

# CYBER WORLD

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The power of style contributes to improving the factory environment



# Ken Okuyama

president of KEN OKUYAMA DESIGN



# Tomohisa Yamazaki

president of Yamazaki Mazak Corporation

Yamazaki Mazak signed a contract with industrial designer firm Ken Okuyama Design in the fall of 2008 for a new approach for the style of Mazak machine tools. In this issue, we will present an outline of a conversation between Mr. Ken Okuyama and Mr. Tomohisa Yamazaki regarding the goal, focus and effect of this change of style.

## Ergonomics・Working Environment・Identity

—Recently, there is a strong trend in the machine tool industry to renew the style of machines. What was the reason that Mazak decided to change the machine style?

**Mr. Yamazaki;** There are three major reasons.

First, we felt that ergonomics should be emphasized in order to realize increased ease of operation.

Second, we wanted to contribute to improving the working environment of customers' factories.

Third, we wanted to have a very clear product identity – when looking at all the production equipment installed in a factory, you can tell at a glance which are Mazak machine tools.

**Mr. Okuyama;** From the standpoint of the industrial designer, we also paid attention to these points. Machine tools were originally used just by machinists. However, just as manufacturing has undergone many changes, such as the type of workpieces produced and the skill level of operators, the machine tools themselves should reflect these changes.



For example, when I went to the McLaren Technology Center in the UK, the Mazak machines were placed in the most prominent position of the plant. Additionally, they were all highly-polished to a bright shine, and I could deeply feel how these machines are used. As a result, I had an idea that future machines should have the appropriate style for an advanced factory environment.

#### **Global industrial designer for global machines**

—What is the reason that you decided to forge a partnership with Mr. Ken Okuyama?

**Mr. Yamazaki;** The word design has many meanings – mechanical engineering, specifications, concept, and many others. However, in Japan design only means shape and color. In this point, Mr. Okuyama has a unique perspective from his experience in Europe and the United States. Therefore, it was natural to think he is the best person to be in charge of the design of Mazak machines that are sold globally.

**Mr. Okuyama;** Our partnership began with a letter that I received from Mr. Yamazaki after he read my book. I found that we share similar values for corporate management and philosophy. Additionally, I feel the same in that we should always strive to be the first in the industry as well as best in the world – this became the decisive factor of the president regarding the machine style. Even if an expert chef prepares excellent cuisine, he will be very disappointed if no one makes any effort to taste his dishes. I feel the president gave me a great opportunity to serve many delicious dishes.

**Mr. Yamazaki;** My first impression when I saw the first design was that it did not have enough impact.. But, on further examination it was obvious that great attention had been spent on the details. There was a good example at one of our customers. When a partner company visited their factory, they saw one of Mazak's new machine tools and said, " If you are using such a wonderful machine, you will definitely produce high-quality parts. " I think you can tell from this that an image of high-quality performance can be felt from the external appearance.

#### **Style makes it possible for the operator to realize machine's potential**

—Which points did you pay attention to when designing the new machine style?

**Mr. Okuyama;** In terms of design for human beings – it is the same for machine tools as automobiles which I have been involved with for many years. The approach always is for the maximum ease of operation. As a result, the new machine style includes items such as large door openings for excellent operator access, easy to use door handles, large windows to easily monitor machining, and other similar features.

**Mr. Yamazaki;** I think this ergonomically focused style concept will increase productivity by improving overall ease of operation. To increase the productivity, it is very important for the operator to use the full capability of a machine. I think the style should be an important factor, along with multi-tasking and overall machine functionality.

#### **Designing the Company**

—What is your vision for design strategy?

**Mr. Okuyama;** I admire the vision of Mazak to create the world's best machine tools. In the future I would like to design not only its products, but also the company itself.

**Mr. Yamazaki;** Looking at the increasing trend for other companies to introduce new machine style, I think my decision to do this was correct. I hope that we can develop in the future more revolutionary products like the MAZATROL CNC, the MAZATROL FMS and INTEGREGX in collaboration with Mr. Okuyama.

**Mr. Okuyama;** I think it is important to find unfilled customer requirements and develop revolutionary products that meet these market needs.

**Mr. Yamazaki;** As Mr. Okuyama mentioned, successful Yamazaki Mazak products were developed by researching market requirements and introducing innovative and unique machines that meet these needs. I want to knuckle down to open a new page in our company history by the collaboration with Mr. Okuyama.



