

SHAPE IT

OSG Global Tooling Magazine | WINTER 2019



Reaching New Heights

Strategic acquisitions to enhance OSG support network for global aerospace manufacturing

Technical Insight

SynchroMaster Tap Holder

Customer Report

Lifting Productivity

TRS 3-flute coolant-through carbide drill slashes machining time in bulldozer track frame production

Meet OSG

Employee Interview in Singapore

Rising to the Next Stage



A Message from the President

In 2018, OSG recorded the highest net sales in its history. I would like to express my sincere gratitude to the support of our customers, business partners and employees for making this achievement possible. OSG will continue to focus on customer demand in accordance with changes in times, and strive to live up to our reputation as your number one reliable partner.

Although the global economic health has been very robust this past term, we are also faced with rapid changes and uncertainties. Digitalization and electrification are spreading across all industries. The automotive industry is no exception. Electric vehicles (EVs) have become the gateway to the future of mobility. I suspect that someday in the future, battery-powered models will take reins from the combustion engine as the king of the road. Cars will simply become a giant sensor and a part of the big data phenomenal that drives the global economy. OSG is positioned to respond to the sudden surge of technological transformation and will endeavor to continue to expand its business domains.

As geopolitical tensions intensify with a potential decline in global trade, OSG is prepared to further enhance its production system to provide uninterrupted products and services to its patrons. In the next three to four years, OSG will invest approximately 50 billion yen or more to revamp its global production system, ensuring that it is optimal, flexible and highly competitive. Working in unison with our global network to provide the best service possible, I am confident that OSG will rise through uncertainties and preserver into the next stage in time.

A handwritten signature in black ink, appearing to read 'Norio Ishikawa'.

Norio Ishikawa

President & CEO of OSG Corporation

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OSG Corporation International Headquarters

3-22 Honnogahara, Toyokawa, Aichi 442-8543, Japan Tel: (81) 533-82-3288 Fax: (81) 533-82-1132 www.osg.co.jp



Reaching New Heights

Strategic acquisitions to enhance OSG support network
for global aerospace manufacturing

Max Suzuki
OSG Corporation



The aerospace industry is expected to witness significant growth in the coming years with increasing air travel in China, the Middle East and other emerging nations. Globally, the demand for new technologically advanced fuel-efficient aircrafts continues to rise. Manufacturers are always in seek of improved materials and processing methods to enhance parts in less time, build complex features with ease while maintaining overall cost efficiency.

The demand for advanced aircrafts also accelerated the consumption of superalloys and composite materials. Heat-resistant superalloys, such as nickel alloys, provide strength and structural reliability at high temperatures, which is required in advanced jet engines. In addition to superalloys, a large percentage of new aircrafts components include composite materials due to their superior strength and substantially lightweight characteristics.

As failure at 35,000 feet above ground has major consequences, the aerospace industry has extremely low tolerance of risk. Aviation parts and components are highly regulated with strict requirements. Certification is a major barrier to entry into the aerospace sector. OSG has been promoted to the Advanced Manufacturing Research Centre (AMRC) Tier 1 tool supplier since June 2015. As AMRC is the world's most advanced aerospace research facility, this achievement is a recognition of OSG's advanced technology and ability to work on a wide range of projects with utmost quality control.

For many years, OSG has supplied cutting tools for the processing of aircraft parts around the world. OSG has built a high reputation for its capability to effectively process difficult-to-machine materials such as superalloys and composites. As technology continues to evolve, OSG is also constantly researching and developing new cutting tools solutions dedicated to the aerospace industry. Acquiring and responding to customer feedback is one of the most critical processes in product development. To better serve end users and to obtain accurate feedback, OSG has strategically acquired three aerospace related manufacturers in France and the United States in the past couple of years – SMOG Industries, AMAMCO Tool and Desgranges Holding S.A.S.

September 2017

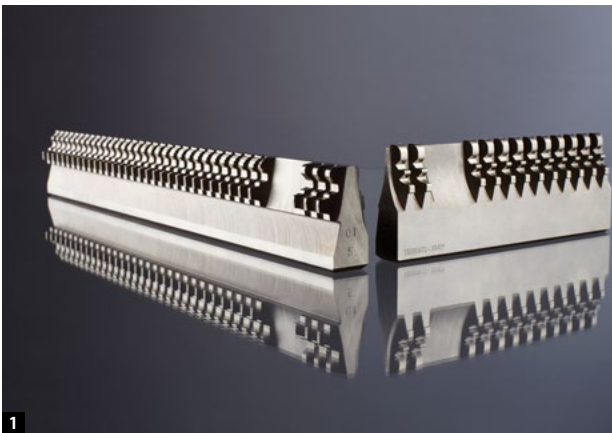
SMOC Industries in France

OSG became the major shareholder of SMOC Industries by taking 55 percent of its shares in September 2017. Founded in 1946, SMOC is a French manufacturer based in Tullins, a small city in the heart of the Alps. In the early days of SMOC, the company specialized in the production of special cutting tools and form tools for milling and turning machines. In 1969, SMOC began manufacturing broaches. In 1975, SMOC began the development of Christmas type broaches for Airbus engines.

Today, SMOC is a leading manufacturer in Europe for aircraft engine cutting tools. SMOC relies on its creativity, innovation and research and development team to ensure continuous progress. In spirit of innovation and research, SMOC has been involved for many years in several aircraft research programs, including the LEAP engine, which was developed by Safran Aircraft Engines and GE.

As of 2017, SMOC employs over 100 staff and has recently opened a new 1,600-square-meter facility dedicated to aeronautic and tool management in addition to its existing 3,500-square-meter production capacity in three buildings in Tullins. With 40 CNC machines working in three shifts, SMOC is able to manufacture any kind of round or flat broach. In addition to new tools, SMOC also offers re-sharpening services, tool repair, management of tools, and technical assistance on site.

Looking ahead to 2019, SMOC is scheduled to open a new re-sharpening center in China and strives to expand its presence in the United States. SMOC will look to rely on the OSG global network to continue to strengthen its international expansion.





1. An image of SMOC Industries' Christmas tree broaches, which are used to manufacture slots on turbine disc for helicopter engines, aircraft engines and gas turbines.
2. Utilizing some of the latest manufacturing equipment, SMOC maintains high quality control throughout its production process.
3. Profile grinding of the Christmas tree broaches at SMOC's production facility in Tullins, France.

April 2016

AMAMCO Tool in the United States

AMAMCO Tool, located in Duncan, South Carolina, was founded in 1972. As of April 2016, the company operates as a subsidiary of OSG USA, Inc. AMAMCO Tool is a custom, cutting tool manufacturer that designs and produces application-specific cutting tools primarily for the aerospace and composite industries. Core products include drills for hand, CNC and advanced drilling units (ADU). The company also manufactures high quality diamond coated routers and drills currently used by all major and Tier 1 aerospace manufactures in the United States and abroad.

With a passion for quality and service forged in its foundation, AMAMCO currently has a work force approaching 100 with an average tenure of over 11 years. As AMAMCO continues to grow, the company plans to further expand its production floor space in the next 12 to 18 months in addition to its existing 35,000-square-foot manufacturing facility.

AMAMCO helped develop innovations on the Boeing 787 Dreamliner development project, a success that has helped to carryover to supply contracts on the 777, 737 and other aircraft production lines. Due to its success at Lockheed, Boeing and other manufacturers, and while competing against much larger, international companies, AMAMCO consistently achieved excellence in providing superior tools and technical services. Winning many critical contracts, the company often achieved “single source” supplier status for its many custom prints and designs, acquiring exclusive production relationships.

