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MARKET INSIGHTS

Indian Industry:
Sustainable Recovery
Yet to Happen

SPECIAL FEATURE

Adaptive Measures
for Success—VUCA

EVENT REPORT

Reaching New Heights



HIDEHIRO ISHIURA

Director General
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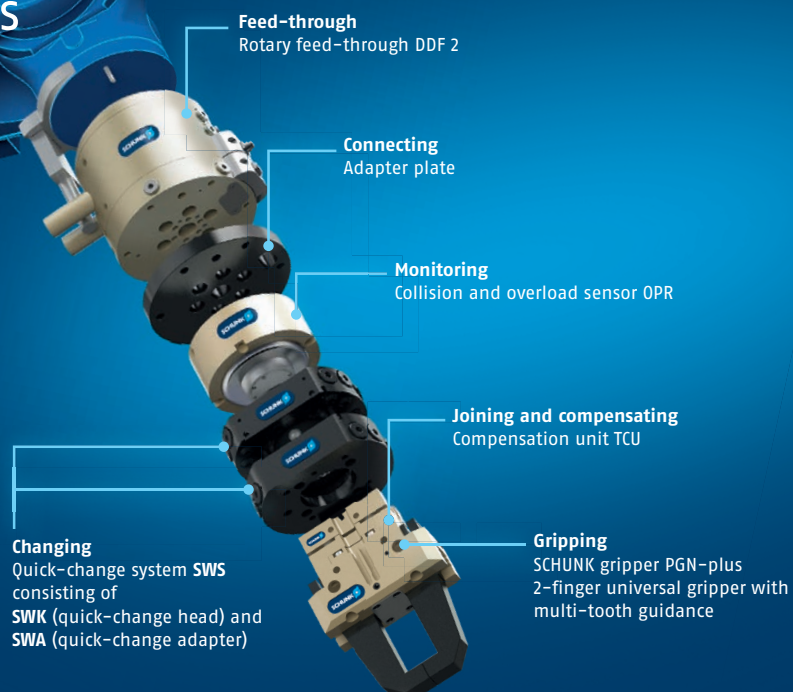
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MOTOR SHAFT



MACHINING TIME

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New Capital Goods Policy to Beef Up Manufacturing

India's first ever national Capital Goods policy has seen the light of day. On May 25, the Union Cabinet of India approved this new policy that envisages increasing production of capital goods from ₹230,000 crore in 2014–15 to ₹750,000 crore in 2025 and raising direct and indirect employment from 8.4 million to 30 million. 'Taking into account the strategic role played by Capital Goods in the manufacturing sector, the government's decision is a positive step to scale up manufacturing, attract fresh investments and establish India firmly as a global manufacturing destination. To continue growing at a robust pace, India needs to upgrade its technology across various sub-sectors of manufacturing, increase the pool of its skilled workforce and promote growth and capacity building of micro, small and medium enterprises. All this will be achieved by having in place the Capital Goods policy.

The International Monetary Fund in its World Economic Outlook Update has projected India to continue growing at an impressive rate of 7.5 per cent in 2016–17.² With India's entry into the Missile Technology Control Regime coming closer to realization, prospects of a boost in production and enhanced export orders are on the anvil. India's joining will lead to technology transfer and product value-addition.

The Union Cabinet's easing of norms in the National Civil Aviation Policy is a positive step for the aviation business. The new policy will lead to diverse opportunities for start-up airlines. The scrapping of the 5/20 rule means that the unconnected will now be connected and the un-served will be served. The implementation of the Goods and Services Tax bill in the monsoon season will give a fillip to the manufacturing sector.

The Indian Machine Tool Manufacturers' Association has strengthened its programs to steer the Indian machine tool industry to its upward growth trajectory. The 6th Machine Tool Industry Summit held in Kochi focused on the VUCA world and how India could emerge as a leader from it. In this edition, you will read more about the Machine Tool Industry Summit and winning in a VUCA world. I am sure that the chapter will be very valuable to you.

This September, IMTMA will be organizing a new machine tool expo in Pune as part of its endeavors to bring innovations in manufacturing to regional doorsteps. Organizing a machine tool expo in Pune, one of the richest industrial belt in the country, presents an immense opportunity for the manufacturing industry to widen its horizons. The expo is shaping up nicely and we will soon witness leading industry players showcasing their new technologies and innovation. This will enable the local industry to observe manufacturing technologies 'live'.

I would like to conclude by calling upon the industry to wholeheartedly support our initiatives and join hands with IMTMA in moving towards a more competitive machine tool industry.

See you in Pune!

PG Jadeja, President, Indian Machine Tool Manufacturers' Association (IMTMA) and Chairman & Managing Director, Jyoti CNC Automation Ltd

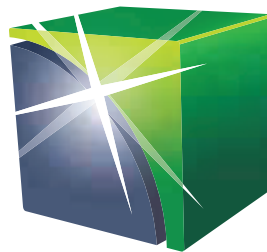
¹. Press Information Bureau, Government of India, May 25, 2016, <http://pib.nic.in/newsite/PrintRelease.aspx?relid=145622>, last accessed on June 14, 2016.

². Subdued Demand, Diminished Prospects, World Economic Outlook Update January 2016, available at <http://www.imf.org/external/pubs/ft/weo/2016/update/01/> last accessed on June 14, 2016.



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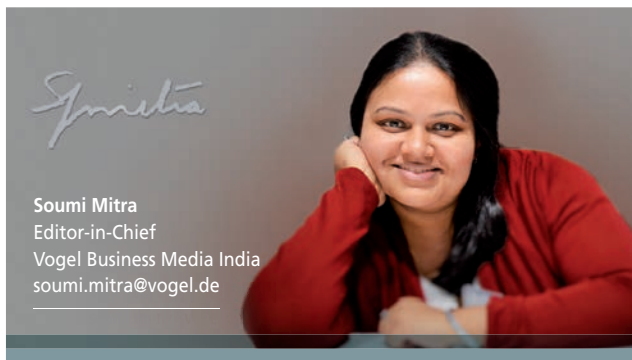


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Revolutionizing Change Initiatives

The current market scenario in India shows that the only way to succeed is that of innovation and collaboration. Gauging opportunities and leveraging on them quickly is what will help companies stay ahead. An example that brings this to light is the recent history that was scripted once again by the Indian Space Research Organisation (ISRO) with the successful launch of 20 satellites at one go from the Satish Dhawan Space Centre in Andhra Pradesh's Sriharikota.

Relying on its work horse, Polar Satellite Launch Vehicle PSLV-C34 to carry the satellites, ISRO achieved the biggest ever mission for India's space agency. Consisting of 17 commercial satellites as part of its payload, and two from Indian academic institutions, this is the 36th consecutively

"The Sun will rise and set regardless. What we choose to do with the light while it's here is up to us. Journey wisely."

~Alexandra Elle

successful mission of PSLV and the 14th in its 'XL' configuration. There were satellites from the USA, Canada, Germany and Indonesia contributing hugely to this mission. On one hand, for the first time ISRO launched a Google-made Earth imaging satellite—the 110 kg 'SkySat Gen2-1' capable of capturing sub-meter resolution imagery and high definition video. And on the other, ISRO created history by launching two indigenous academic satellites 'Sathyabamasat' and 'Swayam' developed by students of Sathyabama University, Chennai and College of Engineering, Pune, respectively.

Clearly, the key takeaway of such a mammoth global collaboration is to understand how it facilitates in developing and testing different approaches to support innovation, entrepreneurship and growth. In this context, we present this issue that validates that in today's volatile economy, competition is very dynamic, and it is necessary for companies to mitigate several input-cost disadvantages through global sourcing. As being at a competitive advantage depends on making more productive use of resources, which requires continual innovation.

Without further ado, I wish you all an interesting read and await your feedback as always!

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▲ **BIG INTERVIEW:** Director General, Japan External Trade Organization (JETRO), Hidehiro Ishiura.



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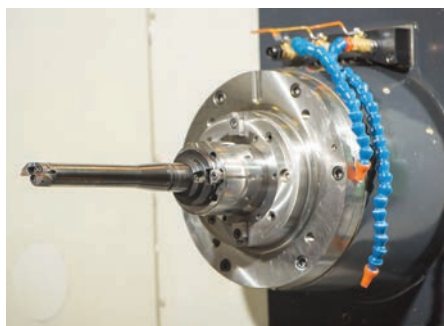
▲ **MILLING:** The combination of the air bearing spindles and ultra-fine balanced SCHUNK TRIBOS polygonal toolholders provides for immediate brilliant results in the production of coin punches.

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▲ **TRAINING:** Rough sketching is important in terms of flexibility and speed as it reduces the cognitive load.

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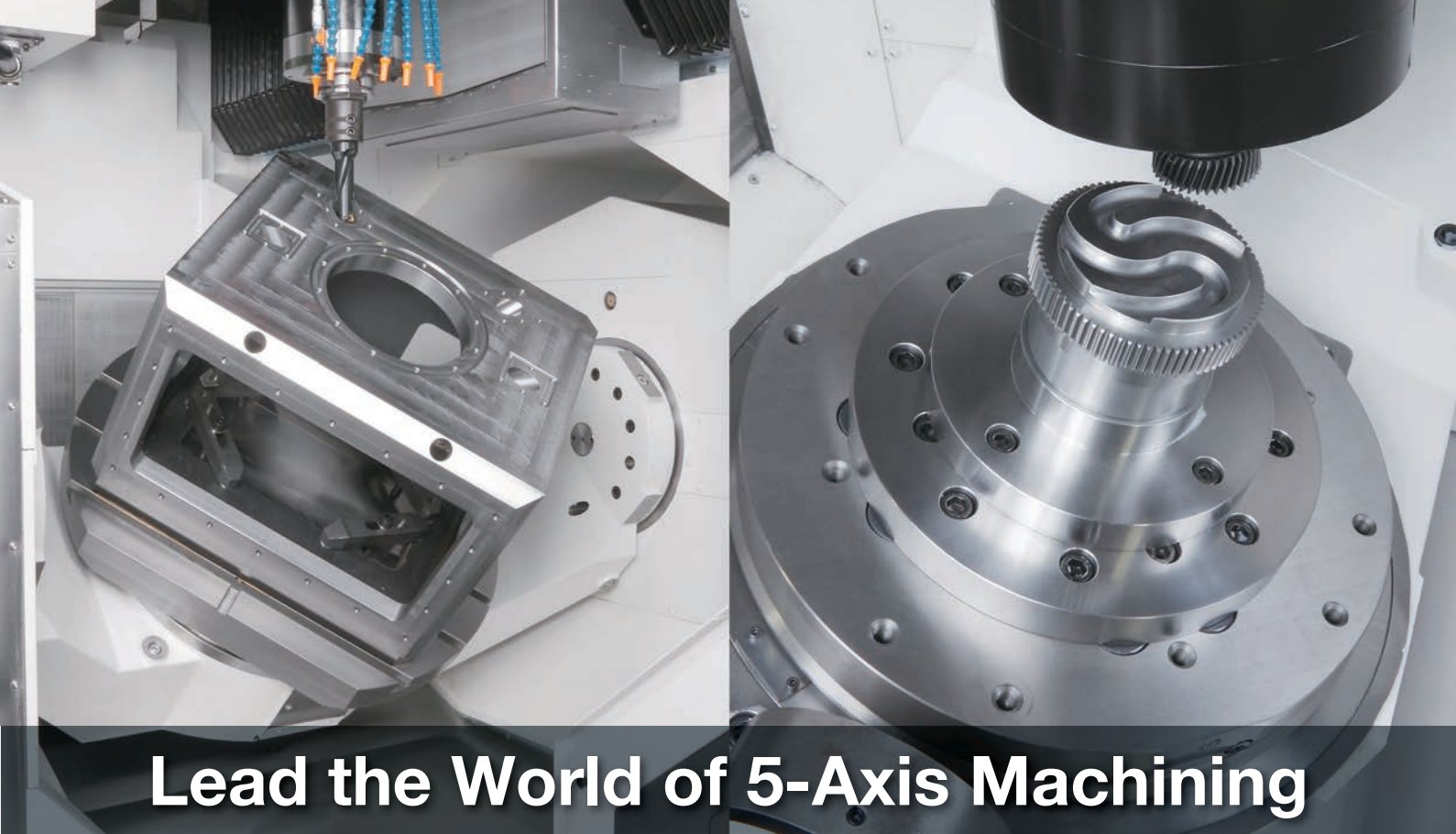
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Terminology Confusion?!



“While marketing and business development seem at times to overlap each other, they are important terms that need proper definition, a process approach with empowered process owners.”

CEO,
Micromatic Machine Tools Pvt Ltd,
TK Ramesh

Terminology in organizations and industry can be confusing. The terms marketing, sales and business development are used interchangeably by most people across companies and industries, more so in our machine tool business. People, especially organization structure builders, are not able to conceptually picture the respective business processes and build around it.

The reality for success is that sales, marketing and business development are distinct but interrelated roles in all businesses. The organizations that are able to understand this, mark peripheries not boundaries to suit their specific needs, communicate this within the organization and externally to their customers have sustainable good performance.

Defining processes under these terms

Having understood this, how do we go about defining these terms, grouping activities and setting up the processes these functions stand for—

Marketing can be thought of as processes that:

- ▶ Develop assets, competencies, products, etc., which facilitate the base for business and relationships.
- ▶ It could also be indirect interactions with customers to understand their needs and communicate our offerings.
- ▶ It could be activities that sets the stage for sales and contributes by making selling easy.

Selling is the process, which involves the direct interactions we have with customers with the sole objective of getting their commitment to enter a contractual relationship. This includes cold calls, proposals, objections, negotiations, until the business is won or lost. Selling simply means converting product or service into income.

Business Development classically focuses on the processes that take the organizations from their present stage to the next and has a focus that is both inward and external. Business development deals with alliances, discovery of partnership opportunities, shared resources and such other opportunities.

The word ‘marketing’ is mostly used as a euphemism for sales in our business, and it is gaining popularity because of the generic discomfort with sales, and hence the word ‘marketing’ seems like a more professional term but not only is this incorrect but also it serves no value add to organizations.

While marketing and business development seem at times to overlap each other, they are important terms that need proper definition, a process approach with empowered process owners. This truly creates and delivers value to all.

In a nutshell

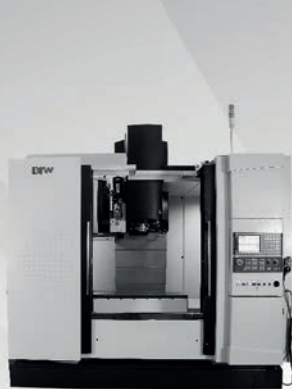
The degree of separation between business development and marketing will always vary in different organizations. This is okay. Especially in smaller companies, sales people themselves might be responsible for both processes. But as one grows, separating and clearly defining the roles of the two teams will allow each team to focus on what they do best, and help one’s business reach new heights.

MMI

The views expressed by the author are personal and he can be contacted at rameshtkr@gmail.com

Vertical Machining Centres

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- ▶ Bridge Type
- ▶ Moving Column
- ▶ Twin Spindle
- ▶ Five Axes
- ▶ Double Column



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Winning in a 'VUCA World'

A VUCA world brings with it a set of opportunities that businesses can cash in while navigating through the many layers of structural changes.

Conducting business in a world which is simultaneously volatile, uncertain, complex and ambiguous (VUCA) is a challenging task. A VUCA world however also brings with it a set of opportunities

Source: IMTMA

that businesses can cash in while navigating through the many layers of structural changes. Adopting and adapting technology provides results. In the 80s and 90s, it was personal computers and servers that gave businesses a fillip. The establishment of technology brought in digital forces such as big data, crowd-sourced creativity,

additive manufacturing, and so on. The new technological and social forces of change are radically affecting innovations and the way business is done.

Innovative technologies

The manufacturing world needs to make full use of these to get profound results.



Source: thinkstockphotos.in

Businesses are trying to capitalize on the opportunity presented by a VUCA world.

DIGITAL VERSION

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Technology in use today may no longer be in vogue tomorrow. Technology and innovations are here to stay for our better future.

The changing times are quite crucial for a manufacturing world that is interconnected throughout. Positive or negative fluctuations in one part could lead to tremors being felt in another. Falling crude oil prices or changes on the political front are affecting macroeconomic parameters.

Numerous opportunities

So businesses too are trying to capitalize on the opportunity presented by a VUCA

world. The 'Make in India' initiative launched in 2014 is a shining example of bringing the economy forward for a robust and sustainable growth.

The positive sentiments stemming from its launch has helped Indian manufacturers to cope with uncertainties and tap in to the plethora of opportunities.

The developments create different effects and the manufacturing world needs to gauge the factors and make wise decisions. In a VUCA world, firms go from boom to bust overnight. It is a daunting task to keep pace with expansion and contraction. Fresh challenges necessitate fresh priorities and more so in a world that is becoming more VUCA continuously.

Financial instability, supply chain interruptions, regulatory hurdles and ever changing customer demands make it requisite to change business operations. Such volatility demands agile and clear decisions. Uncertainty necessitates that risks be converted into a competitive

advantage. Having a global mindset and focused expertise will come in handy to tide over such situations.

Organizations whether large or small can no longer afford to remain aloof from innovations. They also have to be open to collaborations. The industry needs innovators who can invent better theories, frameworks, processes and tools to create the next big innovation. Innovations should go hand-in-hand with technological advancements.

In conclusion

To come out as a victor in the VUCA world, the manufacturing industry needs to have a positive rather than a defensive approach. Investing in businesses when the chips are down will pay rich dividends when the situation improves.

The industry will be able to establish leadership by working with these contradictions and not by going against factors that determine VUCA. **MMI**

MEGA SUMMIT

The 6th Machine Tool Industry Summit – Driving Growth from 'Make in India' & Winning in a VUCA World

The 6th Machine Tool Industry Summit was held at Kochi from May 12–15, 2016. More than 225 delegates from about 72 companies across India participated in the event. The three day summit included well planned strategic sessions, panel discussions and presentations from experts and achievers from the Indian machine tool industry. The summit was divided into multiple thought provoking sessions; some of them held concurrently, with discussion breaks for company introspections, brain storming, Q&A sessions and networking.

The inaugural session address by Past President, IMTMA, Shailesh Sheth on 'Portends for the Indian machine tool industry from the emerging global and Indian economic scene' presented the linkages between the current Indian economic scenario vis-à-vis the Indian machine tool industry and the projected trends and expectations for FY16–17. In his keynote address, International Group Publisher, Gardner Business Media Inc, USA, Claude J Mas, made a presentation on 'Trends in the Global Machine Tool Industry and its impact on India' which covered areas such as sourcing strategies, geographical trends in metal cutting and metal forming, shift in machine tool manufacturing competence centres, status and trends of 'solution' business and impact of breakthrough concepts.



PG Jadeja, President, Indian Machine Tool Manufacturers' Association (IMTMA) addressing the audience at the Machine Tool Industry Summit in Kochi.

Source: IMTMA

A special session on 'VUCA and Industry 4.0' was the highlight of this summit which brought out the leadership qualities and skills required to thrive in a VUCA world. The four disruptions driving Industry 4.0, impact on machine tools by this latest revolution in manufacturing and approaches to leverage on this opportunity was encapsulated in this session.

Held every two years, the summit provides a forum to the entire machine tool fraternity, viz., machine tool builders, sub-suppliers, accessory & allied equipment manufacturers, vendors, R&D institutions, industry experts and individuals to network, collate ideas and set forth a process of organized thinking, analysis and deliberations.

Germany Commits More Investments into India

Berlin, Germany – Encouraged by the buoyant Indian economy, which is witnessing several on-going reform initiatives of Prime Minister Narendra Modi, German companies are stepping up their investments in India. “The ‘Make in India’ initiative has emerged as one of the key drivers in fostering German investments into India,” stated Parliamentary State Secretary in the German Ministry of Economic Cooperation and Development, Hans-Joachim Fuchtel at the Indo-German

Business Dialogue that was recently held at the Indian Embassy in Berlin. The Indo-German Business Dialogue is a high-level business platform organized by the Indian Embassy in Berlin in partnership with the Member of the German Parliament, Mark Hauptmann, to encourage and facilitate new investments by German companies into India. The first meeting of the Indo-German Business Dialogue was attended by Members of the German Parliament, and over 250 representatives of the German industry, Chambers of Commerce, industry associations, academia and think tanks. Addressing the participants, Indian Ambassador to Germany, Gurjit Singh, called on German companies to step up their investments in India and emphasized the growth prospects which India had shown.

Source: Embassy of India, Berlin



The Indo-German Business Dialogue was recently held at the Indian Embassy in Berlin, Germany.

Mitsubishi Elevator India Launches New Plant

Chennai – Mitsubishi Elevator India Pvt Ltd, a subsidiary of Mitsubishi Electric, Japan, has announced the launch of its new plant in Vemgal, near Bengaluru city. Spread over an area of 89,000 sq m, the facility with a floor space of 25,400 sq m and manufacturing capacity of 5,000 units annually has the capability to expand production in the future. The first elevator is scheduled to be delivered in December 2016. By producing locally, Mitsubishi Elevator India expects to strengthen the product

competitiveness in terms of price and cut down on delivery time by focusing on its NEXIEZ-LITE elevator model for low to mid-rise buildings in the Indian market. Special emphasis will be placed on the efficient integration of sales, manufacturing, installation and maintenance. One of the breakthrough product of Mitsubishi elevator is the fastest elevator (speed of 20.5 m/sec) in the world (Shanghai Tower in China) that uses artificial-intelligence technologies, continues to receive high evaluations in the industry. Speaking on the occasion, Managing Director, Mitsubishi Elevator India Pvt Ltd, Iwao Oda said, “We strive to achieve our goal of being the No.1 brand in quality through our Quality in Motion policy (Safety, Ecology, Efficiency and Comfort).”