Yamazaki Mazak is a global company for both marketing and locations of production facilities. This is the second in the series in which we introduce some of the history and culture of the countries where our production plants are located. This issue introduces the greater Cincinnati area in the United States where Mazak Corporation is located.

# MAZAK around the World



02 U.S.A.

Cover picture



**The Cincinnati Skyline  
from the Kentucky  
side of the Ohio River**



Mazak Corporation (Florence, Kentucky)



## **John A. Roebling Suspension Bridge**

The John A. Roebling Suspension Bridge, measuring 1,057 feet (322 meters) at its main span, was designed and built by Roebling in 1866 and was the largest suspension bridge in the world at that time.

## Greater Cincinnati-Northern Kentucky: A Land of Opportunity for Mazak Corporation (U.S.A.)

Florence, Kentucky, part of the Greater Cincinnati-Northern Kentucky region, is home to Mazak's North American Headquarters where the company has been manufacturing some of the most advanced Vertical Machining Centers, Turning Centers and Multi-Tasking machines since 1974.

The Greater Cincinnati-Northern Kentucky region has always been booming with business. Going back to the early 1800s, the area was a hub for westward expansion and commerce due to its location along the Ohio River. As a result, Cincinnati became home to the first mass immigration of Germans in 1830 and Irish in 1840. The Suspension Bridge, built by John Roebling in 1866, brought even more connectivity to the area, serving as a river crossing between Ohio and Kentucky.

Our late chairman and CEO, Mr. Terry Yamazaki, chose this region for Mazak's North American Headquarters because he had his eye on becoming the world's largest machine

tool builder. The area was central to major manufacturing companies and a number of universities, and its tradition in the machine tool industry afforded good access to skilled labor and technical talent.

When Mazak started in Florence, Cincinnati was at the center of the machine tool industry. Several machine tool companies were operating in the area; however, over the years, Mazak Corporation thrived in this location.

Mazak has maintained its competitive advantage over the years by continuously investing in its Florence operations. To date, Mazak has expanded its Kentucky manufacturing facility more than 15 times to its current size of 420,000 sq. ft. (37,800m<sup>2</sup>), enhancing its capabilities through technology upgrades. Today, Mazak produces more than 100 different machine tools, including the Kentucky-designed ORBITEC 20 and QUICK TURN NEXUS 450 MY.





# MAZAK around the World



The riverfront features both Paul Brown Stadium, home of the Cincinnati Bengals, and the Great American Ball Park, home of the Cincinnati Reds.



## Skyline's Cheese Cones and 3-Way

Signature dishes from Skyline Chili.

## Food and Drink

It's no secret that Americans love fast food. While there are countless famous fast food chains on the market, two, in particular, have roots firmly planted in Southern Ohio and Kentucky.

Skyline Chili®, founded by Greek immigrant Nicholas Lambrinides in 1949, is part of the reason chili is such a big deal in Cincinnati. Among the many menu options, the "3-Way" chili order, for example, contains three staples: chili sauce, spaghetti and cheese. For the more adventurous in spirit, the "5-Way" also includes onions and beans. Kentucky Fried Chicken®, or KFC, is a popular chain of fast food restaurants based in Louisville, Kentucky. Colonel Harland Sanders founded the company in 1952, though the idea of KFC's fried chicken actually goes back to 1930.



## Kentucky Bourbon

The name of Bourbon comes from Bourbon County, which is named after the French House of Bourbon in appreciation of Louis XVI's assistance during the American Revolutionary War.

Another popular indulgence with ties to Kentucky is Bourbon, an American whiskey produced since the 18th century and known for its distinct mellow flavor and amber color. A barrel-aged distilled spirit made mostly of corn, Bourbon gets its name from its historical association with an area known as Old Bourbon, near what's now Bourbon County in northeast Kentucky. The Kentucky Bourbon Trail®, which features six signature distilleries—Jim Beam, Wild Turkey, Maker's Mark, Woodford Reserve, Heaven Hill Distilleries and Four Roses—draws in millions of visitors to the Bluegrass State (Kentucky's nickname) every year.





Kentucky Derby (Churchill Downs, Louisville Kentucky)

## Sports

The Greater Cincinnati-Northern Kentucky region is home to some extreme sports fanatics. After all, the area offers every kind of sporting event imaginable, from professional baseball to one of the oldest and most famous Thoroughbred horse races.

