Cutting Thread Mill for
Non-ferrous Materials

AT-2 R-SPEC is engineered to dramatically reduce machining time in non-ferrous metal applications such as aluminum alloy by its continuous helical cutting ability, which combines drilling and threading into a single process.

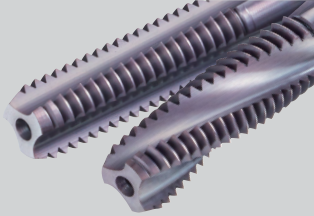


THREADING



EXOTAP® DC Premium Threading Solution for Aluminum Castings

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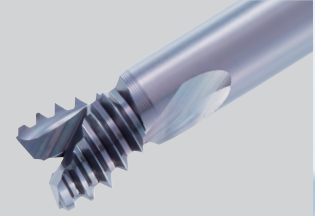
A Brand A-CHT & A-CSF Advanced Performance Carbide Coolant-Through Taps

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HY-PRO® NRT Performance Form Taps for Materials <32 HRC

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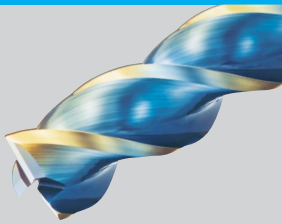


A Brand AT-2 R-SPEC Advanced Performance End-Cutting Thread Mill for Non-ferrous Materials

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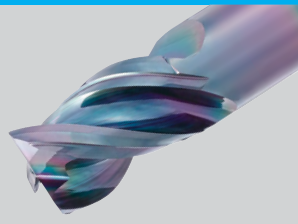


END MILLING



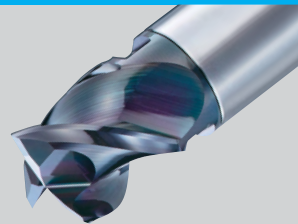
A Brand AE-TL-N DLC Coated End Mills for Non-Ferrous Materials

Advanced performance DLC coated carbide end mills for non-ferrous materials. With excellent cutting sharpness, they are able to suppress burrs to achieve excellent surface finish and are extremely effective for non-ferrous materials such as aluminum alloys that require welding resistance and lubricity.



A Brand AE-VTS-N DLC Coated End Mills for Non-Ferrous Materials

DLC coated carbide end mills for non-ferrous materials suitable for a wide variety of applications with high efficiency and quality. Its DLC-IGUSS coating further improves tool life with excellent welding resistance and lubricity, which is effective in the machining of non-ferrous materials such as aluminum alloys.



PHOENIX® PXM-PXAL DLC Coated Exchangeable Head End Mill Series for Non-Ferrous Materials

PHOENIX PXAL is a DLC-coated exchangeable head end mill series for large-diameter milling with superior surface quality in non-ferrous materials. An abundant lineup including square, corner radius, and reduced shank types accommodate a wide range of applications.



REAMING

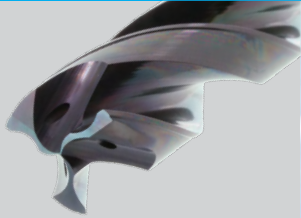


PCD Reamer Polycrystalline Diamond Reamers

Polycrystalline Diamond (PCD) reamers are designed for superior machining accuracy and surface finish in holmaking operations. OSG has the expertise & capability to design & manufacture custom reamer solutions to meet the demands of any holmaking application.



DRILLING

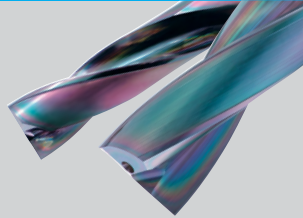


TRA-HO High Feed 3-Flute Carbide Drills for Aluminum

The Special TRA-HO drills are special order drills designed for increased productivity in aluminum with excellent hole positioning.



COUNTERBORING



A Brand ADF/ ADFO Solid Carbide & Coolant Through Flat Drills

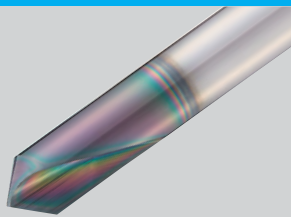
The A Brand ADF & ADFO enable one-step flat bottom drilling to simplify machining time and tool management. Suitable for a wide variety of drilling applications.



Chassis & Structural Parts

The structural components of EV are made from both cast and aluminum alloys. These components require milling, drilling and threading. OSG's product lineup for structural components can assist in your production needs.

CHAMFERING



A Brand AD-LDS Advanced Performance Spot Drills

The A Brand AD-LDS increases processing speed for both centering and countersinking. Constructed with extreme toughness, high wear and heat resistance characteristics to ensure stable and consistent tool life.



