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THE MACHINIST

ULTIMATE GUIDE TO PROFITABLE MANUFACTURING

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INTERVIEW
USHERING INDUSTRY 4.0

CASE STUDY
OLD WAYS FOR A BETTER FUTURE

CONSTRUCTION EQUIPMENT
GST TO REDUCE COST

HUMAN RESOURCES
PUTTING 'PEOPLE' FIRST

VIBRANT VETERAN

Rajan Nanda, Chairman & Managing Director, Escorts Limited, honoured with Hall of Fame at The Machinist Global Manufacturing Summit 2016

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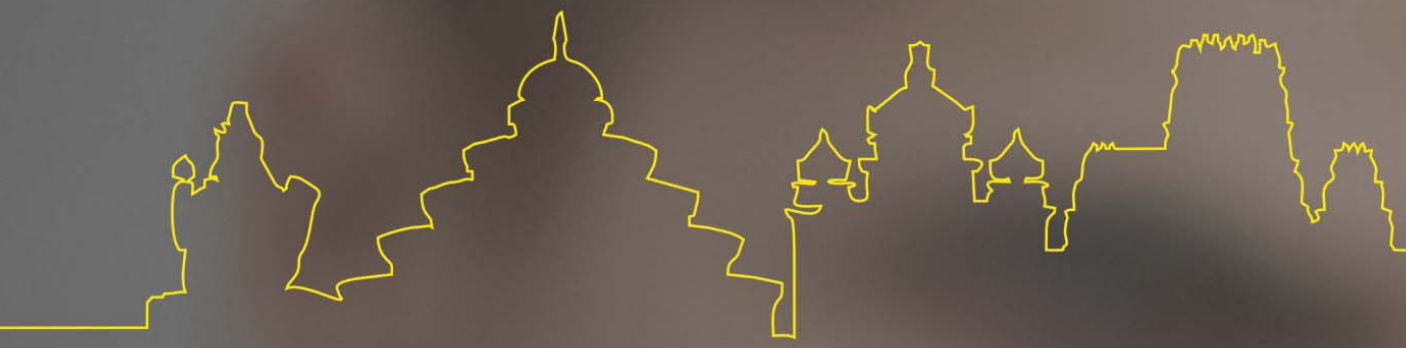