Before they were the Cincinnati Reds®, they were the Cincinnati Red Stockings, baseball's first all-professional team. Over the years, the Cincinnati Reds team has had several famous players at the plate, including Pete Rose, Barry Larkin and Hall of Famers Johnny Bench, Joe Morgan and Tony Perez, and has made nine appearances at the World Series.

Paul Brown Stadium is home to the Cincinnati Bengals®, a member of the AFC's North Division in the National Football League. The Bengals franchise has employed several memorable players over the years, including Terrell Owens, Carson Palmer, Chad Ochocinco and Boomer Esiason. The Bengals proudly won AFC championships in 1981 and 1988, which took the team to the Super Bowl in 1982 and 1989. The team also enjoyed a good year in 2011.

For motorsports fans, The Kentucky Speedway, just 30 miles from Mazak, has been hosting NASCAR and the Indy Racing League annually since opening in 2000, welcoming top racing names such as Will Power, Helio Castroneves, Ryan Briscoe and Roger Penske. Penske Racing® is the most successful Indy car racing team in history, with 159 race wins, 12 National Championships and 203 pole positions. In fact, Mazak has had the pleasure of experiencing countless racing wins as a long-time technical sponsor of Penske



1. Drivers of Penske Racing® From left, Will Power, Helio Castroneves, Ryan Briscoe (Kentucky Speedway, Sparta Kentucky)
2. Kentucky Speedway (Sparta Kentucky)
3. Cincinnati Reds® (Great American Ball Park, Cincinnati Ohio)
4. Cincinnati Bengals® (Paul Brown Stadium, Cincinnati Ohio)

Racing. Since 1993, the Mazak logo has been prominently featured on IndyCar and NASCAR Series cars.

Lastly, the Kentucky Derby®, also known as the "Run for the Roses," held 80 miles from Mazak, takes place annually at Churchill Downs Racetrack in Louisville, Kentucky on the first Saturday in May. It is attended by visitors from all over the world and is the first of the three races in the "Triple Crown" Thoroughbred racing series.



## Integrated production from material supply to assembly



Mr. Minehiko Imai (Left) and Mr. Yoshitomo Tahara (Right) in front of the Integrex j-200



Example medical machinery components

### **Machining, Press Working, Welding and Assembly—**

The products produced by Koketsu are so varied, it is better to compare the company to a large department store instead of a specialty store as would be the norm for most job shops. Koketsu's business policy is not to refuse any order from a customer. As a result, their production quantities range from prototype parts to mass production. The key factor that makes this possible is their production system which uniformly controls all machining details.

### **Uniform control system thanks to business integration**

According to Mr. Yoshitomo Tahara, the

director of the Koketsu machining department, Koketsu produced many urgently needed replacement valves after the disastrous earthquake in Japan last year. Accepting unexpected orders is not as easy as it might appear to be. As already mentioned, the integrated production system makes it possible for Koketsu to meet deadlines without any compromise on quality.

Koketsu was founded in 1968 as a metalworking company. The first NC lathe introduced to their factory was in 1977, and their factory expansion started soon afterwards. In 2002 their uniform production control system was introduced which enabled them to handle a wide variety of machining requirements. Approximate breakdown of their

production:

30%	Pneumatic control components
25%	Control components for vertical parking systems
15%	Hydraulic control components
7%	Components for automotive, medical, and other industries

### **Unique capability for a reasonable investment**

Breakdown of processes performed by Koketsu:

60%	machining
30%	press work and welding
10%	assembly

The layout of the facilities in the Koketsu's factory illustrates their business policy of taking orders for a wide variety of machining. Their factory looks like a small





#### 【Profile】

Headquarters and plant:  
3333, Tuchida, Kani city, Gifu Prefecture,  
509-0206 Japan  
No. of employees: 60  
www.kg-koketsu.co.jp



Quick Turn Nexus 200MSY-II

machine tool show with a large number of machine tools from many different companies installed shoulder to shoulder. "In order to make the most of the distinctive capabilities of each machine, we do not make purchases from just one machine tool company but from many," Mr. Tahara commented. Among the machines installed in their factory, the Integrex j-200 installed in mid January of this year stands out by its presence. According to Mr. Tahara, the installation of the Integrex j-200 was to implement Mazak's unique "Done-In-One" concept in order to add high value to their products. A Quick Turn Nexus 200MSY-II was installed earlier in Koketsu's factory. However, since Koketsu is handling orders from the medical industry, the decision of installing a strategic machine to widen their range of business was made. One of the main factors for the decision to purchase the Integrex j-200 was its

excellent value. The Integrex j-200 provides a very wide range of machining capability at a much lower price than competitors' machines. Other factors include its orthogonal Y-axis design, wide machining area, and large capacity tool storage. The Integrex j series was developed under the concept of providing higher quality machining with shorter in-process time. The reason Koketsu decided to purchase the j series machine shows they are on the same track.

