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The official magazine of Indian Machine Tool Manufacturers' Association

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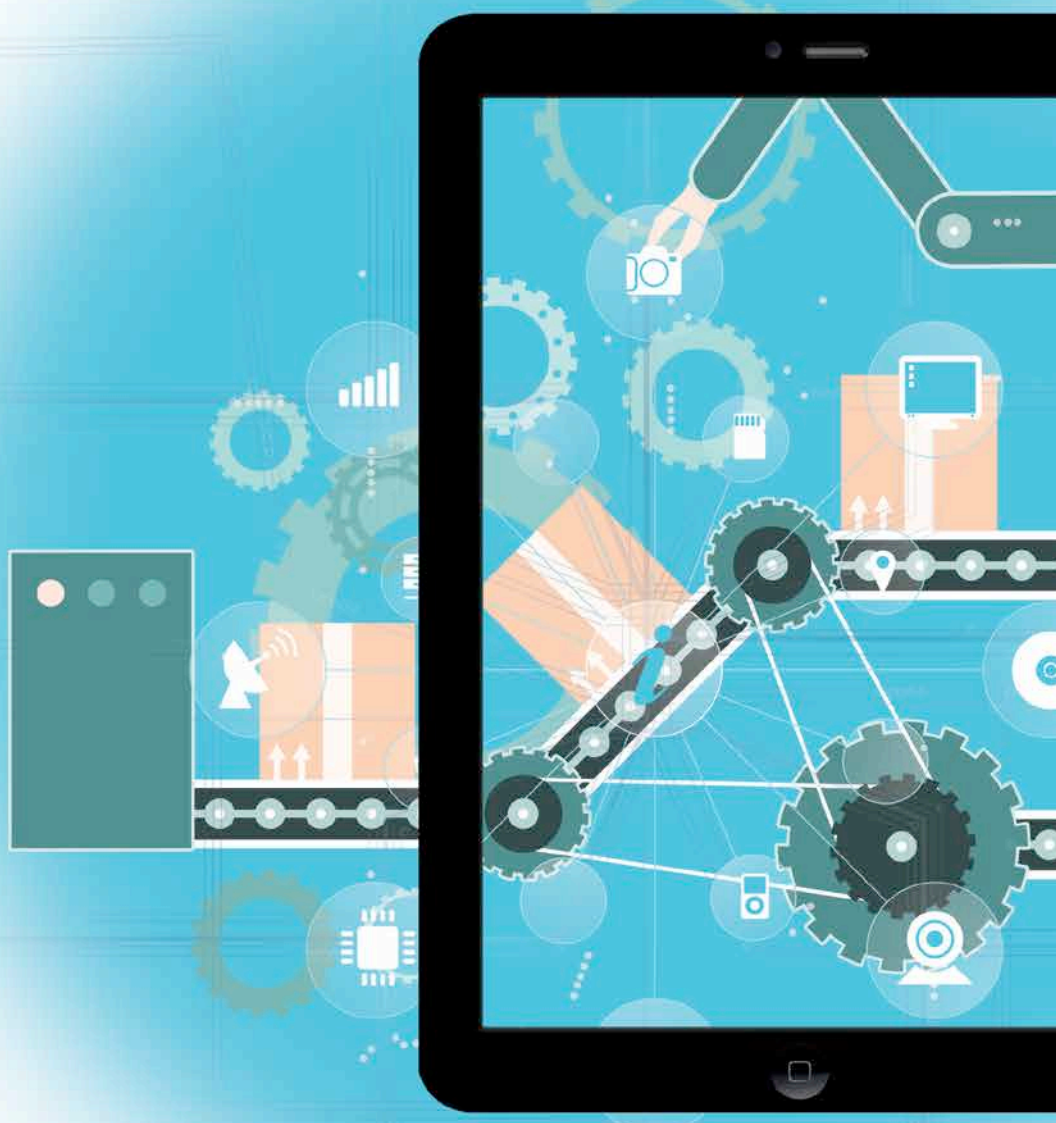

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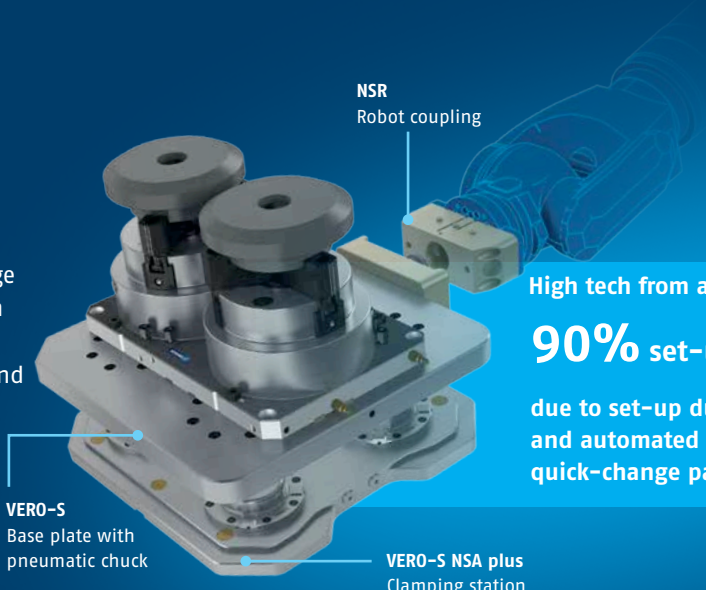

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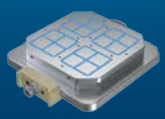

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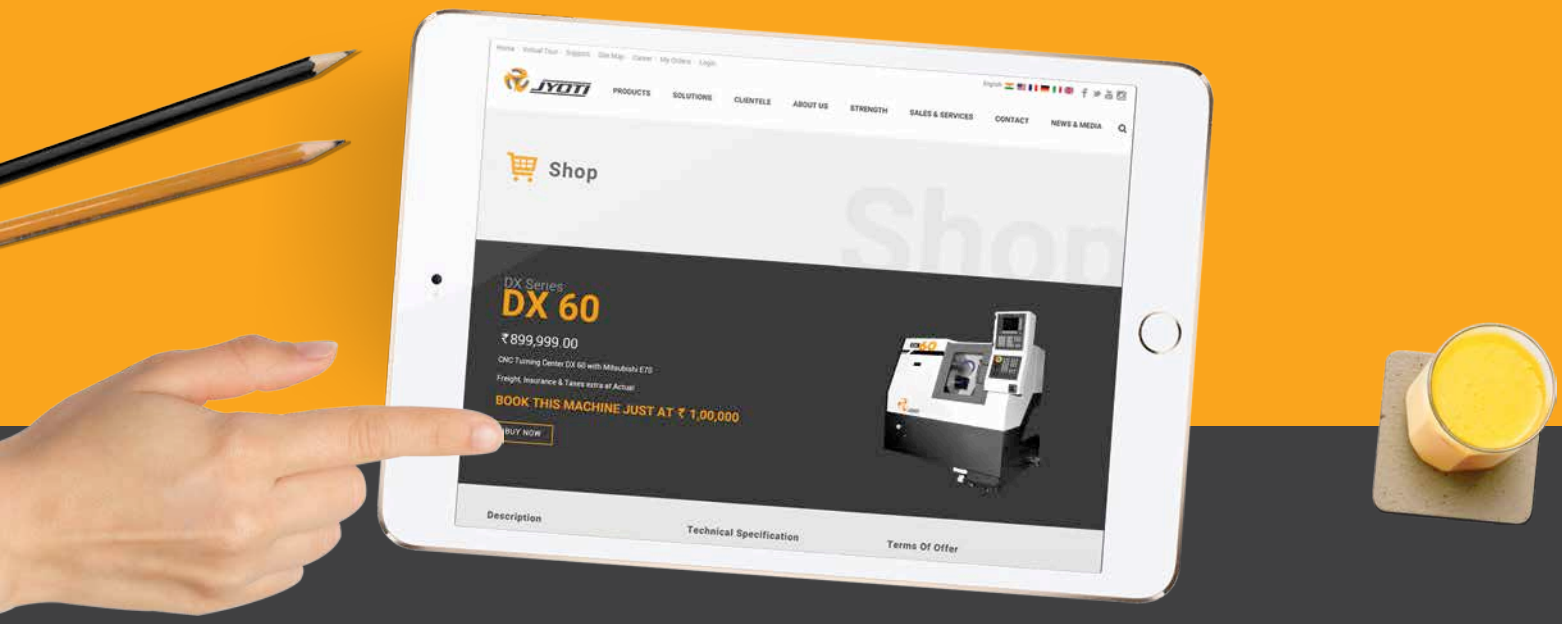

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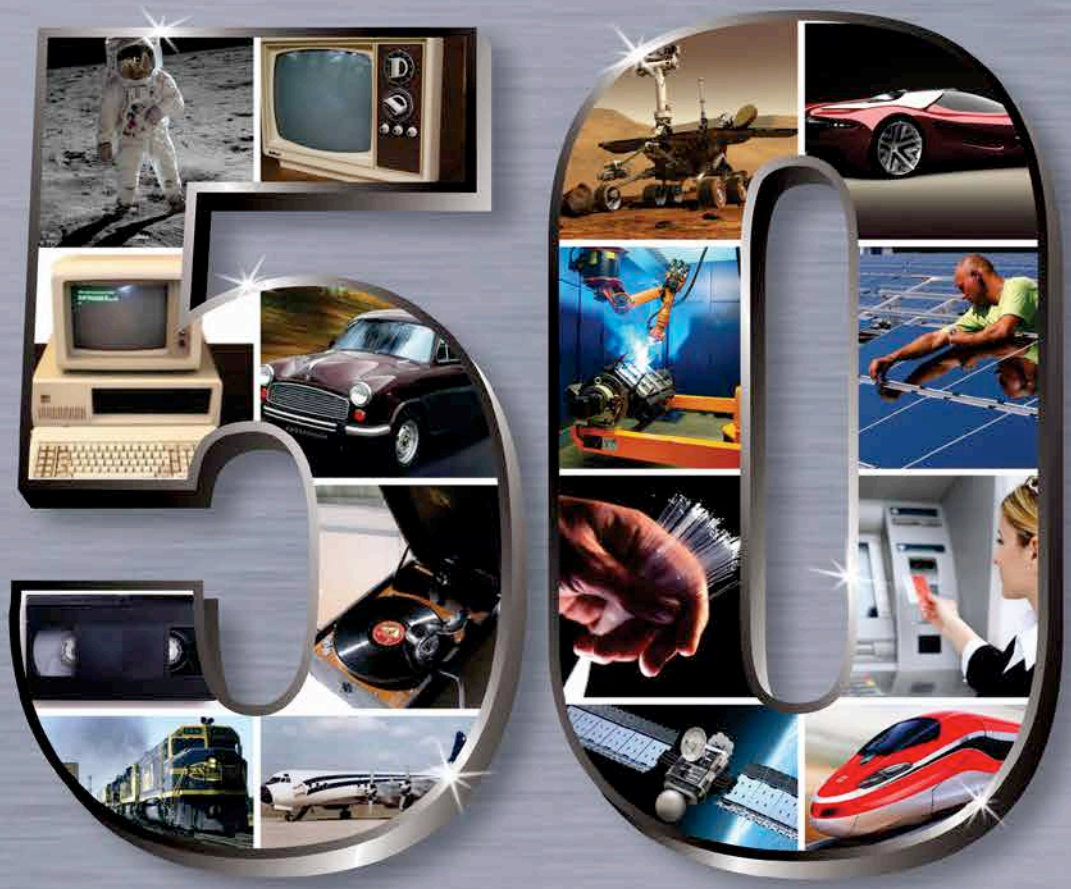

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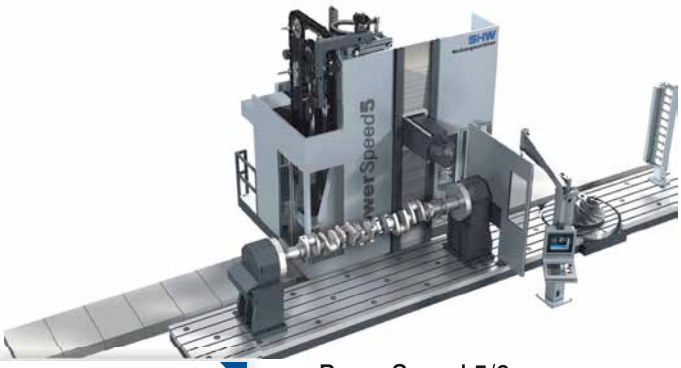

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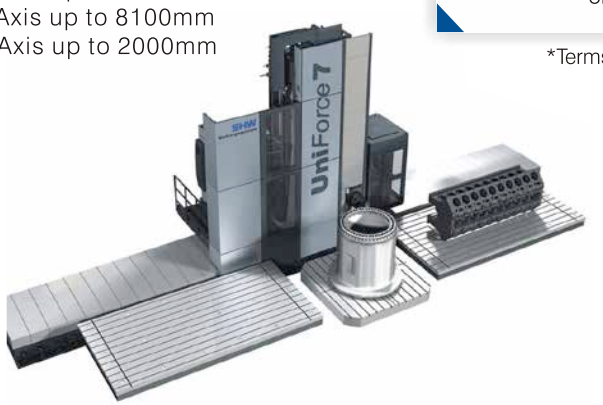

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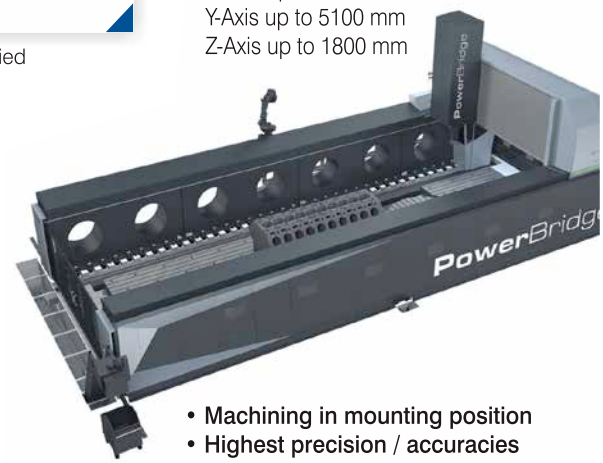

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Dear Readers,

Amidst a volatile, uncertain, complex and ambiguous (VUCA) world, the Indian economy is shining bright. Inflation has continued to moderate steadily and consumer price inflation has decreased.[1] The growth rate of the GDP for 2015–16 is estimated to be 7.6 per cent.[2] The Reserve Bank of India's move to lower the benchmark repo rate by 25 basis points to 6.5 per cent has sent the right signals. The reduction in borrowing costs for automobile and real estate buyers will encourage consumers to buy.[3] The manufacturing industry and the machine tools segment are brimming with positive sentiments as they take the next steps to steer the ship forward.

The opportunity is apt for foreign firms wishing to establish their business in India, especially in the manufacturing sector. India has set up the National Investment Infrastructure Fund for attracting foreign investments, particularly in infrastructure development. The country is also promoting renewable energy in a big way. It has opened various sectors for FDI including railways and defense and has removed discretions in decision making processes to ensure ease of doing business. All these bode well for manufacturing.

Over the years, the Indian Machine Tool Manufacturers' Association (IMTMA) has been fully committed to support the machine tool industry in innovative ways. IMTMA is organizing the 6th Machine Tool Industry Summit in Kochi. The summit will focus on the new paradigms—driving growth from 'Make in India' and winning in a VUCA world.

In the month of September, IMTMA will be organizing a regional machine tool expo in Pune to bring innovations in manufacturing to the doorsteps of Tier II and Tier III cities of India's western region. More initiatives are on the anvil.

In this edition of MMI you will read about advanced concepts of GD&T for Implementing Design for Manufacturing & Assembly. I am sure that the contents therein will be very valuable for all the readers. I would like to conclude by calling upon the industry to wholeheartedly support our initiatives and join hands with IMTMA in moving towards a more competitive machine tool industry.

Happy reading!

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

[1]. Mid-Year Economic Analysis 2015-2016, Ministry of Finance, Government of India, available at http://finmin.nic.in/reports/MYR201516English.pdf, last accessed on May 2, 2016.
[2]. Monthly Economic Report of March 2016, Department of Economic Affairs, Ministry of Finance, Govt. of India, available at http://finmin.nic.in/stats_data/monthly_economic_report/2016/indmar16.pdf, last accessed on May 2, 2016.
[3]. Manojit Saha, 'As RBI cuts repo rate, home loans could become cheaper', The Hindu, April 6, 2016, http://www.thehindu.com/business/Economy/as-rbi-cuts-repo-rate-home-loans-could-become-cheaper/article8438571.ece, last accessed on May 2, 2016.

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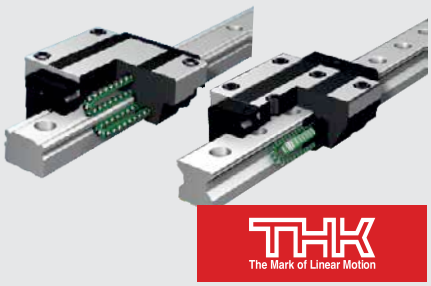
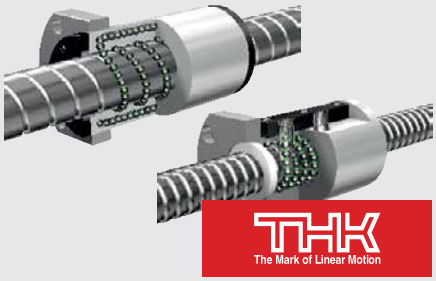
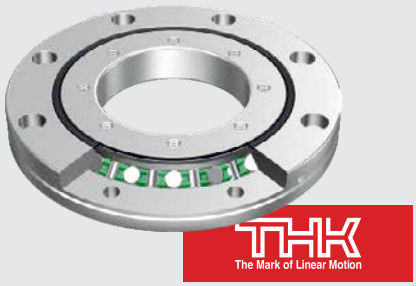


Precision Ball Screws



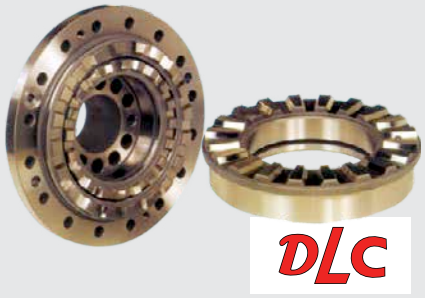
Precision Cross Roller Ring



Clamps for Linear Guides

Cross Roller Guides

Curvic Coupling



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Efficiency Precedes Economy

Before travelling to Taiwan last month, I had a faint idea about the island's recent history and politics but was completely unaware about their food, culture and people. I toured the country as a part of the international media entourage visiting several machine tool companies organised by Taiwan External Trade Development Council (TAITRA)—more about that in the oncoming pages.

While touring around the country, I found its economy robust. Attributed largely to its dynamic technology sector that is well-acknowledged globally as an important producer of technological machines and appliances. An astute example I wish to share is that of one I witnessed at the National Museum of Fine Arts in Taiwan. I stumbled upon one of the exhibitions being held there. It revolved around the theme of the 'Regeneration Movement'. The exhibition presented creative rendering and contemplations of several groups of artists on the topics of 'Transforming and Recycling'. The importance of recycling is strongly recognised in the country, and it gives its people the tools to innovate. And, this creates jobs for professional recyclers and refurbishers, which, subsequently, creates new markets for the economy.

"Technology is nothing. What is important is that you have a faith in people, that they are basically good and smart, and if you give them tools, they will do wonderful things with them."

~Steve Jobs

In this context, we present this edition filled with a technology – market mix of reads and invite you to the ACMEE show in Chennai, next month to witness the latest display of technologies in the machine tool sector.

Signing off and wishing you all a happy read!

SM

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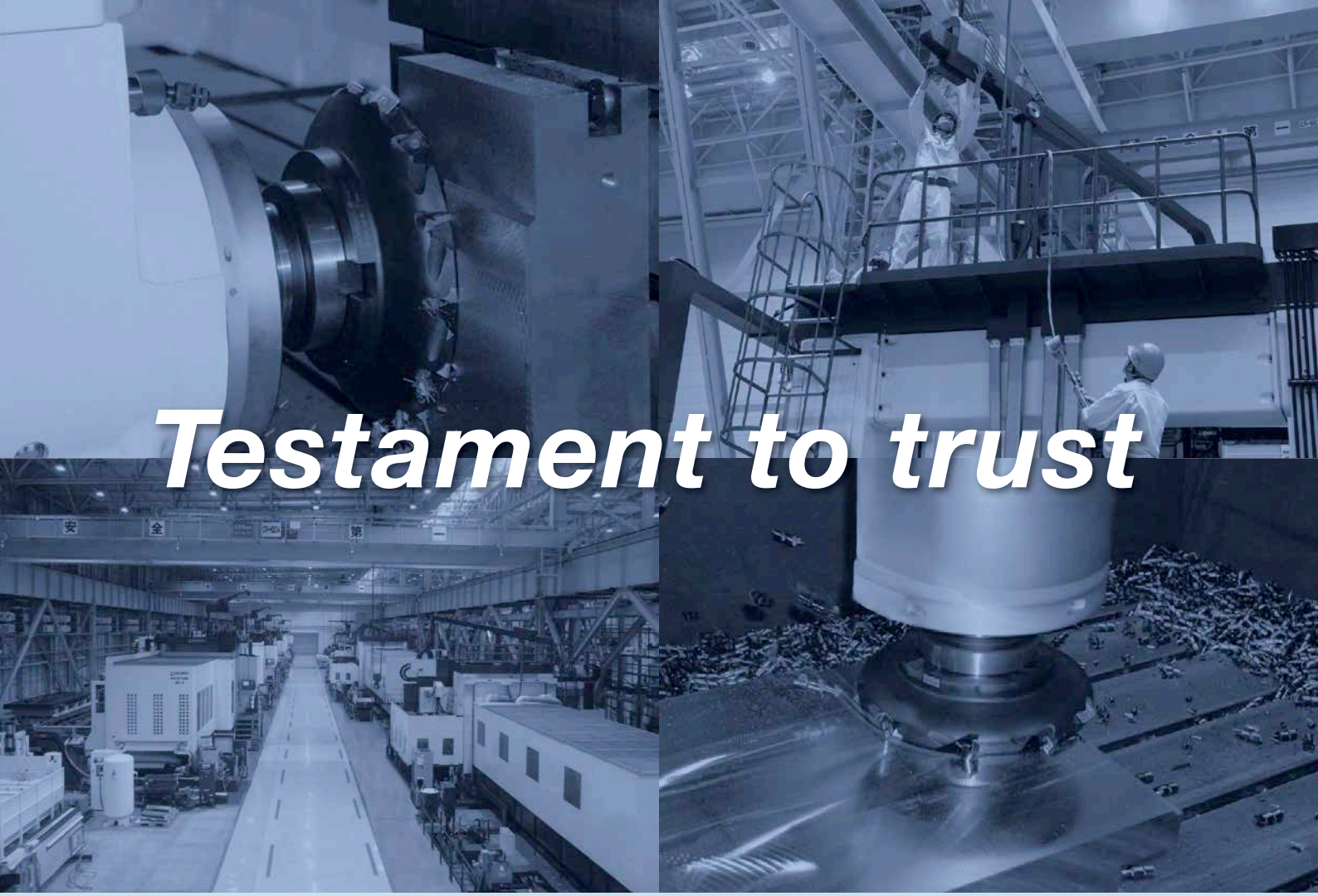

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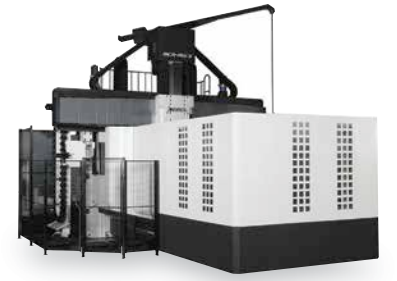

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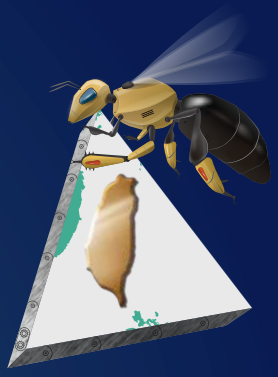

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The Competition Game: Intense and Extreme

> **"Emerging markets far from being targets for exploitation are generating a wave of disruptive product and process innovations."**
>
> CEO,
> Micromatic Machine Tools Pvt Ltd,
> TK Ramesh

The machine tool world is witnessing churning and upheaval across geographies with traditional products and business processes being turned over at short notice. The forces of globalization, technology and liberalization working together are making life more and more difficult for executives and organizations.