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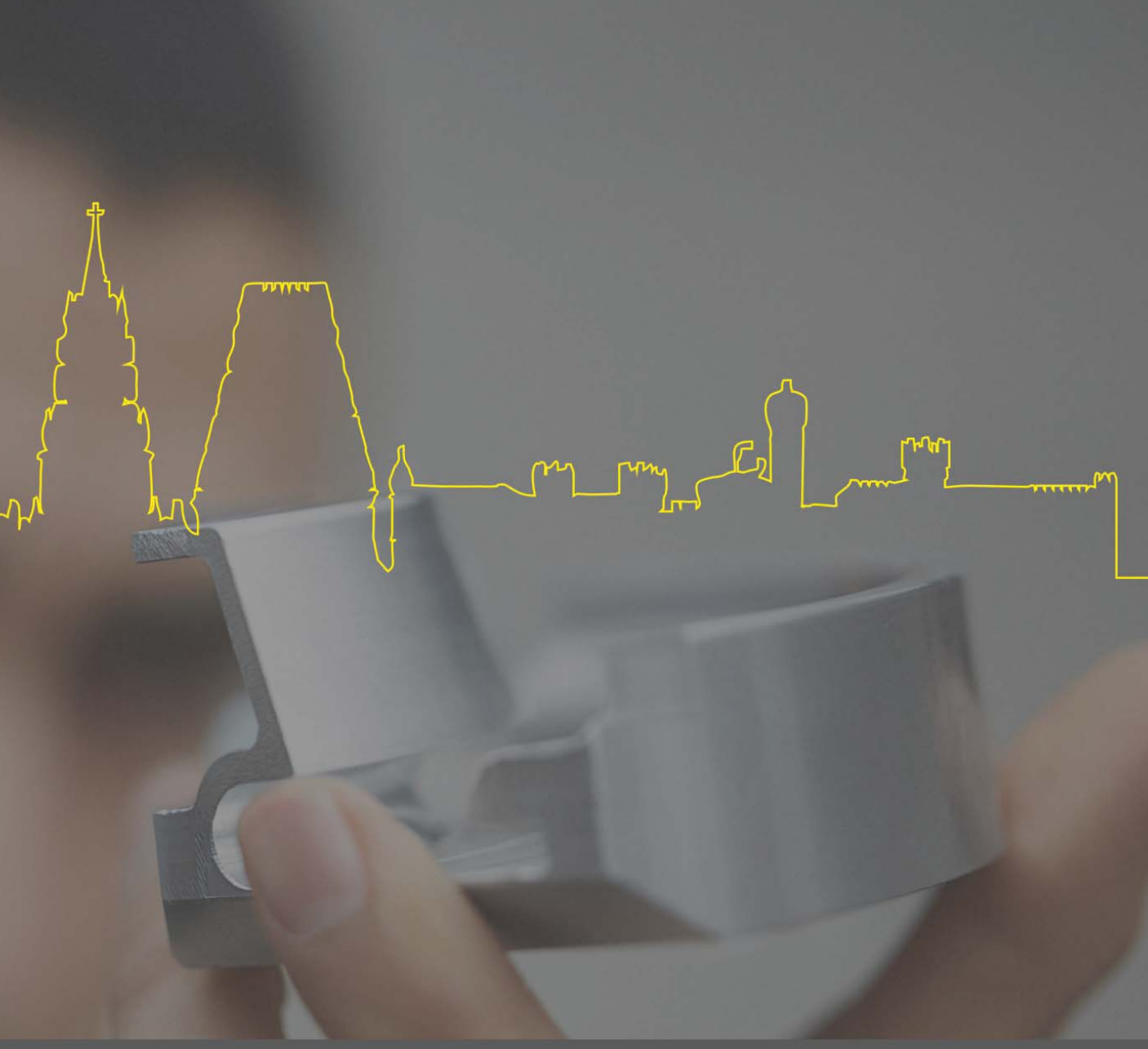

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Living legends

There is a Native American saying that reads - "Honour your elders. For they have the wisdom to teach what we have not learned yet." Youth is probably the biggest demographic advantage that India holds when compared to the developed or other developing countries. Yes, young people surely are an enormous asset to our nation. And rightly so, governments and organisations are focusing on training, educating and empowering them.

However, in this youthful quest for future, we tend to sometimes forget the endeavours of the older generation that has contributed immensely in giving us a robust foundation. While many of these vibrant veterans are still young at heart and are still quite actively involved in nation building, many times the young ones get precedence over them.

True, we need fresh graduates and young engineers to turn to the manufacturing profession but is it right to dismiss or overlook those 'oldies'

"AT A TIME WHEN MANUFACTURING WASN'T CONSIDERED TO BE THE 'IN' THING, SOME OF THEM STRIVED AND BROUGHT REPUTE TO THIS INDUSTRY."

who have given their years to bring the industry to where it stands today? Do the young ones not require 'real' role models? This was also one of the thoughts in our minds while instituting the 'The Machinist Hall of Fame'. The objective is to honour and recognise the work of industry leaders who have spent most of their lives in literally creating and developing Indian manufacturing.

At a time when manufacturing wasn't considered to be the 'in' thing, some of them strived and brought repute to this industry. Their excellent entrepreneurial skills and leadership abilities have resulted in Indian organisations today becoming manufacturing brand par excellence in the global arena across sectors. Indeed, they are the living legends and role models for manufacturing excellence. It is with this spirit that we honoured Shri Rajan Nanda, Chairman & Managing Director, Escorts Limited, with 'The Machinist Hall of Fame 2016'. For your enormous contribution to Indian manufacturing, thank you sir.