Managing Director, Mitsubishi Elevator India Pvt Ltd, Iwao Oda.

Source: Mitsubishi Elevator India Pvt Ltd

Blaser Swisslube Productivity Trophy Awards

Gurgaon – Blaser Swisslube India, with an aim to honor the exceptional cooperation and mutual success by enhancing productivity, economic efficiency and machining quality of its customers in India with the help of its Liquid Tool, awarded the Productivity Trophy for year 2015 | 2016 to five manufacturing companies in India. At the Productivity Trophy award ceremony held at The Westin, Gurgaon on June 13, 2016, Egger

Pumps, QH Talbros, Ognibene, TBK and RSB Transmissions were awarded in the categories of Tool optimization, Total costs of ownership, Environment Health and Safety, Productivity increase and Process optimization respectively. Director-Maruti Center for Excellence, Maruti Suzuki India Ltd, MM Singh honored the awards ceremony as the chief guest and delivered an inspirational speech on productivity and quality in the

automotive industry. As a keynote speaker, Managing Director–MMTC-PAMP India Pvt Ltd, Rajesh Khosla ornamented the evening by taking all the participants through a unique dimension of ‘The Art of Precious Metal Transformation’ and emphasized on the fact that trust is precious. In addition to this, CEO, Blaser Swisslube AG, Marc Blaser addressed the participants on different dimensions of productivity

and competitiveness in manufacturing. Managing Director & CEO, Siemens Industry Software India, Suman Bose opened his tomes to make people more familiar about Industry 4.0 and revealed the finer picture of Industry 4.0. Customers walked through the Liquid Tool gallery and were excited to look at the different dimensions of productivity and possible high returns by investing (ROI) in the Liquid Tool.

Source: Blaser Swisslube India



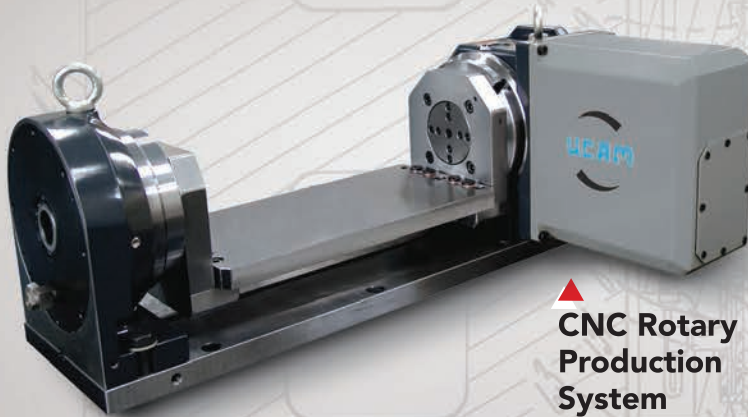
Glimpses of the Productivity Trophy for year 2015 | 2016 hosted in Gurgaon by Blaser Swisslube India.

Turbo charged performance.

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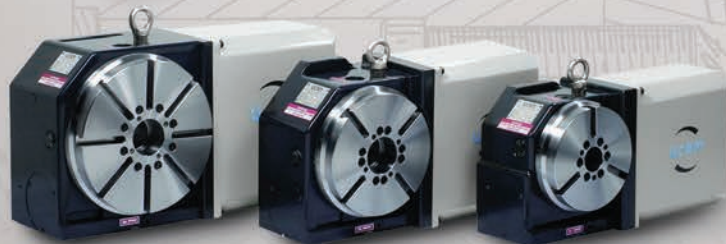
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▲ CNC Rotary
Production
System

Tilting
Rotary
Table
▼



▲ CNC Rotary Table

Renishaw Opens New Additive Manufacturing Solutions Centre in India

Pune – Renishaw, the global engineering technologies company, has inaugurated a new Additive Manufacturing Solutions Centre on June 15, 2016 in Pune, India. The new facility will provide a secure development environment in which customers can expand their knowledge and confidence using additive manu-

facturing (AM) technology. The Solutions Centre will be equipped with the latest AM systems and staffed by knowledgeable engineers to allow fast access to deploying the technology, all at fixed predictable costs.

Additive manufacturing, often referred to as metal 3D printing, is widely recognized as a

transformational manufacturing technology that will impact on everything from components in aircraft engines and satellites, to dental restorations and surgery for facial reconstruction. Renishaw, which is the UK's only supplier of metal AM machines, sees the new Indian center as a cornerstone in its ambition to be a major contributor to the adoption of AM in the established and fast growing high technology Indian manufacturing sector.

Director, Renishaw, Rhydian Pountney, responsible for the Indian sales and marketing operations mentions, "We are delighted to be opening the first solutions center in India. The thrust of the additive manufacturing centre is to create a platform on which we can work together in close partnership with our customers in order to help them realize the be-

nefits of AM in their products and manufacturing processes."

"Renishaw's vision is to make AM a mainstream manufacturing technology, used in series production of high performance parts for aerospace, medical, automotive, oil & gas, mould & die and consumer products. The technology will enable companies to design and make innovative products with spectacular gains in performance and efficiency," says Head of Global Additive Manufacturing, Renishaw, Clive Martell.

When adopting any disruptive new manufacturing technology, companies will go through a rigorous assessment process to understand the potential benefits, and to prove the reliability and capability of the production process. The investment in time, resources and equipment to achieve this can be significant.



Renishaw inaugurated a new Additive Manufacturing Solutions Centre in Pune, India.

Deutsche Messe Enters Mexican Market

Hannover, Germany – Deutsche Messe has acquired a majority stake in Magna ExpoMueblera in a key move that expands its footprint in the American trade fair market. The acquisition gives Deutsche Messe a presence in Mexico to match its lineup in the USA, Canada and Brazil. ExpoMueblera is an international trade fair for timber processing, woodworking, furniture production and equipment. It has been a staple of the Mexican wood-industry trade fair market for 22 years and is the undisputed leader in its seg-

ment. The show will next be held at the Centro Banamex exhibition center in Mexico City from January 18–21, 2017. "The deal marks a major milestone in Magna ExpoMueblera's development and enables the show to grow its position in the Mexican market as a leading trade fair for the timber processing and woodworking industries. It also means that Magna ExpoMueblera is now a member of the Woodworld stable of trade shows," commented Managing Board member, Deutsche Messe, Dr Andreas Gruchow.



Deutsche Messe expands its footprint in the American trade fair market.

EuroBLECH 2016 Presents Online Competition

UK – After the great success of the first online competition in 2014, this year, EuroBLECH 2016 is presenting 'The New Generation of Sheet Metal Working.' The online competition will reward six organizations or individuals in the sheet metal working industry for best practice, innovation, excellence and outstanding performance in six categories. Following this year's main theme at EuroBLECH, 'The New Generation of Sheet Metal Working,' the competition categories are focusing on recent developments and trends in the sheet metal working industry. The first category, 'Fac-

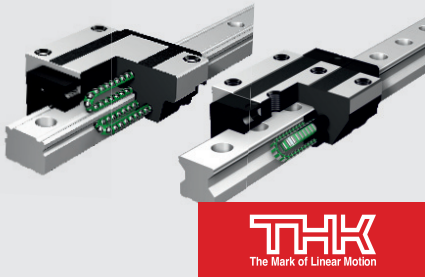
tory of the Future,' will reward organizations or individuals for the clever implementation of smart manufacturing methods. The second category, 'Women and Innovations,' will focus on cutting-edge projects and accomplishments initiated by women in sheet metal working. The best university projects in science and engineering involving sheet metal technology can compete in the category 'Academic Excellence.' The category 'Original Design' is open to companies producing unusual products made from sheet metal. Finally, 'The Young Generation' is seeking for outstanding performance of junior employees and young inventors, and the 'Clean Technology' category will reward eco-friendly solutions and sustainable manufacturing methods..



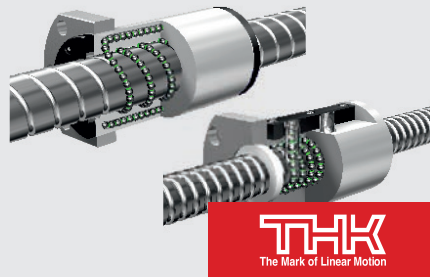
The New Generation of Sheet Metal Working at EuroBLECH 2016.

LINEAR MOTION TECHNOLOGIES

Linear Motion Guides



Precision Ball Screws



Precision Cross Roller Ring



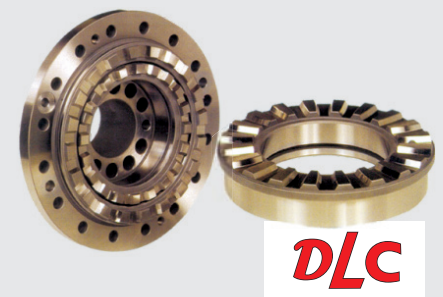
Clamps for Linear Guides



Cross Roller Guides



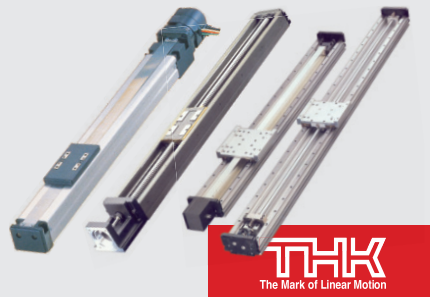
Curvic Coupling



Precision Locknuts



Linear Actuators



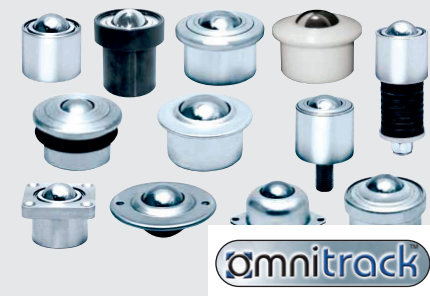
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BRR to Drive Sustainable Development Practices

Mumbai – The ‘Sustainability Initiatives Practice’ at Frost & Sullivan welcomes the Securities Exchange Board of India (SEBI) initiative of mandating the top 500 listed Indian companies (based on market capitalization of the BSE and NSE) to include their sustainability agenda in the form of Business Responsibility Reporting (BRR). The reports need to detail the initiatives taken by the companies from an environmental, social, and gover-

nance (ESG) perspective, based on the National Voluntary Guidelines (NVG) launched by the Ministry of Corporate Affairs (MCA), Government of India (GoI). These guidelines lay down the comprehensive principles that need to be adopted by the companies as part of their business practices and a structured BRR format that requires certain specified disclosures. Director, Sustainability Initiatives Practice, Frost & Sullivan, Nitin Kalothia

says, “This is indeed a great approach to instill the sustainability culture in India’s top companies and urge them to embrace it as a means of achieving success in business. The ultimate goal of BRR is to lead to sustainable development of the country.”



Source: freepik.com

BRR aims to lead sustainable development in the country.

AMTEX 2016

New Delhi – The Asian Machine Tool Exhibition (AMTEX) 2016, the 11th Edition of the machine tools exhibition of international standards was recently held from July 8–11, 2016 at Pragati Maidan in New Delhi. The event showcased a wide array of machine tools, machineries and allied products. Experts from length and breadth of the machine tool and manufacturing industry in India were seen participating in this gleaming event. The exhibition was inaugurated by Meiban

Engineering, Rishi Kapoor; Muratec Engineering, Hiroaki Kiriya; Managing Director, Cyril Pereira and Director, Reed Triune Exhibitions Pvt Ltd, Mohammed Shakeeb; CEO, Reed Exhibitions India, Michael Mandl; Ace Micromatic Pvt Ltd, TK Ramesh; Country Head, Haas India Pvt Ltd, Terrence Miranda and Executive Director, Sahajanand Laser Technology Ltd, Maulik Patel amidst numerous top dignitaries, trade bodies and international leaders.



Numerous top dignitaries at AMTEX 2016.

Source: Reed Triune Exhibitions Pvt Ltd

Proper Material Selection Can Increase Fuel Efficiency By 7%: CII-CMC

Mumbai – Corrosion is widely recognized as one of the biggest challenge faced by the automotive industry. The Confederation of Indian Industry–Corrosion Management Committee (CII-CMC) was constituted in 2006 under the chairmanship of Padma Shiri awardee, Director, National Institute of Advance Studies, Bengaluru, Dr Baldev Raj to address this crucial subject and educate the industry about solutions to tackle and control this menace. About 90 per cent of corrosion is associated with iron-based materials, thus manufacturing with the right mix of material is one way of dealing with corrosion. “Material selection is crucial in many ways

—with every 10 per cent of weight eliminated from a vehicle’s total weight, fuel economy improves by 7 per cent. This is because it takes less energy to accelerate a lighter object than a heavier one, lightweight materials offer great potential for increasing vehicle efficiency. Corrosion in automobiles lead to loss of material leading to failure and breakdowns, dimensional inaccuracy, degradation of aesthetics, deterioration of mechanical properties and increase in maintenance cost,” says CII–Corrosion Management Committee and former Chief Consultant Engineers India, Dr V R Krishnan.

German Machine Tool Industry Reinventing Itself

Frankfurt am Main, Germany – “From a position of strength, the German machine tool manufacturers have to utilise the changes in the markets, among the customers, in the technology, and in the products themselves, in order to generate new opportunities for enhanced competitiveness,” said Chairman, VDW (German Machine Tool Builders’ Association), Dr Heinz-Jürgen Prokop speaking at VDW’s

anniversary conference in Frankfurt am Main. About 400 invited guests from the business and academic communities, the media and trade associations celebrated the event with a ceremony and a gala evening themed around ‘125 Years of VDW’ under the motto ‘valuable -dependable- worthwhile’. “The three attributes stand for the association’s performative capabilities, and for the issues it has been addressing ever since it was founded in December 1891,” explained Dr Prokop. They describe the manufacturers’ field of action: markets – machines – people. Intensive analysis of these issues has underpinned the sector’s own success story, said Dr Prokop. At the same time, the ongoing challenges for the companies involved can also be derived from these issues.



Chairman, VDW (German Machine Tool Builders’ Association), Dr Heinz-Jürgen Prokop speaking at VDW’s anniversary conference in Frankfurt am Main, Germany.

Source: VDW

National Instruments Presents Cutting-edge Technologies

Bengaluru – National Instruments India (NI) has recently hosted a series of automotive roadshows across the country to showcase NI platform-based tools and technologies specifically designed to cater to the automotive industry in India. The roadshows which were hosted through live demos and technical presentations were

attended by over 100 engineers from various automotive companies. Commenting on the roadshows, Managing Director – IndRA at National Instruments, Jayaram Pillai said, “The automotive industry is a big focus area for National Instruments in India. As the presence of electronic control units is increasing in modern automobiles, so is the

emphasis on Hardware-in-the-loop testing (HIL Testing). In this context, one of the main focus of our automotive roadshow was HIL testing, especially how this technology is enhancing to incorporate test strategies for hybrid electric vehicles too.”



HIL testing is gaining focus in the automotive sector owing to increase in electronics in cars.

ExxonMobil Collaborates with Micromatic Machine Tools

Delhi/Gurgaon – ExxonMobil Lubricants Pvt Ltd has announced its partnership as the official lubricant partner for Micromatic Machine Tools Pvt Ltd, the marketing and service company of the 1200 crore Ace Micromatic Group which is India's largest machine tool conglomerate. The collaboration will see Mobil Industrial Lubricants support Micromatic Machine Tools with their advanced range of industrial lubricant products and services, backed by the leadership

and expertise from the company. Micromatic Machine Tools is the preferred supplier for many Indian OEM and component manufacturers. Mobil distributor's ability to collaborate with MMT service team will ensure customer satisfaction through technical services and on time product deliveries. In addition, the partnership will see structured joint implementation to create awareness on right oil, at the right time and right place through training programs, customer education seminars and knowledge enhancement sessions with Mobil and MMT engineers. All of these combined will contribute to the success and strengthening of the relationship for the long-term.



ExxonMobil Lubricants Pvt Ltd announced its partnership as the official lubricant partner for Micromatic Machine Tools Pvt Ltd.

Source: Micromatic Machine Tools Pvt Ltd

Knorr-Bremse Expands Its Commercial Vehicle Powertrain Business

Pune – GT Group's core business is the development and manufacturing of EGR valves and exhaust brakes for diesel engines used in the commercial vehicle sector. The owner-managed company with around 250 employees operates four locations in the Peterlee area and ranks in both product segments amongst the worldwide market leaders. “The strategic fit of GT Group to Knorr-Bremse and the strong position of our combined businesses will enable us to meet the needs of our worldwide customers regarding the emission-compliant operation of diesel engines even more comprehensively,” explains Member of the Executive Board, Knorr-Bremse AG, Dr Peter Laier responsible for the commercial vehicle sys-

tems division. “We access in-depth know-how in new technologies as GT's mechatronic exhaust valves complement Knorr-Bremse's existing product portfolio in Asia. Therefore we are planning a close engineering collaboration especially between GT emissions systems and our subsidiaries in Japan and China. Together with the GT Group we are aiming to grow in new regions and strengthen our market position in Europe and North America. This way Knorr-Bremse will take a further step towards its declared aim of offering integrated system solutions and subsystems that boost customer benefits, reduce costs and ensure both the safe and efficient operation of trucks, trailers, and buses over the entire life cycle.”

Industrial Digital Printing Machine in Turkey

Turkey – Mezit Technology, a Bursa-based company, has manufactured an industrial digital printing machine for the first time in Turkey, in collaboration with Kollmorgen products and engineering. Following successful trials, the machine has started production. Mezit Technology officials state that the machine is 20 per cent faster than its counterparts.

The machine was manufactured as a result of R&D efforts that lasted around six months, and has been intensely sought-after by textile manufacturers from Turkey and from several other countries. As owner of Mezit Technology, with substantial industry-specific experience in digital

printing, owner of Mezit Technology, Ibrahim Demir tells their startup story, “I have significant experience in the digital printing industry, and many years of expertise. During this time, I worked with several companies and learnt almost all the intricacies of this field. As a result of our evaluations, we decided that digital printing technology must be used more intensively in an important textile production centre like Turkey and even these machines must be manufactured in Turkey. We have diligently selected and gathered a technical team who will design and manufacture this machine, thus forming a highly experienced team.”

Enhanced Lathe Systems for Complex Machining

Source: Mitsubishi CNC



Mitsubishi Electric, with the M800/M80 Series, brings to the forefront milling and multi-axis and multi-part system control features that have been significantly improved to execute extremely complex machining with ease and efficiency.

Touch operation provides you unprecedented ease of use.

Multi-axis, multi-part system control features

- Supports up to 8 part systems, 32 axes and 8 spindles
- Loader control via sub-part system control
- Spindle superimposition control
- Multiple spindle synchronization set control

Milling features

- High-speed high-accuracy control
- Super Smooth Surface (SSS) control
- Spindle-mode servo motor control

Features for large-sized lathes

- Re-thread cutting
- Thread cutting override
- Real-time tuning
- Large-size display

User operability

- Workpiece coordinate system shift
- Easy setup of barrier check parameters
- Simple monitor screen showing narrowed-down information

Conversational programming

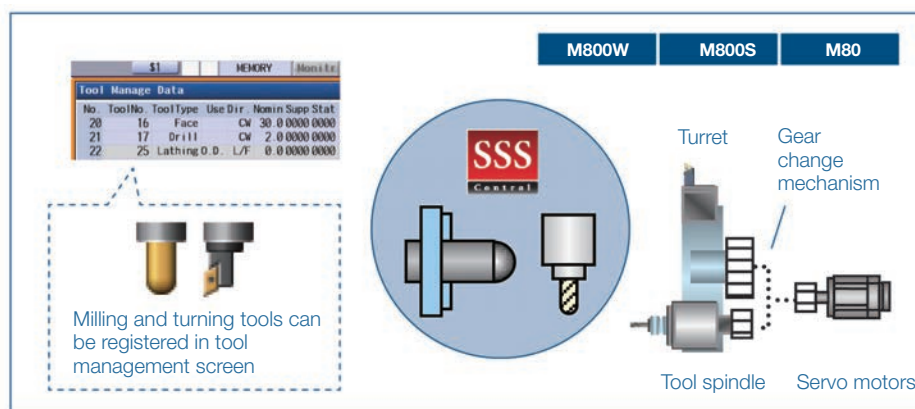
- Program edit with timing synchronization between part systems
- Interactive cycle insertion
- 3D program check

Implement ever more complex machining in an easy and efficient manner

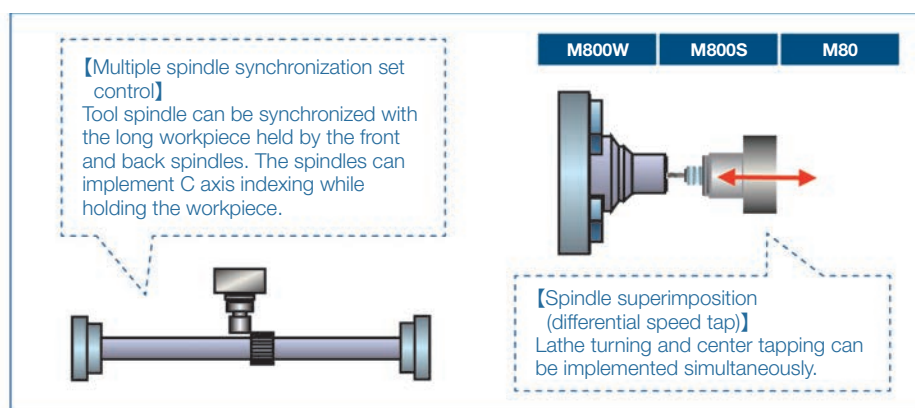
Milling features have been improved through high-speed, high-accuracy control and SSS control. Multi-axis, multi-part system control features have also been upgraded. A wide variety array of these features help ensure high productivity.