#### Main equipment for new markets

After the installation of the Integrex j-200, the operators completed a training program to learn about machine operation by producing various workpieces. The training included machining with the long Y-axis stroke and angle machining taking advantage of multitasking operation for a wide range of complex components. Since

Koketsu will be working with the medical and other industries requiring complex machining, the newly installed Integrex j-200 will be their main piece of production equipment for this field.

The installation of the Integrex j-200 was not only to replace CNC lathes and vertical machining centers, but also for the company to enter untraveled fields. For this reason, it is difficult to compare productivity before and after the installation at this point in time. However, once the full operation of the Integrex j-200 starts, fast delivery of complex components will surely be added to their business.



This is the "M CODE" which links to the machining video of the INTEGREX j-200. Please refer the below for the further details.



Mr. Yoshitomo Tahara, director of the Machining Department



Integrex j-200 January 2012



M CODE is an easy access to the machining movie



M CODE is available at App Store<sup>SM</sup> or Google Play<sup>TM</sup>. Please search with "M CODE System" and download the necessary file.

Please be notified that M CODE application is necessary when to play the video. M CODE application is also available at App Store or Google Play.

\* Access from the QR code is also available. \* M Code application is free of charge.



## Medical components 「Done In One」

Turner Medical Inc. is one of the few tier-I-level suppliers to the medical industry that can boast it manufactures FDA(U.S. Food & Drug Administration)-approved surgical implants and the devices used to install them. Producing both implants and instrumentation is considered rare for non-OEM medical companies, but the shop that once specialized in tool and die work is now a recognized leader in medical manufacturing with upwards of \$1.75-million worth of product shipped out of its facility on a monthly basis to customers nationwide. Becoming a successful instrument and implant shop didn't happen over night at Turner Medical. It took a great deal of time, effort, and commitment on the part of all of the shop's 80 employees to attain ISO 13485

certification and gain FDA registration. But these achievements also hinged on the shop's continuous forward thinking approach to manufacturing and, more specifically, machine tools.

As common practice, Turner Medical routinely sells its outdated machine tools to make room for the latest new technology. While many shops hang on to machines as long as possible, Turner Medical operates under the belief that manufacturing with old technology comes at a price.

"If a shop lags in regards to machine tool technology, it will get left behind in the medical industry. A shop can not compete working on outdated technology," said Bill Turner, president of Turner Medical. "Those machines simply take up space and fall short when compared with the speed, cycle times and surface finish capabilities of newer equipment. Older technology may remain current longer in other industries, but not in the medical machining world."

Turner Medical purchases a great deal of advanced machine tool technology from Mazak Corp. The shop's 17 Mazak machines, acquired through Mazak distributor Pinnacle Machine Tools, provide the necessary complex machining capability, dependability, efficiency, precision, and, most importantly, speed that Turner Medical needs to remain competitive and cost effective.

"The future in medical machining is taking fast, light cuts at high spindle rpm to actually remove more material in less time than is possible running slower and taking heavier cuts. Any time we can bring in new machines, such as the Mazaks, and knock 40 percent off a part cycle time, we are taking cost out of that part," explained Turner.

Some of the medical components Turner Medical manufactures include those for orthopedic surgery, specifically spinal devices and implants. It also supplies customers with various other implants such as rods, plates, and screws, as well as



surgical products such as screwdrivers, mallets, cutting tools, bone pins, drill sleeves and guides, locking nuts, depth gauges, and removal instruments.

When the shop initially entered the medical sector, it manufactured mostly instruments, but that work came in waves. To fill the gaps between instrument jobs, Turner Medical added implants to its repertoire and boosted its working schedule from two 10-hour shifts Monday through Friday to around-the-clock production.

Cycle times vary from 2 minutes to 2 hours, depending on the part. Instruments may have shorter cycle times than implants, but can involve as many as 50 components at final assembly.

High machine tool spindle rpm lets Turner Medical increase metal removal speeds by maximizing feed rates for the extremely small tooling it uses for cutting intricate features in medical parts made from stainless steels and titaniums. The shop considers a 3.18 mm (0.125") diameter end mill a big tool and routinely works with cutters as small as 1.02 mm (0.040") in diameter.