AMAMCO is proud to be a part of the OSG family and looks forward to a long and productive future, providing innovative solutions to the aerospace and wide variety of the many other industries OSG and AMAMCO serve.



1. AMAMCO Tool in Duncan, South Carolina, USA. AMAMCO is well known for manufacturing combination drills, countersinks, counter bore and high-quality reamers.



2. AMAMCO's flute grinding department. AMAMCO Tool was built to offer alternatives to the more commonly mass-produced, 'off-the-shelf' cutting tools, while contributing innovative custom development and prototype solutions.

3. AMAMCO compression router with cutting edge geometry design, using two opposing flutes configured to sandwich composite layers together, that eliminated delamination. A diamond coating is also applied to the cutting surface using, at the time, a recently developed chemical vapor deposition (CVD) process.

4. F-35 production line in Texas, USA. With capabilities to eliminate delamination in the routing of advanced carbon fiber (CFRP) composite wing skin material while achieving significantly longer tool life versus other cutting tool providers, several AMAMCO diamond-coated tools are currently used by Lockheed in drilling applications on the F-35. Photo courtesy of Lockheed.

September 2015

Desgranges Holding S.A.S. in France

Established in 1946, Desgranges is a French manufacturer of standard and special cutting tools, and supplies to major French contractors in civil and military aviation, automotive and high-tech related sectors. Its primary efforts are focused on the machining of hard materials, the assembly and machining of composite materials and stacks, and services associated with the cutting tool life cycle.

Located in Andrézieux Bouthéon Cedex, France, Desgranges currently employs 81 staff and has a 3,000-square-meter production capacity. From Concorde to the A350, Desgranges has always been heavily involved in the manufacture of cutting tools for the aeronautical industry. This extensive experience has given rise to the creation of Nexam in 2005, a brand of tools specifically for assembling airframes. In 2008, Desgranges Cutting Tools became a strategic supplier for Airbus. In September 2015, Desgranges Cutting Tools sold 100 percent of its shares to OSG. The acquisition allows OSG to further expand its operations in Europe while the Desgranges group is supplied with valuable means to accelerate product development.



1. Desgranges Cutting Tools in Andrézieux-Bouthéon, France. Desgranges is a French manufacturer of standard and customized cutting tools for sectors including civil and military aviation, automotive and high-tech industry.

2. Desgranges operator on a CNC machining center.



To enhance growth and to provide the best possible aerospace solutions for manufacturers, OSG actively participates in strategic collaborations and partnerships. Each of OSG's subsidiaries are equipped with unique strengths and offer their own special products. With these new innovative partners, OSG will strive to continue to aid manufacturers shape the future flight path of aerospace technology.



SynchroMaster Tap Holder

Next generation synchronized tap holder designed to turbocharge tapping performance

Takayuki Nakajima

OSG Corporation Applications Engineer
(Tap Development Division)

Machining troubles associated with tap processing are far more frequent in comparison to other rotating tools, such as drills and end mills. Manufacturers often struggle with threading applications because there are few effective solutions. For example, what kind of measurements would you take to achieve the following?

- **Prevent sudden breakage of taps**
- **Stabilize tap life**
- **Improve thread quality**
- **Stabilize short chamfer taps' performance**

All of the above are difficult to achieve. When a tapping problem arises, most operators would troubleshoot by lowering the cutting speed, which would in turn reduce productivity.

To help manufacturers who use machining centers with synchronous spindles overcome these common tapping obstacles, OSG Corporation has recently introduced a new generation synchronized tap holder – the SynchroMaster – engineered to turbocharge performance by dampening excessive forces in rigid tapping environment.

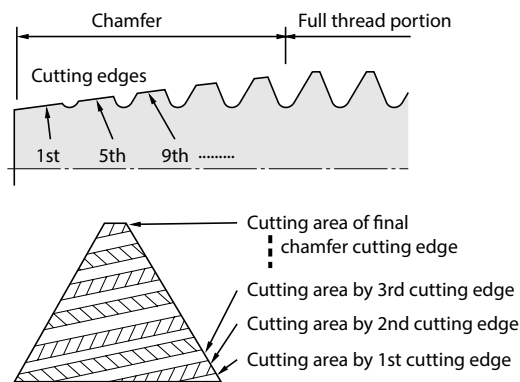


The SynchroMaster tap holder is designed to turbocharge tapping performance on CNC machines with synchronous spindles by compensating for synchronization errors during the threading process.

Why Tap Processing is Difficult

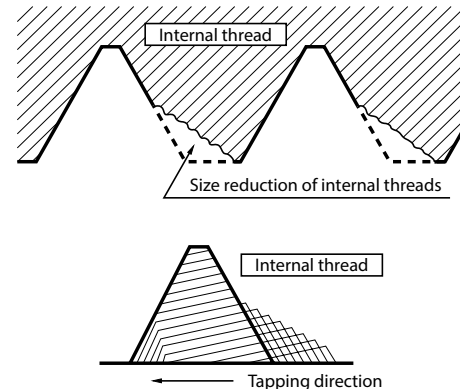
One of the causes is that the feed per revolution is fixed. The cutting of internal threads is performed by the chamfer section of a cut tap. In principle, the full thread portion of a cut tap does not perform any cutting, but merely follows the path cut by the chamfer. As the tap rotates, each cutting edge of the chamfer gradually increases the depth of cut along the lead, which forms the thread ridges to guide the position of the tap thereafter. Figure 1 illustrates the tapping process in the case of a 4-flute cut tap.

Figure 1. Cutting process of tap (4-flute)



Rigid tapping, also known as synchronous feed tapping, is one of the most common tapping methods used on modern machining centers. If the machine's spindle rotation and feed are synchronized to match a specific thread pitch as the tap is driven in and out of a hole, the shape of the pitch would be correctly formed. When there is a feeding error (leading or delaying), a size reduction (pitch dislocation or enlargement) would occur, which affects the precision of threads. Figure 2 illustrates a scenario where the tap feeding error (leading) occurred due to excessive cutting force, which causes size reduction of the internal threads.

Figure 2. Size reduction due to cutting by leading



Theoretically, a solid type tap holder without any tension-compression is appropriate for machining centers with synchronous spindles. However, there will always be small discrepancies between the synchronization and the actual movement (feed) of the specific tap being used. As the machine ages, the discrepancy between the spindle speed and feed and the tap's movement can become more significant. With a solid holder where no movable value is permitted, any deviation occurred would increase the thrust load on the tap, which would greatly reduce tool life and thread quality due to the extra axial forces being exacted.

Fortunately, with the right combination of machining center and tap holder as illustrated in figure 3, feeding error can be prevented.