Significant progress has also been made in frequently used operation as well as programming, such as tool offset and workpiece coordinate system shift, which allows operators to easily implement ever more complex machining.

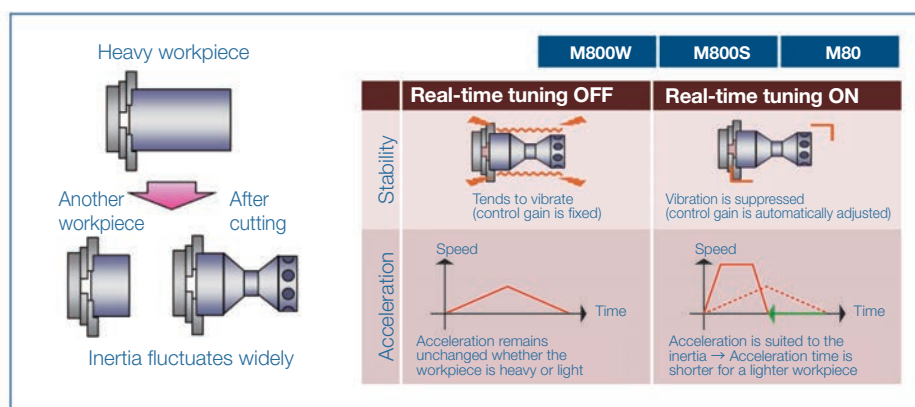
Source: Mitsubishi CNC



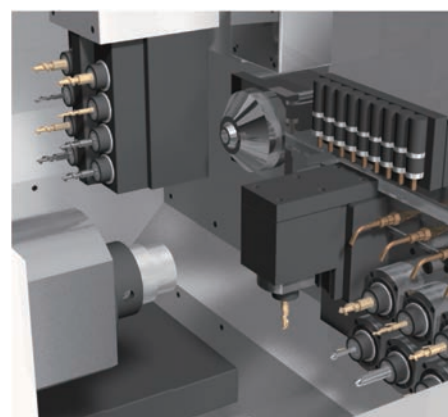
High-speed, high-accuracy control and SSS control are available for milling using the lathe system. A servo motor driven by a servo drive unit can be controlled as a tool spindle.



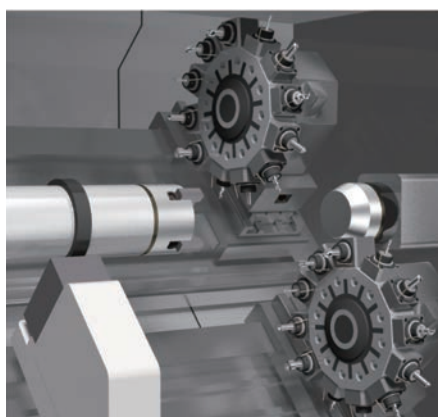
M800 Series controls up to 8 part systems, 32 axes and 8 spindles. This CNC provides the advanced multi-axis, multi-part system control features including loader control using sub-part system, spindle superimposition and synchronization of multiple spindle sets.



Real-time tuning helps maintain the stability of large lathes. This function detects vibration caused by significant fluctuation of work inertia and automatically adjusts the control gain.



Automatic Lathe



Multi-Task Lathe

Improved milling features using a tool spindle

High-speed high-accuracy control features accumulated originally for machining centers are now available in lathe system. Fine milling can be implemented at high speeds on a lathe. This CNC enables a servo motor, instead of a spindle, to act as a tool spindle. Any of the servo control axes driven by multi-hybrid drive can be used as a tool spindle. This contributes to the downsizing of machining tools.

Multi-axis multi-part system control features help to reduce cycle time and maintain synchronization between part systems

M800/M80 Series provides 'Spindle superimposition control, 'a feature that enables simultaneous execution of turning and center tapping, although they needed to be executed individually.

These features are effective in eliminating idle time, resulting in a significant reduction in tact time. This CNC also offers features that maintain synchronization between part systems, which is required for automatic lathes, in particular. These enable operators to implement ever more complex machining safely and securely.

Significantly easier programming

Programming has been made much easier: program edit screen shows the synchronization points between part systems in an easy-to-understand display, and conversational programming allows insertion of canned cycles. After programming, operators can check the programs through 3D work simulation before actual cutting.

Mitsubishi Electric—one of the global leaders in the manufacture and sales of electrical and electronic equipment for industrial use—actively participates in machine tool exhibitions to throw light on its innovations for the industry.

The company recently participated at ACMEE 2016 held in Chennai from June 16–20, 2016, and AMTEX 2016, held in Delhi from July 8–11, 2016. These platforms were used by Mitsubishi Electric to display its best-in-class technology including standard CNC—E70 and C70 and also lately launched M80/M800 Series. The M80/M800, a next generation CNC controller from Mitsubishi Electric, features a touch-screen display and user-friendly interface. One of the key advantages of this product is its simplicity. It allows users to check the machine's operating status at a glance on the home screen itself. Thanks to such ease of operations, the controller has grabbed the attention of visitors.

Source: Mitsubishi Electric



Cosmos Display CVM1060 with Mitsubishi M80 Controller in ACMEE Exhibition at Chennai.



S&T Exhibited Manford VL610 with Mitsubishi M70 Controller during ACMEE Exhibition at Chennai.



Jyoti Exhibited VMC 850 with Mitsubishi M70 Controller during AMTEX Exhibition at Delhi.



Cosmos Exhibited Smart Mill with Mitsubishi M70 Controller during AMTEX Exhibition at Delhi.



Electronica Exhibited Arjun 650 with Mitsubishi M80 Controller during AMTEX Exhibition at Delhi.



Multi Axis Exhibited KD 6040 with Mitsubishi M70 Controller during AMTEX Exhibition at Delhi.

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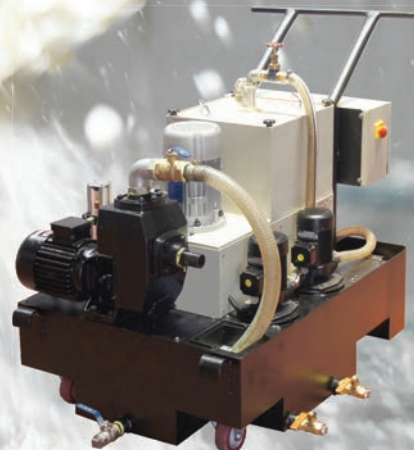
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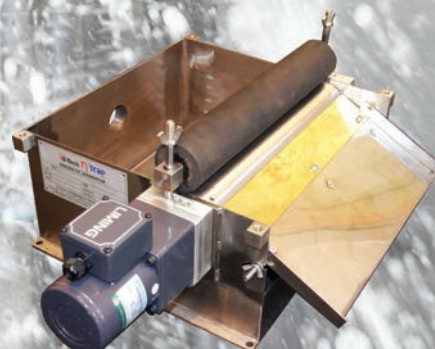
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Indian Industry: Sustainable Recovery Yet to Happen

The IIP data recently released by the Central Statistics Office reveal that the Indian industry has slowed down in 2015–16 suggesting that the recovery seen in 2014–15 after three consecutive years of slowdown could not sustain for long and a sustainable recovery is yet to happen.

This article is written in an attempt to answer the question raised through the previous article titled “Turn-around of the Indian Industry?” published in the November 2015 edition of MMI. The recovery of the Indian industry clocked

in 2014–15 after three consecutive years of slowdown during 2011–12 to 2013–14 could not lead to a sustainable turn-around as the Indian industry slowed down again in 2015–16, based on the Index of Industrial Production (IIP) data released by the

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Central Statistics Office in May 2016.

Overview

The output of the Indian industry as measured by IIP grew 2.4 per cent during 2015–16 vis-à-vis 2.8 per cent during 2014–15. This followed a growth of -0.1 per cent in 2013–14, 1.1 per cent in 2012–13, 2.9 per cent in 2011–12 and 8.2 per cent in 2010–11.

The manufacturing sector which has weightage of approximately 75 per cent in the IIP decelerated to a growth of 2.0 per cent in 2015–16 from 2.3 per cent in 2014–15. Thus, major contribution to slowdown of 2015–16 came from the manufacturing sector though the electricity generation sector too contributed to the slowdown (figure 1).

Within the manufacturing sector, capital goods and consumer non-durable sectors weighed down heavily on IIP. The capital goods sector contracted by 2.9 per cent during 2015–16 as against an expansion of 6.3 per cent during the previous year. Whereas, the consumer non-durables sector shrank by 1.7 per cent against a



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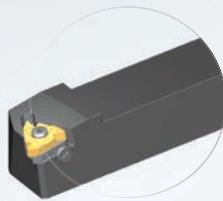


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growth of 2.8 per cent. Basic goods too contributed to the slowdown of industrial output as the former decelerated to a growth of 3.5 per cent in 2015–16 from 6.9 per cent in the previous year. However, consumer durables grew by 11.2 per cent against a contraction of 12.6 per cent leading to a growth of 3.0 per cent in the output of consumer goods as a whole (consumer durables plus non-durables) during 2015–16 as compared to a fall of 3.5 per cent during 2014–15. Intermediate goods grew by 2.5 per cent during 2015–16 against 1.7 per cent in the previous year.

Some of the factors that are considered to have contributed significantly to 2015–16's reversal of industrial recovery registered in 2014–15 following three consecutive years of slowdown over 2011–12 to 2013–14 are described below.

Global economic slowdown

Global economic slowdown has impacted the global demand for Indian industrial products. This is reflected in the export-performance of Indian goods. Exports declined by approximately 15 per cent in 2015–16 as compared to the previous year in terms of the US dollar. Exports declined across all major markets such as Europe, Africa, America, Asia, CIS (Commonwealth of Independent States) and the Baltic region.

Particularly, slow economic recovery in the Euro area and slowdown in China have impacted India's exports to those markets. Exports to the Euro area declined by nearly 10 per cent whereas exports to China shrank by close to 25 per cent. As the Euro area and China constitute approximately 17 per cent and 3.5 per cent of India's total exports respectively, any substantial decline in exports to those markets is bound to impact the overall exports in the same direction.

Torpid domestic demand

On one hand, Indian exports declined substantially, on the other hand, imports too declined by approximately 15 per cent in 2015–16 in US dollar terms. The fall in imports reflects moderation in domestic demand, though it also factors in fall in prices of some of the imported goods such as crude and refined petroleum products. Moderation in domestic demand is also indicated by deceleration of the overall consumption expenditure. Although private final consumption expenditure (PFCE) accelerated in 2015–16 as compared to 2014–15 registering a growth of 7.4 per

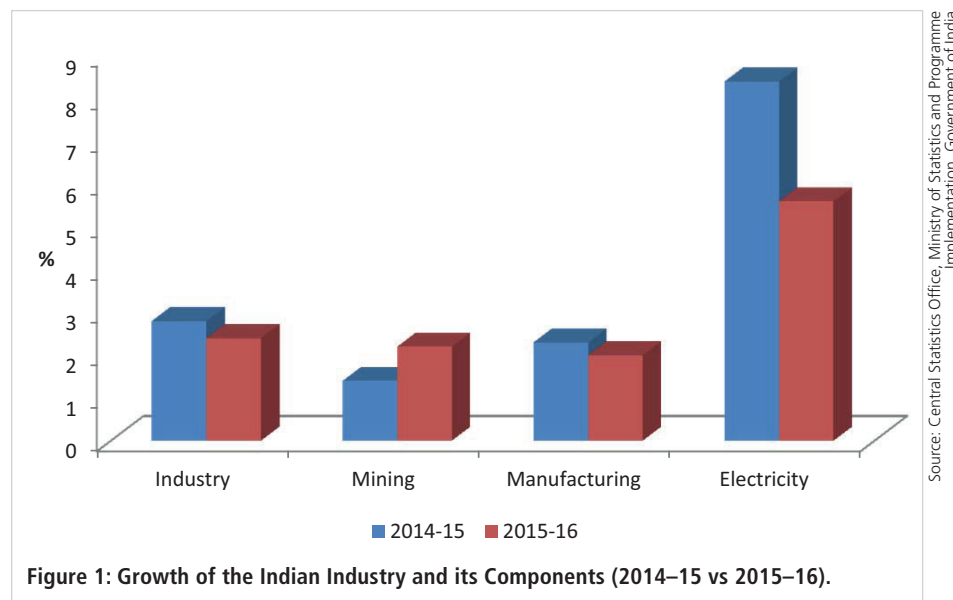


Figure 1: Growth of the Indian Industry and its Components (2014–15 vs 2015–16).

cent vis-à-vis 6.2 per cent, government final consumption expenditure (GFCE) slowed down sharply with a growth of just 2.2 per cent in 2015–16 as against 12.8 per cent in 2014–15. Consequently, the total consumption expenditure (PFCE plus GFCE) decelerated to 6.6 per cent in 2015–16 from 7.2 per cent in 2014–15.

High interest rate

Though the Reserve Bank of India (RBI) cut the key policy rate (repo rate) several times over the past few years leading to current repo rate at 6.5 per cent, its transmission has been insignificant. Consequently, the rate of interest at which banks lend to the customers (consumers or corporates) is still high. High rate of interest means low return on future investment thereby providing disincentive to businesses for fresh investments on one hand, and lower margin and weak profitability of the companies affecting their ability to reinvest on the other. Further, high interest rate encourages individuals to save more instead of spending on consumption. It also discourages them to satisfy their consumption demand by way of credit. Both ways, high interest rate tends to dampen consumption demand.

Sluggish investment

High interest rate as explained above and capacity under-utilization have dampened the investment demand. When the existing capacity is not fully utilized, it gives little incentive to make investment in further capacity addition. Contraction in capital goods output as discussed earlier and slowdown in credit offtake to the industry are indicative of sluggish investment. Gross

bank credit to the industry grew by just 2.7 per cent in 2015–16 as against 5.6 per cent in 2014–15. Sluggish investment is also borne out by the slowdown in gross fixed capital formation (GFCF) in 2015–16. GFCF grew by just 3.9 per cent in 2015–16 as against 4.9 per cent in 2014–15.

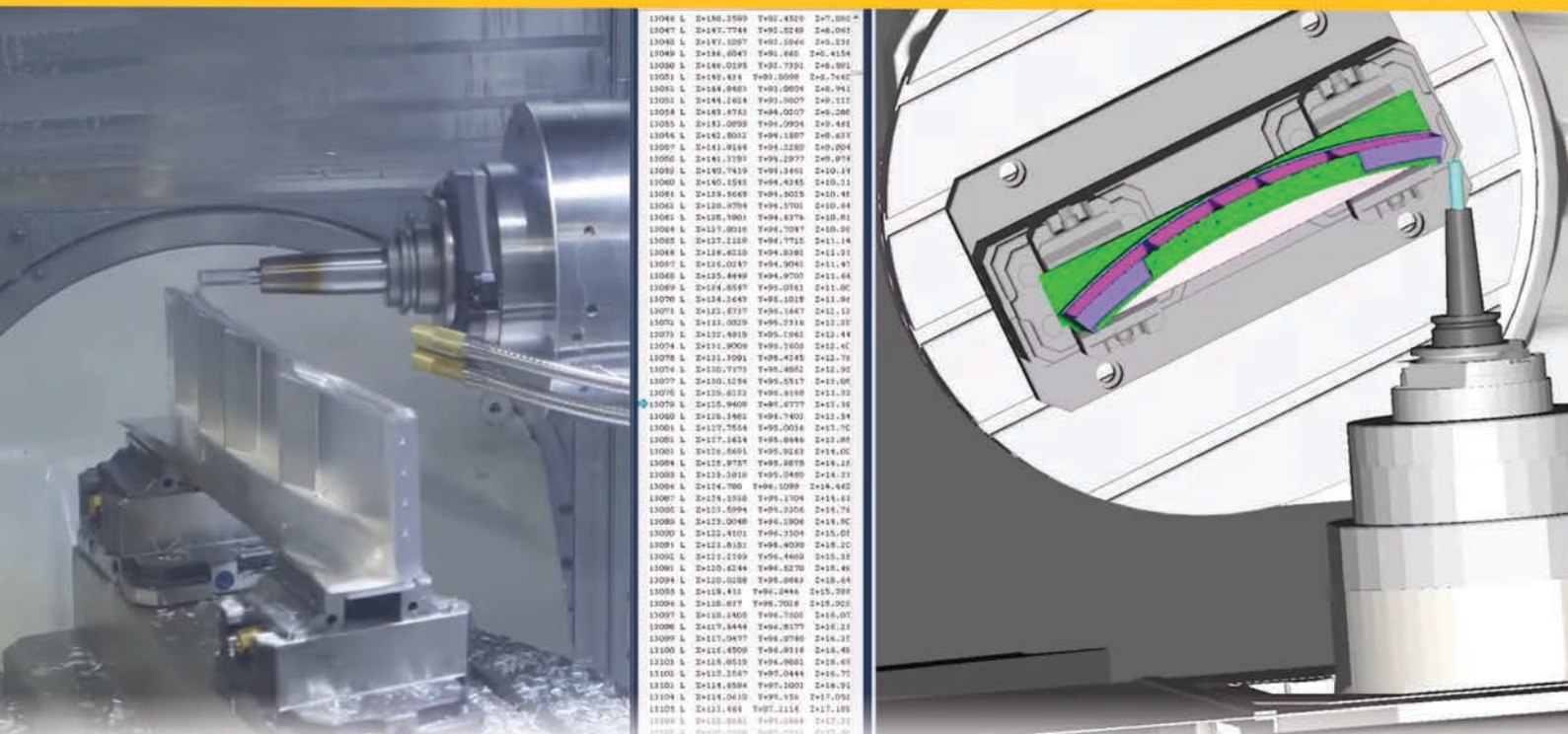
Final thoughts

The positive trajectory of the Indian industry traversed during 2014–15 after three consecutive years of slowdown (2011–12, 2012–13, 2013–14) appears to have short-lived as evidenced by the IIP numbers of 2015–16.

The following factors can be said to drive the reversal of the upward trajectory.

- ▶ The reduction in repo rate (key policy rate) by RBI could not translate into similar reduction in lending rates by the banks leading to still-high interest rates.
- ▶ Global economic slowdown particularly slow pace of the Euro area's economic recovery and slowdown in China impacted the global demand for Indian industrial products.
- ▶ It appears that the Government's efforts to rein in the fiscal situation impacted the consumption demand.
- ▶ Torpid investment demand caused by capacity under-utilization and high interest rate.
- ▶ Slow pace of infrastructure growth impeding the industrial growth.
- ▶ Though ease of doing business seems to have improved, the degree of improvement is insignificant, and still a lot remains to be done by the government on this front. According to the World Bank, India improved its ranking from 134 in 2014, but only by 4 points to 130 in 2015. **MMI**

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Broadening Horizons

Recently, Research and Markets, a global think-tank mentioned in its latest report that the Indian machine tools market is slated to grow at a CAGR of 12.6 per cent during the period 2016–2020. With its technological expertise in terms of product design capability and process technology, the burgeoning Indian machine tool sector is well-equipped to respond quickly and effectively to the changing demands of the international market. To validate this, we spoke to India's leading machine tool builders who are exporting to dynamic emerging markets in Latin American countries.

Latin American (LATAM) countries have enticed the world with its mesmerizing landscapes, foot-tapping music, sumptuous cuisines, to high energy-driven football matches. Sharing similar geography, culture, socio-economic development priorities, attitudes, and mindsets of people India and Mexico are two large emerging economies with democratic, secular, and pluralistic systems, as well as convergent worldviews. Both the countries are almost at comparable levels of economic and technological development and are members of G-20. LATAM stands out significantly as the largest vehicle export destination accounting for 19 per cent of India's total exports in 2015–16 and consumes 29 per cent of India's global motor cycle exports.

Achieving growth by tapping new markets across the globe.

According to Engineering Export Promotion Council of India (EEPC), Mexico's imports from India jumped to a 12.18 per cent increase with a well-diversified basket, comprising engineering goods, automobiles and auto parts, pharmaceuticals, & so on. Besides Mexico's own sizable market and investment-friendly policies, the country enjoys the strategic advantage of North American Free Trade Agreement (NAFTA) drawing large FDIs. Hence, several Indian companies are increasing their investment in Mexico to sell their products to its NAFTA partners—US and Canada as well as to the 40 plus countries with whom Mexico has Free Trade Agreements.

