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The official magazine of Indian Machine Tool Manufacturers' Association

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What is Needed for Unattended Wire EDM

REPORT SW-2014

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K2X 20, KX 10, KX 30

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NX 1810, NX 2215, NX 3215,
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VMC (3-4-5 Axis Moving Column)
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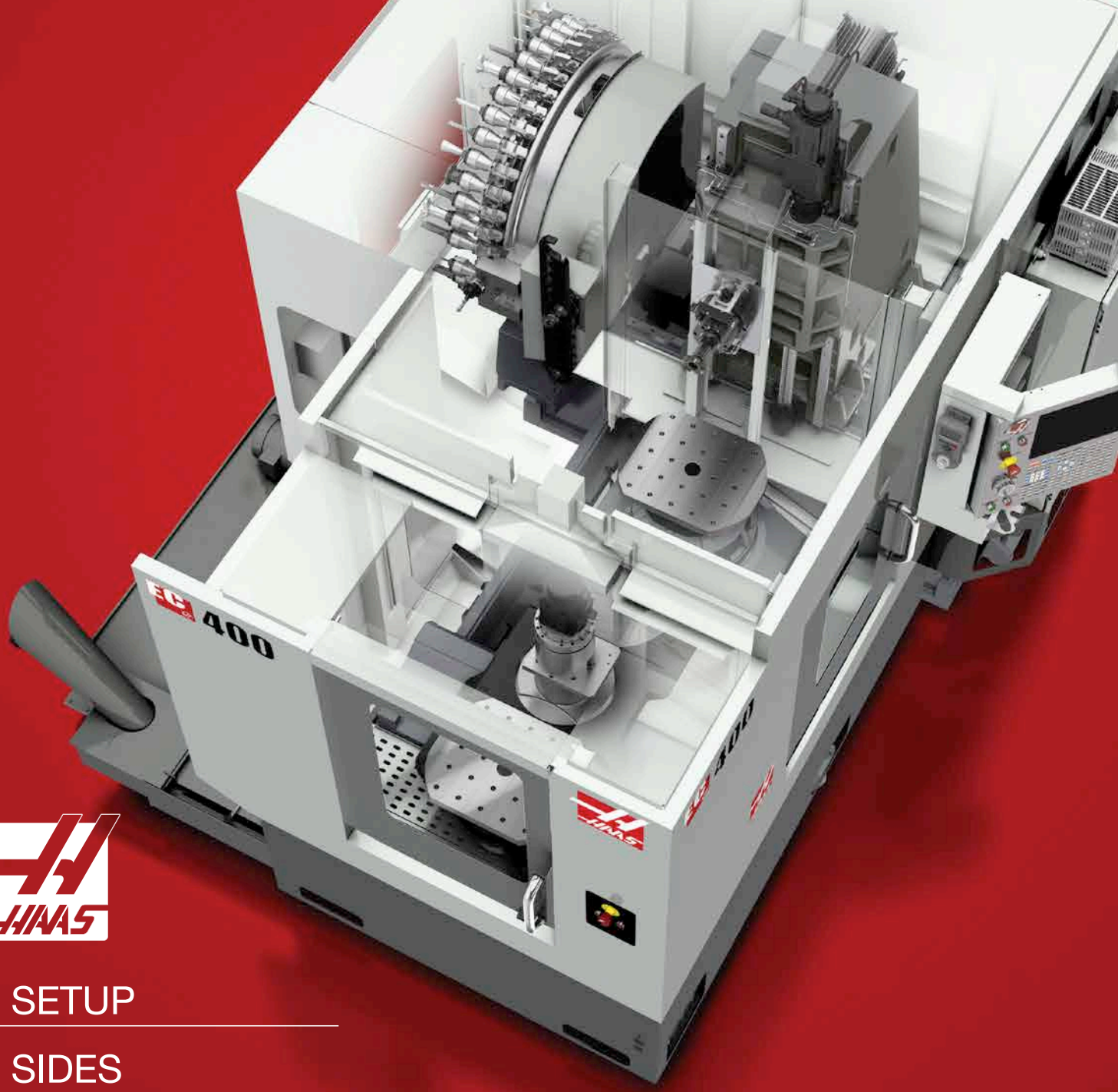

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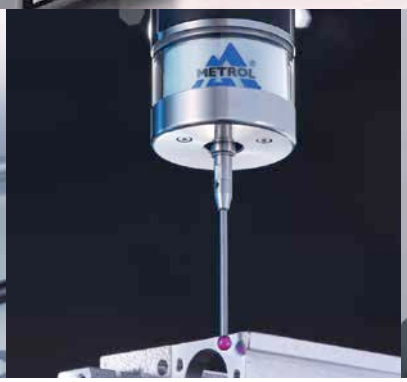

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L Krishnan
President, Indian Machine Tool Manufacturers' Association (IMTMA) and
Managing Director, TaeguTec India Pvt Ltd

A Beacon in Turbulent Times

An overwhelming response at the IMTEX trade show has always been a motivational factor and a harbinger of the times ahead. IMTEX Forming 2014 was likewise encouraging, with 440 exhibitors displaying 500 machines and tools over 30,000 sq mt exhibition space. Over 44,000 visitors from across the world marked their presence, which resulted in business orders worth ₹405 crore and inquiries worth ₹4,187 crore. I surely hope these numbers will act as a catalyst to boost the sector towards positive growth.

IMTMA received key official delegations from ACMA, BHEL, BEL, COFMOW-Indian Railways, ISRO, NAL, HAL, Government Tool Room & Training Centre and Ordnance Factory Board in the span of six days of the event. The visit by these delegations rejuvenated the confidence of exhibitors since they belong to the 'upper band' of the machine tool buyers in the forming sector.

I would like to make a special mention about the 'Academia Pavilion' at IMTEX Forming 2014, which I was happy to know, had an enthusiastic participation from 24 reputed educational institutes, of which one was from the UK. It is noteworthy that within a span of four years, Academia Pavilion initiative of IMTMA has started attracting international participation as well. In the coming years, we hope to take it to the next level and expect many more national and international institutes to share their valuable research and project works for the benefit of metalworking industry.

This May, IMTMA will bring the decision makers of the Indian machine tool industry on a single platform for its game changer 'Machine Tool Industry Summit', to be held in Goa, which will focus on the current challenges and strategies to be adopted for 'winning in turbulent times'.

I wish you a very pleasant reading and hope to see you all in Goa at the Machine Tool Industry Summit.

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*DMC 650 V exhibited with SIEMENS control at Die & Mould

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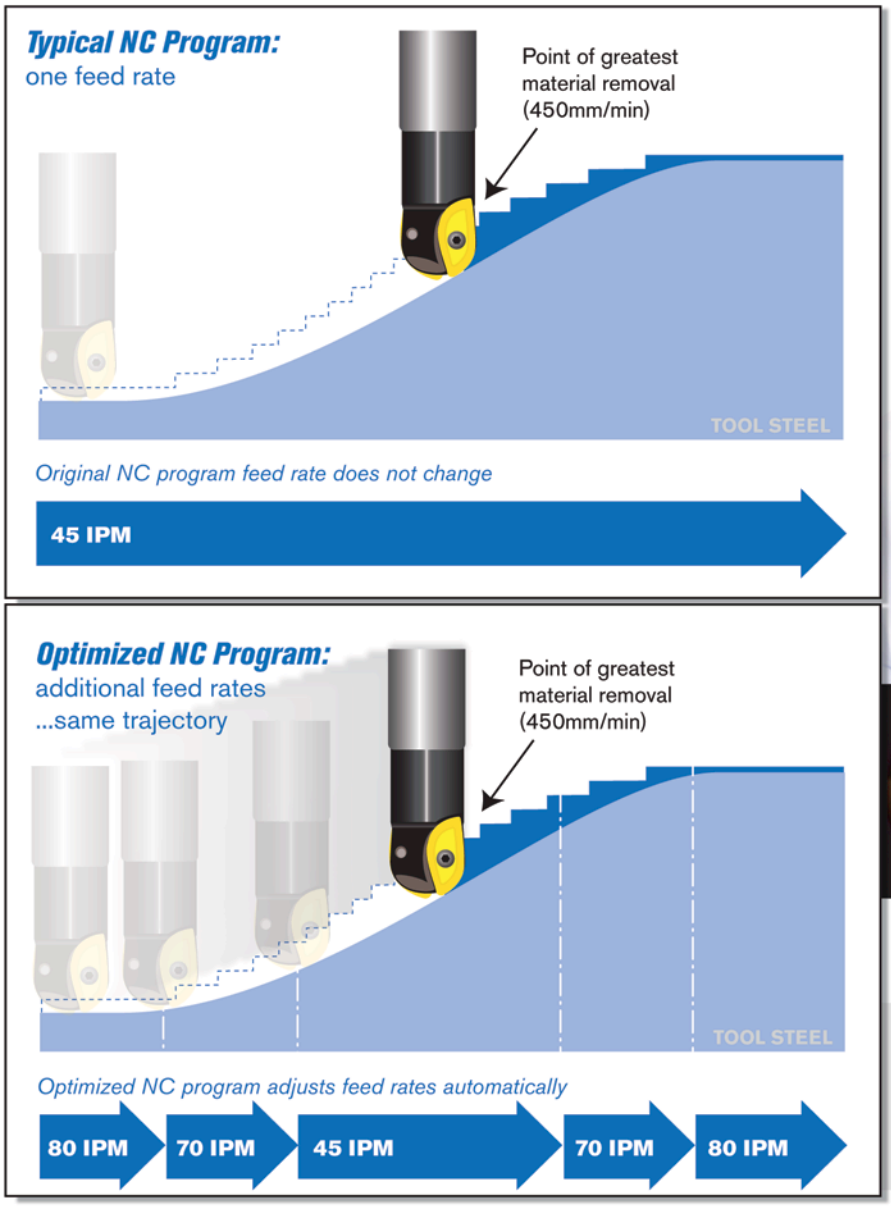

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The Power of One…

While listening to the Bengali song, *'jodi tor daak shune keu naa ashe tobe ekla cholo re'* which signifies *'if they answer not to thy call, walk alone'*, penned by Rabindranath Tagore, the first non-European Nobel laureate in literature, at the recently concluded awards ceremony at IMTEX Forming 2014, I realized how the song roots on the listener to continue his arduous journey, irrespective of support from others. Written more than a century ago in the backdrop of social and political movements, the song holds a strong appeal to many solitary reapers who do not believe in the force of numbers but in the power of one.

With this idea of standing out and creating a niche for themselves, people flocked to IMTEX Forming 2014 and Tooltech 2014, despite uncertain market and political conditions. Be it the participants, the visitors - domestic and international; the industry delegates; or the students – all were enthused with excitement to pave a new way with undaunted spirit. What amazes me are people who believe that it is faith and enthusiasm for achieving something that makes a life worth living. Hence, any challenge thrown their way does not make any difference to them, as they are always on the perseverance mode.

"Faith and enthusiasm for achieving something makes a life worth living."

In this context, we present in this issue hordes of innovations and advancements that we witnessed at the shows we were a part of, namely IMTEX Forming 2014, SolidWorks World 2014 and ACREX India 2014.

Please share your feedback as you always do on our other technology stories too! Your support means a lot to us.

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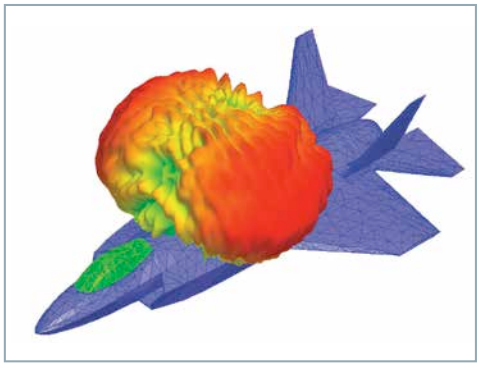

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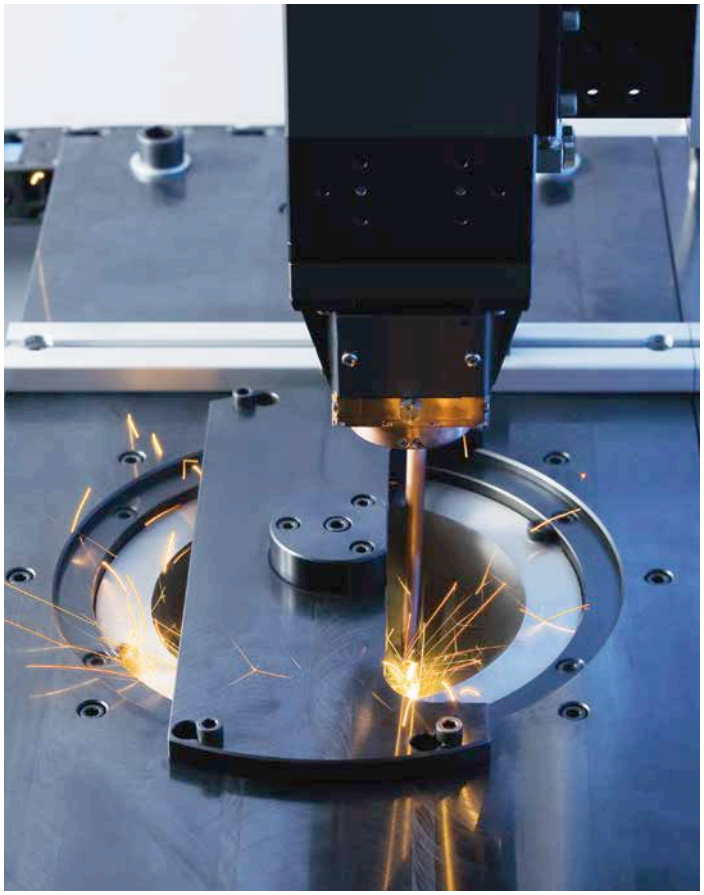

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CEO, Micromatic Machine Tools Pvt Ltd, TK Ramesh

Advertising and promotion are probably the most misunderstood terms inside companies. And almost always, everybody from the newest trainee in any department to the managing directors has an opinion on these. I recollect a discussion with a project head very early in my career who told me that he could take a final decision on ordering technical equipment worth ₹5 million but would require the approval of top management for deciding the color of an invitation card that they were planning to send out for the inauguration of a project. This is not only true in the industrial B2B scenario but also in many consumer B2C cases.

How much should companies do in-house and how much should be outsourced?

Wouldn't it be more cost effective to develop an in-house advertising and promotion team or hire our own creative teams? Won't we have more control over the finished product that way?

The answer is simple. We need different creative perspectives for our many products and segments.

As most creative people have a certain personal style, in-house hiring would mean that the content for all our brands would begin to look very similar over time. By working with different agencies, each with its own unique creative approach, we can tap the brains of many talents to achieve consistently great and unexpected results.

I have had both wonderful and painful experiences with agencies. These experiences have taught me that developing a good working relationship with an agency that fosters a creative environment and consistently produces great work is a learned skill. For mutual benefits, be clear that advertising agencies are businesses too, and have a profit motive — understand their working and motives.

Partnering with an agency

Managing your relationship with an agency is like walking a tightrope in many respects. Creative people by nature are emotive, and happy people are critical to good campaigns. Creative people could also be insecure with frail egos.

You are the boss

You understand and drive the business; they don't. This may sound aggressive but you must establish this right from the beginning in the correct manner. Often, agency executives think they know more about the business and ignore the strategic direction, and when this happens strategic focus is lost in creative storms. The brand gets advertising that is incredibly creative, but the campaigns do nothing to communicate product benefits or convince customers 'why to buy'.

Focus on the positioning strategy

Many times, agencies take the positioning strategy given to them and revise it to fit their own frame of reference or business style. For instance, doing things that are easier from an execution view point rather than the concept.

Know what you're spending on

Be cautious when it comes to protecting your market development budget. Agencies love to tell you that they're going to do this or that and need your verbal approval. Make the agency provide written estimates of everything they are going to do before they do it, understand exactly what each line item entails — ask, question if you are not sure.

Give time and freedom to explore

Many marketing people make the mistake of telling the agency how the finished campaign should look. Usually this innocent comment gives the agency a vision of what they believe you want them to create. The better way to manage the agency is to give them a clear, succinct positioning strategy – one that has a clearly focused target audience, strong consumer benefits, and rational 'reasons why' and let them go!

Review periodically and creatively

Creative review meetings to evaluate your agency's work should be conducted with much decorum and care. Bear in mind that when the agency comes in to present the work, all of it has been reviewed several times before you get the chance to see it. Be careful to offer fair, honest, and timely feedback, yet in a way that fuels idea building and not idea bashing.

Honest and open feedback

When you have seen all of the work that the agency has presented, give them your gut reaction right there on the spot. Don't wait and let it settle. Your gut reaction is probably the right reaction. Tell them which concepts worked for you and which did not — again, strategically first, and creatively second. Great advertising and promotion are innovative, creative, unique, and convincing. When all of the elements come together, most campaigns become greater than they could have ever been imagined at the beginning when just a few strategic words were scribbled on a page. MMI

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

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MAKING THE RIGHT MOVE?

Safety and efficiency are vital for the sustainability of an organization. Here are some queries that have been answered relating to these topics.

I work for an oil company and we are planning to set up a terminal station to handle petro-products of the plant. While the basic instrumentation has been decided, should safety be a crucial consideration, and how can risk be defined for my plant?

KS Bhavik, Maharashtra

All process industries have to deal with significant potential hazards such as fire and explosion, toxic release and so on due to the nature of materials involved in these industries. Alternatively, the process itself also may be hazardous. Your terminal station involves handling of petro-products, which are classified as hazardous and inflammable chemical materials. The hazard involved in such a process poses a risk that is defined as the product of the consequence and the frequency of its occurrence.

Safety is defined as 'freedom from unacceptable risk' and this risk for process industries is usually classified as being of 'high consequence and low frequency'. Hence, these processes are classified as low demand or on demand processes as per IEC 61508 and IEC 61511 standards, respectively.

Also, depots and terminals where petroleum products are stored and handled are classified as hazardous areas and require hazards study to be conducted for safety assessment. Hence, in all such hazardous processes, the safety of personnel, plant equipment and environment is of utmost importance and if not properly addressed, could lead to serious fatalities, damage to property and have an adverse impact on the environment.

As a Project Consultant for a tank farm, my role involves assessing risk of the tank, which has hazardous material stored in it. How is risk assessment done for ensuring safety of the plant, operating personnel and environment?

Project Consultant for a Tank farm

Risk assessment can be performed as per IEC 61511 standard (safety instrumented systems for the process industry sector) by conducting a rigorous Process Hazards Analysis (PHA). Techniques such as Fault Tree Analysis (FTA), Failure Mode and Effects Analysis (FMEA), Hazards and Operability Studies (HAZOP), etc., can be carried out to evaluate the level of risk involved in the process. These techniques involve a thorough review of the process design and list the possibility of potential risks.

As a first step, measures such as change in process design and introduction of additional equipment/instrumentation into the process as an add-on layer of protection need to be taken.

The next step is to ensure that the risk, which is minimized after taking these measures, can now be controlled and maintained over the life of the plant. It is also paramount that the systems put in place to ensure safety do not compromise the production process through spurious trips. In order to achieve this combination of safety and fault tolerance, a reliable Safety Instrumented System (SIS) is required, which can bring the plant to a safe state when necessary and also meet the high availability requirements of process industries.

In addition to these, process operators in the PHA, safety training of operators/operating plant personnel and technical staff, well documented maintenance and operating procedures and setting up of emergency response teams/centers can also be employed.

I am planning to set up a flour mill and as the cost of energy is very high in our state, I would like to use the motor at the highest efficiency value. Please suggest an efficient motor as choices abound in the market.

VS Shah, Haryana

Based on the International Standard IEC 60034-30 (2008), the Bureau of Indian Standard (BIS) released IS 12615 : 2011, effective June 2011, which defines New Efficiency classification for single speed, three phase, induction motors. The latest efficiency classes defined are IE2 - High Efficiency and IE3 - Premium Efficiency. The earlier standard IS 12615: 2004 for eff2 and eff1 motors is no longer valid.

The energy efficient 'IE2 and IE3' motors not only reduce energy consumption but also lead to higher energy savings. When IE3 motors are used in place of Standard Efficiency (IE1) motors, savings up to 10 per cent can be achieved depending on the frame sizes. For example, if a 7.5 kW, 4 Pole IE3 motor is used instead of IE1 motor, at 85 per cent full load for 8,000 hours, the total saving from a single motor for a period of one year will be about 2,886 kWH.

As of now, IE3 is the highest efficiency class prevalent among countries adopting IEC standards. Thus, for your new flour mill it will be most beneficial if IE3 motors are used.

SIEMENS

All responses mentioned above are provided by Siemens Ltd and are based on the information/data shared by the addressee; no liability whatsoever will be accepted for any consequences thereof.

You need any information or face any challenges, feel free to write to the below address:
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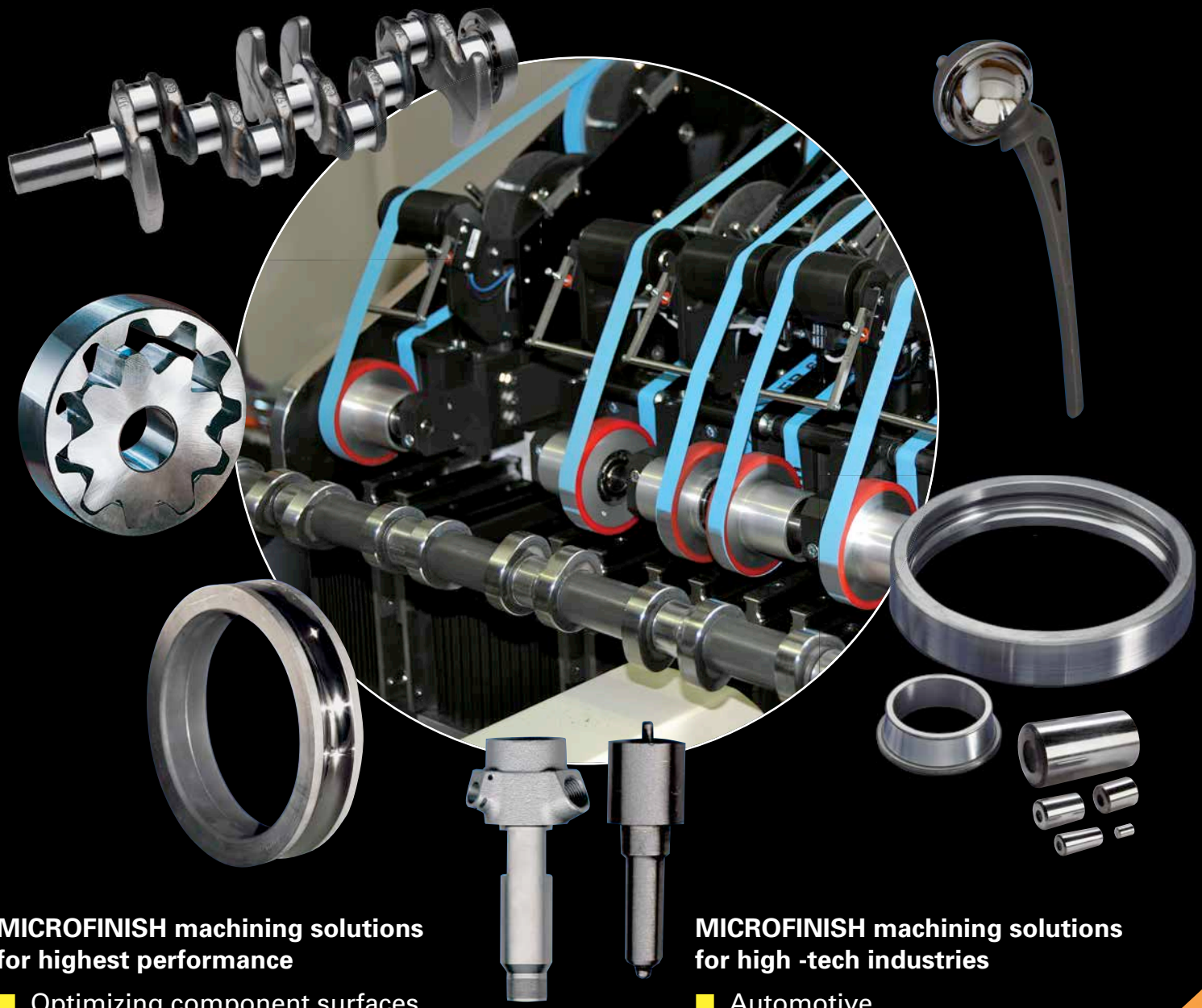

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IMTMA Academia Initiatives Rise Up to Meet Challenges in Machine Tool Sector

Today, with majority of engineering graduates opting for an IT career, it has become a real challenge to get quality workforce in adequate numbers into the manufacturing industry. In this scenario, the Indian Machine Tool Manufacturers' Association (IMTMA) is coming up with initiatives to promote academia–industry interaction and apprise students about career opportunities in core manufacturing segment.

