

SHAPE it

OSG GLOBAL TOOLING MAGAZINE | SUMMER 2024

FEATURE: MANUFACTURING EXCELLENCE

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Advance to the next stage by breaking away from static plans and rigid mindsets

A Message from the President

In March 2024, OSG celebrated its 86th anniversary. OSG has been able to grow to the size it is today by advocating the company's management philosophy of having a "global presence" and finding success overseas under the slogan "economic global presence." On the other hand, to achieve continuous growth in the future, it is critical to break away from static plans and rigid mindsets within the company and refresh the attitude of each and every employee. Last December, in order to respond to various changes in the external environment, OSG revamped the sales structure of its three domestic sales divisions for the first time in 60 years. Even in the domestic market where OSG enjoys high market share, we are making new strategic steps to accelerate growth. Furthermore, in anticipation of a future with rising concerns regarding human resource shortages due to the declining birthrate and aging population, OSG has designated the administration department as a resource management center with the aim of effectively utilizing all management resources, including people, goods, capital and information technology. Additionally, .ACT Co., Ltd., which is made up of members who have contributed to OSG 4.0, was spun off as an in-house venture and became independent. All of these initiatives are efforts to break away from our comfort zone and to tackle new challenges.



We will continue to foster a comfortable working environment and system while maintaining good labor-management relations typical of OSG, which has been built over our long history, so that each and every employee can freely demonstrate their abilities and achieve results. Simultaneously, digital transformation (DX) will be indispensable for strengthening corporate structures that generate profits by saving labor and improving production efficiency. OSG will be striving for a hybrid DX that combines high value-added products created by skilled employees with systematic responses.

Within the company, we are nurturing visualization practices and transparent communication in the workplace, where employees are empowered to voice their ideas and take on new challenges. 2024 is the final year of Stage 1 of OSG's medium-term management plan "Beyond the Limit." Stage 2 will begin in 2025, which will be an important phase for the future. The entire OSG group will work coherently toward our shared mission, move forward with these efforts, and produce results to achieve our goals.

Nobuaki Osawa
President & COO of OSG Corporation

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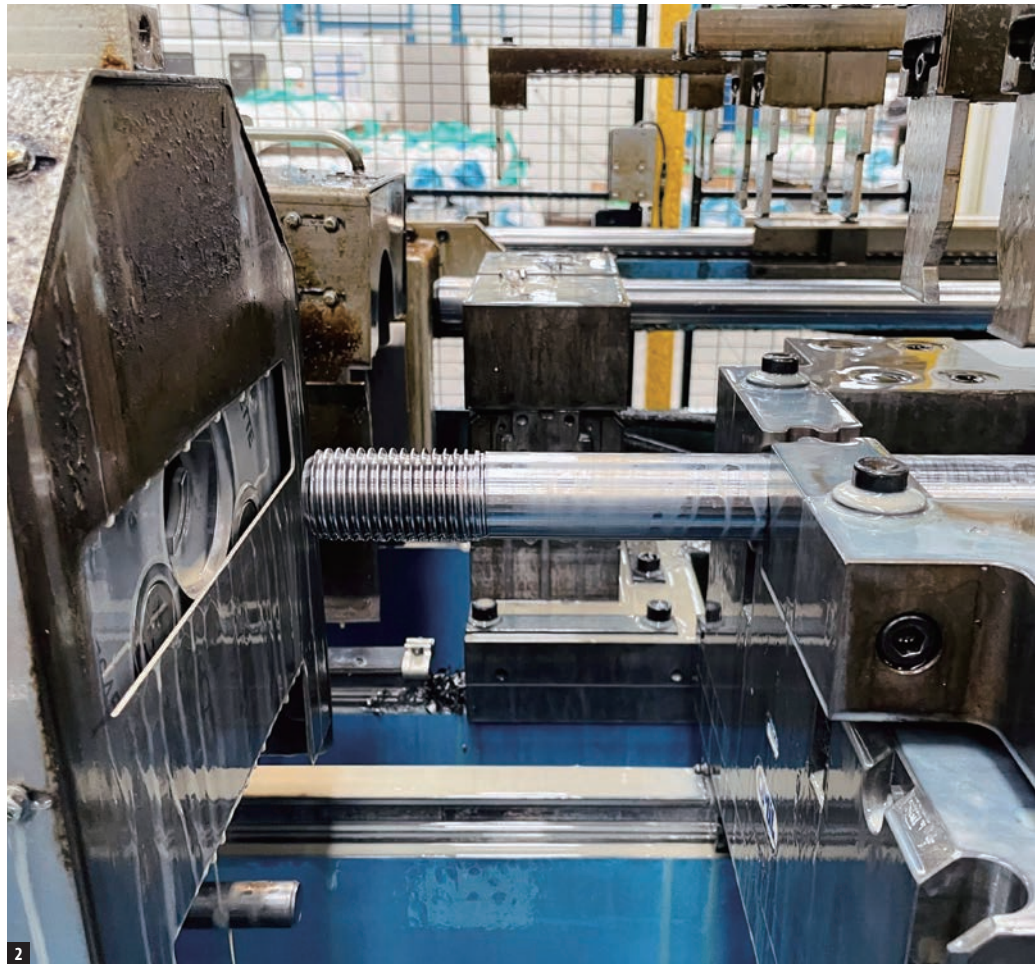
Manufacturing Excellence

OSG cold forming technology supports prestigious structural bolting firm emerged from industrial heritage of Sheffield, England

Hirozumi Kubo
OSG UK

Cold forming is a high-speed forging process that plastically deforms metal using dies at near room temperatures. It is a fast, precise, and automated process that produces large amounts of metal components without removing any material. Unlike hot working, cold forming shapes metal at cooler

temperatures. Because the crystal grains are unbroken, greater strength-to-weight ratio can be achieved with enhanced mechanical properties, which contributes to a stronger and more dependable part. Higher surface finish can also be obtained as there is no corrosion of workpiece.



1. From left, Helix Tool Company Technical Sales Director John Smith, Cooper & Turner Production Manager Andy Gale, OSG UK Area Sales Manager Phil Ridsdale, OSG UK Engineering Manager Kirk Kubo and OSG UK Sales Manager Paul Fitton pose for a photograph at Cooper & Turner's manufacturing facility in Sheffield, England.

2. External threads have been formed onto the metal bar.

Cold forming requires heavy equipment and is ideal for large volume manufacturing. The initial investment of cold forming may be expensive up front, but it is able to eliminate or significantly reduce a variety of secondary operations, which contributes to faster lead time and reduces overall cost.

A wide variety of materials can be cold formed, such as alloy steels, aluminum, brass, bronze, copper, nickel alloys, stainless steels, etc. Cold forming can create large components such as car panels and flat sheets as well as small parts like screws, nuts and bolts. It is suitable for diverse industries such as aerospace, automotive, agriculture, construction, energy, transportation, and more. With short cycle time, high energy efficiency and minimal waste, cold forming is a highly sustainable metalworking process.

Key Benefits of Cold Forming

- High productivity
- High quantity output
- Reduces secondary operations
- Fewer scraps and waste
- Energy-efficient
- Cost effective
- Good surface finish
- Consistent dimensional accuracy
- Greater workpiece load capacity
- High customizability

OSG Cold Forming Solutions

In 1956, OSG began the manufacturing and sales of rolling dies. Today, the company offers a broad lineup of dies and thread rolling products including cylindrical dies, flat dies, trim dies, planetary dies and rack dies. OSG is one of the world's largest manufacturers of rolling dies, with more than 70,000 cold forming tools being produced annually through several production sites in Japan, the United States, Mexico, Germany, China, Taiwan, Korea, Thailand and India.

Utilizing the same advanced technology the company uses for its world-renowned taps, OSG manufactures a variety of dies in accordance with their intended use with superb precision and tool life. OSG can manufacture dies based on any desired specifications and can provide tailored evaluation and solutions.

In 2019, OSG further expanded its product portfolio and emphasis on the European market by acquiring OSG EX-CELL-O, a German company that specializes in cold forming machines and tools that serviced the European market for over 65 years. OSG EX-CELL-O offers highly productive cold forming solutions of involute splines, threads, oil grooves, knurls or other similar shapes on rotationally symmetrical components.

The OSG group cooperates intensively to analyze tool technology in order to provide the best technical solutions to clients in different regions. With a vast product lineup, years of indispensable know-hows and an extensive global support network, OSG is ready to respond to evolving cold forming needs with innovative solutions.



OSG manufactures a variety of dies in accordance with their intended use with superb precision and tool life. OSG can manufacture dies based on any desired specifications and can provide tailored evaluation and solutions.

Cooper & Turner Ltd.

Recently, Cooper & Turner Ltd., a manufacturer of high strength and safety critical fasteners, is able to leverage OSG's cold forming solutions in its bolt production.

Founded in 1863, Cooper & Turner is a global leader in the manufacturing and supply of structural bolting and has a long-standing reputation for quality products and service. Its bolts, studs and industrial fasteners meet the strictest requirements and provide maximum safety for operating in some of the world's most hostile environments - from the heat of the deserts, the cold of the Arctic, to the deepest of seas.