Current scenario

New technologies have eclipsed long established industry champions, with nimbler competitors having sharper value propositions and lower costs emerging from nowhere to take their place. Established companies think that fruits of design and development painstakingly built in home markets can be harvested in emerging markets. However, this is a dangerously complacent view. Emerging markets far from being targets for exploitation are generating a wave of disruptive product and process innovations.

One third of the world's seven billion people live in China or India, so the markets are here, and access to them are getting easier, simpler and faster. The focus of the global players is getting sharper in these markets. To add to the woes, informal social networks add confusion in the overload of information floating around and makes meaningful communication that much more difficult.

On the design and manufacturing fronts of machines, there are powerful forces of aggregation and integration at play. The more formal efforts to coordinate suppliers and assemblers are giving way to informal group working and production driven from modularization.

Relearn and start again

In this turmoil of intense competition, the focus must be on few key issues, cost, productivity and the relationship between price and margins. More importantly, how all of these should change continuously with time to stay ahead in the game.

Companies and executives that have to respond under extreme conditions must remember the length and breadth of the threat; the personality and energy of the competitors who are mostly young, fit and flexible. Their methodologies are new; their behavior fresh and uninhibited. So the companies and executives under threat must relearn their business afresh and take in the seemingly rash moves of the competition with no regard for the traditional pricing methodology. Speed, flexibility, energy and resilience are associated with young and new, and the challenged companies need to get comfortable with prolonged uncertainty. Look for customer inputs and not get taken in by competition inputs.

The cost challenge

Cost is an important factor in extreme competition, building lower cost positions and products earlier and more radically seem a necessity and almost always pay off.

Healthy cost structure also gives you a comfort position to operate from and invest in innovative products and process before the market requires them.

The heart of the cost challenge is the trade-off between margin and market share—when does it make sense to hold price steady in face of new competition or to reduce it in the interest of holding customer base. The answer lies differently for different product segments and circumstances within the company's offerings; these insights need to be carefully cultivated. MMI

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

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Advanced Concepts of GD&T

Geometric Dimensioning and Tolerancing (GD&T) systems have been continuously evolving since the past two decades as globalization in various streams of engineering has been instrumental in defining the details and implementing Design for Manufacturing & Assembly (DFMA). While many in the manufacturing sector use GD&T on a regular basis, many are yet to come to terms with this powerful communication tool.

A thorough understanding is essential for design, manufacturing and quality teams for implementing GD&T and realizing the true potential in terms of interchangeability, reduced cost, reduced re-work, simplified inspection and gauging, etc.

GD&T, its use and its advantages

GD&T defines a set of symbols and rules to mention the dimensions and tolerances in engineering drawing. It eliminates the ambiguities and brings out the designer's intent very clearly. GD&T ensures seamless communication between the design, engineering, manufacturing and quality teams across the entire organization enabling them to work in a concurrent engineering environment. It is well known that the ultimate aim of any design is that it should be manufactured at a minimum cost and with optimum quality standards. GD&T enables the design team to review the design based on functional requirements and assembly considerations. The design intent is brought forward with clarity and conveyed across the organization. Engineering, production, quality, and assembly teams interpret the

Source: IMTMA

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Advanced Concept

Source: IMTMA

The training program focuses on understanding the system of GD&T and the methods of applying it in real time design by using case studies, examples and exercises.

drawing in the same manner without any difference of opinion. GD&T reduces the manufacturing cost and its proper application reduces the lead time for design through manufacturing.

ASME-GDTP Certification

The American Society of Mechanical Engineers (ASME) in recognition of the needs and benefits associated with standard qualifications for professionals using geometrical dimensioning and tolerancing along with the ASME Y 14.5M standard established the Geometric Dimensioning and Tolerancing Professional (GDTP) certification program. The program provides the means to recognize proficiency in the understanding and application of the geometric dimensioning and tolerancing principles expressed in Y14.5.

There are two levels of certification. The first level, Technologist GDTP, provides a measure of an individual's ability to understand drawings that have been prepared using the language of geometric dimensioning and tolerancing as defined in the Y14.5 standard. The second level, Senior GDTP, provides the additional objective measure of an individual's ability to select and apply geometric controls to the drawings.

ASME has established a training program to expand its training activities to meet the professional development needs of engineers and other technical professionals worldwide. Under this training program, ASME works with local ASME authorized training providers to market and promote ASME courses to local communities of engineers and other technical professionals based on the market needs.

Indian Machine Tool Manufacturers' Association (IMTMA) as an authorized training provider of ASME has trained around 125 industry professionals since 2013 in GD&T preparatory courses for ASME GDTP certification. The training program focuses on understanding the system of GD&T and the methods of applying it in real time design by using case studies, examples and exercises. The program covers the philosophies of how, when and where to apply geometrics for producing quality parts. Unique hands-on sessions in the measurement lab to practice with the application of GD&T rules using the functional gauges, conventional as well as state-of-the-art measuring systems such as CMM on various engineering parts and components are a part of the program. On behalf of IMTMA, Director, IMTMA Technology Centre, M Krishnamoorthy, an authorized training instructor with ASME, imparts training for industry professionals. Krishnamoorthy had recently undergone training on advanced concepts in GD&T from ASME at Seattle, USA.

Source: IMTMA

IMTMA as an authorized training provider of ASME has trained around 125 industry professionals since 2013 in GD&T preparatory courses for ASME GDTP certification.

To conclude, the training program helps industry professionals gain thorough understanding of the importance of applying correct GD&T on drawings, the relationship of geometric characteristic and feature types such as RFS, MMC and LMC conditions in real time. MMI

CII Announces 'Shanghai-Mumbai Dialogue'

Mumbai – The 'Shanghai-Mumbai Dialogue' brought together government, industry and think tanks for an annual dialogue that lead to concrete measures to strengthen cooperation between these two cities and eventually extending to the whole of India. Speaking at the conference on China & India: Strengthening Partnership in Science & Technology, Innovation, Financial & IT Services organized by CII in Mumbai, Chief Minister of Maharashtra, Devendra Fadanavis mentioned that the state of Maharashtra is the powerhouse of India and Mumbai is the economic capital of India. He further added that India is a land of opportunity with a billion plus population of which 70 per cent comprise of youth, laying out huge opportunities to companies.

Source: CII

MoU signed between the Shanghai Municipal Commission of Commerce and CII.

Huaheng's First Facility in India

Vadodara – Huaheng Automation Pvt Ltd, the wholly-owned subsidiary of China's Huaheng Welding Co Ltd has announced the opening of its full-fledged fabrication-cum-assembly unit in Savli, Vadodara. The world-class facility has been designed to meet every need of today's welding requirements. Apart from providing standard welding systems such as automated orbital welding systems, mechanized welding systems, robotic welding systems, and automated CNC systems, Huaheng also manufactures a number of customized welding systems to meet customers' requirements. In India, the company plans to launch its Automated Guided Vehicles (AGV) and intelligent storage systems which attracted huge attention and appreciation during the inaugural event. Commenting on the occasion Chairman, Huaheng Group, Xu Xujion said, "We are the leading player in China in the integrated automatic welding solutions domain and are doing business in India for the past 24 years. Seeing the increasing opportunities in India, we are expanding our horizon here."

Source: Huaheng Automation Pvt Ltd

Huaheng unveils its first facility in India.

Dalmia Bharat Foundation and NSDC Join Hands

New Delhi – In line with the Prime Minister's Skill India program and Dalmia Bharat Foundation's focus on corporate social responsibility, the company has signed a Memorandum of Understanding (MoU) with the National Skill Development Corporation (NSDC) to impart vocational training and skills to 60,000 unemployed youth across the country. The MoU stands for a 10 year commitment, during which vocational training will be imparted to benefit the country's youth across various sectors, i.e., apparel, beauty and wellness, retail, auto, healthcare, construction, agriculture, security, plumbing, and servicing capital goods. Some of the job roles identified under these sectors are that of a fitter, instrumentation mechanic, electrician, etc. The duration of these training programs will vary from three–six months. Upon successful completion, trainees will receive a certificate from the NSDC / Sector Skills Councils (SSCs). The first year of partnership will see three training centres at Trichy, Rourkela and Belgaum that will roll out skill training for the local youth.

Source: Dalmia Bharat Group

Dalmia Bharat Foundation signs MoU with the NSDC.

Phillips CNC Open House 2016

Navi Mumbai – In India, Phillips Corporation through its subsidiary CNC Servicing and Solutions India Pvt Ltd represents industry leading global brands such as Haas, Hermle, SHW, Zeiss, Sunnen, Tsugami, Maple, Kent, etc., in India. The 'Phillips CNC Open House' in India—the first of its kind was hosted 2016 at the Phillips CNC Technical Center in Navi Mumbai from May 5–7, 2016. The event witnessed the participation of approximately 800 visitors and 500 companies over the three days of the Open House. The machines that were displayed at the show included: Kent KGS-84AHD Precision Surface Grinder, Tsugami M08J CNC Lathe, Tsugami B0205 Sliding Head Turning Center with Bar Feeder, Maple Taiwan ME- 850 Vertical Machining Center, Sunnen USA SV-2015 Vertical Honing Machine and Zeiss Comet L3D Optical scanning machine. This event showcased the latest technologies in milling, turning, honing, grinding in order to help manufacturers enhance their quality and productivity.

Source: Haas Factory Outlet

The maiden Phillips CNC Open House concluded on May 7, 2016 in Navi Mumbai.

Tongtai Open House 2016

Kaohsiung, Taiwan – Tongtai Machine & Tool Co, Ltd held its first open house on March 10 and 11, 2016 at its headquarters that is located at Kaohsiung, Taiwan. The Taiwan machine tools company rarely holds this kind of big event which makes Tongtai open house even much more special. It was the first time that Tongtai showcased its research, development, innovation, technology application and service by organizing an open house. Tongtai demonstrated an entire series of machines. About 46 machines that were newly developed in the past two years were displayed at the event. Nevertheless, Tongtai's subsidiary Quicktech and Anger Machining from Austria also demonstrated one of their machines. Tongtai has arranged live demonstrations to show the value and ability of Tongtai's ultimate machines.

Tongtai Open House 2016 was themed 'Together to the Future' and addressed Tongtai's ultimate performance on 'machine tools,' 'advanced manufacturing ability' and 'technology application.' The event inspired new ideas and creative approaches while providing strategic links to clients, dealers, suppliers and Tongtai. Machines including CNC Lathe, horizontal/vertical machining center, floor-type boring and milling machine and metal additive manufacturing equipment, etc were exhibited without the limitation of space.

The exhibition was categorized into three areas—'Foundation Pavilion,' 'Solution Pavilion' and the 'Innovation Pavilion'. In the 'Foundation Pavilion', people reviewed Tongtai's 47 year old history and also got an insight into the company's evolution of becoming an ultimate machine tool builder. In the 'Solution Pavilion', the manufacturing ability and industry application of Tongtai machines were showcased.

Source: Tongtai Machine & Tool Co Ltd

The staff of Tongtai Open House 2016.

HELLER WerkTage 2016

Nuertingen, Germany – Last year, more than 800 international visitors attended HELLER WerkTage to experience how HELLER is producing, living and assuring quality in Nürtingen, Germany. In 2016, the company shines the spot-light on 'the new formula for production'. There is good reason to do so, because HELLER will be presenting a new generation of versatile machining centres. Additionally, hands-on demonstrations at the 'Manufacturing Center' and moderated panel discussions will underscore the practical orientation and attraction of the event. Proven, and at the same time, innovative solutions will again be the focus of HELLER WerkTage in 2016. Under the motto 'The new Formula for Production', the company will be presenting high-end machining with maximum productivity from June 15–17, 2016. With a new generation of versatile machining centres, HELLER opens new perspectives. These machining centres feature a fifth axis provided by the workpiece and has been designed for dynamic 5-sided as well as simultaneous 5-axis machining.

Source: Gebr. Heller Maschinenfabrik GmbH

HELLER will provide extensive insights into production and assembly during WerkTage. As in previous years, various guided plant tours are on the agenda.

SANY Group Signs Contract with JNPT for Supply of ERTG Cranes

Mumbai – SANY Group, one of the leading manufacturers of port logistics equipment, has signed a contract with the Jawaharlal Nehru Port Trust (JNPT) for design, manufacture and supply of 15 numbers of Electrically operated Rubber Tyred Gantry Cranes (E-RTGCs). The contract was signed at the Maritime India Summit 2016 in Mumbai between CEO, SANY India, Deepak Garg and Chief Manager, Mechanical & Electrical and Port Planning & Development, JNPT, AJ Lokhande in the presence of Union Minister of Shipping, Road Transport and Highways, Nitin Gadkari; Chairman, JNPT, Anil Diggikar, and Deputy Chairman, JNPT, Neeraj Bansal. The landmark contract flags on the entry of SANY Group into the heavy gantry cranes segment in India. The E-RTGCs developed by SANY come with best-in-class technology, efficiency and performance and will further enable JNPT in developing their port to match the evolving needs of port logistics industry. This new batch of E-RTGCs from SANY will modernize the existing fleet, catering to increasing traffic at the JNPT.

Source: SANY India

SANY Group has signed a contract with the JNPT for design, manufacture and supply of 15 numbers of E-RTGCs.

König Metall Achieves its Business Objectives

Göppingen, Germany – Highly satisfied customers, innovative products, and optimal production processes: these are the objectives set by Managing Director, König Metall in Gaggenau, Germany, Hans-Jörg Leuze. Achieving these objectives came in the form of two recently acquired hydraulic Schuler HPX presses, each with a press force of 400 ton, at the Croatian site of Pisarovina. "For us, as an automobile supplier, Schuler Presses delivers exactly what we need", says Leuze. "Our customers expect us to develop and manufacture parts of the utmost quality, and to do so, we need appropriate machines." In 2014, König Metall had founded the facility in Pisarovina, located about 30 km south of Zagreb. As of today, 200 people work at the location that has shown a rapid growth in the last two years; the first production hall was followed by a second one very quickly. The machine park now includes a total of 22 presses, most of which have been delivered by the Schuler Group. Among other things, the two latest Schuler lines produce parts for trucks and exhaust systems for various vehicles.

Source: Schuler AG

Two hydraulic 400-ton systems from the HPX series are in operation at König Metall's stamping and press plant in Croatia.

EuroBLECH 2016

Hanover, Germany – From October 25 – 29, 2016, EuroBLECH 2016 will open its doors in Hanover, Germany. The exhibition will, once again, be the meeting place for sheet metalworking professionals from all over the world looking to find enhanced machinery and innovative production solutions. Visitors will be able to discover an extensive variety of products, from conventional systems to high-tech solutions, and gain an insight into the latest technological advancements in sheet metal working. With this year's theme 'The New Generation of Sheet Metal Working', EuroBLECH 2016 reflects the trend towards digitalization and smart manufacturing in modern sheet metal processing. Five months ahead of the show, the organizers, Mack Brooks Exhibitions, announced a further increase in exhibition space of the world's leading trade show for this industry sector. A total of 1,410 exhibitors from 40 countries have already secured their stand space at this year's EuroBLECH, the 24th International Sheet Metal Working Technology Exhibition, covering a net exhibition space of 89,000 m^2 across eight halls at the Hanover exhibition grounds.

Source: EuroBLECH

Innovative technologies displayed at EuroBLECH's previous edition.

EMO Hannover 2017

Frankfurt am Main, Germany – 'Connecting systems for intelligent production' is the motto of EMO Hannover 2017. The world's premier trade fair for the metalworking sector will commence from September 18–23, 2017 and will be intensifying its focus on the mega-trend of digitization within the context of Industry 4.0. "Entrepreneurs all over the world are progressing towards digitization and networking of their products, production operations and logistical chains, because they see this as the next quantum leap forward in development, with concomitant gains in competitiveness," explains General Commissioner, EMO, Carl Martin Welcker. "As the key technology for industrial production operations, the machine tool and the production process are particularly crucial to the networked factory," he adds, and asks, "If not at EMO Hannover then where can the international trade public expect an abundance of new solutions designed specifically for their production operations?" Smaller batch sizes, more complex parts, increased part diversity, and a combination of processes are just some of the ongoing challenges for industrial production operations. New solutions and business models with high customer benefits can emerge from the digitization of products and processes. And new vendors can enter the market. Services, consultancy and customer support from the machine tool manufacturers are gaining in perceived importance, and will secure a competitive lead in the years ahead as well, since their share of total turnover is rising. "Users want holistic solutions that can be coherently imaged in a single system. These require thorough comprehension firstly of the processes in place at our customers' facilities, which can be highly disparate, and secondly of the complex technologies featured in our machines," is how Welcker describes the ongoing discussion. Where the individual vendors currently stand in this process and which of them have their noses in front, this will be revealed at the 2017 EMO Hannover. "It is the international shop window for production technology, and the best platform for users to find solutions for their increasingly multifaceted requirements.

In 2017, EMO Hannover will once again be the meeting point for the global world of the machine tool industry," concludes Welcker.

Source: VDW

General Commissioner, EMO Hannover 2017, Carl Martin Welcker.

TIMTOS Pre-Show Press Conference

Taipei, Taiwan – The TIMTOS pre-show press conference was held on the first day of TIMTOS's sister exhibition – MTduo, this is the first time a pre-show conference had been conducted at the event. The organizers specially arranged the conference as it would act as a warm-up for TIMTOS that is scheduled to be held next year and it would also help its sister show—MTduo to grow momentum. Both these shows share similar properties. In MTduo, one can witness customized smart manufacturing technologies tailored towards Industry 4.0, while in TIMTOS one can see the latest products integrating IT technology, Internet of Things, and smart manufacturing. TIMTOS is an extensive exhibition of MTduo. Those being focused in MTduo will be brought into full play at TIMTOS.

Source: TAITRA

The TIMTOS pre-show press conference was held on the first day of TIMTOS's sister exhibition – MTduo.

The 13th Rapid.Tech event

Erfurt, Germany – Additive Manufacturing (AM), also known as 3D Printing has come so far in recent years that it is now possible to print high-quality parts and components from a variety of metals. The latest developments in these technologies and the scope for, and limitations on, their use in the industry will be discussed in the new '3D Metal Printing' trade forum at Rapid.Tech, the international trade show and conference for Additive Manufacturing, which is scheduled to take place from June 14–16, 2016 in Erfurt. Various applications in fields such as aviation and medical engineering illustrate that Additive Manu-facturing processes offer completely new levels regarding product design, efficiency, speed and flexibility in the production of series parts. It is therefore hardly surprising that a growing number of companies are investigating the industrial use of AM technologies. However, standards in series production are significantly more rigorous than in prototyping.

Source: SCHULZ. PRESSE. TEXT

An ongoing session during the last edition of Rapid.Tech.

Siemens, Local Motors form partnership

Texas, US – Siemens and Local Motors have formed a new partnership which is intended to help advance the future of manufacturing by optimizing the development and large-scale 3D printing of cars. The partnership combines the power of Siemens' product lifecycle management (PLM) software technology with Local Motors' leadership in co-created and 3D-printed vehicles—a process called direct digital manufacturing (DDM). With a shared vision for the future of product development, Local Motors plans to enhance productivity in its innovative Local Motors (LM) Labs program by leveraging Siemens' expertise in creating 'digital twins', while Siemens expects to further enhance its digital enterprise software suite to support the latest advances in additive manufacturing and 3D printing. "We have been partners with Siemens since 2011, and this partnership has taken it to the next level by enabling our community of co-creators to innovate even faster," said CEO, Local Motors, Jay Rogers.

Source: thinkstockphotos.in

The overall Budget 2016 is indeed a crucial step by the Government of India towards transforming India.

Impact of the Budget

Budget 2016 – Striking the chord of balancing the fiscal deficit with a boost to the manufacturing sector.

The Budget for 2016 presented by Finance Minister (FM) Arun Jaitley on February 29, 2016 includes key policy announcements and tax proposals of the National Democratic Alliance Government in the backdrop of a tepid global economic environment vis-à-vis an Indian economy growing at 7.5 per cent in 2015 and being viewed as the 'one bright spot' in the global economy.

After the FDI liberalisation of 1991, the biggest innovative reform by the Government of India in the Indian manufacturing sector is 'Make in India' which was announced globally on India's 68th Independence Day —15th August 2014.

The introduction of Make in India, Clean India, Smart Cities, Skill India, etc., campaigns along with further liberalization of the FDI policies in defense, constructions, railways, etc., have strengthened India's attractiveness especially in the hi-tech and modern manufacturing space. Resultantly, within two years of the formation of the new government, India has witnessed a renewed level of investment

Aashish Kasad
Partner – Tax and Regulatory Services
Ernst & Young LLP, India
aashish.kasad@in.ey.com

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Budget

interest *(Chart 1)* by the global economies and significant commitments by several large countries to partner with India in its growth agenda.

While India's attractiveness has increased manifold, the global macroeconomic landscape is passing through a rough and uncertain terrain. This situation is further exacerbated by declining prices of a number of commodities, reduction in crude oil prices, volatile exchange rates, and turbulent financial markets, more so equity markets, including that of India, which have been swinging on fears that the global recovery may be uncertain and long drawn.

Despite all the global pressures, India's growth story has largely remained positive mainly on the back of domestic consumption demand aided by steady employment and relatively low inflation. While India is heading to 8 per cent growth, Euro zone, Japan, Brazil, Russia are largely below the global growth rate of 3.5 per cent. Foreign exchange reserves of India are at their highest ever levels of $351.5 billion (as of early February 2016). India has achieved the fiscal target of 3.9 per cent of GDP for FY 2015–16 and the target for next year has been retained at 3.5 per cent. It is interesting to note that India has witnessed fiscal deficit of less than 4 per cent for the first time after seven years.

Given the same, the FM in his Budget speech had announced that he had two policy options; either in favour of boosting India's growth at the expense of fiscal targets or achieving fiscal consolidation and stability. The FM wisely opted for the path of fiscal prudence and meeting the fiscal targets to strengthen the foundation of a stable and sustainable growth despite the global economic turbulence while ensuring that the development agenda is not compromised.

Given the same, the Budget policies are around an innovative theme of 'Transform India' which catered to 'nine distinct pillars' *(Chart 2)*.

The FM had announced tax reforms in nine categories across significant thrust areas, with an eye on boosting Make in India, growth and employment generation, the rural economy, business environment, providing certainty in taxation and use of technology for enhanced tax efficiency.

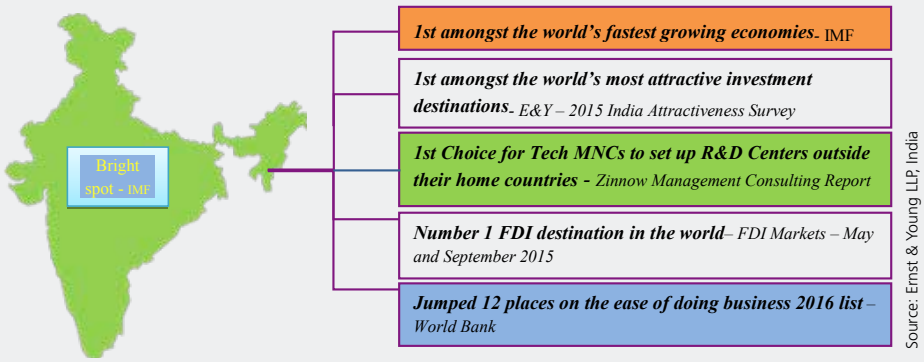

Chart 1 – India's attractiveness.

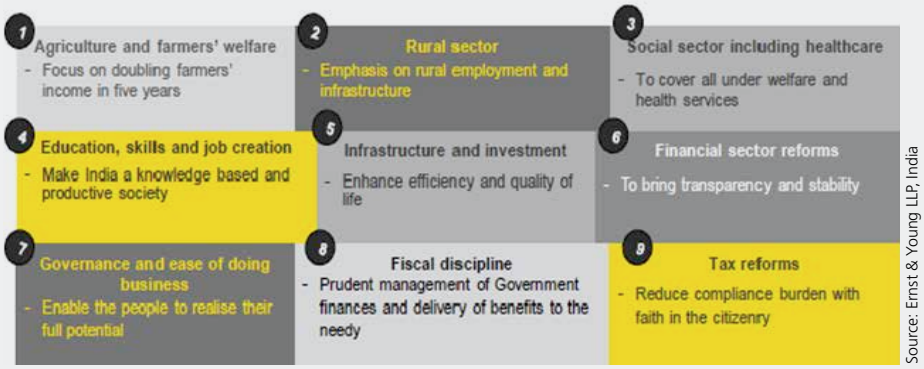

Chart 2 – Nine pillars of policy measures and tax reforms.