Editor & Chief Community Officer

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Israel committed for 'Make in India'

SPEAKING at the 'Roundtable on Indo-Israel Cooperation in Defence & Homeland Security', organised by FICCI, Brig. Gen. (Retd) Mishel Ben Baruch, Director, SIBAT, Ministry of Defence, Israel, observed that the meeting was a historic event for India-Israel collaboration in Defence and Homeland Security, and an opportunity to find ways to enhance cooperation between India and Israel in these areas.

Referring to the address of the President of Israel, Brig Gen Baruch highlighted that Israel is committed for 'Make in India and Make with India' in security domain. He underlined three core competencies of Israel to cope up with neighbours; spirit of people to be united, technological solutions to the problems and friendly countries like India, which also face same cross-border threats from un-friendly neighbourhood, just like Israel.

"We are willing to cooperate with India and transfer technologies through partnership with Indian companies. SIBAT and Ministry of Defence of Israel are committed for long term relationship with India," he said.

India becomes Associate Member of CERN

INDIA AND EUROPEAN Organization for Nuclear Research (CERN) signed an agreement yesterday making India an Associate Member State of CERN. This follows CERN Council's adoption of the resolution to this effect on September 15, 2016. The agreement was signed by Dr. Sekhar Basu, Chairman, Atomic Energy Commission and Secretary, Department of Atomic Energy and CERN Director General Dr. Fabiola Gianotti in Mumbai.

In recognition of most significant contributions, in 2003, India was awarded the Observer status of CERN, and subsequently invited to join CERN as an Associate Member. Last year, the Indian Cabinet gave its approval following which the CERN Council has accepted India as an Associate member.

India-Russia sign MoU for modernisation of railways

A PROTOCOL has been signed between Ministry of Railways and Russian Railways under co-operation Memorandum of Understanding (MoU) between both the Countries. The protocol covers technical and execution study for upgradation of the speed of passenger trains up to 200 kmph on existing Nagpur-Secunderabad corridor of Indian Railways. A MoU has been signed between the Ministry of Railways of the Republic of India and the Joint Stock Company "Russian Railways" for Technical Cooperation in the Railway Sector wherein modernisation of existing lines of Indian Railways in order to raise train speeds up to 160-200 kmph is one of the cooperation areas. Mumbai-Ahmedabad High Speed Rail Project is the only sanctioned High Speed project in India. The Project is approved for implementation with Financial assistance of Government of Japan upto the extent of 81 percent of the project cost of approximately Rs.98000 crore. The target for completion is 2023.

Godrej enters non-metallic side of aerospace industry

GODREJ & BOYCE has inaugurated a new facility, which will help the company in entering into the non-metallic side of the aerospace industry. This will enable Godrej & Boyce to manufacture more value added assemblies and systems. The new facility will manufacture rubber and composite components such as Ablative lining for Solid Motor Casings, Reinforced Airframe Seals, Conductive Seals, EFI/RFI Shielded

Seals, Aero-engine components, Composite motor casing, Sandwich panels (honeycomb / foam, Ceramic Matrix Composite (CMC) Sic-Sic, NOBBED and other High-temp Aero-engine parts.

In defence, Godrej & Boyce also manufactures Riveted structures, Tankages, Engines for IGMT 5 missile programme and Actuators for Aircrafts. The company has also significantly contributed towards the famed Prithvi Missile, which uses a liquid engine.

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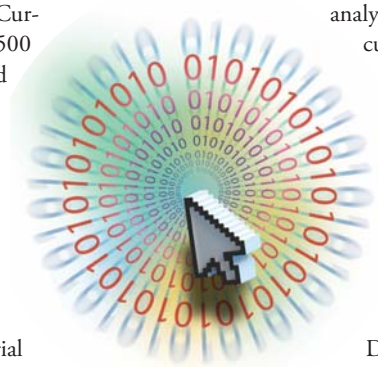
GE opens a digital hub in Bengaluru

GE has opened its largest Digital Hub in Bengaluru. Currently employing 1,500 highly skilled IT and software professionals, GE Digital's Hub in India will create an additional 1,000 technology positions. This new location will deliver world-class solutions for the Industrial Internet of Things (IIoT) for GE's customers, making it easier for industrial companies to execute a strategic digital transformation to drive internal productivity.