1. Stacks of threaded parts. Cooper & Turner is a global leader in the manufacturing and supply of structural bolting and has a long-standing reputation for quality products and service.

2. Cooper & Turner's production plant in Sheffield, England, United Kingdom. Founded since 1863, Cooper & Turner has over a century of acquired knowledge and experience in high strength and safety critical fasteners.



Stocks of metal blanks (round bars).

Cooper & Turner's global headquarters is located in Sheffield, South Yorkshire, England. Sheffield is a historical city that thrived and flourished with steelmaking dating back to the 16th century. Sheffield's unique geography offered optimal steelmaking conditions - the hills supplied coal, iron and millstone grit for the workshops' grinding wheels; the city's seven rivers provided waterpower (in the days before steam); its forests were the sources for wood and charcoal. And most importantly, Sheffield became the birthplace of manufacturing innovations such as crucible steel

(cast steel) and stainless steel, which continue to dominate the world's steel industry for years to come. Cooper & Turner emerged alongside this history.

Since its foundation in the 1800s, Cooper & Turner continuously contributes to the fastener industry, supplying high strength friction grip fasteners, including ground-breaking inventions and patents such as the "Coronet Direct Tension Indicator," a product that ensures correct torque tensioning for high strength bolting assemblies.



A cold forming machine at Cooper & Turner's production plant in Sheffield, England.

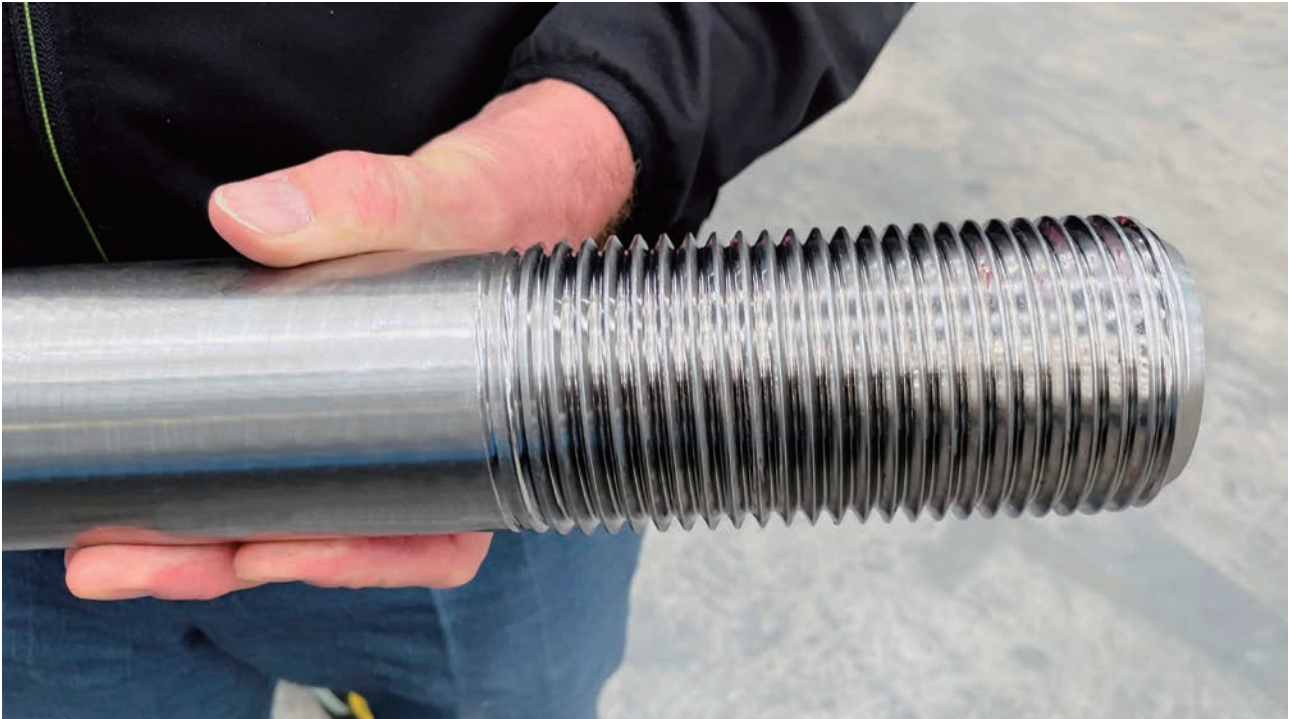
Some of the markets that Cooper & Turner services include renewable energy, oil and gas, construction, rail, tunnelling, petrochemical, and subsea. Cooper & Turner's strategic operations in Europe, Asia Pacific and the United States allow the company to support customers on a global basis.

Cooper & Turner's production plant in Sheffield has an estimate land area of 35,000-square-meter. Its extensive manufacturing facilities with both hot and cold forging capabilities enable the company to supply a wide range of products in various sizes.



Thread rolling is a widely applicable method for mass production of fasteners, using the plasticity of metals to form the external threads onto metal blanks (round bars), by roll feeding the bar between two or several sets of rolling dies.





A threaded metal bar.

Over decades of fastener making, Cooper & Turner has progressed from various styles of thread making to rolling dies, achieving requirements in both quality and quantity. Thread rolling is a widely applicable method for mass production of fasteners, using the plasticity of metals to form the external threads onto metal blanks (round bars), by roll feeding the bar between two or several sets of rolling dies. This method enables high volume production at a typical rate of 10 to 1,500 parts/min with high precision and minimum variation. Unlike milled threads, high quality surface finish is maintained across long production shifts. Moreover, uncut fiber flow makes approximately 20 percent stronger threads. Therefore, the quality of rolling dies has been a vital importance to Cooper & Turner to be at the top of the game.

OSG UK Area Sales Manager Phil Ridsdale and Helix Tool Company Limited (Helix), a top tier OSG distributor, have been in touch with Cooper & Turner for many years seeking for new business opportunities in rolling dies. OSG first supplied flat die samples in 2017 and the rest is all success stories. Today, OSG supplies more than 12 sizes of various dies, ranging from M30 to M72, with more opportunities on the scope. There is twofold to what made OSG rolling dies stand out for Cooper & Turner to change. One is the most obvious defining factor: tool life. Back in 2017, the first M30 sample supplied achieved over 12,000 bars compared to 6,000 bars by the competitor dies. OSG dies, although 10 to 15 percent more expensive, performed to improve cost per unit over 50 percent as well as massively reducing machine downtime.



An OSG M42 x 4.5 cylindrical die. Cylindrical dies are ideal for a wide range of precision threaded parts. Thread rolling cylindrical dies are used in set of two or set of three. OSG offers customization in accordance with any desired specification.

The second factor is OSG's technical expertise and reliable support network. Before OSG became the main die supplier at Cooper & Turner, there had been times where OSG went above and beyond to deliver solutions. One of the times was when OSG went as far as to inspect the machine and material settings to resolve issues that machined bolts were not gauging correctly and was halting production output already under pressure. Having provided full inspection report on the tools (dies) to cancel out the possibility of faulty dies, investigation led OSG to discover that the material bar sizes were out of tolerance in disparity, leaving not enough volume of material to be rolled and achieve pitch diameter and major diameter of the threads required.



Helix Tool Supply Management

Helix Tool Company Limited was established in 1994 in the heart of Yorkshire in Northern England and has been OSG's technical supply partner for over 25 years. Tool Supply Management (TSM), one of Helix's latest inventory tracking solutions, is a vending machine that is engineered to maintain accurate inventory, enable short delivery, and simplify report as well as invoicing for its users.



Stocks of OSG rolling dies. OSG supplies more than 12 sizes of various dies, ranging from M30 to M72, to Cooper & Turner.

As this case demonstrates, depth of knowledge on not only tools but surrounding factors and the utilization of scientific approach are the strength of OSG's technical support. Last but not the least, Helix, OSG's technical supply partner for over 25 years, has been an immense part of maintaining stability in the supply chain; Tool Supply Management (TSM), one of Helix's latest inventory tracking solutions, is a vending machine that is engineered to maintain accurate inventory, enable short delivery, and simplify report as well as invoicing for its users. With the proximity of its Sheffield branch to Cooper & Turners, Helix enables precise communication between both OSG and Cooper & Turners, by grasping accurate information in a timely manner pertaining stock, delivery, technical or commercial issues - all of which, added values to the customer experience.

Product quality is of paramount importance to Cooper & Turner as its products are safety critical and must function in some of the most rigorous environments. With unique metallurgy, design methods and surface treatment technologies to improve productivity, accuracy and tool life, OSG will continue to go beyond the limit to support Cooper & Turner in its pursuit of manufacturing excellence.

6C x OSG

The new standard for hard and brittle material processing

Hirofumi Inayoshi
OSG Corporation

Hard & Brittle Materials

Hard and brittle materials such as cemented carbide, ceramics and quartz glass offer incredible wear resistance and heat resistance. With material properties that cannot be met by metal or plastic-based materials, hard materials are increasingly applied in a wide range of industries such as automotive, mechatronics, chemical, medical, aerospace, and more. The use of cemented carbide, ceramics and quartz glass in particular has elevated year by year in the mold and semiconductor sectors to improve precision and durability of components.

