

SHAPE IT

A MAGAZINE FROM OSG | 2018 VOL. 2

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Staying ahead of the ever-changing world of manufacturing

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A Message from the President

March 26, 2018 marks OSG Corporation's 80th anniversary. We would like to express our heartfelt gratitude to the support of our customers, business partners and shareholders for making it possible to welcome this day.

Taking a moment to reflect upon this special milestone, the global economy and our business environment have significantly evolved in the last 20 years. China has grown into the second largest economy after the United States with tremendous spending and manufacturing power. It has earned the title of the "world's factory" with low production costs, abundant labor pool, vast talent base and business ecosystem. In terms of technology, we are now living in an era of Internet systems and services. Business is no longer dependent on local customers for survival. Rather, enhanced connectivity has revolutionized the method of sales, communication and the pace of business by opening the doorway to a worldwide audience for goods and services.

Then, what kind of an era will it be in the next 20 years? I suspect that the manufacturing industry will be significantly transformed with electric vehicles (EVs) and the Internet of Things (IoT) taking center stage with greater emphasis on sustainability and resource sharing. In anticipation of a decline in the demand of cutting tools for the manufacturing of automobile engines, OSG will endeavor to expand its business in new markets, such as space, aerospace and the medical industry. Looking ahead, OSG will continue its global expansion while increasing its business in regrinding and recoating services. We will advance into new markets other than cutting tools with our superior coating technology. The method of sales will also evolve based on specific market needs. Sales channel will likely be divided into two key categories – tailored sales service with technical support and mass distribution through the worldwide web to accommodate needs quickly and easily. Nevertheless, all efforts must focus on customer demand in accordance with changes in times.

OSG became 80 years old, but our vision is as clear as before. The secret to continuous growth is by confronting and staying ahead of change. It is also crucial to listen to the voices and ideas of the new generation. With versatility to accommodate evolving needs, I am confident that OSG will be able to continue its path of success through and beyond our 100th anniversary.



Norio Ishikawa
President & CEO of OSG Corporation



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OSG's seminars are paid workshops available to both distributors and end users focused on in depth metal cutting processes. Seminars are interactive and can provide great opportunities to share perspectives related to specific topics, gaining expert knowledge and networking with other professionals.

TOOL MASTER CERTIFICATION

Staying ahead of the ever-changing world of manufacturing with continuing education

Reiko Masuhara, Naoko Sakata, OSG Corporation



In addition to collateral materials such as workbooks, manuals or handouts, cutting demonstrations are often included in seminars, allowing the participants to experience the information in person.

The manufacturing industry is consistently evolving through the new discovery of materials and technologies. In the last couple of decades, industries have shifted emphasis on cleaner energy and greater fuel efficiency, leading to the application of new materials, coatings, and processing techniques that require sophisticated cutting tools capable of accommodating these new requirements. The solution for today may be a solution of the past tomorrow. To meet the complexity of modern manufacturing, continuing education is essential.

CONTINUING EDUCATION PROGRAMS

OSG Corporation currently offers three types of continuing education programs – e-learning, technical seminars and on-demand training.

E-LEARNING

OSG's comprehensive e-learning programs are cost-efficient and flexible, allowing participants to take courses at their convenience. OSG offers two types of e-learning programs based on skill level. The introductory level is divided into six sections, covering the fundamentals of taps, end mills, drills, gauges, indexable and turning tools. The advanced level is divided into two sections, focusing on drilling, threading and milling applications.

TECHNICAL SEMINARS

OSG's seminars are paid workshops available to both distributors and end users. Every year, OSG offers a combination of 1-day or 2-day technical seminars nationally in Japan. Programs are offered based on three levels – beginner, intermediate and advanced. Seminars offered at the corporate headquarters include live demonstration at its recently renovated technical center and accommodation at the company's very own Guest House, which was completed in 2012 to encourage communication among the tooling community.

ON-DEMAND TRAINING

OSG's on-demand training is designed for end users who are new to metal cutting. OSG accommodates individual requests by dispatching its tooling experts to designated locations to provide tailored training services.

OSG Corporation's lecture hall at the corporate headquarters in Aichi, Japan. Every year, OSG offers a combination of 1-day or 2-day technical seminars nationally in Japan at various locations, including its corporate headquarters.



TOOL MASTER CERTIFICATION PROGRAM

In manufacturing, technology and management practices change at an ever-increasing rate, a gap is formed between the foundation provided by an academic education and the management competencies required in today's business environment. The OSG Tool Master Certification Program was established in November 2017 to bridge this education gap.

OSG's Tool Master Certification Program involves the documentation of successful completion of metal cutting courses and their associated examinations. Upon the passing and completion of the certification requirement, participants are certified as an OSG Tool Master or an OSG Tool Expert Adviser. This achievement demonstrates an individual's expertise in the field of metal cutting and personal commitment to professional development.

OSG's Tool Master Certification Program ensures the competence of metal cutting professionals through a measurement of skills and knowledge, which provides reassurance to the cutting tool users, knowing that the quality of technical support they receive from certified individuals is guaranteed by OSG.

TECHNICAL SEMINAR	E-LEARNING
Basic	Threading: Introductory
Intermediate	Drilling: Introductory
Advanced	Milling: Introductory
Tooling: Introductory	Gauges
Threading Applications	Indexable Tooling
	Turning Tools
	Drilling & Threading Applications: Advanced
	Milling Applications: Advanced

A sample list of courses required to be certified as an OSG Tool Master and OSG Tool Expert Adviser.



An example of an OSG Tool Master certification card. Upon the passing and completion of the certification requirement, participants may be certified as an OSG Tool Master or an OSG Tool Expert Adviser.





Takehiro Asai

Senior Customer Service
Supervisor

Profile:

Asai joined OSG Corporation in 1980. During his 38-year tenure at OSG, Asai has played a crucial role in multiple divisions, including manufacturing, research and development, marketing and customer service. Currently, Asai is the project manager of OSG's training programs. He is one of the key lecturers and has been an instructor for 14 years. Asai also serves as a visiting lecturer at OSG Taiho in Taiwan and OSG Shanghai in China.

“OSG's training programs focus on metal cutting technologies. We rarely include sales pitch in our training materials, and would include our products for demonstration purposes only. Our courses not only cover cutting tools, but also materials, cutting oil, heat treatment, processing technologies, tool drawing, etc. All of the knowledge and techniques acquired from the course apply to other cutting tool brands as well. The new certification program is highly beneficial because end users can only receive quality support from representatives with adequate metal cutting knowledge.”