Figure 3. Combination of machining center and tap holder

Machining Center	Tap Holder	Movable Value
Without synchronous spindle	Tapper	Large: 5-7mm
With synchronous spindle	Solid holder	0
	SynchroMaster	Small: 1mm +/-

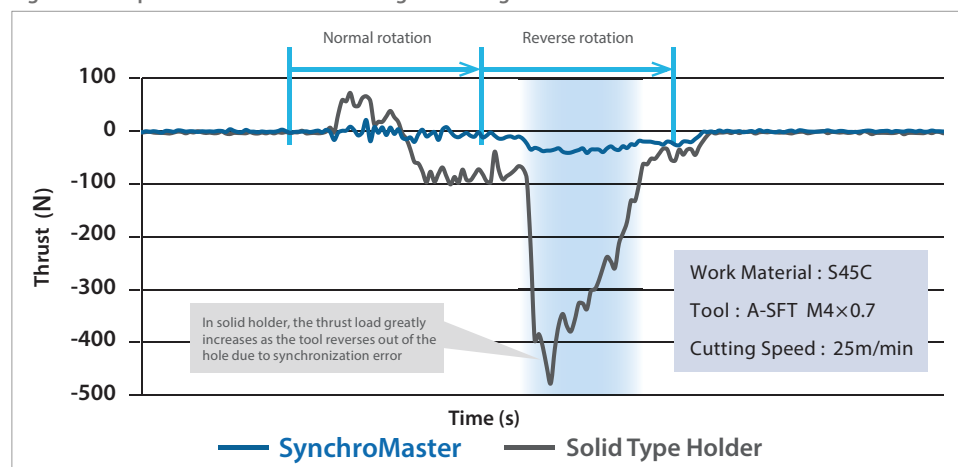


High thrust force and an increase in cutting pressure are caused by the discrepancies between calculated feed and actual movement of the tap. The SynchroMaster tap holder's unique micro float unit eliminates the extra axial forces on the tap to enable long tool life, stable tapping performance and precision thread quality.

Features & Benefits of SynchroMaster

The SynchroMaster is a tap holder constructed to allow a slight amount of axial movement to compensate for axial deviations that are unavoidable in rigid tapping. Its micro tension-compression float eliminates the extra axial forces on the tap, leading to longer tool life, consistent tapping depth and improved thread quality. As illustrated in figure 4, the uniquely integrated float unit absorbs the loads in the thrust direction, significantly reduces thrust forces occur during reverse rotation.

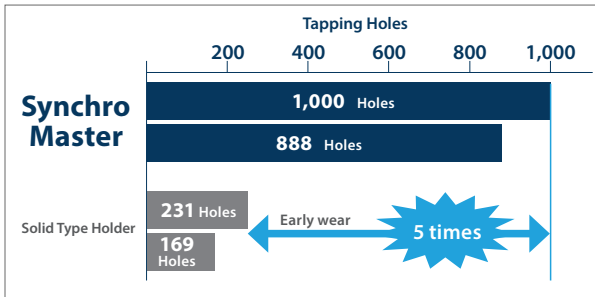
Figure 4. Comparison of thrust force during machining



Cutting Data

Figure 5 illustrates a tool life comparison of a short chamfer tap when used in combination with the SynchroMaster tap holder and a solid type holder. The cutting tool used for the test was a M4 x 0.7 1P short chamfer spiral tap. The shorter the chamfer, the cut made per cutting edge increases. For this reason, applications with short chamfer taps can easily become unstable. Tapping in S45C, the M4 x 0.7 1P short chamfer spiral tap with solid type holder averaged approximately 200 holes. When use in combination with the SynchroMaster tap holder, on the other hand, thrust load was significantly reduced and the short chamfer tap was able to achieve nearly five times the durability versus the solid type holder.

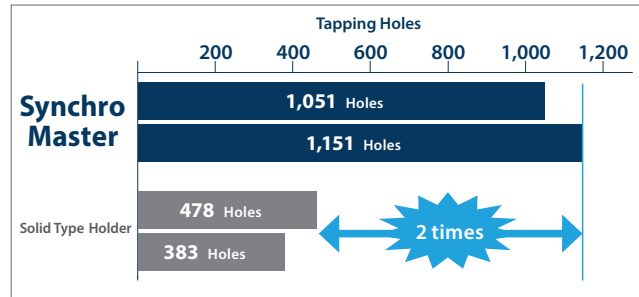
Figure 5. Short chamfer spiral tap tool life comparison



Work Material: S45C Tool: A-SFT M4 x 0.7 1P Cutting Speed: 10m/min

Additionally, as illustrated in figure 6, the SynchroMaster tap holder is effective not only for cut taps, but also for form taps. Since cutting does not take place with form taps and the internal thread is processed by using the plastic deformation of the material, the processing load for form taps is even higher than cut taps. As highlighted in figure 6, the SynchroMaster tap holder was able to double the tool life versus solid type holder even for form taps.

Figure 6. Form tap tool life comparison



Work Material: SCM440 (30HRC) Tool: S-XPf M10 x 1.5 2P Cutting Speed: 15m/min

For manufacturers who are especially struggling with unstable tool life, poor thread quality, low productivity and large variations in depth length on rigid tapped

holes, look to the SynchroMaster tap holder to turbocharge your tapping performance.

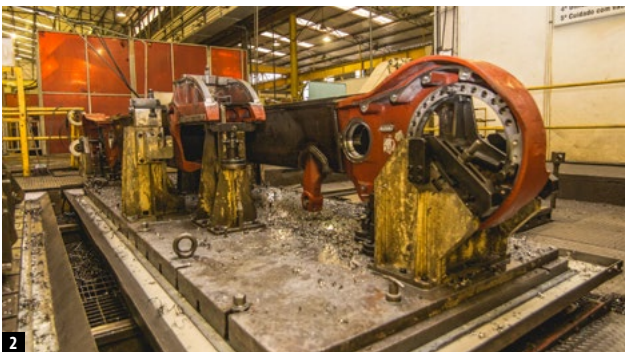


¹ From left to right, Komatsu Operator Waldir dos Santos Tavares, Komatsu Process Engineer Rafael Fernando Braz and OSG Sales Technician Valdir Lima inspect the TRS 3-flute coolant-through carbide drill in front of a track frame at the Komatsu do Brasil plant in Suzano, São Paulo.

Lifting Productivity

TRS 3-flute coolant-through carbide drill slashes machining time in bulldozer track frame production

Valdir Lima, OSG Sulamericana

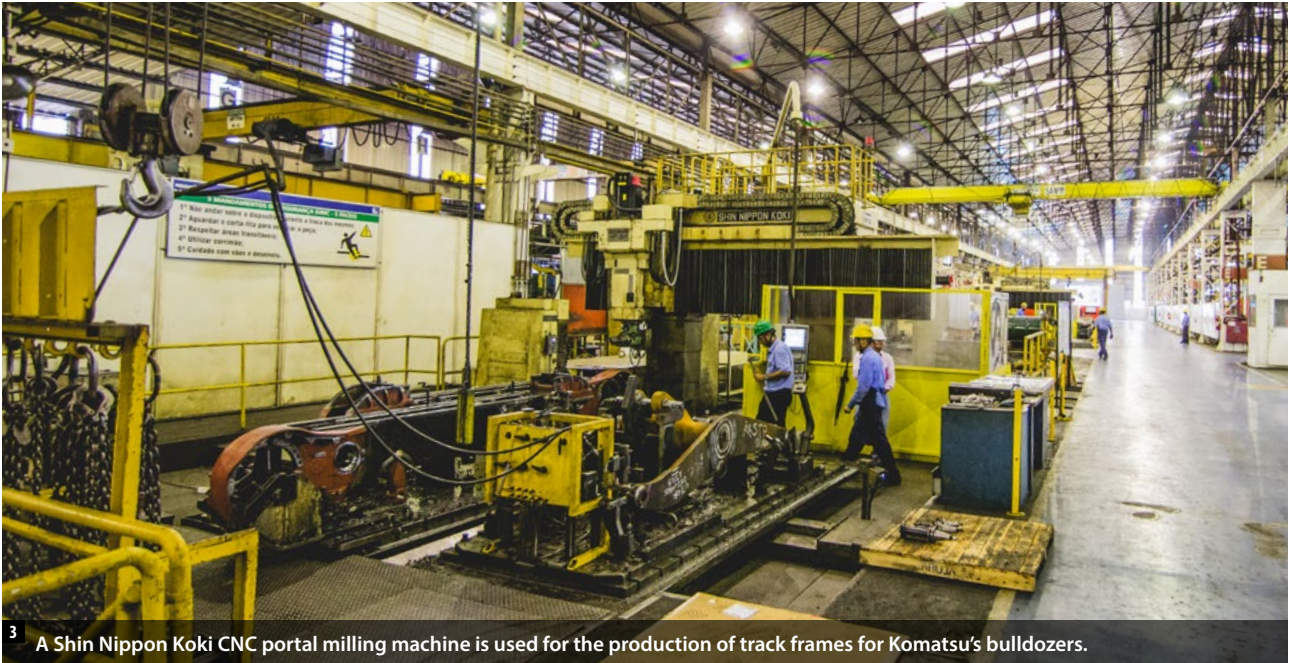


² A track frame, which is a side-frame component of the bulldozer, waits for completion at Komatsu do Brasil's production plant in Suzano, São Paulo.