Although hard materials are ideal for many applications, they can be weak against impact and can break unpredictably due to their brittle characteristic. In addition, the processing of hard materials is highly challenging, requires a lot of time, and the tools used are subject to severe wear, making it an expensive production process. High tool wear and ensuring that the required level of precision is met while keeping machining cost low are some of the common obstacles of processing hard and brittle materials.

Grinding has been the standard technology used for machining hard and brittle materials. For materials that are electrically conductive, electrical discharge machining (EDM) is also used. These methods, however, often require long cycle time and many processing steps.





6C x OSG



6C x OSG

To enhance cost efficiency in the processing of hard and brittle materials, OSG Corporation has partnered with 6C Tools AG in 2022 and established the 6C x OSG brand.

Founded in 2015, 6C Tools AG (6C) is a tool manufacturer based in Zurich, Switzerland. 6C, which manufactures cutting tools using solid polycrystalline diamond (PCD) as a base material, is a startup company that supplies products to precision processing manufacturers in Switzerland and abroad.

Established in 1938, OSG Corporation is one of the world's leading comprehensive cutting tool manufacturers. OSG holds the No. 1 position in the Japanese cutting tool market as well as a top-ranking position globally, with a production, sales and technical network spanning more than 30 countries. OSG's world-class R&D facilities and laboratories are staffed by highly trained engineers, all dedicated to developing the highest quality products using environmentally friendly processes. OSG has traditionally maintained a powerful marketing presence in manufacturing industries including automotive, aerospace and mold and die. OSG also supplies products to energy-related industries, the construction equipment industry, as well as to the manufacturers of micro precision equipment that requires high machining accuracy, such as semiconductors for 5G, precision molds, mobility, and robotics.



6C x OSG is a cutting tool series optimized for the processing of hard and brittle materials with high precision and good surface finish at a new level of geometric complexity. The 6C x OSG brand proposes a new concept for machining free-form shapes out of hard, brittle materials without the drawbacks of both grinding and EDM. PCD tools by 6C x OSG enable direct machining that is highly efficient and accurate, which shortens machining time, reduces costs, minimizes energy consumption, and contributes to the realization of carbon neutrality.

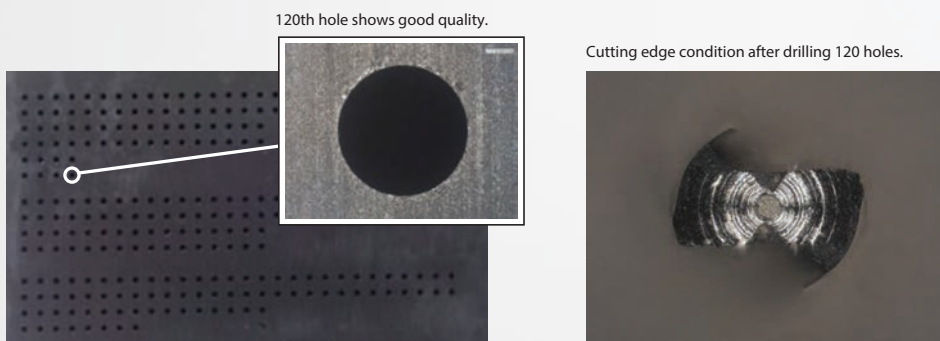
Product Overview

PCD Drill “PCD-MXD”

The PCD-MXD is composed of solid PCD engineered for long tool life in the drilling of hard and brittle materials. Its unique w angle geometry prevents chipping on the tool and workpiece. Furthermore, its low helix flute form improves tool rigidity, making it ideal for machining hard and brittle materials such as cemented carbide, ceramics and quartz glass.

Machining Example

The average tool life of a conventional diamond coated drill in silicon carbide is around 30 holes. As depicted in figure 1, the PCD-MXD demonstrates superior tool life by completing 120 holes with a single tool in silicon carbide and can continued to be used.



Process	Tool	Tool Size	Number of Flute	Cutting Speed (min ⁻¹)	Feed (mm/min)	Step (mm)	Depth (mm)	Coolant
Drilling	PCD-MXD	φ 0.6	2	8,000	1.0	0.01	3.8 Blind Hole	Water-soluble Coolant
	Conventional Diamond Coated Drill							

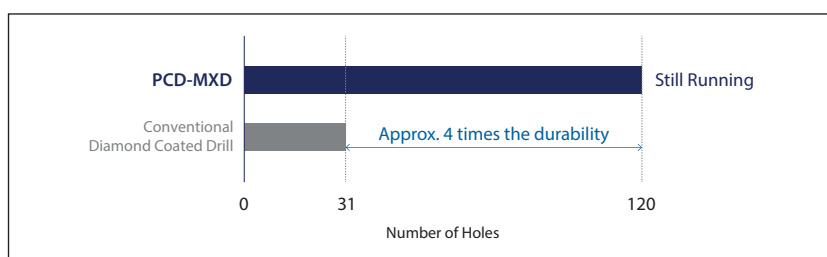


Figure 1. Silicon carbide processing example: drilling 120 holes with a single tool

PCD Radius End Mill “PCD-MRM”

The PCD-MRM is composed of solid PCD engineered for long tool life in the milling of hard and brittle materials. Its ultra multi-flute configuration makes roughing highly efficient while enabling a mirror finish. By featuring a helix flute geometry, cutting resistance is minimized. The PCD-MRM is suitable for hard and brittle materials such as cemented carbide, ceramics and quartz glass.



Machining Examples


As illustrated in figure 2, the PCD-MRM demonstrates high machining efficiency by removing a volume of 380 mm³ in cemented carbide in just four and a half minutes with normal wear progression and can continued to be used.

WORKPIECE

Work Material
Cemented Carbide (V30) 88.5 HRA

Size of Workpiece
20 mm x 20 mm

Removed Volume
380 mm³




Cutting edge condition after machining

No.	Process	Tool	Tool Size	Number of Flute	Cutting Speed (min ⁻¹)	Feed (mm/min)	Depth of Cut (mm)	Coolant	Machining Time
1	Trochoidal Slotting	PCD-MRM	φ 2 x R0.1 x 3	15	25,000	1,000	ap = 1.6 ae = 0.1	Air-blow	1:10
2	Side Milling						ap = 1.6 ae = 0.1		3:25

Total Machining Time: 4:35

Figure 2. Shape processing of cemented carbide: removes a volume of 380 mm³ in just four and a half minutes

Figure 3 depicts the PCD-MRM's capability to complete roughing to mirror finishing in cemented carbide with a single tool.

WORKPIECE

Work Material
Cemented Carbide (GU20) 91.5 HRA

Size of Workpiece
30 mm x 30 mm x t20 mm



No.	Process	Tool	Tool Size	Number of Flute	Processing Method	Cutting Speed (min ⁻¹)	Feed (mm/min)	Depth of Cut (mm)	Coolant	Machining Time
1	Roughing	PCD-MRM	φ 3 x R0.1 x 5	25	Down Milling	14,000	350	ap = 0.005 ae = 0.45	Air-blow	6:54
2	Finishing					14,000		ap = 0.005 ae = 0.07		

Total Machining Time: 51:08

Figure 3. Mirror finishing of cemented carbide: completes roughing to mirror finishing with just one tool

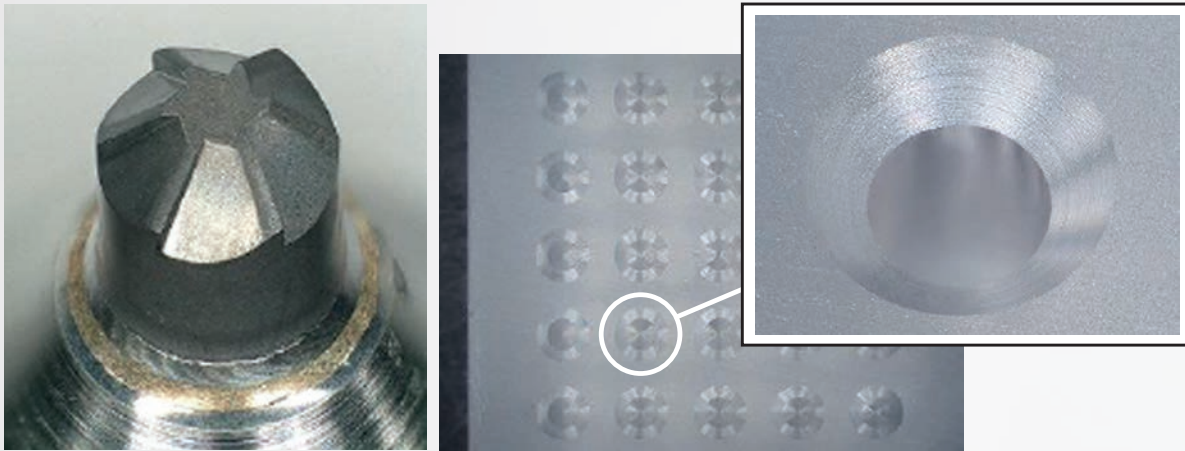
PCD Chamfering Tool “PCD-MCM”

The PCD-MCM is composed of solid PCD engineered for long tool life and high machined surface quality even in hard and brittle materials that are prone to chipping. By featuring a multi-flute configuration, machining efficiency is enhanced. The PCD-MCM is suitable for hard and brittle materials such as cemented carbide, ceramics and quartz glass.