TOOL MASTER CERTIFICATION PROGRAM

Participant Interview



Shingo Inoue

Yoshioka Kogyo Co., Ltd.
Sales Manager
(Metal Cutting Division)

Certified OSG Tool Master

Q: How did you come across OSG's training programs?

A: My former job was in a completely different field. I knew nothing about distributions nor the products that we sell. I was encouraged to take the introductory classes by my employer. At the time, I attended one of the seminars held at the OSG Corporation headquarters in Toyokawa, Aichi. I still remember my instructor from then.

Q: Why did you continue taking classes upon the completion of the introductory courses?

A: The customers that we interact with are often metal cutting professionals with a high degree of metal cutting knowledge and skills. It may be difficult to reach the same level. But in order to propose a solution, I feel that having adequate knowledge is essential. With basic knowledge, we can have a good conversation. Therefore, I was determined to continue learning.

Q: Which do you prefer – e-learning or technical seminar in person?

A: From the perspective of convenience, e-learning is great because I can do it when I want to learn. On the other hand, I find technical seminars to be extremely valuable because they provide actual demonstrations where we can experience the actual tool selection, testing and troubleshooting. The key merit is being able to use our senses in person – remembering the sound when machine trouble arises, the smell of burnt material – which are things that we cannot learn from textbooks nor our daily work. With technical seminars, participants get hands-on experience from skilled experts on state-of-the-art machines. Moreover, these workshops provide opportunities to meet other professionals in the same industry with different background. It's a lot of fun to take classes together and discuss the challenges we face in our work. No matter how many seminars I attend, there are always new discoveries.

Q: Do you have any experience where you feel that you have benefited from attending these training programs?

A: When I visit a client and do not know the answer to a question, I would revisit the course materials to try to figure it out myself. Because sometimes it's difficult to ask other about them. I also use the course materials for training new employees. They are great materials.

Q: What was your impression when you first heard about the OSG Tool Master certification program?

A: I was surprised but was very happy to hear about it. From the perspective of the end user, they would definitely prefer getting helped by someone with adequate knowledge than someone without. It provides reassurance.

Q: Would you recommend others to get certified?

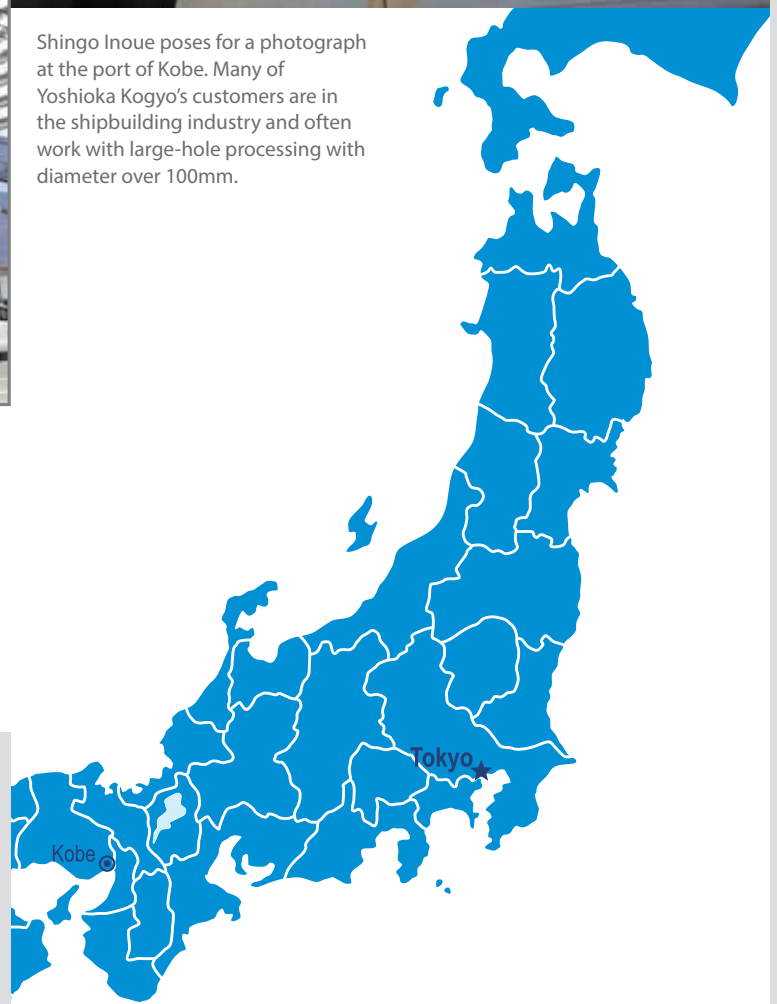
A: Our company encourages continuing education. As it would also provide improved services to our clients, I would highly recommend other employees to participant.



Shingo Inoue poses for a photograph at the port of Kobe. Many of Yoshioka Kogyo's customers are in the shipbuilding industry and often work with large-hole processing with diameter over 100mm.



Yoshioka Kogyo's headquarters in Kobe, Japan.



Company Profile

Yoshioka Kogyo Co., Ltd.

Established: 1956

Number of Employees: 30

Headquarters: Kobe City, Hyogo Prefecture, Japan

Core Products and Services: sales of cutting tools, manufacturing of machinery parts, installation of factory facilities and maintenance work, sales and purchasing of second-hand machinery

www.yoshioka-kogyo.co.jp



TOOL MASTER CERTIFICATION PROGRAM

Participant Interview



Koji Watanabe

Ohtake Co., Ltd.
Sales Manager

Certified OSG Tool Master

Right: From left to right, OSG Corporation Marketing Supervisor Reiko Masuhara, Ohtake President Masahiro Okuwa, Ohtake Sales Manager Koji Watanabe, OSG Corporation Senior Customer Service Supervisor Takehiro Asai and OSG Corporation Sales Manager Masashi Yano. There have been approximately 15,000 participants in OSG's training program. As of spring 2018, only 15 participants so far have qualified for the highest level Tool Master certification. Koji Watanabe from Ohtake is one of the few individuals who have successfully acquired the highest level Tool Master certification from OSG.

Q: Why did you decide to take the training courses offered by OSG?