Key tax proposals of Budget 2016 impacting the manufacturing sector

Reduction in corporate tax rate—immediate boost to the newly set up manufacturing companies:

▶ The FM in the previous budget had proposed that tax incentives under the Income-tax Act, 1961 ('the Act') would be phased out with a simultaneous reduction in corporate tax rates to 25 per cent over a four year period. As the FM had the challenging task of meeting the fiscal deficit target set of 3.5 per cent GDP for 2016–17 he has struck a balance of reducing the corporate tax rates marginally and not completely phase out the incentives / deductions with immediate effect.

▶ It is proposed that new manufacturing companies, incorporated on or after March 1, 2016, will have an option to be taxed at 25 per cent provided they do not claim profit or investment linked deductions, investment allowance and accelerated depreciation. This optional reduced tax rate would provide a simplified way to declare taxable income and reduce litigations.

▶ Further, an existing company whose turnover does not exceed ₹50 million in FY 2014–15 would be taxed at the rate of 29 per cent.

▶ India Inc will greatly appreciate a clear roadmap on the movement of the Indian corporate tax rate to 25 per cent, in the quest of a predictable tax regime.

Phasing out of incentives/deductions – providing a clear road map to investors and reducing litigations:

▶ This is an innovative reform to simplify the Act as the incentives/ deductions have been subject to amendments from time to time and prone to litigation. Some of the key incentives/ deductions which are proposed to be phased out are: *(Refer Table 1)*

Rationalising/widening the scope of certain incentives/deductions which directly benefits the manufacturing sector:

▶ **Start–ups**

- 100 per cent deduction of profits is proposed for three out of five years for eligible start-ups set up between April 2016 and March 2019.
- Would be liable to pay MAT.
- Start-ups defined as business undertaking innovation, development, deployment or commercialization of new products, processes or services

Table 1: Key incentives / deductions

Incentive/Deduction	Presently	Proposed
Units in Special Economic Zones ('SEZ')	Profit linked deductions on profit derived from exports of articles or things or services - 100 per cent of profits for first 5 years - 50 per cent for next 5 years	No deduction if commencement of activity is on or after April 1, 2020
Expenditure incurred on any notified skill development project	Weighted deduction of 150 per cent	100 per cent from April 1, 2020
Deduction in respect of specified business – cold chain facility, warehousing facility for agriculture, affordable housing project, etc.	Weighted deduction of 150 per cent of capital expenditure	100 per cent from April 1, 2017
Expenditure on approved in house scientific research	Weighted deduction of 200 per cent of expenditure (not on cost of land or building).	150 per cent from AY 2018–19 to AY 2020–21 and 100 per cent from AY 2021–22

Source: Ernst & Young LLP, India

driven by technology or intellectual property; total turnover should not exceed ₹250 million per annum.

- **Investment allowance**
  - Presently, manufacturing companies were entitled to claim of 15 per cent of the value of the new plant and machinery of ₹250 million or more, 'acquired and installed' in a tax year.
  - To remove the hardship of satisfying the dual condition of acquisition and installation of the new machinery in the same tax year it is proposed to allow the claim of 15 per cent in cases where the new machinery has been acquired in a tax year and installation of the same is done on or before March 31, 2017.

- **Employment generation linked incentive**
  - Benefit extended to taxpayers engaged in non-manufacturing activity as well.
  - Following conditions proposed to be liberalised:
    - Incentive available even if increase in one eligible employee (presently10 per cent increase required)
    - Employment threshold proposed to be reduced from 300 to 240 days.

Announcement driven by the OECD Base Erosion Profit Sharing reports:

- Action Plan 5 – To incentivise the development of indigenous patents, the FM has proposed a concessional tax regime of 10 per cent (instead of existing 30 per cent) from the worldwide exploitation of patents developed and registered in India. This would help India in becoming a global research and development hub and a catalyst to progress from 'Make in India' to 'Innovate in India.'
- Action Plan 13 – Country by country reporting (Cbc Reporting) – Indian multinationals having a consolidated revenue exceeding €750 million, would be subjected to exhaustive documentation norms through a three tiered standardized approach on country by country reporting, master and local file. This will provide tax authorities with information to assess TP risks and determine on which areas the audit enquiries could be effectively deployed. International groups would need to assess readiness and begin preparing for complying with the Master File and Cbc Reporting requirements.

Other key direct tax announcements which would aid in ease of doing business in India, reduce litigations and support taking, informed business decisions by bringing clarity in tax laws are:

- Clarity on implementation of internationally accepted concept of Place of Effective Management ('POEM') and General Anti-Avoidance Rules ('GAAR').
  - POEM has been deferred by one year and made effective from AY 2017–18 onwards which is welcomed as the draft guidelines relating to POEM were issued only towards the end of December 2015.
  - GAAR which was deferred for the past two years is proposed to be implemented from AY 2017–18 onwards;
- Assurance for no retrospective amendment to provide a stable and predictable taxation regime;
- No MAT on foreign companies having no PE in India;
- Non-applicability of higher rate of withholding tax on payments to non-residents in absence of a Permanent Account Number. Alternate document as may be prescribed could be submitted;
- Notices and document request can be issued by a Tax Department in electronic form.

While the above tax proposals are much welcomed, the manufacturing sector is rightly and eagerly expecting the roll out of GST (which would replace multiple taxes such as CENVAT, central sales tax, state sales tax, octroi, etc.) from April 2017, which hopefully sails through the coming parliament sessions.

Concluding thoughts

As the Government of India is nearing completion of two years in office, which witnessed big innovative reforms and fast track implementation, the stakeholders closely look forward to the 'implementation' of the Budget policy announcements. It is encouraging to note recent media reports which state that the Department of Economic Affairs has written to all ministries for speedy implementation of the Budget announcements.

The role of Niti Ayog, which has replaced the Planning Commission, vested with the responsibility to monitor the implementation process of policies, would be tested. Niti Ayog in its 'Reports of Group of Secretaries and Action Plan for Implementation – Transforming India', released in mid-April 2016, has already laid down action points for implementing the polices which includes moving India to a double digit growth and to increase the manufacturing contribution to 25 per cent of GDP (presently at16 per cent) by 2022.

The overall Budget 2016 is indeed a crucial step by the Government of India towards transforming India positively to ensure India marches steadily towards a double digit GDP growth! MMI

*The authors views expressed here are personal.

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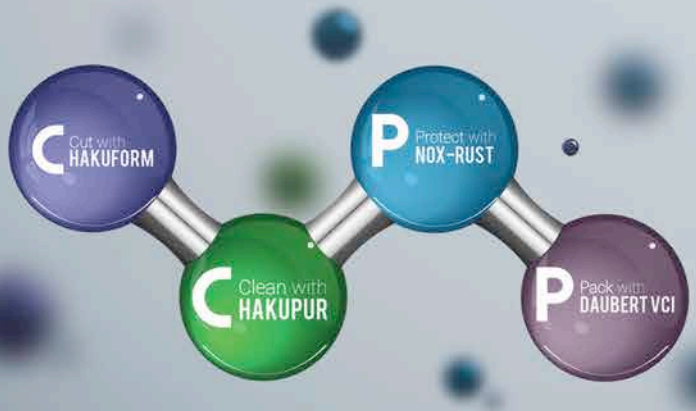

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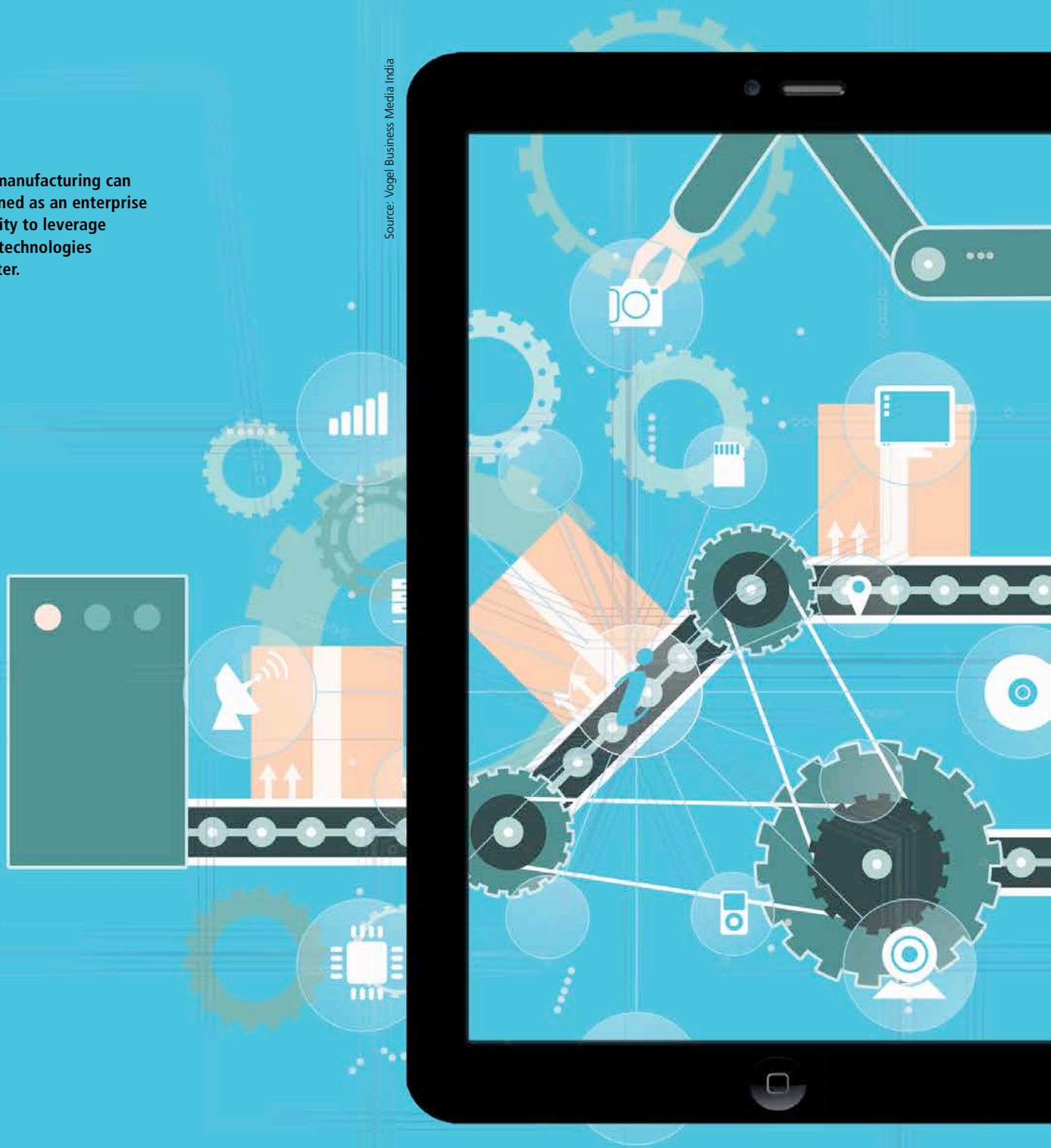
Smart Manufacturing – Digitizing the Industrial Enterprise

Smart manufacturing can be defined as an enterprise capability to leverage digital technologies for better.



Source: Vogel Business Media India

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Smart Manufacturing

The fourth industrial revolution is affecting all industrial enterprises across the globe. The proliferation of innovative information technology within value creation systems brings about new business opportunities. But on the flip-side, challenges must be overcome to be able to take these opportunities. Smart manufacturing is a capability to use digital technologies for more efficient, more effective and ecologically more sustainable value creation systems. One of the cornerstones of smart manufacturing addresses the question how companies leverage the value of data—both from internal sources, but increasingly of those of the entire ecosystem.

Prof Boris Otto
Director – Information Management & Engineering, Fraunhofer IML
Otto@iml.fraunhofer.de

The emergence of smart services brings about not only new challenges but also great opportunities. Customer value creation is no longer solely dependent on physical product offerings, but rather on how one materializes it as hybrid product-service bundles. Competitive advantage in the long-run will be increasingly determined by a company's ability to offer digital services around their traditional service and product offerings. Successful examples can be found at tool machine manufacturer TRUMPF, for example. The company is offering an App Store around sheet metal processing on top of their tool machinery product portfolio. Furthermore, the automotive sector is planning autonomous driving of trucks not only in Germany, but also elsewhere in the world.

The business logic of smart services follows four common principles. Firstly, smart services address a comprehensive customer demand; they support an end-to-end customer process. Secondly, as a consequence of that, they tend to be highly individualized, i.e., lot-size 'one'. Thirdly, as no player in traditional value chains is able to orchestrate all the capabilities needed to do so, smart services require an ecosystem. Lastly, many smart services are ubiquitous, i.e., they can be consumed anywhere at any time.

So-called digital native companies such as Uber and AirBnB have mastered the business logic of smart services. However, many enterprises in countries with strong manufacturing sectors want to leverage their traditional asset, i.e., the physical product. They do not want to only rely on the 'digital' aspect of smart services. For instance, in Germany, they have been successful by offering world-class products and through excellence in managing supply chains. However, the trend towards individualized, hybrid products—in line with parallel developments towards more regional products, for example—results in dramatically increasing complexity of our value creation processes (see Figure 1).

To cope with this complexity industrial enterprises deploy cyber-physical products, manufacturing analytics and autonomous devices and machinery in their factories; in short: smart manufacturing approaches.

Smart manufacturing can be defined as an enterprise capability to leverage digital technologies for better, i.e., more efficient, more effective, more resilient and more eco-friendly value creation processes.

Convergence of manufacturing and information technology

In brief terms, smart manufacturing is about making use of the convergence of manufacturing and information technology. But this convergence is not an end in itself, of course. It is rather a requirement of the design of innovative hybrid products that follow different business logics as the ones we used to produce over decades.

Figure 2 shows the architectural layers of hybrid products in their context of the digital economy. As can be seen on the left hand side, hybrid products materialize as bundles of smart services based on smart data on one hand side and smart (physical) products based on smart infrastructure spaces on the other. Many digital native companies make

Source: Daimler AG

Smart manufacturing is about making use of the convergence of manufacturing and information technology.

Source: Fraunhofer IML

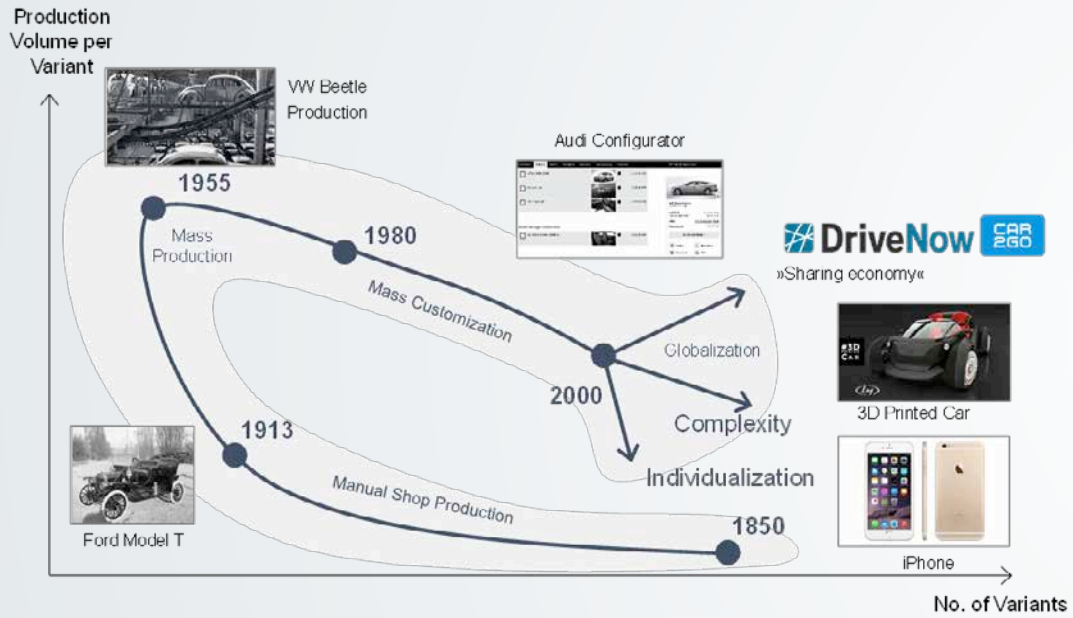


Figure 1: Complexity in value creation systems.

use of the fact that these architectural layers can be decoupled. For example, Uber does not own taxis and AirBnB does not own hotel rooms. Instead these companies concentrate on offering smart services to the end customer. The physical product itself is threatened to be commoditized.

Mastering the entire architecture stack, though, has the potential to offer maximum value to the customer in a one-stop shopping mode, i.e., delivering the hybrid product bundle consisting of both physical components and digital services. TRUMPF, to come back to the aforementioned example, offers digital services to their customers that are able to analyze production noise emitted by their machines for malfunction or maintenance needs and in doing so ensuring maximum equipment efficiency. And Tesla is building their electric cars according to platform strategies as we know them from smart phones. New functionality such as the intelligent side mirror is made available through software updates.

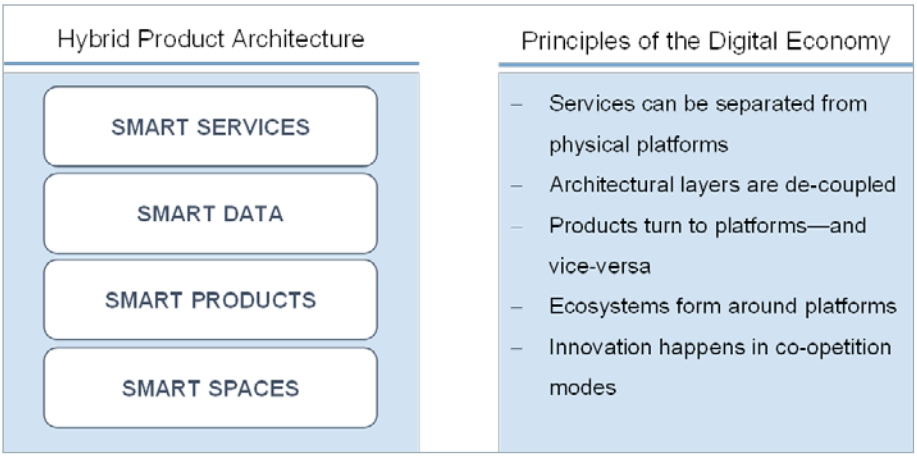
Offering hybrid products such as these requires industrial enterprises to build up smart manufacturing capabilities, in short: to think manufacturing and information technology as one.

India and Germany: complementary strengths

Smart manufacturing is the key to developing the manufacturing sector in Germany. As the country is highly industrialized with high labor costs, the adoption and proliferation of cyber-physical systems in value creation systems is a prerequisite to stay competitive. Furthermore, the German manufacturing sector is highly developed with regard to embedded systems used in industrial machinery, for example. The country, though, has high demand of skills and competencies in the fields of information and digital technology, it may be doubted whether it can meet this demand from internally only. The Indian information technology sector is highly developed, the three companies Tata, Cognizant and Infosys alone employ more than 600,000 people. More importantly, these companies are able to offer consulting and integration services in highly innovative fields such as cloud computing and digital technologies. Thus, the Indian information technology sector offers capabilities that are needed by many German industrial enterprises.

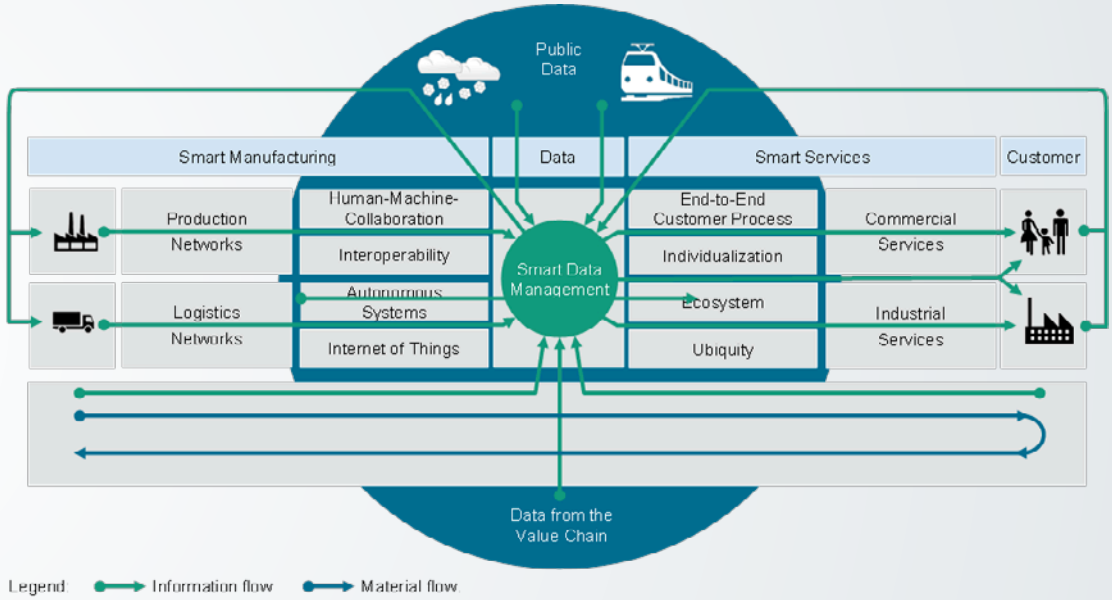
Vice-versa the German manufacturing sector is leading in production engineering and technology as well as related information technology fields such as embedded systems. Both industrial information technology as well as digital, often consumer-driven technologies and competencies are needed to build fully-fletched hybrid digital products as outlined in Figure 2. Obviously, Germany and India bring complementary strengths to the table. Joint endeavors would allow German and Indian companies to offer hybrid products needed on a large scale.

Another question is related to internal



Source: Fraunhofer IML

Figure 2: Hybrid products and the digital economy.



Source: Fraunhofer IML

Figure 3: Smart data management.

adoption of smart manufacturing approaches in India. Opponents of the idea argue that the Indian manufacturing sector is characterized by low labor costs and limited automation and, thus, smart manufacturing approaches would not add any value. While that is true, of course, smart manufacturing is not only an end in itself. As outlined above, smart manufacturing is a prerequisite to be able to offer smart services. Consequently, adopting smart manufacturing approaches might be a path of innovation for many industrial enterprises in India to address new business opportunities.

The role of information and data

Data is the key resource to link smart services on one hand and smart manufacturing on the other (see Figure 3). Smart data management allow the industrial enterprises to leverage the assets of the past and at the same time take the digital opportunities that lay ahead of them.

Smart data management is about managing data flows from the customer to the customer covering all internal and external players in the ecosystem. It requires the capability to exchange and link own data assets with those of partners in the value chain as well as those of public data sources.

Towards an industrial data space

In this context, the Industrial Data Space aims at a virtual data space which facilitates the secure exchange and the easy linking of data assets within industrial ecosystems. In doing so, the Industrial Data Space provides a means designed by all users to embark on the digital transformation while at the same time always keeping control over one's data assets, thus, at all times keeping digital sovereignty.

The Industrial Data Space does not necessarily require a central data vault (such as Data Lakes, for example), but it rather materializes as the entirety of Industrial Data Space endpoints, i.e. instances of a trusted, certified piece of software that we call the Industrial Data Space connector. MMI

HIGHLIGHTS

What makes the Industrial Data Space unique are the design principles that were articulated by the user companies such as:

- Digital sovereignty over data assets
- Secure data supply chains from the 'cradle to grave' of data assets
- Collaborative governance and common rules of the game
- Trusted network of data, i.e. of data providers/owners and data users
- Trustworthiness through certified endpoints
- Scalability and network effects through inter-cloud integration, for example
- Open and participative design and development process

The Industrial Data Space initiative is an excellent opportunity for Germany and India to work together to enable smart manufacturing solutions in the two of both countries. At present the initiative is organized in two ways:

- On October 1, 2015, we were able to kick-off a Fraunhofer research project to develop the precompetitive components of the Industrial Data Space. The activities are funded by the German Federal Ministry of Education and Research.
- In parallel we worked together with our industrial partners—of which many are today in this room as well such as ATOS, SICK, thyssenkrupp—to create a chartered association to bundle the user requirements and to funnel the industrial expertise around the Industrial Data Space architecture. On January 26, 2016, we reached our first milestone and founded the Industrial Data Space association. The chartered association is open for contributions and also members from all countries around the world.