It is a known fact that there is a close correlation between the growth of the machine tool industry and a country's economic development. India is now at the crossroads, with its machine tool industry mature enough to reach the next level. It has evolved from the levels of manufacturing standard components for mass production on one hand, but on the other, it is facing difficulties to penetrate niche sectors like aerospace, defense and medical engineering. Conventionally dependent on the automotive sector, currently the industry is finding it difficult to sustain positive growth due to a marked decline in sales in majority of segments in the automotive sector.

Source: IMTMA

Cars, consumer appliances, electronics, steel, shipbuilding, etc., have been the major focus areas for machine tool players. Going forward, if India wants to retain its strength and current position of production and consumption in the world of machine tools, it has to decide whether it will tread the acquisitions and mergers route, which led to the decline of the US machine tool industry framework, or actively adopt infusion of new technology that can transform the Indian counterpart into a force to reckon with in the world market.

Aiming high

To ensure a strong foundation, India needs to groom its talent pool to augment production efficiency and promote innovation by way of developing new technologies. Realizing this requirement, IMTMA has over the years undertaken initiatives to enhance competitiveness in metalworking sector and impart knowledge and training by means of seminars, hands-on workshops, finishing schools and orientation programs.

Academia Pavilion at IMTEX

Through its flagship trade show IMTEX, IMTMA reaches out to academic institutions and provides a platform to showcase their research activities and projects to the user industry every year at the designated 'Academia Pavilion'. Industries have welcomed this initiative and several companies are exploring collaboration opportunities with academic institutes to come up with possible solutions for implementation on the shop floor.

The Academia Pavilion at IMTEX Forming 2014 showcased the best research projects by 24 leading institutions, of which one was from the UK. The criteria for selection included innovation and technology, manufacturing technology relevance, environmental aspects, project status, industrial partnership, project recognition, communication skills and display clarity. Currently the space is provided free of cost to the interested colleges that are involved in research projects for the metalworking industry.

During the tradeshow, IMTMA also organized the industry-academia workshop on January 27, 2014, to highlight the significance of research and development activities.

Source: IMTMA

The Academia Pavilion at IMTEX Forming 2014 showcased the best research projects by leading institutions

Jagruti-IMTMA Youth program

Under Jagruti-IMTMA Youth program – another useful IMTMA initiative for spreading awareness – young engineers from mechanical background are invited every year to attend

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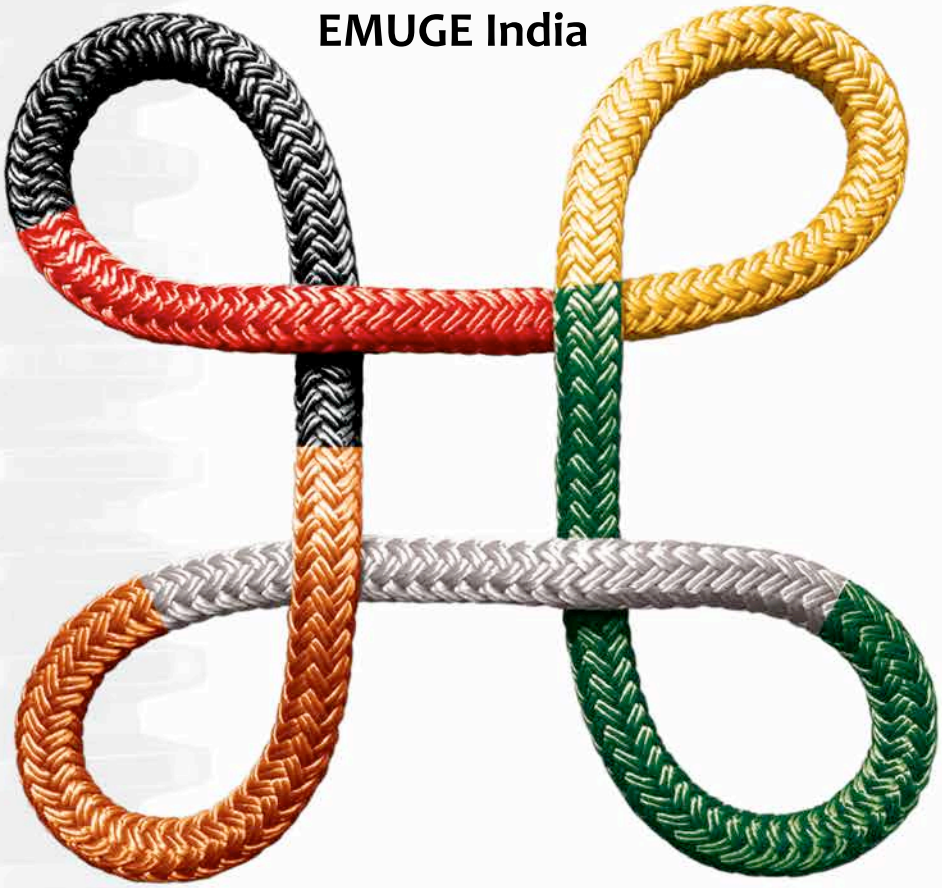

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Source: IMTMA

Jain Engineering College students during IMTMA Finishing School session

IIT-Madras at IMTEX Forming 2014 Academia Pavilion

- The Indian Institute of Technology, Madras has been a regular participant at the IMTEX Academia Pavilion. In 2014, the team members displayed their projects in the field of micro-machining processes like micro milling, micro drilling and micro turning.
- Regarding their experience at the show, the team members stated, "Many visitors showed interest in the high speed machining of 6061 T6 aluminum alloy using PCD tool. Mechanical micro machining also caught their attention. Some companies are seeking collaboration and looking forward to utilize the expertise of our professors in establishing miniaturized micro machine tool facility at their manufacturing units."

Finishing School for Jain Engineering College students

- IMTMA has been successful in engaging a batch of students from Jain Engineering College in its 'Finishing School Program in Production Engineering' for a hands-on, extensive, industry-endorsed curriculum.
- Speaking about the relevance of the program, one of the officials stated, "We see an increase in confidence level among the students after attending this hands-on training program. We are sure many more colleges will find this program beneficial."
- Based on the response, Jain University, an autonomous educational body, has put forth a request for a prospective post-graduate program in manufacturing in association with IMTMA.

the show for learning about the latest trends in the metalworking industry. This has succeeded in inducing renewed confidence among the youth to explore career options in this industry. Students from 17 institutions participated at IMTEX Forming 2014.

Few students from the group opined, "This show was very informative and we gained knowledge about different varieties of laser cutting equipment and a range of other tools. Overall, it was a learning experience for us and we came across various new technologies, both indigenous and foreign."

Spreading awareness in colleges

For making the engineers industry ready, the students need to be aware of the industry needs, prevailing technologies as well as skills that can help them pursue a meaningful career. In yet another academia initiative, IMTMA teams from the 'Design Institute' and the 'Productivity Institute' conduct awareness programs in various engineering colleges to highlight various career opportunities in manufacturing and metalworking industries through interactive sessions and presentations. This has kindled a passion towards core manufacturing among fresh engineers. Many of them have shown interest in strengthening the cause of the manufacturing industry.

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Source: IMTMA

Students' delegation at IMTEX under Jagruti – IMTMA Students program

Moving in the right direction

The gap that exists between academia and industry is acutely evident in Europe, asserted CEO, Schneeberger AG, Dr Hans Martin Schneeberger, while raising his concern about the skill shortage in the industry. "This calls for better cooperation among industry, academia and governments to train the future workforce. People are the most important drivers of innovation for high-tech SMEs," he noted.

Schneeberger also raised the question as to, "How can the machinery industry ensure the continuity of innovation if it is deprived of a skilled workforce?" The governments, companies and industry associations need to work hand-in-hand to make manufacturing industry attractive to young people.

Executive Vice President, FANUC Corporation, Japan, Dr Kiyonori Inaba, who recently visited the IMTMA Technology Centre, while drawing a parallel between Indian and Japanese training facilities appreciated the training initiatives of IMTMA. He showed immense interest in its hands-on training methodologies.

IMTMA will continue its academia initiatives and make consistent efforts to add value to the industry, institutions as well as the workforce, thereby strengthening the foundation of machine tool industry in India. MMI

For more details about the Academia Pavilion initiative at IMTEX, please mail to sreedhara@imtma.in

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Bosch Rexroth Completes 40 Years in India

Ahmedabad – February 18, 1974, marked the beginning of a German-Indian success story. The joint venture Rexroth Maneklal Ltd began with the official entry in the commercial register. Since then, with the continuing development of the Indian economy, Bosch Rexroth in India has changed as well. The joint venture has turned into a 100 per cent affiliate of Bosch Rexroth AG.

Moreover, the Indian company has taken over several tasks that had previously been carried out from Germany. "Here, we have established the know-how and the capacities to develop products and system solutions that are tailor-made for meeting Indian demands. In the next few years, we are expecting an above-average growth in India," emphasized Managing Director, Bosch Rexroth India, Dr Johannes Grobe.

For this reason, in Ahmedabad, Bosch Rexroth has constructed a highly modern plant that commenced its operations in 2013. There, the company is also producing components for the newest system solution: an electrohydraulic hitch control for tractors. Based on a German platform in India, the solution fulfills Indian demands perfectly.

Source: Bosch Rexroth

Bosch Rexroth's highly modern plant at Ahmedabad

Industry Associations Show Support for EMTE-EASTPO 2014

Singapore – The EMTE-EASTPO machine tool exhibition will witness key market leaders at the Shanghai New International Expo Center from July 14–17, 2014. EMTE-EASTPO CEO Summit, a high-level summit focusing on profitable growth through state-of-the-art manufacturing, will be held in conjunction with this exhibition.

To date, the inaugural joint exhibition has secured strong support from industry associations representing the major end-user sectors of the machine tool industry in Asia.

The joint exhibition will feature the high quality standards of major global exhibitions such as strict exhibitor admission rules, protection of intellectual property rights and live product demonstrations.

This year's exhibition will see country groups from Czech Republic, Italy, Germany, South Korea, Spain and Switzerland as well as an impressive list of exhibiting companies including Agie Charmilles, Bystronic, Carl Zeiss, Fastems, Starrag and Körber Schleifring.

Exhibits will also be presented according to product sectors, including machine tools, precision tools, parts, components, accessories, manufacturing and process automation, etc.

Source: CECIMO

Knowledge sharing and networking at the Bavarian pavilion

Messe Frankfurt Acquires Automotive Engineering Show

Mumbai – Messe Frankfurt Trade Fair India Pvt Ltd formally announced its acquisition of the Automotive Engineering Show, India's only trade fair focused on technologies for automotive manufacturing. Previously owned and managed by Focussed Event Management Pvt Ltd, the Automotive Engineering Show further expands Messe Frankfurt's portfolio of mobility and infrastructure fairs by promoting innovations at the manufacturing level for one of the world's fastest growing automotive markets.

Previously the Director, Focussed Event Management Pvt Ltd and the current Exhibition Director, Messe Frankfurt Trade Fair India Pvt Ltd, Sameer Khedkar expressed, "Our show has until now displayed an overall growth parallel to the Indian automotive industry over the past six years. It seemed like just the right time for us to join forces with a world-class company like Messe Frankfurt, enabling us to get better at doing what we've always done."

Source: Messe Frankfurt Trade Fair India Pvt Ltd

Exhibition Director, Messe Frankfurt Trade Fair India Pvt Ltd, Sameer Khedkar

Solutions for Hard Fine Machining – GRINDING SYMPOSIUM 2014

Thun, Switzerland – The UNITED GRINDING Group – Körber Schleifring – is inviting its customers and interested members of the public to the 3rd GRINDING SYMPOSIUM that will be held from May 21-23, 2014, in Thun, where an insider's view of current and future developments in hard fine machining can be gained.

Intelligent processes for cost-effective production, which contribute to competitiveness and long-term success, will be presented. In addition, individual production solutions, which fulfill the highest quality requirements and are unparalleled in the industry, will also be showcased.

The latest technologies of the UNITED GRINDING company brands, including several world innovations – innovative developments to increase productivity, quality and efficient applications will be demonstrated live in a total of 14 technology presentations. Leading experts will supplement the practical demonstrations with lectures on the latest research results and current developments.

Source: UNITED GRINDING Group

Live demonstrations of the latest technologies in hard fine machining will be showcased at the event

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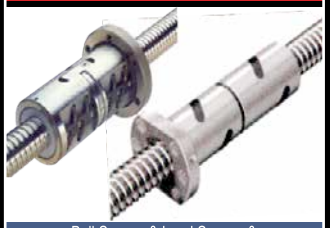

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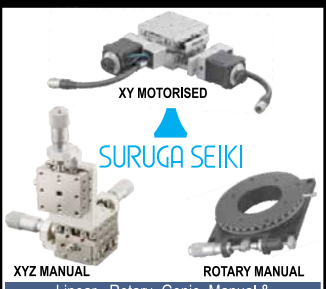

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● BANGALORE ● NEW DELHI ● CHENNAI ● HYDERABAD

Siemens Productivity Trailer Covers the Western Belt

Bengaluru – The 'Siemens Productivity Trailer' made another successful drive across the western states of Gujarat and Maharashtra. 'Siemens Productivity Tour' is a mobile road show highlighting innovative technologies for productivity and efficiency improvement while also showcasing financing options for SMEs, pan India. Close to 9,000 visitors from various industries including automotive, packaging, textile, F&B, steel and chemical gained an experiential insight into the features, advantages and benefits offered by Siemens products. The road show attracted maximum visitors at Vatva, Sanand, Rajkot, Anand, Baroda, Thane, Raigad and Pune.

"I had a wonderful experience visiting the Siemens trailer and all the products from the company were displayed under one roof," said Managing Director, Jyoti CNC Automation Ltd, PG Jadeja, one of the many visitors to the Siemens Productivity Trailer.

Currently in Bengaluru, this trailer will cover the states of Andhra Pradesh, Tamil Nadu and Kerala before entering the eastern region by mid 2014.

Source: Vogel Business Media India

Managing Director, Jyoti CNC Automation Ltd, PG Jadeja

Source: DMG Europe Holding AG

The DMG MORI logo is a prominent eye catcher on either side of the car's huge fin

DMG MORI becomes Premium Partner for Motorsports

Bielefeld, Germany – Porsche introduced DMG MORI as its new exclusive premium motorsports partner at the Geneva International Motor Show.

Under the motto 'Mission 2014. Our Return' Porsche is returning in 2014 to the LMP1 class of the FIA World Endurance Championship (WEC) after an absence of more than a decade.

DMG MORI, as the exclusive technology partner of the Porsche team, will support Porsche in its return to the top class of sports car world motor racing championships (WEC).

Vice President, LMP1, Friedrich Enzinger said, "We are very proud of this partnership for our challenging WEC project."

Chairman - Executive Board, DMG MORI SEIKI AKTIENGESELLSCHAFT, Dr Rüdiger Kapitza stated, "DMG MORI represents tradition, precision and technological leadership with a global presence and is, therefore, an ideal match for the brand values and technological demands of Porsche."

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In order for mining companies to grow profitably in this challenging environment, they have to become dynamic and agile businesses

Source: depositphotos.com/georgios

Towards More Efficient Mining

The mining industry faces many pressures. Five industry experts discuss the current happenings in the sector and how these will affect sustainability. Various innovations that require to be implemented in order to make it more viable have been discussed.Here's an overview…

The long-term outlook for mining companies is not at all bleak. Fuelled largely by the growth in developing economies, the world's demand for minerals and other natural resources is constantly increasing as the growing middle class populace in the emerging economies are spending more on various goods, services and housing. The development of new infrastructure and making of consumer goods boost the demand for minerals and also increases investments in mining. However, the industry is also facing pressure from different directions. The constantly evolving demand trends, commodity market volatility and pressure for improved performance from mining assets are forcing many miners to review their business processes and operations.

"The biggest economic challenges for the mining industry today arise from the result of high demand for mineral commodities in a rapidly evolving and unstable global economic environment. The industry tends to follow a cycle; phases of high risk and large investments to boost production for accommodating demand increases are followed by phases of capital expenditure and cost reductions during periods of economic instability and consequent, temporary decline in demand," says Senior Vice President, Metso - Process Technology and Innovation (PTI) global organization, Walter Valery.

Walter Valery
Senior Vice President
Metso - Process Technology and Innovation (PTI)
Global Organization
walter.valery@metso.com

Increased competition and scarce resources will continue to put pressure on mining ventures. The ability to control costs, particularly during short-term down cycles, has become crucial for the industry. If mining companies want to grow profitably in this challenging environment, they have to become dynamic and agile businesses.

In addition, the industry also needs to improve the efficiency of production with environment-friendly processes that utilize less energy and water in a sustainable and socially responsible manner. Moreover, if the shortage of skilled mining and processing labor as well as the fact that mineral resources have declining metal grades and are located in areas that are increasingly difficult to access are taken into account, it is easy to see that the challenges facing the mining industry are many.

Source: Metso Corporation

Technologies such as GPS and RFIDs can be used on site to improve safety of employees

New technology and services lead the development

But there are also many opportunities for cost containment, capital allocation and improved return on investment in the industry. Most of the opportunities are powered by advances in technology and developments in the outsourcing market.

According to the Natural Resources Industry Lead, Accenture Asia Pacific, Nigel Court, the mining industry is able to capitalize on advancements such as integrated operation centers and integrated decision making using analytics and supporting performance management frameworks.

"New technologies provide an ability to identify improvement opportunities throughout the supply chain. Specialized software and bespoke applications can track the location and quality of materials and equipment performance. There are also opportunities in automation and IT to deploy consistent operations maintenance, supply chain management and business support across remote operations. The potential cost savings offered by combining lean production with selective automation is too great to ignore," states Court.

He accentuates that the future of mining requires a major cultural change from the traditional structure of functional silos to integrated operations. "The mining sector can learn from other industries that have pioneered business-services models integrating stand-alone services into multi-towered service organizations, thereby resulting in end-to-end support. These models can be adapted in, for example, mine planning and customer order management, as well as in pricing and risk management."

From isolation to optimization

Mining is essentially based on a series of operations that are interconnected and interrelated, with the performance of one operation affecting another. Traditionally, these operations have been treated, analyzed and optimized separately. This often results in less than optimal outcomes, as changes in one area can sometimes even be detrimental to downstream processes.

Valery's team at Metso PTI has the expertise to tackle these kinds of problems. The company provides global consulting services, products and development of solutions to optimize customer production processes – from mine to processing plants.

"Metso PTI provides total process integration and optimization services. We analyze and optimize each process in the context of the entire production chain. We have been successful in helping our customers increase their profitability by delivering improvements in production and efficiency while at the same time minimizing costs and environmental impacts. The continuous improvement and support provided to Minera Antamina in Peru is a good example of our optimization projects. Our services resulted in production increases of more than 30 per cent for the hard ores processed at this mine," mentions Valery.

As per Court, containing cost increases and managing through the cycle – ramping up for growth and scaling back for dips in demand – will be the key to commercial success for miners in the future.

Strategy and Transformation Leader, IBM Global Business Services, Henry Vila notes that the traditional approaches to mining may soon become obsolete. "In the past, mines were built around a commodity-focused business model and driven by product output. In the mines of the future, the business model is value- and relationship-focused and driven by customer demand. Mining companies will do more with less, optimizing their use of capital and building flexibility. The focus will be on realigning relationships to build the financial solidity of suppliers, partners and customers. This, in turn, will build profitable relationships that will enable the company to transcend commodity trading relationships only," Vila envisions.

Social responsibility – the license to operate

Today mining companies are asked to do

Source: depositphotos.com/xtrekx

Innovations are imperative in the mining sector to ensure its sustainability

The Sustainable Way Underground

According to the Sustainable Mining and Innovation for the Future (SMIFU) Consortium, open-pit surface mining may continue to dominate in the future, but a more rigorous focus on underground mining is a must for certain commodities and companies. Future mines will be deeper and will extract lower grades under more stringent workplace and environmental regulations. They will also probably be located in remote areas with harsh climatic conditions coupled with more consistent demands for societal responsibility.

Here are eight important features of underground sustainable mining and innovation for the future, as defined by the SMIFU Consortium:

A single control room - Processed information from the rock, from the personnel and the machinery and equipment is delivered to the control room online. Thus it is possible to control and fine-tune the complete operation chain, from resource characterization to end-product. The extensive use of sensors, cameras and image techniques allows the transmission of 'live broadcasts' in the control room or elsewhere as needed.

No human presence in the production areas - All work processes are remote-controlled or automated. Special robots are developed for the preventive maintenance of equipment and safe retrieval operations. The maintenance of the robots as well as essential equipment repair is conducted in structurally safe, underground vaults. All underground equipment is electrical and the use of diesel is banned.

Continuous mechanical excavation - Continuous flow is a key issue for lean mining and further automation. The future mine is a continuous process, which means that continuous mechanical operation is also used for hard rock types. High reliability is a key prerequisite for continuous mining.

An attractive workplace - Every person in the workforce is highly skilled and motivated, and the organization nurtures a learning and safety culture that attracts talented young men and women.

Pre-concentration - Barren rock is separated underground to minimize both the energy needed for haulage and transport as well as the environmental impact on the surface.

Resource characterization - Sensors and monitoring systems are used to describe the mineral content and structures of the rock for optimization of ore recovery, safe underground openings and efficient product control.

End-products - In order to be more sustainable, waste rock should be turned into products. Mine-site metal production should, if possible, be carried out to avoid unnecessary transportation. Added value generated in situ should also contribute to a richer social life at the mine site.

Suppliers - The role of equipment manufacturers is very important. They will design reliable machines and have online contact with equipment for condition monitoring and for carrying out maintenance and overhaul of components. This helps safeguard high production performance.

Source: Sustainable Mining and Innovation for the Future (SMIFU) Consortium

their business with minimal environmental impacts and in accord with the surrounding communities. But can the companies in the mineral exploration and development industry really help solve social issues in a way that is also good for business?

President of the International Council on Mining and Metals, Dr R Anthony Hodge believes this to be possible. He points out that mining companies need to establish trust with the local communities that are stakeholders in their operations.

"The greatest insurance policy that a mining company has is community trust. Progressive mining companies see themselves as members of the community," says Dr Hodge. He notes that the business value of solving social problems goes beyond local communities – it can also help mining corporations reduce financial risk and gain access to financing.

"For humankind to walk more lightly on the earth and to achieve the kind of poverty reduction that is needed across the world, we need more efficient services. But at the heart of every efficiency improvement are still the metals and minerals that are mined," states Hodge.

Safety up, environmental train down

Practical examples of making the future of mining more sustainable include further improvements in safety and using energy and the environment in smarter ways.