Small tooling is used for machining parts such as spinal implants at Turner Medical. These implants are actually sets – two pieces that match up with each other. Each piece requires an extremely intricate tooth



Example implants and instrumentations





From left, Mr. Charles Tucker, Turner Medical's vice president of operations and Mr. Bill Turner, president of Turner Medical



Mazak machines installed in factory

pattern for gripping the human spine. The shop machines the titanium implants complete on its Mazak INTEGREX i-150 Multi-Tasking machines featuring 12,000-rpm milling spindles and 5,000-rpm main spindles.

Mazak's INTEGREX i-150 is a compact footprint Multi-Tasking machine that turns and mills small complex handheld parts. It eliminates the drawbacks typically associated with turn-mill-type machines, such as short axis strokes and restricted machining areas. The milling spindle on the machine moves in  $\pm 100$  mm (3.94") Y-axis strokes and provides Turner Medical with -10 to 190-degree B-axis movement in increments as small as 0.0001 degrees. Part volumes differ between medical instruments and implants. An instrument job can involve lot sizes from 1 to 100 pieces, while implant jobs entail part families requiring hundreds of pieces each. The shop machines most of its implants on either its Swiss-style machines or on the Mazak INTEGREX i-150s.

Bill Turner saw the INTEGREX i-150 during a Mazak-hosted trip to Japan before the machine was available in the United States. He immediately realized it would benefit his operations.

The shop has two INTEGREX i-150s on its shop floor, arranged face-to-face in a cell that runs production 24/7. One operator oversees both machines that, for the most part, run unattended with 4-ft bar feeders supplying raw part material. The machines have a bar work capacity to 65 mm (2.56")

diameters.

"With the Mazak INTEGREX i-150s, we have increased machining speed and improved on tolerances. Their speed and accuracy are consistent, and they, along with our other Mazak machines, provide the flexibility to run either instruments or implants on the same machine," said Turner.

Among its many Mazak machines, the shop also has three Mazak VARIAXIS 500-5X II 5-axis vertical machining centers and one VARIAXIS 630-5X II 5-axis vertical machining center, all of which provide done-in-one part capability through full simultaneous 5-axis machining. According to Turner, the more machining operations the shop can do on one machine, the better its part quality.

Turner Medical's VARIAXIS 500-5X II machines sport 12,000-rpm spindles, while its VARIAXIS 630-5X II offers 18,000 rpm. Machine table sizes for the two models measure 500 mm x 400 mm (19.69" x 15.75") and 630 mm x 500 mm (24.8" x 19.69"), respectively. Both machine models feature tilting-rotary tables that tilt 150 degrees and rotate 360 degrees.

Compact spindle cartridges on the Mazak VARIAXIS line of machines make for better workpiece accessibility and minimize interference issues. Linear guides on all axes of the machine spindle heads not only reduce non-cutting time for Turner Medical, but also ensure the utmost accuracy for the shop's high-feedrate machining.

"Our Mazak INTEGREX and VARIAXIS



High-accuracy, complex machining is required

machines are able to machine the top surfaces, side surfaces, and any surfaces in between on our parts. This done-in-one capability is critical to us because we try to eliminate the need to move parts from one machine to another to reduce the risk of error," said Turner.

Additionally, the Mazak machines help ease complex part programming because they allow Turner Medical to program using conversational or EIA modes. The shop has had to switch from conversational programming to programming machines completely off line with EIA due to part complexity and the fact that, nine times out of ten, customers send solid models instead of prints.

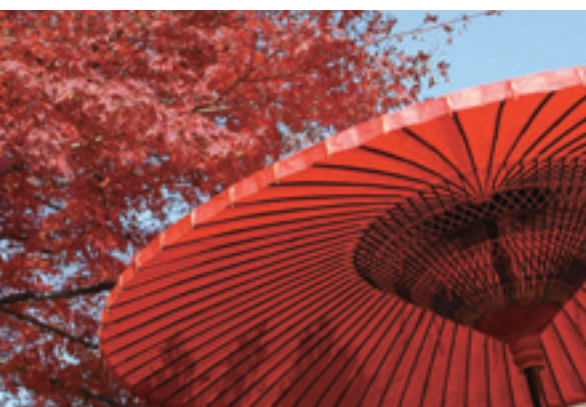


Madeleine (a very rich pastry) created from Washi expresses its natural color

Normally, paper is made from wood pulp. However the materials used in Japanese Washi are made from the bark of three different plants which belong to the mulberry family. Washi is basically handmade and over time many special techniques were developed in different regions throughout the country. In particular, "Mino Washi" is made in the Mino region and is just a 30 minute drive from the Yamazaki Mazak Minokamo plant. Mino Washi is one of the best known types of traditional Japanese paper and was designated a traditional Japanese craft in 1985.