Machining Example

As depicted in figure 4, the PCD-MCM is able to achieve both machining efficiency and good machined surface quality even in quartz glass.

Tool Appearance



No.	Process	Tool	Tool Size	Number of Flute	Cutting Speed (min ⁻¹)	Feed (mm/min)	Depth (mm)	Coolant
1	Drilling	PCD-MXD	∅ 1.0	2	15,000	6	2.0 Blind Hole	Water-soluble Coolant
2	Chamfering	PCD-MCM	1 x 45° x 2	6	32,000	64	Chamfer Diameter ∅ 1.8	

Figure 4. Chamfering of quartz glass: achieves good machined surface quality even in quartz glass

PCD Thread Mill “PCD-MTM”

The PCD-MTM is composed of solid PCD engineered for long tool life in the threading of hard and brittle materials. By featuring a multi-flute configuration, machining efficiency is enhanced. Furthermore, its single thread form reduces cutting resistance and minimizes the pitch diameter difference between the hole entry and inner hole. The PCD-MTM is suitable for hard and brittle materials such as cemented carbide, ceramics and quartz glass.

Machining Examples

As depicted in figure 5, the PCD-MTM demonstrates five times the processing efficiency versus a conventional tool in internal thread milling of Zirconia. In addition to the reduction of cycle time, good thread quality is also achieved.



Tool	PCD-MTM $\phi 1.55 \times 0.4$ -INT
Material	Zirconia
Conventional Method	Electroplated Tool
Thread Size	M2 x 0.4
Threading Length	2.5 mm (Through)
Depth of Cut	0.1 mm
Cutting Speed	195 m/min (40,000 min ⁻¹)
Feed	10 mm/min

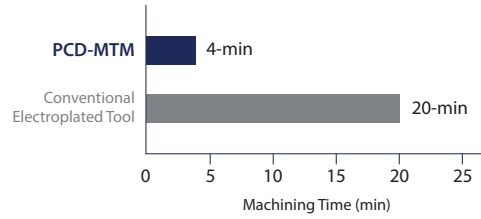
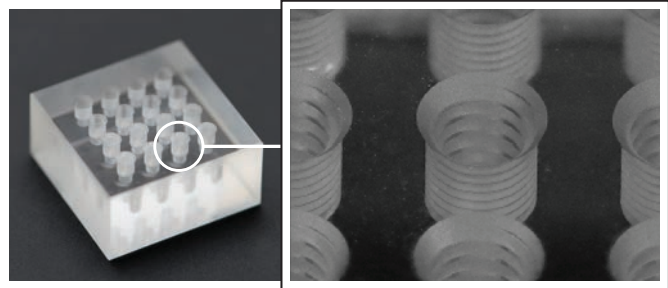


Figure 5. Internal thread milling in Zirconia: 5 times the machining efficiency

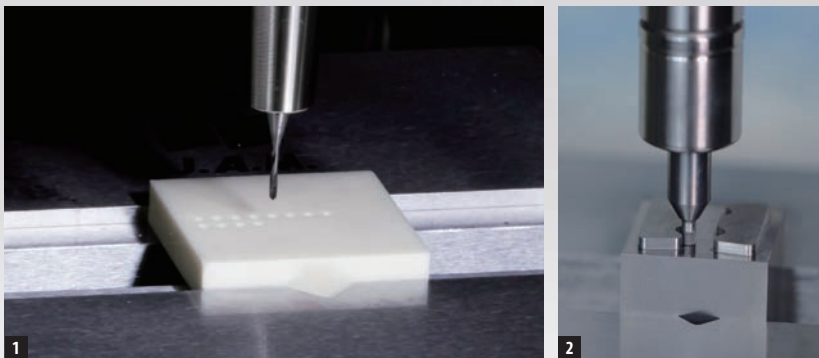
Figure 6 is an internal thread milling example in quartz glass. The PCD-MTM demonstrates high machining efficiency and good thread quality.

Cooperation: Sodick Co., Ltd.



No.	Process	Tool	Tool Size	Cutting Speed (min ⁻¹)	Feed (mm/min)	Depth of Cut (mm)	Coolant	Machining Time
1	Drilling	PCD-MXD	$\phi 1.6$	10,000	15	6.5 (0.2 mm Step)	Non-water-soluble Coolant	0:50
2	Chamfering	PCD-MCM	1 x 45° x 2	25,000	190	C0.2		0:01
3	Threading	PCD-MTM	$\phi 1.55 \times 0.4$ -INT (M2 x 0.4)	20,000	41	4 (2-pass)		3:37

Figure 6. Internal thread milling in quartz glass: achieves high-quality threads even with high-efficiency machining

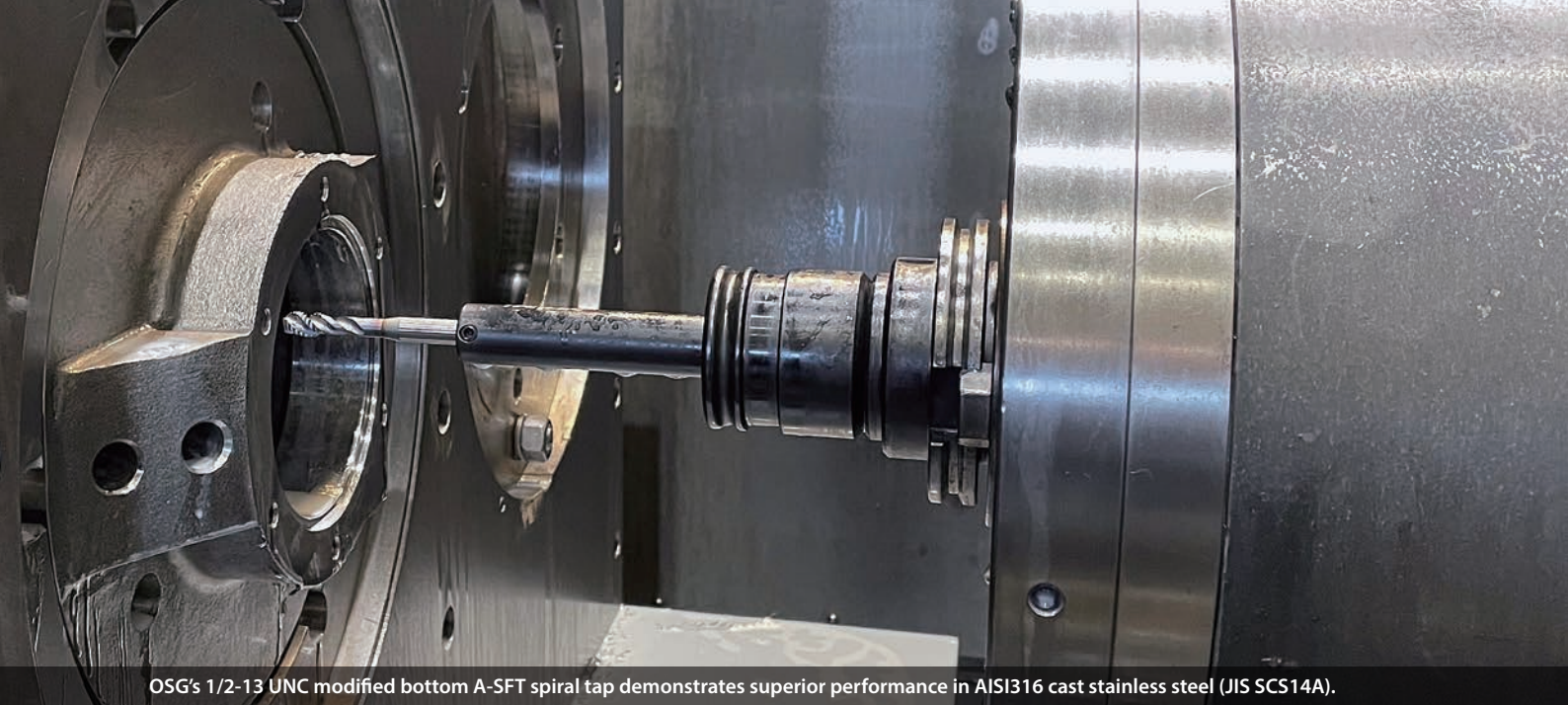


1. 6C x OSG is a cutting tool series optimized for the processing of hard and brittle materials with high precision and good surface finish at a new level of geometric complexity.

2. PCD tools by 6C x OSG enable direct machining that is highly efficient and accurate, which shortens machining time, reduces costs, minimizes energy consumption, and contributes to the realization of carbon neutrality.

As a new standard for the processing of hard and brittle materials, 6C x OSG proposes innovative machining technology that does not compromise on processing quality and production efficiency.