Harsh, dangerous, stressful, demanding and masculine are common keywords come to mind when referring to the heavy industry, which may include construction and mining. Due to these negative perceptions, this sector often struggles to secure adequate skilled professionals while facing a backlog of projects. Against the general stigmas, jobs in heavy industry have a high degree of autonomy and employ some of the most sophisticated and powerful machines in their manufacturing process.

Komatsu Limited, a Japanese multinational corporation and one of the world's largest manufacturers of construction equipment and mining equipment, is a key player in support of the growth of the heavy industry worldwide. Founded in 1921, the Komatsu Group today consists of over 180 companies around the globe. In 1975, Komatsu do Brasil Ltda. was established to serve as Komatsu's South American division.

Located in Suzano, São Paulo, the Komatsu do Brasil plant has approximately 634,000-square-meter of production floor space and employs 647 staff. At this state-of-the-art facility, Komatsu do Brasil is always looking for new solutions to boost speed, safety and cost efficiency to provide heavy industry businesses with reliable quality products.



³ A Shin Nippon Koki CNC portal milling machine is used for the production of track frames for Komatsu's bulldozers.

Bulldozers are some of Komatsu do Brasil's core products. A bulldozer is a tractor fitted with a dozer blade used for maneuvering materials such as soil, sand and rubble. Bulldozers are used on a wide range of sites, including mines, military bases, heavy industry factories and farms to handle projects that require highly mobile, powerful and stable earth-moving equipment.

A bulldozer is made up of a number of components, such as the cab, track, coiled track, frames, blade, engine, hood, rollers, idlers, and more. The manufacturing of bulldozers requires a combination of processes, such as CNC machining, welding and powder coat painting involving skilled technicians as well as robotic support with automated assembly line.

Komatsu was seeking processing improvement in their production of track frame, which is a side-frame component of their bulldozer. In terms of production volume, Komatsu manufactures approximately 1,200 vehicles per year.

Made of cast steel, each track frame has 46 through holes measured at 14 mm in diameter and 37 mm in depth. The machining center being used to produce these track frames is the Shin Nippon Koki CNC portal milling machine. A BT50 tool holder is also used to secure the tooling. Komatsu was originally using a competitor 2-flute double margin coolant-through carbide drill with a 140-degree point angle for this application. With the 2-flute drill, Komatsu was encountering problems such as tool breakage, processing time and performance instability.



The TRS "Mega Muscle" drill is designed specifically for drilling at feed rates 1.5 to 2 times faster than 2-flute drills. The TRS is suitable for any application that currently uses 2-flute coolant-fed drills in cast aluminum, cast iron, carbon steels, alloy steel, die steel, stainless steel and hardened steel less than 45 HRC.

Two-flute drills have their limitations when the need to cut production cost in half while doubling efficiency arises. Looking to improve production cost efficiency, Komatsu Process Engineer Rafael Fernando Braz, who is responsible for the manufacturing of the track frames, consulted with OSG regarding the application, as Komatsu and OSG have a long-time partnership in both

Brazil and in Japan. Upon a detail evaluation of the application, OSG recommended the 14 mm diameter TRS "Mega Muscle" 5D 3-flute coolant-through carbide drill (EDP# 8663400).



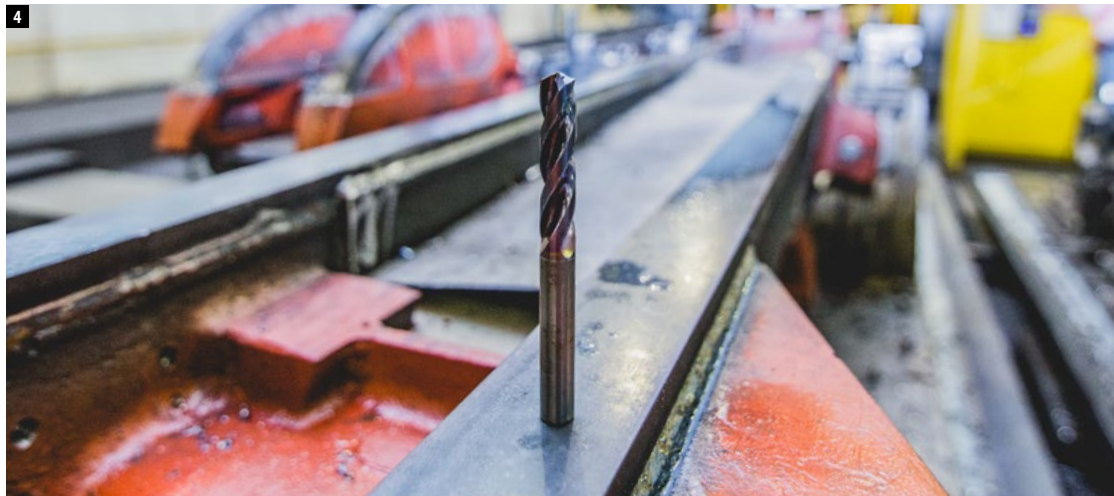
Conventional 3-flute drills are most commonly used in the

processing of materials with short cutting chips, such as cast iron and cast aluminum. Because 3-flute drills have a smaller flute size (chip room) than 2-flute drills, they are less frequently used in difficult-to-machine materials like steels. OSG's TRS is the world's first 3-flute drill for steels with patented flute shape that breaks steel chips into small, manageable pieces for easy evacuation, enabling ideal performance even in steels. This feature allows for increased feed rates up to 1.5 to 2 times faster than 2-flute drills. Further, its 120-degree equal spacing margin allows vibration-free processing and improved hole tolerance with less work hardening, which gives secondary operations such as tapping even more tool life.

The original competitor tool was running at a rotational speed of 1,800 min⁻¹, feed rate of 455 mm/min, and

4. The TRS "Mega Muscle" drill is the world's first 3-flute drill for steels. Patented geometry permits stable chip ejection, even with less chip pocket space inherent in 3-flute drills. The TRS is able to help Komatsu reduce machining time by 30 percent and double tool life in their production of track frames.

5. A pair of track frames pending for completion at Komatsu do Brasil's production plant in Suzano, São Paulo.



cutting speed of 70 m/min. The processing time per part was 22 minutes. The TRS, on the other hand, runs at a rotational speed of 1,900 min⁻¹, feed rate of 950 mm/min and cutting speed of 85 m/min. The TRS is able to reduce processing time to 15 minutes and 52 seconds per part, which is equivalent to approximately 30 percent time reduction. In terms of tool life, the previous tooling choice required four drills per month. With the TRS, only two drills are required per month, decreasing tool consumption by half.