### Important material for traditional Japanese houses

As described by the visitors from Europe many years ago, Washi and traditional Japanese houses have a close relationship. For example, the ancient high-floored construction used a steep thatched roof, mud-daub walls, and straw mat floors. Afterwards, houses with a tiled roof became popular in Japan, but Washi was still used for sliding doors, folding screens and paper screen doors for admitting light in order to

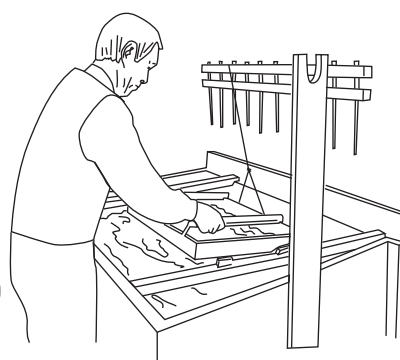


Japanese umbrella made of Washi

### Produced in Japan over several centuries

The technology of paper came from China over 1700 years ago. Japanese paper money, Japanese paintings, paper for calligraphy and wood prints wouldn't exist if it weren't for Washi. Recently, Washi has become widely used for many additional purposes – some are introduced here.

# Traditional craftsmanship



WASHI

# 02

Before Japan began its long period of national isolation in the seventeenth century, some European visitors after they returned to their home countries expressed their surprise at seeing that Japanese houses are mainly made of wood and paper. The paper which surprised them was "Washi," – which is stronger, has a higher density and normally thicker than conventional paper.



adjust the temperature. In addition, Washi-paper sliding screens with a small glass window door in order for the elderly to view a garden were widely used.

### Various uses

Washi has been widely used outside the home, such as for Japanese umbrellas and rain coats adding agents for solidity and water resistance. Additionally, washi is used for Japanese hand-fans, paper robes and other textiles.

### Washi as an art and craft

Washi has been utilized for the repair of important cultural properties all over the world by its excellent resistance to aging and soft and strong characteristics.

For example, the world's thinnest paper "Tengu-shoji" has great strength, although it is just 2.0 g per 1 m<sup>2</sup> (0.007 oz / ft<sup>2</sup>) and is widely used for this type of application.

Currently, Washi is also used for art crafts. The "Washi sweets" are one example which is created by Ms. Miki Kura, an artist in order to

develop the potential for Washi.. You can see another example at the Mazak Art Plaza located in Nagoya. A large tapestry made by Washi is on the wall of the main lobby entrance, which was created by Ms. Eriko Horiki, a Washi artist.



"Washi sweets" look very realistic



World's thinnest paper "Tengu-shoji"  
Photograph provided by HIDAKA WASHI CO., LTD



Beautifully decorated hand-fan



"Shoji" paper screen doors in a Japanese house



Large tapestry created by Ms. Eriko Horiki (Main lobby of Mazak Art Plaza)

# New products

## ● The vertical traveling column machining center widely used across all of Europe VTC models locally developed at YMUK (UK)



The VTC series with a wide range of specifications has been in production for many years. This vertical traveling machining center has been designed to meet the needs for today's challenging and diverse range of manufacturing applications where performance, flexibility and precision are key product attributes. The VTC range of products is available in either 3, 4, 5 and 6-axis configurations. The flexible configuration of the VTC provides the capability to process an extensive range of components from medium to large across industries including aerospace, power generation, industrial equipment and general subcontracting. It features a long, large table long in the X-axis direction for long to large components. Additionally, the machine can be utilized as a 2 pallet changer by using the center partition. Mazak exhibited the VTC-560/25 and VTC-800/30SR at EMO 2011 held in Hannover, Germany. Both of these models were locally developed by YMUK. This machine series has been exported to many countries such as Japan, USA and Asia.