A: In order to distinguish ourselves from other distributors and to provide the best possible services to our clients, it's our company policy to regularly participate in continuing education activities. I am not the only one who has taken courses and seminars. All of our staff at Ohtake are also taking part in these activities so that everyone would be able to answer our clients' inquiries.

Q: What kind of benefits have you gained from taking these courses?

A: When a customer asks a question, the ability to answer right the way makes a big difference. After taking all of the metal cutting courses, I can confidently say that I am able to provide my clients' with adequate advices. All the information taught from the courses are practical and can be applied right the way in our daily work.

Q: What is your impression of the new Tool Master certification program?

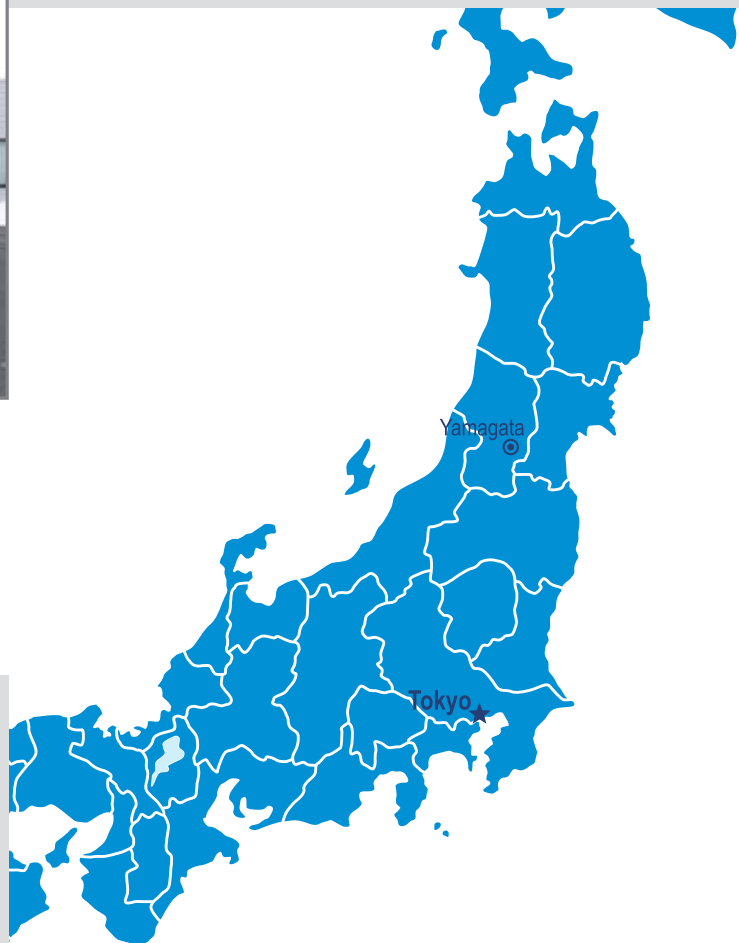
A: There wasn't any certification program available when I first started attending the technical seminars and online courses. It's also not very common from cutting tool manufacturers in Japan. Many of the courses offered by other cutting tool manufacturers are targeted toward end users. I think the certification program is a great motivation for us to keep learning. At Ohtake, once we achieve the OSG Tool Master certification, we would include it in our business card. Many customers may not know about our company, but they are familiar with OSG. So getting certified by OSG helps increase our company's creditability.

Q: How do you feel about this accomplishment?

A: I received my Tool Master certification in fall 2017, with credits that I have accumulated since 2007. It happened that when I first joined the company, OSG was offering a technical seminar in Sendai. After attending I was very fascinated by the manufacturing industry and was eager to learning more about new technologies. I did not find attending seminars and taking courses online to be stressful. Before I knew it, I have successfully passed all of the requirements and was able to obtain this credential, which I feel very proud of.



Ohtake's headquarters in Yamagata, Japan.



Company Profile

Ohtake Co., Ltd.

Established: 2002

Number of Employees: 13

Headquarters: Yamagata City, Yamagata Prefecture, Japan

Core Products and Services: sales of precision cutting tools, rolling tools, measuring tools, auxiliary tools, machinery equipment and machine oil

www.ohtakenet.com

SOLID CERAMIC END MILLS

High efficiency machining in heat resistant alloys

Kohichi Ohta, OSG Corporation Applications Engineer (End Mill Development Division)

Ceramic end mills have been developed as an effective tooling solution for high efficiency roughing of heat-resistant super alloys (HRSA), which are widely used in the aerospace and energy industries. HRSA are classified as hard materials that are difficult to machine because of their excellent high-temperature strength and low thermal conductivity. HRSA materials such as Inconel 718 have a tendency to soften when temperature exceeds 700 Celsius, allowing easier cutting. As ceramic end mills have high-temperature tolerance, they are a perfect fit for these hard materials.

Ceramic end mills are roughing tools that machine dry. High efficiency roughing is achieved by applying the heat generated from the fast, dry cutting as a part of the cutting mechanism while machining in the designated temperature range where the strength of nickel-based metal decreases.

OSG's ceramic end mill series employs an optimum ceramic grade ideal for high-speed machining at high-temperatures in difficult-to-machine materials such as Inconel 718, with roughing efficiency dramatically surpassing carbide end mills. Two types of ceramic end mills are included in the series – the CM-RMS peripheral cutting edge type and CM-CRE end cutting edge type.

Compared to carbide end mills, ceramic end mills are superior in hardness at high-temperatures. However, ceramic end mills' resistance against transverse stress are less than half of carbide end mills, making them easily prone to unexpected breakage when used under inappropriate cutting conditions. To minimize sudden breakage, OSG's CM-RMS features optimum flute geometry to enable smooth chip evacuation even at aggressive cutting condition. Its negative cutter form increases cutting edge rigidity to enable long tool life as illustrated in figures 1 and 2. The CM-RMS is available in 4-or 6-cutting edge specification to accommodate individual application needs.

The CM-CRE end cutting edge type ceramic end mill does not only excel in flat surface milling, but also in 3D applications, such as the machining of turbine blades. Its large-diameter specification reduces the risk of breakage during machining and enables optimum cutting speed without being restricted by the capability of the machining center. Furthermore, the CM-CRE is regrindable and can be reincarnated by cutting

OSG's ceramic end mill series employs an optimum ceramic grade ideal for high-speed machining at high-temperatures in difficult-to-machine materials such as Inconel 718, with roughing efficiency surpassing carbide end mills.

away the used portion.