Market dynamics

Mexico—a front runner among LATAM countries—is a major auto components hub catering to North

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Broadening Horizons



America. “Its proximity to the US market makes it an ideal sourcing destination with relatively low manufacturing cost,” shared Chairman & Managing Director, Jyoti CNC Automation Ltd, and President, Indian Machine Tool Manufacturers' Association (IMTMA), PG Jadeja. In sync, CEO, Micromatic Machine Tools Pvt Ltd, TK Ramesh affirmed, “Though the Mexican market has slowed down of late, there are possibilities of revival in the coming years, essentially owing to lower cost of production & logistics and the country's proximity to the big US market. Brazil and Mexico significantly meet the local consumption demands of the automotive, aerospace, white goods industry from the US as well as LATAM markets. The Indian machine tool sector caters to all these industry segments.” Observing an interesting phenomena, Director, Chennai Metco, C Renganathan opined, “There are not many capital equipment manufacturers in Argentina, and hence despite stiff currency, conditions and exchange rules, Argentine customers are still importing capital equipment. The absence of local manufacturers place Indian companies at a competitive pedestal as Indian companies enjoy a clear



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"Indian CNC Machines are at par with any European or Japanese machines in terms of product engineering and performance."

President, Indian Machine Tool Manufacturers' Association (IMTMA) and Chairman & Managing Director, Jyoti CNC Automation Ltd, PG Jadeja



"Brand building and local service support is very important. However, as we are supplying through our dealers, they provide the required interface."

CEO, Micromatic Machine Tools Pvt Ltd, TK Ramesh



"The biggest challenge faced by the Indian manufacturers in Latin American countries is to establish an end-user brand recall of Indian products."

Director, Chennai Metco Pvt Ltd, C Renganathan

price advantage to the American and European suppliers." For Chennai Metco, LATAM is a good market with repeat orders for its heavy duty cutting machines from customers such as Scania, Volkswagen and Fiat in Argentina and several other customers in Brazil, Chile, Mexico and Peru. Notably, Micromatic Machine Tools have supplied its hydraulic cylindrical grinding machines to Guhring Mexicana, S.A. de C.V and Ekin Mexico S.A. de C.V through its US-based dealers and has no local LATAM dealer. Aligning on the same lines, Maulik Patel, Executive Director, Sahajanand Laser Technology Ltd added that the Indian machines are in substantial demand from machine tool, electronics, heavy machinery and metal forming sectors.

Adding another dimension to gaining

stability in the LATAM market, General Manager, Heller Machine Tools de México and Former President, Mexican Association of Machinery Distributors (AMDM), Salvador Icazbalceta Valle pointed, "It is very important to station service engineers and make available spare parts easily in Mexico."

Paving the way through challenges

The ease of doing business prevails in most parts of LATAM, but the real challenge lies in understanding the market dynamics. "These markets are drastically distinct from the other

global markets. Though the customers here, share similar elements with their global counterparts, such as willingness to learn about machines, extensive study prior to finalizing machines, there is a demand for more and more features in budget machines," emphasized Patel. Talking of challenges in LATAM, Jadeja stated, "High import duty, foreign exchange regulations, financial instabilities, prolonged custom clearance are responsible for delays in finalizing deals. However, during the last 4-5 years, we witnessed lot of positive changes in Brazil,

Principal Trade & Investment Officer and Director of Pro Mexico for SAARC, Rodrigo Blanco (3rd from left) recently spoke on the business climate and opportunities available for India engineering industries in Mexico during a conference organized by EEPC India.



Source: EEPC India

India's trade with Latin America

Country	Exports in 2015-16 (in million US dollars)
Brazil	2650
Argentina	535
Mexico	2865
Colombia	888
Peru	703
Chile	679

Major exports in 2015-16

Sectors	Total in \$ million
Vehicles	2796
Equipments and machinery	557
Aluminum products	376
Iron and steel products	363
Iron and steel	308
Electrical machinery	265

Source: Ministry of Commerce of India

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Source: Micromatic Machine Tools Pvt Ltd



"Mexico is a market where all machine tool manufacturers from the world have an opportunity to compete. It is important for them to have service engineers and spare parts in the country itself, which could be either offered directly by the companies or through local representatives."

General Manager, HELLER Machine Tools de México, and Former President, AMDM, Salvador Icazbalceta Valle



"The Brazilian market welcomes all modern technologies, processes and machinery available around the world, in order to increase its production and have more competitive costs. Hence, each Indian-made machinery answering those necessities are wanted in our market."

Head- Events, Reed Exhibitions Alcantara Machado, Alexandre Telles



"Though the customers in Latin America share some similar thoughts as their counterparts in other parts of the world—such as willingness to learn about machine, extensive study prior to finalizing machine—they demand for more and more features in budget machines."

Executive Director, Sahajanand Laser Technology Ltd, Maulik Patel

Argentina and Mexico, which helped us establish our business in these countries." Speaking of the high custom duty, especially in Brazil, Ramesh shared, "The cost of our standard products is not attractive to the local

markets. However, tooled up solutions that require engineering and trials have a better chance." The average Brazilian company looks for quick deliveries and many a times customers retract post learning the high lead time. Submitting his thoughts on these lines, Rengenathan elaborated, "We do not see any difficulty in product engineering, but branding, marketing and increased logistics time are unfavorable factors that need to be addressed in a collective and concerted effort

to position Indian machines as an option to the LATAM companies."

Waltzing the way ahead

As Brazil has very limited domestic CNC machine manufacturers, most of its market demands are met by importing machines from Europe, Japan, Korea and Taiwan. It is clear that to surge ahead Indian machine tool manufacturer must provide low-cost, high-end machinery.

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Source: Sahajanand Laser Technology Ltd

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- ▶ Wheel dia. 12" / 14" max.
- ▶ Machine Size 1020 X 1260 X 1030 Stand: 1320 X 1270 X 810
- ▶ T-slot table, Cam Vise



Baincut XXL Auto - CMXXL 017A

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- ▶ 25 HP motor, 3 Phase Motor
- ▶ Hydraulic Automation
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- ▶ T-slot table

Source: Chennai Metco Pvt Ltd

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Strengthening Bilateral Trade

In a candid dialogue, Director General, Japan External Trade Organization (JETRO), Hidehiro Ishiura voices his views on the benefits of Indo-Japan relations. Excerpts of the conversation follow.

The year 2014, saw an increase in the number of Japanese business establishments in India. According to you, what are the reasons for Japanese companies wanting to set up their companies in this part of the globe?

Hidehiro Ishiura: The huge potential that the Indian domestic market offers is a major factor that influences the investment decisions. Various studies have projected that by 2030, India is poised to become the third largest economy in the world. The purchasing

power of the Indian middle class is also expected to be ranked at number one around the same year. In addition, India offers a comparative advantage in terms of skilled workforce and cost competitiveness, making it a suitable destination for export oriented manufacturing. The geographical advantage that India possesses also favors exports to African and Middle East countries. Automobile and engineering related sectors form a major chunk of the overall Japanese investments in India.

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Strengthening Bilateral



With the demographic dividend favoring India, there would be a huge demand for automobiles in the coming years fuelled by rising incomes and easier access to financing.

Availability of quality human resource is another reason that has significantly influenced investors' decision in locating their investments—beneficiaries of which have been states like Tamil Nadu that are doing well in the education sector. I am told that Tamil Nadu turns out more than one million graduates annually.

How is Japan External Trade Organization (JETRO) working with organizations in India to build mutual trade and investment?

Ishiura: JETRO works closely with the central and respective state governments in facilitating trade and investments. We also closely cooperate with leading trade bodies and industry associations like CII, FICCI,

"India offers a comparative advantage in terms of skilled workforce and cost competitiveness, making it a suitable destination for export oriented manufacturing."

Director General, Japan External Trade Organization (JETRO), Hidehiro Ishiura



Source: VBMI

ASSOCHAM, ACMA, SIAM, AIEMA, MCCI, etc. JETRO coordinates Japan's participation in major trade shows and also facilitates trade delegations both to and from Japan. We also organize seminars and road shows to support the state governments' in promoting their respective states to potential investors in Japan. We also occasionally sponsor buyer delegations to Japan. JETRO has also supported Japanese Prefectures and Indian state governments in entering into MoUs that are mutually beneficial.

Most Indian companies constantly try to improve their productivity and working environment by introducing and practicing Japanese best practices. As an organization, how do you help develop these practices in helping companies expand and establish themselves in India?

Ishiura: Japanese manufacturing techniques and practices like kaizen, quality circles, TPM, just-in-time, etc., are being implemented quite extensively in the Indian industry. The number of Deming Awards won by the Indian industry is a testimony to this. JETRO cooperates with organizations like The Overseas Human Resources & Industry Development Association (HIDA) and Alumni Associations (AOTS) in propagating these initiatives. These organizations have mentors who have been trained in Japan and on their return they disseminate their knowledge through various workshops that are conducted regularly. Such training programs have contributed significantly to the industrial HR development in countries like India.

PERSONAL



"Japanese businesses should travel to Indian cities other than the major metros because there is vast unexplored business potential in the smaller towns across India."

Hidehiro Ishiura

What are the challenges you face in a country such as India in terms of ease of doing business, and setting up shop in the country?

Ishiura: Japanese companies operating in India generally point out that institutional impediment to doing business in India includes matters related to land, taxation, environmental clearances in addition to matters related to infrastructure development. According to the ranking of ease of doing business 2016 by World Bank, dealing with construction permits, enforcing contracts, etc., are critical issues that need to be addressed. In India, there is no dearth of

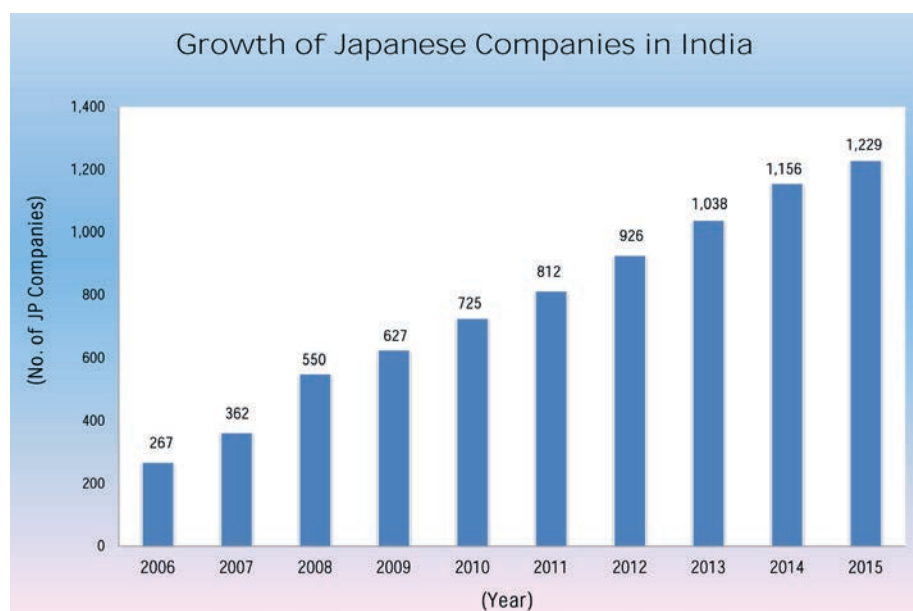
laws and regulations, but what is required is the proper enforcement of these laws within a time bound manner. The undue delay in effecting a legal settlement is a damper for investments.

It is quite heartening to note that recently the administration has taken note and is moving fast to arrest the decline. More than anything else, the realization among the government that business environment needs to be drastically overhauled, so as not to miss the investment bus, is a big step forward. It is also good that there is a healthy competition among various states in India to attract investments. Such a competitive environment is a catalyst for faster development of the economy.

In your opinion, what are the changes you wish to see in India so that trade relations can be strengthened between Japan and India?

Ishiura: I wish more and more Indian business persons would visit Japan to have a first-hand experience of the country and its business practices. Even in today's digitally networked environment, real time meeting between potential partners is welcome. Similarly, Japanese businesses should travel to Indian cities other than the major metros because there is vast unexplored business potential in the smaller towns across India. Language is still a barrier to a certain extent in the India-Japan business scenario. Though more and more Indians, with their innate affinity for languages, are picking up Japanese communication skills, Japanese nationals too should take up English language skills. Participation in relevant Japanese international trade fairs is one way to initially identify potential business partnerships. JETRO with its extensive network (comprising 74 offices in 55 countries and 45 offices in Japan) helps companies do business with Japan. We also welcome international companies to Japan with open arms. JETRO's Invest Japan Business Support Centre's (IBSC) is a one-stop centre for establishing a business base and starting your business in Japan. Indian companies and entrepreneurs are most welcome to explore Japan as an investment destination. Further details of our activities can be accessed at www.jetro.go.jp. **MMI**

Source: JETRO



The interview was conducted by:
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Innovating for the Future

Accurate Gauging & Instruments Pvt Ltd was established in 1987 to focus on the digital age of metrology products. Since its inception, the company has focused on the indigenous development of 3D co-ordinate measuring machine (CMM) for realizing the futuristic need of the industry. Managing Director, Accurate Gauging & Instruments Pvt Ltd, Vikram Salunke takes us through the company's journey so far.

Based in Pune, Accurate Gauging & Instruments Pvt Ltd (AG&I) has pioneered the manufacture of quality measuring instruments in India. The company offers a comprehensive range of 3D co-ordinate measuring machines (CMM), auto gauging stations, air gauges, standard room products, measuring machines, calibration masters and tool pre-setters and its services include third party inspection and NABL accredited calibration services to cater to the needs of industry.

The organization presented its first CMM at the IMTEX in 1991, which was later delivered to the Central Railway Parel workshop. Following this milestone, the company not only gained several contracts but also won awards. Managing Director, Accurate Gauging & Instruments Pvt Ltd, Vikram Salunke asserts, "Thanks to the confidence shown by HK Firodiya, our company supplied one of its first five machines to ZF Steering Gear in Pune and to Mico (now Bosch) in Nasik. For this development, the in-house R&D center at Accurate Engineering received its first National R&D award in 1994 at the hands of the President of India."

Early beginnings

In its early years, the company developed an air bearing technology and designed the

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structure based on its earlier experience in the field of air gauging and fixtures. However, it was still dependent on its suppliers for key granite components. Sometime, in 2002, the company acquired facilities of a well known Italian company, Poli, and relocated its plant to Saswad near Pune. This acquisition helped Accurate Gauging develop high-precision ground and hand lapped granite guides for the next generation CMMs. Today, Accurate Gauging



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The company's facility in Saswad near Pune.



CMM Assembly Shop.



Source: Accurate Gauging & Instruments Pvt Ltd

can hand finish granite parts for geometric accuracies of less than 1 micron/meter.

The company has one of the best vertically integrated manufacturing facilities in India. Salunke advises, "From pre machining of granite parts to finish lapping, micro machining of air bearings, paint shop to final calibration everything is housed under one roof at our facility in Saswad that is spread over five acres of land. We have an advanced climate controlled facility with a built-up area of approximately 50,000 sq ft. This facility also houses the mineral casting facility for casting machine tool beds set up with Swiss know how."

The premises are continually upgraded to allow for world class quality and inspection. "Every year a major part of our investments go in to reducing uncertainties of calibration set up used by us. Investments are made in the advanced laser calibration set up, ball bars and error compensation devices built-in advanced carbon fiber materials. We are also investing in R&D for new products and process to ensure that our technology is constantly upgraded and stays in line with the expectations of our customers," avers Salunke.

With its in-house manufacturing capability, the company took up greater challenges every year and received orders from prestigious customers like Bosch, TATA, BrahMos Aerospace and ISRO for the bridge type measuring machines. The feather in the cap was when Accurate successfully executed the order for a Horizontal arm measuring machine to Comau and later to Volkswagen facility in Pune. Another feat was to be able to supply a high accuracy bridge CMM to the latest and most advanced facility of GE in India.

Bridging the need gap

Accurate brings out innovative solutions for the global market. Speaking about how the organization gauges the need gaps in the industry and hence tries to bridge these gaps, Salunke states, "Over the past 30 years, Accurate has developed a very close knit network of global expertise in the field of metrology. This enables us to bring in the expertise required while designing new solutions." He also attributes participating in international shows as another way to stay tuned to the advances in technology.

Global footprint

AG&I exports to over 32 countries and hence its facility has to develop products of international quality as well as those that stand out from the rest. Reminiscing on how challenges helped the company establish its mark in the globe, Salunke asserts, "We received a challenge from our Swiss customer to build the first ever Gantry CMM. It was a difficult task but we managed to successfully accomplish it, and this helped us build a trusting customer base in western markets." The challenge turned out to be a blessing in disguise for AG&I and a chance for them to showcase their capabilities.

Speaking on the other challenges faced in different parts of the world, he adds, "Currently, we export our machines to USA, Europe, parts of Asia and Middle East. One of the challenges to develop a profile in the export market is brand recognition. As one of the late entrants in the field, we have to invest significant efforts to develop good distribution and after sales service channels. Owing to relatively low volumes, the pricing of our inputs remains on the higher side as compared to the global competition.



"We invest in R&D for new products and process to ensure that our technology is constantly upgraded and stays in line with our customers' expectations."

Managing Director, Accurate Sales & Services Pvt Ltd, Vikram Salunke

Additionally, we have to strike a good balance between the services we offer and the cost of the machines. All of these aspects are looked at constantly to prove that we are a world class manufacturing entity."

The company recently delivered a Gantry CMM to a supplier of structural parts to Russian aircraft company Sukhoi. Salunke informs that the entire experience of dealing with a veteran customer in the field of metrology was very challenging. "We are all very excited that we met this challenge with flying colors! We hope to bring these products to Indian companies like HAL, BHEL and Indian railways to meet their advanced needs on the measurements in near future," he adds.

Innovating for tomorrow

AG&I is continuously evolving so that its customer too can evolve and bring about innovation. "Industry 4.0 is inevitable, and in order to help our customers that are working on Industry 4.0, team Accurate realized the need of the industry to have measuring machines close to the manufacturing area. Recognizing the challenges to address this need, the design team once again came up with its latest launch of the XT 400, a machine built on high precision LM guides instead of conventional air bearings with an accuracy of 2.9 Um," states Salunke.

This innovation was recognized as one of the top 20 innovations in the country by the DST Lockheed Martin India innovation program in 2016. This innovation is now selected for support under this program for its commercialization in USA. One thing is certain for AG&I—Innovation doesn't stop!

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Precision Machining and Grinding facility in the Plant.



Source: Accurate Gauging & Instruments Pvt Ltd



Recognizing and leveraging opportunities in the midst of volatile, uncertain, complex and ambiguous environment will determine who succeeds and who fails.

Adaptive Measures for Success

It is said that the only constant in the world is change. Any anyone who wants to survive needs to adapt to change. This is especially true for businesses as the market scenario currently is undergoing continuous changes. Here's taking a look at the volatile, uncertain, complex and ambiguous (VUCA) environment and potential ways in which one should be prepared and ready to adapt.

According to Chief Advisor, Champions for Societal Manufacturing (CSM), Prof Shoji Shiba, the VUCA environment has been long time coming. He avers, "Former CEO of Intel, the late Andrew

Grove, one of the best known CEOs in US had predicted VUCA business environment way back in 1996. In his famous book 'Only the Paranoid Survive', he mentions that we are in the age of 10X or drastic change. This 10X change in society in essence the same as what we are now calling the 'VUCA world'. The book symbolizes how to survive under the 10X change in society. He advises that one needs to observe with an open mind and pay serious attention to the business envi-

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Adaptive Measures



ronment 'like the paranoid' to survive in this environment." However, Shiba is the first to point that before looking at this solution, introspection is necessary. He continues,



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“There is one very important issue before we start observing with an open mind and paying serious attention to the surrounding like the paranoid and that is to identify our unchanging identity. If you have no identity for your unchanging element, then you will not be able to leverage on the opportunities that exist in the VUCA environment. Once you strongly identify yourself what your unchanging element is, you will be flexible to change and see the reality of the situation. Otherwise you will tend to stick to your current or past experiences and not be able to see something that exists beyond VUCA.”

Identity analysis

This brings us to the question—how does one identify our unchanging identity? There is no general solution to this question. Prof Shiba asserts, “I can share what I do. I ask myself three questions before taking any daily decision—Where do we come from? What are we? And where are we going? This is the key to adaptability and sustainability.”

VUCA challenges

Volatility and uncertainty is a norm in today's world. There are a number of factors at play. Speaking on the same, President, IMTMA, and Managing Director, Jyoti CNC Automation Ltd, PG Jadeja advises, “One of the factors is the economic scenario and growth. Another is the demand and

supply gap. Further to this, there are the increasing expectations of the customer and the ability to meet the same wherein technology plays a vital role. The challenge is to keep oneself abreast by identifying new strategic leadership opportunities. We need to have our feet placed firmly in the local market, and simultaneously we need to act on a global scale.”

Aligning strategies

It is important for Indian companies to change the way they adapt to the current environment. Winners in such environments are those who are extremely agile and can anticipate key trends and ride them. According to Prof Shiba Indian companies or managers tend to look at their business in the limited sense of



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"Organizations need to capitalize on opportunities presented in the VUCA environment."

**Director General, IMTMA,
V Anbu**



"The challenge is to keep oneself abreast by identifying new strategic leadership opportunities."

**President, IMTMA, and Managing Director,
Jyoti CNC Automation Ltd, PG Jadeja**



"Where do we come from? What are we? And where are we going? This is the key to adaptability and sustainability."

**Chief Advisor, Champions for Societal
Manufacturing (CSM), Prof Shoji Shiba**

production. He calls this the 'small m' mindset—where 'm' refers to manufacturing. "The manufacturing process has several other aspects—design, research and development, sales and supply chain, to name just a few. This is typical to all the companies in India irrespective of their sector. It therefore becomes important to look beyond the narrow production process," he opines.