“When we needed improved performance, OSG’s TRS drill demonstrated superior results for our application,” said Komatsu Process Engineer Rafael Fernando Braz. “The TRS 3-flute drill helped us solve a critical application very successfully, and we intend to expand this solution to other applications.”

The heavy industry is a key sector that contributes to the development and growth of the global economy. As Komatsu has demonstrated, dirty and manual work is a stereotype of the past. The modern heavy industry is high-tech, safe, powerful and reliable. As the heavy industry’s tough materials and large production require strong tools designed for performance, OSG is ready to supply superior tooling solutions to help manufacturers in this important sector continue their journey of constructing excellence.

“Our partnership with OSG has always been a positive experience,” said Braz. “In addition to providing satisfactory tooling solutions, OSG’s staff always supply us with the latest metal cutting knowledge so that we can fully leverage the cutting tools as well as our equipment to reach optimum cost efficiency.”



6

6. A close-up of a completed track frame on a bulldozer. The manufacturing of bulldozers requires a combination of processes, such as CNC machining, welding and powder coat painting involving skilled technicians as well as robotic support with automated assembly line.

7

7. A fleet of completed bulldozers lining up at the Komatsu do Brasil’s production plant in Suzano, São Paulo. A bulldozer is a tractor fitted with a dozer blade used for maneuvering materials such as soil, sand and rubble. A bulldozer is made up of a number of components, such as the cab, track, coiled track, frames, blade, engine, hood, rollers, idlers, and more.

High-Feed, High Accuracy & Tight Tolerances Milling

WXS-LN-EBD rib processing ball nose end mill demonstrates long tool life and superior accuracy in high-feed processing of metal rollers at 54 HRC

Magnus Hoyer, OSG Germany



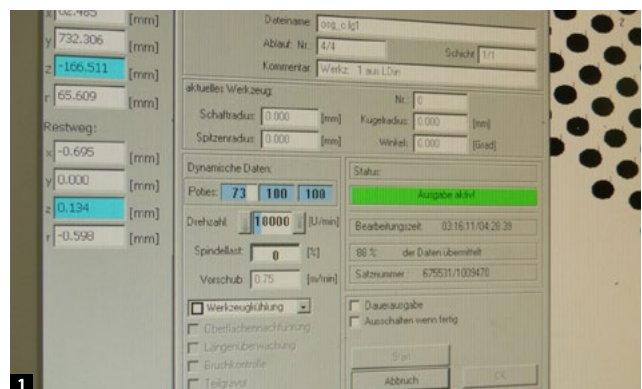
The WXS-LN-EBD is a 2-flute, long-neck ball nose carbide end mill designed for high-feed milling of hardened steels up to 65 HRC and stainless steels.

A manufacturing process that involves the embossing of sheet metal stamping rollers in 1.2379 tool steel at a length of 80 mm. At first glance, the production of this component seems neither demanding nor difficult. The challenge, however, lies in the detail, which involves maintaining a tolerance of 0.01 mm and continuous machining of up to 24 hours. With the small diameter embossing, the cavities in the rollers are positioned tightly, which prevents the use of high-feed-rate as the milling machine does not have adequate room to accelerate or decelerate. As a result, the cutting tool for the job has to quickly grind through the short traverse paths with great precision. With the rollers being made out of high hardened materials at 54 HRC, an end mill with a sharp cutting edge would be the typical tooling choice. At least that was the experience for PräWeba Engraving and HSC Technology GmbH.

Established in 1996, PräWeba is a group of specialists for CNC production located in Bad Lauterberg, southern Harz, Germany. Led by Managing Director Rolf Stilzebach, who has years of experience in the

programming of part processing, PräWeba's core services include engraving, tool making, forming and CAD services. PräWeba works with a wide variety of requirements, surfaces and materials, such as plastic, Plexiglas, brass, aluminum, stainless steel, and other metals up to a hardness of 65 HRC.

For more than two decades, PräWeba has supplied precision products for various renowned clients around



Because the cavities in the metal stamping rollers are so tightly packed, PräWEBA sets its cutting parameters to approximately 90 percent value of OSG's recommendation for the WXS-LN-EBD.

the world for their industrial applications. PräWeba prides itself in its quality of work. The company places great emphasis on dimensional and detail accuracy. In metal manufacturing, even minimal inaccuracies in seemingly unimportant parts may add up in subsequent processes in such a way that the overall result is unacceptable. To guarantee absolute precision, PräWeba always manufactures products using modern CNC milling machines, high quality clamping systems and optimum cutting tools.

In the case of PräWeba's metal roller production, which involves the machining of tightly packed cavities, the tolerances for the final product are in the micrometer range, where the tolerance of the embossing tool must lie within +/- 0.01 mm utilizing a cutter diameter between 0.4 and 0.8 mm.

As tooling cost is factored into the cost of the overall production, which would be passed on to the client, PräWEBA is always particular with their tooling choice. PräWEBA welcomes new tooling solutions as long as significant improvements in cost efficiency can be achieved. The tooling that PräWEBA initially employed was fair. However, when compared with the WXS-LN-EBD, OSG is the obvious winner in both processing time and tool life.

The WXS-LN-EBD is a 2-flute, long-neck ball nose carbide end mill designed for high-feed milling of hardened steels up to 65 HRC and stainless steels. Equipped with OSG's original WXS coating for superior heat and wear resistant, this rib processing end mill series is able to

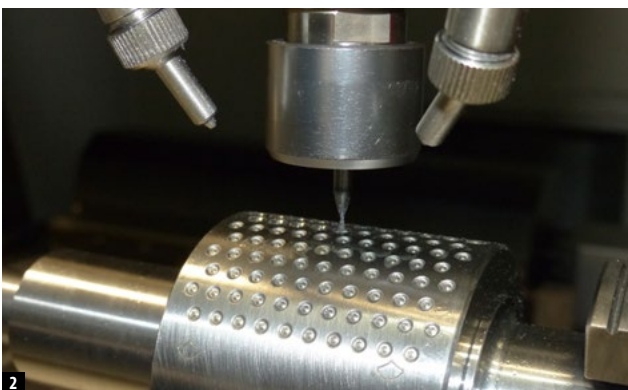
achieve optimal performance with high precision and efficiency under aggressive machining conditions.

PräWEBA was running their previous milling cutter at a speed of 13,000 rpm. In contrast, OSG's WXS-LN-EBD ball nose end mill is capable of running at a speed of 18,000 rpm under identical cutting environment. Furthermore, every embossing roller would cause a great deal of wear on the cutting tool due to the metal's high hardness at 54 HRC. PräWEBA's previous tooling choice required 16 to 20 end mills per roller. With OSG's WXS-LN-EBD, only six end mills are required per roller.

"We have tested, calculated and weighed up our alternatives," said PräWEBA Managing Director Rolf Stilzebach. "The conclusion is that OSG's WXS-LN-EBD is capable of running at higher feed rates and gives us approximately 20 to 30 percent longer tool life, saving us considerable tooling costs."

As the WXS-LN-EBD is designed for highly efficient milling in applications involving hard metals, intricate details and smooth finishes, PräWEBA is using it for both semi-roughing and finishing processes to take full advantage of the tool's dual capabilities.

Machining centers today are capable of following precise, complex tool paths at high feed rates. With the right tooling choice, even intricate parts that require high accuracy with tight tolerances can be processed at high feed rate to maximize cost efficiency.