	560/25	820/20	820/30
Table size	3000 x 560 mm (118.11" x 22.05")	2500 x 820 mm (98.43" x 32.28")	3500 x 820 mm (137.8" x 32.28")
Travel (X/Y/Z)	2500/560/560 mm (98.43"/22.05"/22.05")	2000/820/720 mm (78.74"/32.28"/28.35")	3000/820/720 mm (118.11"/32.28"/28.35")
Feedrate (X/Y/Z)	50000 mm/min (1969 IPM)		
Spindle speed (15%ED)	CAT-40, 12000 rpm, 22 kW(30HP)(15%ED)		

	800/20SR	800/30SR
Table size	2500 x 820 mm (98.43" x 32.28")	3500 x 820 mm (137.8" x 32.28")
Travel (X/Y/Z/B/C)*1	2000/800/720 mm (78.74"/31.5"/28.35")±10°/360°	3000/800/720 mm (118.11"/31.5"/28.35")±10°/360°
Feedrate (X/Y/Z)	50000 mm/min (1969 IPM)	
Spindle speed (50%ED)	CAT-40, 18000 rpm, 35 kW(47HP)(50%ED)	

\*1 C-axis for rotary table (option)

## ● The VERTICAL CENTER NEXUS COMPACT locally developed at Mazak Corporation (USA) targeting the medical component industry

The R&D Department at Mazak Corporation also has been developing unique products to meet production requirements in the market. The new VERTICAL CENTER NEXUS COMPACT was developed to target the medical component industry. This new machine was introduced at the "T3" (Tomorrow's Technology Today) event held at Mazak Corporation last fall. This machine features a very narrow width, 25% narrower when compared to other vertical machining centers, and a variety of options, 3-axis, 5-axis, high-speed spindle, and others to meet a wide variety of production requirements.

Table size	650 x 400 mm (25.59" x 15.75")
Travel (X/Y/Z)	500/430/510 mm (19.69"/16.93"/20.08")
Feedrate (X/Y/Z)	36000 mm/min (1417 IPM)
Spindle speed (15%ED)	12000 rpm 25HP, 20,000 rpm 40HP*
Floor space	150.1 x 295.4 cm (59.1" x 116.3")

\*option



India Supplier Meet 2012



## ● Yamazaki Mazak India PVT.,LTD. awarded by John Deere India

Yamazaki Mazak India PVT.,LTD received an award from John Deere India as an exceptional business partner which was presented at the "India Supplier Meet 2012" held January 24<sup>th</sup> 2012. The "India Supplier Meet" is held to honor the partner companies which contributed to John Deere with the award evaluation based on price, delivery time, productivity and parts supply. Mazak was the only machine tool manufacturer that received this award.

John Deere is known as the world leading producer of agricultural and construction equipment. John Deere was established in 1837 and its headquarters is located in the United States



## ● Vodafone McLaren Mercedes powers ahead with Mazak



Two HYPER VARIAXIS 630 utilized for the machining of race car components



McLaren's new race car model MP-27

Vodafone McLaren Mercedes recently extended its contract with Mazak and took delivery of two new HYPER VARIAXIS machines.

The OFF-season for Formula 1™ is usually the busiest time of year for the teams as new cars are designed and made ready for the coming season. This year has been no different with the new Vodafone McLaren Mercedes MP4-27 car having already been unveiled to admiring reviews. However, the new car is not the only new face at the McLaren Technology Centre in Woking, Surrey. The team recently took delivery of two new HYPER VARIAXIS machines, which takes the complement of Mazak machines to a total of 21, including multi-tasking and multi-axis machines, such as the INTEGREGX, VORTEX and VARIAXIS, as well as QUICK TURN NEXUS lathes and FJV machining centers.

"The HYPER VARIAXIS offers us a significant increase in capacity, both in terms of the number of machines within the factory and also the size of the machines, in particular the machining envelope," says Ian Greenfield, Senior Production Engineer at McLaren Racing Ltd.

"We already have a number of small 5-axis machines, but we had no large, super-fast, dynamic machines capable of machining the maincase insert or rear crash structure of the car at the speed and quality we require. We wanted a machine, or pair of machines, which could handle the more complex long lead items which have been traditionally made by subcontractors."

The new machines are, currently, being used exclusively on machining parts for the Vodafone McLaren Mercedes

race car, including the rear crash structure, which is a complex titanium component; and the rear wing pylon which has a complex titanium surface. In addition, the machines are being used for the rear end maincase insert, a titanium component with a billet weight of 60 kg (132 lbs.) and a final weight of less than 4 kg (9 lbs.).