There is a need to expand this thought from 'small m' to 'BIG M', where 'Big M' refers to everything under the umbrella of manufacturing and the society. Prof Shiba advises, "It is very important to create a massive number of internal business strategy experts who would be able to vertically integrate the various aspects of business. This would help in overcoming the silo structure of functioning. This is another dimension of Big M approach. Together, these two aspects play a critical role in enabling managers to identify and work towards priorities with respect to a changing environment. A companywide implementation would not just help in shaping and aligning strategies but also create leaders within the company who understand and implement them."

Leveraging opportunities

Agreeing with Prof Shiba, Director General, IMTMA, V Anbu adds, "Doing business in a VUCA World is a challenge. Organizations need to capitalize on opportunities presented in this environment. India's 'Make in India' initiative is one such opportunity to take the country's economy on an upward growth trajectory."

Anbu further suggests that by focusing

on technology development through centers of excellence, Indian machine tool builders can develop high-tech machines indigenously and reduce imports and hence help with sustainability. "Companies also need to develop a detailed understanding of emerging markets and the specific requirements of their customers. The industry also needs to explore possibilities of acquiring foreign technology and entering into joint ventures with international machine tool builders. This will help Indian manufacturers to gain access to high-end technology and new global markets. Export promotion through Indian Engineering Brands in overseas exhibitions must be given a thrust. This will result in cost effective presence in export markets for Indian engineering firms and give a fillip to manufacture and export of advanced machine tools as well," he states.

Speaking on the current fluctuating economy and recommending counteractive measures for the machine tool sector, Jadeja affirms, "Various steps can be taken towards helping organizations attain sustainability. One can look into developing advanced technology for futuristic applications through contracts given by users in strategic segments. Another avenue that needs to be explored is the acquisition of technologies from overseas.

The government could also include machine tools in the list of items for meeting offset trade obligation. Measures such as these will bode well for the industry and give major thrust for export of machine tools from India in the future."

Enabling competitiveness

Indian Machine Tool Manufacturers'

Association (IMTMA), since its inception, has kept its focus on helping the machine tool industry grow abundantly. In this particular climate, too, the association is at the forefront in assisting both the government as well as its members to strengthen the backbone of this sector. Advising on the association's achievements so far, Anbu divulges, "IMTMA's sustained advocacy with the Government of India yielded positive results in the government reducing customs duty from 7.5 per cent to 2.5 per cent on critical components for the machine tool industry. Under the DHI scheme, a Centre of Excellence for Production Technology has been set up at IIT, Madras, called 'Advanced Manufacturing Technology Development Centre'. Establishment of a machine tool park by Government of Karnataka will make the machine tool sector more competitive by providing an ecosystem for development of cost effective technologies."

Adding to this, Jadeja says, "To leverage our global understanding, technology and knowledge and provide the best possible solutions in these times, IMTMA organizes events such as the Vision 2020 Conclave (for apprising top management of the machine tool industry on long-term vision strategies), the Symposium on Smart Manufacturing (for encouraging the industry to adopt automation in manufacturing process), the Machine Tool Industry Summit (for helping companies to thrive in a VUCA world), etc."

In a nutshell, it is about seeing all experiences as learning opportunities and continuously re-examining the current ways of doing things. That is how organizations will thrive in a VUCA World!

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Leadership plays an important role in the success of any organization. Read on to know how industry stalwarts define leadership and the way it paves the roadmap to sustainability and growth.

As all of us have varying personalities, it is understandable that the way we look at leadership also differs. However, one common point that can be agreed upon is that the type of leadership style employed decides the outcome of how the organization journeys to its growth potential.

Qualities for growth

Managing Director, Wirtgen India, Ramesh Palagiri avers, "A leader should have long term strategic vision with short term execution skills. This would ensure and accelerate the growth of a company." Agreeing with this sentiment, and elaborating on the qualities a leader must possess, Managing Director, VDMA India, Rajesh Nath adds, "As a leader, one must listen...a lot! A leader must be willing to work, to understand the needs and desires of others. A leader asks many questions, considers all options, and leads in the right direction. He also works to be the motivator and initiator, and must be a key element in the planning and implementing of new ideas, programs, policies, events, etc. Furthermore, a good leader realizes that he cannot accomplish everything on his own. He will

know the talents and interests of people around him and thus delegates tasks accordingly. He recognizes the potential of people and tries to harness them."

Dynamic decisions

The world is moving faster than ever. Managing Director, Jungheinrich Lift Truck India Pvt Ltd, Manojit Acharya adding to this opines, "Management and leadership today have moved far away from the 'century old routine'. Whether this change has resulted in the dynamic organizational behavior or the sea change in organizations behavior has prompted this change to happen can be a matter of debate. Organizations and team members today have become far more dynamic. It is not uncommon nowadays to have team members question or even challenge the decisions of the leader. In such scenarios, it is natural for the leader to also be dynamic in ways of managing the teams."

Every company is confronted with constantly changing scenarios on which we as managers very often only react but it would be better to be proactive. Gone are the days when a one-size-fits-all solution can work to bring about profitability and sustainability. "Therefore, in our communication to our employees we have to mention all the time that changes are inevitable and a changing environment is the

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Leading the Way!



norm not the static one. Companies have to continuously monitor their business environment, foresee upcoming changes and redesign our strategies," asserts Managing Director, Karcher India, Ruediger Schroeder.

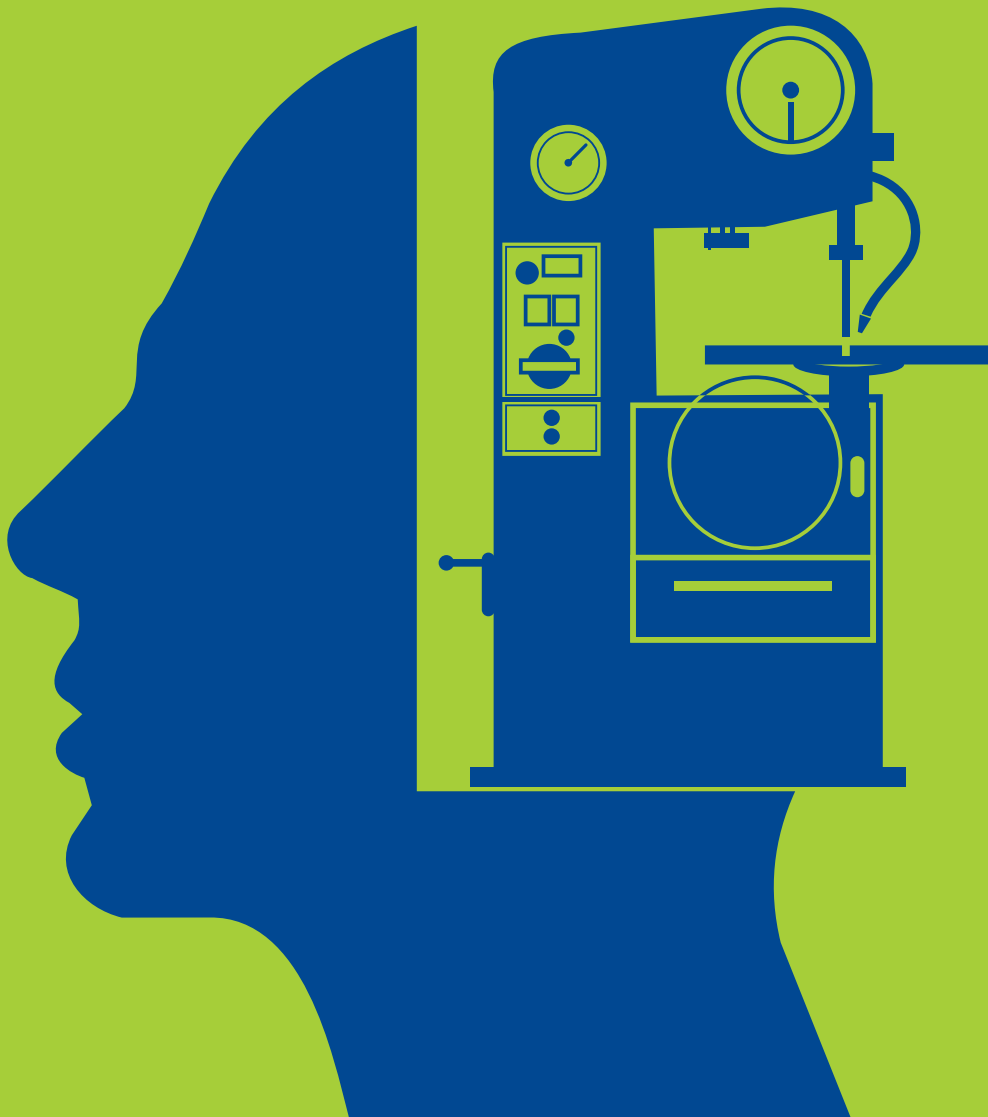
Elaborating further on how these thoughts change the way one leads, President, Baumuller India Pvt Ltd, Jitendra Joshi states, "I am a thorough believer of situational leadership. This means, that there is no single 'best' style of leadership. Leadership style needs to be task-relevant, situation based. Cognizance of the characteristics of the individual or team being lead is taken while choosing the style. Speed in thoughts and agility in action are the basic ethos of my team."

Communication is key

The one element that seems to resonate is the importance of keeping communication simple and transparent. "In our company we lay emphasis that the colleagues are aware of the various activities being undertaken by the company. Through the weekly meeting the



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"Each team member is an integral part of the organization and is equally responsible for its success or failure."

**Managing Director, VDMA India,
Rajesh Nath**

activities/projects are discussed in detail and responsibilities identified. After that the colleagues are given a free hand to complete the assignments," comments Nath.

Open communication is important throughout all levels of the company, Schroeder emphasizes, "We are trying to communicate our key topics and challenges to all levels of the company. As MD, I visit our branch offices at least three times per year and always have a meeting with the whole team where I address general topics of the company as well as local issues. Also the team has the possibility to ask questions or make suggestions for improvements. It is imperative that communication is not only a one-way street! Your employees must have the possibility to communicate to their managers but also to the MD at any time with any topic. I have in addition an open door policy which works out quite well."

However open the lines of communications, challenges will also arise in the way organizations choose to communicate. Acharya expresses, "Like in any other organization, we also have our set of challenges related to communication. The employees always feel that there is not enough communication from the management. The



"Good communication and interpersonal skills can help solve many conflicts of interest."

**Managing Director, Wirtgen India,
Ramesh Palagiri**

dilemma for the leaders is to evaluate which communication needs to go to which levels in the organization and what do they interpret from the communication."

Joshi in agreement with this threw light on the issues that arise with inadequate communication. He discloses, "There have been multiple scenarios wherein we had to sort out issues arising out of insufficient and incorrect communication. We believe that communicating important things through multiple communication channels is important. We have institutionalized various platforms for discussing and tracking every week important parameters such as quality, order position, project management, delivery lead times, etc., where team members could track their individual performance vis-à-vis organizational benchmarks." Seconding him Palagiri voices, "Good communication and interpersonal skills can help solve many conflicts of interest."

Motivation is key!

One other aspect of a good leader is to motivate his people. Palagiri affirms, "Identify the right talent, give them clear measurable targets, and then empower them to take decisions." The basic motivational philosophy



"Extraordinary performances have to be celebrated and communicated as examples also with some extra bonuses."

**Managing Director, Karcher India,
Ruediger Schroeder**

of any organization towards its members should be to help them get what they want. "I strongly believe that if team members are to develop this healthy self image within an organization, a leader must follow five basic rules: Do what's right, do the best you can, treat others as you'd like to be treated, exhibit a positive attitude and expect the best at all times. As a leader, I try to lead by example. In my opinion excitement is contagious. When the leader is motivated and excited about a cause, the team would be more inclined to follow," reveals Nath.

Another aspect of motivation is encouragement and acknowledgement, which should trickle down from the top. Schroeder conveys, "The company vision, the company targets and the individual targets have to be communicated as well as the achievements, which I think are one of the most critical success factors. Empowerment, trust and performance feed-back are then further elements to motivate the team. Competition where possible is helpful but only if the team spirit is not lost, we don't want employees who just 'fight' for themselves. Extraordinary performances have to be celebrated and communicated as examples also with some extra bonuses."

According to Acharya, motivation stems from attitude. "If the leader is enthusiastic, excited and motivated about the cause and company, the team too will be inclined to follow. One must also recognize the efforts of others and reinforce action. This keeps the group energized and result oriented. And finally, one should take decisions based on conviction and follow it through with confidence. Confidence and respect cannot be attained without leadership being consistent."

In line with motivating comes competition, but competition should be healthy. Joshi concludes, "Compete not just with competition but also with self to improve one's performance."

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"If the leader is enthusiastic, excited and motivated about the cause and company, the team too will be inclined to follow."

**Managing Director, Jungheinrich Lift Truck
India Pvt Ltd, Manojit Acharya**



"No single 'best' style of leadership. Leadership style needs to be task-relevant, situation based."

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The combination of the air bearing spindles and ultra-fine balanced SCHUNK TRIBOS polygonal toolholders provides for immediate brilliant results in the production of coin punches.

A Perfect Finish as Part of the Milling Process

Straightaway to a perfect finish and perfect quality: What in the past would have been hardly conceivable in milling is now becoming a regular trend owing to modern machine concepts and tools. The number of precision applications in which milling is no longer followed by grinding, polishing or eroding is growing continuously. In these applications, the toolholding systems perform several tasks: they ensure exact run-out accuracy of the tools, compensate vibrations, and guarantee both high geometric precision and perfect surface quality.

Whether in the watch and clock industry, machine making or medical technology: in virtually all machining disciplines, companies are

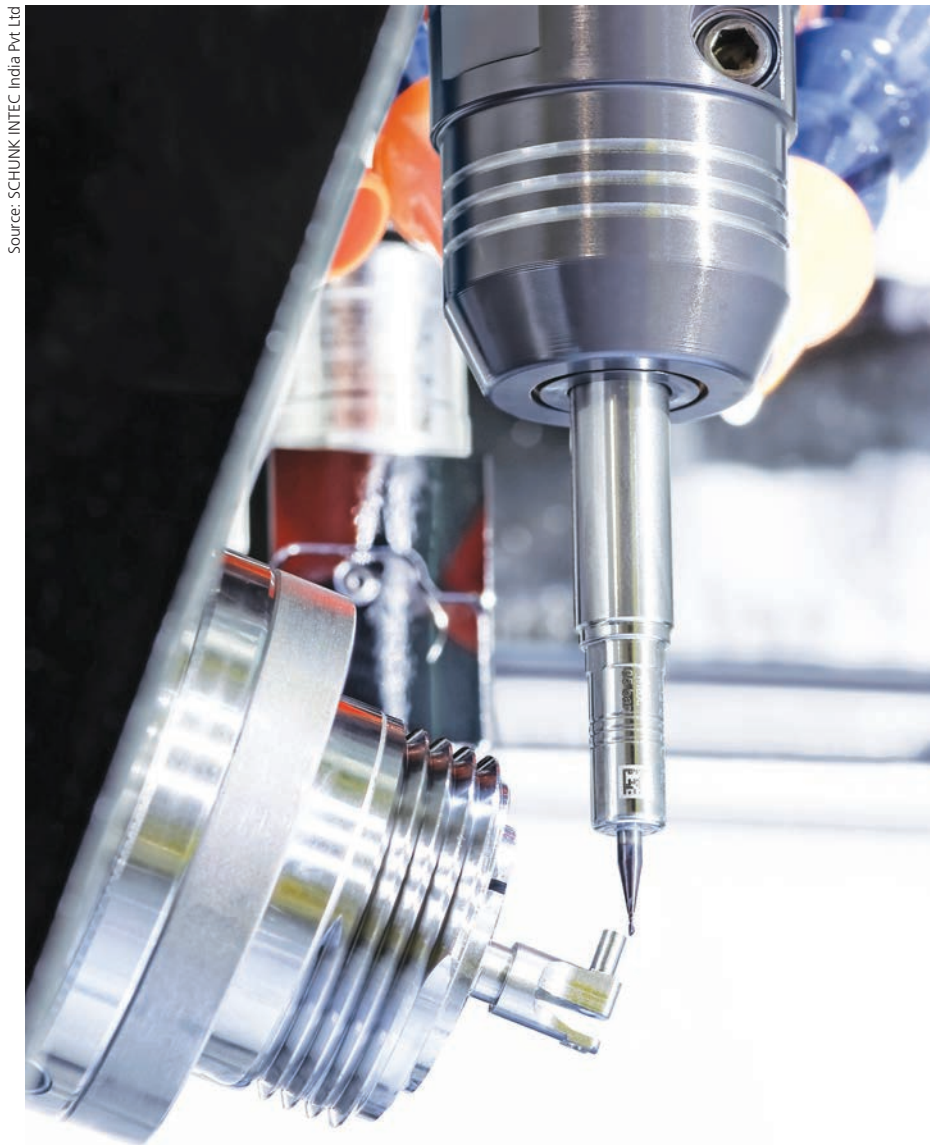
Heinold Kostner
Head of Product & Portfolio Management for
Clamping Technology
SCHUNK GmbH & Co KG
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searching for efficient ways to streamline processes. Especially manufacturers who use ultra-precision machining processes, in which the engravers and finishers put the final touch on surfaces by hand, are pioneers in this respect. In view of machining times of up to 100 hours for a single workpiece, investments in innovative machine concepts, air bearing spindles, and modern

tools pay off quickly—assuming the high precision of the machine is retained all the way to the cutting edge. The toolholding systems play a decisive role in this connection.

Mirror finishes with precise geometry

The levels of quality that can be achieved with precision machining nowadays



For the production of medical instruments, this application combines SCHUNK TENDO E compact hydraulic expansion toolholders with SCHUNK TRIBOS extensions.

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A Perfect Finish



fascinate even experienced users. Often the quality that can be achieved is equal to the results of eroding, grinding, polishing or laser-beam machining, yet much faster and therefore more economical. Test series with an aerostatically surface guided ultra-precision machining center at the ETH Zürich show that a consistent surface quality of $Ra < 25$ nm can be achieved with line-by-line milling, and $Ra < 3$ nm with

surface milling. These levels of quality correspond to polished surfaces, and also exhibit high-precision geometry. While injection molds for high-gloss plastic parts in the past were first milled and then finished using an intricate polishing process; today it is possible to produce objects with extremely flat and smooth surfaces during the precision machining process. The effect is even more pronounced in the case of non-ferrous metals: through milling alone with diamond tools, it is possible to achieve geometrically precise mirror-finish surfaces that are suitable for use in laser optics, for example. The result is a combination of several effects: the time-consuming process of finishing is reduced significantly, while reducing the risk of convexities occurring or corners being



The SCHUNK TRIBOS RM precision toolholder is also available in an ultrafine balanced version with a balancing grade of G 0.3 at 60,000 rpm.

rounded during grinding and polishing.

Wear-free clamping

Conventional toolholding systems, such as collet chucks or heat-shrink toolholders, are generally not capable of such demanding machining tasks. Users repeatedly complain of chatter marks, damaged tools, imprecisions in the workpiece and concentricity errors, which are caused by minute contamination of the clamping faces. However, SCHUNK TRIBOS polygonal clamping technology features special properties: even the standard version of the patented technology from SCHUNK, the competence leader for clamping technology and gripping systems, achieves run-out and repeat accuracy of < 0.003 mm with an unclamped length of $2.5 \times D$, and a balancing grade of G 2.5 at 25,000 rpm. Since TRIBOS polygonal toolholders have no moving parts, they are not mechanically sensitive, and therefore ensure virtually maintenance-free and wear-free clamping. Even after several thousand clamping set-ups there is no material fatigue. In addition, they feature excellent vibration damping. With a hydraulic toolholder, tool change is achieved with minimal cleaning within a few seconds, to ensure a stable process.

Depending on the type, the toolholders, which are suitable for all tool shanks in h6 quality, have been tested at speeds up to 205,000 rpm. Even tools with very small shank diameters starting at 1 mm can be clamped and changed while maintaining process stability.

Owing to the high demand from companies in micro mold making, the optical industry, medical technology, and



Source: SCHUNK INTEC India Pvt Ltd

In mold making, the combination of ultra-precision machining centers and SCHUNK TRIBOS polygonal toolholders achieve perfect surfaces.

the coin, clock & watch, and jewelry industries, SCHUNK has recently expanded its standard product line to include ultra-fine balanced SCHUNK TRIBOS polygonal toolholders. Since then, the TRIBOS-Mini and TRIBOS-RM series with the interfaces HSK-E 25, HSK-E 32, and HSK-F 32 starting with clamping diameters of 0.5 mm are also available with a balancing grade of G 0.3 at 60,000 rpm.

The ultra-precision toolholders offer outstanding features for implementing the most demanding tasks with respect to dimensional stability and surface quality. Compared to conventionally balanced toolholders for micro machining, the tool life is also improved.

Reduction of chatter marks in volume machining

That toolholders also have a significant effect on the surface quality in volume machining was confirmed in a study by the wbk Institute for Production Technology in Karlsruhe, which was conducted under the supervision of Prof Dr-Ing Jürgen Fleischer and presented in the year 2014. Different toolholders were tested in full slot and half slot milling on several machines. It was demonstrated that the SCHUNK high-performance hydraulic expansion toolholder TENDO E compact achieves up to 300 per cent longer tool life than a comparable heat shrink holder.