After switching to OSG's WXS-LN-EBD rib processing ball nose end mill, PräWEBA is able to increase tool life by an estimate of 125 percent in their production of metal stamping rollers.

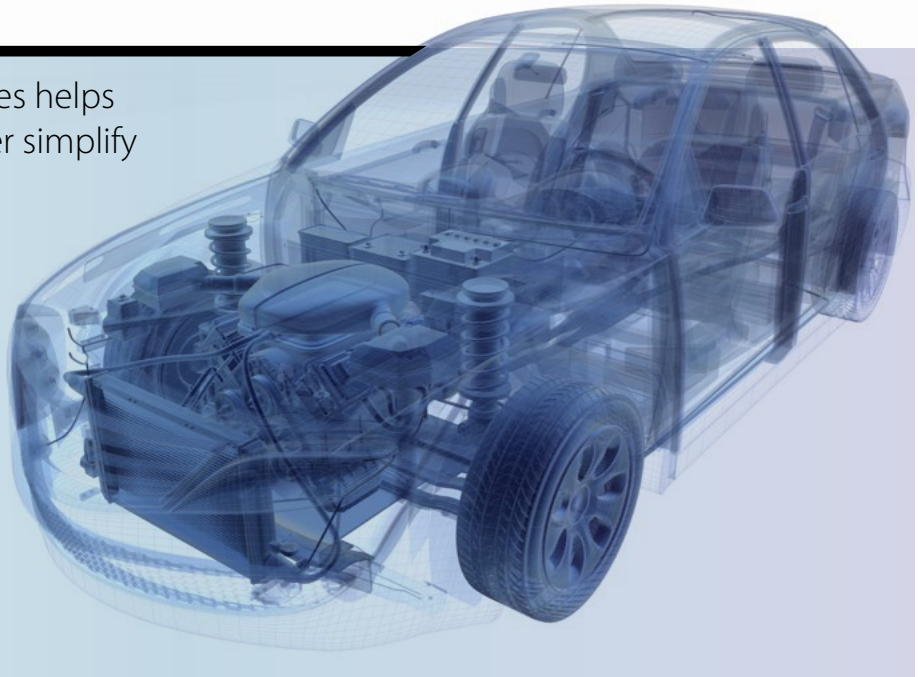


From left to right, PräWEBA Production Manager Sascha Wedemeyer, PräWEBA Managing Director Rolf Stilzebach and OSG Sales and Technical Specialist Nico Henze.

One Tap Does It All

Multi-purpose A-Tap series helps automotive manufacturer simplify tool management with enhanced efficiency and tool life

Jiang Encheng, OSG Shanghai



If you ask me to compare work to running, I think our daily work is a 100-meter dash, providing cutting tool solutions is a 1500-meter race, and recommending appropriate new products is a 4x400-meter relay. What kind of a race would satisfying customers' needs be?

In my opinion, it would be an endless marathon.



During the lean production meeting about a year ago, we visited the northern city, which is famously known as the Detroit of China for its automotive industry. The entire 1,200 km journey is equivalent to the distance from London to Budapest. However, in this remote city, there are more than 300 automotive factories, and our customer is one of the biggest manufacturers in China with over 130,000 employees. During this journey, we visited one of their production facilities with approximately 600,000-square-meter of production floor space and over 1,500 staff.

In the automotive industry, no matter how stable production is, every factory has its own requirements for cost control and processing efficiency, which also applies to the cutting tools they employ.

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.



An automobile is consisted of many different parts made of various materials, such as aluminum, carbon steel, alloy steel, cast iron, stainless steel, and more. Each material has different characteristics. For example, to effectively machine aluminum alloy, the cutting tool needs to be sharp with capability to withstand welding. Cutting tools used for machining cast iron must be rigid and has good wear resistance. For stainless steel, tools should have a good balance between wear resistance and toughness. Having a cutting tool specifically designed for a designated material is ideal. However, when it comes to tool management, the idea of material specific tooling can become inconvenient. When a manufacturer works with a new product with a different material, cutting tools would have to be repurchased, and this procedure is especially common in threading processes.

During the lean production meeting, we introduced OSG's A-Tap series to the customer for consolidate tooling management, as it is designed to accommodate a wide range of materials. The customer, whose name cannot be disclosed due to confidentiality reasons, did not have any previous experience with multi-purpose taps and was highly suspicious of the concept.



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 and reduces cutting forces. 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 patented 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.

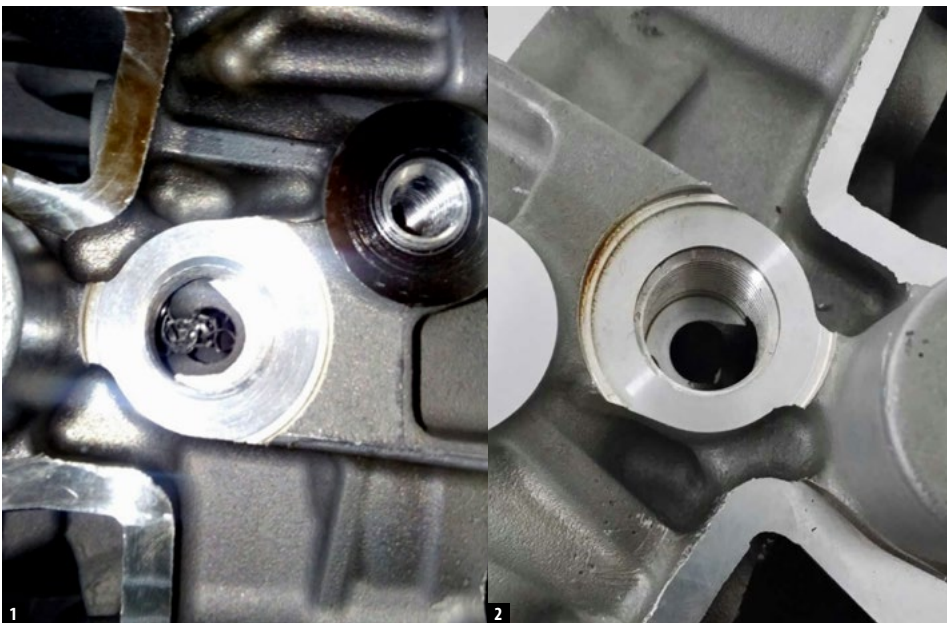
After sharing a great deal of cutting data with successful results, the customer was willing to put the A-Tap A-SFT spiral tap to the test.

During the cutting tool trial, we used six pieces of A-SFT (M8X1.25) to process three different materials – carbon steel, aluminum alloy and stainless steel, on the same

machine. We ran the trial twice with a new tool for each material to measure result.

At the end of the trial, the average tool life was 1,400 holes in S50C at a cutting speed of 15 m/min, 4,000 holes in ADC at a cutting speed of 20 m/min, and 1,000 holes in SUS304 at a cutting speed of 10 m/min. What's more impressive is that all of the taps could continue to be used due to minimal wear. Because of the excellent versatility, performance and tool life, the number of taps required for this customer's production could be reduced by 15 percent.

After this initial success, this client consulted with us on a different process – the threading of an aluminum engine cylinder block with an annual production volume of approximately 250,000 pieces. A M20x1.5 tap is used to thread a bottom-through cross-hole using a local Chinese brand vertical machining center. The client's previous tooling choice had chip evacuation problems, where the chips would have to be removed manually every time, which affects the stability and efficiency of the production.