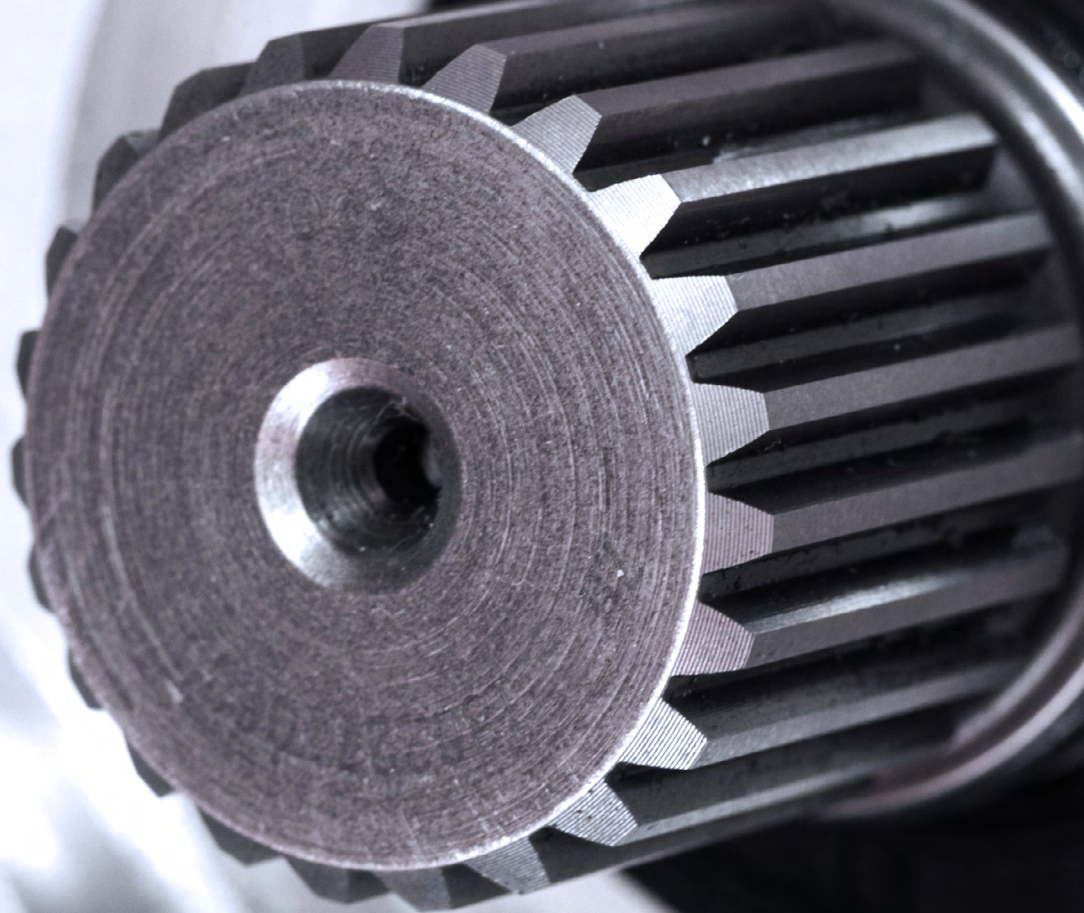
PHOENIX® PLDS Indexable Centering and Chamfering Cutter

PHOENIX® PLDS is a versatile series of indexable tools for spot drilling, countersinking & chamfering.

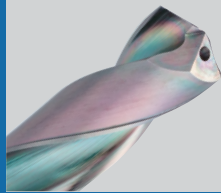


Shafts

The motor shaft is located inside the rotor, and serves to transfer rotation & torque to the parts of the transmission. Shafts are made from alloy steel, with machining done in both the soft and heat-treated states. Machining challenges in the soft state include chip evacuation during deep-hole drilling. OSG has a comprehensive lineup of carbide coolant-through drills for hole depths up to 50xD.



DRILLING



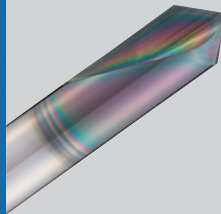
A Brand ADO

Coolant-Through Carbide Drills

OSG's premium line of coolant-through high performance drills, designed to drill in a variety of steels up to 50xD without pecking. New point geometry reduces thrust forces, while our proprietary EgiAs coating provides drastically higher hardness and heat resistance, enabling higher speeds and incredible tool life.



CHAMFERING



A Brand AD-LDS

Advanced Performance Spot Drills

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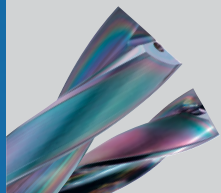
PHOENIX® PLDS

Indexable Centering and Chamfering Cutter

PHOENIX® PLDS is a versatile series of indexable tools for spot drilling, countersinking & chamfering.



COUNTERBORING



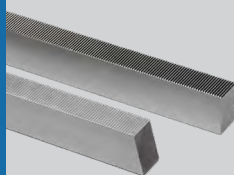
A Brand ADF/ADFO

Solid Carbide & Coolant Through Flat Drills

The A Brand ADF & ADFO enable one-step flat bottom drilling to simplify machining time and tool management. Suitable for a wide variety of drilling applications.