Especially noteworthy, with only one

exception, the SCHUNK TENDO E compact hydraulic expansion toolholder always achieved better surface qualities than heat shrink toolholders. The deeper the grooves, the stronger was the effect of chatter marks. The damping properties of hydraulic expansion technology results in longer tool life as well as significantly better surface quality. Even at an identical surface quality, it is possible to achieve higher cutting and feed rates.

Effective double for 5-axis machining

For high-precision 5-axis machining SCHUNK TENDO E compact hydraulic expansion toolholders, and SCHUNK extensions can be combined to produce extremely effective clamping units. In the case of minimal interfering contours the hydraulic expansion toolholders provide strong support for the extensions while damping the vibrations that occur during machining.

The combination of run-out accuracy, and vibration damping protects the tool cutting edge, lengthens the tool life and provides for brilliant workpiece surfaces. For stable tool change, TENDO hydraulic expansion toolholders require only a conventional Allen key; for TRIBOS SVL, a simple, manually actuated clamping device is sufficient. The entire clamping process is completed within a few seconds. Both clamping devices are maintenance-free and insensitive to impurities. **MMI**

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Rough Boring Tool Cuts Challenging Material

By using Sandvik Coromant's DuoBore 821D rough boring tool, Excelco/Newbrook Inc. increased feed rates and saved shop production time cutting Nitronic 40 for aerospace work.

In high-stakes aerospace applications, a nearly complete workpiece is worth more than a decent-sized home in virtually any suburb, tooling can be critical to a shop's success. Excelco/Newbrook Inc (ENI) of Silver Creek, New York, was at a crucial juncture, having tried every boring solution

it could think of, when it called in cutting tool supplier Sandvik Coromant (Fair Lawn, New Jersey). Using the company's rough boring tool, ENI says it was able to double its feed rate and finish the part 90 per cent quicker than it could with its original process.

In business since 1947, ENI fabricates complex aerospace and defense equipment for clients such as Lockheed Martin, Boeing, Northrop Grumman and General Dynamics. It specializes in titanium, Inconel, Hastelloy and other metals equally difficult to machine. Much of this equipment is deployed in such critical-use applications as nuclear propulsion systems, undersea systems, and deep-space

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Rough Boring Tool



equipment, and all are made to demanding requirements.

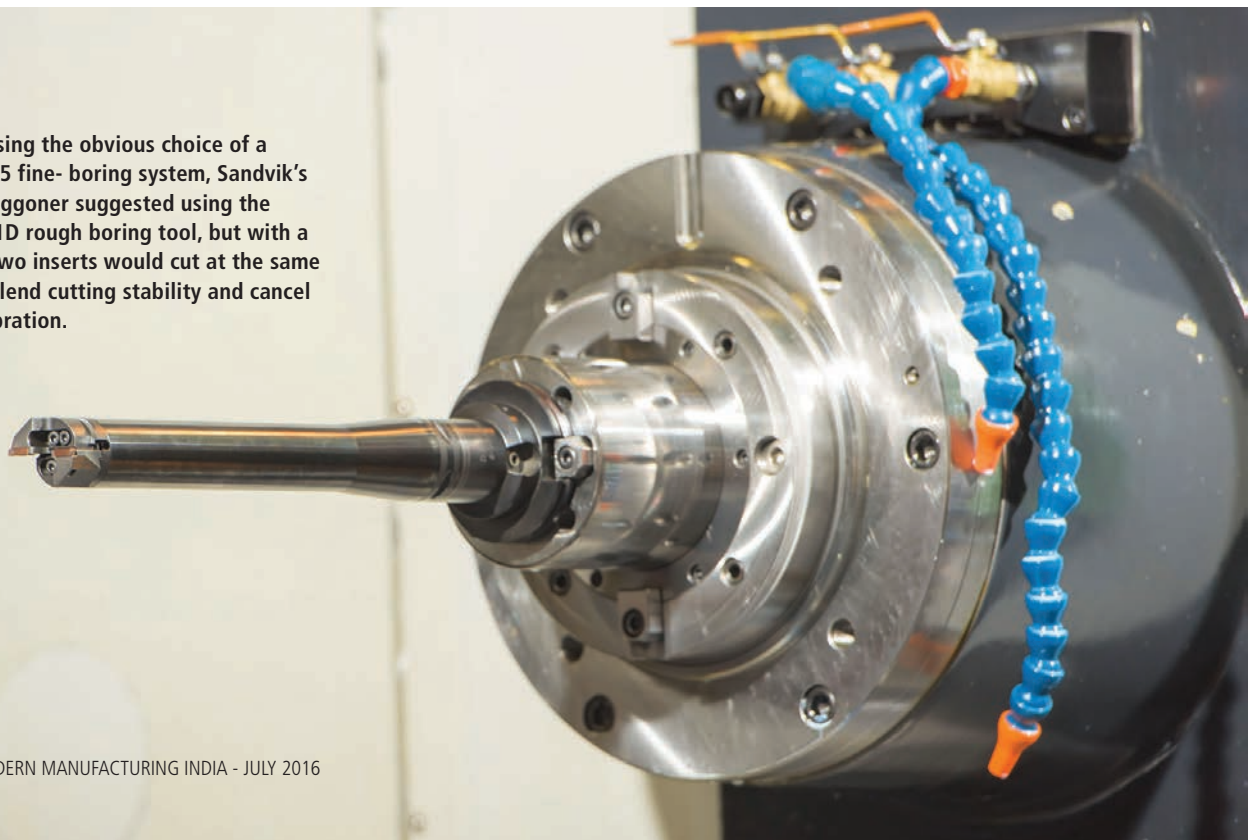
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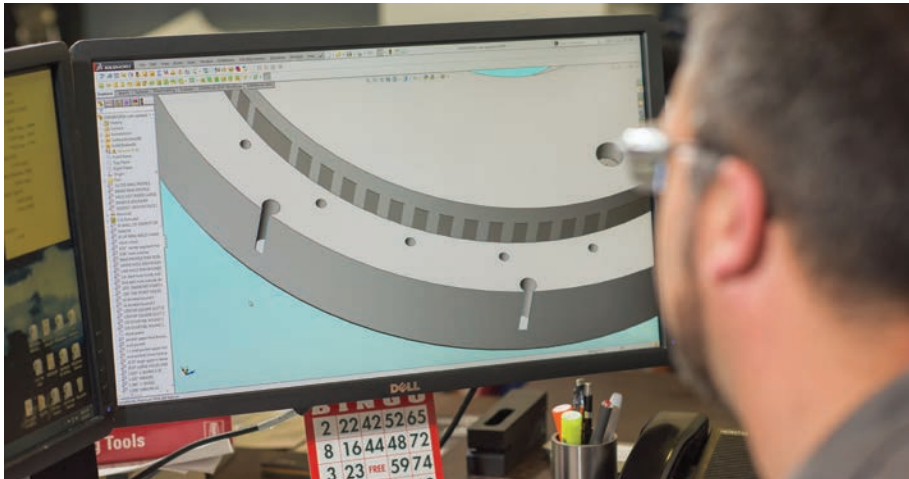
At first glance, the shop floor might appear fairly typical, even though most of its equipment is large: a handful of boring



Emily Probst
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Instead of using the obvious choice of a CoroBore 825 fine-boring system, Sandvik's Christian Waggoner suggested using the DuoBore 821D rough boring tool, but with a twist—the two inserts would cut at the same diameter to lend cutting stability and cancel potential vibration.





The most difficult operation was drilling 50 flat-bottom holes measuring 1.9 inches in diameter by 6 inches deep, situated around the periphery of the workpiece. Each of the holes breaks into a matching slot milled through the part's OD, forming an outward-facing-C shape.

Source: mmsonline.com

shape that makes for a severely interrupted cut. Worse, the hole tolerance is $+0.002/-0.000$ inch on the diameter, with true position accuracy within 0.010 inch. It was enough to keep any seasoned machinist awake at night, Penkaty and Dorman say, and they were no exception, "You are not working with much tolerance, and with that kind of material, there is no room for a mistake."

The operation took 80 hours per part. Each hole was roughed out with a spade drill, followed by a modified drill to flatten the bottom of the hole and successive passes with a boring bar prior to milling the slot. "Because of the hole depth, we had a lot of problems with taper," says programmer Dan Kreamer. "Also, there is a boss at the top of the hole we have to work around, so the boring tool sticks out around 11 inches from the spindle face. Everything works against us on this part."

In detail...

mills, one of which is big enough to machine a semitrailer; lathes capable of turning shafts 6 feet in diameter and nearly three times that in length; a flying-bridge waterjet; an assortment of high-tech welding equipment; and a number of super-sized CMMs and 3D gaging arms to measure the shop's output.

Despite these capabilities, ENI recently ran up against a job that tested the shop's machining mettle—a large, precision closure head in excess of 70 inches in diameter and 18 inches thick made of Nitronic 40, a very challenging material to machine. The high-strength, corrosion-resistant stainless steel is typically used in chemical processing, nuclear-containment systems and a variety of aircraft engine components. According to the American Steel and Iron Institute (AISI), this stubborn superalloy carries a machinability rating of 22—comparable to Waspaloy or Nickel 600, and far tougher than most 300-series stainless steels. According to ENI, it requires a heavy feed and rigid tooling, and it will work-harden if you give it half a chance. In short, Nitronic 40 is a real bear to cut.

Hurdles

Operating a Doosan Infracore DBC 130 horizontal boring machine, machinists Dale Penkaty and Troy Dorman spent weeks working across two shifts to get the closure-head parts completed. One operation in particular posed a significant production challenge: boring a series of 50 flat-bottom holes measuring 1.9 inches in diameter by 6 inches deep, situated around the periphery of the workpiece—like holes drilled in the face of a giant soup can.

Each of the holes breaks into a matching slot milled through the part's outer diameter, forming an outward-facing-C

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Once the slot was milled, a final boring pass was needed to bring the hole to its final diameter. Boring can be a challenge under the best machining conditions, especially with blind holes. The chips tend to pile up in front of the tool, and hitting the bottom of the hole can spell disaster. The closure head took boring to a new level of difficulty—between the interrupted cuts and the Nitronic's poor machinability, ENI's machinists were forced to index the finishing insert after every hole. This meant they had to back off the boring head, take a test cut, measure and adjust until the correct diameter was achieved.

At this point in the machining process, the workpiece was nearly complete, but with the production backlog mounting behind this stalled job, ENI's production crew knew they had to find a better boring solution. They tried different carbide grades and insert geometries, a range of feeds and speeds, larger and smaller nose radii, but nothing worked.

Kreamer suggested they give Sandvik Coromant a call. The team had worked with Sandvik's Christian Waggoner in the past and, based on his recommendations, were having good luck on a similar, yet smaller, application.

Waggoner visited the facility, observed the machining operation and spoke with the machinists. Considering the part



Machinists Dale Penkaty and Troy Dorman operate the Doosan Infracore DBC 130 horizontal boring machine where the closure head was machined. With Sandvik's tooling, the men could complete a part in a single shift, a 90 per cent time savings compared to the previous process.

tolerance, conventional logic said he should recommend a CoroBore 825 fine-boring system. With the ability to adjust boring diameter in increments of 0.002 mm (0.00008 inch), a cartridge-style insert and a system size range to handle most anything ENI could throw at it, the 825 should have been the tool of choice, and would have surely provided the accuracy and repeatability needed to complete the holes in a reasonable amount of time.

But that is not what he did. The problem, he explains, is the interrupted cut. With the 825's single insert, every rotation of the spindle takes the insert in and out of the cut, creating harmonics and tool vibration sure to destroy even the best of carbides. Given the interrupted nature of the cut, and considering the need to bore 50 holes per workpiece, Waggoner decided to take a different approach and recommend the DuoBore 821D rough boring tool.

The solution

Designed as a roughing tool, the 821D carries two cutting inserts, each 180 degrees apart. Under normal use, one of those inserts is set to a slightly smaller diameter

than the other and shimmed to sit a few thousands ahead, thus creating a step-boring effect at twice the feed rate of a single-edge boring tool. Waggoner knew that if he could set the two inserts to cut at the same diameter, each would lend stability to the other when it swung out of the cut, thus canceling any potential vibration. Also, because the 821D utilizes Sandvik Coromant's Silent Tool boring-bar shank, the harmonics generated by the interrupted cut and extended-reach application would be canceled.

He says it took some finagling, but Waggoner worked with ENI's machinists to set up a test fixture and map out a process to set the tool. With fingers crossed, the team took the first cut.

The results were astounding, Kreamer says. "You have to be careful when you set the tool, because the cut needs to be perfectly balanced. Even so, we finished the first part in a single shift, a 90-per cent time savings over the previous process," he says. In addition, they no longer have to index the insert after every hole. Instead of 50 insert tips per part, ENI now uses five to six, with minimal test cutting. "The tool is exactly where we expect it to be, every time," Kreamer says.

The collaborative problem-solving of both the production team and Waggoner helped the company create a sound machining process, reducing the shop's backlog by nearly one month. **MMI**



The boring tool sticks out around 11 inches from the spindle face, so reducing vibration during the boring process was critical.

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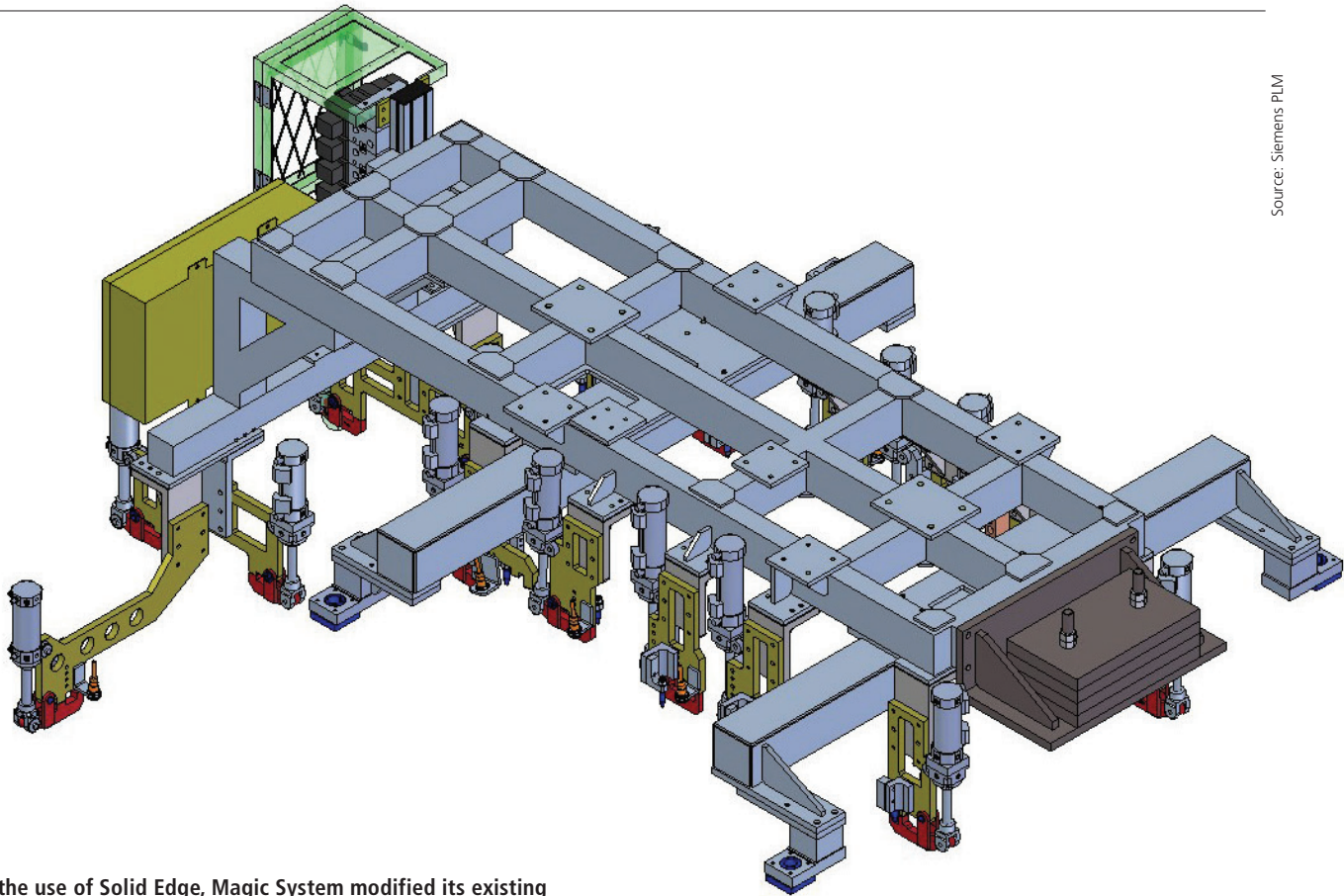
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Through the use of Solid Edge, Magic System modified its existing methods, thus achieving greater productivity.

Increasing Productivity

Automation design firm uses Solid Edge to enhance competitiveness and increase design productivity by 20 per cent.

Siemens PLM Software solution enables Magic System to standardize the process so it can effectively handle requirements of automotive companies.

Facing numerous challenges

Magic System is a design company that specializes in automation design, robotic systems, jigs and check fixture applications. As a design partner of Hyundai Motors, the company is a proven high value provider for the automotive leader's

automated design and jig design needs. However, the company had faced some issues. Increasing pressures to create designs in a shorter amount of time while satisfying market trends, compliance requirements and fast-changing consumer needs was a major challenge. Infrastructure was causing concern as the company had to manage a growing repository of design data. In addition, Magic System was experiencing significant problems using its 2D design system. Converting data was also problematic.

Worse, design projects were subject to constant errors throughout the process. The company also had difficulty understanding which products required precise design. This caused a decline in

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Increasing Productivity



drawing accuracy. Ultimately, the company had to hire outside services to meet its customers' requirements, which restricted its ability to build in-house design capabilities and provide value-added engineering services.

Changing the playing field

Magic System set a goal of creating an



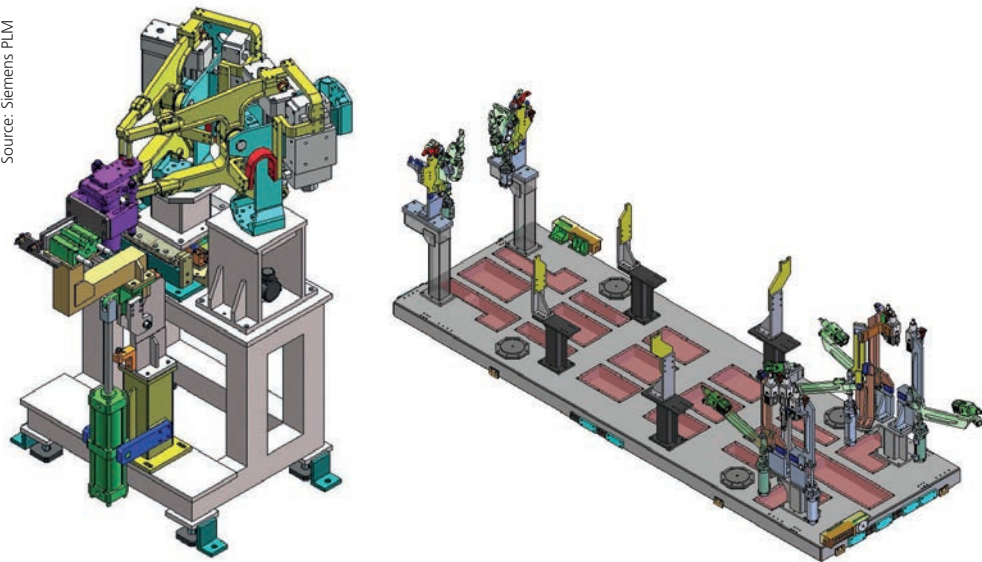
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"Magic System increased design productivity by 20 per cent with the implementation of Solid Edge."

Chief Executive Officer, Magic System,
Dong-bae Lee

Source: Siemens PLM



After evaluating the leading CAD tools, the company deployed Solid Edge software from PLM specialist Siemens PLM Software.

environment capable of responding to customers' requirements through in-house design expertise. This meant strengthening its skill sets, both in terms of people and technology. After evaluating the leading computer-aided design (CAD) tools, the company deployed Solid Edge software from product lifecycle management (PLM) specialist Siemens PLM Software. Solid Edge provides a seamless 2D and 3D design environment that supports a standardized design process as well as delivers a dedicated jig design application.

Siemens PLM Software provided Magic System with training services. Magic System first conducted training on Solid

Edge to advance the skills of its designers. The company then provided specialized training for using Solid Edge to create a design standard, including tailored training for jig design that enabled designers to directly apply their knowledge to their design work. "The use of Siemens PLM Software's Solid Edge has not only improved our design productivity, it has established the foundation for quickly responding to customer needs," says Chief Executive Officer, Magic System, Dong-Bae Lee.