Summarizing, there are many opportunities for Germany and India to collaborate in order to make smart manufacturing happen. The time is now to do so.

Tooling it the India way!

The establishment of a 'TAGMA Centre of Excellence Training (TCET)' in Pune is the need of the hour to promote the tooling industry in India especially when the county is focusing on reviving the manufacturing industry. In a tête-à-tête with VBMI, President, TAGMA India and Managing Director, Vasantha Tools, Dayanand Reddy highlights the challenges and future prospects of this burgeoning industry.

What is the current market scenario of the tool room industry in India?

Dayanand Reddy: After the Modi government came into power, the general sentiment in the market has been quite optimistic. Today, the emerging economies are not performing well; however, the Indian economy is still looking positive. Our economy is strong as our internal demand is healthy, which leads to an increase in consumption and derives growth. If we speak about the automotive industry, numerous international automotive companies are establishing their manufacturing bases in India in order to develop automobiles for their global audiences. This move has lead to an increase in demand for the tooling industry in the country; however, I do not believe that we are equipped to meet the growing technological demands of the customers.

Source: TAGMA India

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Tooling it the India way!

In this case, how can the technological gap be reduced? What are the measures/ initiatives undertaken by TAGMA India to address this challenge?

Reddy: As an association, TAGMA India has been undertaking various activities, specifically, in the past two years to address this, such as conducting road shows in vital cities viz., Mumbai, Pune, Delhi, Ahmedabad, Bengaluru, Hyderabad, Chennai and Coimbatore. Players from the buying as well as the customer segment are encouraged to speak on their latest technologies in these road shows to impart knowledge to other industry players. Through these initiatives, we are aiming to bring industry players together on a common platform so that they can compliment and support each other. This

"The total project cost of TCET is estimated to be around ₹51.91 crore. A grant to the extent of 80 per cent of plant and machinery, i.e., ₹26.27 crore is sought from the Government of India under the 'Enhancement of Competitiveness of Capital Goods Sector' scheme."

President, TAGMA India and Managing Director, Vasantha Tools, Dayanand Reddy

will prove beneficial for the tool room industry to achieve a quantum leap regarding their business activities.

Apart from this, the association is planning to establish its own centre—TAGMA Centre of Excellence Training (TCET)—in Chakan, Pune. The centre proposes to house all key facilities for tool manufacturing; the main focus would be on those activities and services, which are not available with the small and medium units such as tool trial and validation, calibration set up, skills upgradation, etc. In addition to the tooling industry, the centre will serve towards the development of all the manufacturing clusters. The objective behind setting up this centre is to serve the local SMEs who cannot afford expensive machines so that they can increase their capacities and capabilities.

Is the government supporting you in this project?

Reddy: Yes, TAGMA India has positioned the project for financial assistance from the Department of Heavy Industry, Government of India under the 'Scheme for Enhancement of Competitiveness of Capital Goods Sector'.

PERSONAL

"Our economy is strong as our internal demand is healthy, which leads to an increase in consumption and derives growth."

Dayanand Reddy

The total project cost is estimated to be around ₹51.91 crore including land and building, equipment, infrastructure and other related components. A grant to the extent of 80 per cent of plant and machinery, i.e., ₹26.27 crore is sought from the Government of India under the scheme and the balance of ₹25.69 crore will be brought in by the promoter as equity and term loan. We have approached the commercial bank SIDBI for ₹16 crore and the remaining amount of ₹9.69 crore has to be provided by TAGMA India and the local industry. The project will be implemented within a year. The Centre of Excellence and training at Chakan, Pune is proposed as a pilot project and the promoters will replicate the model at three other locations across India.

What is the reason most industry players import tools?

Reddy: Industry players do not want to import their tools as the process includes travelling, which is not a cost effective option for them. Also, after the trial tool is delivered to the customers, it has to be approved from them, which takes about a month to be finalized. This process is time consuming. However, they are not left with any option as Indian tool rooms fail to provide the necessary facilities here.

How can this challenge be overcome?

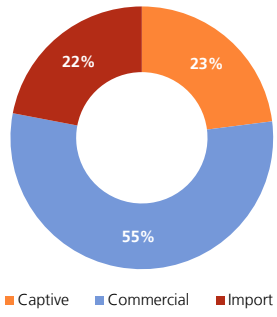
Reddy: The challenge can be overcome only through co-operation and sincere effort from all the stake holders. The tool manufacturer in partnership with the OEM's must identify short term and long term needs initiating investment in the technological gaps and capacity building. Finance being the main issue, it must be facilitated jointly with the support from the OEM's and the Government of India that is keen on promoting manufacturing growth through the 'Make In India' program. Recognizing the tooling industry as a 'Priority Sector' will ensure a win-win situation for the growth of both the tooling as well as the manufacturing industries.

What are the future prospects for the Indian tool room industry?

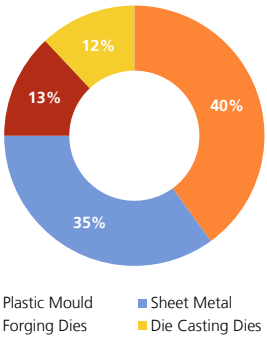
Reddy: The future prospects are on a positive note. The auto sector is a major contributor to our industry. With 108 cars and bikes launched at Auto Expo 2016 along with many more manufacturing sectors opening up under the 'Make in India' program over all, augers well for the Indian tooling industry. MMI

Market size of the Tooling Industry

Tooling source wise Break up of - Total Tooling Demand

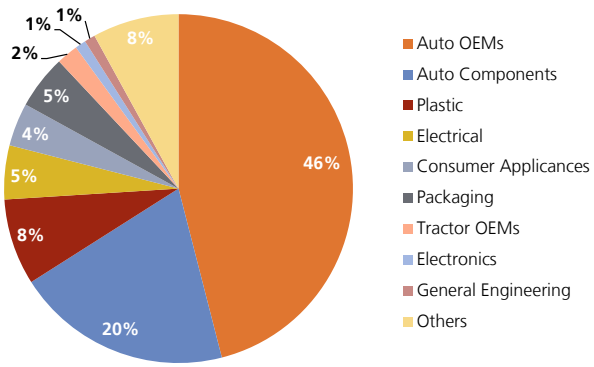


Tooling source wise Break up of - Total Estimated Demand



The estimated market size of the Indian tool room industry for the year 2014–15 is ₹15,100 crore, with imports contributing to 22%, i.e., ₹3,322 crore.

Segment wise breakup of Total Tooling Demand



Source: TAGMA India

The interview was conducted by:
Ahlam Rais, Senior Sub Editor,
Vogel Business Media India
ahlam.rais@vogel.de

Source: Mitsubishi Electric India Pvt Ltd

Mitsubishi Electric's new CNC Technical Center in Peenya, Bengaluru.

Changes for the Better

Mitsubishi Electric recently inaugurated its CNC Technical Center in India. The new facility was built to further improve its commitment to its customers across India. In addition to this, it is also a small way of contributing towards the 'Make in India' initiative, as the Center has Assembly, Repair, Training Center, Showroom, Service Part Center, Sales & Service Office for its customers under a single roof.

Mitsubishi Electric Corporation has a rich history and for over 90 years has provided reliable, high-quality goods across the globe. From manufacture, marketing and sales of electrical and electronic equipment used in information processing and communications, space development and satellite communications, consumer electronics, industrial technology, energy, transportation and building equipment, the company has done it all. Group Companies of Mitsubishi Electric, in India, have been manufacturing in the country since 1998; however, Mitsubishi Electric India Pvt Ltd began its CNC business in India in 2012.

Nedra Pereira
Deputy Editor
Vogel Business Media India
nedra.pereira@vogel.de

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Changes for the Better

The company has since been offering a wide range of innovative and high-quality products for the Indian market. This includes

Source: Mitsubishi Electric India Pvt Ltd

(L–R) Director – Mitsubishi Electric India Pvt Ltd, Division Head–FAID, Makoto Yokoyama; MD, S&T Engineers (P) Ltd, D Shanmuga Sundaram; DMD, Yamazaki Mazak India Pvt Ltd, Hiromasa Ohtake; CEO, Bharat Fritz Werner Ltd, Ravi Raghavan; Corporate Executive, Group Vice President, Industrial Automation Machinery Marketing Division, MELCO, Noriaki Himi; MD, Mitsubishi Electric India Pvt Ltd, Makoto Kitai; MD, Ace Manufacturing Systems Ltd, Ramadas P; MD, Cosmos Impex (I) Pvt Ltd, Nagesh V, and General Manager, CNC Systems, Takahide Yoneda at the ribbon cutting ceremony at the inaugural ceremony of the CNC Technical Center.

products and solutions for air conditioners, automotive equipment, elevators & escalators, factory automation and industrial systems, power systems, photovoltaic solutions, semiconductor & devices, transportation systems and visual & imaging.

Even though it is still in its nascent stage in the country, it is doing its part to show further commitment to the 'Make in India' initiative as well as support to their customers. This is by the means of a newly inaugurated CNC Technical Center in Peenya, Bengaluru. Managing Director, Mitsubishi Electric India Pvt Ltd, Makoto Kitai asserted, "By setting up this CNC Technical Center in India, we have demonstrated our commitment to invest, foster innovation, enhance skill development, and support the 'Make in India' initiative. CNC Machines are the future of our industries that use precisely programmed commands aimed at accuracy and productivity. This CNC Technical Center will enable expansion of manufacturing capacity and reduced delivery time." The local assembly and repair center will help decrease downtime, and thus support manufacturers to have responsive and robust production with minimal downtime. Agreeing with this sentiment, General Manager, CNC Systems, Takahide Yoneda stated, "We have established this CNC Technical Center to consolidate business operations. With this technical center, we aim to fulfill the demands of the growing Indian market and thereby making a small contribution to the 'Make in India' initiative."

Inauguration of facility

Delegates that were invited to inaugurate the facility on May 9, 2016 included, MD, Mitsubishi Electric India Pvt Ltd, Makoto Kitai; Division Head – FAID, Mitsubishi Electric India Pvt Ltd, Makoto Yokoyama; MD, S&T Engineers (P) Ltd, D Shanmuga Sundaram; DMD, Yamazaki Mazak India Pvt Ltd, Hiromasa Ohtake; CEO, Bharat Fritz Werner Ltd, Ravi Raghavan; Corporate Executive, Group Vice President, Industrial Automation Machinery Marketing Division, MELCO, Noriaki Himi; MD, Ace Manufacturing Systems Ltd, Ramadas P; MD, Cosmos Impex (I) Pvt Ltd, Nagesh V, and General Manager, CNC Systems, Takahide Yoneda.

Evolving according to need

The company's CNC business has seen a remarkable growth of 50 per cent in sale units in the last financial year. Considering the huge growth potential of Indian market, one of the reasons for opening this facility is to provide a means to contribute towards the expansion of the Indian machine tool market.

The new facility is spread across 15,700 sq ft and includes a three storey

Source: Mitsubishi Electric India Pvt Ltd

The extensive range of CNC equipment along with product specifications at the showroom in the facility.

Source: Mitsubishi Electric India Pvt Ltd

Inventory of components housed at the Center.

"By setting up this CNC Technical Center in India, we have demonstrated our commitment to invest, foster innovation, enhance skill development, and support the 'Make in India' initiative."

Managing Director,
Mitsubishi Electric India Pvt Ltd,
Makoto Kitai

"We have established this CNC Technical Center to consolidate business operations. With this technical center, we aim to fulfill the demands of growing Indian market."

General Manager – CNC Systems,
Mitsubishi Electric India Pvt Ltd,
Takahide Yoneda

building that features a showroom, conference room, office, training room and four dedicated areas toward repairs, part refurbishment, assembly and stock holding & finished goods.

Bird's eye view

As one enters the facility, through the reception area, there is a showroom, which features the CNC equipment manufactured by the company along with product specifications. The area is open and visitors can examine and inquire about the product range in this area. Moving on to the shop floor, the first massive area one sees is the warehouse. This section houses an extensive inventory of components and delivers them to customers across India with the aim of delivering within 24 hours. This facility also offers after sales service support to customers from India as well as Sri Lanka and Bangladesh. The second area one comes across is the assembly area, which is used to assemble the parts and also action the latest software upload for the CNC equipment. Alongside the assembly area is a dedicated space for servicing parts. In addition, the facility has a dedicated repair center where testing, repair and calibration are carried out with advanced test equipment by skilled engineers so that high-quality repair can be conducted.

With this CNC head office in India, the sales and support the company offers will be enhanced as assembly of CNC package for machine tool builders, repair centre and training center for customers will be under one roof.

Training

The Center's training room is located on the third floor of the facility and is equipped with eight workstations capable of training a batch size of 16 at a time. Training sessions cover the subject of operation, maintenance and interface. The training courses range between 1–2 days with comprehensive knowledge sharing and practical sessions and are aimed at OEM's, distributors and end users. This will help produce trained technical personnel who understand the function and operation of its products sufficiently to be able to design solutions and maintain equipment at peak operation levels and troubleshoot and resolve many problems faced independently. The company will further enhance the type of trainings being given at the Center with time and need.

Source: Mitsubishi Electric India Pvt Ltd

The training room wherein technical personnel will be trained on topics of operation, maintenance and interface for CNC equipment.

Source: Mitsubishi Electric India Pvt Ltd

Repairs being conducted with advanced test equipment and skilled engineers.

All in all

Every endeavor carried out by the company is guided by three corporate principles—Corporate Responsibility to Society; Integrity and Fairness; and Global Understanding Through Business—inspiring the company to continually improve the way it addresses its economic, environmental, and social responsibilities around the world. Embracing the spirit of its corporate statement, Changes for the Better, and its environmental statement, Eco Changes, Mitsubishi Electric endeavors to be a global, leading green company, enriching society with technology, all its products are developed with superior energy efficiency and the environment in mind. The facility as well is an embodiment of the same.

Apart from the newest addition of the CNC Technical Center in Peenya, the company manufactures transportation systems, automotive equipment and factory automation products from Bidadi near Bengaluru, Gurgaon and Pune, respectively. As per a public announcement by Mitsubishi Electric Corporation last year, they are in the process of commissioning a manufacturing facility for elevators in Vemagal, Kolar District, which is scheduled to start operation in FY2016. With companies such as Mitsubishi Electric investing in India, the mission of making India a manufacturing hub will soon be a reality. MMI

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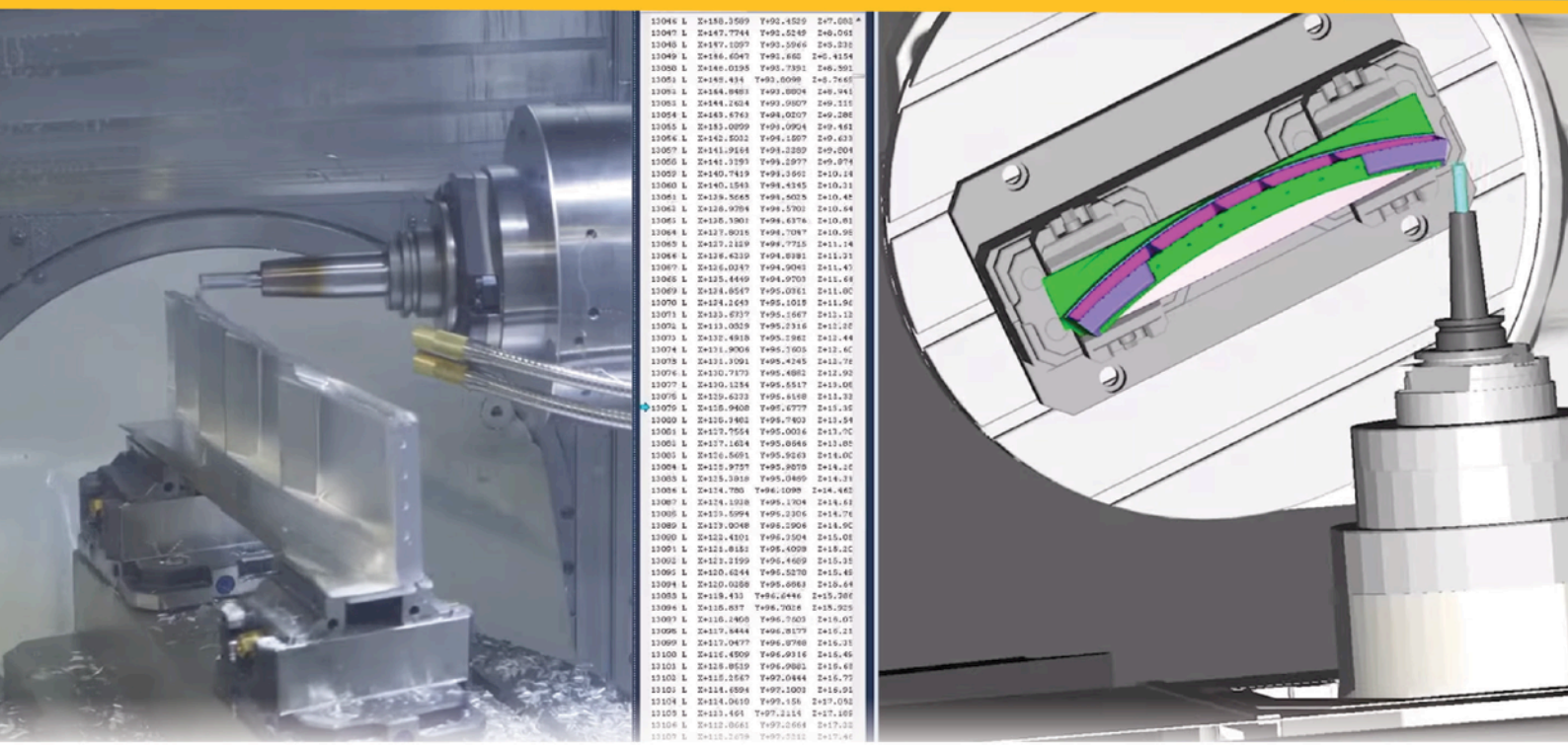

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Milling Titanium

When the right cutting tool, toolholder, cutter paths and machining parameters are applied intelligently, a shop may have more capability to mill titanium effectively than it recognizes.

Machine tools designed for milling titanium are generally characterized as having heavy, rigid structures with spindles designed for high torque at low spindle speed. Large spindle tapers and high-pressure coolant are also typical. For multi-axis work, a beefy trunnion and rotary table may be provided as well.

However, a shop with a 40-taper vertical machining center in sound condition should not rule out this manufacturing resource for effectively and profitably milling titanium. Mike MacArthur, VP of engineering and a titanium expert at cutting tool manufacturer RobbJack, has been promoting this point for a while now. Importantly, he does not take a purely cutting-tool-centric view of this proposition, although cutting tool considerations naturally become a focal point, simply because a systematic approach to milling titanium revolves around managing the conditions that enable an end mill to remove this tough material efficiently.

Mark Albert
Editor-in-Chief
Modern Machine Shop

"Regardless of the type of machine tool a shop has for milling titanium, the principles of milling titanium are the same. What has changed in recent years are the options available for controlling variables that these principles are based on," MacArthur says. These options create choices that are appropriate for milling this metal on many existing machining centers, he goes on to say.

For example, toolpath algorithms that ensure constant engagement of the cutter in the workpiece material are especially effective—and necessary—in titanium. Super-accurate toolholders with highly concentric, rigid gripping force address another requirement for titanium machining. A high-pressure coolant delivery system on a machine is advantageous. Of course, the range of end mills designed for various machining operations in titanium are now well developed and available from many cutting tool manufacturers.

"In fact, there are so many choices, it can be a bit confusing or intimidating for planners and programmers," MacArthur admits. "The simple guidelines presented here can keep the cutting tool selection process very manageable, though."

Taking the heat

The background to any discussion of titanium milling has to cover the issue of heat.

Source: mmsonline.com

Machining this titanium workpiece, which could fit inside a cigar box, is a manageable job for today's generation of machining centers. Details about the process are under the second heading, Really Cool Tool Paths.

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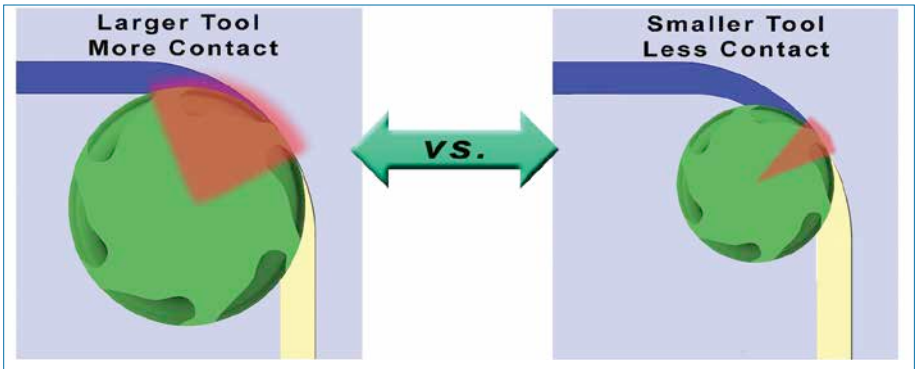
Milling Titanium



Source: mmsonline.com

Using a smaller tool reduces the contact between the cutting edges and the workpiece surface. As a result, less heat is absorbed by the tool. This strategy requires a programmed tool path and the proper speeds and feeds that enable this smaller tool to remove material efficiently.

Excessive heat can quickly damage the cutting edges of an end mill and thus undermine the 'support structure' built into the rest of the cutting strategy. Titanium needs a strong, sharp cutting edge, because a clean, shearing action enables this material to form chips that leave a superior workpiece surface, absorb heat and flow up the flutes smoothly.

"Cutting tool manufacturers have the right designs to do this, but it is up to the shop to put in place the means that protect this cutting edge," MacArthur says.

Really cool tool paths

Perhaps the most important way to protect the cutter when machining titanium is to provide tool paths that avoid conditions that overheat the tool and degrade the cutting edges. For milling pockets and wide slots, this can be accomplished by using toolpath algorithms that maintain a constant angle of engagement between the cutter and the workpiece. Today, most of the CAM software developers offer such algorithms, under a variety of names. All of them create a tool path that restricts how much of the tool radius can be in contact with the workpiece at any time. In a slot, such a tool path will usually follow a regular trochoidal pattern. The tool moves in a series of uniform curves from side to side as it forms the slot. The uniform arcing of these moves is rather easy to see, MacArthur asserts.

When applied to an irregularly shaped pocket, the toolpath algorithms create a pattern that may be much harder to discern because it does not seem to reflect the shape of the pocket's sidewalls at first. In fact, that tool path is designed to avoid burying the cutter in corners or during sudden changes in direction by removing material with a progressive series of circular and arcing moves. Although the offerings from different CAM developers may vary in terms of significant nuances or speed of processing, they all provide a similar benefit when machining titanium—the ability to use a smaller-diameter cutter at smaller stepovers and at higher tool rotations per minute.

This approach achieves an adequate metal-removal rate with lighter cuts. The lighter cuts, in turn, keep the individual flutes of the cutter in contact with the workpiece for a shorter period of time, so less heat can be absorbed. "And that is how this strategy wards off the excessive heat buildup that damages cutting edges," MacArthur concludes.

To put some representative numbers to this concept, he describes the following sample test part. A block of 6Al4V titanium (6 by 4 by 1.5 inches) was machined (roughing and finishing) with a ½-inch-diameter cutter with six flutes. The feed rate was 75 ipm and 400 sfpm. Radial depth of the cut was 0.05 inch—10 per cent of the cutter diameter. Axial depth was 1 inch (two times cutter diameter). In this example, approximately 22 cubic inches of material was removed in slightly less than 15 minutes. To give perspective to the metal removal potential indicated here, MacArthur adds that, in a strictly roughing operation using this approach, a 1/2-inch-diameter cutter is capable of removing more than 65 cubic inches of 6Al4V titanium in 15 minutes.