SPLINE



Rack Die

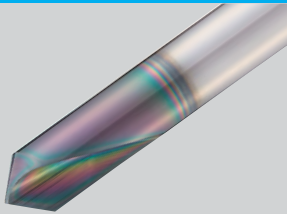
Designed to Eliminate Machine Adjustment

OSG rack dies are designed to eliminate machine adjustments. Simple die setup & installation guarantees the perfect workpiece, reduces setup time, and eliminates rejected parts. OSG has the expertise & capability to design & manufacture custom rack die solutions to meet the demands of any cold forming application.





CHAMFERING



A Brand AD-LDS
Advanced Performance
Spot Drills

The A Brand AD-LDS increases processing speed for both centering and countersinking. Constructed with extreme toughness, high wear and heat resistance characteristics to ensure stable and consistent tool life.



PHOENIX® PLDS
Indexable Centering and
Chamfering Cutter

PHOENIX® PLDS is a versatile series of indexable tools for spot drilling, countersinking & chamfering.



GROOVING



A Brand AE-VMS
Anti-Vibration Carbide
End Mills

The AE-VMS end mills bring you the new standard for milling. Variable lead geometry suppresses vibration and enables stable and high efficiency milling. With its substrate of micrograin carbide, it also comes with OSG's newest multi-layer DUARISE coating for superior surface quality and a full offering including square, corner radius, and long reach to cover all your needs.



SKIVING



Skiving Cutter
Designed for Gear Shaping
in Aluminum Alloy

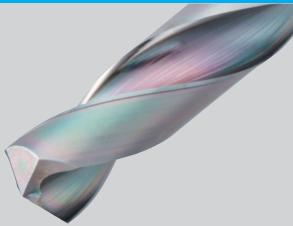
Skiving cutters are designed for gear and spline machining in a variety of materials, including steels and aluminum alloys. These custom tools can be applied to both internal & external gears, and are a highly cost-effective alternative to gear shaping and other soft machining processes.



Gears

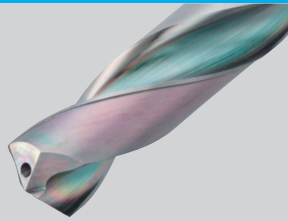
Gear parts for EV are made from alloy steel, with machining operations performed both before and after heat-treatment. Traditionally, gear machining has been done by hobbing on dedicated machines; however, more automakers are transitioning to power skiving on CNC machining centers for increased manufacturing flexibility. OSG has an offering of standard and custom tooling solutions for gear machining, from hobbing to skiving.

DRILLING



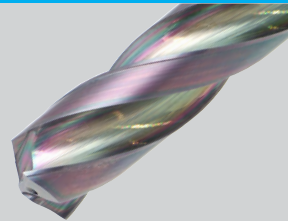
A Brand AD
Carbide Drills

OSG's premium line of solid carbide high performance drills. New wavy point edge form creates sharp cutting action for reduced thrust forces, while our proprietary EgiAs coating provides drastically higher hardness and heat resistance, enabling higher drilling speeds and incredible tool life.



A Brand ADO
Coolant-Through
Carbide Drills

OSG's premium line of carbide coolant-through high performance drills, designed to drill in a variety of steels up to 50X diameter without pecking. New point geometry reduces thrust forces, while our proprietary EgiAs coating provides drastically higher hardness and heat resistance, enabling higher drilling speeds and incredible tool life.