Strengthening in-house capabilities

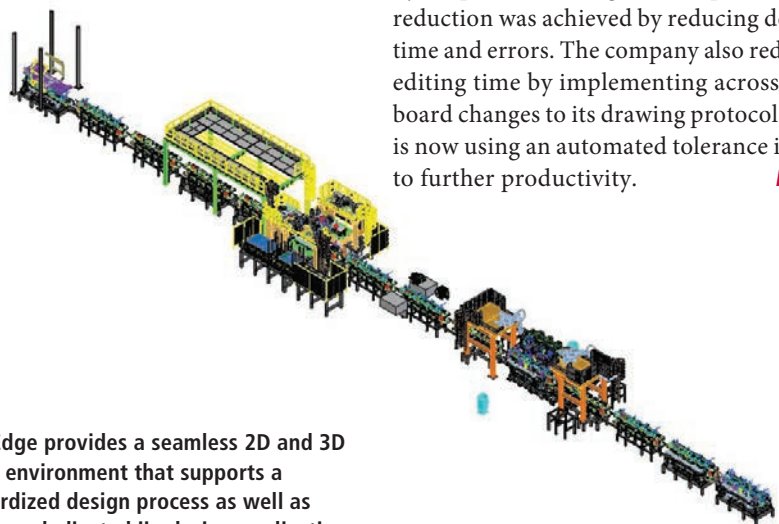
Through the use of Solid Edge, Magic System established a systematic design process. By modifying its existing methods, the firm achieved greater productivity. Value-added services are in place. Using the software's jig design capabilities, the

company now draws effective designs that meet the ever-more complex requirements of automakers. Today, the company has the infrastructure in place to readily respond to the requests of customers who need multiple products designed within a short time. Furthermore, Magic System's designers are now highly skilled and substantially more productive CAD users.

Magic System is helping its customers rapidly introduce competitive products across the global market. With the full rollout of Solid Edge, the company has garnered a new and important trust throughout its customer base. New business is on the rise. Lee notes, "Siemens PLM Software's representatives and Solid Edge software have helped strengthen our in-house design capability. We received expert training services on a very powerful design solution." Using Solid Edge, Magic System's design productivity has increased by 20 per cent. A significant part of this reduction was achieved by reducing design time and errors. The company also reduced editing time by implementing across-the-board changes to its drawing protocols and is now using an automated tolerance index to further productivity.

MMI

Source: Siemens PLM



Solid Edge provides a seamless 2D and 3D design environment that supports a standardized design process as well as delivers a dedicated jig design application.

Siemens PLM

Solid Edge

Challenges

- Convert 2D design data using CAD
- Improve design productivity and reduce errors

Solution

- Establish Solid Edge as a design standard
- Reinforce in-house design capability by supporting education and training services
- Standardize on Solid Edge design through education and training

Results

- Increased design productivity by 20 per cent by reducing design time and errors
- Reinforced design capability by implementing standardized process
- Built internal infrastructure that enabled quick design of multiple products

Replacing 3-Jaw Chucks

The KTR Group in attempt to its reduce idle and set-up times in production and to further optimize throughput time were looking for optimized clamping solutions. Hainbuch offered them solutions that provided all this and more. Read on to know more.

During the periodic replacement of the machines at the KTR Group, the clamping devices were also questioned. The requirements were significant improvements in set-up times and in the manufacturing process for handling chips and contamination. Some cases had negative effects on the appearance of the workpieces. In this backdrop, EMO 2013 was soon to take place in Hannover and the responsible people wanted to get an overview of the market. At this point in time, they had not been in contact with Hainbuch

as a manufacturer of the clamping devices. However, at the exhibition, it quickly became clear that the right solutions could be found from Hainbuch. In the meantime, KTR and Hainbuch had become close partners and had successfully optimized manufacturing step-by-step. The Hainbuch clamping devices had completely satisfied the requirements and offered additional advantages.

KTR is pursuing a course of growth and optimization

The family-run business with high-level research and development competence, which specializes in couplings, brakes, coolers, and hydraulic components for industrial applications, imposes the most rigorous

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Replacing 3-Jaw Chucks



Source: Hainbuch



In the hydraulic stationary chucks there is no longer any room for chips, and changing from O.D. clamping to I.D. clamping is quickly accomplished.

requirements on itself and on its suppliers. The most rigorous requirements particularly apply for the core business, couplings with diameters from 10 millimeters to two meters. Close tolerances and outstanding concentricity properties are demanded. Director-Production Management, KTR, Matthias Telker is responsible for process optimization at all manufacturing locations. Telker states, "To obtain the maximum, to deliver permanent quality of premium products, as well as being successful internationally constant improvements in all areas are unavoidable." KTR supplies companies around the world in the following industries: railway and transport, agricultural and construction machines, machine tools and automation, wind power, and is increasingly supplying to companies in the areas of marine engineering, smelting and foundry technology.

Off to new horizons

In 2013, there were extensive upheavals in manufacturing. The stipulations were to reduce idle and set-up times in production in order to further optimize throughput time. Consequently, Production Manager, KTR, Günter Schleyer was intensively involved with this topic. "Several machines were due to be replaced after reaching the limit of their service life. Therefore, we re-examined the clamping area. The important questions for us were: How will we position ourselves in the future, and how do we increase flexibility?"

Among other things we use machines in floating processes for both series and single-item productions. Here, we were at a crossroad: On one hand we required a specialized series production, and on the other hand we needed a fast, flexible cell for the single parts." His colleague, Production Manager, KTR, Franz-Josef Reder, was assigned to deal with the new clamping system. In his research, Reder then encountered the clamping devices from Hainbuch. This resulted in their visit to the Hainbuch exhibition booth at EMO.

From presentation to rental, from rental to purchase

KTR requested that the responsible Hainbuch Outside Sales Representative, Rudolf Meyer, should visit Rheine. Meyer sat down at a table together with both Schleyer and Reder, as well as employees from the manufacturing and design departments and checked which clamping devices could fit with the KTR products. However, to become thoroughly acquainted with the products, test their handling, and to see whether the employees could exploit the potential of the clamping devices, the company opted for Hainbuch's rental offer. "By the way, the rental was a great thing," adds Telker. Early in 2014, KTR received the Torok manual chuck with a base plate, a clamping head, and a mandrel for the trial phase. For Telker the overall time savings was extremely important. "How does the system perform in the daily routine? Is it rigid, and can it meet our practical requirements? Can we organize our set-up more efficiently with it? Of course the holding forces and repeatability were highly significant. This is where our manufacturing imposes very high requirements," reports Schleyer and Reder. "Practical experience had

shown us that conventional jaws were out of the question. For our coupling manufacturing parts are machined at high cutting speeds. Cams and bores are milled and drilled, so that we have a wide variety of chip shapes that must not impair the function of the clamping devices. The clamping device should be practically self-cleaning. Needless to say, the implementation of the Torok manual chuck on one of the milling machines of the production line passed the test with flying colors. With these findings the green light was given for working together with Hainbuch. In addition, according to Schleyer there was the fact that the production employee must operate two machines. "Our machines must have certain synchronization in the runtimes. This is an absolute must, particularly for the multi-machine operation." The result? One manual chuck is not enough, more parts must be clamped. KTR returned the Torok that had been rented for test purposes.

Machines were changed over step-by-step

KTR ordered a clamping pallet with four Hydrok SE hydraulic stationary chucks in the hexagon version along with clamping heads and mandrels for the new machining center announced in 2015 from Hainbuch. Schleyer explains, "The Hainbuch system is custom-tailored for our products, particularly the flexibility of the clamping heads and mandrels. We indeed use the clamping heads very intensively; however, we always have special components for which we use their mandrels. At the same time, right from the start we have also planned to use the Hainbuch clamping system for the turning machines that we ordered in 2015. Therefore, we use the TOPlus mini chuck. We have a consistent system, whether for turning or milling. Now we are



Outside Sales Representative employee Rudolf Meyer from Hainbuch helps to obtain the maximum, wherever he can. (L-R: Günter Schleyer, Rudolf Meyer, and Franz-Josef Reder).

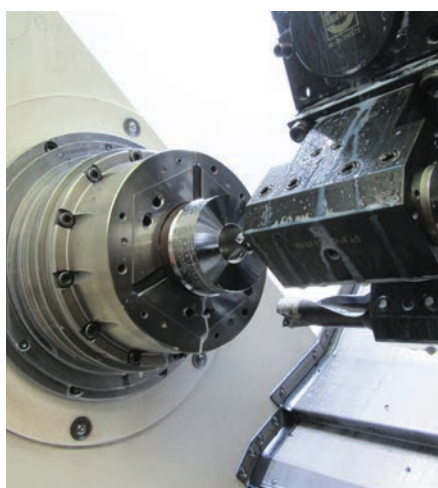
able to change within the modular system, and therefore, we are much more flexible." Thanks to the new turning machines in relation with the new clamping tools, some coupling series can be completely manufactured in one clamping set-up. Reder recalls, "New investments in manufacturing are opening up new possibilities for us in this area. Now we can bundle different machining steps and thus reduce throughput times." Telker is also sure that the development will move forward in this direction. "We save a lot of time and gain flexibility," adds Telker.

Advantages as far as the eye can see

The expenditure for the KTR Group has more than paid off. The required qualities can now be achieved with more simple means. The blanks are clamped in and you are ready to go. Re-clamping and intermediate measurements are unnecessary, and set-up times have been significantly reduced. It was even possible to reduce set-up times for multi-machining operation, and manufacturing processes are better synchronized. Moreover, the handling and reliability of the clamping devices have also shown impressive benefits at all implementation sites. Reder says, "Use of the Hainbuch clamping systems was a real step forward. Manufacturing has been simplified, tolerances are perfectly complied with, and the shop floor has become leaner and more flexible." Telker enthuses, "With the new clamping devices, we have been able to gain larger advantages. Consequently, performance has increased substantially." But what about the holding forces? "Absolutely secure, even though we are machining at just 5 millimeters," concludes Telker. **MMI**



The right clamping head or mandrel for every diameter.



The Hainbuch mini chucks keep their promise.

Source: Hainbuch

Source: Hainbuch

Redefining Quality Norms

Accuracy and on time delivery of projects are key requirements for the tooling industry.

Godrej Tooling Division (Godrej) relies on Renishaw solutions to save time, money, reduce scrap and achieve a high level of accuracy.

Godrej is a household name in the Indian market, with international presence in The Netherlands, Saudi Arabia, the UAE, Oman, China, Vietnam, Malaysia and Singapore. Founded in 1935 as a captive tool room, the Godrej Tooling

Division commenced commercial operations in 1993 and manufactures press tools, die casts and special-purpose machines, jigs and fixtures. With revenues exceeding ₹1.2 billion, the company caters to the tooling needs of Toyota, TATA, Honda, GM, Maruti Suzuki and Siemens, amongst others.

Godrej, India's largest tooling solution provider, has unsurpassed capabilities in the manufacture of complex dies, with

15–20 per cent of its products being exported around the world. As part of its Total Productive Maintenance (TPM) initiative Godrej follows PQCDSM (Productivity, Quality, Cost, Delivery, Safety, and Morale) and Kaizen guidelines. The main objectives of its TPM initiative are to reduce down time to zero and ensure on time deliveries. Therefore, maintaining the accuracy of its equipment, including CNC and EDM machines, with high

Source: Renishaw plc



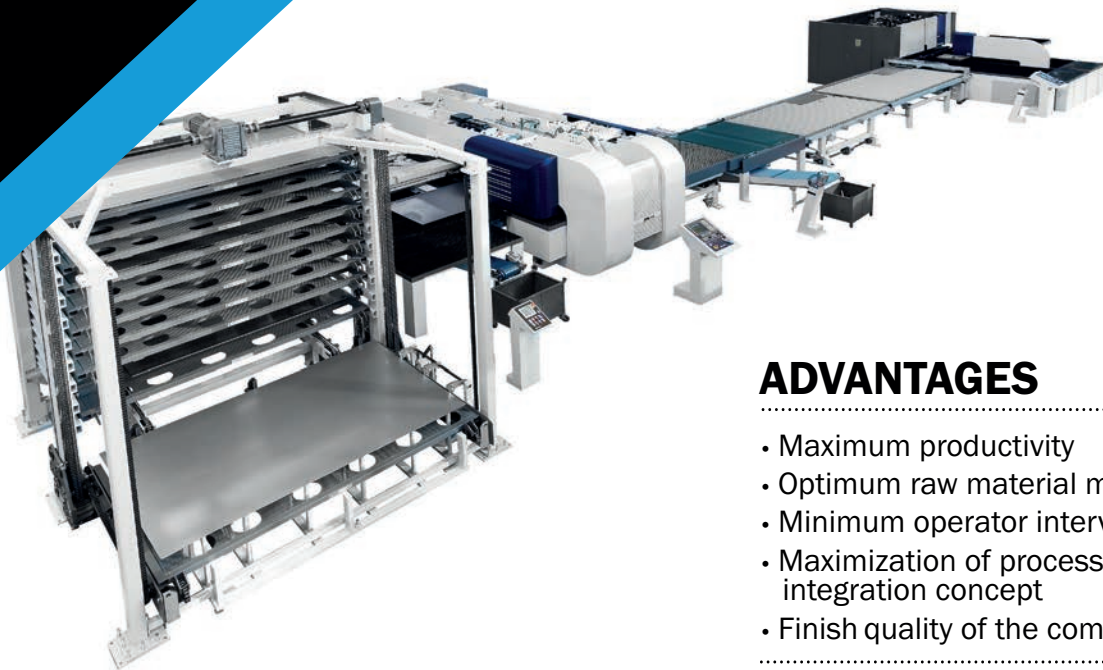
Godrej personnel calibrating a CNC machine with an XL-80 laser.



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Redefining Quality



precision calibration equipment is essential.

Experience with Renishaw's precision

In the early days, Godrej's evaluation of accuracy was difficult to obtain. National Aerospace Standard NAS979 tests (standardized cutting tests for CNC milling machines) were performed by a highly skilled expert as part of machine commissioning. These tests were problematic and time-consuming to carry out. In 1996 Godrej purchased Renishaw's ML10 laser system after hearing about the quality of the product and was impressed with its accuracy and reliability. Furthermore, Godrej was surprised how simple it was to use and avoided expensive errors common in the NAS test.

Although the ML10 only measured 9 parameters, as compared to 13 in the NAS tests, the improvement in the result quality was more important than the parameters left undiagnosed. The data reading was instant and easy to analyze. Godrej soon realized that the Renishaw laser system would save time, money and reduce scrap. Its accuracy prompted Godrej customers to specifically request for ML10 certification. Senior General Manager, Godrej, SM Nayak explained, "The product is rugged and stable, we only call Renishaw for upgrades. There has never been an instance of product failure."

Godrej has since upgraded to Renishaw's XL-80 laser system designed with simplicity and ease of use in mind, reducing the need for a highly skilled expert. Nayak says,



QC20-W ballbar test set up at Godrej.

"Renishaw's service is second to none, and they have an immediate response time. We requested training and were delighted that in a week the training was complete." The XL-80 laser measurement system offers high performance calibration for motion systems, including CMMs and machine tools.

The journey continues

As part of its expansion, Godrej Machine Tools purchased multiple CNC machines in its tooling division. This posed new challenges as the machines needed to be tested for additional parameters such as circular interpolation and drive tuning. Once again Godrej turned to Renishaw and found a solution in the QC20-W telescoping ballbar system which identifies machine errors easily with a high degree of accuracy. It directly determines servo mismatch, geometric accuracy, squareness, positional errors and reversal spikes in all three planes (xy-yz-zx). Since the adoption of the QC20-W ballbar testing Godrej's down time and rejection rates have reduced.

Delivering results

In the tooling industry, quality parameters are critical and customers expect a product life span of 10 years. Through its adherence

to the highest quality and accuracy standards, Godrej has been able to deliver products with a life span of 125,000 cycles, far ahead of the industry norm of 50,000 cycles.

Godrej's customers in defense, aerospace and nuclear application industries request audits during the manufacturing process to ensure quality measures are being maintained, and will insist on seeing ballbar certificates for the machines. Nayak explains, "Renishaw has helped Godrej to redefine quality norms, boost in-house capabilities, competence and confidence and help reduce costs."

Beyond savings to revenue generation

Die and mould customers choose Godrej because of the long life span of its dies resulting from tightly controlled quality parameters. The customer demand for high quality and precision measurement prompted the company to provide laser and ballbar certifications. Now Godrej offers calibration services to others, generating an additional revenue stream. Godrej's manufacturing facility is equipped with state of the art CNC, EDMs and jig boring machines. Nayak states, "High precision calibration of these machines with a Renishaw laser or ballbar is key to quality and reliable performance."

MMI

Source: Renishaw plc



XL-80 laser for high performance calibration.

ADVANTECH**LNC**

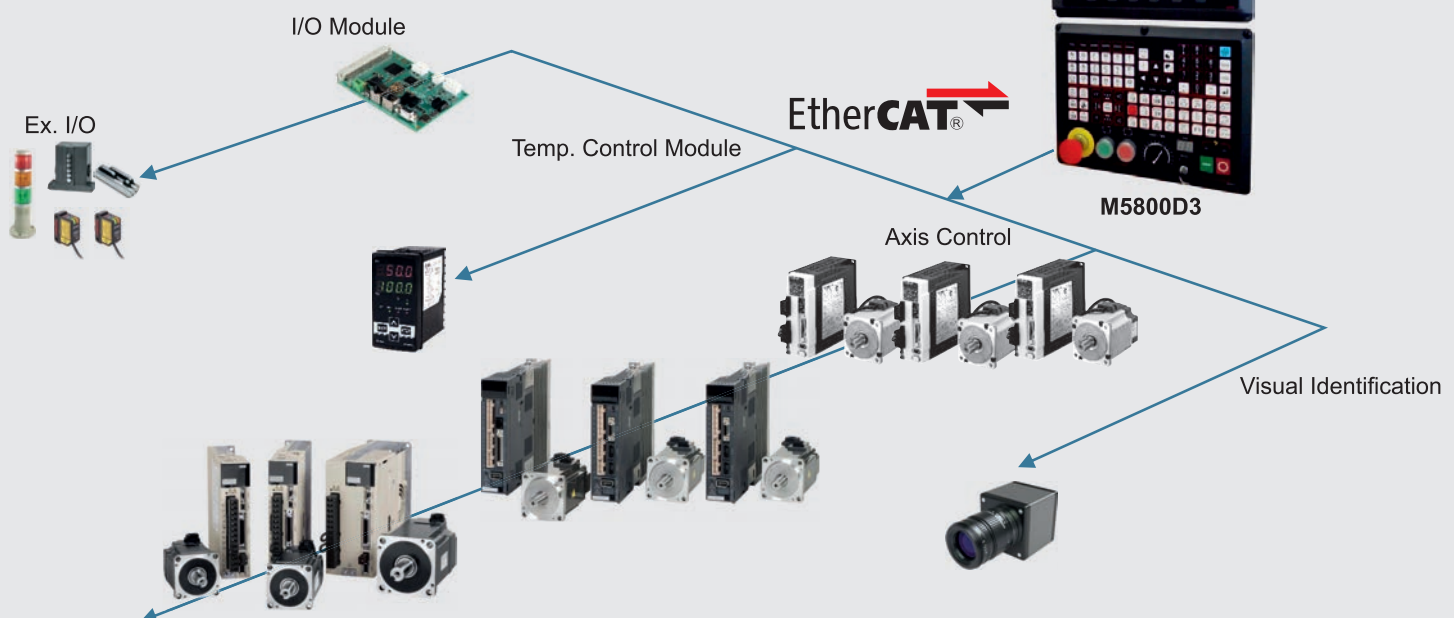
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Manual Drafting Vs CAD

CAD based systems offer an advantage for experienced designers, but for beginners to understand ratios and proportions, it is better to start with manual drafting and later on switch over.

One are the days when you could see technical students carrying a drafter and board. With the advent of computers and development in drafting & 3D mechanical software, drafters and boards have moved into oblivion. All the technical institutions are making use of the solid

modelling cad based software. It is also prescribed by the AICTE.

While technology upgradation is a must for technical people as it helps them to get exposure at an early stage, not much thought or study has been done to analyze the effect of total removal of manual drafting processes by making use of the drafter, sheet and pencil during the initial design and draft learning process.

While it is a need for every designer to know and use the 3D solid modelling software, which helps in better product design, better turnaround time, cost reduction and avoid costly mistakes, there is a need to study about the effects of using the

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Manual Drafting Vs CAD



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Source: Shrinivas S Bhat



Rough sketching is important in terms of flexibility and speed as it reduces the cognitive load.

3D modelling software and elimination of manual drafting on a paper by a fresh student who has very little or almost zero knowledge about the technical subject, design or drawing. What is the effect of total removal of manual drafting in problem solving and analytical skills as well as spatial visualization? Does the usage of the 3D software help in increasing creativity? Does it help the student to understand the subject better? Can he carry out a design that is practical and workable? Does it take the constraint of the machine shop into consideration or help the learner to know about it?

It is better to list down a few definitions to understand the above queries:

Technical Design: a systematic way of designing a solution to a problem or meeting a particular need or want.

Technical problem solving: refers to the systematic way of investigating a situation and implementing solutions.

Spatial visualization: the ability to imagine the radiation of depicted objects, the folding or unfolding of flat patterns, the relative change in position of an object in space or the motion of machinery.