Ceramic end mills enable higher cutting speeds and longer tool life versus conventional carbide end mills, which would not be able to tolerate such high-temperature machining condition. For manufacturers who are in search of

significantly greater productivity in hard rough milling operations, solid ceramic end mills may be the ultimate tooling solution. ✖



CM-RMS 4-flute peripheral cutting edge type ceramic end mill is ideal for side milling, slot milling, helical milling, contour milling and ramping. The CM-RMS 6-flute peripheral cutting edge type ceramic end mill is suitable for side milling, helical milling and contour milling.

Figure 1

Continuous Use is Possible with Low Level of Cutting Chip Welding

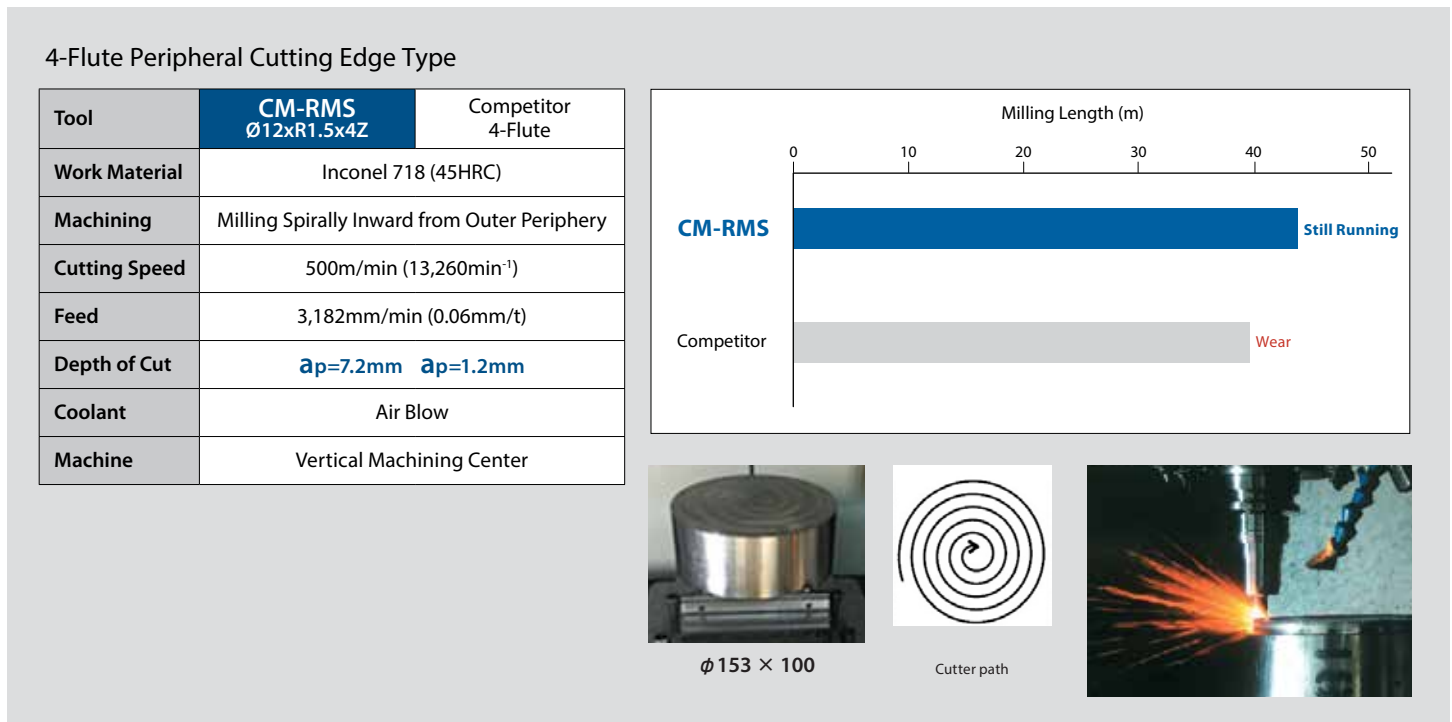
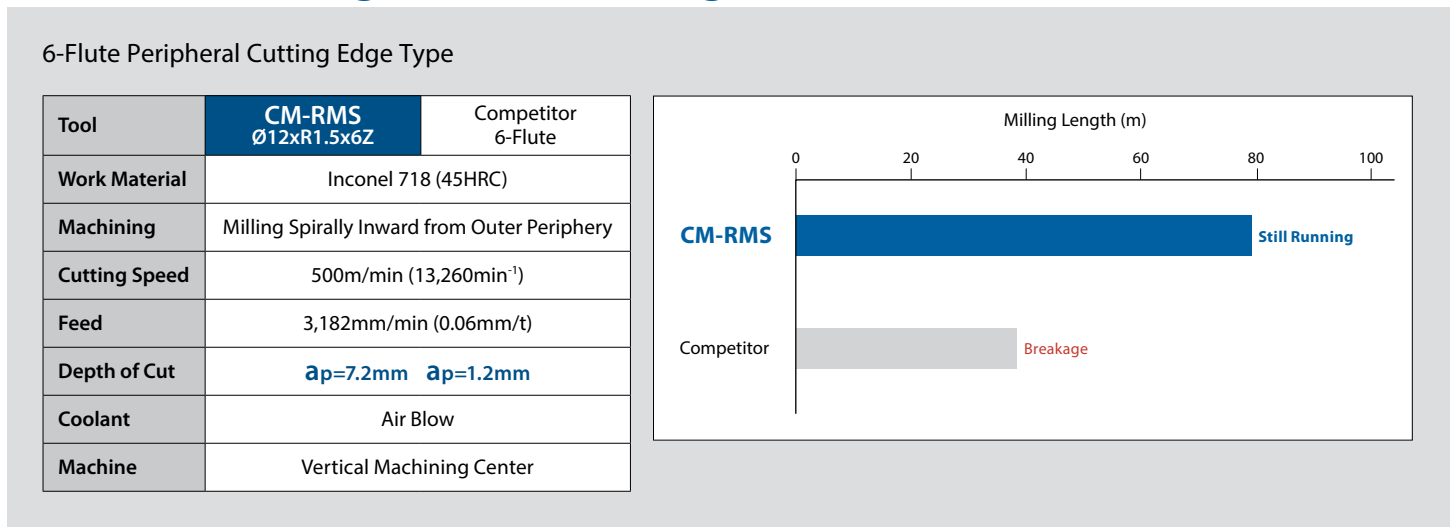


Figure 2

Stable Machining Free of Breakage





SETTING TRACK ON **RELIABILITY**

All-purpose A-Tap stops tool breakage in hand tapping process of rolling stock production

Gabriel Fernando Gialorenço, OSG Sulamericana



Hyundai Rotem's Brazil production plant was established in 2015 in Araraquara, São Paulo. Hyundai Rotem Brasil currently employs 136 staff and has a total production space of 157,850.08-meter-square.