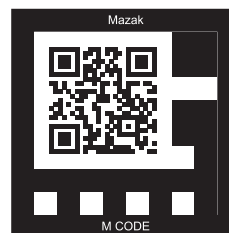
"The rear crash structure is one of the most complex parts of the car and the first ever part we machined on the HYPER VARIAXIS," says Greenfield. "It was a real test for the machine and the guys running it." He continues: "We are running the machines 24 hours a day, 6 days a week at the moment. We have made 20 rear crash structures, each taking in excess of 125 hours per unit. The machines run unmanned as they are equipped with an oversize tool magazine and a chip management system." Previously, the team used subcontractors to machine a number of the parts as it did not have the machine capacity to take on this type of work. "These components would have been made on 3-axis machines with multiple set-ups and operations," says Greenfield. "Having two identical machines of our own allows us to machine components simultaneously. When we need a pair for the car, we make a pair."

As you would expect, the team has already identified quantifiable improvements from the new machine. "We ran two identical jobs, one on the older VARIAXIS 500 machine, which has served us well, and one on the new HYPER VARIAXIS," says Greenfield. "The tooling, programming and materials were identical, but the new machine demonstrated a 100 per cent improvement in

tool life on the roughing cycle."

He continues: "We also use the latest roughing cycles from our CAM system on the new machine, which allows us to utilize the high feed rate of about 50,000,mm/min (1969 IPM) between cuts. The load on the cutting tool is also kept constant, with the special coolant system washing away the chips. As a result the roughing times have been greatly reduced compared to our other machines, by approximately 25 per cent when using titanium. This is really only possible using the HYPER VARIAXIS machines because of the rapid feed rates and acceleration and deceleration curves."

The new HYPER VARIAXIS machines have had a major impact on the team in the short time since installation, but nobody is taking anything for granted in the build-up to the new season. (Team McLaren has started the new season by winning the 2012 Australian Grand Prix)



← This is the "M CODE" which links to the machining video of the HYPER VARIAXIS 630. Please refer the page 8 for the further details.

## ● Opening of Leipzig Technology Center in Germany

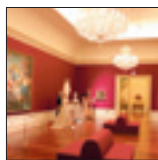


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The Leipzig Technology Center was opened to provide enhanced before and after sales service and support to the expanding German market. This new Technology Center located in Leipzig is the fourth technology center in Germany. The open house event was held from Wednesday November 22nd to Friday the 25th. Yamazaki Mazak had established its first support base in Dusseldorf in 1970 and then established the Technical Center in Frankfurt. Today there are 4 Technology centers in Goeppingen, Ratingen, Munich and Leipzig.

Yamazaki Mazak has been providing not only high quality products but also advanced machining technology, expertise and consultation for each customer's requirement through these Technology centers. The location of the new Technology Center reflects Mazak's commitment to providing the highest levels of customer service and support across Europe in particular for the automotive, energy and general machinery industries.



THE YAMAZAKI MAZAK MUSEUM OF ART

vol. 3

## Masterpiece

Émile Gallé  
(Violet Vase)

This vase made by Émile Gallé was exhibited at the Paris Exposition of 1889 and has a deep impression of amethyst. Before the appearance of Gallé, glass had to be extremely clear in order to serve as proof of high quality. However, Gallé dared to include impurities in glass to be more expressive. By doing so he expanded the world of glass, taking it a level never experienced before.

Engraved on the base of the vase is a verse by the poet Maurice Rollinat, "Ta modestie est une âme de violette. Rollinat" which means "Your modesty is a violet soul". Gallé endeavored to incorporate personal emotion into glassworks by using several techniques. These masterpieces, including this example, were called "Talking" vases.



Émile Gallé (Violet Vase)  
1889 H.11.3cm x W.7.4cm (4.45" x 2.91")

SÉRUSIER, Louis Paul Henri  
Homage to Anne of Brittany  
Hommage à Anne de Bretagne

The subject of this work is Anne, Duchess of Brittany (1477-1514). Anne was duchess of the land of Brittany, which had strongly maintained its independence from France. During her turbulent life she was forced into two strategic marriages to French kings, and Brittany, like Anne, became a possession of France. After Sérusier spent a memorable summer in the small village of Pont-Aven in Brittany, he may have felt the urge to paint this picture as a tribute to the legendary Anne. The young knight holds out a pot in which a young tree is planted, expressing his respect to the duchess. The style of the painting is reminiscent of a tapestry, appropriate to an episode from the late middle ages. This decorative quality is characteristic of "Les Nabi" paintings.



SÉRUSIER, Louis Paul Henri 1922 Oil on canvas 103 x 96.2cm (40.55" x 37.87")

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