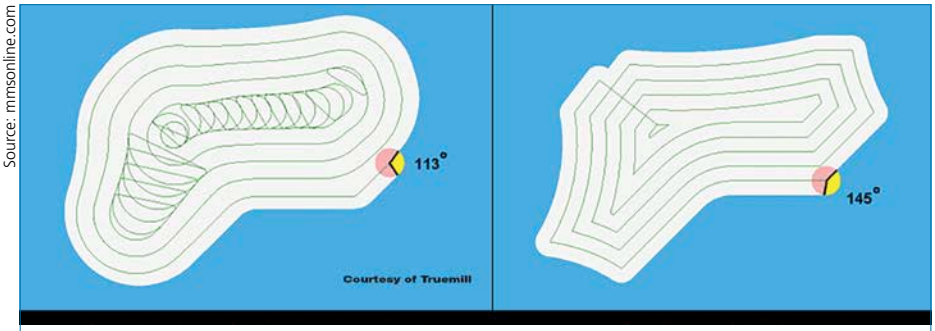
What is significant here is that the rigidity and torque requirements for machining with these parameters do not demand the capability of a large 'titanium machine', but are achievable with many vertical machines produced within the last five or six years. "The latest generation of 40-taper machining centers are more rigid and capable then preceding models, because builders are applying finite element analysis and other advanced design tools," MacArthur explains.

The flute section

Of course, strong, sharp edges are not the only design characteristic that cutting tool manufacturers give to end mills for titanium. Common design principles include uneven flute spacing to break up harmonics that can induce chatter, helix angles that vary from flute to flute for chip flow, and a coating that is smooth, slick and slow-wearing to reduce frictional heat. Eccentric relief along the cutting edges is also typical, because it supports and strengthens the cutting edges, which are ground and polished for sharpness.

"This is not to say that all titanium end mills are created equal," MacArthur cautions. RobbJack, for example, applies its own proprietary concepts and innovations to end mill design. The differences may be subtle as well as significant, so shops should look closely at a supplier's offerings, he advises.

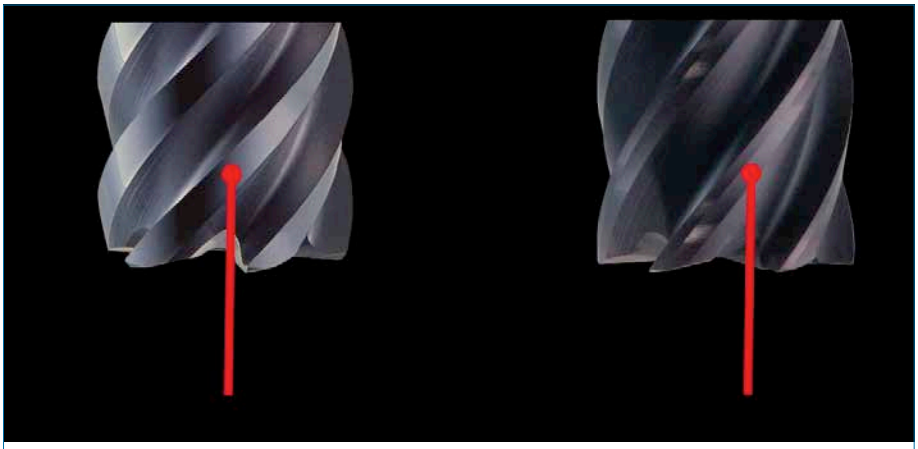
Regardless of the supplier, end mills suitable for machining titanium may have four (or fewer) flutes and as many as 10 (or more).



Source: mmsonline.com

Programming techniques that control the angle of engagement between the cutter and the workpiece can keep cutting conditions constant. Although the resulting tool path (shown on the left) makes more motion for the cutter than traditional paths, it enables the programmer to choose small stepovers and a high spindle speed that are right for machining titanium.

Source: mmsonline.com



Red markers point to contrasting forms of relief applied to cutting edges on these end mills. The eccentric relief on the left provides better support and protection for cutting edges when machining titanium as compared to the standard relief shown on the right.

Source: mmsonline.com

The three smaller end mills shown above have four, five and six flutes. When programming a cutter for an operation that requires more engagement between the cutter and workpiece (as in traditional roughing), choose the smaller number of flutes.

"Many shops get stuck when deciding the best number of flutes for titanium work on a general-purpose machining center," MacArthur says. "Advice from a supplier on this choice can seem a bit mysterious, especially if the shop is new to titanium machining."

Choosing the number of flutes is best understood as it relates to the strategy of managing how much contact each flute has on the surface of the workpiece. In situations where the flutes are more likely to be in contact with the surface, a smaller number of flutes are preferred. In situations where the flutes are less likely to be in contact, a larger number is preferred.

Because end mills with a diameter of ½ inch or smaller are the best fit for the power and rigidity profiles of a 40-taper machine, four-flute end mills are a good choice for heavier cuts and for pockets with many tight corners. Settings that generate 125 to 200 sfpm at a 15-ipm feed rate are average for a four-flute end mill. Stepovers in X and Y that are as much as 25 per cent of the tool diameter are acceptable here.

Where permissible, however, using a six-or eight-flute end mill of a comparable diameter is a good choice for open, rectangular pockets, because applicable speeds and feeds typically reach 400 sfpm. This makes this tool very productive. The corresponding feed rates of 45 to 75 ipm are indicative of this potential. Six-and eight-flute end mills perform especially well when constant-engagement tool paths can be applied. Stepovers in X and Y will range from 2 to 10 per cent of diameter in this case. High-speed finishing cuts that leave a smooth surface are also an ideal operation for this type of tool.

Toolholders that hold

Super-accurate, high-quality toolholders are a must for milling titanium. The quality of the toolholder influences a machining operation in several ways. Secure clamping in the machine tool spindle enhances rigidity of the entire cutting tool assembly. The accuracy of the toolholder minimizes runout and contributes to consistent conditions when the tool is in the cut. Well-balanced toolholders reduce stress on the machine spindle and on the cutting tool, while also reducing causes of vibration. Super-accurate toolholders provide higher gripping force on the cutting tool, too. Because milling titanium creates higher cutting forces than milling softer, freer cutting materials, the gripping power of the toolholder is critical. "There is a wrinkle in this scenario that is often overlooked or misunderstood," MacArthur warns. "It is the roundness of the tool shank." A tool shank manufactured to a very high level of roundness complements and enhances the benefits of super-accurate, high-quality toolholders. This roundness directly affects its degree of contact with the clamping surface of the toolholder. The roundness of the tool shank and the quality of the toolholder go hand-in-hand, but most discussions of toolholder requirements neglect the importance of using tools with exceptional roundness. (According to MacArthur, the tool shank on a RobbJack end mill for titanium is produced to a roundness of 0.000025 of an inch.)

Roundness of the tool shank is especially important with small-diameter cutting tools, because the area of contact between the cutting tool and holder is proportionately smaller. Any loss of contact reduces gripping force significantly.

The Pressure is On

Metalworking coolant has three functions: It provides cooling, lubricity and chip control. All three functions are valuable when milling titanium. MacArthur notes that three coolant considerations are critical to machining titanium: high pressure, adequate volume and consistent flow on the cutting zone. End mills for titanium usually have thick cores to resist deflection, so the channels between the flutes are not especially commodious. However, they are adequate when light cuts produce thin chips that can be flushed up and out. This is true even for six- and eight-flute styles in which space for chip flow is especially tight. In short, copious amounts of coolant at high pressure (as high as 1,000 psi) greatly reduce opportunities for chips to become trapped between flutes.

A thoughtful approach

This article suggests that a practical approach to milling titanium enables shops to consider the capability of existing machining resources such as a newer VMC. The approach is practical because suitable choices in cutting tools, toolholders, CAM software and so on are readily available.

However, this approach could also be called as a thoughtful one, because it calls for users to learn about titanium, understand its characteristics and apply basic principles knowledgeably. And any serious effort to master the machining of titanium must follow this call earnestly. MMI

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Ceramic Products with ULTRASONIC

5-axis ULTRASONIC machines from DMG MORI enable CeramTec to perform complete machining of complex ceramic parts and hard metal extrusion dies.

More than 100 years of experience in production and development as well as more than 3,600 employees characterize the CeramTec Group with headquarters in Plochingen, Germany, as one of the leading international manufacturers of technical ceramics. Over 10,000 different products and components are supplied by the ceramics experts to customers from the automotive industry, electronics, energy and environmental engineering, mechanical as well as medical engineering. Amongst others, the broad product portfolio results from the fact that CeramTec has already invested in three ULTRASONIC machines from DMG MORI: one ULTRASONIC 20 linear for the complete machining of complex ceramic parts, one ULTRASONIC 60 FD for peripheral grinding of Si3Ni4 and SiC components with highest precision requirements as well as one ULTRASONIC 40 eVo with PH 150-8 for the grinding of hard metal dies.

Source: DMG MORI

While CeramTec machines numerous workpieces with conventional grinding machines, the ceramic experts now also have three 5-axis ULTRASONIC machines at their disposal.

Source: DMG MORI

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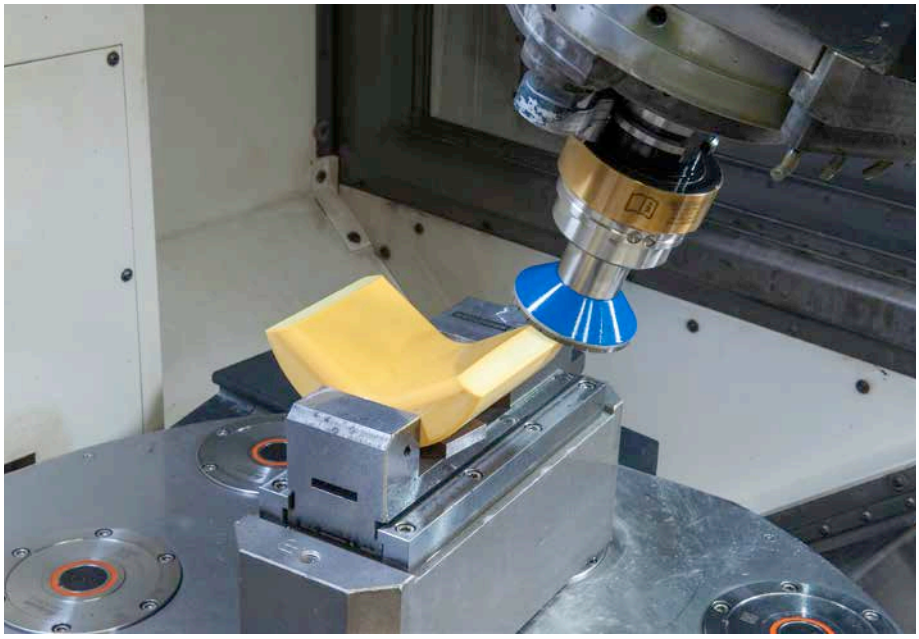
Ceramic Products



Source: DMG MORI

5-axis simultaneous machining by means of ultrasound has significantly extended the ceramic product portfolio of CeramTec.

The properties of technical ceramics today far exceed what is associated with conventional ceramics. They are far from being brittle or fragile. If required, ceramic components replace high-strength steel components in mechanical or automotive engineering. "Ceramic components can even have a springy effect," says Frank Ostertag, responsible for production planning at the headquarters of CeramTec. There are numerous application options, for which unbeknown to the industry so far ceramics are a viable alternative. "Technical ceramics can potentially have significant advantages, like their tremendous thermal resistance."

With its expertise in the field of modern high-performance ceramics, CeramTec develops and makes products from scratch, including ceramics production starting with the powder. "We can thus resort to a broad material range and use suitable ceramics for every task," says Biljana Sevdic, who is responsible for production planning in Plochingen. Usually, CeramTec builds a pressing form for the end products, afterwards the part gets sintered. The subsequent grinding ensures that the products meet the high quality requirements.

Extending the range of services with ULTRASONIC technology and 5-axis simultaneous machining

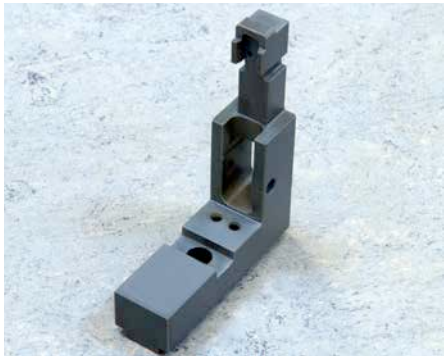
While CeramTec machines numerous workpieces with conventional grinding machines, the ceramic experts now also have three 5-axis ULTRASONIC machines at their disposal. "The 5-axis simultaneous machining by means of ultrasound has considerably extended our ceramics product portfolio," says Ostertag when describing the extension of the machine park. "The ULTRASONIC 20 linear enables the complete machining of our more complex and in terms of precision more demanding parts, the ULTRASONIC 60 FD is used amongst others for peripheral grinding and drilling of Si3Ni4 and SiC components with highest precision requirements, and the ULTRASONIC 40 eVo with PH 150-8, installed at the site in Lauf, Germany, is for direct grinding of hard metal extrusion dies."

All-round solution

Once CeramTec got into complete machining of ceramic components with the ULTRASONIC 20 linear—this includes a number of other smaller components, in addition to dental implants—a conclusion was quickly drawn that the technology was also interesting for larger workpieces. "We have been able to further extend our options with the versatile ULTRASONIC 60 FD", says Ostertag when describing the acquisition. The turning function, combined with the sturdy machine design and ultrasonic machining enables outstanding precision during peripheral grinding. Equipped with the PH 150-8 pallet handling the ULTRASONIC 40 sets a new standard for the productivity of CeramTec. While the individual pallets with the hard metal pressing dies are prepared in parallel to production, the machine can optimally run at full capacity.

Sevdic sees a crucial advantage in 5-axis simultaneous grinding compared to working with conventional grinding machines: "We can directly grind complex contours on the ULTRASONIC machines. Conventional grinding machines would be quicker, but a custom made and very costly contoured grinding wheel would be needed each time." This is completely uneconomical, particularly for very small batch sizes or single parts.

With the knowledge to be able to produce even complex ceramic components economically, CeramTec is able to provide its customers with even better and more economical solutions today. "The sales department is, thus, in a much better position if it wants to offer a suitable component solution", says Ostertag. "This way, we will hopefully be able to use technical ceramics more often in the future, as currently steel or plastic have set the standard." MMI



Source: DMG MORI

Thanks to the ULTRASONIC technology, the portfolio of CeramTec also comprises highly complex workpieces, so that the sales department can always offer suitable solutions.

Visions Become Reality

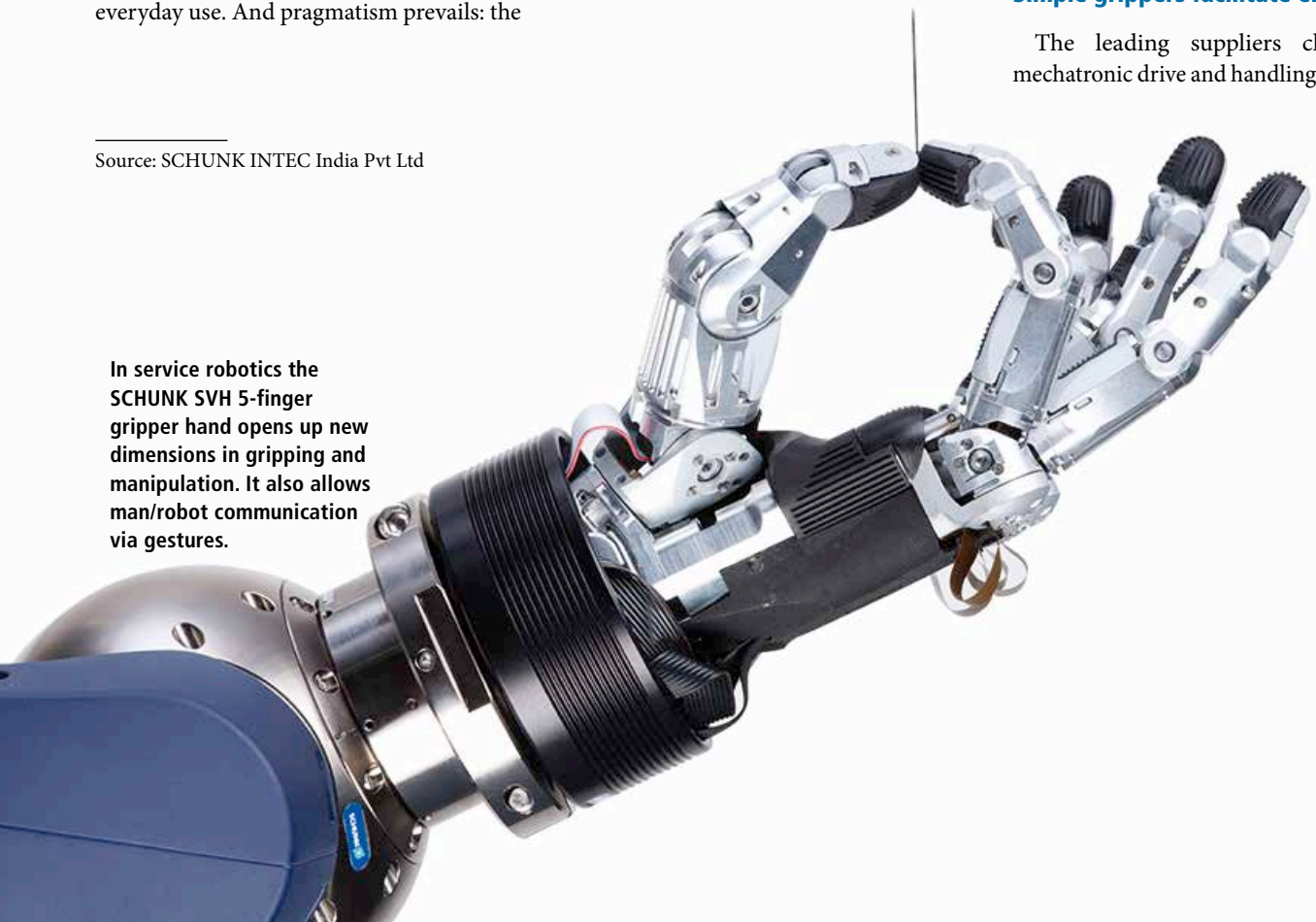
Admittedly, the iron hand of the legendary knight Götz von Berlichingen and SCHUNK's 5-finger hand have very little in common. Yet it cannot be denied that the first personal handshake with the agile high-tech gripper creates an unnerving feeling. The soft handshake soon dispels all skepticism, however, giving way to enthusiasm for the possibilities of modern mechatronics. Since Hannover Messe 2015, where the mechatronic masterpiece caused a sensation in the media, the innovative SCHUNK gripper has become a shooting star in the area of flexible handling. Whether uncertainty, cautious fascination or endless enthusiasm: the mechatronization of handling has many facets and offers huge opportunities for users who dare to let go of convention and courageously embrace innovation.

While visionaries like to cultivate images of self-organizing robot fleets and skeptics just as vehemently attempt to make nonsense of the concepts of Industry 4.0, a brief look at the actual situation shows that mechatronic handling solutions are not arriving with a big bang, but rather, are gradually creeping into everyday use. And pragmatism prevails: the easier it is to integrate a mechatronic component in the process, the more reliable it will function; and the less know-how is needed during installation and operation, the greater will be the acceptance. Linear direct axes are already an integral component in high-performance assembly applications in the electronics industry; the automotive industry unreservedly combines pneumatic and mechatronic modules to create equally reliable and flexible hybrid gripping systems; in the handling of small components, simple mechatronic small component grippers are replacing the previously widespread pneumatic pickers.

Simple grippers facilitate entry

The leading suppliers cluster their mechatronic drive and handling components

Source: SCHUNK INTEC India Pvt Ltd



In service robotics the SCHUNK SVH 5-finger gripper hand opens up new dimensions in gripping and manipulation. It also allows man/robot communication via gestures.

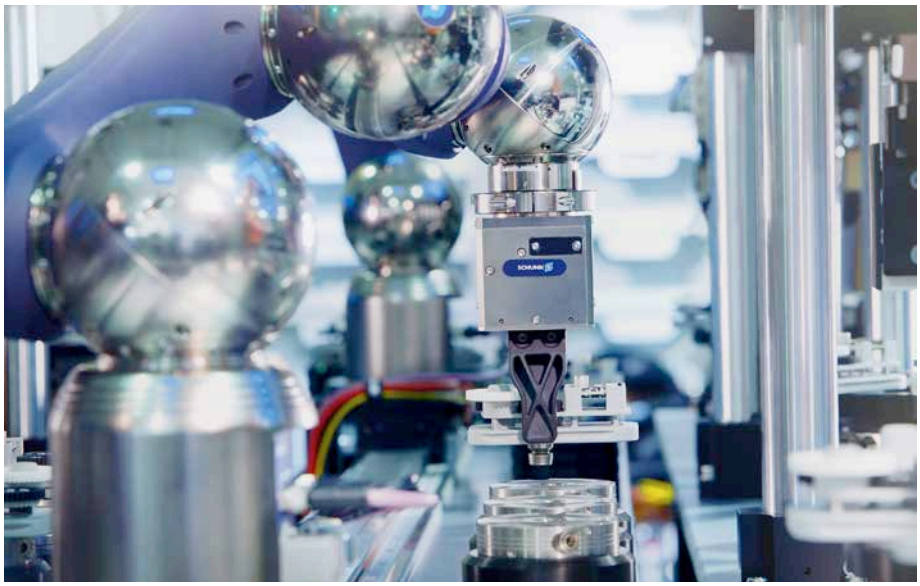
Source: SCHUNK INTEC India Pvt Ltd

Source: SCHUNK INTEC India Pvt Ltd

SCHUNK LDx linear direct axes are already widely used today in high-performance assembly.

according to different levels of complexity. At SCHUNK the standard products extend from the simple mechatronic module that can easily replace a pneumatic component on a one-to-one basis, through adaptable modules that can be equipped with different servomotors, to intelligent mechatronic grippers. The latter offers an entire bundle of convenient functions, such as control via an integrated web server, gripped part detection or stepless regulation of the gripping force. The mechanic who in the past put pneumatic components into operation can do the same today with simple mechatronic components, without first having to acquire extensive know-how. Opening and closing of the mechatronic alternatives is no more complicated than with pneumatic grippers. Proven and efficient guidance principles, such as the junction roller guide in the case of small component grippers or the patented multi-tooth guidance for universal grippers, are being transferred by SCHUNK to the mechatronic products. This creates confidence, shortens the development time and ensures maximum process stability, as the guidances have withstood the test of time in thousands of pneumatic modules. The more strenuous task at present is to convince users that a gripper can be positioned, that a force is returned and that the use of mechatronic modules could possibly eliminate entire stations. While enterprises in the electronics industry and medical technology are quite progressive in the case of more complex components, other sectors are only gradually starting to trust the new technology.

SCHUNK offers a diversity of modules as a response to these differing rates of mechatronization, therefore enabling custom solutions. They extend from conventional pneumatic components with no sensors whatsoever that fulfill only their core function, through pneumatic components with simple or complex sensors to intelligent mechatronic modules. With the help of optional accessories such as analog magnetic switches, users and system planners can also equip pneumatic modules with intelligence. More than ever before, it is possible to define how much of it should be used in the particular applications.



Source: SCHUNK INTEC India Pvt Ltd

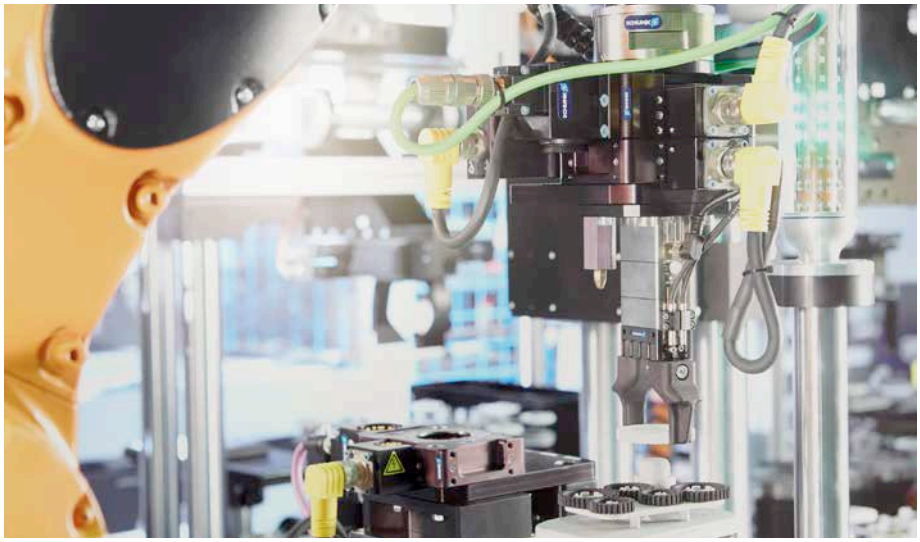
The SCHUNK LWA 4P Powerball Lightweight Arm enables flexible and even mobile handling operations.