From left to right: Hyundai Rotem Tool Manager Olavio Almeida, OSG Sulamericana Applications Technician Gabriel Fernando Gialorenço, Hyundai Rotem Purchaser Giulia Cardoso Fiorotto, Hyundai Rotem Purchaser Lidiane Montanari and Hyundai Rotem Production Assistant Marcos Moreira.

Rail transport is one of the most sustainable mode of transports available today due to its cost effectiveness, reliability and minimal impact to the environment. Developed to handle both freight and passenger traffic, rail transport demand continues to rise around the world in response to rapid urban expansion and globalization.

Owned by the Hyundai Motor Group, Hyundai Rotem is one of the world's largest railway system providers renowned for its world-class technology and quality. It supplies a majority of South Korea's rolling stocks and plays a leading role in the development of railway systems in 50 countries worldwide, including large metropolitan cities such as Hong Kong, Vancouver and Philadelphia.

Manufacturers in the railway industry are constantly under pressure to bolster infrastructures, enhance services, while simultaneously achieve overall cost-reductions. Hyundai Rotem was confronted with cost-reduction

challenges in the production of rolling stocks at its Brazil production plant, which was established in 2015 in Araraquara, São Paulo. Hyundai Rotem Brasil currently employs 136 staff and has a total production space of 157,850.08-meter-square.

Hyundai Rotem has been carrying out the assembly of trains at their Araraquara plant since August 2015. Rolling stocks, which are rail vehicles used in the rail transport industry, are key products of Hyundai Rotem Brasil. Made of 304 stainless steel, each rolling stock requires multiple threading processes in the train composition, such as the door groundsills, panels, seats and other structural parts. Threading processes are required for new rolling stocks as well as old ones that are in need of repair.

Hyundai Rotem's production volume varies based on the number of trains being delivered, damaged parts and respective exchanges. On average,

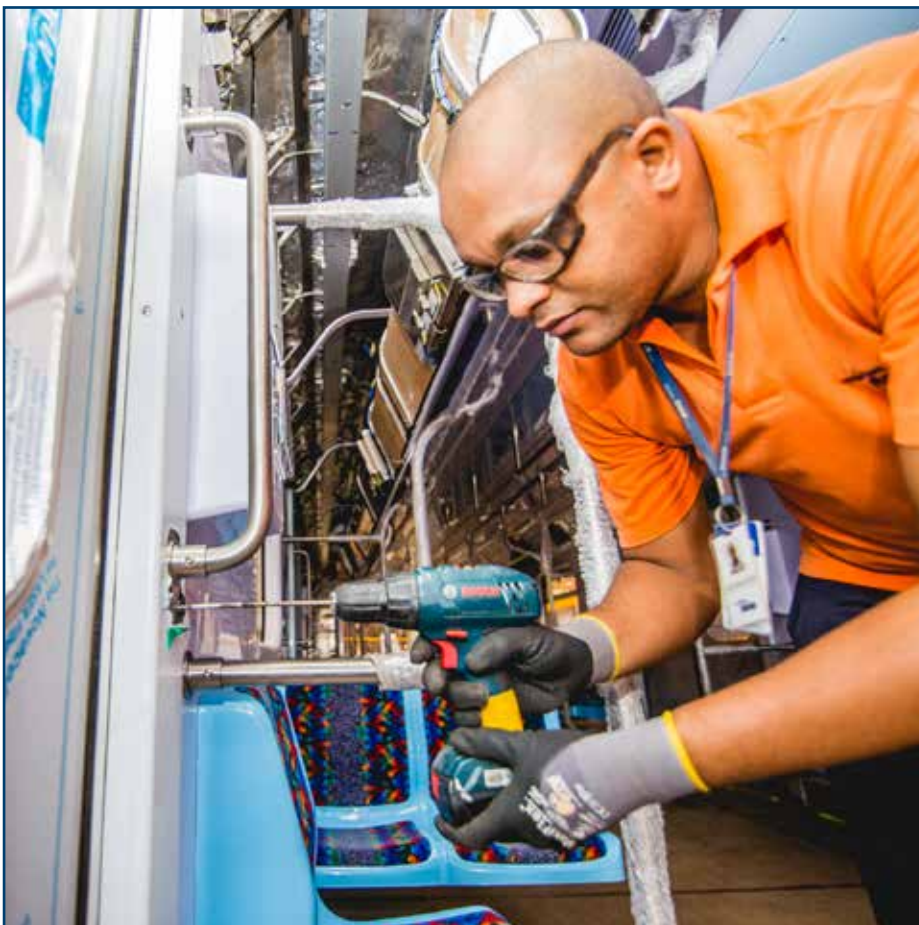


From Top: The interior of a rolling stock, which is a rail vehicle used in the rail transport industry, and is a key product of Hyundai Rotem Brasil.

Hyundai Rotem is one of the world's largest railway system providers renowned for its world-class technology and quality.

Made of 304 stainless steel, each rolling stock requires multiple threading processes in the train composition, such as the door groundsills, panels, seats and other structural parts.

Left: Threading processes are required for new rolling stocks as well as old ones that are in need of repair.





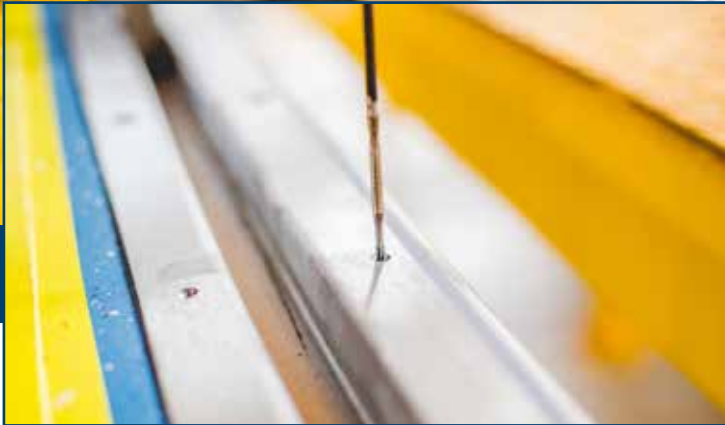
Hyundai Rotem's previous tooling choice averaged 30 threads per tool. By switching to OSG's A-Tap series, Hyundai Rotem is able to achieve 10 times the tool life under identical cutting condition.