The Digital Hub is a center for co-creating industrial software and analytics solutions with customers and GE experts, aimed at solving complex business problems. At the center of this collaboration is Predix, GE's distributed operating system built for the industrial world. Demonstrating the strength of the platform, Predix helps customers harness the power of the Industrial Internet and contribute significantly to GE's goal of achieving USD 1 billion in productivity by 2020.

Tata Steel opens a Ferro-chrome plant

CHIEF MINISTER of Odisha Naveen Patnaik inaugurated the 55,000 tonne per annum (TPA) Ferro-chrome plant set up by Tata Steel in the company's Gopalpur Industrial Park in Ganjam district of Odisha. It is yet another testimony to Tata Steel's commitment for the development of the state of Odisha.

The Ferro-chrome plant at Gopalpur is an environment-friendly plant with state-of-the-art pollution control equipment and technology such as the ETP (Effluent Treatment Plant) & STP (Sewage Treatment Plant). It has 100 percent water harvesting facility that caters to most of the water needs of the plant. It has an indigenously built semi-closed hybrid furnace, which is first of its kind in India and components procured from all over the world to maintain high standards of quality and safety. Also, it is the first plant in India to use briquetting method of Chrome ore fines agglomeration.

Capacity addition progressing at 12 major ports

GOVERNMENT has set a target of 100 MTPA for capacity addition at 12 Major Ports for the year 2016-17. This will be achieved by completing 29 projects with an investment of Rs. 4,815 crore. The capacity addition in Major Ports for the year 2015-16 was 93.84 MTPA against the target of 92.81 MTPA. Total 33 projects are proposed to be awarded during 2016-17 in Major Ports with an investment of Rs. 9,845 crore in addition to the above projects.

Cheap Chinese imports hurting Indian MSMEs

INDIAN MICRO, Small and Medium Enterprises (MSMEs) are facing tough competition from cheap Chinese products and it is evident from the high growth of India's imports from China.

As per information compiled from the data provided by Director General of Commercial Intelligence & Statistics, Imports in respect of 11 major product groups, largely manufactured by MSMEs in India, have grown from China at a higher rate than their respective imports from all Countries combined during 2012-13 to 2015-16.

As these 11 product groups accounted for 74 percent of India's total imports from China in 2015-16, a significant proportion of Indian MSMEs seem to be adversely affected from Chinese imports as compared to the rest of the World. These product groups pertain to Electrical and Electronics, Mechanical and Metallurgical products on the one hand and Chemical, Glass & Ceramics based products on the other.

Indian Railways exploring Maglev trains

INDIAN RAILWAYS has floated an Expression of Interest (EOI) for designing, building, commissioning, operation, running and maintenance of levitation (Maglev) based train system on Public Private Partnership (PPP) basis.

The Railway route for this project has not been defined at such an early stage of the project since the initial thrust is on developing and implementing a cost effective solution of such a technology.

While floating the EOI, it is envisaged that the execution and funding pattern of this project will be on PPP basis.

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A list of key events happening between December 2016 to September 2017, both nationally and internationally.

Plastivision India 2017
January 19-23, 2017,
Mumbai
www.plastivision.org

IMTEX 2017
January 26-February 1, 2017,
Bangalore
www.imtex.in

CONEXPO-CON/ AGG
March 7-11, 2017
Las Vegas, NV (US)
www.conexpoconagg.com

TIMTOS
March7–12, 2017
Taipei (Taiwan)
www.timtos.com.tw

Automotive Engineering Show
March 21-23,2017
New Delhi
www.aes-show.com

ACMA Automechanika New Delhi 2017
March 21-24, 2017
New Delhi
http://acma-automechanika-newdelhi.in.messefrankfurt.com/newdelhi/en/exhibitors/welcome.html