Sketching/manual drafting & CAD

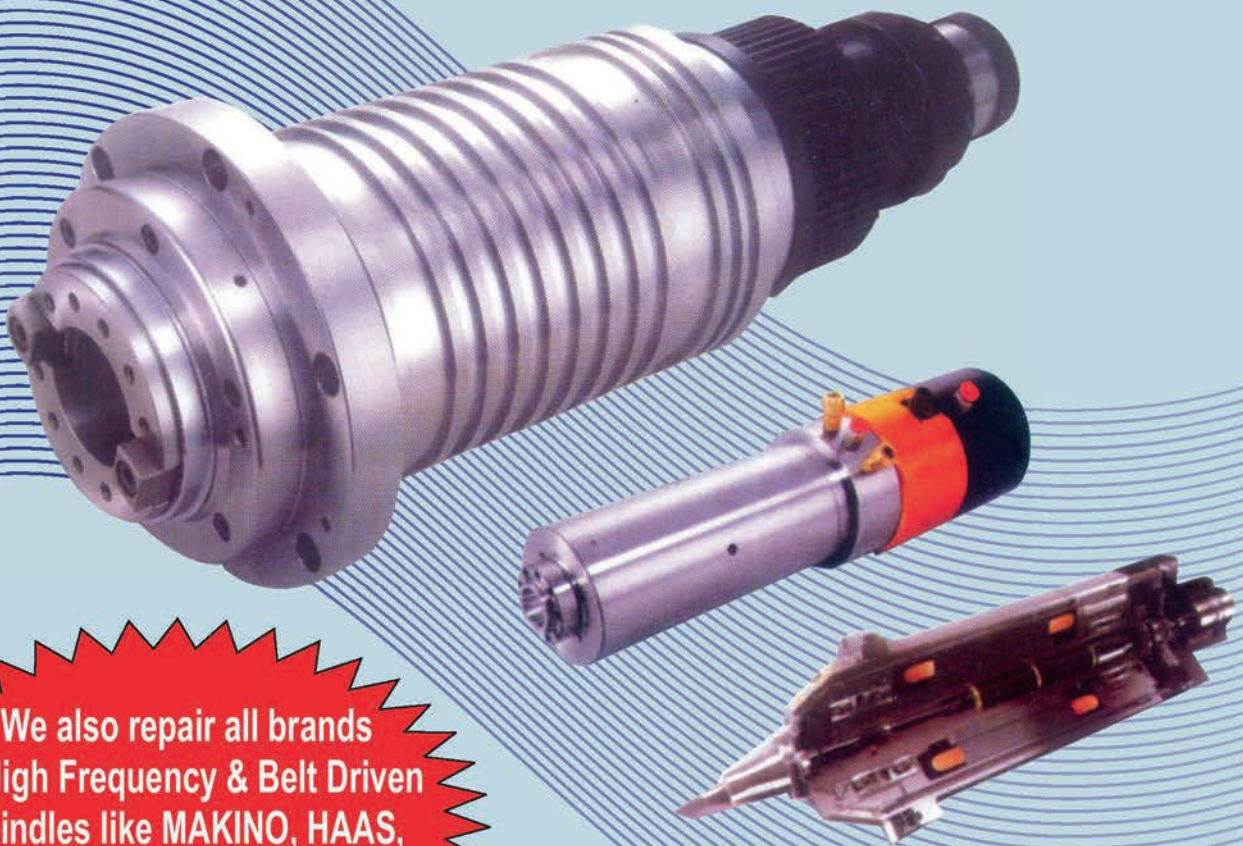
In a series of experiments, Ultman (1990) shows the necessity of sketching during all developmental stages of a mechanical design, the author emphasis the primary benefit offered by the fluency, flexibility and inaccuracy of sketches. Jenkins & Martin



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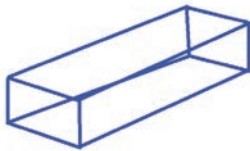
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(1993) also indicate that rough sketching is important in terms of flexibility and speed; it reduces the cognitive load and avoids the need of putting effort on grappling with the software part.

When processing three dimensional geometry, the software needs to extract spatial information from the flat sketch. There are reports of technologies being developed to generate three dimensional objects from multiple 2D views. However, there is no technology available at present for processing single view sketches, depicting three dimensional objects. The primary difficulty is to perform projection from the plane of the sketch to three dimensions. This step is mathematically indeterminate, but the human mind can accomplish this with little difficulty.

The two dimensional line drawing lacks depth of information, the reconstruction process is ill posed mathematically. For example, the sketch shown below. The sketch depicts a three dimensional object.



However the sketch itself is a collection of more than two dozens of lines drawn on a flat media. Humans perceive it as a 3D object whereas for a computer, it is nothing but a set of lines projected.

Overall, sketching is important for the following reasons:

- ▶ It is fast, suitable for short term memory
- ▶ It describes the object without the need for a particular sequential structure
- ▶ It requires minimal commitment, easy to draw and discard

- ▶ It allows one to focus on the problem of solving mechanical design than spending the energy on understanding the software
- ▶ It is inexact and abstract, avoiding the need to provide unnecessary details

Hence, we can conclude that sketching is important from the point of view of generating ideas quickly and creating a basic concept.

Manual Drafting

Manual drafting is carried out after the idea generation, design and required calculations are finalized. During the drafting process, the designer or draftsman makes use of drawing instruments such as scale, compass, etc., and will be drawing to a scaled ratio. During this process, two things happen. First he learns the ratios and sizes of the part as he is using the actual scale; for example, when he is using a bolt of M10 of length 100 mm, he will be using an actual ruler to draw it and in turn he gets a mental image of what size the bolt will be. It helps him to decide in the next drawing whether he can use the same sizes for a similar kind of situation. This reduces the design time by reducing the decision making time. Secondly, he also decides some of the dimensions and sizes required for parts on the spot, which are less critical as he can see the actual sizes in the ruler. Again the time is reduced. Over a period of time, the drafter/designer can easily judge the ratios and proportions. This helps him to arrive at design considerations very easily.

Employing CAD for general education purposes in a curriculum is very different from its use in the industry or engineering. The industry is a typically profit driven entity. Their main objective is to make profit and stay in business. CAD is a more efficient design tool than manual drafting, it allows

designs to be created and modified more easily and quickly. Designs and models may be directly transferred from the computer to CNC machines for RPT or for analysis.

It is easily portable, modified and associative, that is, when a model or drawing is changed subsequently all the concerned entities upgrade themselves. It saves costly errors which may happen after manufacturing and can foresee the problems before hand. The time and steps to produce a part can be greatly reduced and profit can be increased by using CAD based systems.

In the education system, there is often an attempt to reflect the current practice of the real world. But in the real world, the worker would have already done some basic foundation of the subject during his learning phase and hence he incorporates that and upgrades it to a higher technology.

Without the basics, directly adopting the latest technology in the market would not be such a good idea in order to develop the trained manpower. Knowledge should be built on reasoning rather than the support offered by the software.

Challenges

One of the biggest drawbacks carried out by the students who are directly working on CAD based systems without practicing on manual drafting is the understanding of proportions and scale, which hampers their problem solving ability in mechanical design.

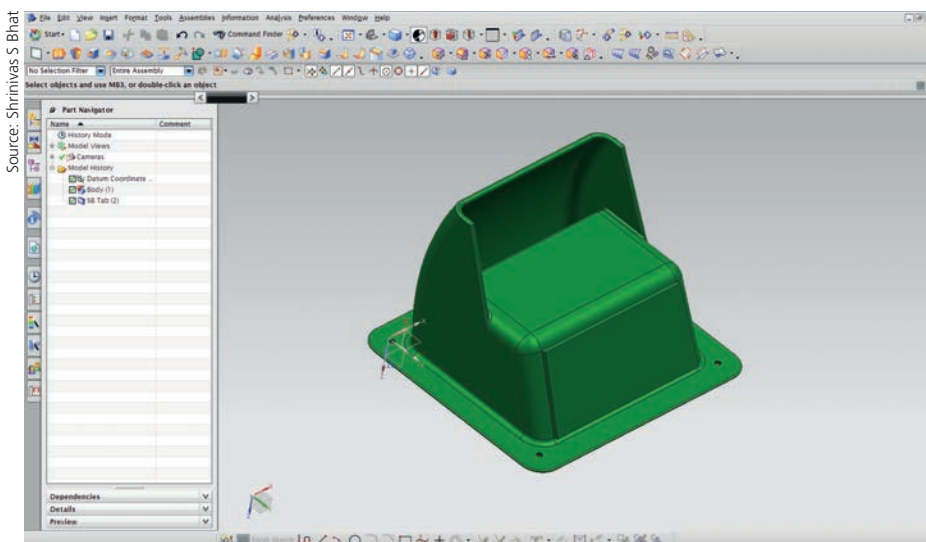
Also, in CAD based systems where he has the option to enlarge or reduce, it is often difficult for a student to make out whether the proportions are correct as he cannot make out the real size of the object.

The other drawback that tends to happen with the CAD based system is that it reduces the ability of spatial visualization of the student as he is not exposed to solving the problem by making use of 2D drawings or construction of a 3D model by visualization.

Conclusion

As a trainer in a technical college and also with hands on experience in actual design and manufacturing processes catering to various tooling and aerospace industries, for more than 20 years, we have witnessed the transformation from manual drafting to CAD based systems. After regular interactions with both industries and the students, the feeling is that, CAD based systems offer an advantage for experienced designers, but for beginners to understand ratios and proportions it is better to start with manual drafting and later on switch over to CAD.

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3D model designed using CAD software.

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The show directory being unveiled at the hands of the Guests of Honour.

Reaching New Heights

ACMEE 2016, organized by the Ambattur Industrial Estate Manufacturers' Association (AIEMA), shattered all its previous records. The five-day event had around 465 participants including 125 from 25 countries, with direct participation from 40 countries, in four halls, spread across 18,500 sq ft at the Chennai Trade Centre in Chennai.

India is at a juncture when the machine tool and component industry is playing a massive role in upscaling the country's prowess in innovation and technology. ACMEE 2016, with opening its doors, has created the perfect opportunity for being able to leverage on global technology within the halls of the Chennai Trade centre.

President, AIEMA, V Raju stated that AIEMA is the largest industrial cluster in South East Asia with 2000 manufacturing units engaged in producing engineering, IT, and consumer goods and ACMEE is a platform that allows to showcase these technologies.

Inauguration

The biennial show was inaugurated in the presence of esteemed personalities, exhibitors and visitors. The Guests of Honor included Director General, Japan External Trade Organization (JETRO), Hidehiro Ishiura; EVP & Dy MD, Isuzu Motors India Pvt Ltd, Hitoshi Kono; Dy MD, India Yamaha Motor Pvt Ltd, Riuji Kawashima; MD, Toshiba JSW Power Systems Pvt Ltd, Yoshiaki Inayama; MD, SCHUNK Intec India Pvt Ltd, Satish

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Reaching New Heights



Nedra Pereira
Deputy Editor
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Sadasivan; MD, ACE Manufacturing Systems Ltd, P Ramadas; MD, MMC Hardmetal India Pvt Ltd, Eiji Hagitani, and Zonal General Manager, SIDBI, V Sridharan.

A traditional lamp lighting ceremony took place, followed by a ribbon cutting ceremony. Chairman, ACMEE, R Ramchander welcomed everyone present at the inauguration. He said that this edition was the best edition of ACMEE given the number

of participants and visitor registrations exceeding all previous numbers. "It is another red letter day for us, as ACMEE celebrates its 25th year in supporting the industry," he further commented on how far ACMEE has come.

Make in India

Chief Guest, Director General, Japan External Trade Organization (JETRO), Hidehiro Ishiura averred, "ACMEE has a strong focus on the latest machine tools, and is aptly placed in line with the Indian Government's 'Make in India' campaign. At this event, fruitful partnerships will arise and I hope that all who attend will benefit from their presence here." He also spoke on how owing to the campaign, skill development across the sector will increase.

Adding to this, Inayama commented, "We do several trainings in line with CSR activities to increase the skill on man power. So far 30 people have been trained."

Kawashima too said that because there is competitiveness in the industry, especially for foreign companies setting up base here, up gradation of skill is necessary.

Convenor, AIEMA, K Ayyappan speaking on the benefit of having a platform such as



Representatives of the Taiwanese companies along with speakers at the conference.

ACMEE stated, "A look at the difference in technology available at this show since its previous edition is a clear indicator of how fast things change in the industry. ACMEE acts as a catalyst between the exhibitors, visitors and industry. I thank you for your presence here."

Taiwan Pavilion

A first of many, this year's edition also saw ACMEE's first country pavilion from Taiwan. Six companies, viz., YEONG CHIN MACHINERY INDUSTRIES CO LTD, FAIR FRIEND ENTERPRISES CO LTD, EXCETEK TECHNOLOGIES CO LTD, HIWIN TECHNOLOGIES CORP, CHAIN HEADWAY MACHINE TOOLS CO LTD, AND TONGTAI MACHINE & TOOL CO LTD, leveraged upon ACMEE to showcase the plethora of solutions to the Indian market, specially the aerospace and automotive industries.

A special 'Taiwan Machine Tools Product Launch Press Conference' was also held

during the show to throw light on the various 'Made in Taiwan' machine tools as well as acquaint potential customers to their dealers present in India. At the conference, Executive Director — Economic Division, Taipei Economic and Cultural Center in India (TECC), Dr Guann-Jyh Lee; Chairman, ACMEE, R Ramchander; Director General, Taipei Economic and Cultural Center in India (TECC), Charles C Li; Additional Chief Secretary, Industries Department, Govt of Tamil Nadu, IAS, CV Sankar, and Editor-in-Chief, Modern Manufacturing India, Soumi Mitra, presented their experience and views on how mutually beneficial the India and Taiwan ties will be for the consolidated growth of both countries. The aforementioned growth of both countries. The aforementioned six companies also advised on their plans and products for the Indian market.

On a concluding note, the show was one that was not to be missed. If you did, be sure to catch the next edition that will take place in 2018.

MMI



(R-L): Director General, JETRO, Hidehiro Ishiura; MD, Toshiba JSW Power Systems Pvt Ltd, Yoshiaki Inayama and Dy MD, India Yamaha Motor Pvt Ltd, Riuji Kawashima discussing the need for skill development in the country.

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Swivel Modules



The SCHUNK SRU-mini-Speed swivel unit sets standards for cycle time and frequency in high-performance assembly applications. Compared with swivel units equipped with conventional damping, the high-

speed rotary module from SCHUNK, the competence leader for clamping technology and gripping systems is able to literally double the number of cycles. The new unit size 12 enables up to 4,200 cycles with swiveling times starting at 0.16 seconds. Size 14 enables up to 4,200 cycles with swiveling times starting at 0.21 seconds, and size 10 enables 3,700 cycles per hour with swiveling times starting at 0.16 seconds. The secret of such high, stable performance is the patented damping system, which combines an elastomer with an oil-damped shock absorber.

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Sheet Storage

The SLTL Sheet Stacker is marvelous in its weight carrying capacity, which is 2,800 kg per pallet with being extremely energy efficient. Customized stocking options such as 10, 15, 20 floors make it compatible regardless of the type manufacturing facility. Equipped with an elevator that has dual linked chains allows strong holds over the sheets while transportation. The sheet stacker is compatible with various types of metal forming system such as laser cutting, turret punch, water jet, etc. By installing sheet data into the software, the machine accurately recognizes the sheet by their thickness, and then measures the sheet from the inputs, making the inventory tasks more smoother.



► **Sahajanand Laser Technology Ltd**

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High-Speed Machining Centers



The drill tap machining center DTC-400 XL is designed specifically for high-speed drill, tap and milling applications. Components that demand frequent tool change and short machining times would be suitable applications for these machines. It is compact and powerful, loaded with BT-30/BBT-30 spindles. The machine is built with an optimally designed

structure to take care of cutting forces, cushioning high speeds and accurate tapping. Engineered for cost effectiveness, it is equipped with roller type LM guideways for better rigidity. The machine has high rapid traverses of 60/60/48 m/min on the 3 linear axes respectively. Furthermore, it has high speed pocket tilting type automatic tool changers with a 16 tool capacity and a chip to chip time of 1.9 s.

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Five-Cutting Edge Insert Lines



TaeguTec has launched two new five-cutting edge insert lines—RTMX and RTHX—with related cutters specifically dedicated to stainless steel and difficult-to-cut materials used, not exclusively though, in aerospace, oil & gas and power generation industries. ChaseMold's RTMX and RTHX inserts come in 10 and 12 millimeter sizes and their chip formers are available in three types: MM, ML and MLL. The MM chip former is recommended for unstable conditions, the MLL for stable conditions and the ML covers the middle range between the MM and MLL types. The RTMX is a press-to-size type line for economy while the RTHX ground type is dedicated towards high precision machining with both line's offering a high positive rake angle for low cutting resistance.

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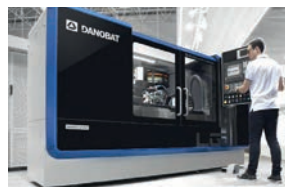


Mitsubishi has expand MVX indexable inserts type drill series having high rigidity steel body which enables drilling up to 6 L/D applications. The SOMX type inserts are interchangeable from inner to outer position, have 4 cutting edges and a unique wavy chip breaker design for improved chip control. The peripheral edge also has a wiper type geometry for excellent hole wall accuracy and surface finishes. The main features are—economical four corner insert, unique wavy breaker design, wiper edge for excellent wall accuracy, ideal combination of outer CVD and inner PVD coated insert, high rigidity body, variety of grades and breakers for steel, stainless steel and cast iron applications.

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Cylindrical Grinding Machine



The DANOBAT LG-1000 grinding machine is an external and internal horizontal grinding machine, which is an extension of the DANOBAT range. It includes more features, is capable of grinding parts within a maximum between-centres distance

of 1000 mm. The LG range has been developed for the manufacture of highly complex parts such as cutting tools, hydraulic precision components and automotive parts. Its natural granite bed ensures great thermal stability. The cooled electro-spindles on the wheel head produce a maximum peripheral wheel speed of 120 m/s that covers the range necessary for grinding with conventional abrasives (45–60 m/s) or super-abrasives (20–120 m/s) with maximum torque.

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Portable Measurement System



The FARO Edge ScanArm HD delivers rapid point cloud collection with extreme resolution and high accuracy—all in a compact, lightweight and easy-to-use system. The new functionalities enable scanning across diverse surface materials regardless of

contrast, reflectivity or part complexity and without any special coatings or target placement. Users can dramatically reduce required training time with the new crosshair feature and existing LED Rangefinder functionality, which provides real-time scanning feedback. It is the ideal tool for product development, inspection, and quality control and offers capabilities such as point cloud comparison with CAD, rapid prototyping, reverse engineering, and 3D modeling.

► **FARO Business Technologies India Pvt Ltd**

T: +91 (011) 46465664, E: india@faro.com
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New Milling Grade

Dormer Pramet has launched a new milling grade and also expanded its face milling range for stainless steels. The M6330 grade has been developed specifically to achieve longer cutting edge



durability and reliability in a range of difficult-to-machine materials with and without coolants. Particularly suited to adverse cutting conditions, including interrupted cutting, the grade is now available with many of Pramet's most popular inserts, including the ADMX, HNGX, LNGX, LNMU, OEHT and numerous other ranges. It promotes greater operational reliability and tool life, with a high resistance to heat-related cracks. This is owing to improved abrasion resistance from a new substrate and PVD coating.

► **Dormer Pramet**

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www.dormerpramet.com

Precision Measuring Center



The fully automatic CNC-controlled precision measuring center P 40 from KLINGELNBERG is designed as a compact unit for the workpiece diameter range up to 400 mm. At the heart of the P 40 is an accurate, durable rotary table. Configured as a measuring axis (C axis), it provides concentric seating of the workpieces to be

tested. All precision measuring centers are now equipped with new versions of the calibration software and an advanced graphical user interface. The new Windows user interface, soon to be established on the market under the 'EasyStart' brand, allows the machine operator to operate the machine in a manner that is both significantly easier and target-oriented.

► **KLINGELNBERG GmbH**

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All-In-One RFID Reader



The BIS M-4008 from Balluff is an all-in-one RFID reader with integrated processor. The 13.56 MHz reader with IP67 protection and a rugged die-cast zinc housing features a Profinet interface, needs no additional processor and can communicate directly with the control level. The

reader is an ideal choice wherever a lean solution is needed for detecting data carriers on workpieces and workpiece carriers at individual stations. Typical applications include material flow control in production facilities, conveying systems and assembly lines. The device is the only all-in-one reader in the market with an integrated 2-port Ethernet switch for constructing simple line and ring topologies.

► **BALLUFF India**

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Cleaning System

The Universal 81W cleaning system is a low-cost, highly efficient system which, owing to its modular design, can be used for a very wide range of applications in cleaning parts. Depending on the features installed the Universal 81W is suitable not only for removing oil and emulsion from mass produced parts but also for the fine cleaning of assembly parts. All the cleaning stages use an immersion process and aqueous media. Removal of large quantities of swarf from mass-produced parts and particles of dirt with a defined size in fine cleaning can be achieved by selecting the appropriate filtering system and other application-dependent optional extras.



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the design has therefore been laid on a high degree of rigidity: closed box frames instead of a C-frame, forged instead of turned tool spindles, clever positioning of spindle tilting mechanisms and a double-walled frame design for temperature insensitivity.

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- Horizontal Machining Centers
- CNC Boring Machines

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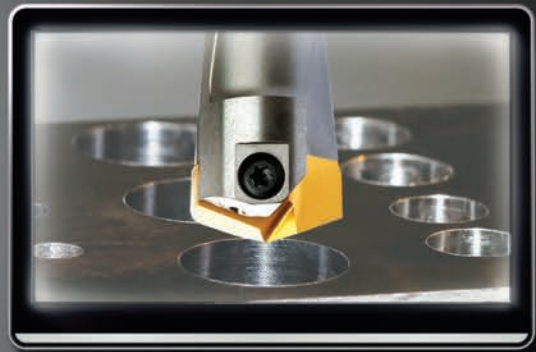
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