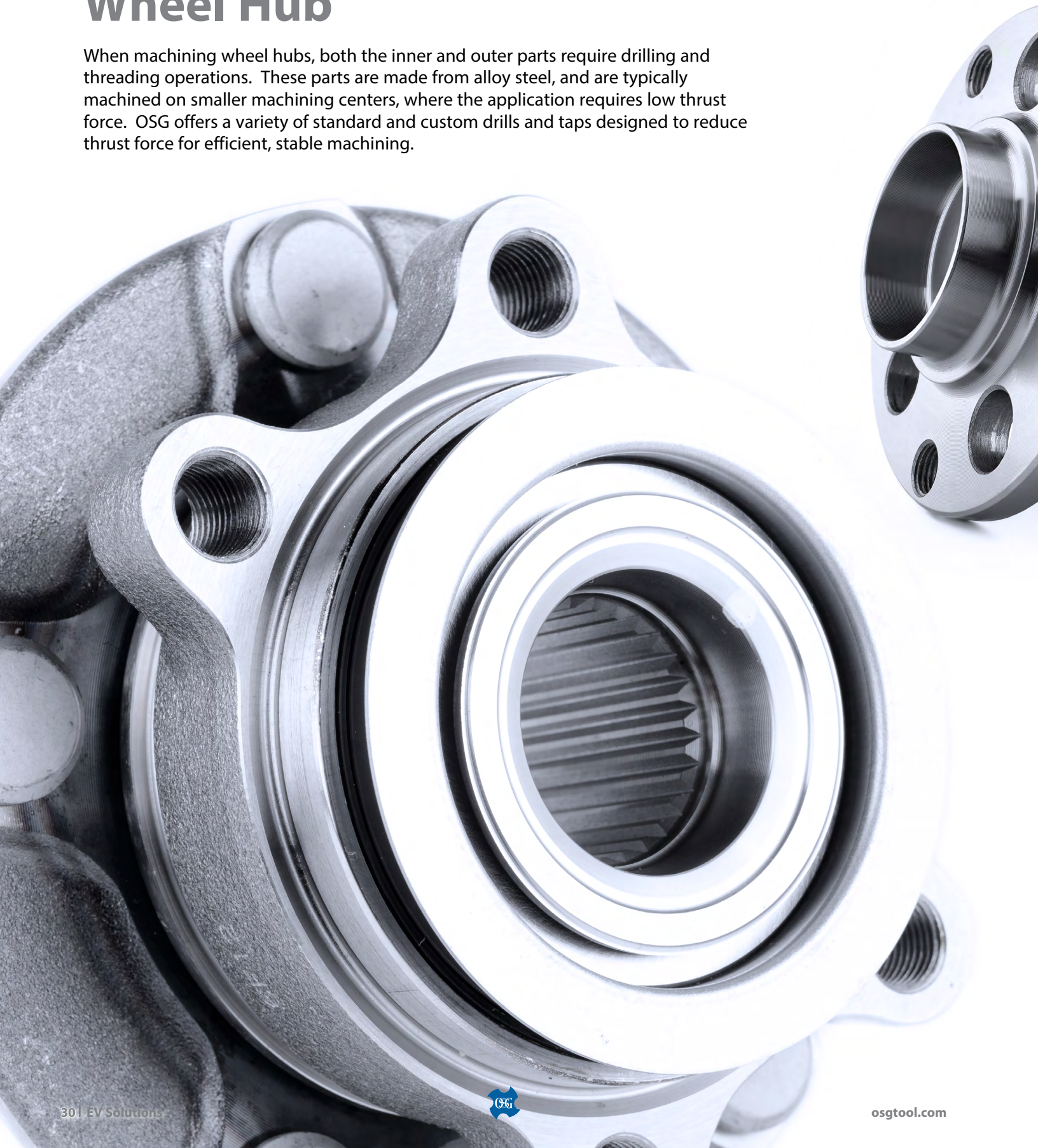
A Brand ADO-TRS
High Feed 3-Flute
Carbide Drills

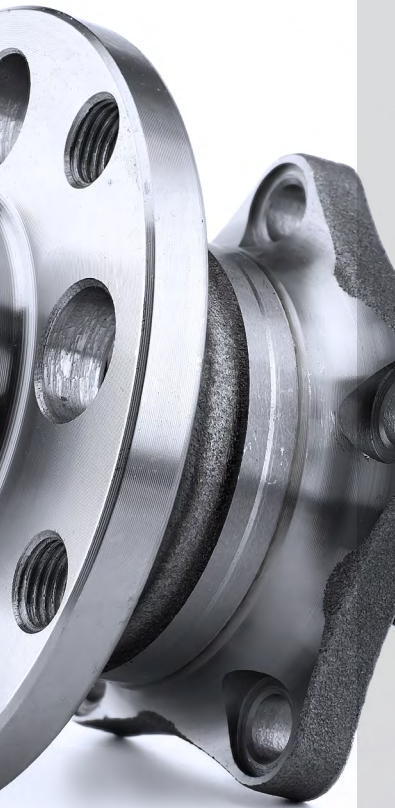
The A Brand ADO-TRS drill with its advanced performance 3-flute geometry, allows for reduced vibration, higher feed rates, improved chip evacuation, decreased work hardening, and stable drilling. The end result is up to 3X faster than 2-flute drills and up to 3X longer life.



Wheel Hub

When machining wheel hubs, both the inner and outer parts require drilling and threading operations. These parts are made from alloy steel, and are typically machined on smaller machining centers, where the application requires low thrust force. OSG offers a variety of standard and custom drills and taps designed to reduce thrust force for efficient, stable machining.





DRILLING



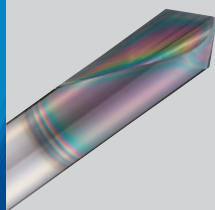
A Brand AD/ADO

Solid & Coolant-Through Carbide Drills

OSG's premium line of solid and coolant-through carbide high performance drills. New wavy point edge form creates sharp cutting action for reduced thrust forces, while our proprietary EgiAs coating provides drastically higher hardness and heat resistance, enabling higher drilling speeds and incredible tool life.



CHAMFERING



A Brand AD-LDS

Advanced Performance Spot Drills

The A Brand AD-LDS increases processing speed for both centering and countersinking. Constructed with extreme toughness, high wear and heat resistance characteristics to ensure stable and consistent tool life.



PHOENIX® PLDS

Indexable Centering and Chamfering Cutter

PHOENIX® PLDS is a versatile series of indexable tools for spot drilling, countersinking & chamfering.



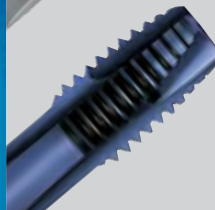
THREADING



A Brand A-POT

Advanced Performance Spiral Point Taps

Designed to simplify tool management and to excel in a wide variety of materials and applications. The A-POT is made from powdered metal HSS and has OSG's patented V coating to achieve excellent wear resistance as well as unique geometry that enables greater chip control.