Field components collect more process data

Three central issues currently dominate the development of mechatronic handling systems: connectivity of components all the way to the field level, functional safety and man/robot collaboration. The trend is towards field components that can do more than their actual function, i.e., more than gripping, turning or linear motion. In short, the field components of tomorrow will generate information. The gripper not only grips but also reports back a force, for example. Such data can be converted into useful information, such as whether or not a part is in order. This increases the functionality of the components, and also decentralizes calculation processes; in other words, data processing and information acquisition take place directly in the component and not only in the PLC. This method of acquiring information at the component level is not entirely new because grippers have long been able, by means of single point magnetic switches, to provide information on whether a part is gripped or not. What is changing is the depth of this information. The use of an analog magnetic

switch instead of a conventional magnetic switch, for example, enables the precise differentiation of single components. Even more advanced are mechatronic grippers with the capability of storing information about which measured value belongs to which component. Such a gripper analyzes the acquired data, uses it to determine which component is gripped and automatically reduces the gripping force in the case of sensitive parts that are susceptible to deformation, for example. Contact pressures or torques during assembly can also be measured and monitored in real time. New component types can easily be integrated in such processes. In addition, intelligent workpiece carriers or intelligent type plates make it possible to uniquely identify the single components, allowing adaptation of the process precisely to the particular part, as well as documentation. In extreme cases, individualization down to a quantity of one is possible.

A bus system can be used to connect the mechatronic components both with each other and with the higher level system controller to create a cyber-physical system. This connectivity of the modules is undoubtedly a major opportunity; however, also one of the biggest challenges, owing to the large number of real-time Ethernet interfaces, each of which creates its own standard. In order to fully utilize the potentials of mechatronic handling, the field of mechanical engineering will have no choice but to narrow the focus to essential standards. Currently PROFINET, EtherCAT and EtherNet/IP are the most promising worldwide standards.



Source: SCHUNK INTEC India Pvt Ltd

SCHUNK offers a diversity of mechatronic products, enabling users to implement customized solutions.

Safety functionality increases cost effectiveness

In addition to 'connectivity', 'functional safety' and 'man/robot collaboration' are the primary issues in mechatronic handling. Experts assume that direct collaboration between man and robot will extend throughout the entire production process in the middle and long term. Instead of working next to each other in mechanically separated spaces at present, man and robot will cooperate in a barrier-free environment in the future. Especially in assembly applications, there will soon be a drastic increase in the number of collaborating systems. Certified safety gripping systems today already allow the functions Safe Limited Speed (SLS), Safe Operating Stop (SOS), and Safe Torque Off (STO). In SOS, the modules are continuously supplied with power, so that gripped parts are held safely even without mechanical gripping force in the event that a process is interrupted. As soon as the safety zone is released, the grippers directly switch back to regular operating mode without delay and without having to restart the system. Such safety functions can increase productivity and cost effectiveness especially in large systems. Another advantage of certified safety systems is that the safety certification can be limited to the pool of system components, so that the system does not have to be certified as a whole. The functional safety of components presents new challenges to manufacturers, from separate specifications, through the actual certification and qualification of the assembly and service employees to documentation.

The mechatronization of handling systems is a process consisting of numerous small steps. The focus is on networked components and systems that continuously monitor their own status and that of their environment, but also allow a high variance. These components in the future will perform more than just their function; they will also generate information. In addition, collaborating and mobile systems will become increasingly important and will present new challenges with respect to process organization. To avoid being left behind by the market, companies will have to stay on the ball and continuously develop both their products and their processes, as well as the know-how of their employees. MMI

Source: SCHUNK INTEC India Pvt Ltd

The mechatronic pick and place units of the SCHUNK PPU-E series are the fastest high-performance assembly units currently available in the market. They allow a variable process design with minimal cycle times.

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High-Speed Milling Cuts Lead-Time

Replacing some electric discharge machining processes by high-speed cutting has cut an Irish toolmaker's mold lead-times by up to 20 per cent to typically 14 weeks. Two machines have been automated with pallet changers so that they can be operated around the clock, unmanned at night.

Source: Hurco

An inhaler injection mold die machined on the other Roeders RXP500 high-speed cutting centre.

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High-Speed Milling

A lot of electric discharge machining previously carried out by Galway Tool & Mould (GTM) has been replaced by high-speed cutting at up to 42,000 rpm on three German-built Roeders machining centres supplied by Hurco Europe, High Wycombe, through its local sales representative in Ireland, Michael Gannon.

Running around the clock

Two of the machines, which are all installed in a temperature controlled environment, have been automated with pallet changers so that they can be operated around the clock, unmanned at night. Owner & Managing Director, GTM, Padraig McFadden said, "As a result of this and other measures, mold lead-times have been cut by up to 20 per cent to typically 14 weeks and we have increased productivity significantly." The main specialism of the company, which was

Barbara Schulz
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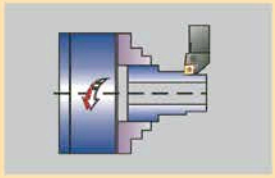


SC-8K
GANTRY LOADER

SC-14
BIG BORE LATHE

SC-25
CNC HEAVY DUTY LATHE

CNC Internal Grinding

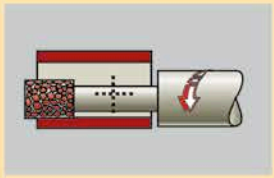
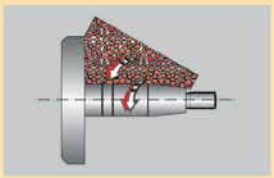


FIG-200 SPL CNC
BIG BORE GRINDER

FIGT-300 CNC
FOUR STATION TURRET

FIGE-150 CNC
ID / OD GRINDER

CNC Cylindrical Grinding



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CREEP FEED GRINDER

SGR-60
ROTARY GRINDER

SG-63
HYDRAULIC / PLC

Automats

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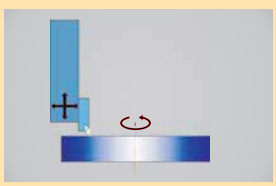
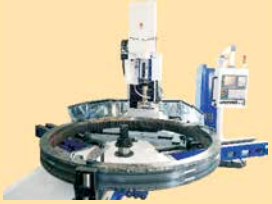
TD36
AUTOLOADING

A42/60

Vertical Turning Lathe





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Source: Hurco

The 38-position pallet change system that feeds the Roeders RXP601 DSH.

Source: Hurco

Mark Walsh at the control of the Roeders RXP601 DSH 5-axis machining centre.

founded in 1990, is the manufacture of high precision injection molds for the medical, pharmaceutical and high-volume packaging sectors worldwide, from single-impression molds for prototyping to 48-cavity molds for producing complex plastic devices such as inhalers.

In addition, a small number of micro molds are produced to make, for example, miniature rotor gears and screws for medical assemblies or for over molding stents. Components down to 10 mg can be molded to tolerances of ± 0.005 mm, consistently and reliably. The successful working practices implemented by GTM at its Galway factory resulted in a doubling of turnover between 2012 and 2015 and an increase in floor area. There are now 30 employees of whom three are apprentices.

Migration from EDM to high-speed milling is one factor in that success, but others are the opening of a metrology laboratory for tool validation and an in-house trial facility for molds equipped with Fanuc electric molding machines ranging from 100 to 300 ton capacity. McFadden emphasized that customers get a perfect turnkey mold every time, which has been designed, manufactured and tested for process viability, including correct shrinkage allowance.

2007 was a year of change for GTM, which until then derived a large proportion of turnover from automotive mold making. Much of this work rapidly disappeared overseas, notably to China, so McFadden diversified into other areas, particularly the medical industry for which Ireland had become a global manufacturing centre. Characteristic of medical mold work are the requirements for tighter tolerances and better surface finishes as well as shorter lead-times that are normal in the automotive sector.

Demand for shorter lead-times called for high-speed machining

GTM was sparking a lot of small parts for molds, but electrode manufacture is time-consuming and EDM is itself a slow process. The decision was taken to replace as much EDM as possible with high-speed machining using small-diameter, ball nose milling cutters. It was a move that would save 70 per cent of the time needed for this part of the manufacturing process, according to shop floor manager, Mark Walsh. Every mold that passes through the Galway factory now undergoes some high-speed cutting on one of the Roeders.

"Back in 2007 we asked several potential HSC machine suppliers to make test cuts on one of our molds. The Roeders machine beat all the others in terms of speed, accuracy and surface finish," Walsh said. "It was noticeably better in all areas, partly because the German machine builder was an early adopter of linear motors for the axis drives."

A Roeders RXP500 3-axis VMC with a 40-tool magazine was duly installed. Despite it having run 24/5 plus extensively at weekends for more than eight years, Walsh confirmed that the machine is just as good today in terms of the accuracies and surface finishes achieved as when it was new.

This level of performance led automatically to the purchase of a second Roeders 3-axis RXP 500 in 2013 to cope with raised production levels. Automation was fitted in the form of an automatic, 8-pallet changer that allows any mix of jobs to be set up and run unattended overnight, or over an entire weekend if longer-running jobs are selected.

During the day, both RXP500s can be attended by one person due to the automation fitted to the second machine. Walsh was palpably enthusiastic when he spoke of how many more hours they were getting out of the spindles for the same number of operator hours. MMI

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World's New Lever of Change

Cloud-based Onshape is a SaaS platform that facilitates CAD collaboration (synchronous and asynchronous) on any device, for any browser, at any time.

Archimedes once said, "Give me a lever, a place to stand, and I will move the earth." This statement will inspire engineers for generations to come. If Archimedes was alive today, he would observe that the design and manufacturing worlds have moved considerably. Not only since the third century BC, when he invented the Archimedes Screw Pump (still in use for agriculture and mining today), but most dramatically over the past 20 years.

John McEleney
Co-founder & CEO
Onshape Inc
jmceleney@onshape.com

Not so long ago, products were designed and manufactured in the same facility. Engineers and designers could walk down to the shop floor and immediately watch their visions come to life. This is often no longer the case. With today's distributed design and supply chains, it is far more common to work with CAD professionals, vendors and factories across the country and around the world.

Globalization has created amazing new business opportunities, but it has also introduced serious challenges.

Leveraging the Full Power of the Cloud

The lever of change to move the CAD world is the internet, but most designers, engineers and manufacturers are not yet leveraging the full power of the cloud. Most CAD tools used today are still running on Windows desktops. Files are being shared by email or Dropbox, but there is no control over who ultimately can access or modify them. And when it comes to managing your files, the restrictive check-in and checkout approach of the traditional PDM is increasingly creating roadblocks to productive collaboration.

As an engineer, I love having candid conversations with CAD users about their daily challenges. Designers and engineers tell me they have been pulling their hair out

Source: Onshape

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World's New Lever

trying to keep track of multiple versions of a file or watching their changes get accidently erased by another team member. What these users say they truly need is the CAD version of Google Docs, a way for people to collaborate on the same model at the same time. They seek a better, more efficient way to understand each contributor's changes without tripping over each other's work.

Engineers' brains are racing non-stop and do not slow down when they leave the office. Granting them immediate access to their projects on their personal tablets, mobile phones or any web browser—without the hassles of entering license codes—would be transformational. There would be no obstacles or delays to acting on their ideas in the moment.

CAD for a Changing Workforce

CAD professionals also have a more flexible business model on their wish lists, expressing a desire to purchase CAD as a monthly service instead of at a fixed cost of $5,000 to $6,000 per seat (plus regular upgrades and maintenance). The reason: Today's companies have fluctuating workforces and need tools that are highly flexible and scalable. Using a SaaS version of CAD would be a competitive advantage because it allows you to quickly add people to your team for a short period of time.

For similar reasons, many other industries have already migrated to the SaaS model. For example, Customer Relationship Management software used to be only accessed by logging onto servers. That world, of course, has moved to Salesforce. But we are not suggesting that you switch to a browser-based solution because everyone else is doing it. CAD in the cloud is about boosting collaboration, making all of your engineers, designers and manufacturers more productive. It also gives you access to thousands of cores for computing versus, say, only 1, 2, or 4 cores on your PC.

That is why we have built Onshape, a SaaS platform that facilitates CAD collaboration (synchronous and asynchronous) on any device, for any browser, at any time. In Archimedes' terms, we would like to be your place to stand when you pull that lever of change. The time has come for engineers and designers to take advantage of the same benefits others have enjoyed over the past decade. As the business world continues to speed up, we look forward to working with you as we improve the next generation of CAD. MMI

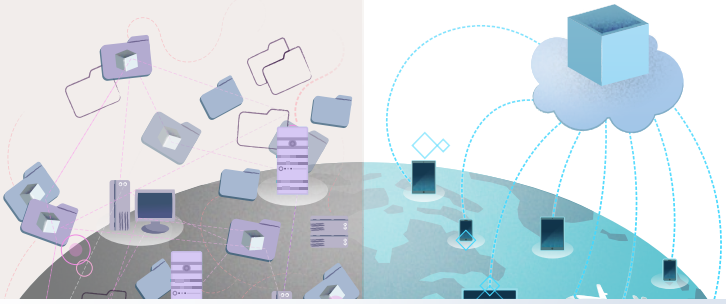
4 CAD COLLABORATION

WORKING WITH COPIES

It's impossible to work as a team using desktop CAD without making copies of files. Copies to the server for your co-workers. Copies shared by email or Dropbox to work with customers and suppliers. It's painful, costly, confusing and inefficient.

AMAZING COLLABORATION

Full-cloud CAD runs on any web browser, and on tablets or phones. CAD files all live in one single location, so you can access and share the master data without copies and redundancy.



6 CAD STABILITY

DESKTOP-INSTALLED CAD SYSTEMS CRASH

When your desktop crashes, you not only lose work since the last time you saved, but also lose the time required to reboot and redo the work.

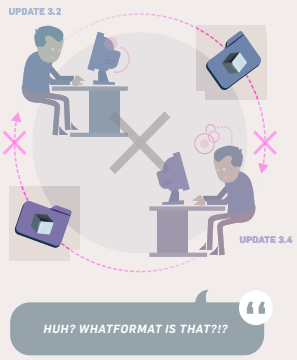
REDUNDANT SERVERS = CAD PEACE OF MIND

Full-cloud CAD runs and stores data on multiple redundant servers. If one server has an issue, the others fill the void and you keep going uninterrupted. No more wasted time or lost work.

5 CAD COMPATIBILITY

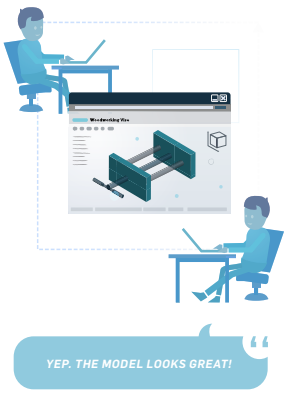
CAD SYSTEM INCOMPATIBILITY

If you're not working in the same version of CAD software as your design partner, you're in for a long struggle. You may as well be speaking a different language.



EVERYONE ON THE SAME SOFTWARE

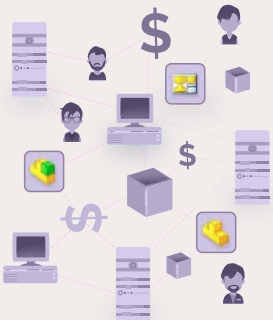
Using CAD in a browser, your design team, customers and suppliers are always on the same version of software – the latest version.



7 CAD VERSION CONTROL

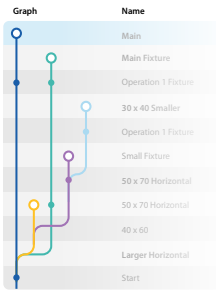
PDM AS AN AFTERTHOUGHT

The dirty secret of desktop CAD is that it creates a lot of files. Eventually, you'll need to add a expensive PDM system to keep track of them all. With PDM, costs increase, more IT support is needed, and the likelihood of you using the latest software diminishes.



BUILT-IN VERSION CONTROL

Full-cloud CAD simplifies data storage and has built-in version control. It provides superior data management without constraints. No more confusion on who made the latest changes to a design. No need to spend any money on PDM. Reinvest in your company instead!



Trends in Condition Monitoring

Fluid systems are usually the heaviest, most critical, most combustible and most hazardous; they are also the most powerful. This power is what makes them ideal for controls. Here's an overview of the global trends that are evolving in the field of maintenance with a focus on hydraulic and fluid systems

In the dogged world of maintenance, whether it is a plant, isolated equipment or integrated and complex systems, only the steely and lionhearted endure.

Redundant hydraulic and fuel lines crisscrossing at every juncture are essential to the design of the most sophisticated systems such as airplanes and ships. In fact, the logistics and shipping infrastructure around the globe will come to a halt without fluid control systems.

The self-referential world of maintenance

Maintenance, condition monitoring and diagnostics are nothing but work added on top of work. It is the metaphorical label given to the physical phenomena of prevention of degradation. An eventuality that cannot be stopped, will only hasten if unchecked, and the impact needed to prevent its rapid progression is a system that is prone to maintenance.

Maintenance, condition monitoring and diagnostics together epitomize the human condition. It requires thorough investigation of root causes—a practice so important to world progress that all the provisional information we have so far discovered has followed this very scientific method, which involves doubt and deeper exploration in a systematic way.

When such is the extent of a field of activities, one would imagine its horizon to be sweeping, with polished approaches and esteemed importance. Yet, when one thinks of maintenance, condition monitoring and diagnostics, images of oil spills, rust-laden machinery, steaming clouds of over-cooked electronics and big banners with the word 'BREAKDOWN' come to mind.

Vikram Singh
Director
Hind Hydraulics & Engineers Pvt Ltd
vikramsingh@hindhydraulics.com

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Trends in Condition...

Future trends focus on key areas first and maintenance follows later

It is a big fallacy of Indian companies where investment is made into high-end equipment but no financial attention is given to the parameters controlling the usage. Beyond hiring a well-interviewed operator, no further tactical planning takes place regarding the entire operational usage of the new equipment.

Maintenance should be thought of as embedded deep into any process. By its very definition—process means physical action undertaken that is dynamic and it is that dynamic nature of the process that should be the primary focus of any comprehensive program that involves upkeep. We are in an era where assembly of static structures and control systems is not the primary activity in manufacturing. A dynamic influence of information and technology has made systems smarter and complex.

At Hind Hydraulics & Engineers for instance, we make a plan for any new equipment and then make another plan for its operational team based on what functions we will need from them. All of this is simulated in a dry run by using last year's manufacturing data. Data from a three month operations period is analyzed to see what would have happened if the new machine was occupying

Source: thinkstockphotos.in

Systems such as hydraulic and fluid controls that are very complex and not completely predictable in terms of future behavior will benefit the most from artificial intelligence.

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Companies that survive in the future will be ones that are sustainable in terms of regulatory compliances and their environmental footprint.

its space during that time and ready to run. Where would we fall short? What kind of ebb and flow a new team will create and many other factors.

In the world of Industry 4.0 where the influence of the information age has finally entrenched deep into the roots of the industry, maintenance still struggles. In particular, the shifting world of hydraulics and fluid powered systems and machinery has yet to see any acceptance of the age of information other than a surface level applicability.

The design and testing of hydraulic and fluid powered systems has highly variable interactions. Proof leads to modification, parameters are changed, simulations are used to analyze behavior and algorithms designed to optimize the system. Such is the level of raw mathematical achievements of humans and computational power of computers that designing a system with the complexity, criticality, redundancy in safety and optimization in performance is a task now achievable by a sole person sitting in front of a CAD/CAM/Simulation software.

This application of information is now used in almost every department of an organization that has a tactical approach to goals and vision it has set for itself. From ice-cream retailers to rocket manufacturers, the knowledge that information can be put to use in adding robustness and creating an edge over competition is nothing new.

Unraveling Fluid Flow

One of the reasons why hydraulic and fluid systems lag behind in this applicability is because it is much easier to calculate the micro-state of each constituent in a current (electro-magnetic radiation) traveling through a wire than fluid flowing through a pipe. The current is subject to physical parameters such as temperature and vibration in a much more linear fashion. Fluid flow on the other hand responds in a more unpredictable manner ranging from chemical reactions within the fluid structure to vortexes, back-flow and reaction flows, to name a few. The complex boundary between the whole 'fluid flow' and constituent-particles is hard to study but understanding this interaction is very important.

It is time a deeper look is taken at hydraulic and fluid systems. Just collecting data on a 'current-condition' like vibration and temperature is not enough. A contextual approach is required.

Can the Artificial Intelligence field provide an unlikely solution?

In the world of a high degree of determinism in natural and man-made systems, why is fluid control and maintenance not up to scratch? The answer is simple—Objectivity. Take the example of artificial intelligence (AI) —In the late 60s, the field boomed with optimism. A computer had been taught to play chess and eventually beat grandmasters. In the subsequent years, AI took a big blow. They could teach robot complex computational techniques to solve the most challenging of problems but they could not teach it to learn how to walk a staircase—an activity we all consider far more mundane than Fourier Transforms.

Why was this and how does it apply to Fluid Control Systems Maintenance?

One of the established reasons for failure of AI back then was that there is a subjective nature to AI. Instead of programming a robot with all the set of algorithms it will need, it is programmed to learn, become aware of, and even improve its own algorithms. This is called Machine Learning.

Whether or not a fully functional AI is built, it is as clear as a fluid that our capability to teach machines will be sophisticated enough that a certain level of awareness will arise in them. Systems such as hydraulic and fluid controls that are very complex and not completely predictable in terms of future behavior will benefit the most from this.

Distinguishing the future of Fluid Control Systems and how they are monitored

In the health industry, this principal is already being applied. Instead of collecting isolated data of key parameters of a person's health, a holistic picture is generated of their human body by an advanced computer system. This characterization of data into the subset of a particular human temperament can revolutionize the maintenance of such systems by providing added information and subjective meaning to the monitoring and diagnostics that so far rely only on excellent comprehension of the data, an activity riddled with human error and needing expertise which is in short supply.

Is there a concealed undertaking that will influence Fluid Maintenance?

Technology adoption, data-driven management, cloud and mobile technology will together change the outlook of the shop floor when seen from a maintenance perspective. Assets will be more responsive and run at a higher efficiency. The biggest challenge to fluid maintenance however, where dealing with hazardous compounds is all too common and in-fact a requisite constituent of the field will be the introduction of the spheres of regulatory compliance and environmental impact into its realm.

Companies that survive in the future will be ones that are sustainable in terms of regulatory compliances and their environmental footprint. Exercising this sort of regulatory purview is long past due in India. The governing bodies are slowly coming to this realization. However, globally, the presence of a matured industry dedicated to providing service in this field can already be seen because of the high demand for regulatory compliance and hazardous waste management that is needed.