1. Chip evacuation problem was a headache for the client in their production of aluminum engine cylinder block. Cutting chips had to be removed manually every time, which affects the stability and efficiency of the production.

2. A clean thread produced by a custom A-SFT with extra oil holes on the side.



After a throughout evaluation of the application, we concluded that the A-Tap A-SFT is also a great fit for the process. In order to resolve the problem completely, we recommended adding oil holes on the side of the A-SFT, which OSG offers as a custom item. With the aid of the extra cutting lubricate, the cutting chips are able to be ejected from the hole smoothly during the threading process. Moreover, with the previous tooling choice, in order to create stable chip shape, the cutting speed had to be maintained at 35 m/min. If the cutting speed exceeds 35 m/min, the volume of the spiral chip would be enlarged, making it more difficult to be evacuated. With the A-SFT, on the other hand, the cutting speed is able to be increased from 35 m/min to 50 m/min, which increases the processing efficiency by 42.8 percent.

With an increased processing efficiency and the capability of being able to average 20,000 holes in tool life, this client could not be more satisfied and has since implemented more of the A-SFT in their production lines.

The demand of manufacturers is constantly evolving and the need for improvement is never-ending, just like an endless marathon. Although there is no end, we must continue our journey of continuous development to help manufacturers stay ahead of their race.



Scan for details

ADO-TRS “Triple Revolution”

3-Flute Coolant-Through Carbide Drill Series

The ADO-TRS “Triple Revolution” is OSG’s latest drilling innovation for ultra machining efficiency in a wide range of materials. Its unique R gash geometry enables high thrust resistance and exceptional chip control, which are common challenges of 3-flute drills. With its low cutting resistance capability comparable to 2-flute drills,

the ADO-TRS is able to create short and compact chips stably. Furthermore, its wide chip pocket configuration allows trouble-free chip evacuation even at high speeds and feeds. With the addition of OSG’s original EgiAS coating, superior wear resistance and long tool life can be achieved.



ADFO

New Coolant-Through Style Added to ADF Flat Drill Series

The ADF multi-purpose flat drill series for inclined surfaces and counterboring applications has been expanded with the coolant-through ADFO suitable for stainless steel applications.

Machining a flat hole traditionally required the use of an end mill and a drill. The ADF enables one-step drilling thereby simplifying machining time and tool management. The drill’s balanced point form improves precision and minimizes the shifting of the hole position.

Its sharp cutting edge results in low cutting force to minimize burrs even in thin plates. With wide chip room geometry, trouble-free chip evacuation can be achieved. Furthermore, with the addition of OSG’s new proprietary EgiAs coating, tool life can be prolonged with excellent heat and wear resistance.

The ADF is engineered for a wide variety of drilling applications including inclined surfaces, curved surfaces, counterboring, eccentric holes, thin plates, etc.



AE-VML

New Long Flute Style Added to Anti-Vibration Carbide End Mill AE-VMS Series

The highly anticipated long flute AE-VML for high-speed side milling has been added to OSG's AE-VMS anti-vibration carbide end mill offering, a series designed to attain an all new level of milling efficiency coupled with superb finish quality suitable for a variety of milling applications.

High-speed side milling is made possible by the AE-VML's large thick core design. Its unique flute form with high tool rigidity and excellent chip evacuation properties enables stable milling performance and the suppression of burrs. 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. The DUARISE coating's multi-layer construction minimizes thermal cracks, allowing the AE-VMS series to excel even in water-soluble oil.

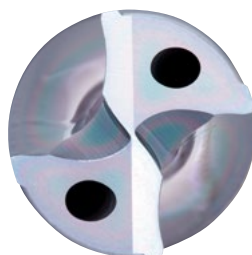
Available in square, radius, stub length, long neck and long flute, the AE-VMS is designed to accommodate a wide range of milling operations including slotting, side milling, helical milling, contour milling and ramping in stainless steel, cast iron, carbon steel, alloy steel and hardened steel (up to 40 HRC).



ADO

40xD and 50xD Sizes Added to ADO Next Generation High Performance Carbide Drill Series

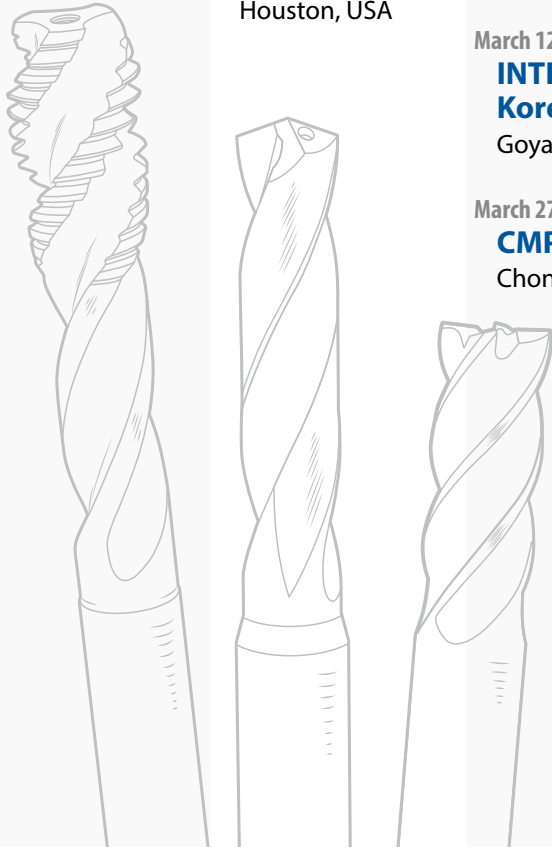
The ADO series, OSG's premium line of solid carbide drills with through coolant, has been expanded with 40xD and 50xD sizes for highly efficient deep-hole drilling. The ADO's unique R gash geometry enables super low cutting resistance and exceptional chip control. Its new flute specification with smooth chip evacuation and high tool rigidity qualities are engineered for optimum performance in ultra-deep-hole applications.



Global Events

2019 Exhibition Schedule

01 January	02 February	03 March	04 April	05 May
<p>January 24–30 IMTEX Bangalore, India</p>	<p>February 5–7 Expo Manufactura Monterrey, Mexico</p>	<p>March 3–5 Grainger Show Orlando, USA</p>	<p>April 6–8 ISA Houston, USA</p>	<p>May 7–11 EXPOMAFE São Paulo, Brazil</p>
	<p>February 5–8 Intec Leipzig, Germany</p>	<p>March 5–8 Industrie Lyon Lyon, France</p>	<p>April 15–20 CIMT Beijing, China</p>	<p>May 9–11 CCEME Zhengzhou, China</p>
	<p>February 21–23 LMT Lab Day Chicago, USA</p>	<p>March 12–14 InnoForm Bydgoszcz, Poland</p>	<p>April 16–18 Fastenal Customer Expo Aurora, USA</p>	<p>May 14–16 EASTEC West Springfield, USA</p>
	<p>February 26–28 HOUSTEX Houston, USA</p>	<p>March 12–16 IDS Cologne, Germany</p>	<p>April 17–20 INTERMOLD Tokyo, Japan</p>	<p>May 14–17 Mack-Teck Budapest, Hungary</p>
		<p>March 12–16 INTERMOLD Korea Goyang, Korea</p>		<p>May 21–24 Moulding Expo Stuttgart, Germany</p>
		<p>March 27–29 CMPI Chongqing, China</p>		<p>May 22–25 BUTECH Busan, Korea</p>