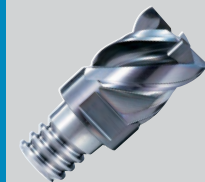
WXL-CPM-POT

Special Order Spiral Pointed Tap for Steels

A spiral-pointed tap utilizing OSG's proprietary CPM powdered metal substrate and WXL coating, WXL-CPM-POT provides extended tool life in through-hole applications in steels. OSG has the expertise & capability to design & manufacture custom tap solutions to meet the demands of any threading application.



SPOT FACING



PHOENIX® PXVC

Exchangeable Head End Mill Series for Superior Surface Finish

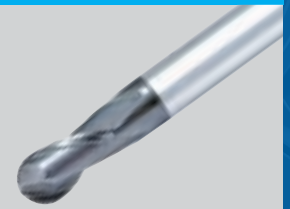
PHOENIX® PXM is an exchangeable head end mill series for superior surface finish and precision in a variety of applications.



Brakes & Calipers

While calipers are a part of the traditional friction braking system, electric vehicles still require them for certain types of braking. Regenerative braking recovers some of the kinetic energy that would otherwise turn into heat and instead converts it into electricity. In this system, the motor drives the wheels during acceleration or cruising, but the wheels drive the motor while decelerating. Depending on the part, calipers can be made from steel, cast iron, or aluminum. OSG's standard tooling lineup offers solutions for drilling and milling in all 3 materials.

END MILLING



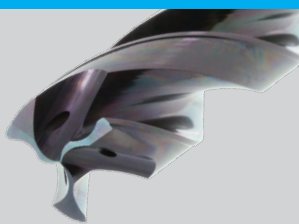
CRN-EBD

CrN Coated End Mills for Non-Ferrous Materials

CRN-EBD is OSG's CrN coated carbide ball nose end mill series for aluminum alloys and other non-ferrous materials. The sharp cutting edge and excellent ball radius tolerance enable accurate, high quality machining.



DRILLING



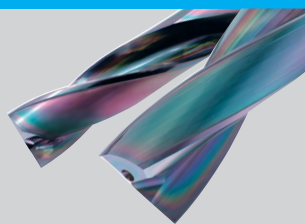
TRA-HO

High Feed 3-Flute Carbide Drills for Aluminum

The Special TRA-HO drills are special order drills designed for increased productivity in aluminum with excellent hole positioning.



COUNTERBORING



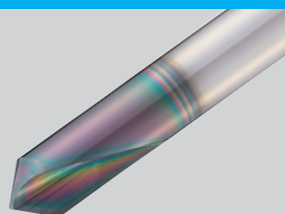
A Brand ADF/ADFO

Solid Carbide & Coolant Through Flat Drills

The A Brand ADF & ADFO enable one-step flat bottom drilling to simplify machining time and tool management. Suitable for a wide variety of drilling applications.



CHAMFERING



A Brand AD-LDS

Advanced Performance Spot Drills

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PHOENIX® PLDS

Indexable Centering and Chamfering Cutter

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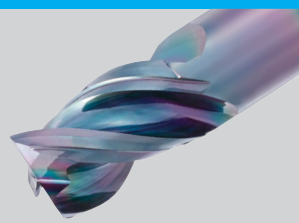
END MILLING



A Brand AE-TL-N

DLC Coated End Mills for Non-Ferrous Materials

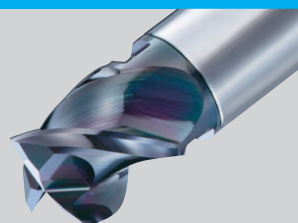
Advanced performance DLC coated carbide end mills for non-ferrous materials. With excellent cutting sharpness, they are able to suppress burrs to achieve excellent surface finish and are extremely effective for non-ferrous materials such as aluminum alloys that require welding resistance and lubricity.



A Brand AE-VTS-N

DLC Coated End Mills for Non-Ferrous Materials

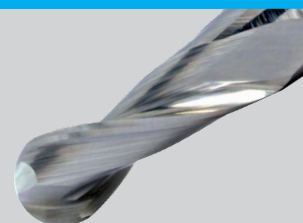
DLC coated carbide end mills for non-ferrous materials suitable for a wide variety of applications with high efficiency and quality. Its DLC-IGUSS coating further improves tool life with excellent welding resistance and lubricity, which is effective in the machining of non-ferrous materials such as aluminum alloys.



PHOENIX® PXM-PXAL

DLC Coated Exchangeable Head End Mill Series for Non-Ferrous Materials

PHOENIX PXAL is a DLC-coated exchangeable head end mill series for large-diameter milling with superior surface quality in non-ferrous materials. An abundant lineup including square, corner radius, and reduced shank types accommodate a wide range of applications.