"In the past, the safety of mines was based on training procedures and local policies. Today, new smart programs such as location awareness technologies, GPS and RFIDs can be used to improve the safety of employees," Vila emphasizes.

In the case of sustainability, it is already well known that the major consumer of energy at the mine site is comminution. In fact, it consumes up to three per cent of all electrical power generated in the world. According to Vice President, Technology Management and Research, Metso, Jari Riihilahti, up to one third of all energy used by a mine and minerals processing plant goes to grinding, "Efficiency of comminution has traditionally been low. The industry needs smart ideas to improve the process performance. This will reduce operating expenses and the greenhouse gas emissions of comminution. There is actually no shortage of such smart ideas, but we need to continue to invest in new innovations. Safety and energy and water efficiency are common targets in developing our equipment and service solutions." MMI

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"The Indian Machine Tool Consumption is Expected to Grow during the Next Five Years"

Elaborating on the Association's significant contribution towards the development of its members, Director General, CECIMO, Filip Geerts emphasizes on how the forthcoming EMTE-EASTPO machine tool exhibition will serve as a jumping-off point for European manufacturing companies aiming to spread their footprint in Asia. Excerpts of the edited interview...

How does CECIMO (European Association of the Machine Tool Industries) contribute towards sustainable manufacturing growth of its members in terms of providing research base, trained workforce and right market access?

Filip Geerts: CECIMO represents the interests of the European machine tool industry to the EU policy-makers in Brussels who, through policies and regulations, have a direct impact on the business framework in the EU single market. It acts as a knowledge base and an intermediary to communicate the needs of the sector to regulators and also participates in discussions of expert groups and policy networks facilitated by the EU institutions, whereby industry stakeholders can give their inputs to design policies and programs for research, training and other areas such as finance.

With respect to market access, the European Commission has an exclusive competence in this area such as negotiating trade agreements on behalf of EU Member States. CECIMO is closely involved in the Commission's civil society dialog through which it provides inputs for the negotiations such as trade figures compiled by our economic department, and information on market access barriers affecting our companies in third world markets. Moreover, the Association actively aids European machine tool companies in gaining access to new markets by providing them with a launch pad through the EMO and EMTE-EASTPO exhibitions.

Source: CECIMO

How would the forthcoming EMTE-EASTPO machine tool exhibition help European manufacturing companies to expand their footprint in Asia?

Geerts: We have seen a dramatic shift of machine tool markets from Europe to Asia over the past decade. This is partly due to rapid industrialization of the region and partly as a result of an economic crisis in the EU that has hit investments. In this context, European companies need to open up to international markets and integrate global supply chains to win new markets. Nevertheless, most of the European machine tool builders are small or medium-sized and have little experience in remote and large markets beyond Europe.

EMTE-EASTPO will act as a springboard to help them gain exposure to China and other markets in the neighbouring countries. It will connect them to high-profile customers to strike new sales deals and select right business partners. As for experienced machine tool builders, they will be able to leverage on the

"We have seen a dramatic shift of machine tool markets from Europe to Asia over the past decade." - Filip Geerts

European brand of EMTE (European Machine Tool Exhibition) to expand their reach in Asian markets.

Considering the fact that the future of the machine tool industry is intelligent automation, how can shows like EMTE-EASTPO make a difference in creating awareness about the latest trends in the sector?

Geerts: EMTE-EASTPO will feature the latest trends in the machine tool industry. Besides the live demonstrations according to product sectors, it will comprise several knowledge-sharing platforms. The EMTE-EASTPO CEO Summit is one of the events aimed at top machine tool buyers from China and the rest of Asia. Targeting around 200 CEOs and directors, this one-day summit will feature a panel of distinguished speakers from Bystronic, COMAU (Shanghai), CEIBS China (Shanghai) and Volkswagen Group China among others to share their expertise on attaining profitable growth through state-of-the-art manufacturing. One of the topics will revolve around applying innovation and high-tech solutions for successful manufacturing. This session will provide deeper insights to profitable operations utilizing the latest production technology, such as automation and robotics. We will also be conducting several onsite seminars and technical tours to highlight the trend and create awareness among players in the industry.

Talking of R&D and innovation, how energy and resource efficiency can be improved in machine tools?

Geerts: R&D and innovation activities are the focus areas in Europe because these are strictly linked to ecodesign capability. This capability is the key for bringing energy-efficient machine tools into the market, removing low-energy performing products and shifting competition towards resource efficiency. That is why the machine tool industry considers ecodesign as a strategic tool for long-term business sustainability. Machine tool manufacturers are highly focusing on energy-efficiency measures that are either technical, applied to the machine, or organizational, applied to the production process. According to an inquiry carried out among European machine tool builders for CECIMO in 2013, the most popular measure was the minimization of energy consumption for non-productive stages (standby mode). Improvement of the main machining function, which impacts the overall performance of a machine tool, was the next priority. In the third place was the manufacturing strategy, and since it is associated with productivity, it is positively correlated with economic targets. Secondary process functions for lubrication and cooling and the optimization of hydraulic systems complete the top five measures.

PERSONAL

"Today, Asia consumes almost 64 per cent of all machine tools in the world and will remain an important market for European machine tool producers even if no substantial growth of the consumption ratio is foreseen."

Filip Geerts

Please elaborate on how the show would act as an ideal sourcing platform.

Geerts: The first EMTE-EASTPO exhibition will have the full support of CECIMO and its 15 member associations. It will offer several networking opportunities introducing CECIMO and the Partners Networking Village, where members of our partner associations can meet, interact and share industry updates. A dedicated marketing and publicity campaign is also in place to attract buyers from the supply and value chain of the manufacturing industry spanning Russia, China, India and several other countries from the Southeast Asian region. We are also working closely with industry associations across the region and have issued personal invitations to them and their members to tap opportunities at EMTE-EASTPO for their sourcing needs.

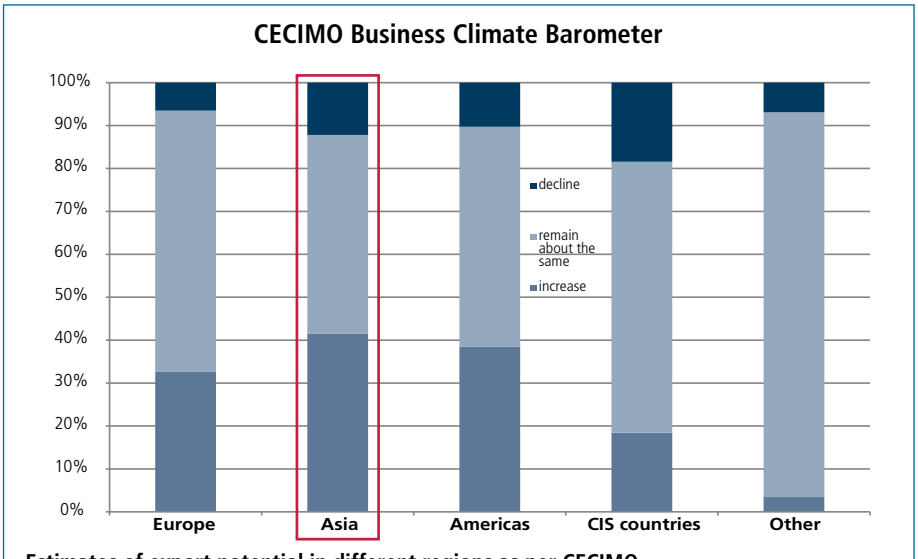
How do you perceive the growth of machine tool market in Asia, especially in China and India in the next five years?

Geerts: Today, Asia consumes almost 64 per cent of all machine tools in the world and will remain an important market for European machine tool producers even if no substantial growth of the consumption ratio is foreseen.

The governments of China and India are making efforts to rebalance their economies. Their future economic growth greatly depends on the success of the reforms they carry out. Obviously, this level of success will also be reflected in the European machine tool builders' outlook. The fact that China is moving towards an increasingly consumption-based economy clearly changes the machine tool consumption structure. A quick shift away from over-investment could lead to a shortage of liquidity and a sharp tightening in credit conditions. With that in mind, we estimate the Chinese machine tool consumption growth to average almost 10 per cent over the next five years.

The Indian government's inability to push through the necessary economic reforms has caused a considerable economic slowdown and a drop in machine tool consumption averaging over 15 per cent over the last two years. Despite some concerns about monetary policies, the Indian machine tool consumption is expected to grow during the next five years. MMI

Source: CECIMO



Estimates of export potential in different regions as per CECIMO

The interview was conducted by:
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Productivity Enhancement through Advanced Shop Floor Management

The US automotive supplier, BorgWarner optimized production at its German subsidiary, BorgWarner Cooling Systems by utilizing FORCAM's shop floor management technology 'Factory Framework'. As a result, the overall production efficiency in the plant, housing a total of 40 machines, increased by 4.3 per cent within six months.

BorgWarner Inc, a US automotive supplier and market leader in the field of drive components and system solutions, conducts business with well-known manufacturers globally – in the US, Asia and Europe. BorgWarner has branches at more than 60 locations in 19 countries.

A subsidiary based out of Markdorf in Germany is the largest branch of the BorgWarner 'thermal systems' division with a total of 12 production facilities. Core business segments in Markdorf include engine radiator systems for commercial vehicles as well as off-highway machines (agricultural and construction). The Markdorf branch comprises 320 employees and has also been witnessing continuous expansion since 1999 towards becoming a sales and development center.

With an aim to become more efficient and integrate lean manufacturing philosophy into production, the company sought the assistance of FORCAM GmbH, an independent IT and consulting

Source: FORCAM

Source: FORCAM

Operational excellence realized by the synergy between a shop floor MES system and shop floor CIP management

BorgWarner Inc

Challenges

Aid production efficiency by:

- Integrating lean manufacturing philosophy into production

Solutions

Incorporating a custom-fit production management system by FORCAM. This included undertaking continuous improvement process (CIP) by:

- Function-oriented production data collection
- 5-S program – sort, straighten, shine, standardize and sustain
- Lean transformation to CIP organization
- Lean manufacturing organization + technology

Results

- Detailed process monitoring and objective evaluation of machinery
- 4.3 per cent increase in productivity in six months
- Processes that are synchronized, standardized and designed to meet specific needs
- Transparency within production orders and machine cycles
- Bottlenecks and weaknesses get immediately recognized and analyzed precisely
- Holistic integration of machines, production orders, personnel, and management in the continuous improvement process
- Standardized key performance indicators (KPIs)
- Target-oriented performance measurement and benchmarking
- Visual management
- Overall plant efficiency continuously measured and improved

company with global headquarters located out of Friedrichshafen, Germany.

Advanced shop floor management

FORCAM offers leading solutions for productivity optimization (shop floor management). IBM is a global sales and service partner of FORCAM. The company is represented globally by offices in France, England and the US.

Together with FORCAM, the BorgWarner team in Markdorf developed and implemented an individual, custom-fit production management system 'Factory Framework' for 40 machines that systematically collects and processes machine and operating data. Current process states are visualized online and all weak areas (including technical, logistical and organizational failures) are analyzed with precision. Plant Manager, BorgWarner Cooling Systems GmbH, Jürgen Bischoff said, "We had already started some optimization measures, but these were not enough. With FORCAM, we took another step forward and included the machine data in our production optimization. FORCAM offers the newest web technology for ideal production management."

The Central Management System visualizes and optimizes production by creating a symbiosis between lean organization and lean technology towards a sustainable increase in productivity. It is accompanied by a continuous improvement lean manufacturing process.

Towards efficient production

The production management system offered by FORCAM delivered excellent results in every sphere, be it in the area of maintenance, production scheduling or management, while also simplifying operations for the foreman.

For the foreman, shift data collection became easy through the graphic and tabular display of the latest information including the current shift. All machine details are shown via a mouse click. Key figures and high-quality machine data collection enabled precise information gathering. Moreover, the solution brought in more transparency by providing a clear and concise overview of all areas as well as possible disruptions and downtimes.

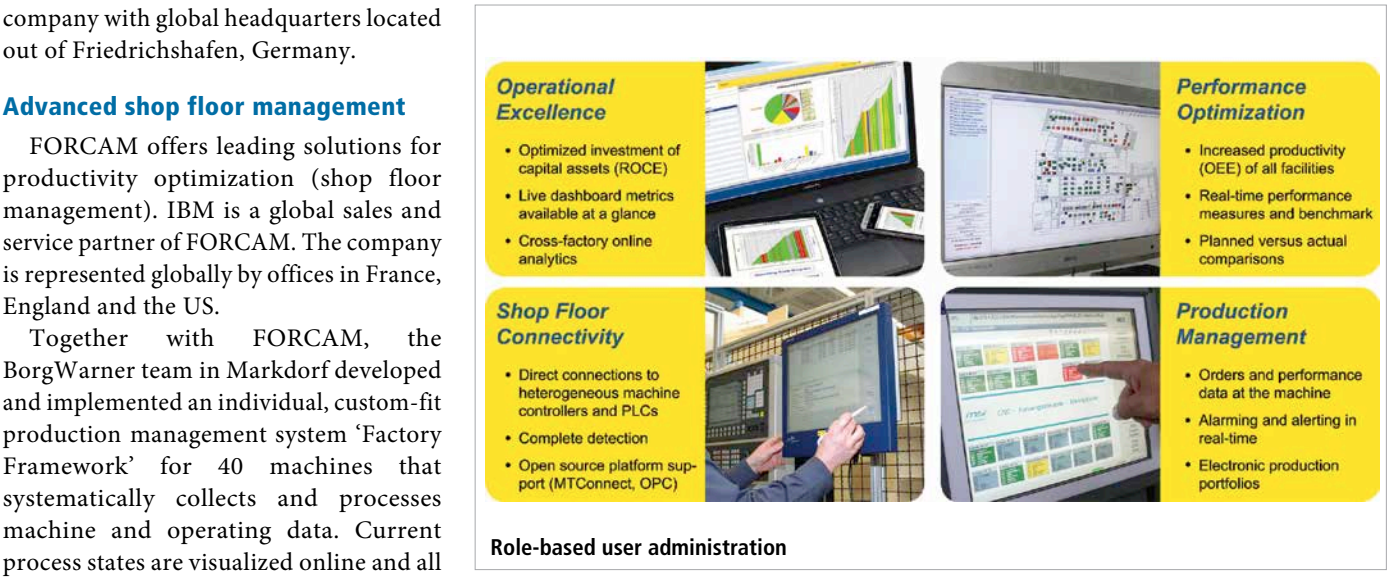
To enable better maintenance, the system ensures detailed machine failure collection – a detailed 7-stage statement of problems; data are organized in SAP ERP in parallel, etc. It provides failure hit lists by way of graphically prioritized display sorted by duration.

When it comes to production scheduling, optimized planning is possible with appropriate updates of actual cycle times in SAP ERP; adjustment of workplace capacity; scheduling and calculation of product costs; higher quality data in SAP ERP; time bases for production and set-up time for calculation of utilization rates. Moreover, it gives a clear picture of actual versus target performance by reporting deviations from targets with proper analysis.

IT support also helps in recognizing delays and disruptions caused by performance losses. Detailed scheduling ensures reduction in cycle times, holding times, set-up times as well as higher degree of capacity utilization and better information.

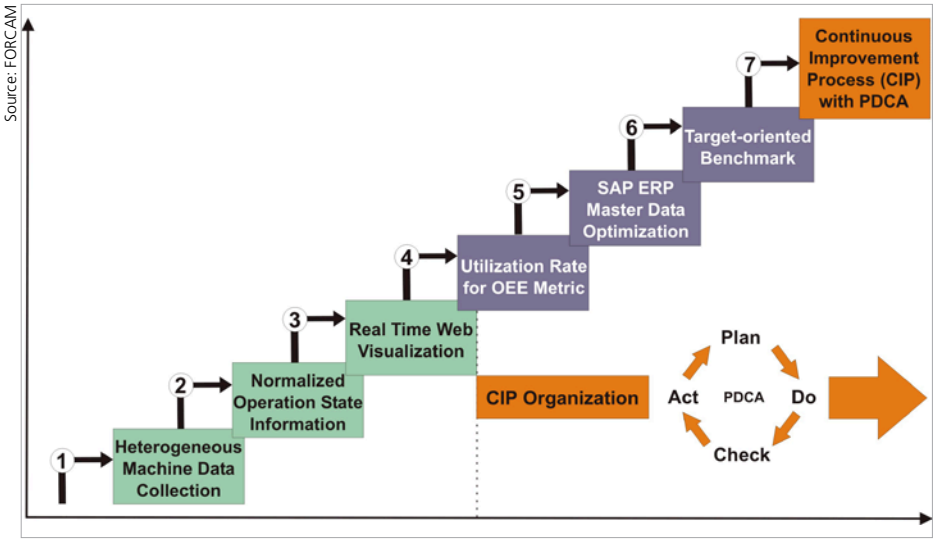
Last but not the least, the system adds value on the management front too by enabling comparisons such as comparative reporting and analysis of utilization and operating ratios across all machines; this makes poor planning easily obvious. Besides, personnel and machine performances are easily viewed and with cyclically updated production data, clean visualization is made possible.

Lean Management Coordinator, BorgWarner Cooling Systems GmbH, Martin Strehl concluded, "FORCAM'S technology is unique and has exceeded our expectations in all categories important to us: strategy, functionality and costs." MMI



Source: FORCAM

Role-based user administration



Source: FORCAM

Steps to best performance

Simulation-based Engineering Tools: Implications for Defense Organizations

Simulation-based engineering (SBE) tools have been proven to deliver significant return on investment and cost savings to defense programs. However, as the defense community enters a period of increased financial scrutiny and uncertainty, top organizations are implementing best practices in the areas of SBE processes and people to better support design for affordability.

SBE tools such as finite element analysis, computational fluid dynamics and electromagnetic field solvers are proven contributors to the product development process in the defense industry. However, the industry often focuses on the tools' capabilities. While fundamental capabilities are necessary for effective contribution, they represent only a fraction of factors that enable best-in-class organizations to leverage full value from these tools. In general, how the tools are used (process) and who are using these (people) are assigned lower priority or neglected altogether by the wider modeling and simulation community. This introduces inefficiency factors that become embedded and accepted as a business cost in terms of operations and new program proposals.

In this era of defense spending constraint and uncertainty coupled with the re-emergence of Design for Affordability (DfA) as the governing mantra, organizations must address these inefficiency factors to support the need to do more without more.

Robert Harwood, Ph.D.
Marketing Director-Aerospace and Defense Industry
ANSYS, Inc

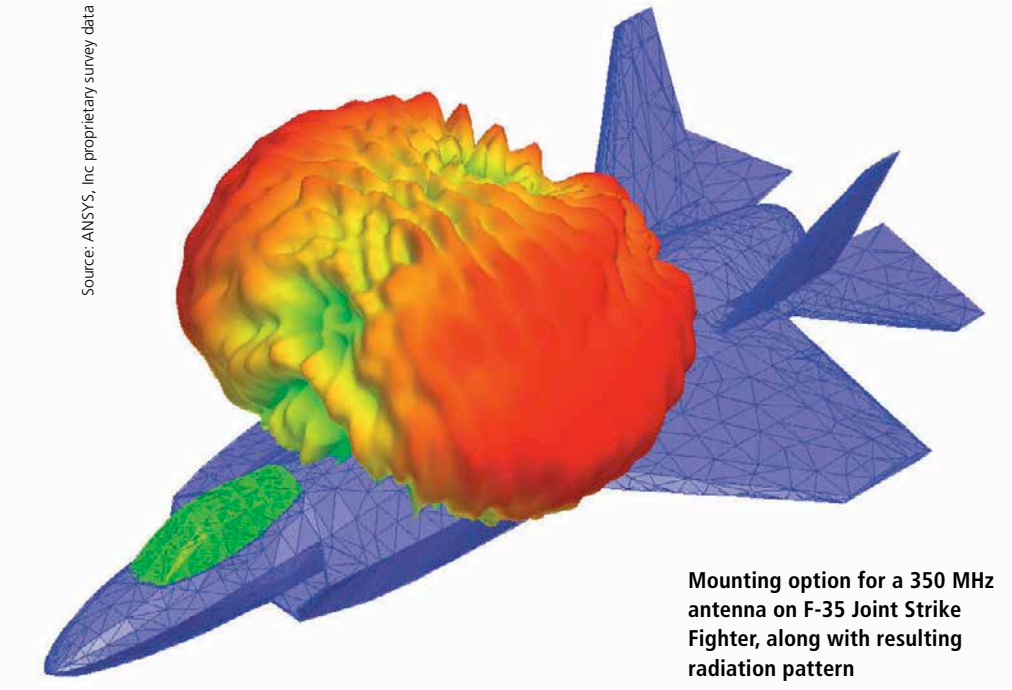
The surveys of defense modeling and simulation community that leverages SBE at leading government facilities as well as contractors around the globe by ANSYS have brought to light top three contributors of embedded inefficiency:

- Flawed processes for data exchange between segregated engineering disciplines and functions
- Limited data and knowledge reuse
- Lack of focus on staff development, training and task automation

Implementation of best practices

However, these inefficiencies can be overcome by implementing certain tried and tested best practices. Several top organizations reaped huge benefits after adopting these best practices.Numerous studies around the globe have demonstrated cost, schedule and quality impacts that SBE tools can have on defense programs. For example, the US Department of Defense (DoD) produced a return-on-investment study, which revealed that defense programs that invested in SBE averaged a return of between 6 and 13 times. These tools support the DfA initiative and hence proliferate throughout the defense product development community.

In terms of DfA for highly engineered defense technology, Senior Vice President, Booz, Allen and Hamilton (a technology consulting firm), Mike Jones, asserted that it is necessary to 'challenge those design decisions that were made 15 to 20 years ago at program inception' and 'change the design'. According to him, implementation of DfA through this redesign process can yield a 30 per cent reduction in acquisition and



Source: ANSYS, Inc proprietary survey data

Mounting option for a 350 MHz antenna on F-35 Joint Strike Fighter, along with resulting radiation pattern

sustainment costs. SBE tools serve as an ideal resource to cost-effectively challenge design decisions.

SBE processes and people

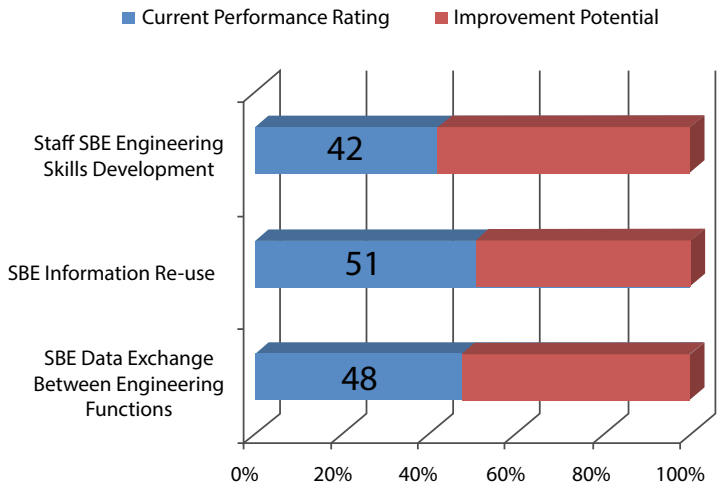
Reports that indicate the value of SBE tools typically show a return on investment that is based on process outcomes. For example, the value in applying SBE tools can be determined by the number of physical tests eliminated, shortening the design cycle or reducing product failures. However, the efficiency of the process itself or of the people using the tools is rarely assessed.

Studies have revealed that while incremental tool enhancements will make a contribution to DfA, a significant impact can be made by improvements in process and people. To understand these and place them in context, it is necessary to review the historical development of SBE tools and understand the environment in which they are used.

Inefficiency in the process

As software-based engineering simulation emerged, tools focused on physics and capabilities to solve a narrow application. Usability was of little concern as the user was typically the developer of the code. This led to a small number of expert users who had developed tools that were used only within their engineering function — for example, specialist aerodynamics codes in the aerodynamics group; thermal codes for the thermal team; electronic codes for the electrical department; and structural codes for stress engineers.