06

June

June 4–6

Zhengzhou International Hardware Electrical Exhibition

Zhengzhou, China

June 4–7

ITM Poland

Poznań, Poland

June 11–13

Fastener Expo Shanghai

Shanghai, China

June 12–13

Amerimold

Rosemont, USA

June 14–17

IMTOS

New Delhi, India

09

September

September 16–21

EMO

Hannover, Germany

September 17–19

Fastener Show

Las Vegas, USA

10

October

October 1–3

TOOLEX

Sosnowiec, Poland

October 3–5

EXPOLAB

São Paulo, Brazil

October 8–10

METAVAK

Gorinchem, Netherlands

October 11–13

CWMTE

Chengdu, China

October 23–26

MECT

Nagoya, Japan

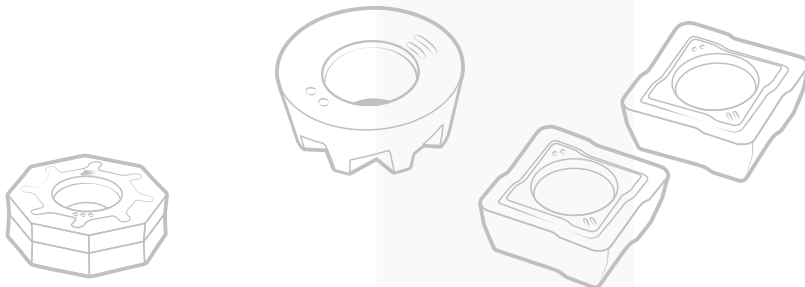
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December

December 6–7

Fastenal Employee Expo

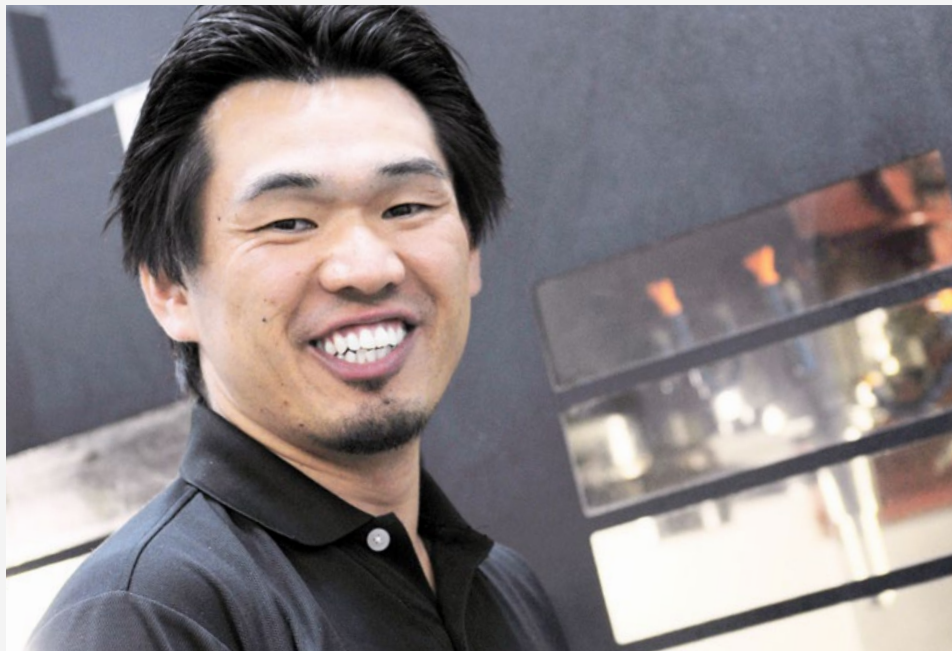
Orlando, USA



OSG Around the World

Employee Interview with

Katsutoshi Watanabe



Katsutoshi "Ben" Watanabe

Company Location: Singapore

Position: Engineering Manager

Joined OSG: 1997

Motto: "To be prudent yet fearless"

Tell us about your work & experience at OSG.

I studied electrical engineering in college and joined OSG Corporation's engineering division in 1997, more than 20 years ago. In 2015, as Engineering Manager, I was assigned to temporary transfer to OSG Asia in Singapore to serve as Sales Engineering Manager for the Southeast Asia region.

Tell us about your daily routine.

Southeast Asia is a large region made up of many different countries. My role changes depending upon location and needs. In general, I provide technical support for the entire southeast Asia region. For countries without an office, such as Pakistan, I would also take on the role of a salesman. In addition to engineering

and sales, I also serve as general manager, taking charge of pricing, ordering and inventory management.

What is most challenging about your work?

I have worked mostly as an engineer throughout my career, so having sales responsibility now has become a new challenge to me. As an engineer, my focus has always been on tool performance. However, selling tools often is not only about the cutting tool and performance. The distributor, pricing and relationship with the end user all play a critical role in tool selection. Simply providing technical support is insufficient. In order to provide adequate products and services to the global market, we must learn about other aspects of the business.

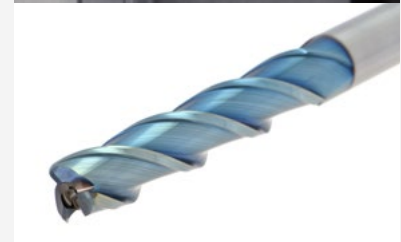
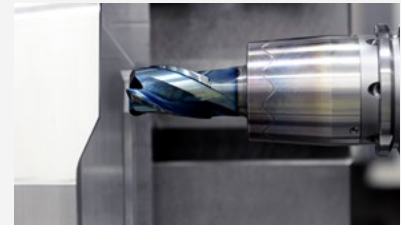


What is unique about the Singapore division at OSG?

The atmosphere at OSG Asia in Singapore is very energetic and friendly. We have many female staff at the OSG Asia office and they are incredibly independent and self-driven. Company dinner is also a very big deal in the Singapore culture.

What is your favorite OSG tool?

My favorite OSG tool is the AERO series for high-efficiency milling of large aluminum aircraft components, which I have personally developed. This series' astonishing chip evacuation capability always draw a great deal of attention whenever I present this lineup of end mills to new end users.



The AERO series is a high-performance carbide end mill series designed for high-feed milling of aluminum alloys with superb surface finish. Its high rigidity geometry enables the use of high-power equipment over 80kW for ultra-efficiency milling of large aluminum components. The AERO series' optimal flute shape enables trouble-free chip evacuation. Furthermore, its DLC coating provides the cutting tool with a shiny and smooth surface, optimal for aluminum alloy machining that requires welding resistance and lubricity. The AERO series is available in various styles and sizes for both roughing and finishing processes.



How do you spend time on your day off?

Aside from playing badminton on a local team in Singapore, I often travel overseas for leisure with my wife during my time off work. Air fare is relatively inexpensive in southeast Asia since all of the countries are very close by one another. Thanks to the reasonable pricing and close proximity, it's very easy to have a weekend get-away overseas. After relocating to Singapore, I have been able to meet many wonderful people from all around the world. This experience is a great treasure of my life.



1. Back row, second from right, Watanabe poses for a group photo with his teammates during the Asian-Japanese badminton tournament held in Thailand. In addition to Japan, Japanese who work in other Asian countries also participant in this annual tournament.

2. Watanabe and his wife pose for a photograph at the Samutprakarn Crocodile Farm and Zoo in Bangkok, Thailand.

3. Watanabe makes a huge leap at the Pinnacles Desert in Nambung National Park in Australia. During time off work, Watanabe often travels overseas for leisure with his wife in the nearby region.

4. Far left, Watanabe enjoys dinner with the OSG Malaysia team during a business trip visit.



The A Brand

The Tooling Master Class