All users of hydraulic and fluid control systems should be encouraged to rethink how they maintain their systems and what would be the ultimate cost of not paying enough attention to an already easy-to-neglect realm of manufacturing. MMI

EVENT CALENDAR

Event Name	Contact	Date & Venue
BIEMH - International Machine Tool Exhibition	Carmen Gorostiza T: +34 (94) 4040078 E: mcgorostiza@bec.eu www.biemh.bilbaoexhibitioncentre.com	May 30–June 4, 2016 Bilbao Exhibition Centre, Spain
ACMEE 2016	S Raghavan T: +91 (0) 9790974048 E: info@acmee.in www.acmee.in	June 16–20, 2016 Chennai Trade Centre, Chennai
ICAARS 2016	Dr. M Sundaram T: +91 (422) 4344777 E: icaars.rae@gmail.com www.psgtech.edu	June 23–24, 2016 Coimbatore, Tamil Nadu
IMTOS 2016	Kamlesh Gohil T: +91 (0) 9328899503 www.kdclglobal.com	July 3–6, 2016 Pragati Maidan, New Delhi
AMTEX 2016	T: +91 (80) 43307474 E: info@reedtriuneexhibitions.com www.amtex2015.com	July 8–11, 2016 Pragati Maidan, New Delhi, India
MMMM 2016	Gagan Sahani T: +91 (11) 40828282 gagan.sahni@itei.in www.mmmm-expo.com	10–12 August, 2016 Pragati Maidan, New Delhi, India
IMTS 2016	T: +1 (703) 8932900 E: AMT@AMTonline.org	September 12–17, 2016 McCormick Place, Chicago, US
Machine Tool Expo 2016 – Pune	Mahesh T: +91 (0) 9886680466 E: Mahesh@imtma.in www.mtx.co.in	September 29–October 02, 2016 Auto Cluster Exhibition Centre, Pune
30.BI-MU	T: +39 (02) 26255860 E: bimu.esp@ucimu.it	October 4–8, 2016 Fieramilano, Italy
JIMTOF 2016	E: jimtof@tokyo-bigsight.co.jp www.jimtof.org	November 17–22, 2016 Ariake Koto Tokyo, Japan
Euromold	DEMAT GmbH T: +49 (0) 069274003 E: info@demat.com	December 6–9, 2016 Dusseldorf, Germany

To suggest an event, please send details to nedra.pereira@vogel.de

Source: VBMI

The 360-degree Digitalization tour set up by Siemens during the Industry Analyst Conference in Boston consisted of a robotic arm holding an interactive display to demonstrate its capabilities and portfolio in the Internet of Things.

The Power of Digitalization

Following its yearly practise, Siemens PLM software invited its customers, industrial software analysts, executives and members of the international press under one roof in Boston to discuss emerging trends in the digital space. This annual analyst meet revolved around Siemens' digitalization strategy for its entire value chain process, which involves the complete integration of product design, manufacturing process planning, digital manufacturing, factory floor operations, and production automation from the company within the Digital Factory division.

Interlaced with the twin themes of 'digital enterprise' and 'digital industrial revolution', the event witnessed an audience-packed hall and compelling presentations by Siemens' executives and its customers. While presenting the keynote address Siemens AG, Chief Strategy Officer, Dr Horst Kayser emphasized on the importance of digitalization and the digital change that is taking place across business and industry.

Change is constant

In his presentation—The Digital Change Constant—Dr Kayser provided insight into Siemens AG's commitment to digitalization. According to him, Siemens AG invested €4.1 billion in research and development in 2014, much of which was focused on its digital technology platform and enablers. Proudly he said in this context, "We put our money where our mouth is, and we are applying digitalization technologies to ourselves." For Siemens, digitalization is a huge business, with its vertical software generating revenues of €2.4 billion for FY2014 and digital services generating that of half a billion euros. With its top-tier position globally, in both industrial and building automation, it is evident the company is poised to lead the industry into the age of digitalization.

He stated that digitalization will generate disruptive power and change present business models. It will bring customers into production process and become a Prosumer. Speaking on the future of data-driven opportunities Dr Kayser mentioned that the company is focusing on user- and machine-generated data as by 2020, it is expected that there will be five times as many connected devices as there are people. In this backdrop of technology development wave, simplifying IT, bringing out cloud applications, and embracing big data are three new challenges that Siemens PLM has to face.

Soumi Mitra
Editor-in-Chief
Vogel Business Media India
soumi.mitra@vogel.de

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Power of Digitalization

Source: Siemens PLM

Siemens AG, Chief Strategy Officer, Dr Horst Kayser stated that digitalization is already big business for Siemens, with revenues generated in FY2014 amounting to more than a couple of billion euros.

Source: VBMI

While emphasizing on how smarter products are appearing across all industries from driverless cars, pilotless airplanes, personalized body implants, to self-optimizing energy generation, President & CEO, Siemens PLM Software Inc, Digital Factory Division, Chuck Grind stressed that digitalization is the strategy needed to realize smart innovation, as it weaves a digital thread through the entire value creation chain.

Innovation for the future

Presenting his perspective on the digital industrial revolution, President & CEO, Siemens PLM Software Inc, Digital Factory Division, Chuck Grind pointed out that all industries are entering an era of smart products produced in smart connected factories; this will drive new business models. With the rise of smart products in the market, he averred, "The development cycle is getting significantly shorter (by about 25 per cent) and the profit margin window is getting smaller." Hence companies require introducing more products in a shorter time to meet the 'smart' expectations of both consumers and industry. In this backdrop, he said, "If the product development process is slow, you find yourself with a product that was great for the world three years ago."

Talking about smarter products that are appearing across all industries, he stressed that digitalization is the strategy required to realize smart innovation, as it weaves a digital thread through the entire value creation chain. Furthermore, he introduced the company's 'Smart Innovation Portfolio' aimed at facilitating design engineers to meet the challenge of creating more complex products in a shorter period of time.

According to Grind, digitalization technology has always been a driver in business model evolution. Advanced technologies such as crowd sourcing design, 3D printing, system driven product development, and advanced robotics are transforming enterprises' digital progress. Hence, it is not only important to have a complete platform to support product innovation but also the platform should know how to produce a product and virtually simulate its functions for practical application scenarios.

Compelling presentations

Subsequent presentations by other senior members and product managers of the company explained how Siemens PLM Software's new Catchbook sketching app; Solid Edge design software, NX CAD, CAM and CAE software; LMS simulation and testing solutions; Omneo big data analytics platform; and Teamcenters Active Workspace interface and align with the Smart Innovation Portfolio. Siemens Digital Factory and Siemens PLM executives presented a range of messages that revolved around the company's digitalization strategy. Taking forward the continued focus on core competencies and long term strategies that were articulated in the Siemens executive presentations, its customers focused on the Internet of Things (IoT) and stressed on connecting all the way from engineering to Smart Connected Assets.

Customer speak

Among several customer presentations that brought the digitalization message home was of Chief Digital Officer & CIO, Konecranes, Juha Pankakoski. Taking the centre stage he explained how the company used Teamcenter as the backbone of its Industrial Internet initiative. As part of the initiative, Konecranes collects data from its equipment to help serve its customers and build better relationships with them. "Behind the Industrial Internet is an effective way to manage data in the product lifecycle, that's what Siemens delivers," said Pankakoski.

Another customer story came from Dell, which was a supplier quality management case study. Dell was having trouble conducting root cause analysis in a time effective manner and tying the results of these findings to particular suppliers. To address this challenge, Dell selected the Camstar product Omneo to collect error log file data from its machines in the field, store this data in a Hadoop based big data lake, and provide analytical tools to internal quality engineers as well as external suppliers. The benefits reported were dramatic, with root-cause analysis cycle times going from six weeks to six hours, which is the difference in catching issues before they hit customers or afterward.

Takeaway

Executive Vice President, Digital Enterprise Realization, Chief Manufacturing Officer, Siemens Product Lifecycle Management Software Inc, Digital Factory Division, Dr Helmuth Ludwig summed it up well when he pointed out that transformative technologies are disrupting and revolutionizing global business and creating major challenges for manufacturers. These manufacturing companies will be compelled to meet these challenges and transform product design and production methods or miss the competitive window of opportunity. It is well-acknowledged that survival in today's competitive market demands digitalization. At the same time, it is also true that it cannot occur in a siloed manner. The high pressure of increasing product complexity and shrinking design deadlines will only work counter to each other. To stay afloat in this critical situation, companies will have to provide integrated software solutions that provide a common thread throughout the entire value chain process. MMI

Designing for Experience

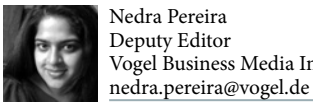
With around 8,000 participants, including those physically present as well as those attending via the live stream, 300 breakout sessions and over 110 partners attending, SOLIDWORKS World 2016 opened its doors to another year wherein several examples were discussed pertaining to the underlying topic of 'changing the way people do things' at the Kay Bailey Hutchison Center in Dallas from January 31 to February 3, 2016.

SOLIDWORKS World is true to its name and is one of the best showcases of how technology imitates life and how life is better because of technology. "Its gadgets and gizmos a plenty and whozits and whatzits galore…" and yes, these may sound like the lyrics to the 'Part of Your World' from Disney's The Little Mermaid but it really does hold true for this event.

Make great design happen

As always, the event has three general sessions wherein announcements, customer showcases and case studies are discussed. This year was no different. At the first general session of SOLIDWORKS World 2016, CEO, SOLIDWORKS, Gian Paolo Bassi introduced the day's themes: flexibility and innovation. He stated that the key to creating better products is not only about providing tools to solve problems quicker but rather about using the right mix of creativity and execution.

To add to this sentiment, President and CEO, Dassault Systèmes, Bernard Charlès took to the stage to announce Dassault Systèmes' continued commitment to investing in SOLIDWORKS. Furthermore, he highlighted various instances of how designers across the globe are making ideas a reality through the use of the 3DEXPERIENCE platform. One example that caught my attention, in particular, was the project that uses the platform to map Singapore so that the city's architecture, infrastructure, planning, resources, etc., could be analyzed virtually, and decisions in that regard can be taken in sync with sustainability in mind.



Nedra Pereira
Deputy Editor
Vogel Business Media India
nedra.pereira@vogel.de

Source: SOLIDWORKS

SOLIDWORKS World 2016: Changing the way you design!

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Designing for Experience

New applications

This year's edition announced three new applications:

- SOLIDWORKS Visualize, a suite of rendering tools, which helps organizations, including nontechnical users, leverage 3D CAD data to create photorealistic marketing content that is print and web-ready in minutes.
- SOLIDWORKS PCB is a partnership with Altium that allows users to design printed circuit boards used in many IoT designs. This is immensely important as consumer demand for experiences and connected devices become the norm.
- 3D printing integration with Sindoh, which allows for one-click printing directly from SOLIDWORKS with the capability to check progress from your desktop or mobile device.

Uniqueness galore

SOLIDWORKS World always showcases innovation and the second general session was filled with several examples of how

SOLIDWORKS is a tool that can be used in various sectors and verticals that can turn ideas into reality. Founder, Yahoo Tech, David Pogue was given the task of interviewing three customers: the Japanese Space Elevator Association, Brewbot, and Trusst Lingerie.

Space Elevator

Space Elevator is researching the next generation of space transport. Instead of using rockets to transport materials, people, etc., Space Elevator is experimenting with the concept of a 100,000-km lift into space. The concept is to lift cargo and people into space safely and in minimum time. The idea is about a 100 years away from delivery; it still is an important step towards enhancing our relationship with space travel.

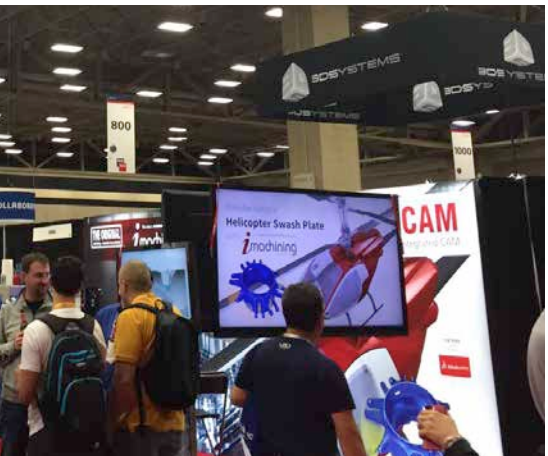
Brewbot

The company, Brewbot, has now made brewing beer at home a simple task via digital distribution. It has created an automated brewing solution that you can use to craft your own beer or follow recipes from 40 breweries. You select the beer you want to make in Brewbot, the company sends you the ingredients, and then you complete brewing in about 4.5 hours. This solution is also being used by bars, restaurants and breweries.

Trusst Lingerie

SOLIDWORKS as a company has always harped on the theme of 'changing the way we design'. Its users think the same way too. Engineers Sophia Berman and Laura West conceived the idea Trusst Lingerie when they realized that the 100-year-old design of the bra really was not providing the support women, especially those with a larger bust, need. The two did what any other engineer would: fix the design. By inserting a truss in the bra design, women actually get proper support from their lingerie. For this reason, David Pogue described the founders as 'the Steve Jobs of lingerie'. Hence, in a nutshell, it's this kind of problem solving that makes SOLIDWORKS users unique.

Interactions at the Partner Pavilion.



Source: SOLIDWORKS

Community matters

The SOLIDWORKS community has around 5 million users who are passionate, demanding and brilliant. It is this group that drives how SOLIDWORKS improves. As is the case with every SOLIDWORKS World event, several updates were also revealed this time around. User group chapters from San Diego and Seattle were honored for reaching their 20th anniversaries and SOLIDWORKS User Group Network awards were also announced.

One other aspect that must be mentioned is the collections of apps designed by SOLIDWORKS engineers to help get their own children excited about design. The SOLIDWORKS Apps for Kids allows teach concepts from four stages of engineering: ideation, creation, enhancement and production.

Concurrent collaboration

The third general session stressed on how the SOLIDWORKS manufacturing ecosystem enables engineering and manufacturing teams to work concurrently. Because there is no data importing, one can take the product from art to part inside SOLIDWORKS. Model-Based Definition (MBD) is at the center of the ecosystem. Since introducing MBD last year, the ecosystem has now expanded to include Model-Based Manufacturing, Model-Based CMM, Model-Based Costing and Model-Based Inspection.

An example that highlights the benefit of this ecosystem was also shared by SOLIDWORKS Brand User Experience Leader, SOLIDWORKS, Kishore Boyalakuntla involving .decimal, a custom manufacturer of devices for proton, electron, and photon therapies used in cancer treatment. Long story short, .decimal receives patient information from a medical provider and within 24 hours manufactures a custom device. So far, the company has served more than 51 thousand patients with around 200 thousand custom devices. All of this was achieved with the SOLIDWORKS manufacturing ecosystem in partnership with CAMWorks.

Other examples

To demonstrate the variety and extent of this connected technology, Boyalakuntla discussed SureFlap and its line of pet doors. It works on the principle of collecting data from microchips embedded in one's pet to allow or deny access into the house; thereby, eliminating 'unwanted visitors' from entering the house.

Connected devices are one way engineers are taking designs to the next level. For SureFlap to improve the dog and cat door, it used a combination of SOLIDWORKS, Xively and NETVIBES. This ecosystem included

Source: SOLIDWORKS

CEO, SOLIDWORKS, Gian Paolo Bassi introduced the day's themes: flexibility and innovation.

product design via SOLIDWORKS, connecting the device to the cloud with Xively, and finally partnering with NETVIBES to process and analyze the information flowing into the smart device.

India focus

India is an important market for the company, and it has set high expectations in terms of growth for SOLIDWORKS in the market, approximately 20–25 per cent. Vice President, Strategy, Community & Business Development, SOLIDWORKS, Dassault Systèmes, Suchit Jain, asserted, "We want our customers to have all the flexibility they require in helping them manufacture their products. Hence, our products are available in three flexible options: Desktop, Connected, and Online. It aims at helping customers save on time and costs. And this is in line with catering to how manufacturing has changed over the years, i.e., it is now increasingly becoming software based." One particular example he highlighted was of Ather Energy, founded by IIT Madras alumni, which brought out India's first smart electric scooter.

Adding to this, Director Sales, Professional Channel – India, Dassault Systèmes, PM Ravikumar stated that India's capability needs to be enhanced. "India's potential is now being realized with the 'Make in India' campaign but a shift in focus towards designing in India should also be catered to. I love what Late Dr APJ Kalam said 'Make in India is fine, but we should Design in India'. This will help in bringing about a developed India, one where its entire potential is realized. And there's where SOLIDWORKS can help as it will help in design innovation and manufacture," voiced Ravikumar.

In short

SOLIDWORKS World 2016 did not disappoint. Each example showcased a common thread: experience. If you missed this edition, fear not, you can attend the next one like a super star as it is set to be held in Los Angeles, California in 2017. MMI

Source: TAGMA India

The event was inaugurated in the august presence of tooling industry leaders.

DIEMOULD INDIA 2016

The four day event witnessed the presence of global stalwarts from the tooling fraternity. Read on to know more...

The 10th biennial DIEMOULD India (DMI) show began on a high note at the Bangalore International Exhibition Centre in Bengaluru on April 6, 2016. The mega trade event witnessed around 280 plus exhibitors showcasing cutting-edge technologies. Exhibitors from Austria, Canada, China, France, Germany, Italy, Japan, Korea, Portugal, Singapore, Spain, Sri Lanka, Sweden, Switzerland, Taiwan, Thailand, UK, United Arab Emirates and USA also participated at the event. The highlights of the show were the extended product range, i.e., New Product Range —3D additive manufacturing technology solutions, precision machining, aerospace, injection moulding machine and related solutions along with the maiden B2B Pavilion. The four day event witnessed the participation of stalwarts from the tooling fraternity representing 18 different countries.

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DIEMOULD INDIA 2016

Inauguration ceremony

The event was inaugurated in the august presence of tooling industry leaders, exhibitors and visitors from India and overseas. The Guest of Honour was Founder President, TAGMA INDIA and Managing Director, Nettur Technical Training Foundation, N Reguraj and the the keynote speakers were Former President, TAGMA INDIA and Chairman, Stiack Engineering Pvt Ltd, Anil C Kilachand; Vice Chairman, Makino Asia Group Companies, KS Sankaran; President TAGMA INDIA and Managing Director, Vasantha Tool Crafts Pvt Ltd, A Dayanand Reddy and Vice President, TAGMA INDIA and Managing Director, Mastercraft Engineers Pvt Ltd, R Sree Prakash.

The inauguration ceremony began with the national anthem followed by the lamp lighting ceremony. In his address, Reddy welcomed the tooling fraternity who graced the occasion. He informed that the edition is special because the exhibition will enter into double digits, i.e., the 10th edition and also because it is being held in the Silver Jubilee year of TAGMA. Reddy thanked the

Compiled by
Ahlam Rais
Senior Sub Editor
Vogel Business Media India
ahlam.rais@vogel.de

Source: TAGMA India

President TAGMA India and Managing Director, Vasantha Tool Crafts Pvt Ltd, A Dayanand Reddy welcomed the tooling fraternity who graced the occasion.

Source: TAGMA India

Industry leaders take a look at the latest technologies at the event.

Source: TAGMA India

Aerial view of the DIEMOULD India 2016 exhibition.

past presidents who were instrumental in launching the DMI exhibition. He further mentioned about the growth witnessed by DMI 2016 over its previous edition DMI 2014 in terms of increase in the number of exhibitors by 32 per cent, exhibition area by 19 per cent and tool room participation by 35 per cent. Reddy revisited the quote of Late Dr AP J Abdul Kalam, in which he had stated during the inauguration of the 9th DMI exhibition, about the need of a vibrant tooling industry for the development of any country. He also requested everyone to work in a collaborative manner to strengthen the tooling industry.

Reddy also presented a brief on the setting up of a common facility center for the tools, moulds and dies industry—TAGMA Centre of Excellence and Training (TCET) at Chakan, Pune with an objective to upgrade the existing tooling industry.

Maiden B2B Pavilion @ DMI 2016

TAGMA had launched a new B2B initiative wherein TAGMA had invited OEM's and Tier 1 companies to participate in order to facilitate direct meetings between tool buyers and tool manufacturers. TAGMA had given complimentary stalls to the OEM's and Tier 1 companies as an incentive. With more than 50 meetings held over the four-day event, the initiative proved to be a grand success.

Some of the toolmakers who made the best use of this initiative were Kishore Industries from Aurangabad; Planet Tools, Tara Tools, Viniel Hitek from Pune, Bhagyashri Home Appliances from Nagpur, Protech India, Intech DMLS from Bengaluru and many more. The initiative garnered excellent feedback with visitors expressing their desire to have a bigger pavilion for the next DMI with more OEM's and Tier 1 companies participating! MMI

HIGHLIGHTS

B2B Pavilion @ Hall 3

The companies who set up stalls at the B2B pavilion were:

- JBM group looking for sheet metal die makers
- Precision Seals looking for plastic injection mould makers for their brake systems
- Mahindra & Mahindra looking for sheet metal die makers
- AO Smith Water Products Pvt Ltd looking for plastic injection mould makers and
- CYIENT Ltd looking for vendors for their aerospace business

Expanding Beyond Horizons

Last month I had the privilege of being hosted by the Taiwan External Trade Development Council (TAITRA) and was able to get an insider's view of the impressive strides that the island country's machine tool industry has been making.

During my one week stay in Taiwan, I visited 10 companies from the machine tool sector. Taiwanese machine tool builders and their suppliers keenly develop leading-edge technologies to produce premium machineries with a focus on global expansion. It ranks as the fourth largest source of machine tools in the world; being preceded only by Germany, Japan and Italy.

Having toured the manufacturing facilities of the subsequent mentioned companies, I realized that it is an undeniable fact that the Taiwanese machine tool companies strive continuously to meet the rapidly changing needs of the market; and consequently, stand out as one of the most important sectors contributing to Taiwan's export economy.

Shieh Yih Machinery Industry Co Ltd (Seyi)

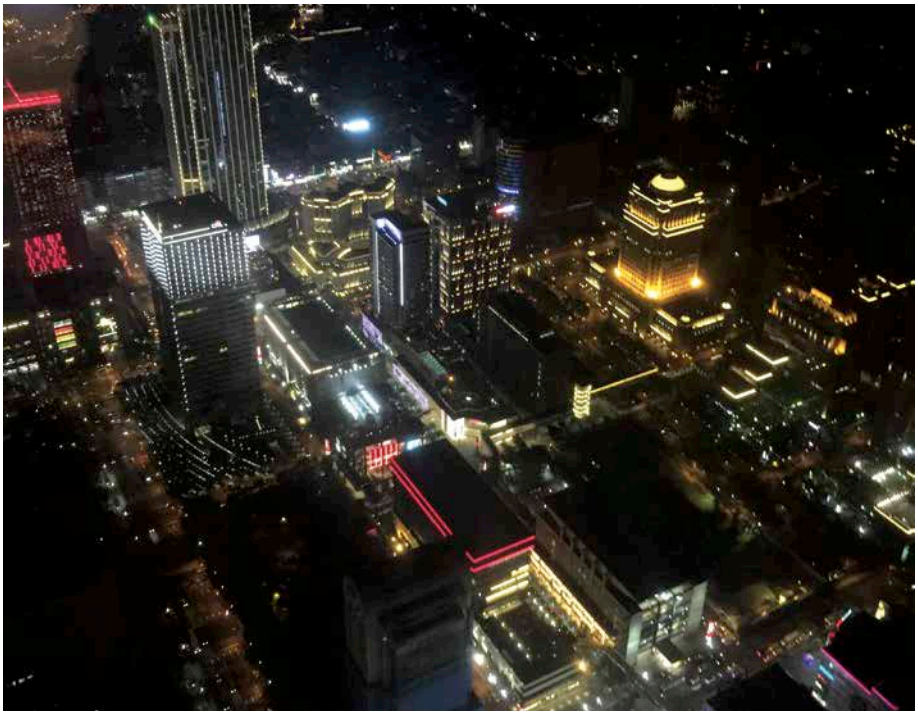
Seyi's customized mechanical presses, total automation solution services, stamping technology and metal-forming production consulting services are widely sought after globally. Vice President, Shieh Yih Machinery Industry Co Ltd, Steven Lee proudly averred, "The USA alone accounts 70 per cent of our exports followed by Europe and India." Adding to this Vice President Sales & Service Division, Shieh Yih Machinery Industry Co Ltd, Thomas Chou voiced, "Titan, Toyota, and Maruti Suzuki are our regular customers in India. Hence, it is opportune for us to participate in AMTEX 2016 in Delhi to make new contacts and meet the existing ones." The company develops advanced technologies continuously to serve its customers better. No doubt its latest machine designs make it easy to integrate automation, save more energy and reduce 30 times the noise, thereby, increase the tool lifespan by over 50 per cent. Evidencing this Lee shared, "Around 7 per cent of our annual budget is assigned to research and development (R&D)."

Chung-Hsin Electric Machinery Mfg Corp

Recognizing the importance of investing in R&D, Vice President, Chung-Hsin Electric Machinery Mfg Corp, Vincent Lin pointed out that the company parks around 3 per cent of its annual turnover in R&D. With an annual group revenue of US $400 million per year, it specializes in linear motor driving technology, manufactures gantry type 5-axis machining centers to meet the requirements of high-speed and high-precision machining.