Tool selection and usage are aligned with an individual engineering function, not the broader needs of the program that individual functions combine to serve. While the process of usage may be efficient within a single discipline, this narrow perspective can be detrimental to the wider usage demanded by the program. Tool procurement is often driven from an engineering function perspective, not a programmatic perspective. The combination of tools selected on a function-by-function basis may be suboptimal when viewed from a program perspective – concerning both cost and function.



Source: ANSYS, Inc proprietary survey data

Top three SBE practices that defense organizations identified as having the greatest potential for improvement

Usage of SBE tools

SBE tool usage is often restricted to resident domain experts. As a result, these experts often spend significant portions of time fulfilling non-expert tasks such as model preparation or repeated setup of variational studies. As products become more complex and interdependent, applying tools that are limited to a single engineering discipline increases the risk of failure during systems integration as they do not account for wider interactions and interference.

The outputs from sophisticated simulations in one engineering function are required as inputs for others during concurrent design. Incompatibility between multiple tools across different functions results in loss of fidelity (as data are averaged or interpolated) and time (as scripts or in-house interpolation schemes must be used). The same operations must be performed repeatedly in each engineering function, as each tool requires its own interpretation and modification of the underlying geometry model. Not only is this inefficient, it results in engineering functions

Source: ANSYS, Inc proprietary survey data

According to a senior engineer at Space Exploration Technologies coupling simulations through efficient multiphysics resulted in reduction in system weight and development time

becoming desynchronized in the product development cycle, since one team's updates are not captured in another team's analysis.

Many organizations do not have formal processes for capturing SBE knowledge. While data and files may be archived in a structured way, the knowledge and engineering intent synthesized from data is typically lost. This results in similar problems being solved repeatedly across different programs. Tools such as product lifecycle management and their variants have delivered significant benefits to the product development process. However, their focus on the practical aspects of a product such as bill of materials fails to address the issues listed, which focus on understanding the behavioral attributes of the product.

Improvement areas

The surveys of modeling and SBE community have resulted in the identification of three major improvement areas that include:

- Staff simulation-based engineering skills development, training and process automation
- SBE data reuse and knowledge capture
- SBE data exchange between engineering functions

The best-in-class organizations focus on two key best practices:

Amplify existing engineers' productivity

- Automate routine processes to free up engineers' time to focus on complex issues
- Coordinate SBE and IT investment strategies to ensure that hardware and software requirements are aligned
- Parametric modeling and optimization
- Strategic partnership with SBE tool provider as opposed to client-vendor relationship

Democratize SBE use in an organization

- Customized SBE tool interfaces and capabilities to facilitate use by less-experienced engineers or intermittent users
- Direct modeling used to enable analysis to be performed at pre-CAD stage
- Formalized training processes and aggressively protected training budgets

Open and collaborative platforms

Many organizations have established open and collaborative platforms for simulation that facilitate sharing and capturing of knowledge in addition to archiving data. These organizations have been able to do this within constraints imposed by the secure nature of defense projects. Typical attributes implemented by them include:

- Dedicated engineering architecture for simulation data management
- Centralized simulation data management solution
- Cloud (internal or external) deployment of data management
- Integration of data management solution with PLM system
- Change management and control for modeling and simulation
- Global visibility into product behavior and performance data
- Governance and project management protocols
- Traceability with audit trails and IP security
- Combination of protection technologies
- High data volume and value
- Supply chain interaction and management

Facilitating better data exchange between engineering functions

To improve the acknowledged performance gap in the ability to exchange data and information between segregated engineering functions, several organizations have implemented a comprehensive and integrated multiphysics simulation solution. This solution includes different levels of scale and fidelity to be applicable at different stages of the product development cycle. Typical attributes implemented include:

- Physics-based simulation tools that can interact seamlessly at different levels of fidelity (linear to non-linear, steady to transient)
- Physics-based simulation tools that can interact seamlessly across disciplines in a common working environment with minimal manual intervention (e.g., aero-loads transferred directly to stress analysis within a common simulation environment)
- Physics-based simulation tools directly connected to functional and architectural system-level models
- Common geometry models serving segregated functional engineering teams
- Simulation capabilities determined from program requirements as opposed to individual functional requirements
- Framework that supports access from distributed engineering teams
- Ability to leverage high-performance computing resources across physics disciplines
- Integration of commercial and in-house simulation tools in a common environment

Integrated organizations: Segregated SBE tools

With the evolution of SBE tools, there is also the resulting segregation of simulation tools within each discipline. Many organizations have not applied the same integrated principles to SBE tool use as they have done to the overall product development processes and hence fail to reap the benefits.

Defense organizations typically operate as a matrix that consists of distinct functional engineering disciplines overlaid by product development programs. Variants of the matrix system have been implemented, including Integrated Product and Process Development (IPPD), Total Quality Management (TQM) and concurrent engineering. Such frameworks are implemented with the intent of reducing program cost, improving program schedule and delivering high quality products. MMI

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What is Needed for Unattended Wire EDM

The promise of running a wire EDM for long stretches without much operator attention is enticing, but many shops never manage to pull this off. Here are some tips to make it happen.

Using an energized wire to slice through metal is the essence of the wire electrical discharge machining (EDM) process. Synchronized computer control of the machine's axes enables it to cut intricate shapes that form the periphery of the workpiece or contoured openings within. Following a complex path in a steady, highly controlled manner is a very efficient method to produce these shapes in materials that might otherwise be difficult or impossible to machine, although 'time in the cut' may stretch for many hours.

Mark Albert
Editor-in-Chief
Modern Machine Shop
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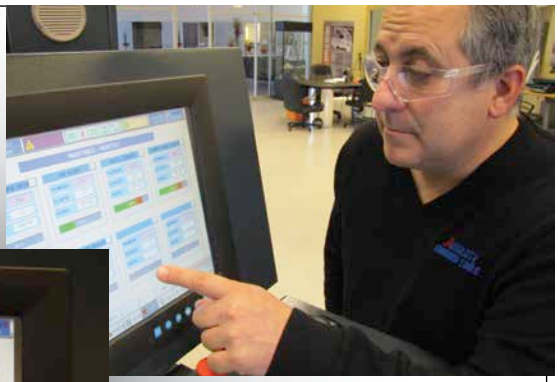
Today's typical wire machine offers standard or optional features that enable it to operate for extended periods of time without the close attention of an operator. These features include automatic wire threaders, tooling fixtures for multiple part setups, sensing and feedback systems for adaptive control and advanced electronics.

The prospect of exploiting this capability for unattended operation often figures prominently in a shop's justification for acquiring this technology, whether by first-time or experienced users of wire EDM. However, many of these shops fail to take full advantage of wire EDM's inherent potential for round-the-clock operation. Somehow, a shop may never manage to muster the wherewithal to produce good parts on the wire machine during times when the workforce is away. As a result, much of the substantial earning power represented by unattended operation of the wire EDM process is lost. Frustrated and disappointed, some shops give up on in-house wire cutting, sell the machine and settle for sending the work out to a subcontractor.

In his career as a Wire EDM Specialist and Sales Engineer, Mark Cicchetti has seen this situation too often and he believed it can and should always be avoided. Now serving as EDM Technical Director, Absolute Machine Tools' Accutex EDM product line, Cicchetti has developed a proactive approach to make sure that buyers of wire machines from Absolute have the best chance to fully implement unattended operation of the wire EDM process and maximize the return on their investment.

"There's no magic or mystery to it. Any shop can master the necessary concepts and instill the discipline to make it a dependable routine," said Cicchetti. In fact, he believed, the experience is likely to lead to further efforts to make other machining processes available for lights-out operation. "Wire EDM is a good place to start the journey to full automation in the machine shop," he stated. Even for shops that do not find a place for wire EDM in their operations, a look at what it takes to implement unattended wire EDM can offer valuable lessons about managing the move to automation.



EDM Technical Director, Absolute Machine Tools Inc, Mark Cicchetti points to items on the maintenance screen open on the operator's panel of the machine's control unit. These displays enable the user to check for any maintenance or service issues that might disrupt a period of unattended operation before it is completed.

Source: mmsonline.com

Have a plan, a real plan

To get ready for unattended wire EDM, a company needs a plan. "This is the first thing a company must do and the plan has to be complete, detailed and specific," advised Cicchetti. This plan should be based on research to make sure that provisions for unattended operation are included in the machine, the tooling, the programming software and the shop infrastructure

(especially its communication/messaging network).

The plan needs to be documented and copies shared with everyone in the shop who will be involved in EDM operations, including the engineering and sales staff. "Input and buy-in from the sales people are often overlooked, but it is essential because supporting the wire machine with incoming work is critical," Cicchetti said.

He added that a good plan includes a timeline and due dates, with lists of action items assigned to the individuals responsible for carrying them out. Recurring action items such as regular maintenance routines, supply replenishment and reordering of consumables and wear components should also be spelled out, with appropriate intervals clearly stated in each case.

A good plan also identifies the capacities needed on the EDM unit, such as sufficient wire supply (spool size), long-lasting energizing pins (also called power feeds) and filter life (adequate to cover the intended period of operation, such as over a weekend.) Likewise, the reliability of the wire threader and the adaptive features of the power supply unit for predictable cutting conditions should be evaluated for automated applications.

Get everyone on board

As soon as a shop begins planning for automated wire EDM, it should also get a firm commitment from top management. This means more than getting the general manager or shop owner to give an okay to the EDM department's intention to run its wire machines in the unattended mode. It must be clear that unattended operation usually requires a change in 'lifestyle' for many people in the shop, especially if this is the shop's first experience with automation or unattended operation.

Managers at the top should expect new and different behavior on the shop floor and not be surprised by these changes.

"Commitment boils down to practical budgetary factors too," averred Cicchetti. Further he believed that investment in new tooling, optional equipment on the machine and training have to be expected and accepted. Training is especially important. "If top managers balk at setting aside time and expenses for adequate training of operators, programmers and other shop positions, then there is no real commitment and the success of an automation initiative becomes uncertain," he explained.

He continued, "Planning for unattended operation and getting management commitment go hand in hand. Selling to management is more easily accomplished when it sees a solid plan emerging. Likewise, an EDM department can build a better plan when it has facts and figures from management."

Source: mmsonline.com

An obvious concern is that an adequate supply of wire will be available to complete all the cutting operations while the operator is away. Accutex EDM wire machines track wire usage so there is no guesswork in making this determination. A 22-pound spool of wire is shown here, but a 35-pound spool can also be installed.

Evaluate the workload

Cicchetti noted that a shop must understand the nature of the workload that is targeted for unattended wire EDM. "Shops tend to look at the gravy work first and that can be a trap. They think of the big blocks of steel that can be threaded one time and will cut non-stop for 30 hours in a single shape. It's easy to get unattended operation for those pieces," he cautioned.

He further mentioned that it is more important for a shop to be able to recognize groupings of workpieces such as similar stamping die details that can be set up in multiples and processed consecutively. Accommodating this kind of work forces a shop to address the need for appropriate tooling and setup procedures as well as programming capability. This also pushes a shop into the area where unattended operation provides the greatest cost reductions and time savings.

Similarly, a shop must be able to recognize the kind of work that does not lend itself to this approach. "Repair work and other jobs that are unpredictable are best excluded from the mix for unattended operation," said Cicchetti. If it requires craftsmanship and expert tweaking at the machine, or if features are not precisely dimensioned upon arrival, it is best to set it aside for manual operation.

Cicchetti points out that a thorough evaluation of a shop's workload often leads to a challenge for the shop's scheduler or scheduling system. "The demanding manual jobs must be balanced with time to set up work that will fill the periods of unattended operation. Often this can be resolved by explaining the priorities to the scheduling department," he revealed.

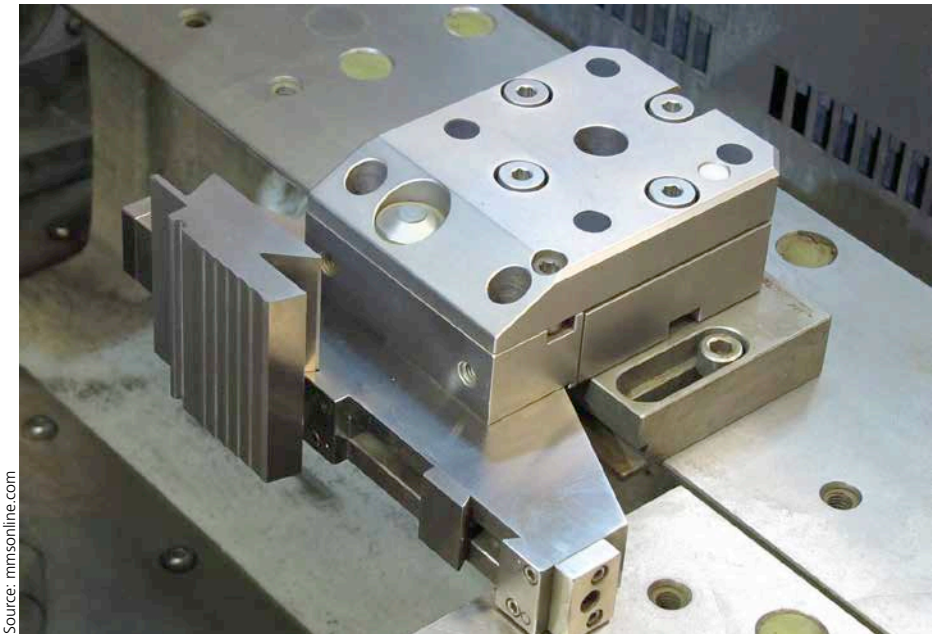
Tooling for offline setup

A frequent point of resistance to unattended operation is the idea that a shop's array of wire EDMed parts is too diverse for 'production work'. The comment Cicchetti often hears is, "All our parts are of different sizes, profiles and materials. Unattended will never work for us." His response is to explain the importance of an appropriate approach to EDM tooling methods. "It's a combination of having the right workholding elements and the habit of doing setups offline — that is, on a dedicated station away from the machine," he added.

He defined the right workholding elements as those found in a high-quality integrated tooling system such as offered by System 3R, Erowa, Hirschmann and others. "Regardless of the system you choose, it must be accurate, repeatable and durable. Don't buy on price alone. Ask tooling suppliers about tooling packages that include the basic components to get started. Extra pieces can be added as needed. A shop with basic toolroom equipment can fabricate custom pieces, as well," he suggested.

Cicchetti recommended that the first tooling strategy a shop should implement to do more unattended operation is offline setup. "Essentially, this means having duplicate pallet receivers on a surface plate at the workbench and on the rails in the machine. Then it's just a matter of mounting workpieces on fixtures or clamping devices that interface with a common pallet that can be transferred from the setup station to the identical receiver on the machine," he explained. Fixtured parts can be aligned in three axes offline with a dial indicator and/or a height gage at the surface plate before moving.

The next step is to locate the parts on the offline station as well, he said. This entails measuring and recording part coordinates to be input at the machine. "A shop in the habit of using the pick-up function on the wire machine loses all the time that could be used for wire cutting," he explained. Picking up the coordinates on the machine involves using the wire on the machine as a kind of



Source: mmsonline.com

An integrated tooling system that facilitates offline fixturing and presetting of workpieces is vital to unattended operation. A basic strategy is to have a pallet receiver on the surface plate (left) that matches identical units mounted on the rails inside the machine's work tank.

sensor probe that touches off all the edges of the parts, a procedure that takes an average of about five minutes per part. Over a year's time, the accumulated on-machine pick-up time represents around 130 hours of lost wire cutting per machine, Cicchetti calculated. Offline setup and presetting win back that lost time.

Some shops gain proficiency at offline setup and eventually reach a point where having a robot and a part storage carrousel begin to make sense. This is not the ultimate goal for every shop, he notes. Likewise, a number of shops may legitimately discover that their work is not conducive to unattended operation, but he believes this number is very small. "Every shop with wire EDM owes it to itself to consider unattended operation earnestly before making that conclusion," he said.

Reprocess the process

One of the most difficult adjustments a shop has to make when implementing automated wire EDM is learning to process workpieces with unattended wire EDM in mind. This is a challenge to every level in the shop. Designers, programmers and machinists will have to change their habits. "This is the kind of change that is likely to create the most resistance, but it is also the most promising opportunity for a shop to reach new levels of teamwork and communication. I think a shop needs to tackle this adjustment with both realism and optimism," Cicchetti mentioned.

Mentioning a few of the most important processing changes a shop must embrace suffice to show the scope of this adjustment: Planning for the best use of automated wire EDM begins when ordering the raw material. For example, blocks must include sufficient stock for the fixture to grip on.

Block preparation procedures must provide for slug management. The slug is the mass of material released when the wire tool path is complete. There has to be a strategy to hold the slug in place while the workpiece is being wire cut. Proper size and placement of start holes is one element in this strategy, too.

The order of additional machining operations or processes must be sequenced to be wire EDM-friendly. For example, heat treating and grinding may require rethinking. When and what to inspect can change in order to facilitate wire cutting without the operator to catch and fix problems. This may mean simply getting into the habit of holding a block up to the light to check that start holes are present, go all the way through and are not clogged with chips or debris.

Designing in a feature that becomes a common gripping surface for the standard modular components in an integrated tooling system is another thing to consider.

The right path to programming

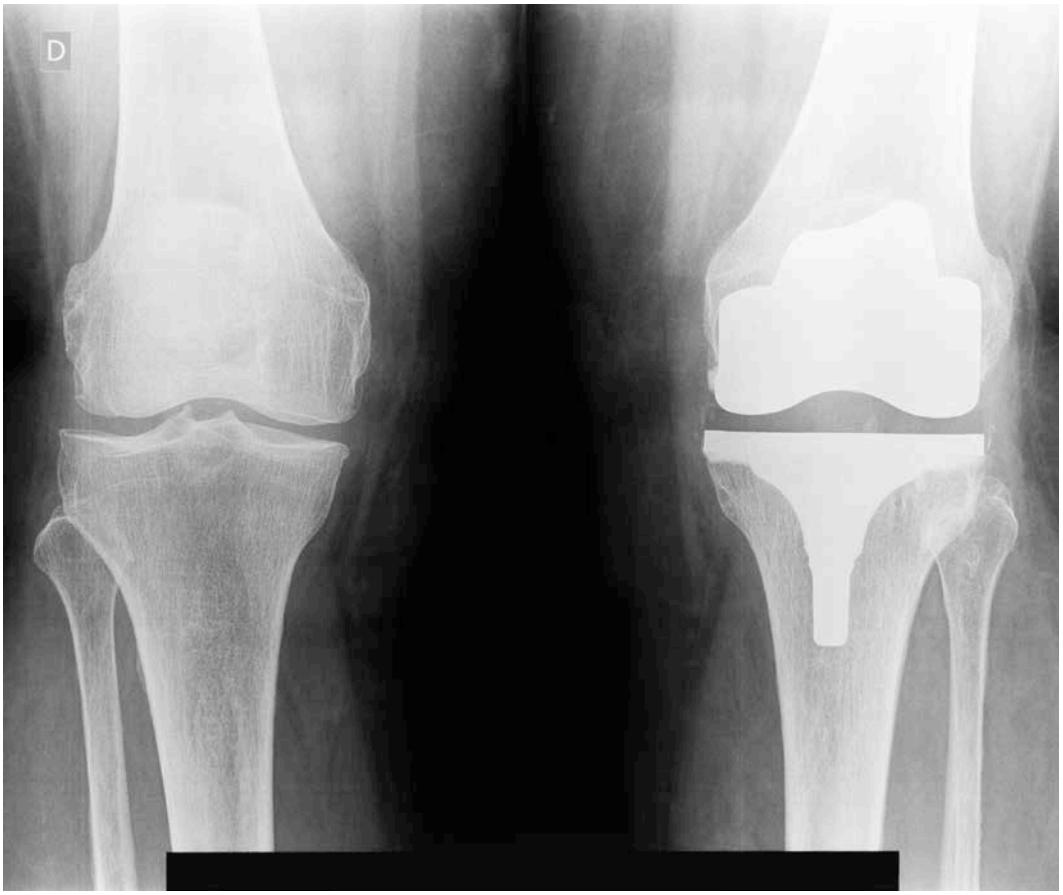
Many CAM systems offer modules for programming wire EDM. A shop planning for unattended operation should not assume that all wire modules support this mode of operation equally well. According to Cicchetti, all planners should discuss the programming software requirements needed for automation with the machine supplier. The software should be capable of writing programs that utilize the wire machine's features for automation.

Moreover, he explained that some wire machines provide on-board programming functions that can be applied on the shop floor to enhance the wire path generated by the offline programming system. For example, certain functions are designed to facilitate unattended operation. These may include a function that automatically adds stops at a specified distance along the wire path for slug retention. This function may also generate a program that automatically retraces the path to remove these stops in the proper sequence for safely releasing the slug. Generating the appropriate skim cuts may also be an automatic function. If the machine is not equipped with such on-board functions, the shop should be sure that similar capability is provided by the offline programming software. For flexibility, the operator should be able to activate or deactivate the automatic functions at the machine, so switching between manual and unattended operation is easily accomplished.

In any case, programmers may need additional training to prepare programs that enable unattended operation.

Cicchetti also noted that it is important for the programming software or the machine control to provide an accurate estimate of cut time for each part program. The accuracy of this estimate depends on realistic values for the numerous variables in the wire EDM process. Reliable estimates are vital to scheduling and planning unattended operation. "There's no point in setting up a machine to run overnight if the cumulative cut times are over or under the available hours," he pointed out. "If you put a block in and you don't know how long it's going to take to cut the shape, you don't know what will be done in the morning or what's not going to be done," he continued.

Finally, he urges shops to choose a wire machine supplier with experience in unattended operation. This supplier can be a key player in the planning and implementation stages. Automating the wire EDM process can help a shop succeed by reducing production costs and improving responsiveness, but achieving this success is not automatic. "It takes planning, commitment, training and openness to change. Even having the best equipment in the world doesn't change that fact," he concluded. MMI



X-ray showing knee replacement with ceramic implant

Source: Seco Tools

Ceramic Implants Give New Lease Of Life

Practically, all major medical implant OEMs are actively pursuing, in one way or another, the viability of manufacturing various common implants from ceramics. This material is gaining popularity in the medical field, especially for its properties of longevity.

Mention ceramics and most people visualize dinner plates or coffee mugs that easily shatter when dropped on a hard surface. However, this is not the case when it comes to industrial and medical ceramics. These are much tougher, denser, and therefore not as brittle and, unfortunately, not that easy to machine using conventional methods. Thankfully though, laser beams may offer a remedy. Ceramics are perfect for implant use. They provide much higher levels of strength, wear resistance, smoothness and biocompatibility when compared with metals and polymers. However, ceramics lack one important quality – machinability.

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Present norms

Currently, a very select range of ceramic implants are being produced. They come in simple shapes because they are produced using grinding machines with diamond wheels that have limited capabilities when it comes to accessing contours and pockets and other complex part shapes. The grinding process is also slow, making manufacturing costly and, in turn, the implants extremely expensive, so much so that a limited number of patients opt for them over the more affordable metal implants.

The majority of implants produced today are made from titanium, cobalt, chrome or stainless steel. And the most common implants are for knee and hip replacements, but femoral, articular and tibular components are also prevalent.

The average lifespan of metal implants depends on use. The more active the implant recipient is, the faster the implant will wear. In some instances, this may only be a short time of about 10 years, possibly 25 years for a less active person. This means

that, for younger recipients of metal implants, the initial implant would quite possibly have to be replaced one or two more times in the course of the person's life span. And it should be noted that the rehabilitation for such orthopedic type operations as knee and hip replacements is quite painful and extensive.

Why ceramic is better?