ProMat 2017
April 3-6, 2017
Chicago, (US)
www.promatshow.com

AMTEX 2017
April 12-15, 2017
Mumbai
www.amtex-expo.com

Hannover Messe
April 24–28, 2017
Hannover (Germany)
www.hannovermesse.de

INTEC 2017
June 1-5, 2017
Codissia Trade Fair Complex, Coimbatore
www.intec.codissia.com

Delhi Machine Tool Expo
August 10-13, 2017
New Delhi
www.mtx.co.in

EMO Hannover
September 18-23, 2017
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Tata Hitachi displays its equipment at IMME

Tata Hitachi Construction Machinery showcased best of its technological prowess at IMME. Speaking at the event, Sandeep Singh, MD, Tata Hitachi said, "At IMME, we are demonstrating our unmatched strength in Mining by showcasing our Hydraulic excavators: EX1200V, ZX870H, ZX650, ZX470H (Backhoe), ZX470H (Shovel) & the Wheel Loader ZW220. We are also launching our ZAXIS470 Shovel variant. Along with this, our support pavilion showcases CONSITE, the Training Simulator, the FMC Pavilion, the WENCO demonstration, attachments, spares

Mr. Amit Mitra, State Finance Minister with Mr. Sandeep Singh MD Tata Hitachi at TATA HITACHI stall at IMME 2016

support counter and the new Hitachi GET's designed and developed by Hitachi for the Ultra Large Class of excavators." Though the upgrading of technology has improved efficiency of equipment, it has been found that many a times the operator needs to be trained to update his skills to optimise machine usage. Tata Hitachi has set up Skill Development Centers and Operator Training Schools at Kharagpur and Dharwad.

SANY India forays into mining segment

SANY India, a leading manufacturer of construction, heavy machinery and renewable equipment, has announced its foray into the mining segment at the International Mining & Machinery Exhibition (IMME) 2016, held in Kolkata. The SRT55D Dump Truck was launched in the presence of one of the Top 5 SANY customers in the Southern region. The company also launched its SRT range of off-highway dump trucks in India. The new mining business unit will be headed by Dheeraj Panda, who is the BU Head and VP of Excavator at SANY India. SANY's SRT series trucks are largely used in large surface mining sites for transportation of OB, coal, iron ore, limestone, bauxite, etc and in quarry segment. The trucks are equipped with high-strength frame and are 20 percent stronger than any other product in the same category. It has a gross horsepower of 480kW, 650HP@1800rpm and a payload capacity of 60 U.S tons (55 metric tons). SANY off-highway mining trucks are known for its high safety, reliability, durability, comfort and cost effectiveness. Deepak Garg, CEO, SANY Heavy Industries Pvt. Ltd., said, "With our foray into mining segment, we want to set new benchmarks for SANY India. SANY India will offer complete mining solutions and partner with big mining companies for end-to-end solutions. SANY has shown its commitment to the Indian market by announcing various investments across the country and is currently gearing up to realize this vision globally".

Liebherr to showcase latest equipment at Bauma Conexpo India 2016

At Bauma Conexpo India 2016 Liebherr plans to showcase wheel loaders as well as mobile and tower cranes. As a world premiere, Liebherr will display a series of top-slewing tower cranes in a flattop design: The new NC-B cranes. The development of the NC-B series was a specific response to the requirements in congested urban areas of emerging countries. The Liebherr mobile crane LTM 1250-5.1, which will be on display in Delhi is one of the most powerful mobile cranes on 5 axles on the market.

Additionally, at the trade fair, Liebherr is presenting the wheel loaders L 550 and L 580, two models representing the expanded wheel loader product range for the Indian market. The company manufactures these wheel loaders in Dalian, (P. R. China), in close cooperation with the wheel loader competence centre in Bischofshofen (Austria).