6C x OSG products are currently available in Japan, China and Taiwan.



OSG's 1/2-13 UNC modified bottom A-SFT spiral tap demonstrates superior performance in AISI316 cast stainless steel (JIS SCS14A).

Versatile and Efficient

A-Tap simplifies tool management and accelerates productivity in pump component production

Tim Eldridge
OSG USA

Founded in 1933, Gorman-Rupp Company is a world leading manufacturer of pumps and pumping systems. Gorman-Rupp produces pumps for a wide variety of markets, such as municipal, sewage, industrial, mining, construction, petroleum, agriculture and more. The company's extensive line of pump products includes self-priming centrifugal pumps, standard centrifugal pumps, submersible pumps, trash pumps, priming assisted pumps, rotary gear pumps and air-driven diaphragm pumps.

Employing 100 staff, Gorman-Rupp's headquarters is located in Mansfield, Ohio, United States, with over one million square feet of modern manufacturing and warehousing facilities. Gorman-Rupp's pumps are generally made of cast iron, bronze, AISI316 cast stainless steel (JIS SCS14A) and ASTM CD4MCu (duplex stainless steel) to handle corrosive and abrasive fluids. With a fleet of state-of-the-art, fully automated machining centers, high-speed, high-quality machining of pump castings are made possible.

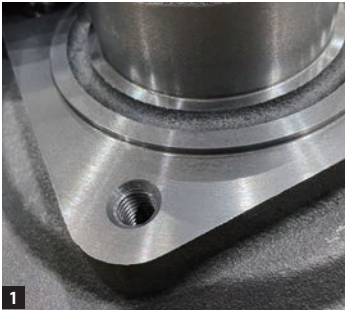


Founded in 1933, Gorman-Rupp Company is a world leading manufacturer of pumps and pumping systems. Employing 100 staff, Gorman-Rupp's headquarters is located in Mansfield, Ohio, United States, with over one million square feet of modern manufacturing and warehousing facilities. Photo courtesy of Gorman-Rupp.

Since nearly every part produced includes drilled and tapped holes, it is no surprise that over the years, Gorman-Rupp has utilized nearly every type and brand of tap available. While Gorman-Rupp produces a wide variety of pumps, a great deal of commonality exists on the component level, allowing the production of "part families" with minor differences such as part size, hole location, material, etc. The number of holes required to be processed vary per part due to the high-mix, low-volume nature of the production. This has resulted in having many duplicate tap configurations as well as a large mix of taps in Gorman-Rupp's tool crib. The company's collection of taps ranges from general-purpose to high-performance that are made by various cutting tool manufacturers.

The large variety of taps presented a challenge to Gorman-Rupp, as it does in many other machine shops. Machine operators often would choose the first tap they find from the tool crib that matches the thread designation, which may not always be ideal for the material or the application, resulting in mediocre results.

To address this problem, Gorman-Rupp contacted OSG in hopes of consolidating its tap selection to a more versatile product that works in all the materials that the company uses in its production of pump housing and various pump components. CNC Programmer Tym Greenwood led the project on the Gorman-Rupp side and laid out the goals of not only consolidating tooling to one manufacturer, but also increasing tapping efficiency and reducing overall cost per unit (CPU). It was important to Gorman-Rupp to streamline its tap selection in a way without sacrificing part quality or CPU.



1. Superb thread finish by the A-Tap. Gorman-Rupp is very pleased with the thread quality left by the A-Tap compared to their previous tooling choice. Even in grey cast iron, the thread finish is exceptional.
2. Gorman-Rupp's extensive line of pump products includes self-priming centrifugal pumps, standard centrifugal pumps, submersible pumps, trash pumps, priming assisted pumps, rotary gear pumps and air-driven diaphragm pumps. Photo courtesy of Gorman-Rupp.
3. The A-Tap is known for its superior chip evacuation capability. It is an all-purpose tap series developed to accommodate a wide variety of materials and machining environments, helping manufacturers simplify tool management.

After reviewing the list of taps Gorman-Rupp had used in the past 12 months, becoming familiar with the parts and manufacturing processes noting the common materials, OSG saw an opportunity to utilize the A Brand A-Tap series.

OSG's A-Tap is an all-purpose tap series designed to simplify tool management and to excel in a wide variety of materials and applications. Achieving trouble-free chip evacuation with a spiral tap in blind holes is particularly challenging and is a main cause of headaches for many manufacturers. To resolve this problem and to improve the ejection of chips, OSG's A-Tap A-SFT has adopted a variable helix flute design, which encourages stable chip evacuation. The helix angle changes from the chamfer, where chips are formed, to the flutes, where chips are evacuated. This unique geometry enables greater chip control that can help produce tightly compacted chips for easy ejection from the hole.

To accommodate a wide range of cutting conditions, powdered metal HSS and OSG's V coating have been employed in this series to achieve excellent wear resistance. In addition, to enable high-speed machining, the A-Tap series incorporates a unique cutting edge design that emphasizes sharpness. Not only does the A-Tap series perform well in general steel, it also excels in difficult-to-machine materials such as stainless steel and mild steel. The A-Tap is compatible with various types of machining equipment – from manual machines to the latest advanced machining centers. Available in spiral flute and spiral point, the A-Tap can efficiently tap nearly any material, making it the most versatile, high-performance tap on the market.

The unique features of the A-Tap make it a perfect choice for Gorman-Rupp to utilize in its tap consolidation project. Once the A-Tap was identified as a potential solution, the highest usage taps were brought in for testing on a variety of machines, materials and applications.

For a AISI316 cast stainless steel (JIS SCS14A) application, testing took place on a Mazak 630 horizontal machining center using OSG's 3/8-16 UNC modified bottoming A-SFT spiral flute tap (EDP# 1650511608). The drill hole size was 0.323-inch (blind hole) and the tapping length was 1-inch. Soluble coolant was applied for the machining. The cast stainless steel housing part has an estimate annual production of 25,000 pieces. Both the competitor spiral flute tap and OSG's A-SFT were used at a spindle speed of

200 rpm, cutting speed of 19.63 sfm, feed rate of 0.0625 ipr and 12.5 ipm. The cycle time was 9.6-second. The competitor tool life was 250 pieces whereas OSG's A-SFT was able to complete 300 pieces. The tool price of the A-SFT is also about \$8.50 USD less than the competitor tool. Taken in consideration of the tool cost, machine cost, tool change time and other factors, the total CPU is reduced by 8 percent versus the competitor tool.

For a ductile cast iron application, testing took place on a Mazak 630 horizontal machining center using OSG's 1/2-13 UNC modified bottoming A-SFT spiral flute tap (EDP# 1650512708). The drill hole size was 0.437-inch (blind hole) and the tapping length was 1.25-inch. Soluble coolant was applied for the machining. The cast iron housing part has an estimate annual production of 25,000 pieces. The competitor spiral flute tap was used at a spindle speed of 350 rpm, cutting speed of 45.81 sfm, feed rate of 0.077 ipr and 26.95 ipm. The cycle time was 5.6-second and the tool life was 400 pieces.

OSG's A-SFT was used at a spindle speed of 530 rpm, cutting speed of 69.38 sfm, feed rate of 0.077 ipr and 40.81 ipm. The cycle time was 3.7-second and the tool life was 600 pieces. The tool price of the A-SFT is also about \$12 USD less than the competitor tool. By switching to the A-SFT, Gorman-Rupp is able to improve 1.5 times the tool life and reduce cycle time by 34 percent. Taken in consideration of the tool cost, machine cost, tool change time and other factors, the total CPU is reduced by 38 percent versus the competitor tool.

The above CPU reductions combined with the convenience of having only one tap style that works for all materials showed Gorman-Rupp the value of the A-Tap series.

"The positive results we are getting combined with the local support make the decision to choose OSG as our primary tap provider an easy one," said Tym Greenwood, Gorman-Rupp CNC Programmer and Project Manager.

Based on a number of tests conducted, Gorman-Rupp concluded that a 20 percent cost reduction versus the prior year can be achieved on all tapping operations. Since then, Gorman-Rupp has converted all of its standard taps to the A-Tap and will continue to further drive efficiency and cost reduction across all areas of the machine shop.



From left, OSG Italia Engineering Manager Andrea Severi, Olimac Production Manager Alessandro Martini and OSG Italia Piedmont Area Salesman Riccardo Costamagna pose for a photograph at Olimac's manufacturing facility in Margarita, Cuneo, Italy.

Perfect Chip Control Even in Deep Holes

VPO-DC-MT cutting tap reduces tapping cycle time and increases tool life in steel bracket code production for corn heads

Andrea Severi
OSG Italia

In tapping applications, most machining troubles are usually caused by unstable chip evacuation. The saving of time in machining and downtime caused by the lack of chip control can significantly reduce manufacturing cost even in small lot production. The elimination of cutting chip problems in its robotic production systems is one of the key objectives of Olimac s.r.l., a world leader in the design and manufacturing of corn heads used for harvesting.