Now consider ceramic implants, which would last 75 years on an average – basically a person's lifetime. An implant recipient would undergo only one surgery and a single recuperation period. Plus, there would be no implant abrasion that generate foreign particles in the body, which occurs with metal implants when they wear.

On the flip side, none of the benefits of ceramic implants will be realized until the material can be cost-effectively machined, making those implants more readily available and affordable. This is why manufacturing shops, universities and other research facilities have been exploring and testing different approaches to successfully machine ceramics using conventional machine tools. So far, one technique that involves a laser is generating very promising results.

Key elements of this cost-effective ceramics machining process are specially designed cutting inserts and the radical use of a laser beam mounted on a multi-tasking machine tool. The machine precisely positions the laser beam ahead of the cutting insert to plasticize the workpiece material, making it easier to cut.

Evolution of machining

Developments in cutter technologies that are facilitating cost-effective machining of ceramics include polycrystalline diamond (PCD) and cubic boron nitride (CBN). CBN shows strong potential in several ceramic applications. Additionally, extremely hard carbide tooling has been tested for ceramics.

To date, laser assisted machining has made it possible to successfully turn, mill and thread ceramic materials such as silicon nitride, zirconium and alumina. But most significantly, the system increases cutting tool life and reduces processing times for these materials, while also allowing parts to be produced that were previously impossible to make.

Those entities involved with the development of laser assisted machining techniques will continue to gain a better overall understanding of the ceramic cutting process, and great strides will be made in the use of ceramics within the medical industry, as well as for other applications such as automotive and aerospace engine components and bearings. Currently, however, there is a need to undertake further testing to gain a better understanding of cutting tool edge preparations and chemical interactions between cutting tools and specific ceramic materials. Extensive testing will also help increase efficient use of laser to heat ceramic materials faster and improve precision with regard to the portions of a workpiece that need to be heated.

Conclusion

If progress with the laser assisted method continues at its current pace, the machining of ceramics, more than likely, could replace diamond wheel grinding in much the same way that hard turning replaced grinding twenty years ago. And while the method is in its infancy, a major milestone has been reached in the quest to reduce the cost of manufacturing medical implants and components from industrial ceramics. MMI

New Era in Die Molding with Mitsubishi CNC Machines

With the aid of sophisticated technologies developed by Mitsubishi Electric India, a total factory automation manufacturer, the company was able to attain advanced machining control. With this, it contributes to the highest accuracy and productivity in manufacturing units worldwide.

The Computer Numerical Control (CNC) machines offered by Mitsubishi have brought in a sea change in the machine tools, machining and manufacturing world. As a global CNC provider as well as the best partner, the company provides optimum technologies and support to the users stepping ahead into the future.

Mitsubishi CNC machines create new values in collaboration with users. By providing prompt responses, solid technologies and user-friendly support systems, the company continuously improves its after-sales service quality for users in the world so that they choose the same brand again.

The technology edge

With remarkable growth opportunities rising in India during recent times, high-end technologies, precision engineering and metalworking industries are likely to witness growth. Fully developed nano-machining technology ensures the highest level of precision, resulting in the need for high performance and automated production facilities.

Mitsubishi CNC products are engineered with cutting-edge solutions and technologies to meet the highest quality requirements of precision industries. The consistent quality offered by the company is aimed at attracting and retaining customers in the dynamic and fast-growing Indian market.

This article highlights the best surface finishing of die mold machines. The Super Smooth Surface (SSS) control technology provides an optimal speed control function for die mold machining with a smooth surface.

The SSS control technology provides an optimal speed control function in die mold machining for ensuring a smooth surface

Source: Mitsubishi Electric India

As for mold machining of three-dimensional shapes, ensuring the smoothness of the machined surface (surface accuracy) is important. In recent years, even in the case of more than 5 m/min feed speeds, the request for high surface accuracy in several μm or less has especially increased. In this case, the quality of instruction shape described in the machining program is often regarded as a problem.

Conventional problem

Generally, to create a machining program with CAM, the motion curve of the tool relative to the workpiece is calculated by approximating the minute line segments. Therefore, a small error is more or less included in the data of minute line segment. For example, as shown in Fig 1, there are many cases like the minute error of the zig-zag shape or the shape of a level difference. These are contained within the limits of the permissible error (tolerance) on CAM processing to form the process originally.

In NC, it is essential to have the process of determining the rate at which it moves according to the shape in order to maintain the trajectory accuracy. If some errors are included in the instruction shape, it is difficult to calculate the accurate determination of the appropriate speed movement. Especially in scan line machining, there are some cases that the fluctuation occurred in the trajectory of movement of the machine and scratch/streak occurred in the machined surface when the magnitude of the error contained in the instruction was formed by path difference.

In order to cope with such problems, the company has developed Fairing Function to correct the shape in the NC Conventional, so as to reduce the error as has been shown in Fig 2 (a). However, in the case of a zig-zag shape or a minute level difference that seems to contain an error, at first glance, it is dif-

ficult for NC to distinguish whether it is a thing with the sense, which should be processed essentially. Especially the program Die-Mold machining comprises tens of thousands of blocks of minute line segments, as there are at least several positions, wherein the part cannot restore the exact shape correctly and where sufficient accuracy is not acquired in many cases.

Since shape correction was performed as shown in Fig 2 (b), it is shifted to the contrary original form, and there was also an example for which accuracy gets worse (A to D part in the figure).

SSS control

The company has come up with a different solution that moves away from such shape correction in which potential risks are hidden. While determining the movement speed depending on the shape, the process is not affected by the error contained in the directive shape and it can generate a stable and optimal pattern of speed.

It is possible to obtain a smooth cutting result even if the pattern and magnitude of the error included in the instruction by the path shape are different. The SSS control technology was developed so as to realize the speed control method in this way.

The following original processing modes are adopted in this technology:

- The global shape judgment based on prediction of instruction form determines the optimal feeding speed
- Efficient acceleration and deceleration without waste even in shape
- Uniform processing that does not depend on the speed and shape instruction

As a result, the following effects can be obtained through the SSS control technology:

A stabilized and high-quality processing is realized

- Irrespective of the speed and shape command to achieve high quality processing in a stable
- There are no streaks on the processing surface even in the command shape that changes consecutively

Reduction of processing time

- Conventional ratio 5:30 per cent of time reduction (comparison with the same accuracy)
- Especially the effect is remarkable when feed rate is higher

Easy parameter setting

- Parameter adjustment for correction of shape is not required
- Easy adjustments that are efficiency-oriented and accuracy-oriented

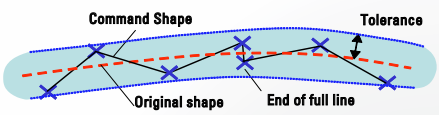
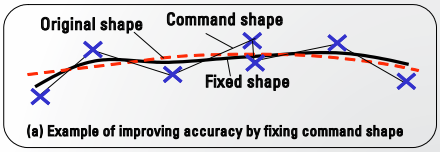


FIG 1: Example of the shape containing error



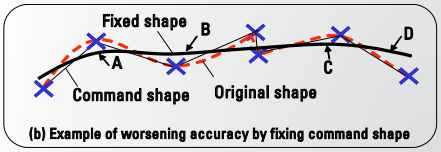


FIG 2: Example of improving or worsening accuracy by fixing shape

FIG 3: The dome-shape worked sample

FIG 4: The sample of corrugated plate type processing

FIG 5: The Noh-mask type processed sample

Source: Mitsubishi Electric India

Samples of processing results

Three samples of processing through SSS control technology are mentioned below.

Dome-shape worked sample (Fig 3): This is the sample shape consisting of the upper half and plane part of the hemisphere. This is processed by the scan line processing of the left-right direction (round trip). The tool used in this processing is ball-end mill of diameter 4 mm, feed speed is 2 m/min and shaft rotation speed is 12,000 min^{-1}.

With the help of SSS control technology, beautiful and shiny processing surface, which does not include fringes caused by vibration and streaks, is realized in both hemisphere and plane portions. Further, at the boundary portion, both hemisphere and plane, excellent accuracy is obtained without streaks.

Corrugated plate type processing sample (Fig 4): This is the sample shape, which contains convex, concave and sharp edge portions. Scan line processing was implemented from the lower left side to the upper right direction (one way) in the figure. The tool used in this processing was ball-end mill with a diameter of 4 mm, feed speed 1 - 8 m/min and shaft rotation speed 20,000 min^{-1}. Even in the part where the command speed is increased up to 8 m/min, it is appropriately controlled at the required speed in order to maintain accuracy. Therefore, the command speed is even location of 8 m/min, a sharp edge (concave portion, convex portion) and a smooth curved surface without streaks are obtained. In addition to the sample, the characteristic type of plastic, there comes a point where the shape continuously changes little by little; without shape changes along the way, natural processing shape was obtained.

Noh-mask type processing sample (Fig 5): This is the example of a sample, which contains various parts of shapes such as concave portion, convex portion, edge and plane portions and so on. This was processed by the scan line processing from the lower left to the upper right direction (round trip). The tool used in this processing was ball-end mill of diameter 6 mm, feed speed 2 m/min and shaft rotation speed of 20,000 min^{-1}. Even in such complex shapes, the SSS control technology can ensure beautiful working surface with shiny overall. MMI

Customers' Voice

Any technology is considered successful when customers accept it wholeheartedly. Mitsubishi' customers are happy to incorporate its latest controllers with Super Smooth Surface (SSS) control technology in their die and mold machines. Some of them share their experiences on this platform.

EVP (CMD)- BFW, Rajesh Sriram Agte

Director-COSMOS, V Nagesh

General Manager, WorkNC, Naresh Palempati

Bharat Fritz Werner (BFW) is greatly admired among the top five machine tool companies in Asia, creating customer pride through value-based partnerships and global standards of excellence with best-in-class people. The company offers a wide range of products to choose from.

Whether you set up a new die and mold facility, or restructure the existing one to maximize benefits, best machining centers are necessary. The technical experts at BFW will be happy to understand your needs and offer the optimum solution.

The Mitsubishi controllers help us achieve high quality surface finish and best of cycle time. They are equipped with high speed control for die mold machining time reduction, SSS control for high-quality machining with balanced accuracy and speed, and nano control for high-accuracy machining with complete nano control and many more features specially designed for die mold machines.

EVP (CMD), Bharat Fritz Werner Ltd, Rajesh Sriram Agte

COSMOS has been closely working with Mitsubishi for the past 15 years. These controllers provide excellent dynamics for die mold application. Besides being a stable control system, these controllers have a user-friendly and supportive graphical interface. With their long presence in the Indian machine tool industry, they understand the requirement of the Indian users and provide many special functions that are highly useful to all users.

With our CVM series machines, we bring to you 'Unity Structure'. This coupled with rigid construction provides superb stability and minimum vibration at tool point to ensure better surface finish and excellent tool life. Some important aspects that many of our customers need to understand are the synchronization between a good machine and a good controller. As Mitsubishi has the latest technology in motors and drives, we have the mechanical structure and high-end design elements to make the most of it. CVM series enables all-round performance with simple switching between application-based servo tuning parameters with COSMOS VMCs. All machines are ready to work in die mold segment where machine is tuned to stiffer axis movements as well as job working where quick movements and rapid acceleration/ deceleration are the key factors, giving the user complete control over a broader range of application using a single machine.

Director-COSMOS, V Nagesh

WorkNC CAM software is the premier automatic CNC software for surface or solid models in mold, die and tooling businesses for 2 to 5-axis CNC programming. The automatic features of WorkNC allow novice CAM operators to automatically set up tool paths in just a few minutes. Used either directly on the shop floor or in your CAD room, the reliability and quality of WorkNC's CNC programming are unsurpassed. Not only us but our customers also testify the combination of WorkNC and Mitsubishi's controllers.

Theoretical time vs actual machining time

Earlier VMC users were not able to estimate the machining hours due to the difference between CAM software time and actual machining time. But now with this combination of WorkNC and Mitsubishi M70 (and above series) we are able to resolve this issue successfully.

Proprietor, Nag Tools, Bhosari, Pune, Nagappa Kumbhar

Surface finish quality

With this combination, we can achieve better surface finish even from local-made machines. Mitsubishi controllers can read close tolerances generated by WorkNC software and produce high quality surface finish.

Proprietor, Shakti Dies and Molds, Bhosari, Pune, Arvind Gadad

By combining Mitsubishi controllers with die mold machine, one can minimize the load on the machine and reduce the tool deflection.

General Manager, WorkNC, Naresh Palempati

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An exhibition for the Car making community

Date: 29 - 31 May, 2014

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- Concurrent conference on "Lowering Costs in Automotive Plants" where senior and very senior executives of the manufacturing community will present their thoughts and debate on the current manufacturing scenario and future trends. It is a must attend for solution providers like yourself.

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Milling Takes another Step Away from a Human Operator

MBFZ Toolcraft, a German company, has introduced a robot technology that help users in mold finishing operations like deburring and polishing. What is more interesting is, the same technology is also expected to meet die manufacturing requirements.

A flexible machining cell that can be adapted to a number of different tasks relies on robot technology to ensure high precision. For mold shops, the unit suits a number of finishing applications, according to its supplier. The German supplier MBFZ Toolcraft believes that component machining with robots instead of CNC machine tools continues to gain importance. The reasons for the trend include the robot's high flexibility as well as its ability to adjust with different tasks with minimal, often acceptable, limitations to precision.

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Saving money with the unit

The company further claims that the advantages of the robot result in a cost-effective solution for industrial machining and this is met with Robo-Box. The unit, with an installation size of 1,800 x 1,800 x 1,800 mm, is said to offer offline programming in the same programming language as for CNC machine tools.

As per MBFZ Toolcraft, the cell is completely new. It combines a 6-axis articulated arm robot from the Swiss supplier Stäubli in a closed production module with a 7.5 kW, water-cooled milling spindle. A slotted table ensures precise fixing of the components. A zero-point

Eight tool positions are available with the Robo-Box as standard for different machining tasks from which the system can automatically take the desired tools without re-clamping

Source: MBFZ Toolcraft

clamping system or a round table can also be used.

Unit touted as a real all-in-one machine tool

Milling is the standard task for the Robo-Box, but for mold makers, the unit is better suited for polishing, deburring and other post-processing applications. There is currently no possibility of using the unit for die applications because of the high requirements for milling precision parts. However, the company claims that this situation may change in future.

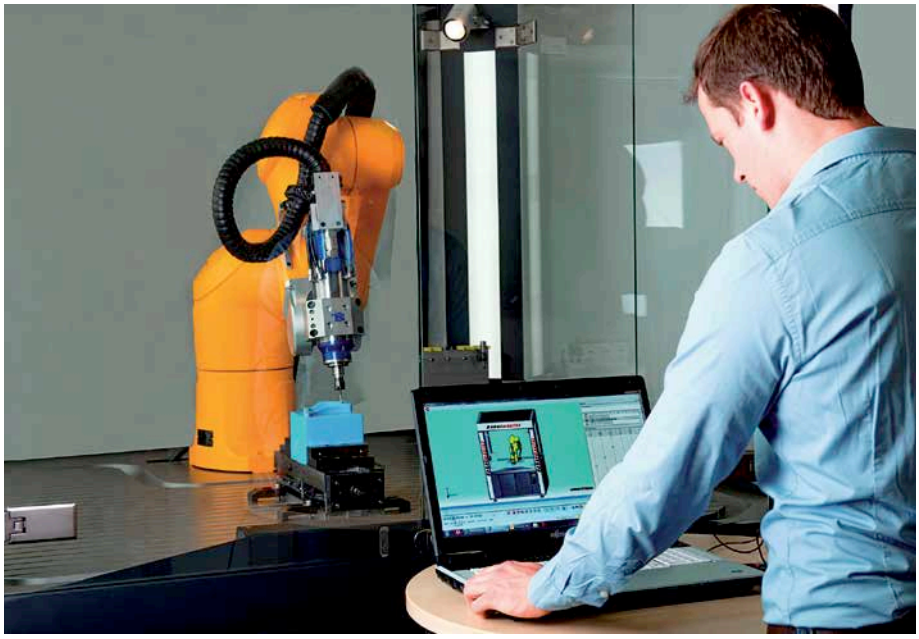
The Robo-Box is said to be a universal solution for many tasks and various materials, including post-processing for injection molding processes such as deburring and in model construction or woodworking. New possibilities include unrestricted access to the component without having to turn it over, as well as expanding the robot's working area through the use of external linear or rotary axes, which can be used simultaneously or indexed. All these save turnaround time for finished components.

The closed machining room is fitted with manual chipping extraction. Extraction can be automated if desired. Eight tool positions are available as standard for different machining tasks, from which the system can automatically take the desired tools without re-clamping.

The tool changer can, of course, be expanded if the task so requires. The operator selects one of two modes: one where the component is supplied to the process (remote TCP applications), the other where it is clamped and processed by the robot.

A key feature of the unit: offline programming

The machining cell robot does not have to be conventionally taught. All kinematic movements are programmed using the Mastercam Robotmaster software before starting work, the supplier said.



Source: MBFZ Toolcraft

The machining cell can be used for mold finishing operations such as deburring and polishing and it may soon meet requirements for die manufacturing

All the robot's movements are visually recorded as kinematics through simulation and optimized and then loaded onto the machining cell's hard disk before work begins. Unlike teaching a conventional robot, no original or reference model is required here. The robot finds all paths independently from the first part and processes the components from batch size one to batch size N.

The unit does, of course, have anti-collision protection to support reliable machining. This approach also increases system availability, the supplier noted. The cell is a customized all-round solution from the product concept through the design, the construction to the final inspection and QA with CE labeling, the company added.

Machine Tool 2.0 – highly flexible in its use

As a machining cell, robot and machining room form a unit that can be used wherever needed as a module of a universal machine tool in production. Depending on the equipment, the unit can perform classic metal machining such as turning, milling, polishing and grinding sequentially. This means the component can be made and refined on the spot, the supplier explained.

The robot does not just perform the loading and unloading of the workpieces. As part of a continuous process chain, upstream and downstream tasks are performed on the workpiece – in the same programming language as that of the machine tools. This allows for metal components from various areas of applications for engine parts as well as functional elements to inserts in toolmaking.

Toolcraft claims that systems are custom-sized depending on the component's dimensions or range of tasks required. This means large bodywork parts or components that place higher demands on the robot are processed with larger robots whilst other tasks are better suited to medium-sized or small robots, which have better access. The size of the machining room is dictated by the tasks specified by the user. **MMI**

Harnessing Power from Alternative Resources

A robust power industry is the essential foundation on which India's growth aspirations rest. More importantly, the country needs to pursue policies, which would minimize its import dependence to meet rising energy requirements.

Despite figuring prominently in the list of developing countries, India is still a low-income group economy and has a long way to go in order to achieve at least the global average gross domestic product per capita. It is imperative to increase the per capita income substantially for improving the living standards of its people. According to the International Monetary Fund, the country ranks 139th in terms of gross domestic product per capita among the 182 nations taken into account.

India needs to accelerate economic growth for increasing the per capita income, and this can be only possible if there is greater access to energy. Even otherwise, in the present day world, it is almost impossible to think of life without electricity. The International Energy Agency in its World Energy Outlook states, "Access to electricity is particularly crucial to human development as electricity is, in practice, indispensable for certain basic activities such as lighting, refrigeration and the running of household appliances, and cannot easily be replaced by other forms of energy."

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Need to reduce energy dependence

Presently, the per capita consumption of both energy and electric power in India is only around 30 per cent of the global average. Despite very low consumption, the country has emerged as the fourth largest energy consumer after China, the US and Russia. Although India is presently the world's fifth-largest electricity producer with an installed generating capacity of around 230,000 MW, almost 400 million people in this country have no access to electricity. Often the discussions among the stakeholders in the power sector and policy makers are centered on projecting the industry's future growth potential and highlighting the shortfall of around 10 per cent between the current peak demand of the existing load and the installed generating capacity. However, the stark reality is that most industry analysts do not take into account the unmet demand of almost 30 per cent of its population. Making electric power available to all citizens is a prerequisite for the economic growth of a country. India cannot stake its claim to sustainable economic growth when a large segment of its population lacks access to electricity.

While oil and gas accounts for almost 40 per cent of India's total primary energy needs, coal accounts for about 53 per cent with the balance being met by hydro, nuclear and other renewable sources. According to energy analysts, its import dependence on crude oil and gas would be in excess of 80 per cent during the Twelfth Five-Year Plan. On the coal front too, the picture is equally dismal. The country is already a net importer of coal, and in the next five years, coal production may fall short of the demand by 20 per cent. Large import dependence leading to worsening current account deficit is a matter of grave concern that will most likely torpedo its economic growth aspirations.

Source: depositphotos.com/kaczor58

Focus on renewable energy can accelerate India's economic growth

Exploring viable options

Should the country be persistent in pursuing the well-trodden path of energy security through traditional sources such as coal, oil and gas-fired electric power plants (in any case, it is not blessed with abundant oil and gas reserves and coal mining is beset with environmental issues), or look at emerging global trends and compulsions for alternatives? The only way India can secure the future is to develop renewable sources of

energy such as solar, wind and others that have emerged as viable options. India is fortunately well-placed in terms of solar energy, wind and other renewable resources.

One of the present debates against aggressively pursuing renewable energy opportunities, especially solar power, is its higher cost compared to conventional power from fossil fuels. However, if this cost is compared with the scenario of almost a third of the country's population having no access to power, one would realize that the argument is fallacious. In addition, solar power costs are drastically declining and as of now the costs are comparable to electric power generation from diesel, a fuel which is highly subsidized, import dependent and not environment-friendly. Additionally, investments in renewable energy would help the country meet its commitment and obligations to the international community in terms of reducing emissions.

Moreover, renewable energy-based generating plants are scalable and can be built even in remote places to meet the locational demands. Compared to the total cost of setting up large centrally generating power plants, be it fossil or nuclear, the cost of setting up small renewable energy-based generating plants and connecting them through microgrid is cost-effective with a quick payback.

Smart grid focus

While India has taken several initiatives to increase the share of power generation from solar, wind and other renewable sources such as bagasse-based cogeneration plants, policy makers need to get their act together to generate the necessary momentum. To enable the power industry to leapfrog, it needs to embrace the path of distributed generation and energy management. Globally, the trend is to adopt smart grid, and India's power sector would benefit immensely by opting for micro-grid supported distributed generation.

While from the energy security perspective, the need is to pursue all viable alternative energy options, from a larger perspective of driving economic growth by leveraging the technological trends, solar power assumes greater importance. The growth of solar power segment would result in learning to compete with the developed countries in an emerging technological space but this is not to belittle the importance of exploiting wind, bagasse and other renewable sources.

Facts and Figures

China has emerged as a leading player in the renewable energy domain. Producing around 30 per cent of the world's photovoltaic (PV) solar systems, the country is the world's largest manufacturer of solar panels and a world leader in the manufacture of solar PV technology. While in the domain of wind power, the country has become the world's largest maker of wind turbines; it is also one of the largest producers of ethanol-based bio-fuels.

The way forward

The World Bank Report 'Paving the Way for a Transformational Future: Lessons from Jawaharlal Nehru National Solar Mission Phase I' prepared at the request of the Ministry of New and Renewable Energy (MNRE) states that with India being blessed with immense solar potential, the country could exploit solar energy to overcome the challenges of energy security and climate change. It adds that solar power can potentially address the shortage by adding to the grid-connected electricity supply and providing a viable energy solution for off-grid areas. "Domestic manufacturing and scale of implementation in India can cause a drastic fall in costs to bring solar power costs to grid parity sooner than other parts of the world," is what the report envisions about the future outlook for solar power.

The report recommends a mission-mode approach to the creation of adequate forward and backward linkages, addressing specific input (raw materials and consumables, power, resources, technology and so on) disadvantages faced by domestic manufacturers vis-à-vis their overseas counterparts.