Hyundai Rotem performs approximately 15,000 threads per month per thread size of M4, M5 and M6 in 6H tolerance according to DIN 371 standard. It is estimated that 1,900 threads are required for each train composition. All of the processes require the threading of through-holes in depth variations of 4mm to 25mm. The threading process involves the use of pneumatic and electric drill drivers at cutting speed of 2,500 RPM. For the lubricant, a cutting fluid composed of highly refined mineral oil with anti-wear, anti-seize and extreme pressure additives is used.

Hyundai Rotem was originally using HSS plug taps with OX surface treatment for

their production of rolling stock. These straight flute general purpose hand taps are commonly used for through hole tapping without using a starter taper tap. Hyundai Rotem was experiencing constant tool breakage throughout its production process with the plug taps. Tool breakage is a serious production obstacle as it is costly, time-consuming, and may cause damage to the part. As a company that is always proactively responding to growing global demand and changing market environment, Hyundai Rotem Manager Daniel Bitencorte and Area Foreman Paulo Caires, who supervise the production of rolling stock, were in search of an alternative solution to improve tool life



It is estimated that 1,900 threads are required for each train composition.

and overall cost. An opportunity for new tooling trial came about when an OSG application technician gave Hyundai Rotem a visit. After a throughout evaluation of the application, OSG recommended the A-Tap A-POT M4 (EDP# 48145144), A-POT M5 (EDP# 48145149) and A-POT M6 (EDP# 48145155).

The A-Tap is an all-purpose tap series developed to accommodate a wide variety of materials and machining environments, helping manufacturers simplify tool management. The A-Tap series includes the A-SFT spiral taps for blind holes and the A-POT point taps for through holes.

To enable high speed machining, the A-Tap series incorporates a unique cutting edge design that emphasizes sharpness. Powdered metal HSS and OSG's patented V coating are employed in this series to enhance wear resistance. 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. As an all-purpose tap series, the A-Tap is compatible with various types of machining equipment – from manual drilling machines to the latest advanced machining centers.

With the previous tooling choice, Hyundai Rotem was using approximately

600 taps per month with each tap averaging 30 threads in tool life. When performing the same work with the A-Tap, on the other hand, each tool is able to complete 300 threads, which is 10 times the durability, resulting in excellent cost savings for Hyundai Rotem.

By switching to OSG's A-Tap series, Hyundai Rotem is able to enhance its operation's stability and quality control. Moreover, the services that come along with the quality products – prompt response and problem-solving ability – makes OSG a reliable partner in Hyundai Rotem's global growth strategy. 🌟



ONE-STEP DRILLING

ADF flat drill eliminates starter hole to simplify machining process and tool management

Siriruk Thammajit, OSG Thailand

Image of the rotor part in S45C after processing. Asia Precision Public Company Limited was initially machining these parts with the use of a drill and an end mill. After switching to the ADF flat drill, Asia Precision is able to consolidate the process, significantly reducing processing time.

Machining flat-bottom holes traditionally required the use of a drill and an end mill. The drill is used in the preliminary center drilling operation to create a start hole, followed by the use of an end mill to complete the process. Not only is the utilization of two tools costly, additional setup time is also required to exchange between tools. When machining flat-bottom holes, maintaining consistent hole quality can also be a challenge. Burrs are common problems particularly in thin plates and unstable cutting environment.

The ADF carbide flat drill, one of OSG Corporation's latest drilling innovations, eliminates all of the mentioned machining challenges with one-step drilling, providing manufactures with



significantly improved processing efficiency and work quality. Asia Precision Public Company Limited is one of the manufacturers who has recently leveraged the ADF's superior performance in their production process. Established in 1994, Asia Precision is one of Thailand's leading precision metal component manufacturers serving customers in various industries, including automotive, camera, compressor, machinery, medical, office automation, telecommunication and aerospace. Located in Muang, Chonburi, Thailand, Asia Precision's capabilities include cold forging, precision machining, gear making, induction hardening, anodizing, aluminum die casting, heat treatment, hot forging and component assembly. Asia Precision's product offering range from cam ring, lens housing, connector, union bearing, piston, valve, drive shaft, flange, bracket, pin, just to name a few.

Asia Precision has four manufacturing facilities in Thailand with an estimate total production space of 20,000 square meters and over 500 employees. The staff at Asia Precision are constantly improving production process to generate cost savings for their customers.

The opportunity to evaluate new tooling options came about when Asia Precision was assigned with a new project involving automotive parts. The work involves the machining of electric oil pump rotor parts in S45C. Each vehicle requires a piece of the rotor part. The monthly production is estimated to be around 26,000 pieces. Each workpiece requires the machining of two slots, measured 10mm in diameter and 28mm in depth. The machining center used for this particular production is the Yamazaki Giken YM-850. Initially, Asia Precision was processing these parts utilizing a 7.5mm diameter carbide drill for center drilling, followed by another 2-flute 10mm diameter carbide end mill to complete the hole.

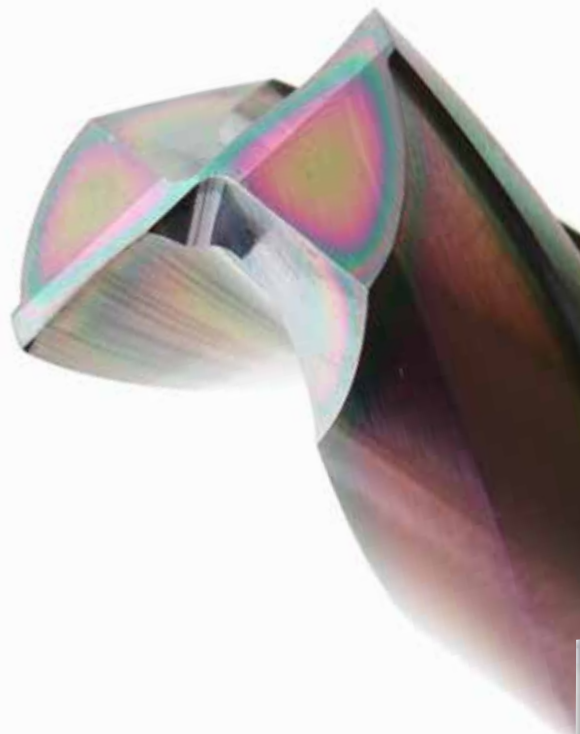
When OSG recommended the 10mm diameter ADF-2D for one-step drilling,

Asia Precision's Senior Manager Prasit Mulgunee welcomed the opportunity in hopes of improving work efficiency.