Founded in 1950, Olimac is a leading solution provider for the agriculture industry with innovative corn heads engineered for higher efficiency in corn cultivation. Today, Olimac exports more than 98 percent of its production all over the globe. Employing approximately 200 staff, Olimac is headquartered in Margarita, a province of Cuneo in the Piedmont region of Italy, with a production area of over 45,000-square-meter.

Olimac's manufacturing plant is equipped with numerous CNC machining centers, with capabilities to optimize work cycles for various lot sizes in different materials, such as alloy steels, cast iron and carbon steel. Olimac's production facility is completely automated with integrated robotic production systems to control all components with superior quality. Advanced CAD-CAM tools are used in Olimac's research and design division, where production processes are transmitted to the machine tools with every working phase being traceable and monitored. In the corn head manufacturing sector, Olimac prides itself as the only company with capabilities to completely design and build all components of the corn head inside its own plant. As a forward-thinking company that is attentive to new technologies, Olimac continuously seeks process optimization to facilitate further growth.



1. Olimac's plant is located in Margarita, a province of Cuneo in the Piedmont region of Italy.
2. Olimac's manufacturing plant is equipped with numerous CNC machining centers, with capabilities to optimize work cycles for various lot sizes in different materials, such as alloy steels, cast iron and carbon steel.
- 3 & 4. Fixed bracket codes made of C40 steel (JIS S40C) for corn heads. Olimac has been manufacturing bracket codes since 2015 in various shapes and quantity.
5. Inside Olimac's manufacturing plant in Margarita, Cuneo, Italy. Olimac's production facility is completely automated with integrated robotic production systems to control all components with superior quality.
6. OSG's VPO-DC-MT form E cutting tap with center-through coolant mounted on a synchronized tap holder.

Recently, Olimac was looking to improve tool performance on its fixed bracket code production made of C40 steel (JIS S40C) for corn heads. The company has been manufacturing bracket codes since 2015 in various shapes and quantity. For this part, the current annual production volume is estimated to be around 25,000 pieces. Each bracket code requires the threading of two M14 x 2 holes at a depth of 36 mm. The pre-hole is drilled with a 12 mm diameter carbide drill at a depth of 39 mm. The parts are machined using a Mazak HCN-5000 horizontal machining center.

Originally, Olimac was using a competitor tap for the application and experienced chip control problems and poor tool life. In search of improvement, Olimac Production Manager Alessandro Martini contacted OSG to optimize cycle time, increase tool life and enhance chip control that has been causing enormous downtime problems in Olimac's robotic production systems.

Shortly after, OSG Italia Engineering Manager Andrea Severi and OSG Italia Piedmont Area Salesman Riccardo Costamagna visited Olimac's production facility to evaluate the application. After analyzing the cutting condition, the dual recommended using the M14 x 2 VPO-DC-MT form E cutting tap with center-through coolant (EDP# 48038191) mounted on a synchronized tap holder with ER16 collet.

The VPO-DC-MT is a powder metal straight fluted tap engineered to excel in cast iron and cast aluminum applications. The high rigidity geometry of this tool combined with OSG's V coating and the highly wear resistant powder metal substrate guarantee high-performance process stability.

For the machining, the competitor tap was used at a cutting speed of 15 m/min (340 rpm) and averaged 4,800 holes. The VPO-DC-MT tap, on the other hand, was tested at a cutting speed of 18 m/min (410 rpm) and averaged 8,200 holes. Comparing the cutting parameter and result against the competitor, the VPO-DC-MT demonstrated a time saving in the tapping process of 20 percent and also boosted tool life by 70 percent.

Thanks to its unique cutting geometry, the VPO-DC-MT tap enables the generation of short and compact cutting chips even in alloy steels, pre-hardened steels, and medium-carbon steels such as C40. The VPO-DC-MT offers an excellent solution to controlling cutting chips when it is not possible to utilize a forming tap.

For Olimac, the VPO-DC-MT tap has successfully eliminated cutting chip problems correlated to machine downtime, enabling greater production efficiency while also decreasing processing costs, which led to a very significant economic saving for the company.



From left, Polund founder Ole Tolderlund, OSG Scandinavia sales representative Morten Larsen and Polund founder Lars Pors pose for a photograph at VTM Summit in April 2023. Held in Odense, VTM Summit is an important trade fair for machine tools, tools and equipment for the metalworking industry in Denmark. Polund's PRO-CLAMP vise was used at the OSG booth for demonstrations during the exhibition.

Clamping Productivity

AE-VML long carbide end mill accelerates performance in clamping system production

Peter Cramer Jensen

OSG Scandinavia



1. Located in the town of Otterup in central Denmark, Maskinfabrikken Polund A/S (Polund) is a manufacturer of clamping systems for CNC machines and a subcontractor for metalworking.

2. The PRO-CLAMP Systems was invented more than 14 years ago to optimize Polund's own production.

Founded in 1998, Maskinfabrikken Polund A/S (Polund) is a manufacturer of clamping systems for CNC machines and a subcontractor for metalworking. Employing 10 staff, Polund is located in the town of Otterup in central Denmark, with an estimate production floor space of 1,600-square-meter.

Initially, Polund was primarily involved with subcontractor work especially for milling and surface grinding. Today, however, Polund's own brand – PRO-CLAMP Systems – has become the core product of the company. The PRO-CLAMP Systems was invented more than 14 years ago to optimize Polund's own production. At the time, Polund felt that its advanced machinery could be better optimized if less time was spent on adjustments and chip removal during production. Thus, the PRO-CLAMP Systems – a fast and flexible clamping solution – was created where cleaning, adjusting and clamping of many items can be done in minimal time. Today, the PRO-CLAMP Systems has advanced considerably. In addition to the standard lineup, Polund also offers customized solutions to help customers maximize production capacity. Currently, 10 CNC machines at Polund are used to produce PRO-CLAMP standard vices and customer specific clamping systems. About 70 percent of the production is standard and 30 percent is custom. Moreover, approximately 50 percent of the production is exported overseas to countries such as Germany and the United States.

Recently, Polund was looking to enhance productivity on the production of a custom clamping system that requires the milling of deep pockets and a high amount of metal removal. Six parts made of Uddeholm Holdax (DIN 1.2311; prehardened steel) are needed to be milled. The parts are machined using a Mazak VTC 830 SR machining center (BT40 spindle). MST's shrink fit tool holder is employed for the processing.

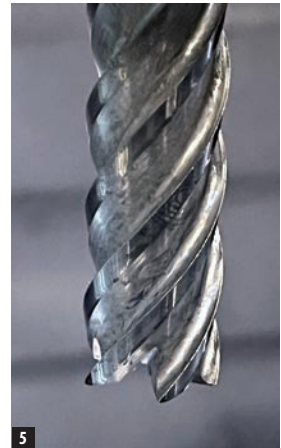
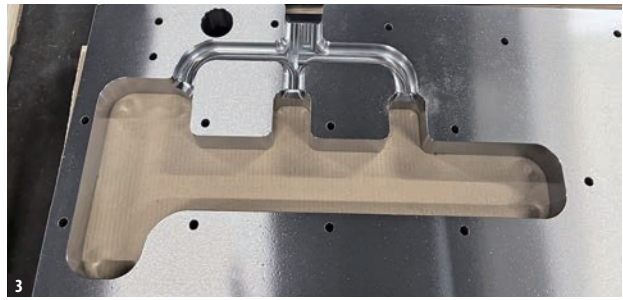
As an existing customer, OSG was called in to offer a solution. OSG Scandinavia sales representative Morten Larsen visited Polund's facility to inspect the cutting condition. Upon a detail evaluation of the application, Larsen recommended the AE-VML anti-vibration long carbide end mill (EDP# 8556378, 16 x 64, 5-flute).

The AE-VML long carbide end mill is a part of OSG's AE-VM anti-vibration carbide end mill series designed to attain an all-new level of milling efficiency coupled with superb finish quality suitable for a variety of milling applications. The AE-VM's sharp positive rake angle geometry significantly reduces cutting force to minimize tool wear and potential damage to the workpiece even under aggressive cutting conditions. Cutting vibration is minimized with the AE-VM's unequal spacing of teeth and variable-lead geometry. Furthermore, its unique flute form helps facilitate trouble-free chip evacuation to enable stable and consistent performance. With the addition of OSG's original DUARISE coating, tool life can be enhanced by its excellent lubricity, superior friction-resistance and high oxidation temperature qualities. Available in a wide variety of styles and specifications, the AE-VM series is designed to accommodate a wide range of milling operations in stainless steel, cast iron, carbon steel, alloy steel and hardened steel.

Polund was originally using a 16 mm diameter 5-flute competitor solid carbide end mill with TiCN coating for the application. The competitor end mill was used at a cutting speed of 251.2 m/min (5,000 min⁻¹), a feed of 3,500 mm/min (0.14 mm/t), feed per revolution of 0.7 mm/rev, an axial depth of cut of 40 mm, and a radial depth of cut of 0.5 mm.



A PRO-CLAMP 5-Axis vice made by Polund, which has a long clamping distance and is ideal for all kinds of clamping associated with 5-Axis machining.