EXOCARB® AERO Blizzard

Ball Nose End Mills for Aluminum Applications

The EXOCARB® Aero Blizzard® series is part of the OSG premium line of carbide high performance end mills specifically designed for either Aluminum or Copper alloys.



Drive Shaft

The drive shaft is a most important part of an electric vehicle that transfers torque from the transmission (motor) to the differential, which then delivers this torque to the wheels to drive the vehicle. Drive shafts are most commonly made from carbon steel. Typical machining operations include forming the spline, typically by forming die, as well as drilling of the yoke end. OSG offers a comprehensive lineup of standard cutting and forming tool solutions for Drive Shaft applications.

SPLINE

Rack Die

Designed to Eliminate Machine Adjustment

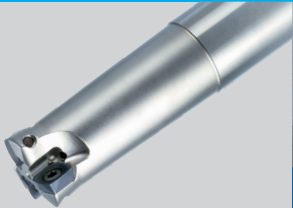
OSG rack dies are designed to eliminate machine adjustments. Simple die setup & installation guarantees the perfect workpiece, reduces setup time, and eliminates rejected parts. OSG has the expertise & capability to design & manufacture custom rack die solutions to meet the demands of any cold forming application.







MILLING



PHOENIX® PHC
Indexable High Feed Cutter

PHOENIX® PHC is a series of high feed end mills and facemills for maximum metal removal rates in a variety of milling applications.



PHOENIX® PRC
Indexable Radius Cutter

PHOENIX® PRC is a highly versatile series of button insert end mills and facemills for contour milling applications.



PHOENIX® PSE
90 Degree Indexable
Shoulder Cutter

PHOENIX® PSE is a versatile series of 90° end mills and facemills, ideal for a wide variety of rough and finish milling applications including facing, side milling, slotting, ramping and helical milling.



**PHOENIX® PFB/
PFR**
Indexable Ball Nose &
Corner Radius End Mills

PHOENIX® PFB & PFR are a series of high precision indexable finish ball nose and radius end mills for superior surface finish and tool life.



Die/Mold Parts

(Panels, Dashes, Bumpers, Lenses, etc.)

Exterior and interior components, such as the hood, trunk lid & body panels, are made by compression molding, while dashboards & bumpers are made by plastic injection molding. The hardened steel molds for these components must be machined to exact tolerances and have excellent surface finishes to maintain part fit and appearance. OSG carries a comprehensive lineup of high performance cutting tools for hardened steel machining & die/mold applications.

MILLING



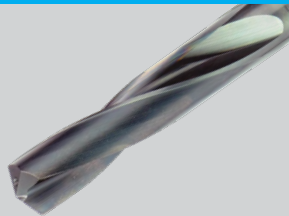
A Brand AE-H Series (Ball End)

Advanced Performance Carbide Ball End Mills

Carbide ball end mills for high -precision finishing of high-hardness steel with emphasis on machined surface accuracy. The DUOREY coating enables longer tool life in high-hardness steel and is high chipping resistant in work materials exceeding 60 HRC.



DRILLING



EXOPRO® WHO-Ni

Drills for Hardened Steels and Nickel Alloys

The EXOPRO® WHO-Ni drill series is OSG's premium performance drilling line for processing Ni-Alloys and Heat Resistant Super Alloys like Inconel 718. This latest innovation from OSG features our own proprietary WXS nano-coating, which has been developed by OSG specifically for high heat applications.



THREADING



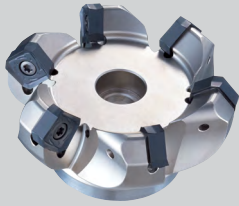
A Brand AT-2

End-Cutting Thread Mill for High-Hardness Steels

Thread mills with end-cutting edge for high hardness steels is ideal for highly difficult high hardness steel applications. Minimizing sudden tool breakage by breaking chips into small and manageable pieces and evacuating them smoothly. Since no pilot hole is required, process integration and the risk of breakage can be avoided.



SPOT FACING



PHOENIX® PAS
45 Degree Indexable
Facemills with 2-Sided
Square Insert

PHOENIX® PAS is a series of 45° indexable facemills. Utilizing a 2-sided square insert, stable and economical rough and finish machining is possible in a wide range of materials.

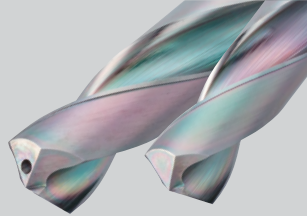


PHOENIX® PXVC
Exchangeable Head End
Mill Series for Superior
Surface Finish

PHOENIX® PXM is an exchangeable head end mill series for superior surface finish and precision in a variety of applications.

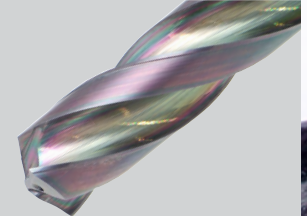


DRILLING



A Brand AD/ADO
Solid & Coolant-Through
Carbide Drills

OSG's premium line of solid and coolant-through carbide high performance drills. New wavy point edge form creates sharp cutting action for reduced thrust forces, while our proprietary EgiAs coating provides higher drilling speeds and incredible tool life.