Soumi Mitra
Editor-in-Chief
Vogel Business Media India
soumi.mitra@vogel.de

Source: VBMI



Taiwan's economy is robust and can be attributed largely to its dynamic technology sector.

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Expanding Beyond

Kao Fong Machinery Co Ltd (Kafo) (ONS Engineers – Indian representative)

Identifying the potential in the Indian market, Kafo caters to the automotive sector of the sub-continent with its high speed double column, horizontal and vertical machining centers. Currently with an annual turnover of US $69 million, around 45 per cent of its revenue comes from its export business. Regional Sales Director, Kao Fong Machinery Co Ltd, Johnstone Chen stated that to ensure the quality of accuracy and delivery time, the company processes the head units and key components themselves and even assembles electrical cabinets to enhance quality and stability. In this backdrop, Regional Sales Director, Kao Fong Machinery Co Ltd, Ricky Chang shared that the company invests around 20 per cent of its annual turnover on R&D.

Asia Pacific Elite Corp (Tongtai Group)

Established in 2001, the company, part of Tongtai Group, manufactures gantry type milling machines with linear motors and high precision 5-axis machining centers. Marketing & Sales Dept, Manager, Olivia Sung shared, "We believe in helping our customers achieve Total Cost of Ownership, which include costs related to everything from purchasing to safety, and hence we invest around 20 per cent of our annual turnover on R&D in this context."

Manford Machinery Co Ltd (S&T Engineers – Indian representative)

Manford has carved its name in manufacturing

"We are proud of our association with Indian customers. Till date we have sold 16 machines in India and look forward to strengthen our base in India through our participation in the IMTEX 2017 show."

President, Luren Precision Co Ltd, Chuck S D Chen

"We work closely with several universities and research institutes to nurture talent and encourage the young engineers to come up with innovative concepts."

Chairman, Goodway Machine Tools Group, Edward Yang

"We are participating in two Indian machine tool shows—ACMEE 2016 and IMTEX 2017—to promote our brand and reach out to more customers as we see immense potential the Indian market holds for us."

President, Honor Seiki Co Ltd, Charles Chen

"The Indian machine tool industry is service driven. The main challenge in selling Taiwanese machines in India is to provide timely service and availability of the manuals in the "English language."

Product Manager, (CNC Sales), Lubi Electronics, Ajay Patel

"Taiwanese machine builders offer very good machine quality at a reasonable price compared to their European peers. The return on investment is certainly faster with these machines."

Accuspirals,Managing Director, Bharat Jain

horizontal and double column machining centers worldwide. The Indian market is very important for the company as it contributes to 12 per cent of its export business. "Our agent in India—S&T Engineers—serves as a catalyst to connect with the Indian automotive and die & mould customers," said Sales Manager, Manford Machinery Co Ltd, Raoul Su. "We spend around 3 per cent of our revenue on R&D," voiced Vice General Manager, Manford Machinery Co Ltd, David Chiang.

Advantech-LNC Technology Co Ltd (ALNC) (Lubi Electronics – Indian representative)

With its high-end robot controllers, ALNC helps users to control multiple systems and multi-brand servomotors via EhterCAT by just one single ALNC controller in real-time. Director, Machine Control & Robotics, Advantech-LNC Technology Co Ltd, Eric Lee said that though the company largely serves the Chinese market, it also has a decent share of business coming from the Indian market through its Indian agent—Lubi Electronics. According to Product Manager (CNC Sales), Lubi Electronics, Ajay Patel, "The Indian machine tool sector is an emerging market, and Taiwan is looked upon as a good sourcing destination for several mechanical components."

Goodway Machine Tools Group

The company specializes in the manufacturing of multi-tasking turning, swiss turning, horizontal turning, vertical turning centers and CNC grinders. In this regard Vice President, Sales Dept, Goodway Machine Corp, Rebecca Hsieh shared, "Around 10 per cent of our machines are customized for major turnkey projects." The R&D investment is around 10 per cent of the company's annual turnover.

Honor Seiki Co Ltd (Tongtai Group) (S&T Engineers, Electronica and Intelmac - Indian representative)

Honor Seiki, part of the Tongtai Group, specializes in making vertical turning centers. President Assistant, Honor Seiki Co Ltd, Olivia Chen said, "Recently, we supplied our machine

Source: VBMI

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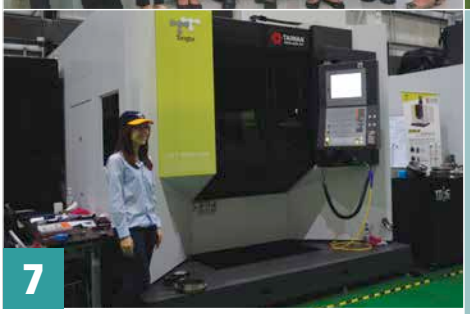

7

1. The Straight Side Direct Drive Servo Press produced by Seyi are environment-friendly and helps save energy up to 50 per cent and enhances productivity by 100 per cent.
2. Chung Hsin Electric & Machinery manufactured this linear-motor gantry machine. The company is one of the machine's users as it also does contract machining for aerospace sector.
3. Regional Sales Director, Kao Fong Machinery Co Ltd, Ricky Chang along with the engineers from ONS Engineers from India while inspecting a machine to be shipped to Maruti Suzuki India Ltd.
4. The group of international journalists at Asia Pacific Elite Corp (APEC) posed happily post tour of the shop floor with the staff members of TAITRA and APEC. Proud of aircraft machining Marketing & Sales Dept Manager, APEC, Olivia Sung (from left fifth) shared that in aerospace, the first machine sale to the customer is extremely difficult.
5. Sales Manager, Manford Machinery Co Ltd, Raoul Su at the company's Nantou plant showing a machine ready to be shipped to the customer.
6. Advantech-LNC Technology Co Ltd facilitates users to do the real-time control of multiple systems and multi-brand servomotors via EhterCAT just by one single ALNC Controller.
7. Assistant of Chairman, Tongtai Machine & Tool Co Ltd, Lin Yen elaborating the features of the iGT800-AM five-axis vertical machining center which is developed for aerospace, mold, and automotive parts machining.

Source: TAITRA

PERCENTAGE OF EXPORTS FROM TAIWAN MACHINE TOOLS (JAN – MAR 2016)

Rank	Country	2016 1-3		2016 1-3 / 2015 1-3 Change (%)
		Value	%	
1	China	173,364	27.3%	-27.7%
2	USA	74,163	11.7%	-16.8%
4	Germany	25,428	4.0%	-3.0%
8	India	20,609	3.2%	4.2%
9	Japan	19,178	3.0%	-25.6%
10	Korea	16,635	2.6%	-17.1%

**Only some of the markets are listed.* *(Unit): US$1,000*

to a Czech Republic company based in India—BONATRANS India Pvt Ltd (Aurangabad)." The company invests in R&D to the tune of 6 per cent of its annual turnover.

Tongtai Machine & Tool Co Ltd (Intelmac, Sree Yantra, Lokesh Machines – Indian representatives)

The company has recently developed an ultrasonic machining center to cut hard and brittle material. Assistant of Chairman, Chairman Office, Tongtai Machine & Tool Co Ltd, Lin Yen said, "We have a strong R&D team to solve as many machining problems as possible." As India is an important market for the company it looks forward eagerly to participate in IMTEX 2017.

Luren Precision Co Ltd (Essor Enterprises – Indian representative)

Similarly, Luren too awaits its participation in IMTEX 2017 as India is a major market for the company. Appreciating the service provided by Luren and its Indian representative, Essor Enterprises, Managing Director, Accuspirals, Bharat Jain one of Luren's customer in India shared, "Recently, we purchased our second machine—a gear grinding machine—from Luren & Essor."

"We invest around 9 per cent of our annual revenue in R&D and work closely with Tongtai University to develop advance technologies," mentioned President, Luren Precision Co Ltd & Vice-Chairman and President, National Defense and Aerospace Committee, Taiwan Association of Machinery Industry, Chuck S D Chen.

Road ahead

Competitively Taiwanese machine tool builders are well-placed with their strong R&D capabilities to develop new categories of machine tools and meeting the requirements of both traditional and emerging manufacturing industries with its comprehensive array of solutions. MMI

Leader's Speak

Executive Vice President, TAITRA, Simon Wang shares his views on how the organization facilitates machine tool companies in Taiwan to grow in the global market and the potential Indian market holds for them…

Initiatives for helping grow Taiwan machine tool companies globally

The machine tool industry is one of the most important industries of Taiwan. Hence, the Taiwanese government has put great effort in making sure that the development of industry clusters is effectively promoted and encouraged. TAITRA, being an organization that specializes in foreign trade promotion, has created a network within the Taiwan industry to successfully integrate resources and organizations so as to help Taiwanese companies compete in the world market.

▶ To offer assistance in marketing promotion

The four year Integrated Marketing Communications Project for the Taiwan Machine Tool Industry started in 2014 with the support of the government is being implemented by TAITRA. This covers various marketing strategies from exhibitions to press conferences, interviews, and seminars. This program targets Taiwan's major export markets for machine tools, such as China, Russia, Mexico, Japan, India, etc. We hope to build a niche for Taiwan-made machine tools. This year TAITRA will participate in nine major machine tool shows held in different parts of the world, such as ACMEE, IMTS, JIMTOF, AMB and Manufacturing/Machine Tool Indonesia.

Source: TAITRA

Executive Vice President, Taiwan External Trade Development Council (TAITRA), Simon Wang

▶ To assist talent cultivation

Taiwan is promoting the talent sourcing program called HiRecruit. Qualified candidates from major markets, such as Russia, Mexico, India, Iran, etc., are recruited, and Taiwanese companies joining this program are able to provide a short-term training for those who come to Taiwan. The candidates will eventually become the sales representatives of their respective Taiwanese companies in their own countries.

▶ To accelerate innovation

Facing fierce competition from China, the Taiwan machine tool industry needs to accelerate research and innovation to stay competitive. In this context, TAITRA collaborates with the Corporate Synergy Development Center (CSD) to conduct seminars every year that cover such issues as a regional marketing strategy to innovation. Furthermore, TAITRA is going to open a new department responsible for data-mining this year. The application of big-data will help TAITRA in predicting market trends and customer needs. We can take advantage of the valuable information, thus helping the Taiwan machine tool industry compete globally.

On the Indian market

Among the major manufacturing industries, automobile and aerospace are two sectors with the highest market possibility for Taiwan's machine tools. India is already one of the major markets for Taiwanies companies, and we are expecting to expand this footprint further in the future. Supported by the present Indian government's industrial policies, India is now keen to develop its infrastructure and manufacturing sector; subsequently, creating huge demands for building construction, transportation, automobile manufacturing, logistics, medical and energy industry. With the excellent quality and competitive pricing of Taiwan's mechanical equipment, we are very positive about the potential co-operation between India and Taiwan in the future.

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Source: ACMEE

Dignitaries at the ribbon cutting ceremony of ACMEE 2014.

ACMEE 2014 AT A GLANCE

Visitors: 45,600
Exhibitors: 450
Country participation: 25
Area covered: 18,000 sq mt

Latest Machine Tools at ACMEE 2016

With 465 participants from 25 countries, ACMEE 2016 is poised to be the best market place for machine tools and manufacturing technologies.

ACMEE 2016, the International Machine Tools Exhibition, will be held at the Chennai Trade Centre, Nandambakkam, Chennai from June 16–20, 2016. Many world leaders including AMS, Schunk, Mitsubishi Minerals, OSG, Makino, Dalian Machine Tool Group, Fanuc, Tsugami, Korloy, LMW, BFW, Jyoti, HMT, Tungaloy, Fagor, Mitutoyo, Losma and many more are participating in this show. Manufacturers from Japan, Taiwan, China, Germany are also participating in this expo in a big way.

Product coverage

Held once in two years, ACMEE 2016 will showcase various machines tools and technologies such as CNC, special purpose machines, industrial robotics and automation, material handling equipment, welding, hydraulic and pneumatic systems, tools, dies and moulds, fabrication, etc. A number of product launches and technologies dedicated towards improving productivity, cost reduction and energy saving for the Indian market is also slated to be launched at this show.

Concurrent with the show, the organizers

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Latest Machine Tools

Compiled by
Ahlam Rais
Senior Sub Editor
Vogel Business Media India
ahlam.rais@vogel.de

of this exhibition, Ambattur Industrial Estate Manufacturers Association, a premier industry association of the country is also undertaking numerous technical sessions and live demonstrations in order to make the event a successful one. For all those looking for the latest in machine tools, improving productivity, cost reduction and energy saving solutions, ACMEE 2016 becomes a show worth visiting! **MMI**

FACT SHEET

Name of the Event: ACMEE 2016 12th International Machine Tools Exhibition

Dates: June 16–20, 2016

Venue: Halls 1, 2, Convention Centre (Hall 3), Hall 4, Chennai Trade Centre Mount Poonamallee Road, Nandambakkam, Chennai – 600 089, India

Participating Countries: India, China, Czech, France, Germany, Italy, Japan, Korea, Spain, Switzerland, Taiwan, Thailand, UK, USA

Product Coverage: CNC machines, CNC & PLC controls, CAD / CAM systems, Special purpose machines, co-ordinate measuring machines, cutting tools and accessories, hydraulics, pneumatics, instrumentation, low cost automation, material handling systems, power tools, testing & measuring equipment, welding, industrial robotics, energy saving solutions, related it and consultancy services.

Entry: Open to business visitors only

Registration Online: www.acmee.in

Concurrent Events: Product presentations, technical sessions, social evenings

Organizers: Ambattur Industrial Estate Manufacturers Association (AIEMA) Ground Floor, SIDCO AIEMA Tower, 1st Main Road, Ambattur Industrial Estate, Chennai–600 058.

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Website: www.acmee.in

FARO's New HDR Laser Scanners

FARO Technologies Inc has announced the release of new 3D laser scanners with high dynamic range photography (HDR) that produce incredibly detailed images in bright and dark lighting conditions as well as increased resolution for superior color depth. Also launching is a major release, version 6, of FAROs well-known point cloud software, SCENE, which now provides instant rendering of scan data and simplified workflows. Historically, 3D laser scanning of scenes with large brightness contrast differences has been a challenge. The new Focus3D X 130/330 HDR models provide the solution to this challenge with performance that is comparable to the human eye.

▸ **FARO Business Technologies India Pvt Ltd**
T: +91 (011) 46465664, E: india@faro.com
www.faro.com

WFL's new M200 MILLTURN

Large turning-drilling-milling centres for the complete processing of complex and high-precision workpieces has been a speciality of WFL for three decades now. With the new M200 MILLTURN, workpiece dimensions have now taken on gigantic proportions! This completely new machine is ideally suited for both heavy machining and high-precision finishing. With this in mind, the machine is constructed in a variety of turning lengths and centre distances, enabling it to process workpieces up to 2 meters in diameter, up to 14 metres in length and up to 60 ton in weight.

▸ **WFL Millturn Technologies GmbH & Co. KG**
T: +43 (0) 732 6913 74612, E: sste@wfl.at
www.wfl.at

LVD Adds New Smart Drawing

LVD Company nv has added a new module to its CADMAN Suite of programming and shop management software. CADMAN-SDI (Smart Drawing Importer) simplifies 2D and 3D CAD file import and calculation of cost drivers so that users can quickly and accurately create job estimates. It features an integrated 3D CAD package used to check or correct imported files. CADMAN-SDI adds yet more functionality to the integrated suite of database-driven CADMAN products designed to help users optimize programming and maximize throughput in the workshop.

▸ **LVD Company nv**
T: +32 (56) 430511, E: kvcl@lvd.be
www.lvdgroup.com

SLTL's Future X Laser Cutting Machine

Sahajanand Laser Technology Ltd's Future X is high on its factor X. With its matchless reflexes, Future X tends to execute tasks quickly, intelligently and also opens the gateway of vast possibilities. The cost-effective system with up to 4 KW fiber laser brilliantly cuts mild steel, stainless steel, aluminum, brass, copper, titanium, coated and textured metal sheets. The fiber laser machine can save as much as 57 per cent of operating costs as compared to the CO_2 machines. Linear motor drive with rigid gantry structure generates 3G acceleration, backed with dynamic edge control that makes the Future X model marvelously effective.

▸ **Sahajanand Laser Technology Ltd**
T: +91 (0) 7923287461, E: mkt.mgr@sltl.com
www.sltl.com

AKD-N Decentralized Servo Drive

The decentralized drive system consists of a central power supply and robust IP67 rated servo drives, which are placed nearby the motor. The system offers everything that is needed for the next generation of machine design and removes everything that hinders the simplicity. Power supply as well as safety and fieldbus communication are combined in one single hybrid cable of only 11 mm in diameter. On the motor side there is also only one cable needed for power, brake control and feedback. Altogether leads to cable savings in the machine of more than 80 per cent. The drives cover a power range up to 4 kW.

▸ **KOLLMORGEN India**
T: +91 (022) 61880200, www.kollmorgen.com

TaeguTec's H-Drill NHD

TaeguTec has introduced a new solid carbide drill—the NHD Drill—that is all set to outperform existing SHD and SHO drills. The new H-Drill NHD's optimized cutting edges are designed for improved drilling stability while its sharp straight cutting edges, with precise web thinning, generates low cutting force and excellent self-centering capability for higher hole accuracy. Furthermore, in order for the NHD to evacuate chips smoothly, TaeguTec has designed the new addition to the drilling family with polished flutes and a wide chip gullet. Solid carbide drills are designed to enhance the tool life for most materials including high alloy and stainless steel due to high hardness and thermal conductivity.

▸ **TaeguTec India P Ltd**
T: +91 (080) 27839111, E: sales@taegutec-india.com
www.taegutec-india.com

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Gold Lion Motion Controllers

Elmo's GOLD LION multi axis controller is perfect for ruggedized applications operating in extreme and harsh environments requiring maximum performance. Complete integration of the Gold Lion with Elmo's advanced servo drives is extremely fast and simple, making it one of the best performing, highest reliability multi axis systems in the market. The GOLD LION high speed compliant EtherCAT network is fast, deterministic with high communication reliability, and superior telemetry capabilities that are essential in military solutions. The fast-real time deterministic operation of the GOLD LION over the EtherCAT network perfectly harmonizes with Elmo's ExtrIQ servo drives within the system.

▸ **Elmo Motion Control Ltd**
T: +972 (3) 9292374, E: leem@elmomc.com
www.elmomc.com

New Generation Cutting Fluid

Zavenir Daubert has recently introduced HAKUFLUID, a new generation cooling lubricant, which combines the benefits of neat oils with those of water soluble cutting fluids. These non-flammable water based (100 per cent oil free) fluids allow better lubrication & tool life than neat oils without any misting problems. The viscosity is variable so that process conditions can be optimized for a wide variety of applications (grinding to broaching) and metallurgies with the additional benefit of extremely low consumption of the lubrication.

▸ **Zavenir Daubert India Pvt Ltd**
T: +91 (0124) 4981000, E: marketing@zavenir.com
www.zavenir.com

Port Crane Application

The crane at the DB Port Szczecin container terminal has undergone a thorough electrical and mechanical refit. As part of the electrical overhaul, Apator Control used systems from the company Control Techniques: Unidrive M AC and Mentor MP DC drives controlled by the Simatic S7 Programmable Logic Controller (PLC). The bridge travel, trolley travel and spreader lift were given new drives, while the remaining electrical systems were integrated for operation through the PLC. The bridge travel's eight 22 kW motors are powered and controlled by the Unidrive M600 frequency converter, which has a rated current of 377 A.

▸ **Emerson Industrial Automation**
T: +91 (044) 66918400, E: IndustrialAutomation@Emerson.com
www.emersonindustrial.com

New two-stage helical bevel gearboxes

NORD Drivesystems expands its latest series of slim two-stage helical bevel gearboxes, adding a new smaller unit for output torques up to 50 Nm. Highly efficient helical bevel type units now complement the line-up of worm gearboxes that is already available for small loads. Thanks to superior manufacturing quality standards, the gear units are highly resilient and withstand large forces on the output shaft. The short-term overload tolerance is 275 per cent, which leaves enough time for the motor protection to kick in. Mechanical blockages do not cause damage, but the drive can start right up again without service interruption.

▸ **NORD Drivesystems Pvt Ltd**
T: +91 (0) 9765490890, E: jyoti.mishra@nord.com
www.nord.com

New Gouging Shield

Hypertherm is now offering a new gouging shield for people wanting even greater control when gouging with Powermax air plasma systems. This new Max Control gouging shield is designed for jobs in which the operator needs to remove a very precise amount of metal. The tip of the shield is engineered and machined in a way that allows the operator to create a very shallow gouging profile. The introduction of the Max Control gouging shield expands the offerings of Powermax gouging consumables which includes the existing Max Removal Gouging shield and HyAccess extended gouging consumables.

▸ **Hypertherm (India) Thermal Cutting Pvt Ltd**
T: +91 (011) 40521201/2/3
www.hypertherm.com

Machined and Bore Plates

The machined plate capacity is 1000 mm x 2000 mm and the standard plates of mold bases are available. High quality raw material such as MS Plates, C-45 plates are available in stock, with thickness ranging from 16 mm–250 mm. Ashna Enterprise also provides material in P-20 – of various grades, .i.e., 2311, 2738, high hardened, etc., as per customer's specification. It also provides multi cavity bore plates. To attain high quality and precision, the company has an in-house tool room and highly motivated team to understand its customer's needs. It is also well equipped with five conventional milling machines, five VMC machines, six surface grinders, lathe machines, etc.

▸ **Ashna Enterprise**
T: +91 (0250) 2450407, E: sales@ashnaent.com
www.ashnaent.com

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EDITORIAL STAFF
Editor-in-Chief: **Soumi Mitra**
soumi.mitra@vogel.de

Deputy Editor: **Nedra Pereira**
nedra.pereira@vogel.de

Senior Sub Editor: **Ahlam Rais**
ahlam.rais@vogel.de

Manager, Creative & Production: **Shanmugam Pillai**
shanmugum.pillai@vogel.de

SALES & MARKETING
General Manager: **Dinesh Mishra**
Tel.+91(0)22 25644469, Mob.+91 9833076669, dinesh.mishra@vogel.de

Deputy General Manager: **Preeti Mishra**
Tel.+91(0)22 25644469, Mob.+91 9820488203, preeti.mishra@vogel.de

Advertising Services, Technical: **Shanmugam Pillai**
Tel. +91 (0)22 25644469, shanmugum.pillai@vogel.de

ADMINISTRATION
Office Manager: **Kruti Bharadva**
kruti.bharadva@vogel.de
Admin Officer: **Ekta Jagasia**
ekta.jagasia@vogel.de

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HEADQUARTERS GERMANY

EDITORIAL STAFF
Group Publisher: **Hans-Jürgen Kuntze**
hans-juergen.kuntze@vogel.de
Editor-in-Chief: **Frank Jablonski (MM)**
frank.jablonski@vogel.de
Editor-in-Chief: **Barbara Schulz (ETMM)**
barbara.schulz@vogel.de

SALES & MARKETING
Head of Sales: **Winfried Burkard**
winfried.burkard@vogel.de
Sales Manager: **Karin Grimm**
karin.grimm@vogel.de

CO-OPERATION PARTNERS:
INDIAN MACHINE TOOL MANUFACTURERS' ASSOCIATION (IMTMA), BENGALURU
Director General: **V Anbu**
Senior Director: **Balasubramanian** bala@imtma.in
GARDNER BUSINESS MEDIA, CINCINNATI, USA
President: **Rick Kline, Sr.**
Publisher: **Travis J. Egan**
Chief Editor: **Mark Albert** malbert@mmsonline.com

PUBLISHER
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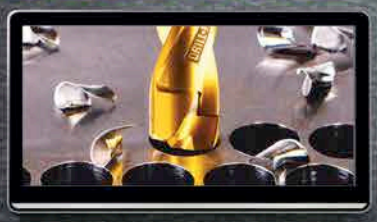

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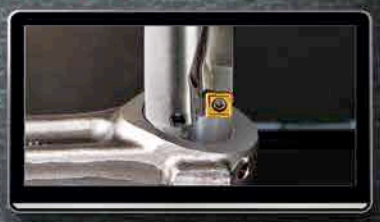

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Plot Nos.119 & 120, Bommasandra Industrial Area, Phase 4, Bengaluru 560 099, India

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