3. One of the six parts of a custom clamping system.

4. OSG's AE-VML end mill in a MST shrink fit chuck.

5. Photograph of the AE-VML end mill after 500 minutes of milling in Uddeholm Holdax (DIN 1.2311). The AE-VML exhibited normal wear and could continue to be used.

Water-soluble coolant (8 to 18%) was applied. The competitor end mill achieved a metal removal rate of 70 cm³/min. OSG's AE-VML carbide end mill was tested at a cutting speed of 140.7 m/min (2,800 min⁻¹), a feed of 7,000 mm/min (0.5 mm/t), feed per revolution of 2.5 mm/rev, an axial depth of cut of 40 mm, and a radial depth of cut of 1 mm. Air-blow was used for the coolant. The AE-VML achieved four times the metal removal rate of 280 cm³/min versus the competitor tool.

The competitor end mill reached its tool life after milling 250 minutes. The AE-VML, on the other hand, was able to complete 500 minutes of milling, exhibited normal wear, and could continue to be used. Test results have demonstrated that an estimate of 10 hours could be saved by switching to the AE-VML for milling the six custom parts. The AE-VML has outperformed the competitor tool in both machining efficiency and tool life. With the satisfactory result, Polund will look to apply the AE-VML in other applications to further optimize productivity and maximize performance.



The AE-VML long type end mill is a part of the AE-VM anti-vibration carbide end mill series designed to attain an all new level of milling efficiency coupled with superb finish quality suitable for a variety of milling applications.



Fundimig has been manufacturing CNH swivel housings since 2017 with an annual estimate production volume of 4,200 pieces. The parts are machined using a Heller H 4000 4-axis horizontal machining center.

Tool Consolidation

Custom carbide step drill consolidates machining process and increases tool life in swivel housing production

Yasmin Natacha Nunes da Silva

OSG Sulamericana

Founded in 1982, Fundimig Indústria De Peças e Componentes LTDA. (Fundimig) is a company that specializes in the casting and machining of parts and components for the agricultural, automotive and industrial parts markets. Employing 1,120 staff, Fundimig is headquartered in the center-west of Minas Gerais in southeastern Brazil, with an estimated production area of 38,300-square-meter. As a specialist in the production and machining of gray and nodular iron castings, Fundimig has been operating for more than 30 years in the national and international markets with a production capacity of over 3,000 tons of parts per month, distributed across three manufacturing units, all of which are ISO 9001-2008 and IATF 16949 certified.



OSG's custom 2-flute carbide step drill is being preset on a Zoller tool presetter.

Recently, Fundimig was looking to enhance its drilling process on a CNH swivel housing production, minimize costs and decrease machine setup time. Fundimig has been making these parts since 2017 and has an annual estimate production volume of 4,200 pieces. The swivel housing is made of ductile cast iron GGG50. Each part requires the processing of 14 M14 x 1.5 6H holes. The pre-drilled holes are 12.5 mm in diameter with a depth of 26 mm (through holes). The parts are machined using a Heller H 4000 4-axis horizontal machining center. A shrink fit tool holder is used for the fixation. Soluble oil is used for the coolant during machining.

Fundimig was originally using a competitor 2-flute coolant-through carbide drill for the application. After drilling, a 45-degree carbide chamfer is used. The competitor carbide drill was used at a cutting speed of 90 m/min (2,300 rpm) and a feed rate of 690 mm/min (0.3 mm/rev). The competitor drill averaged 250 parts (3,500 holes) per tool.

During a visit to Fundimig's facility, OSG Sulamericana Sales Engineer José Eisenhower Galdino Vieira learned of the company's challenge. Upon a detail evaluation of the application, Vieira recommended a custom tool.

To maximize performance, the engineering team at OSG Sulamericana tailored a 12.5 mm diameter 2-flute carbide step drill based on its High-Tech tool series. The custom drill features a unique cutting edge geometry and is coated with OSG's original EgiAs coating for long tool life and excellent performance in cast iron applications.

Under identical cutting condition as the competitor drill, OSG's custom step drill is able to complete 950 parts (13,300 holes) before wearing out, which is nearly four times the durability. Moreover, with OSG's tooling proposal, Fundimig has eliminated the chamfering tool, which reduced tooling cost, setup time, and enhanced the entire production process.

With an aim for continuous improvement, Fundimig always seeks to exceed market expectations in all aspects. As a valuable partner, Fundimig has consistently counted on OSG for processing improvement.

"We trust the quality of OSG's products and in the technical capacity of its group," said Fundimig Engineering Manager Paulo Andres. "This time it was no different. We are very satisfied with the results by achieving our objectives in reducing costs and improving product quality," said Andres.



A custom 12.5 mm diameter 2-flute carbide step drill tailored by OSG Sulamericana's engineering team.



From left, Fundimig Engineer Tiago Nazareno, OSG Sales Engineer José Eisenhower Galdino Vieira, and Fundimig Engineering Manager Paulo Andres pose for a photograph at Fundimig's manufacturing facility in Cláudio, Minas Gerais, Brazil.



A-XPB

Forming Tap

The A-XPB is OSG's latest high-efficiency and multi-purpose forming tap. The A-XPB forms threads by plastic deformation of the work material and does not generate cutting chips. The A-XPB enables the reduction of tool change time caused by cutting chip troubles and machine downtime required for removing accumulated cutting chips. The A-XPB features a special chamfer specification (pat. in Japan) for achieving low thrust. Its special thread configuration (pat. in Japan) improves cutting edge rigidity, making it less prone to chipping. The A-XPB is made of powder metallurgy HSS (CPM) with high wear resistance.

With the addition of a special coating (pat. pending in Japan), tool life can be further enhanced.

The A-XPB is a revolutionary product that excels in a wide range of work materials and cutting conditions with improved productivity, such as small-diameter threading in stainless steel and high-speed threading in high-hardness material of 30 HRC.



ADO-SUS

Carbide Drill for Stainless Steels and Titanium Alloys

Work hardening, welding, elongation of cutting chips and poor thermal conductivity are common problems in the machining of stainless steels and titanium alloys. The ADO-SUS features a tool geometry that emphasizes sharpness to reduce work hardening, thereby prolonging tool life for post-processing including reaming and tapping. Its unique flute form encourages the creation of small cutting chips, which is essential for trouble-free chip evacuation. Furthermore, the ADO-SUS adopts a unique

oil hole design "Mega Cooler" for diameter sizes above 6 mm in 3D and 5D to suppress heat generation and to facilitate smooth chip evacuation. With the addition of OSG's WXL coating, stronger adhesion strength and resistance against welding can be achieved.





AE-CRE-H

High Efficiency Radius Type Carbide End Mill

The AE-CRE-H radius type carbide end mill features multi-flute and unequal spacing teeth specifications to suppress chattering for stable and high-efficiency roughing of high-hardness steels. To achieve both cutting edge strength and good chip evacuation, the AE-CRE-H is engineered with a 2-stage gash shape and a large chip pocket. Furthermore, the AE-CRE-H features a large positive R shape and short

flute length with high tool rigidity to allow large depth of cut and high-feed milling, which is ideal for high-speed direct engraving.

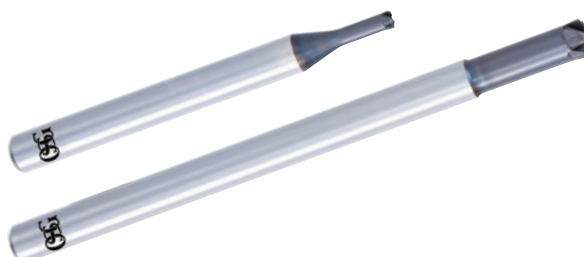


AE-HFE-H

High Feed Radius Type Carbide End Mill

The AE-HFE-H high feed radius type carbide end mill reduces cutting resistance with its unique composite radius shape, and enables high-speed, high-feed machining even at overhang length of $L/D = 7$ in high-hardness steels. To achieve both cutting edge strength and good chip evacuation, the AE-HFE-H is engineered with a 2-stage gash shape

and a large chip pocket. Furthermore, with its unequal spacing teeth configuration, chattering can be suppressed to enable stable and highly efficient machining.





From left, San-en NeoPhoenix's mascot Dunker and OSG's mascot Tap-kun pose for a photograph before the start of March 3rd's home game at the Toyohashi City General Gymnasium in Aichi, Japan. Photo courtesy of San-en NeoPhoenix.

Fusion of Sports & Manufacturing

OSG showcases aluminum milled basketball workpieces at San-en NeoPhoenix home game

OSG Corporation collaborated with San-en NeoPhoenix, a B. League professional basketball team based in the central region of Japan, during a home game at the Toyohashi City General Gymnasium on March 3, 2024.

OSG strives to contribute to the sustainable development of local communities by serving as a top sponsor of San-en NeoPhoenix to support local professional sports. In addition to hosting a mini basketball game at the event to promote sports, OSG displayed two aluminum milled basketball workpieces at the gymnasium to inspire interest in the manufacturing industry.



OSG strives to contribute to the sustainable development of local communities by serving as a top sponsor of the professional basketball team San-en NeoPhoenix to support local professional sports.