Unlike conventional drills, OSG's ADF carbide flat drill is capable of creating holes in inclined and contoured surfaces without requiring a start hole. The ADF's unique balanced form and cutting edge enable reduced cutting forces with smaller chips and stable hole entry with minimal burr. With the addition of OSG's 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, half-hole and thin plates. It is suitable for common materials such as carbon steel, alloy steel, hardened steel up to 35 HRC, and cast iron.

The ADF is able to consolidate the machining process for Asia Precision's application, completely eliminating the



The ADF is a multi-purpose flat drill series engineered for machining inclined surfaces and counterboring applications. Unlike conventional drills, the ADF flat drill is capable of creating holes in inclined and contoured surfaces without requiring a start hole.





OSG Thailand Sales Representative Siriruk Thammajit explains the features and benefits of the ADF flat drill to Asia Precision Senior Manager Prasit Mulgune.



A rotor part in S45C before processing. Each workpiece requires the machining of two slots, measured 10mm in diameter and 28mm in depth.

preliminary center drilling operation. The ADF was also tested against a competitor tool for a durability. At the end of the trial, the ADF was able to more than double the life of the competitor drill, achieving 500 pieces versus the competitor's 200 pieces.

"The ADF demonstrated overwhelmingly superior performance versus the previous procedure," said Siriruk Thammajit, OSG Thailand Sales Representative.

"Asia Precision is now able to combine two operations into one. Taken the time required for tool change, the ADF is able

to reduce the processing time by near 50 percent, and our customer couldn't be more satisfy," said Thammajit.

As a manufacturer who prides itself as a precision metal component specialist, Asia Precision is always seeking to develop new processing solutions to meet the ever-growing customer requirements. The ADF has proven to be a reliable partner in Asia Precision's endeavor for improving quality, reducing machining time and simplifying tool management. ✖



Asia Precision Public Company Limited manufactures approximately 26,000 pieces of rotor part made in S45C monthly.

OSG PHOENIX PSFL

4-Corner Anti-Chatter Roughing Indexable Cutter Series

The OSG Phoenix PSFL is a 4-corner roughing indexable cutter developed for high-productivity milling. The PSFL features a special body design with unequal lead alignment and unequal spacing teeth to suppress chattering even in deep milling applications. The PSFL's high

durability 4-corner insert provides economical yet powerful solution for face milling, side milling and slotting operations. Its 3-dimensional breaker insert's sharp cutting edge and large positive rake angle reduce cutting resistance, allowing optimum performance even under aggressive cutting condition. Four insert types are available to accommodate a wide range of work materials – from general steel to difficult-to-machine materials. ✖



AT-1

Revolutionary 1-Pass Thread Mill for High-Quality Threading

Conventional thread mills often require several passes to generate a thread. The AT-1's revolutionary capability to generate threads in one pass lies in its unique tool geometry. The unequal spacing and variable lead flute of the AT-1 minimizes vibration, thereby enables superior and consistent surface finish.

Conventional right-hand helix thread mill is prone to deflection as the cutting process begins from the tip. In contrast, a first of its kind with a patent in Japan in the thread mill category, the AT-1's right-hand cut and left-

hand helix geometry begins the cutting process from the shank side, thereby reduces deflection. With the elimination of zero-cutting, which is used for the correction of deflection, longer tool life can be achieved.

Made of ultra-fine grain carbide paired with OSG's original EgiAs coating, tool life can be further prolonged with improved wear resistance and toughness. The AT-1's ability to generate threads in one pass reduces machining time, making it a highly efficient thread milling solution in comparison to right-hand helix thread mills.

The AT-1 is designed to excel in a wide range of work materials, including carbon steel, alloy steel, stainless steel, cast iron and non-ferrous metal. ✖



AE-VMS

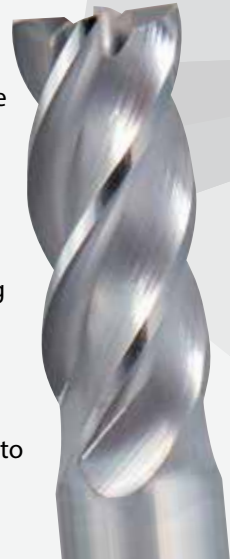
Ø16, 20, 25 Short Length & Ø 1, 1.5, 2, 2.5 Stub Length Added to Anti-Vibration Carbide End Mill AE-VMS Series

Short length in diameter 16, 20, 25 and stub length in diameter 1, 1.5, 2, 2.5 have 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.

The AE-VMS' sharp positive rake angle geometry significantly reduces cutting force to minimize tool wear and potential damage to the workpiece even under aggressive cutting conditions. Chattering is minimized with the AE-VMS' 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 AE-VMS' high tool rigidity, the occurrence of burrs can be suppressed to ensure high milling accuracy. 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 to excel even in water-soluble oil.