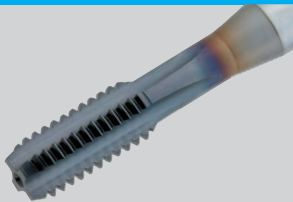


A Brand ADO-TRS
High Feed 3-Flute
Carbide Drills

The A Brand ADO-TRS drill with its advanced performance 3-flute geometry, allows for reduced vibration, higher feed rates, improved chip evacuation, decreased work hardening, and stable drilling. The end result is up to 3X faster than 2-flute drills and up to 3X longer life.



THREADING



EXOTAP® DC
Premium Threading
Solution for Aluminum
Castings

EXOTAP® DC taps feature the combination of ultra-strong rake with our VC10 powdered metal substrate, making this tap the absolute best solution for threading ductile castings.

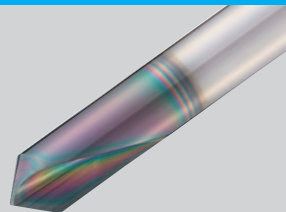


A Brand A-CHT & A-CSF
Advanced Performance
Carbide Coolant-Through
Taps

The A Brand A-CSF and A-CHT offer an ultra-fine grain carbide substrate and a unique flute geometry which excels in cast iron and non-ferrous materials.



CHAMFERING



A Brand AD-LDS
Advanced Performance
Spot Drills

The A Brand AD-LDS increases processing speed for both centering and countersinking. Constructed with extreme toughness, high wear and heat resistance characteristics to ensure stable and consistent tool life.



PHOENIX® PLDS
Indexable Centering and
Chamfering Cutter

PHOENIX® PLDS is a versatile series of indexable tools for spot drilling, countersinking & chamfering.



Steering Knuckle

The steering knuckle is an essential part of a vehicle's suspension and steering systems; containing the wheel hub and linking the front wheels to the steering system. Commonly made of forged steel, it is a critical part of front suspension safety & stability, with machining operations that require high quality surface finish, precision holemaking, and part flatness. OSG offers an extensive lineup of standard and custom tooling solutions to meet all of these requirements.





CV Joint

Constant velocity (CV) joints are located at both ends of the drive shaft, allowing it to transfer power from the transmission to the wheel at variable angles and constant rotational speeds. The components of CV joints, such as the outer race, cage, and inner race, are typically made of carbon steel and are machined in both the soft and heat-treated states. Machining challenges in the soft state include chatter & vibration control, while challenges in the hardened state center around feature accuracy and tool life. OSG offers standard & custom tooling for CV joints that provide stable, efficient, and durable machining with low CPU for high volume production.



MILLING (Inner/Outer Race)



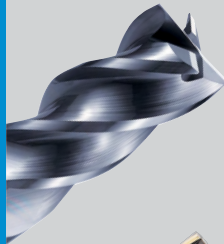
CBN Ball End Mill

Exchangeable Head End Mill for High-Hardness Steel

OSG's CBN-tipped PHOENIX exchangeable head ball nose end mill achieves stable machining and long tool life in high-hardness steel applications. Exchangeable head end mills not only provide excellent performance, but also great economy, as tooling costs can be further reduced by reconditioning (retipping and/or regrinding) through OSG's Regrind Service. OSG has the expertise & capability to design & manufacture custom end mill solutions to meet the demands of any hard milling application.



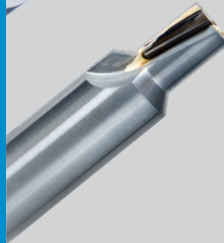
MILLING (Cage)



A Brand AE-VMS

Anti-Vibration Carbide End Mills

The AE-VMS end mills bring you the new standard for milling. Variable lead geometry suppresses vibration and enables stable and high efficiency milling. With its substrate of micrograin carbide, it also comes with OSG's newest multi-layer DUARISE coating for superior surface quality and a full offering including square, corner radius, and long reach to cover all your needs.



CBN Square End Mill

Special CBN-Tipped End Mill for High-Hardness Steels

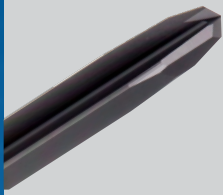
OSG's CBN-tipped end mill achieves excellent machining quality and long tool life in high-hardness steels compared to standard carbide end mills. In production environments where low CPU is a requirement, tooling costs can be further reduced by reconditioning (retipping and/or regrinding) through OSG's Regrind Service. OSG has the expertise & capability to design & manufacture custom end mill solutions to meet the demands of any hard milling application.



Body Panels

Once reserved primarily for sport and supercars, bumpers, fascia and other body panels made from composite materials, such as CFRP, are increasingly being utilized in mass produced vehicles due to their high strength to weight characteristics. Typical machining of these components includes trimming, pocketing, and drilling. OSG's Diamond-coated drills and routers are designed to meet the unique machining challenges of these advanced materials.