1 & 2. A mini basketball game was held at the OSG booth during the March 3rd home game where spectators would receive prizes for participating. 3 & 4. From left, a special collaborative edition tote bag and happi coat (traditional Japanese short jacket worn at a festival) featuring San-en NeoPhoenix's mascot Dunker and OSG's mascot Tap-kun. They were given out as prizes at the March 3rd home game.

OSG has created a life-size basketball made of aluminum as an attempt to connect sports and manufacturing. Iida Craft's scanning technology creates 3D data that reproduces even the complex grain shape of the basketball surface. The 3D data was accurately carved out using CAM software from Aikoku Alpha Corporation. The aluminum basketball net was a collaborative project by machine builder GROB, CAM/CAD solution developer OPEN MIND and OSG in Germany. It is a workpiece that demonstrates the possibilities of 5-axis milling.

OSG supports San-en NeoPhoenix's management philosophy in "making the San-en region a vibrant and smiling town," and will continue to work toward promoting local sports and community growth to contribute to a prosperous future.



From left, a life-size basketball and basketball net made of aluminum were displayed at the March 3rd home game of San-en NeoPhoenix in Toyohashi, Aichi, Japan.



Watch the milling process of the aluminum basketball:



Watch the milling process of the aluminum basketball net (video courtesy of OPEN MIND):



OSG Around the World

Employee Interview with

Agnieszka Majer



Tell us about your background.

I am a business manager by education. I began my professional career at age 20 and gradually climbed the corporate ladder while working and studying full time. For the first few years of my career, I worked at a national distributor as an assistant supporting sales in the cutting tool industry. I was assigned to the threading division and the taps stole my heart ever since. I was responsible for contacts and sales of various tap brands, including OSG. Later in my career, I completed postgraduate studies in pedagogy and earned an MBA degree to verify and expand my knowledge in the field of business management. I also have a diploma in coaching and mentoring. I have been constantly improving my knowledge and qualifications not only in the field of metalworking, which helps me become a better leader and person in general.

Profile

Location: Poland

Position: General Manager at OSG Poland

Joined OSG: 2015

Motto: "There is no evil that does not turn out to be good."

Tell us about your experience at OSG and your daily routine.

In 2015, I was offered with an opportunity to run an OSG company in Poland. After returning from a trip to the OSG headquarters in Japan, I took on this extremely interesting yet challenging task of distributing the best tools to customers in Poland.

As OSG Poland's General Manager, I deal with an array of tasks, coordination, and development supervision. I monitor and verify company activities on an ongoing basis, both sales and tasks related to other departments such as customer service, accounting, and logistics. Every week I would meet with department managers and salesmen. Additionally, every month I would have a chat with employees individually about current issues, as well as their needs, concerns and joys. I like being informed about positive results of my colleagues' work, but I also appreciate when they share difficulties and concerns with me too. This not only develops but also gives us enormous experience, builds trust, and brings us closer to each other and our goals. OSG Poland has a team of experienced and trusted employees without whom we would not be where we are today.

I am also always in contact with our distributors to improve sales. Joint training, projects and implementations bring us to the goal: the satisfaction of our customers. I regularly meet with key clients and suppliers. In addition to commercial issues, I place great emphasis on the automation of processes, the development of programs and technologies that reduces manual work and unnecessary activities. It allows our company to be more efficient and makes our work sensible and organized.



1. Majer poses for a photograph with her husband, 20-year-old son, and 8-year-old goddaughter.
 2 & 3. When Majer is not working, she enjoys taking trips to the lake, the sea, or to the mountains.
 4. Majer and her German Shepherd Fibi.

What is most challenging about your work?

Working with people is exciting, desirable, but at the same time the most difficult task. Active listening is what I have been working on lately. It is quite a challenge for me because I am a talker by nature. However, this is often the key to both sales and mental success - the enormous satisfaction of understanding and being understood. I think it is what everyone wants, including our customers. The rest is a matter of strategy, planning, as well as working smartly and effectively.



What is unique about OSG Poland?

OSG Poland distributes extraordinary products that our competitors in the region do not have. These tools make us special. Our cooperative and involved team offers customers flexible yet personalized approach to fulfill every request. Last but not least, I am the first woman in Europe to take on the position of General Manager at OSG, which I am very proud of.

The office building of OSG Poland, which was established in 2016.

What is your favorite OSG tool?

I appreciate many OSG products, but my favorite tools are taps due to their reliability. No matter how complicated the application is, OSG's taps always finish the job with success and complete customer satisfaction.

Developed in 2023, the A-XPF is a highly efficient multi-purpose forming tap series engineered to excel in a wide range of work materials and cutting conditions with improved productivity, such as small-diameter threading in stainless steel and high-speed threading in high-hardness material of 30 HRC. OSG has been manufacturing taps since the company's founding in 1938, more than 86 years ago.



How do you spend time on your day off?

When I am not working, I enjoy spending time with my beloved husband, my 20-year-old son, and my 8-year-old goddaughter. Some of our favorite activities include reading books, watching movies with our cats, walking our dogs, taking trips to the lake, the sea, or to the mountains. I also enjoy spending time with friends at the theater and cinema, as well as doing yoga and winter swimming with bonfires. Another hobby of mine is singing, which gives me a huge amount of energy, optimism, and willingness to act.

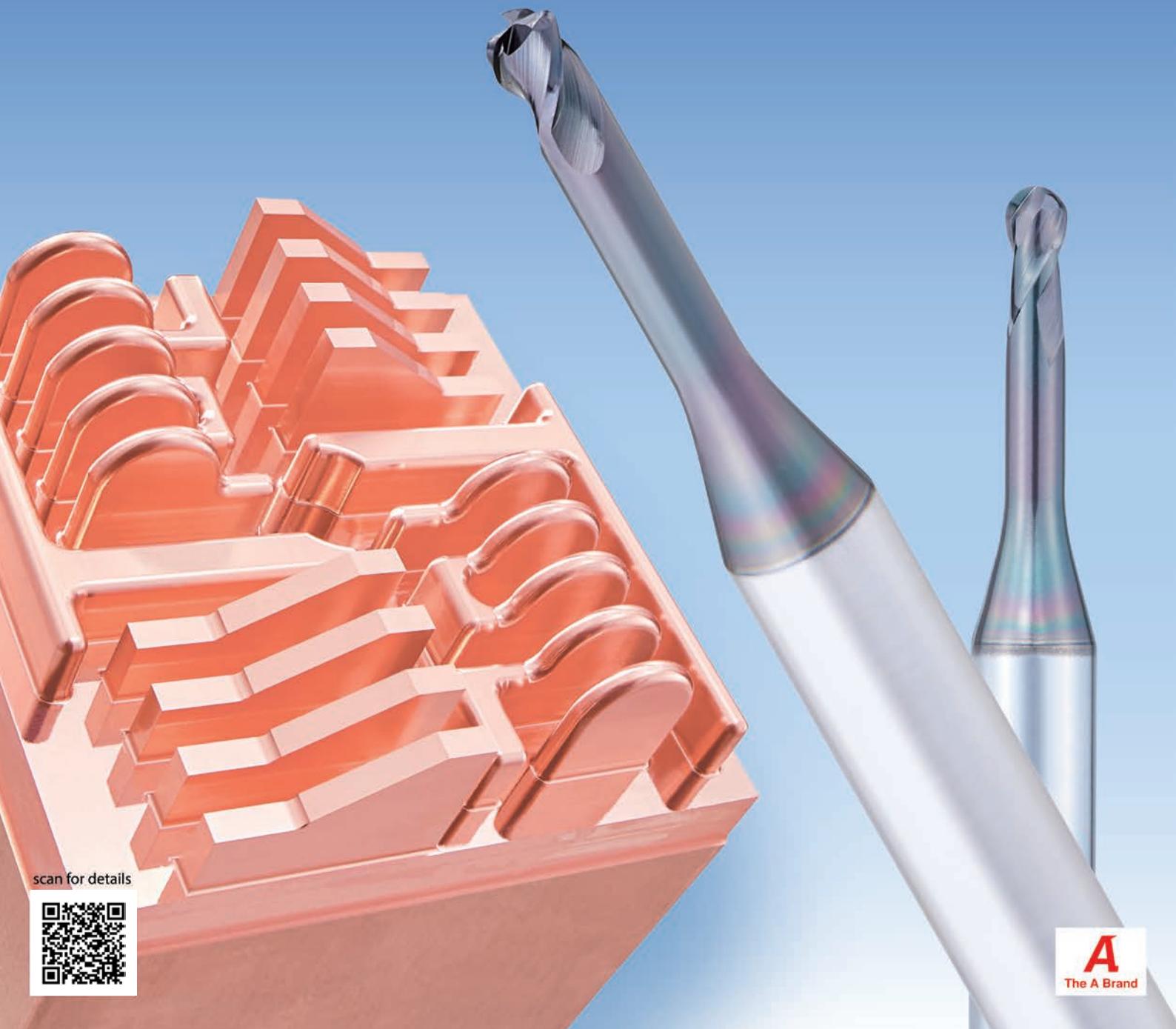


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DLC Coated Carbide End Mills



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