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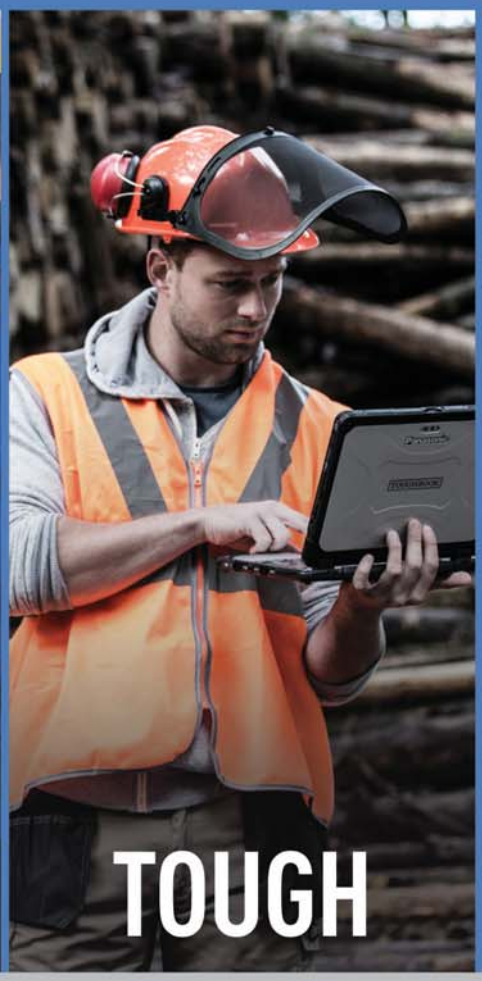

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Volvo CE to launch single-drum compactor

Volvo Construction Equipment will reinforce its strength in road-building with the introduction of the new SD110BA at bC India 2016. The new unit encapsulates the skills and knowledge gained from decades of working in India to deliver a new category-leader. The updated SD110BA single-drum compactor from Volvo CE is designed with productivity in mind, combining powerful performance, quality compaction and versatility to adapt to earthwork compaction applications in India. Utilizing extensive knowledge of India's paving and compaction industry, the next generation compactor is specifically manufactured to place and compact mixed soils, crushed aggregates and base materials beneath flexible pavements capable of accommodating heavy traffic volumes. And, boasting an impressive range of productivity-enhancing features, the Volvo SD110BA ensures profit in every pass.

The robust Volvo SD110BA provides equal measures of efficiency, versatility and stability to ensure superior compaction, shift after shift. Delivering an efficient, powerful performance, the 11-ton class SD110BA combines dynamic drum forces and a heavy drum weight to produce the energy necessary to achieve material target density in fewer passes. With the highest centrifugal force in its class, the SD110BA delivers unmatched performance, ease of operation and outstanding output.

Komatsu opens Asia Training & Demonstration Center in Thailand

Komatsu Ltd has recently opened the Asia Training & Demonstration Center in Thailand to reinforce its training capability for distributors in Asia. In November this year, Komatsu began training there.

The company has a network of 13 distributors in 20 countries of Asia. As part of strengthening Asian business in its mid-range management plan launched in the current fiscal year, Komatsu is adding to its powerful support for distributors' human resource development in order to further reinforce its business foundation for the future, and therefore opened the Center for Asian distributors. Located in Chachoengsao Province, about 60km east of Bangkok, the Center occupies an area of about 77,000 m2. The Center offers a variety of training programs, such as for sales, parts, service, and machine operation, needed for distributors of Komatsu construction equipment and forklift trucks.

BEML participates in the mining exhibition

BEML Ltd a Public Sector Company under the Ministry of Defence and a premier indigenous manufacturer of earthmoving equipment over five decades, participated in the International Mining & Machinery Exhibition and Global Mining Summit which was held at Eco Park, Kolkata.

Dr. Amit Mitra, Hon'ble Minister-in-Charge of Finance, Excise, Commerce & Industries, Public Enterprise, Industrial Reconstruction inaugurated BEML Stall at the Exhibition venue in the presence of Deepak Kumar Hota, CMD and BR Viswanatha, Director (Mining & Construction), BEML. At the exhibition, BEML focused on mining equipment showcasing its higher capacity Dumpers, Dozers and Excavators. BEML equipment are known for self-reliance, higher productivity, user-friendly and popular in the mining industry. Being a leader in the segment, BEML's mining machinery are fully indigenised and robust with improved versions. With its state-of-the-art R&D establishment, BEML has been launching several improvised equipment over the years.