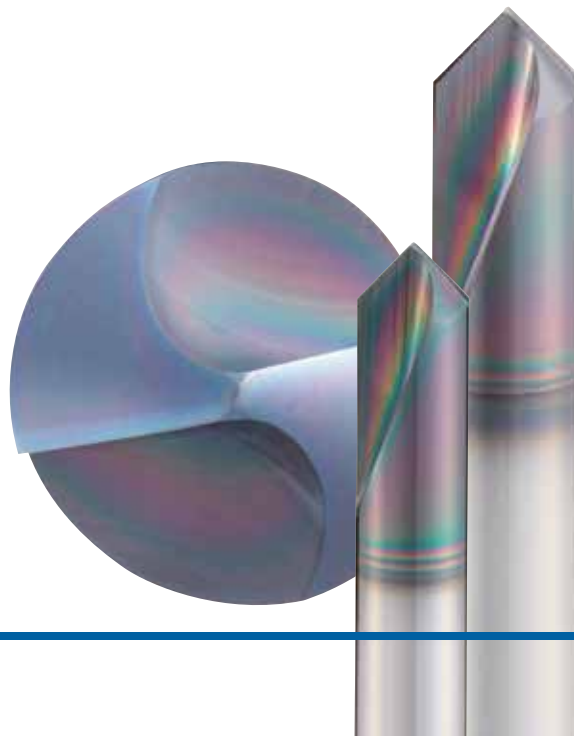
Available in square, radius, stub length and long neck, the AE-VMS is designed to accommodate a wide range of milling operations including slotting, side milling, helical milling, contour milling and ramping in stainless steel, cast iron, carbon steel, alloy steel and hardened steel (up to 40 HRC). ✖



AD-LDS

EgiAs Coated Carbide Starter Drill for Centering and Chamfering Operations

The AD-LDS carbide starter drill is OSG's latest innovation for high precision centering and 90-degree chamfering operations. Carbide starter drill enables higher machining speed in comparison to HSS products. Coated with OSG's original EgiAs coating, the AD-LDS is constructed with extreme toughness and high wear resistance for long tool life. The AD-LDS' cutting geometry is engineered with superior sharpness and high chipping resistance to allow the creation of perfectly round starter hole with minimal burrs, which enables trouble-free secondary operations. ✖



Yana Factory RENOVATION

The world's largest tap plant gets a make-over with new lobby and exhibition space



The main lobby of the Yana tap factory.



Above: The Yana tap factory's newly renovated exhibition space.

Right: OSG's Yana Factory is the world's largest tap plant, with an estimate maximum production volume of 1.5 million taps per month.



OSG Corporation's Yana Factory – the world's largest tap plant – received a make-over earlier in the year, with a renovated lobby and new exhibition space on its second floor.

OSG has been manufacturing taps since its founding in 1938. In commemoration of its 80th anniversary, the Yana tap factory was the first facility to be renovated in 2018 with an objective to further encourage communications with members of the manufacturing industry.

The newly renovated exhibition space embraces the principle of minimalism – removing unnecessary internal walls, stripping down to the core essential to focus on the space's purpose and on

the beauty of its carefully selected furnishings. Color combinations have also been kept to a minimum to enhance the serene and balanced environment. The key display cases have been designed using basic geometric forms, elements without decorations and simple materials. Furthermore, a 2.4 by 1.4 meters monitor is mounted on the wall of the exhibition area to display some of OSG's latest tooling innovations in action.

The brightly lit and streamlined interior design aims to encourage creativity. We hope visitors can appreciate the newly renovated space's simplicity and timeless concept. ✨

DID YOU KNOW?

OSG's Yana Factory is the largest tap manufacturing plant in the world.

- **Maximum Production Volume:** 1.5 million taps per month
- **Total Land Area:** 77,226-square-meter
- **Production Space:** 29,000-square-meter
- **Number of Employees:** 460
- **Units of Machines:** 894

OSG Around the World

OSG Corporation was founded in 1938, more than 80 years ago. Today 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 33 countries. Our commitment to innovation, services, total solutions and out-of-the-box thinking has contributed to our immense success today. However, without our employees, none of it would be possible. We truly believe that our employees are one of the greatest assets of the company. In this section, we will introduce our team members from around the world.

Vis Huang

Employee Interview



Huang (far right) and her marketing team pose for a photograph at the OSG Shanghai office.

Tell Us About Your Work & Experience at OSG:

I studied international trade during college and joined OSG Shanghai's marketing division in 2006. I currently serve as OSG Shanghai's Marketing Manager, overseeing the production of all promotional materials and marketing campaigns in both print and digital. In addition to product promotion, my role also involves market research and event planning, such as exhibitions and seminars.

Tell us about your daily routine.

The work of our marketing department can bring a great sense of accomplishment. I work with our marketing staff on a daily basis to develop marketing plans for various media channels. It is very rewarding to be able to see the progress and results from start to finish. For each marketing project, all members would brainstorm together and work toward a common goal. Our marketing department places great emphasis on team work. It also makes us feel like family.

Vis Huang

Company Location:

Shanghai, China

Position:

Marketing Manager

Joined OSG:

2006

Motto:

业精于勤，荒于嬉，行成于思，毁于随

"Achievements are reached by hard work rather than play; actions should be taken after a thorough thinking process rather than a causal decision."

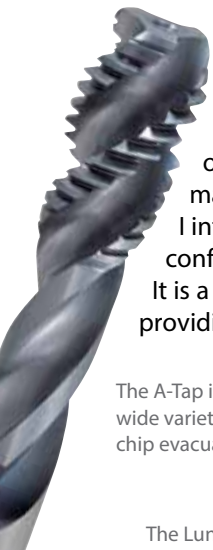
This is a famous quote by the Chinese writer Han Yu from the Tang dynasty.

Life today is often spent running from one thing to the next. Finding time to mediate and reflect can be a challenge. However, self-reflection is the key to improvement. Progress can be accelerated by working hard, studying hard, and spending a little bit of time each day to mediate.

What is unique about the Chinese division at OSG?

The atmosphere at OSG Shanghai is very genuine. This quality has attracted me to work here for 12 years. We are blessed with a leader who always wear a smile and is friendly to everyone he meets. Our staff gets along well and always look out for one another, which creates a family-like environment.

What is your favorite OSG tool?



The A-Tap is my favorite OSG tool. This product is the pride of OSG. 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. Every time I introduce the A-Tap at an exhibition or seminar, I feel confident and proud to explain its features and benefits. It is a marvelous tool that stands out from the crowd, providing great customer satisfaction and success to OSG.

The A-Tap is an all-purpose tap series developed to accommodate a wide variety of materials and machining environments with superior chip evacuation capability.

The Lunar New Year is one of the most prominent festivals in China. Huang and her family visited the local temple earlier this February to pray for a prosperous new year.



Huang and her seven-year-old daughter enjoy time together during the holiday.

How do you spend time on your day off?

During my time off work, I would spend most of my time with family. I have a seven-year-old daughter and she is the treasure of my life. During the holidays, being able to spend every minute with her brings me the most joy. We enjoy playing games, reading and making desserts at home, or going outdoor to enjoy nature.





shaping your dreams

OSG Phoenix PSFL

4-corner anti-chatter roughing indexable cutter series



Scan for details.