DRILLING



EXOPRO® AERO-STAD

Diamond Coated Carbide Triple Angle Drill

The EXOPRO® AERO-STAD is a diamond coated triple angle drill for composites. It is specifically designed to eliminate fiber breakout and delamination issues on both the entry and exit of drilled holes. The drill features OSG's patented diamond coating.



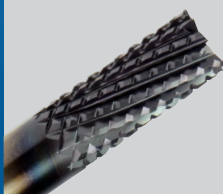
DRILLING



EXOPRO® AERO-REC

Routers for Composites (CFRP)

The EXOPRO® AERO-REC is a diamond coated router for roughing and semi-finishing composites. This router uses extremely low cutting forces for low rigid fixtures and weak spindles.



EXOPRO® AERO-BNC

Routers for Composites (CFRP)

The EXOPRO® AERO-BNC is a fine nicked router specifically designed for carbon fiber composite trimming. The router features a patented cutting geometry coupled with OSG's patented diamond coating.



COMPOSITE

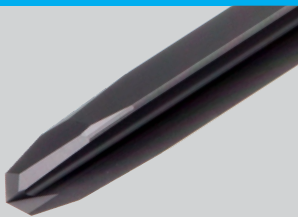




Interior

Interior trim components can be made from a variety of different materials, from metals to plastics, composites, and other non-metals. These components serve both a functional & aesthetic purpose inside the vehicle, so fit and finish are both critical requirements. Fabrication of these components includes trimming, slotting, pocketing, and drilling. OSG's cutting tool solutions for composite materials offers a large lineup of drills and routers designed for machining with excellent efficiency, accuracy & durability.

DRILLING



EXOPRO® AERO-STAD

Diamond Coated Carbide
Triple Angle Drill

The EXOPRO® AERO-STAD is a diamond coated triple angle drill for composites. It is specifically designed to eliminate fiber breakout and delamination issues on both the entry and exit of drilled holes. The drill features OSG's patented diamond coating.



END MILLING



EXOPRO® AERO-REC

Routers for Composites
(CFRP)

The EXOPRO® AERO-REC is a diamond coated router for roughing and semi-finishing composites. This router uses extremely low cutting forces for low rigid fixtures and weak spindles.



EXOPRO® AERO-BNC

Routers for Composites
(CFRP)

The EXOPRO® AERO-BNC is a fine nicked router specifically designed for carbon fiber composite trimming. The router features a patented cutting geometry coupled with OSG's patented diamond coating.



COMPOSITE



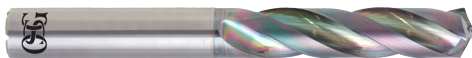
The A Brand *The Tooling Master Class*

LINE-UP

The A Brand is not only a premium tooling brand, it also represents the quality assurance OSG guarantees to each and every customer.

To better accommodate evolving manufacturing needs, the A Brand offering has been expanded. Whether you are looking for better tools or need assistance in choosing the right tool, give one of the A Brand products a try. You will experience a level of quality, reliability and satisfaction that can only be delivered by the A Brand tooling master class.

A-DRILL



A Brand ADO-TRS 3D & 5D



A Brand ADF • ADFO • ADFLS



A Brand ADO 3-50D



A Brand ADO-MICRO



A Brand AD 2D & 4D

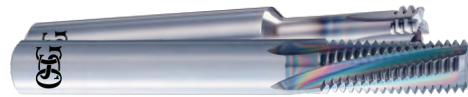


A Brand ADO-SUS 3D, 5D & 8D

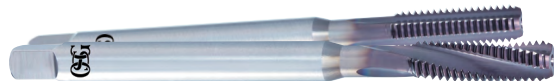


A Brand AD-LDS

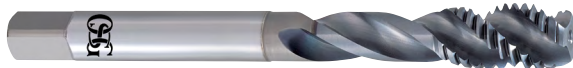
A-TAP



A Brand AT-1, AT-2 & AT-2 R-Spec



A Brand A-CSF & A-CHT



A Brand A-SFT • A-OIL-SFT • A-LT-SFT



A Brand A-POT • A-OIL-POT • A-LT-POT



A Brand A-PIPE

A-END MILL



A Brand AE-VMS • AE-CR-VMS • AE-LN-CR-VMS • AE-VMSS • AE-VMS-RA • AE-LN-VMSS • AE-VML • AE-NIK-VML • AE-CR-VML • AE-VMFE



A Brand AE-BD-H • AE-BM-H • AE-LNBD-H • AE-MS-H • AE-CR-MS-H • AE-MSS-H • AE-CPR4-H



A Brand AE-TL-N • AE-VTS-N • AE-CR-VTS-N • AE-LNBD-N





shaping your dreams

 **Safe use of cutting tools**

- Use safety cover, safety glasses and safety shoes during operation.
- Do not touch cutting edges with bare hands.
- Do not touch cutting chips with bare hands. Chips will be hot after cutting.
- Stop cutting when the tool becomes dull.
- Stop cutting operation immediately if you hear any abnormal cutting sounds.
- Do not modify tools.
- Please use appropriate tools for the operation. Check dimensions to ensure proper selection.

osgtool.com

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