The Indian government and other concerned corporations must recognize that economies, which effectively foster and commercialize innovations, grow faster and set in motion a virtuous cycle of job and wealth creation and higher living standards. Perhaps, key to India's sustainable growth is the development of renewable energy industry, which is necessary to ensure energy security. It is time not only to move forward with necessary initiatives so that India does not miss yet another opportunity but also to ponder why the country is not able to live up to the promise it holds. MMI

Laser Welding in Transmission Manufacture 2.0

Laser welding has numerous advantageous applications, particularly in vehicle production. The process not only allows control on energy emitted by the laser beam, but also achieves higher welding speed. Hence, the amount of power used during welding is reduced, having direct impact towards reducing energy cost.

Source: EMAG Automation

Laser welding a synchronous wheel onto a gear

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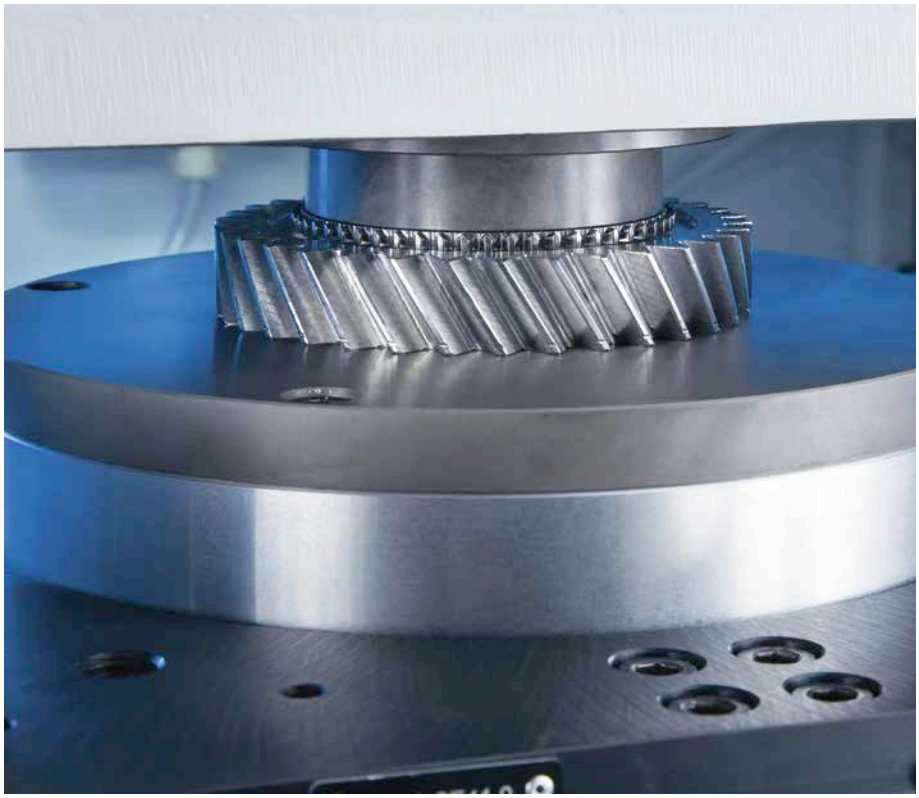
From dual-clutch transmission to the classic differential, modern transmission technology is a pivotal research sector in the automotive industry. With new materials and altered geometries, designers optimize the functionality of the different gearwheels. Furthermore, these wheels are required in larger quantities owing to the fact that the number of speed gears in many passenger cars is on the rise. Several innovative techniques promote the effectiveness of the production processes being applied, for example, laser welding. With their ELC series of machines, the specialists at EMAG have developed integrated solutions for the application of processes with high output rates. The company's in-depth knowledge of the production processes used for many transmission components has added to its competency.

"A first glance at a typical transmission component makes it plain where the challenges lie — even a small wheel with integrated synchronous gear represents a relatively complex design. To manufacture it efficiently and at the highest precision calls for the two different parts to be produced separately and subsequently joined in a joining+welding process. It is at this point that modern transmission manufacturing practices such as laser welding come into its own," explained Managing Director, EMAG

"Laser welding allows one to concentrate a carefully dosed amount of energy emitted by the laser beam on the welding point, minimizing possible warping, whilst still achieving high welding speeds."

Managing Director, EMAG Automation, Dr Andreas Mootz



Source: EMAG Automation

Joining a gear and a synchronous ring

Automation, Dr Andreas Mootz. "The process allows one to concentrate a carefully dosed amount of energy emitted by the laser beam on the welding point, minimizing possible warping, whilst still achieving high welding speeds," he added. Moreover, the welding process from the company uses solid-state lasers of outstanding energy efficiency. Whereas, a classic carbon dioxide laser will achieve an efficiency factor of just about eight per cent, the EMAG specialists can rely on an efficiency factor of approximately 20 per cent with their technology. In other words, the power used to achieve the same optical performance is noticeably less, with energy costs in the production department massively reduced.

Stationary welding device scores heavily

Similarly effective within the total process is the integration of different production sequences on the ELC system. For starters, the work spindle uses the pick-up principle to load itself. The components involved are then clamped and pressed together in the joining press. The clamping technology used ensures highly accurate positioning of the components, providing ideal conditions for the welding process. The design of the stationary optic ensures great operating safety and optimal stability of both machine and welding process. Dependent on workpiece or material, the components can be induction-preheated prior to the welding process and brushed after it – and whatever is required, the process is completed in a single setup. The complete joining+welding process for a gearwheel takes just 12 seconds. This ensures that the components for a differential are thus finish-welded within no more than 40 seconds.

Laser welding leads to advances in light-weight construction

The differential housing as an example clearly shows the possibilities laser welding technology opens up in the general development of vehicle production. For some time now automotive companies have been replacing the screw-type connection between differential housing and crown gear with a welding seam. The result is that the cost of materials reduces and the weight of the assembly falls by approximately 1.2 kg. "When looking at the advances made in light-weight construction in the automotive industry, these kinds of savings mean a lot," stated Dr Mootz.

General market development is positive

The general market development does play into the hands of the German machine builder: It is not only the successful dual-clutch transmission that ensures the need for more gears. Conventional transmission systems too tend to have more speed gears, as this reduces petrol consumption and improves driving comfort. In this context, the company offers a well proven welding technology that provides an energy-saving, high-precision manufacturing process and, at the same time, helps to advance light-weight construction and reduce production costs. MMI

Source: EMAG Automation

Laser welding the differential housing and crown gear has resulted in a weight reduction of 1.2 kg for this assembly

Paving the Path to Success!

Kishan Auto Parts Pvt Ltd, established in 1988, has been a world leader in the manufacture of connecting rods for various industries. Here's an overview of how the company managed to reduce gauging time and costs by 80 per cent and maintained accuracy in parts despite temperature fluctuations.

Kishan Auto parts Pvt Ltd based in Rajkot, Gujarat, is a world leader in the manufacture of connecting rods for major names in the car, compressor, heavy commercial vehicle, tractor, marine engine and earth mover manufacturing industries.

For many years, the company has been using air gauges for checking diameter, circularity and 'bend and twist'. For each of the 360 variants of connecting rods, it has used 3 to 4 different gauges. On larger connecting rods for heavy use applications, this can be at a 100 per cent sample rate.

In Kishan's experience, these hard gauges usually last up to 10,000 uses before they have to be reworked. For each different connecting rod, 3 of the 4 gauges cost ₹6,000 (approximately $120), while the display costs ₹30,000 (approximately $600). However with the 4th gauge, which measures 'bend and twist', the cost goes up to around ₹300,000 (approximately $6,000) – this includes a golden part, which gets easily damaged and often has to be replaced.

In addition, the whole process can take 120 seconds for each air gauge; so for each part tested, the whole process can take more than eight minutes. With increased demand for their products, Kishan needed a faster method of gauging.

Deploying a fast inspection system

Managers from Kishan Auto were in Germany for business meetings and to visit the EMO Hannover exhibition. Having searched without success for more than two years for an inspection system that could achieve the speed of operation they required, they did not have high hopes of finding a solution. It was only as they were about to leave the exhibition venue that they spotted one of the Equator system demonstrations on the Renishaw stand, which was gauging a connecting rod— it was a chance encounter that ultimately solved their problems.

They requested a demonstration within a few days of returning to India, and having seen an Equator gauging their own parts, immediately decided to purchase a system.

Cutting the cost of gauging

Time and ability to cope with

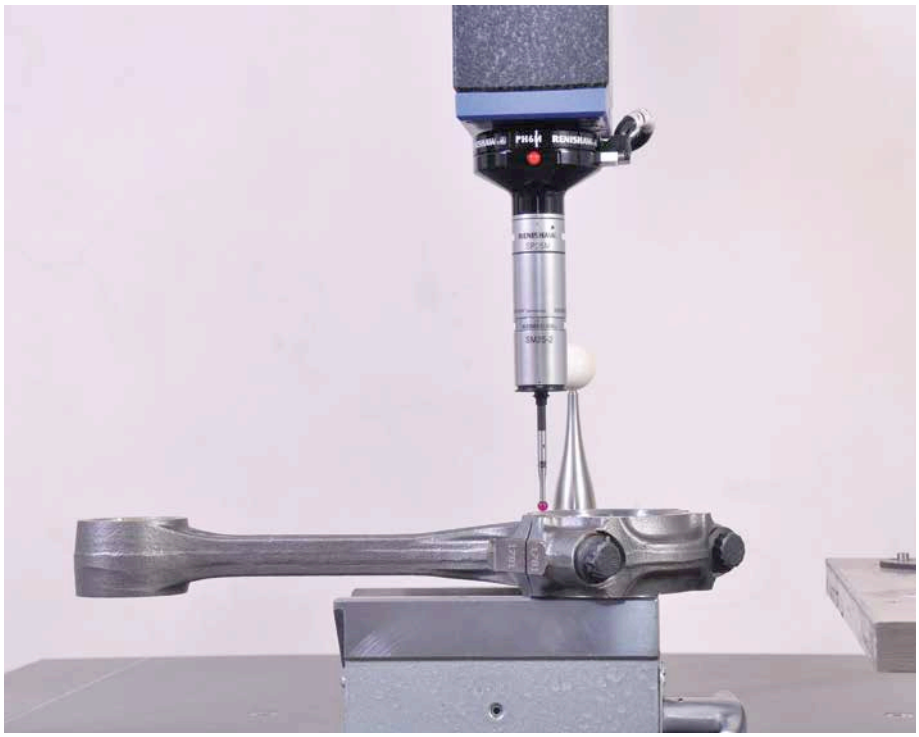
Source: Renishaw plc

Source: Renishaw plc

An operator from Kishan Auto using the Equator gauging system

"Quality is critical to us; we constantly strive to achieve 100 per cent quality, at the same time improving efficiency and passing those savings on to the customer. Equator has taken us to another level."

Managing Director, Kishan Auto, Shantibhai Changela



Source: Renishaw plc

Con-rod master being calibrated on a CMM in a temperature-controlled room

temperature were not the only issues the company faced, the cost of gauging was also an important factor. It has identified 77 variants of connecting rods, which the Equator system can accommodate, and operators use the system to measure 500 units per day in a 10-hour shift. If the company were to invest in hard gauging for all 77 variants, it would mean an investment of ₹23 million (approximately $450,000), just for the hardware alone. There are also other costs to consider, such as skilled labor to set up and maintain these gauges, storage and running costs.

Versatile gauging on the shop floor

Typical gauging times of 55 seconds per connecting rod are a significant reduction over the company's previous methods. The operators can use one Equator machine for many different parts, gauging all the features in a single operation with an immediate pass/fail decision, along with a report of the component dimensions.

Despite its location in Rajkot, where temperatures soar to 40°C (104°F) and drop to 19°C (66°F), the company is seeing repeatable results from the Equator system. This is achieved by remastering at least every three hours, or when the operators know that the temperature has changed significantly —'rezeroing' the system removes the effect of thermal growth from the measurements, and therefore guarantees component quality.

The master part must be kept close to the machine and subject to the same thermal conditions as the production parts. If at any time, the ambient temperature changes rapidly and a part goes out of tolerance, an operator can measure the master part to reset the system and check whether the reported 'fail' is due to the environment.

Traceability and extra capacity

The master parts are calibrated on the company's own co-ordinate measuring machine (CMM) that ensures the traceable accuracy required to guarantee quality. However, the high thermal variation means that the CMM has to be used within the company's temperature-controlled room. Equator enables the organization to extend the certified accuracy to the shop floor, whatever the conditions. For this particular requirement, Equator has removed the need to purchase an additional CMM with scanning capability. Managing Director, Kishan Auto, Shantibhai Changela commented, "Essentially Equator and the CMM complement each other perfectly, one providing the traceable certified accuracy, the other providing the thermal capability and extra capacity."

Quality is the mantra

Quality is the result of the right work ethics and processes for both management and operators in this company. Having the right equipment also helps in achieving the required aims. The introduction of the Renishaw Equator gauging system significantly enhanced quality such that the company is now in a position to operate 100 per cent inspection of components, quickly and easily, and is happy to guarantee 100 per cent quality assurance on all the produced parts. Changela concluded, "Quality is critical to us; we constantly strive to achieve 100 per cent quality, at the same time improving efficiency and passing those savings on to the customer. Equator has taken us to another level."

From strength to strength

The organization started by manufacturing 2,000 connecting rods per month, and today, manufactures up to 50,000 per month with 360 variants. Furthermore, it exports 90 per cent of its production to leading industrial and developed nations including the US, UK, Germany, Singapore, Italy, China, Poland, Brazil and the Netherlands.

The company has a reputation for high quality within required tolerances, but also at a competitive price. It specializes in manufacturing connecting rods from raw materials to finished products within their own forging plants, with a lead time of 60–90 days. MMI

Source: depositphotos.com/depgosper

The right combination of theoretical and practical knowledge can augment the work efficiency of fresh engineers

Bridging the Gap between Youth and the Industry

Thousands of students graduate from technical institutes every year in the country. Yet, the industry complains about the scarcity of employable skilled labor. Here is an overview of the situation and some solutions that can bridge the gap between academia and the industry.

The scarcity of right candidates for blue collared jobs in the manufacturing industry can be attributed to various factors, a major one being the rise of the service industry. As industries such as BPOs, tourism, telecom, real estate, construction, etc., require no special skill sets or knowledge, it is easier for students to opt for jobs in those industry verticals. The high remuneration in these industries is another attractive factor for them. The youngsters are especially fascinated towards an industry that offers easy money as compared to the manufacturing industry wherein the operators have to work in shifts, be competitive and prove their capabilities on the job. Also, there is the fatal risk of product spoilage or machine breakdown along with the physical risk for operators in case of negligence or inefficiency.

Moreover, the working conditions in the manufacturing industry are tough as compared to that in the service industry. Hence, more and more youngsters prefer to work in shopping malls, hotels, tourism departments, etc., where they are engaged in 'white collared jobs'. Students are lured

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by the AC cabins, high salary and possibilities of foreign trips in the long run, which are added advantages offered by the service industry.

Apart from these, the location of manufacturing units also acts as a problem. Shifting of industries to the outskirts of cities creates commuting problems for employees. Spending a large portion of their salary and time on traveling to the outskirts of the city for work make employees rethink. Only the companies that can afford to provide housing or transportation facilities to their employees can hope to retain some of them.

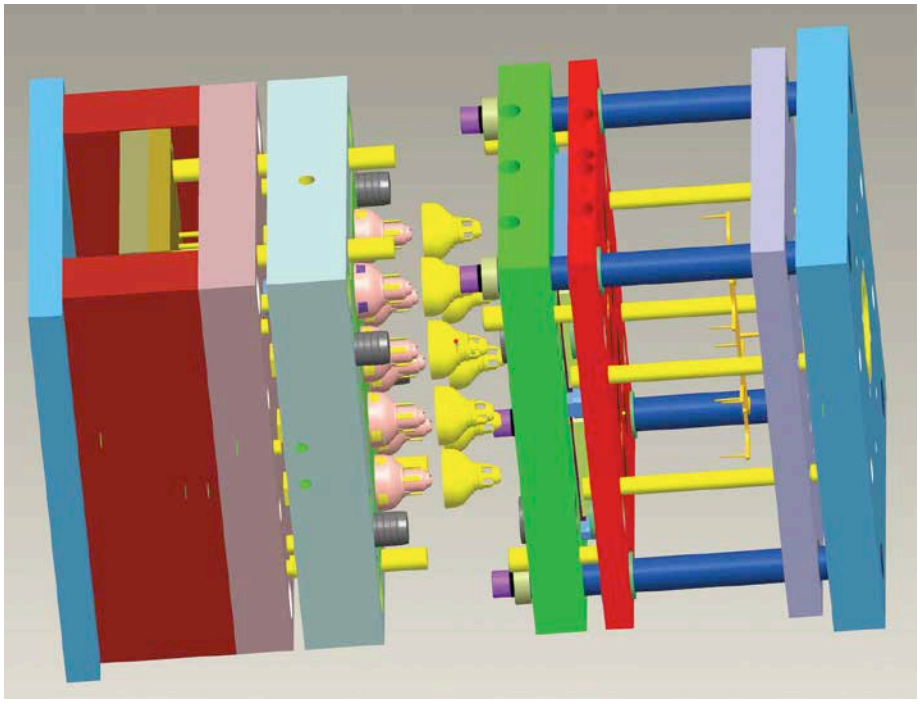
Lack of practical knowledge

Amidst these difficulties, the students who choose to be a part of the manufacturing industry are not as knowledgeable as the industry expects them to be. Unavailability of skilled labor such as machine operators has become a serious problem for the manufacturing sector today. If one analyzes the situation in detail, one can find that this bottleneck is due to various factors, lack of practical training topping the list.

As most of the students have no proper exposure to the actual factory shop floor except for industrial tours where they are given a guided tour, they lack the required practical knowledge. Additionally, due to the inadequate focus on practical projects during graduation, they also lack required professionalism and discipline. This hampers the workplace atmosphere.

Solutions

There are a number of measures that the manufacturing industry and technical institutes can take to attract students and mold them well to undertake technical jobs. Some implementable steps are listed below:



Source: Shrinivas S Bhat

Plastic injection mold parts modeled using solid modeling technique in advanced 3D modeling mechanical software

Making course employment worthy

One of the solutions for attracting students towards this industry is making the courses employment worthy. Private as well as government technical institutes can survey the market and introduce courses that are in tune with the changing times. For example, there is not much demand for a fitter. However, some institutes still offer various training courses in this category rather than in the machinist trade, which is actually in demand. Also, there are fewer institutes that focus on training in operating CNC machines and other advanced technologies.

Investment at the right place

Colleges can focus on providing right infrastructure to students by investing in advanced machinery and equipment. Moreover, they should focus on including updates on the latest technologies in the syllabus. Also it is important to employ staff having industrial exposure, who can share theoretical as well as practical knowledge with the youth.

Innovative approach

Educational institutes can ask students to work on live projects and help students to accomplish tasks while meeting stringent deadlines at the same time, so that they can learn about the sense of urgency. These initiatives will also help students develop a serious attitude towards work. Institutes should also focus on developing good work habits and discipline along with soft skills amongst students.

Hands-on training and working on live projects will help students gain necessary confidence and professional attitude towards work

Source: depositphotos.com/macor

Conclusion

Skilled labor forms the backbone of the manufacturing industry; hence, it is essential to resolve issues with regard to the shortage of labor urgently. It is especially more important to address these challenges sooner than later as India is all set to become a manufacturing hub by 2020. MMI

SAVE THE DATES

EVENT CALENDAR

Event Name	Contact	Date & Venue
9th Die & Mould India International Exhibition	Bhaskar Kanchan mumbai@tagmaindia.org www.diemouldindia.org	April 17-20, 2014 Bombay Exhibition Centre, Goregaon, Mumbai
India Machine Tools & Automation Expo	Dr Harish Arora Tel: +91(172) 4699301 contact@toolautomationexpo.com www.toolautomationexpo.com	April 19-21, 2014 NSIC, Okhla, New Delhi, India
Automotive Engineering Show	Sameer Khedkar sameer.khedkar@india.messefrankfurt.com www.aes-show.com	May 29-31, 2014 Auto Cluster Exhibition Centre, Chinchwad, Pune
INTEC 2014	Tel: +91(422) 2222396 intec@codissia.com www. intec.codissia.com	June 6-10, 2014 Codissia Trade Fair Complex, Coimbatore, India
CIMES 2014	Macy Yao macy.yao@reedhuayin.com.cn www.chinaexhibition.com	June 18-22, 2014 New China International Exhibition Center, Beijing, China
ACMEE 2014	Subram Raghavan Tel: +91(44) 26258619 info@acmee.in www.acmee.in	June 19-23, 2014 Chennai Trade Centre, Chennai, India
EMTE – EASTPO 2014	Sooraj Dhawan sales@emte-eastpo.com www.emte-eastpo.com	July 14-17, 2014 Shanghai New Intl Expo Center, Shanghai, China
IMTS 2014	Whitney Brown wbrown@AMTonline.org www.imts.com	September 8-13, 2014 McCormick Place, Chicago, Illinois, US
EuroBLECH 2014	Tel: +44 (1727) 814400 info@euroblech.com www.euroblech.com	October 21-25, 2014 Hannover, Germany
Hand Tools/ Fastener Expo	V B Sudeep sudeep@itei.in www.iihtexpo.com	November 7-9, 2014 Chennai Trade Centre, Chennai, India
IMTEX 2015	Balasubramanian Pillai bala@imtma.in www.imtex.in	January 22-28, 2015 BIEC, Bengaluru, India
Northwest Machine Tool Expo	Tel: +1 (800) 547-7377 info@cygnus.com machinetoolexpos.com	April 1-2, 2015 Oregon Convention Center, Portland, US

To suggest an event, please send details to kruti.bharadva@vogel.de

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* Digitizing * Rapid Prototyping & Modeling
* Moulding machine/ Die Casting machine
* Accessories for Machine Tools
* Die/moulding polishing machines
* Cutting Tools * Measuring Machines
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IMTEX FORMING 2014
International Forming Technology Exhibition

Going Beyond Innovations

IMTEX Forming 2014 and Tooltech 2014 created a platform for exhibitors to showcase their innovations in metals, composites, robotics & automation, welding & joining, wire-forming & drawing, etc. It also acted as a melting pot for exhibitors, visitors, delegates and academia to join forces and aid better growth of the machine tool industry. All the pillars of the industry assembled at the show to make it a grand success.

Bangalore International Exhibition Centre (BIEC) came alive with the buzzing of machines, the industrious exhibitors and the bustling crowd of delegates and visitors. The occasion was IMTEX Forming 2014 and Tooltech 2014, which was organized by Indian Machine Tool Manufacturers' Association (IMTMA) between January 23 and 28, 2014. Underlining the importance of the event, President, IMTMA and Managing Director, TaeguTec India Pvt Ltd, L Krishnan said, "Globally, forming machines constitute a major part of the machine tools. In India, we need to catch up with this. Such exhibitions will certainly stimulate the demand for metal forming equipment in the country and thus help the growth of the industry."

Shows like IMTEX not only support the Indian metal forming sector but also help foreign companies in the industry to grow. "IMTEX Forming exhibition is viewed by foreign participants as a major marketing platform. They put in tremendous efforts to attract visitors to their booths," said Director General, IMTMA, V Anbu.

Compiled by:
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Inauguration

The formal ribbon cutting ceremony followed by the traditional lamp lighting opened the doors to the exhibition. The inaugural function was graced by eminent personalities in the industry including Krishnan; Chairman, Exhibitions - IMTMA and Chairman and Managing Director, Godrej & Boyce Manufacturing Company Ltd, Jamshyd N Godrej; and Vice Chairman, Toyota Kirloskar Auto Parts Pvt Ltd and President, Society of Indian Automobile Manufacturers (SIAM), Vikram Kirloskar.

While delivering the welcome address, Godrej said, "The biggest challenge for the Indian manufacturing industry is to keep pace with 'technology changes' in several sectors. The machine tool industry needs to continuously innovate, upgrade and invest in technology. This in turn will result in the development of specific solutions for various industrial segments."

Highlighting the importance of the machine tool industry in the manufacturing sector, the Chief Guest, Kirloskar said, "The machine tool industry plays an important role in catering to the needs of both small and large automakers alike. The backbone of many major sectors of industrial activity in India, in the traditional manufacturing context, the machine tool industry has played and will continue to play a key role in enhancing competitiveness and ensuring quality and excellence in the output of the manufacturing industry." However, to enable the machine tool industry to extend a hand to the other manufacturing segments, it needs a strong support, which IMTMA has provided by organizing IMTEX Forming and Tooltech.

IMTEX FORMING 2014 AT A GLANCE

- Visitors: 44,000
- Exhibitors: 440
- Machines on display: 500
- Business generation: ₹405 crore
- Business Enquiries: ₹4,187 crore

Source: IMTMA

Eminent dignitaries at the opening of IMTEX Forming 2014 and Tooltech 2014

"The biggest challenge for the Indian manufacturing industry is to keep pace with 'technology changes' in several sectors. The machine tool industry needs to continuously innovate, upgrade and invest in technology. This in turn will result in the development of specific solutions for various industrial segments."

Chairman and Managing Director, Godrej & Boyce Manufacturing Company Ltd, Jamshyd N Godrej

"The machine tool industry plays an important role in catering to the need of both small and large automakers alike. The machine tool industry in the country has played and will continue to play a key role in enhancing competitiveness and ensuring quality."

Vice Chairman, Toyota Kirloskar Auto Parts Pvt Ltd and President, Society of Indian Automobile Manufacturers (SIAM), Vikram Kirloskar

"We should dedicate ourselves towards enhancing the capabilities in research and technology development and skill building."

Media Chairman, IMTMA, and Corporate Strategy Advisor, Management and Manufacturing Technology, Sheths', Shailesh Sheth

Displays

At this show, about 440 exhibitors displayed around 500 machines and tools spread over 30,000 sq mt space. Amongst them, there were several companies, which held the Indian flag high. Sahajanand Laser Technology Ltd takes a place of pride in this list, which showcased few of its indigenous state-of-the-art technologies at the show. Talking about it, Managing Director, Sahajanand Laser Technology Ltd, Arvind Patel said, "We have dedicated advanced production lines for laser diamond processing systems, laser micro machining systems, laser material processing (cutting and welding systems) and automation systems, industrial high-power laser systems and a separate unit for the radio frequency and microwave structures and components."

Another Indian company that showcased its capability at the event was Mechelonic Engineers Pvt Ltd. "We displayed seam welding machine, which is used for making drums, fuel tanks for the entire spectrum of petrol tanks in the auto sector, including two-wheelers," said General Manager - Marketing, Mechelonic Engineers Pvt Ltd, DK Mahna, and Manager - Sales & Service, Mechelonic Engineers Pvt Ltd, Ranjan Datta.

Rattan Hammers also exhibited its innovative solutions at the show. "We have introduced hammers for advanced machines, solder machine, etc. Besides, hot forging press, roll forging reducer, bar cropping jinn with auto feed - VLC controlled - constitute the latest products offered by us," informed Manufacturing Partner, Rattan Hammers, and President Consortium of Ludhiana Machine Tool Manufacturers and Association of Ludhiana Machine Tool Industries, Sukhdial Singh.

Grind Master Machines Pvt Ltd too used this platform to bring its innovative products to the fore. "Innovation is our base, and it has been our tradition to display a new product at every IMTEX show. This time too, we showcased our new robotic deflashing of aluminum castings process," asserted Managing Director, Grind Master Machines Pvt Ltd, Mohini Kelkar.

Multinationals such as LVD and FANUC also displayed the best of their technologies at IMTEX Forming 2014. The main attraction at FANUC India's booth was its total solution for in-mold labeling (IML). "The development of this technology came about due to the challenges related to process consistency, target cycle time, mold safety aspect, shot weight consistency, etc., faced by end-users," explained President & CEO, FANUC India Pvt Ltd, Sonali Kulkarni.

LVD introduced its two state-of-the-art machines: the Electra fiber laser cutting machine for ultra-high speed cutting of thin sheet metals and the ToolCell, an automated tool changing press brake, allowing users to increase the productivity of their bending shop.

Source: IMTMA

State-of-the-art technologies displayed by exhibitors defined new trends in the industry

Exhibitor speak

Exhibitions create a win-win situation for sellers as well as buyers. This is because sellers can showcase the best of their capabilities while buyers get a chance to witness and experience machine performance before making the final buying decision. Moreover, visitors can see, touch and experience the

"Globally, forming machines constitute a major part of the machine tools. In India, we need to catch up with this. Such exhibitions will certainly stimulate the demand for metal forming equipment in the country and thus help the growth of the industry."

President, Indian Machine Tool Manufacturers' Association (IMTMA) and Managing Director, TaeguTec India Pvt Ltd, L Krishnan

"Though the metal forming segment constituted a small percentage at IMTEX earlier, today it is a stand-alone show. It is noteworthy to observe that Indian companies are adapting to international standards very quickly and several companies at the bottom of the pyramid are catching up."

Director General, IMTMA, V Anbu

machine at the show before actually making a buying decision. "Exhibitions offer a platform for visitors to get hands-on experience with machines. They can practically look at the machine, understand the features and experience the performance. The additional benefit is that they can also look at the wide variety and make the right decision as per their requirements," said Deputy Managing Director, Yamazaki Mazak India Pvt Ltd, S Ravishankar.

Such direct dealings with potential customers allow exhibitors to gain necessary confidence to grow even in the difficult market conditions. "The challenge to grow in the current adverse market scenario can be met by stimulating demand and raising customer confidence to make a purchase decision. The display of value-added innovations, optimized productivity, enhanced quality and reliability helped in that direction," elaborated General Manager-Marketing, Electropneumatics and Hydraulics India Pvt Ltd, SK Saha.

However, the aim of several participants was not just restricted to meet new customers. For EFD Induction Group, this event provided an opportunity to strengthen relationships with existing clients. "Since our customers are spread all over the globe, it makes it quite difficult to meet each one of them on a regular basis. This show however, served as a platform to network with most of our customers and therefore, enabled to bridge the distance," averred Marketing Manager, EFD Induction Group, Santosh Mukundan.

International Pavilion

IMTEX Forming 2014 witnessed impressive participation from foreign exhibitors as well. Four countries including China, Germany, Czech Republic and Taiwan participated at the show, while several other participants came from different parts of the world including Australia, France, Korea, Switzerland, Turkey, Sweden, Japan, Thailand, UK, the US, etc.

The show helped international exhibitors to judge Indian market conditions and enforce their products and solutions accordingly. "IMTEX Forming 2014 enabled us to capture market opportunities here. The market condition appears better; we received many inquiries," observed Sales Department, American - European General Manager, AIDA Engineering China Co Ltd, Marco Daminelli.

Moreover, the event witnessed group participation from UCIMU-SISTEMI PER PRODURRE, the Italian Machine Tools, Robots and Automation Manufacturers' Association, which hosted around 15 companies at the show. Like other participants, the companies in this group offered their innovations to visitors. "Our pavilion showcased laser systems, metal forming and plasma technologies, and cutting lines for sheet metal, among others," informed Marketing Department, American Area, UCIMU, Mattia Puppi.

Additionally, there was participation and delegation from Czech Republic, which saw six participants including Association of Engineering Technology – SST, Czech Water Alliance – CWA, Gearspect Group s.r.o., NKO spol s.r.o., Šmearl Brno a.s. and TOS VARNSDORF a.s.

Industry delegations

On this occasion, Head-Representation in India, Ministry of Industry and Trade, Czech Republic, Dr Ivan Kamenik encouraged Indian companies to invest in Czech Republic. He said, "We attract Indian companies to invest in the Czech Republic. For this we are also offering subsidies and incentives for Indian investors."

IMTMA also hosted a delegation from Namibia during IMTEX Forming 2014. Talking about the show and its business relationships with India, Minister of Trade & Industry, Republic of Namibia, Calle Schlettwein, MP said, "I am impressed that the latest technologies from the globe are brought together and exhibited. It is interesting that the 'Made in India' brand is promoted through this exhibition. Our interest lies in how a country can transform itself from a developing nation that is dependent on the primary sector to one that plays a meaningful role in manufacturing and value-added processes, and accessing

Source: IMTMA

Exhibitors displayed the latest innovations in the machine tool sector

the global market with competitive commodities. India is well placed in this, and we hope we can learn a lot from the Indian example."

Apart from foreign delegations, delegates from various user segments from across the country such as Automotive Component Manufacturers Association (ACMA), Bharat Heavy Electricals Ltd (BHEL), Bharat Electronics Ltd, COFMOW, Indian Railways, ISRO, GTTC, Government Tool Room & Training Centre, Ordnance Factory Board Nagpur & Hyderabad, Hindustan Aeronautical Ltd (HAL), Rifle Factory and National Aerospace Lab (NAL), etc., also visited the show.

Talking about the exhibition, Chief Administrative Officer, COFMOW, Ministry of Railways, PK Agrawal averred, "We had very fruitful interactions with the manufacturers and hope to take these discussions to fructification. In the near future, we hope to have business transactions with the manufacturers who showcased their technology here." Seconding the same, Additional General Manager, Corporate Manufacturing Tech & Investment Planning, BHEL, AK Verma stated, "We could come across many new developments and trends in this show."

In addition to assisting delegates to choose the right machine, the show also helped them to gain knowledge about advanced technologies in the market. "We got exposure to some advanced technologies such as laser cutting and waterjet cutting systems. We have a production and training center in Mysore and we can spread awareness about these technologies to our students," said Unit Head, Government Tool Room & Training Centre, N Ramesha.

Along with the advanced machinery,

Source: IMTMA

Industry delegation from Namibia

Source: Vogel Business Media India

Dignitaries from the Czech Republic at their country pavilion at IMTEX Forming 2014

Deputy Chairman, Technology Committee, ACMA, Sri Karumbati highlighted the significance of promoting 'Made in India' brand. "I was pleased to see Indian manufacturers bringing out new technologies. Compared to previous editions, I came across a lot more Indian presence this time," opined Karumbati.

Seminar

Apart from the showcasing of state-of-the-art machinery and solutions, the event created a knowledge sharing platform in the form of International Seminar on Forming Technology. Interesting presentations classified in three segments such as processes, emerging technologies and new materials, and tooling and design were aimed at revolutionizing the Indian metal forming sector in the near future. These sessions highlighted the latest trends & developments and research activities in forming technology.

Academia-Industry Pavilion

The event further offered an opportunity to academic sector to present its research and ideas through Academia-Industry Pavilion. At IMTEX Forming 2014, around 24 institutions showcased their best projects. IMTMA had reserved the display space, which was provided to the selected institutions, free of cost. Academia-Industry Pavilion was initiated to inspire innovation and out-of-the-box thinking among young students. Also, this helped bridge the gap between educational institutes and the industry as students can experience live machines at the exhibition while the industry can have a look at the student's capabilities through their projects.

Awards

Along with showcasing new technologies, researches and hosting debates on upcoming trends, it is also important to recognize the stalwarts who have shaped the industry. On the similar lines, IMTMA conferred awards to Chairman, ISGEC Heavy Engineering Ltd, Ranjit Puri and Managing Director, BIES, Abhijit Mukherjee.

Puri, an industry veteran, was recognized with the IMTMA-Premier Outstanding Entrepreneur Award for his valuable contribution towards tranforming ISGEC into a global company. Mukherjee was bestowed with the IMTMA President's Award for his contribution towards creating a world-class exhibition facility in Bengaluru as a permanent home for IMTEX.

Conclusion

With the glittering award ceremony, the presence of end-user industry, delegations from Indian and foreign governments, and exhibitors who displayed the best of their technologies, IMTEX Forming 2014 was a grand success. Over 44,000 visitors responded to the event wholeheartedly by placing business orders worth ₹405 crore. The event will continue to support the industry even in the future, given that the business inquiries worth ₹4,187 crore that have been generated at the show are expected to translate into business opportunities.

Overall, the event was not only about innovations and exhibits but also creating a platform for knowledge sharing. Presentations at the seminar and researches displayed by the students would definitely be thought-provoking for the industry in the long run and enable it to deliver better technologies. MMI

Turning Inspiration into Reality!

The 16th SolidWorks World Conference organized by Dassault Systèmes, the 3D experience company, the world leader in 3D design software, 3D Digital Mock Up and Product Lifecycle Management (PLM) solutions, held recently saw partners, industry leaders and the world's most talented and innovative design and mechanical engineers share their stories, explore new ideas and gain inspiration to take their projects to the next level.

SolidWorks World 2014, the annual flagship event of Dassault Systèmes, was held from January 26-29, 2014 at the San Diego Convention Center in San Diego, California, USA. The four day event was a celebration of everything inspired engineering could conceive and make into reality.

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The conference was divided into various sections — presentations, breakout sessions and general sessions. As the lights dimmed at the first general session, it felt like being part of a Sci-Fi movie, with approximately 6,000 people in attendance, when the eatART Mondo Spider took the stage sending the crowd into an applauding frenzy.

Happenings at the event

The SolidWorks product portfolio has expanded to cover 3D CAD, simulation, data management, sustainable design and documentation tools. President and CEO, Dassault Systèmes, Bernard Charlès, talked about how the company in the past 13 years has transformed the world of manufacturing and design by connecting process with product. Ranked number 3 in the Software & Engineering category on the Forbes list of Most Innovative Companies during the past year, the company made various new product offerings at the event, namely Exalead OnePart, HomeByMe and 3D.By.Me. In addition to these, updates and tools that were added to the existing software packages were also shared.

CEO, SolidWorks, Dassault Systèmes, Bertrand Sicot also addressed the crowd to talk about where the SolidWorks community is today, and where it's going. He spoke about SolidWorks' success in helping people 'design without limits'. Sicot also added, "At SolidWorks World we focus on showcasing amazing customers who epitomize the creativity and passion of the SolidWorks community." The event also witnessed a new application—Mechanical Conceptual—that enables users with the freedom to design the way they want, helping them quickly turn inspiration into reality.

Various examples of innovations by users of the 3D design software were showcased. One included the interesting story involving a group of MIT students and their Copenhagen Wheel, which turns an ordinary bicycle into a smart electric hybrid. It learns how you pedal and captures energy when you brake or go downhill; giving you three times the power of a normal cyclist.

Source: SolidWorks

CEO, SolidWorks, Dassault Systèmes, Bertrand Sicot with Geoff Bodine and Bob Cuneo, who are behind the design of the Night Train 2 bobsled that the US team took to the 2014 Olympics in Sochi, Russia

Conceptual design made easy

A key property for a concept design tool

"We believe that the 3D experience platform can help our clients implement their sustainability strategy and imagine products and services that are environmentally friendly, so that one day we can reduce the impact on the planet."

President and CEO, Dassault Systèmes, Bernard Charlès

"As technologies and business models evolve, our users look to us to provide them with the newest tools to help them collaborate more widely and leverage 3D manufacturing and 3D printing in order to be more competitive and innovative."

CEO, SolidWorks, Dassault Systèmes, Bertrand Sicot

"2014 is going to be a new challenge for India. This year three main points will be focused on, namely, new customer acquisition, doubling the VARs investments in terms of sales team and market coverage."

Sales Director – SolidWorks India, Dassault Systèmes, PM Ravikumar

is the ability for designers to easily create, manage and rapidly evolve multiple design concepts simultaneously. All designs 'work' on paper but SolidWorks Mechanical Conceptual allows the user to see how the design would move and interact in a dynamic way, giving a much deeper level of insight than a static sketch. This platform is a cloud-based application that enables six services—Search, Tagging, Collaborative Sharing, Messaging, Cloud Storage and Live Dashboarding capabilities.

A select group of customers had the opportunity to use the platform in their processes and here's what some of them had to say. Engineering Manager, Karl Schmidt, Mike Buchli stated, "SolidWorks Mechanical Conceptual allows us to be competitive in a global marketplace by collaborating with customers in real time from one interface. We can work through ideas concurrently while getting instant feedback from the customer and other team members through the community pages. This workflow allows us to get to the final design quicker and shortens lead time for the customer."

Speaking on the added benefits of the platform, Product Design Manager, Kennedy Hygiene, William Macleod averred, "We can rapidly produce three or more concept configurations in the time it would take to produce one in conventional 3D CAD or Draftsight with the benefit of producing key geometry such as trace path sketches for creating linear output motion from rotational input motion, for example."

Iterations in concept design can be easily made and shared using this platform and once the design is approved it can be easily integrated into SolidWorks for detailing.

Head of Design, Polyrack, Bernd Knab added, "When developing a hinge with SolidWorks Mechanical Conceptual, we implemented the first practical lever geometries within a few steps, which would otherwise have taken several hours. We can then easily create a 3D assembly from a 2D sketch with their relationships. It automatically creates links between the components and the 2D animation is transferred into 3D. These unique features have allowed us to develop a hinge within two days, what required two weeks before."

The platform is set for a general release in April 2014, but will be released in the APAC region nearing September 2014.

Building the impossible

Day one ended on an inspiring note with a keynote address from Director, Biometronics Group, MIT Media Lab, Hugh Herr. He is an engineer, biophysicist and rock climber who lost both legs beneath the knee after being caught in a blizzard for three days while climbing New Hampshire's Mount Washington in 1982. So in love with climbing and scaling new heights, he designed his own prosthetics, giving him the same level of climbing ease that he enjoyed before the accident.

He shared with the audience his vision of a world where there is no such thing as debilitating disabilities, a world in which prosthetics and exoskeletons become an everyday mode of transportation for us. "I'm in the transportation business," Herr joked.

The BioM prosthetic legs mimic the movement of natural limbs by adapting to a person's walking speed and the terrain of the land to help the prosthetic propel the person naturally. Using a battery source and springs for energy, the prosthetic legs augment a person's ability to run and walk and normalize their pace as they move while enhancing stability and controlling for fatigue. The knee acts as an additional energy regenerator for prosthetics that are above the knee.

A user of his own product, Herr added, "The great thing about these BioM artificial limbs is that I can adjust my height to anything I want it to be, if I'm going on a date for example. I can be 6 feet tall if I want to be!" Herr said.

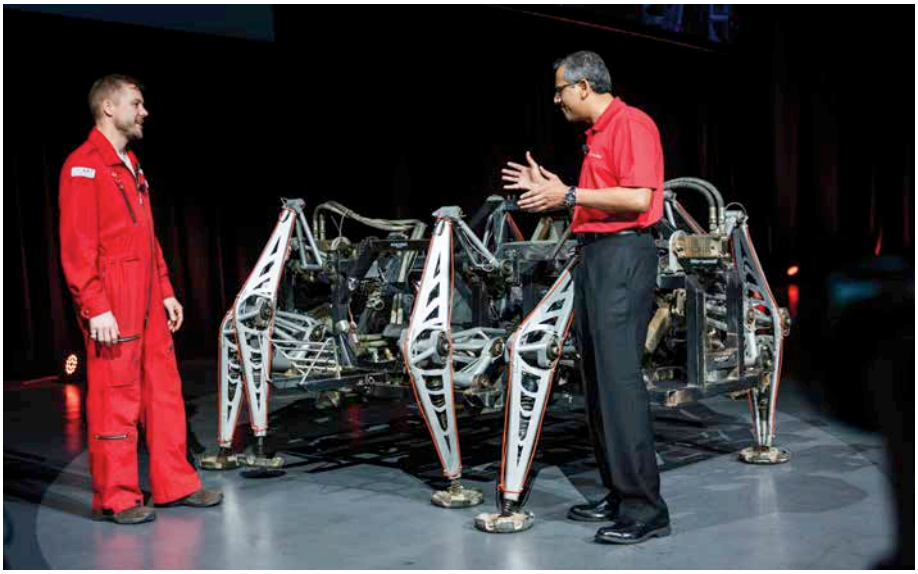
Day 2

After witnessing inspiring innovations on the first day, the audience was treated to yet another session of interesting presentations by user communities and customers. Founder, eatART, Jonathan Tippett talked

Source: SolidWorks

Director, Biometronics Group, MIT Media Lab, Hugh Herr talking about the mechanism of his BioM prosthetic legs with Director of Product Innovation, Dassault Systèmes SolidWorks Corp, Rick Chin

Source: SolidWorks



Founder, eatART, Jonathan Tippett talks about how instrumental SolidWorks was in designing the Mondo Spider

about his organization that fosters art research with a focus on large-scale, technically sophisticated art by supporting both independent and internal art projects. He also gave an overview of how instrumental SolidWorks was in the design of various projects including the Mondo Spider.

Another treat to see was the presentation of the world's first carbon fiber 3D printer by MarkForged. Founder and CEO, MarkForged, Greg Mark showed a video demonstrating the uniqueness of the printer. The aesthetically pleasing- to-the-eye printer, which looked like it was carved out of a single block of aluminum, is incorporated with kinematic fixtures that allow for consistently locating the build stage within 10 microns. Popularizing composites, MarkForged originally started out as a company called Aeromotion that engineered a carbon fiber wing for a racetrack Ferrari. "Shaving two seconds off the two minute lap could be the difference between winning and losing," asserted Mark.

This was followed by one more presentation from BoDyn Bobsled. Geoff Bodine and Bob Cuneo, who are behind the design of the Night Train 2 bobsled that the US team took to the 2014 Olympics in Sochi, Russia, discussed what goes into designing a bobsled used in the winter games. BoDyn was able to use SolidWorks to model the behavior of the sled on the track and it saved the company a bunch of iterations in their design.

Day 3

The final general session of SolidWorks World 2014 kicked off with the revelation of the winners of the 2014 Model Mania contest, where attendees were presented with a finished model and competed to see who could recreate and analyze the model from scratch the fastest.

The importance of SolidWorks certification was also made known. Director - Education, SolidWorks Community, Marie Planchard, introduced instructors from Mt. San Antonio Community College, Max Lizarraga and Jerry Miranda, who offer the CSWA program to its students as part of their coursework. "For their final examinations, students are required to take the CSWA exam because it provides them with industry confirmation and makes it easier for them to get a job after they graduate," Lizarraga and Miranda declared.

The day ended with a look at what the product teams have coming up for SolidWorks 2015.

Focus on India

In a candid chat with Sales Director – SolidWorks India, Dassault Systèmes, PM Ravikumar, insights on the plans for the Indian market were shared. He expressed, "2014 is going to be a new challenge for India. This year three main points will be focused on, namely, new customer acquisition, doubling the Value Added Reseller (VARs) investments in terms of sales team and market coverage."

He added that according to the Dun and Bradstreet Data, India has 27,000 companies that can invest in SolidWorks Technology. This is far too less a number considering India's potential in use of technology.

Apart from the software being popularly used in metropolitan cities, the company will focus its strategy in gaining customers in other cities of the country, especially where its presence has not yet bloomed. He emphasized on how re-sellers can help the company reach out to new customers.

The other aspect the company focuses on is education and community. Ravikumar opined that it is necessary to have a good talent pool who are able to use the software and make best use of its capabilities. He also mentioned how Dassault Systèmes works closely with companies that have training facilities wherein students are selected, trained and certified on the software and then placed in engineering companies.

A recent program in line with the education focus is that if an institution buys a campus license, they also get access to free standalone licenses for the students known as Student Engineering Kits (SEK). This is to ensure that students can make full use of the software. He professed, "Ideas do not come only while working in a lab for two hours. We want students to be able to work on ideas anytime they are inspired to make something." This is in line to create future users.

Other highlights

The entire event experienced not only inspiring but also fresh and unique ideas come to life. It was a treat to bear witness to such amazing innovations and collaborations. Sessions showcasing modeling essentials, design automation, productivity applications and other topics designed to help users work faster and be more efficient were held. More than 200 in-depth technical training sessions were held, many of them hands on, covering topics such as sheet metal for the casual user, the art of the swoopy part and electrical 3D – harnessing.

The event also featured the Partner Pavilion. Over 100 hardware and software vendors that work with SolidWorks applications to deliver new business benefits were present. All in all, the conference was a unique platform that brought together engineering and design professionals, students, educators, partners, resellers and SolidWorks employees from around the globe to witness, share and leverage 3D manufacturing and 3D printing in order to be more competitive and innovative.

The next event will be held in sunny Phoenix, Arizona, USA, from February 8-11, 2015. I can only imagine what's in store for next year's event! MMI

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SIEMENS

ACREX India 2014: Scaling New Heights in Sustainability

ACREX India 2014, a show renowned for its focus on energy-efficient technologies in the fields of air conditioning, ventilation, refrigeration and building services, was held from February 27-March 1, 2014 at Pragati Maidan, New Delhi. Meeting its objective of driving the green agenda among the masses, the event has successfully created a roadmap for ensuring the sustainable future of the industry in general and the world at large.

ACREX India 2014, organized by the Indian Society of Heating, Refrigerating & Air conditioning Engineers (ISHRAE) and managed by NürnbergMesse India, sent across a powerful message that it is high time everyone across the globe should embrace green technologies. With the first-of-its-kind initiative – aiming towards a 'carbon neutral exhibition' – undertaken by any organizer, the event set an example for the whole world to emulate. With sustainability and energy efficiency issues as its major focus areas, the show emphasized on the significance of environment-friendly technologies.

The expo received an overwhelming response from industry professionals, and a large number of visitors marked their presence at the event. ACREX India 2014 was endorsed by the American Society of Heating, Refrigerating and Air conditioning Engineers (ASHRAE) and supported by international industry bodies like United Nations Environment Programme (UNEP), Federation of European Heating and Air conditioning Associations (REHVA), Korea Refrigeration and Air conditioning Industry Association (KRAIA) and Air conditioning, Heating, and Refrigeration Institute (AHRI) among others. It also received support from the Ministry of New and Renewable Energy (MNRE), Government of India.

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Source: NürnbergMesse India

LtoR: Director-International Sales & Business Development, NürnbergMesse India, Thomas Schlitt; National President Elect, ISHRAE, Nirmal Ram; President, ISHRAE, Dipak Barma; Chairman, ACREX India 2014, Ashish Rakheja; President, Delhi Chapter-ISHRAE, Sanjay Gupta; and Convener, ACREX India 2014, Amit Goel

Inauguration ceremony

The event was inaugurated by the President, ISHRAE, Dipak Barma; Chairman, ACREX India 2014, Ashish Rakheja; Chairman, Indian Green Building Council, Dr Prem C Jain; Convener, ACREX India 2014, Amit Goel; National President Elect, ISHRAE, Nirmal Ram; President, Delhi Chapter-ISHRAE, Sanjay Gupta; and Director-International Sales & Business Development, NürnbergMesse India, Thomas Schlitt. The curtain raiser program, organized to mark the beginning of ACREX India 2014 held on February 26, witnessed participation from the Ministry of New and Renewable Energy, and Director, MNRE, Government of India, AK Tripathi graced the occasion.

Giving an insight into the latest industry trends, Barma said, "The Indian heating, ventilation and air conditioning (HVAC) market is expected to grow by 30 per cent to over ₹20,000 crores during the next two years mainly due to acceleration in activities in the infrastructure and real estate sectors. As sectors like retail, hospitality, healthcare and commercial services and also special economic zones (SEZs) require HVAC systems, this market is expected to grow by 15-20 per cent year on year."

While addressing the audience, Rakheja said, "Energy efficiency is no more an option, but a necessity to prevent power crisis as well as conserve the environment. To help fulfill this objective, ACREX India 2014 explored

innovative ways of carbon offsetting. With the objective of promoting energy-efficient buildings, the exposition showcased the latest energy-efficient equipment in the field of air conditioning, ventilation, refrigeration and building services under one roof."

He added, "This show was organized by the industry for the industry. A pavilion on 'Fire & Security' was one of the major attractions at the event. Moreover, the mascot called ACRO was launched for the first time at the exhibition. "

Event at a glance

ACREX India 2014 showcased the entire spectrum of latest products and solutions from the refrigeration and air conditioning segments that included air conditioning systems, refrigeration equipment, temperature control devices, ventilation systems, etc. It also focused on the latest building design trends as well as building technologies and services.

The event has grown rapidly over the last few years, and this year's expo witnessed international participation on a large scale. Besides participation from more than 25 countries including Belgium, Czech Republic, Egypt, France, Italy, Japan, Malaysia, Saudi Arabia, Singapore, Spain, Switzerland, Taiwan, The Netherlands, UK, UAE and Ukraine, the expo hosted country pavilions from the US, Germany, Korea and China. ACREX India 2014 saw participation from 400 exhibitors, who displayed their latest innovations and technologies at the event.

Managing Director, NürnbergMesse India, Sonia Prashar said, "ACREX India 2014 expanded new business horizons for all industry players in the heating, ventilation, air conditioning and refrigeration (HVAC&R) sector. With support from various organizations and active participation from partners, exhibitors and visitors across the globe, coupled with high footfalls, the growth of the show has been exponential."

"The Indian heating, ventilation and air conditioning market is expected to grow by 30 per cent to over ₹20,000 crores during the next two years mainly due to acceleration in activities in the infrastructure and real estate sectors."

President, ISHRAE, Dipak Barma

"Energy efficiency is no more an option, but a necessity to prevent power crisis as well as conserve the environment. To help fulfill this objective, ACREX India 2014 explored innovative ways of carbon offsetting."

Chairman, ACREX India 2014, Ashish Rakheja

Innovation at its best

The key attraction of this year's exposition was the 'Innovation Gallery' in Hall no 15, featuring India's top 50 green infrastructure projects. "The intent was to educate the masses about green buildings that ensure cost and energy savings. The projects featured in this gallery was aimed at those aspiring to build green homes," said Rakheja. This initiative aimed at laying the foundation for the convergence of the latest technologies with state-of-the-art building designs to develop green buildings of the future.

The 'green' outlook

In an endeavor to give an impetus to energy-efficient technologies, the show promoted products that incorporated clean energy sources. Moreover, for promoting the principles of three 'R's' namely reduce, reuse and recycle, concerted efforts were undertaken by the organizer to reduce the use of paper, with special focus on recycling and reusing waste, etc. The serious commitment of the organizer towards maintaining environmental balance was also evident from the fact that over 10,000 trees are planned to be planted across India (the initiative was started eight months ago when ACREX India 2014 was launched) to reduce carbon emissions created by the show.

Concurrent event

The international exhibition for windows, doors, façades and related technologies, machinery and services, fensterbau/frontale India, organized by NürnbergMesse India, was held concurrently to ACREX India 2014. These two exhibitions support cross-sector cooperation and developments in thematically linked segments of building expertise.

Storehouse of knowledge

ACREX India 2014 hosted a series of workshops and conferences featuring leading experts, academicians and technocrats from across the globe. The workshops focused on interesting topics that included 'Cool Thermal Energy Storage in the Era of Sustainability', 'Geothermal Systems - Design Considerations' and 'Energy Security - Renewable or Hydrocarbon' among others.

A grand success

ACREX India 2014 succeeded in expanding the business horizons for the HVAC&R industry with a large number of exhibitors, high footfalls, the vast array of latest products and technologies and the green focus among others. It has served as a knowledge platform to one and all to learn about eco-friendly technologies and their advantages that would help attain industrial as well as economic growth in a sustainable manner. MMI

"By organizing ACREX India 2014, ISHRAE aimed at contributing towards the goal of knowledge dissemination along with display of the latest products."

President, Delhi Chapter-ISHRAE, Sanjay Gupta

"ACREX India 2014 expanded new business horizons for all industry players in the heating, ventilation, air conditioning and refrigeration sector."

Managing Director, NürnbergMesse India, Sonia Prashar

Gauging Technology Trends in the Die and Mold Sector

Dies and molds form an integral part of production process in almost every industry. In a bid to provide an effective platform for die and mold manufacturers to showcase their latest products, Tool and Gauge Manufacturers Association - India (TAGMA - India) is organizing the 9th Die & Mould India International Exhibition at Bombay Exhibition Centre (BEC), Mumbai, from April 17-20, 2014. Read on to know more…

With technological advancements revolutionizing the die and mold sector, growth prospects are on the rise for all industry players who leverage the benefits of innovative products.

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Against this backdrop, TAGMA-India is all set to offer a knowledge platform for the manufacturers and end-users to learn about the latest technology trends in the die and mold industry.

Held biennially, India's largest international die and mold show – the Die & Mould India International Exhibition – has been a trend-setter in terms of creating awareness about the various products and solutions available in the market for meeting specific requirements of customers in varied industries. According to the organizers, it has gained the reputation of being the leading trade fair in India for the die and mold industry and is very large by international standards of various exhibitions held globally that cater to this segment.

Opportunities galore

Spread over 20,000 sq mt, the exhibition would provide an ideal opportunity to all business segments in the tooling industry to display and market their products and

Source: TAGMA-India

A glimpse of the inaugural ceremony of the previous edition

Exhibit Range

- Dies and molds, press tools
- Mold base and standard parts of dies and molds
- Hot runner system
- Tool steel
- Heat treatment
- Gauges
- CAD/CAM system related to dies and molds
- Die spotting
- Additive manufacturing/3D printing
- Rapid prototyping and modeling
- Machine tools for dies and molds, CNC milling/machining center
- Molding machine/die casting machine
- Die/molding polishing machines
- Cutting tools
- Measuring machines
- All materials, equipment, accessories and services covering the entire die and mold industry

Source: TAGMA-India

Visitors taking a look at the technology display

services. In today's fast growing die and mold sector, this is a 'must participate exhibition' for companies to widen their market reach and ensure business growth. Over 30,000 visitors are expected at the event.

With leading companies in India and abroad showcasing their latest, proven technologies that incorporate features to improve productivity, quality and reduce costs, the Die & Mould India International Exhibition aims at accelerating the growth of die and mold industry as well as all other sectors that extensively use dies and molds in their production processes.

Looking back

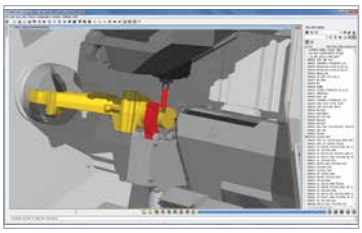
The 8th Die & Mould India International Exhibition held from April 19-22, 2012, in Mumbai was highly successful as evident from the steady growth rate in terms of exhibitors of over 23 per cent, visitors by 20 per cent and exhibition area by 17 per cent, as compared to the previous edition. One of the major highlights of the event was the two international pavilions from China and Germany. It also attracted exhibitors, delegations and visitors from over 25 countries worldwide.

The quality visitors at the event including CEOs, consultants, decision makers, etc., expressed satisfaction about finding ideal solutions that suited their requirements; gaining knowledge on new innovative products, manufacturing processes, etc., covering the entire supply chain in the tooling industry. It thus provided a wide spectrum of solutions to choose from for meeting production and cost challenges and ensuring faster deliveries demanded by customers in the highly competitive manufacturing sector.

Growth catalyst

With the Indian tooling industry expected to witness steady growth in the coming years, the event will act as a catalyst to promote its growth. In this scenario, TAGMA-India invites all stakeholders to avail of the opportunities that will be offered at this interactive platform and reach the pinnacle of success in business. MMI

Software for Die and Mold Applications



CGTech presents OptiPath software for die and mold applications. It is equipped with NC program optimization capabilities to reduce cycle times significantly. Optimized feed rates also result in longer cutting tool life, fewer broken cutting tools and scrapped parts. Additionally, there are better quality parts due to minimized cutter deflection and a better finish on part surfaces and edges due to constant tool pressure. OptiPath works on an intelligence-based machining system where it learns the exact depth, width and angle of each cut, and knows exactly the amount of material that is removed on each cut segment. Based on the amount of material removed in each segment, it automatically assigns the best feed rate for each cutting condition.

▸ **CGTech India Software Solutions Pvt Ltd**
Tel: +91(80) 23186981, E-mail: info.india@cgtech.com
www.cgtech.co.in

Insert Grades

Seco's new TH1000 and TH1500 turning insert grades further extend the company's offerings of extremely wear-resistant solutions for cutting difficult-to-machine materials. The company has engineered the grades to bring high performance and increased productivity to a range of challenging applications such as the machining of superalloy and hardened steel components, which are frequently found in both the aerospace and automotive segments. TH1000, a TiSiN-TiAlN nanolaminate PVD-coated grade, excels in machining the hardest steels, superalloys and hard-faced materials.

▸ **Seco Tools India (P) Ltd**
Tel: +91(2137) 667300, E-mail: seco.india@secotools.com
www.secotools.com/in

GR CNC Gantry Routers

Haas Automation Inc's range of GR CNC gantry routers is now fitted with chip guards as standard, further increasing the safety and cleanliness of the machines. Featuring a powerful 40-taper milling head, GR routers are available in two model configurations - the GR-510 and the GR-712. While the former offers travel in the X, Y and Z axes of 3073 x 1549 x 279 mm respectively, the latter offers customers longer X and Y travels of 3683 x 2159 mm, and the same 279 mm Z-axis. Moreover, each Haas GR gantry router has a 10,000 rpm, 11.2 kW vector drive spindle that provides the power to cut a wide range of different metals and the speed to cut various plastics and additional light materials.

▸ **Haas Automation India Pvt Ltd**
Tel: +91 (22) 61392800, E-mail: indiasales@haascnc.com
www.haascnc.com

Heavy Duty Cranes

Eddycranes Engineers manufactures 'ELMECH' series EOT cranes conforming to Class I, II, III & Class IV(M1toM8), heavy duty application per IS:807-2006, IS:3177-1999, IS:4137-1967 wherever applicable. EOT cranes are manufactured from 0.5 to 150 tons capacity in single girder design as well as double girder design. 'ELMECH' EOT cranes offer technologically advanced features such as box type girders for torsional rigidity and strength, tapered plate design for joining the girders to the end carriage to ensure smooth flow of stresses, duly hardened forged wheels running on spherical roller bearings in 'L' type housing, geared couplings, high torque, crane duty, gear boxes, etc.

▸ **Eddycranes Engineers Pvt Ltd**
Tel: +91 (22) 23522710, E-mail: eddycranes@vsnl.com
www.eddycranes.com

New Geometry for Difficult-to-cut Materials

TaeguTec has expanded its Mill2Rush family of cutters with the 6 cutting edge, double-sided positive inserts. These new inserts are especially developed for difficult-to-cut materials. The new 'ML' geometry design on the Mill2Rush includes a high positive rake angle for reduced cutting force, minimal vibration and longer tool life. The 6NGU line is now available in three chip former types: "M" for general machining of steel and cast iron, the new "ML" for low cutting force on difficult-to-cut materials as well as carbon steel, and alloy steel and the "AL" type designed to machine aluminum and non-ferrous materials.

▸ **TaeguTec India P Ltd**
Tel: +91 (80) 27839111, E-mail: sales@taegutec-india.com
www.taegutec-india.com

Face Milling Platform

With eight cutting edges, the new KSSM8+ face milling platform from Kennametal is focused on maximum metal-cutting performance in cast irons and steel workpieces at a low cost. The platform comes with a wide range of inserts for different applications such as face milling steels, stainless steels, and wet or dry machining of ductile cast irons. The double-sided insert design with eight cutting edges provides users with the lowest cost per edge, while the –LD geometry's positive rake face and honed edges result in lower cutting forces and good floor finishes in medium and finish machining.

▸ **Kennametal India Ltd**
Tel: +91 (80) 22198444
E-mail: bangalore.information@kennametal.com
www.kennametal.com

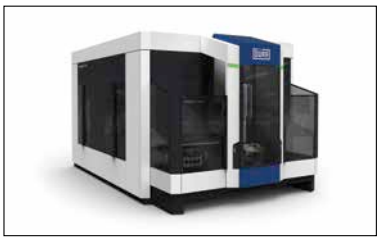
Escalator Deep Cleaning Machine

Upgrading its Rotomac 360, the escalator deep cleaning machine, as per customer feedback, Rosemor has launched ET15B. This has increased its efficiency and hence customers can use the 15 second or 30 second option to clean a step rather than opting for 60 seconds. The new machine thus saves time and money. Another change that has been implemented is the addition of a backup battery on the machine. In case of a power surge, the machine can be safely removed from the escalator without any lifting.

▸ **Rosemor International Ltd**

Tel: +44 (0)1491 838011, E-mail: info@rosemor.com
www.rosemor.com

High-pressure Water Jetting



High-pressure water jetting technology turns out to be expensive as it involves pressures of as much as 3,000 bar. However, Dürr Ecoclean's PulseBoreCenter permits the use of no more than 600 bar in its ultra-high pressure application. The gain is due to the integrated innovative EcoCBooster, which generates a pulsating water jet of much higher kinetic energy. Users will thus benefit from substantial savings in investment and operating cost as well as from improved process results. This innovative technology also offers advantages in other operations such as cleaning, deburring and decoating.

▸ **Dürr Ecoclean GmbH**

Tel: +49 (711) 7006-0, E-mail: info.filderstadt@ecoclean.durr.com
www.durr-ecoclean.com

Universal Robots

Universal Robots has developed UR5 and UR10 models of robots for small and medium-sized enterprises. The handling units are capable of lifting loads of 5 and 10 kg, and weigh 18 and 25 kg respectively, which make them portable. Alternatively, thanks to the software they are coupled with, they offer flexibility in operations. Also, they are easy to use and require no knowledge of robotics for programming.

▸ **Kollmorgen**

Tel: +91 (22) 42270-300,
E-mail: supriya.chanderkar@kollmorgen.com
www. kollmorgen.com

Turn-mill Centers

The NT and NTX series turn-mill centers from DMG Mori offer up to 5-axis and up to 6-sided complete machining, and is equipped with flat bed. The standard milling spindle achieves speeds of up to 12,000 rpm and the turning spindle up to 6,000 rpm. Also, these machines incorporate InvoMilling method from Sandvik Coromant for spur and helical gears, DMG gearMILL software, DCG technology and BMT turret. With these key technologies, complex gear geometries can be economically produced in small and medium-sized batches.

▸ **DMG Mori**

Tel: +91 (80) 40896517, E-mail: manoj.kumar@dmgmori.com
www.dmgmoriseiki.com

Servo Drive

Siemens Industry has launched the newly-developed SINAMICS V90 servo drive and SIMOTICS S-1FL6 servo motor for motion control applications. The drive and the motor together form an optimized servo drive system for positioning, speed and torque control. It not only provides a cost-effective solution but also shortens time-to-market with easy commissioning, thus improving customers' competitiveness. The drive helps addressing a wide range of applications such as pick & place, labeling, horizontal packaging and printing.

▸ **Siemens Industry**

Tel: +91 (22) 33265558, E-mail: anish.churi@siemens.com

Milling Solutions

Vargus Ltd has extended its range of TMSD thread milling solutions for deep holes. The new solutions include TMSD Vertical for small diameter applications and TMSD inserts for American Buttress (ABUT). These new offerings complement the existing TMSD line, providing multi-flute, high productivity and economical solutions for deep-hole thread milling. The 3-flute thread milling tools in the range ensure faster and more efficient machining of applications with smaller tool cutting diameters and a minimum thread size of M11.5 x 0.5 (1/2-28UNEF).

▸ **Vargus India**

Tel: +91 (0) 9899073393, E-mail: info@vargusindia.com
www.vargusindia.com

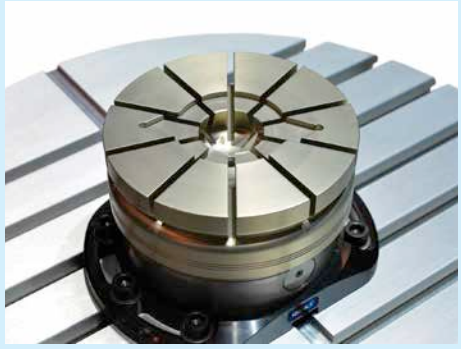
Schunk, a leading provider of clamping technology and gripping systems, has numerous innovative products in its portfolio. Here are some of its offerings:

Robot Coupling

The compact Schunk robot couplings VERO-S NSR continue to set standards at high-efficiency, with robot-supported pallet change on machine tools. With the module VERO-S NSR maxi 220, the system can deliver superior quality pallet handling even in the heavyweight class. It transfers torques up to 4,000 Nm and can reliably handle up to 1,000 kg (at 800 x 800 mm). Due to the developed locking system with patented strokes (fast and clamping stroke) from the company, such large masses can be handled. Locking is done form-fit and is self-retaining. All the components of the powerhouse are made of hardened, stainless steel.

Tool Holders

On the way to 'Industry 4.0', Schunk is setting another milestone. The company has introduced an intelligent tool holder management system through which Schunk's precision tool holders can be marked with an individual data matrix code. Regardless of whether it is done manually by smart phone, or fully automated with a machine tool scanner, every tool holder can be reliably identified with the help of a code and together with the corresponding data base system, they can be exactly assigned. Within the framework of intelligent manufacturing processes, it is possible to generate a precise history together with the data from the superior cloud, with sites of operation, used tools, service life and machining parameters.



Stationary Work Holding

Schunk has developed the SPM plus 138 fixture membranes made of aluminum, where workpieces of various clamping geometries are clamped from all sides with a pull-down effect. First, a 0.5 mm high tuning ring is inserted between the quick-change pallet module and the fixture membrane and later the exact workpiece geometry is milled according to the blank of the fixture's clamping surface. Once ready, the workpieces can be inserted within seconds and the complete circumference is clamped by locking the VERO-S module and the fixture membrane is specifically deformed. Since the whole process is carried out within the elastic range of aluminum, the clamping operation can be repeated several thousand times.

Manual Chuck

Schunk has developed the highly flexible manual chuck ROTA-S flex particularly for users, who want to machine a possibly wide workpiece range on milling/turning machines. It is a combination of the proven lathe chuck of the series ROTA-S plus with extended guideways and transforms them into large, light chucks, which are particularly versatile in use. Compared to conventional lathe chucks used for large clamping diameters, the weight with ROTA-S flex drops down to 60 per cent. At an identical table load, much heavier workpieces can be machined and due to the low height enough space remains for the workpiece and the tools. Moreover, for machining smaller workpieces the extended guideways can easily be disassembled, so that the workpiece accessibility is considerably improved.

Linear Modules

For its ELB linear motor axis, which is specially designed for precise and dynamic strokes, Schunk has combined a powerful linear motor drive with an ultra-smooth, pre-loaded junction roller guide. The result is an extremely compact, rigid and dynamic module, which is able to position comparatively high loads with a long-term excellent repeat accuracy of 0.01 mm. The maximum acceleration is 100 ms-2 and the maximum speed is 4 ms^{-1}. Since the driving force (maximum: 150 N) is transmitted directly and without gears to the slide by the play-free junction roller guide, the operators benefit from the outstanding precision, extremely short cycle times as well as high productivity and process stability, especially in the case of demanding joining and placement processes.

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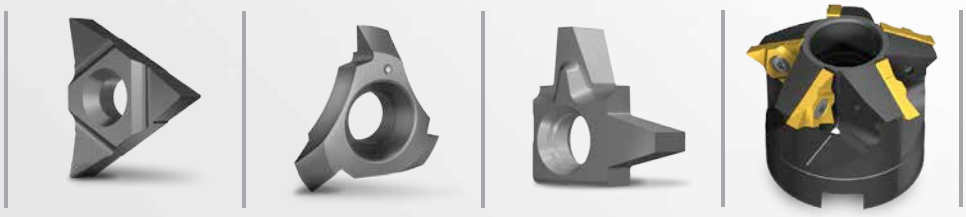

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