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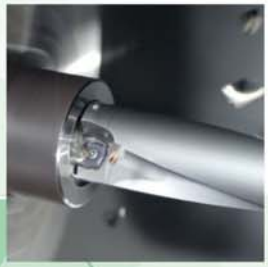

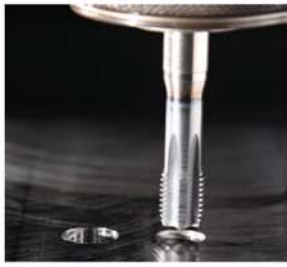

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Addressing **one-piece demand!**

Mercedes-Benz Trucks is using 3D printing to produce truck spare parts economically and with fast production even with small quantities.

Genuine spare parts for Mercedes-Benz trucks which are ordered and delivered even after many years; in the Mercedes-Benz Trucks after-sales service this has already been reality for a long time now. As the next step, Mercedes-Benz Trucks is using the latest 3D printing processes for plastic spare parts as the standard production method in the Customer Services & Parts sector. As of September already, 30 genuine spare parts can be ordered and supplied at the press of a button from the 3D printer, quickly, economically, in any quantity and always in consistent genuine manufacturer's quality ('one-piece demand').

With the use of 3D printing technology as an innovative state-of-the-art production process in after-sales, Mercedes-Benz is taking on the pioneering role and technological leadership among the global truck producers. "In keeping with our brand promise 'Trucks you can trust', we set the same benchmarks for reliability, functionality, durability and economy for spare parts from 3D production as for parts from conventional production," says Andreas Deuschle, Head of Marketing & Operations in the Customer Services & Parts Mercedes-Benz Trucks Division. "However, 3D offers many more possibilities; this is why we shall be rapidly extending the production of 3D printed parts."

Mercedes-Benz Trucks already successfully produces 30 spare parts with the latest 3D SLS printing processes.

Covers, spacers, spring caps, air and cable ducts, clamps, mountings and control elements are just a few examples of economical spare part production in top quality made possible by using the 3D printing process.

Highest 3D quality

Today at Daimler more than 100,000 printed prototype parts are manufactured for the individual company divisions every year. "We benefit from our extensive experience at Daimler with 3D printing processes in prototype construction," comments Andreas Deuschle. The available spare parts consist of high-quality plastic components. Covers, spacers, spring caps, air and cable ducts, clamps, mountings and control elements are just a few examples of economical spare part production in top quality made possible by using the 3D printing process.

The "printed" spare parts are created with state-of-the-art 3D printers based on the Selective Laser Sintering (SLS) printing process. The process parameters have been optimised and determined by the Daimler research and development divisions. Every 3D spare part can be ordered using the special spare part number under which it is recorded in the order code lists and the spare parts catalogues at Mercedes-Benz Trucks. Thus, even after several decades, rapid supply to the customer is ensured via the Mercedes-Benz Logistic Supply Chain through all the sales stages – all over the world.

Advantages through secure supply

The challenge in the spare parts business lies in securing supply even for model series which are no longer produced. This means that the range also includes spare parts for which there is only a low demand in small quantities every year. Producing them is thus increasingly uneconomical for suppliers – production facilities and tools have to be retained and maintained for years. These challenges are now thing of the past as every 3D spare part is available on demand at short notice.

The printing itself can take place within a short time following receipt of the design definition and order, considerably speeding up the production and supply of spare parts. As spare and retrofit parts can still easily be 'reprinted' even after a long time using the data stored and supplied without any complex stocking, no warehousing is required either. At the same time the burden on costs, resources and the environment is also eased, as there are no material surpluses, the disposal of which is very complex.

Source: Mercedes-Benz

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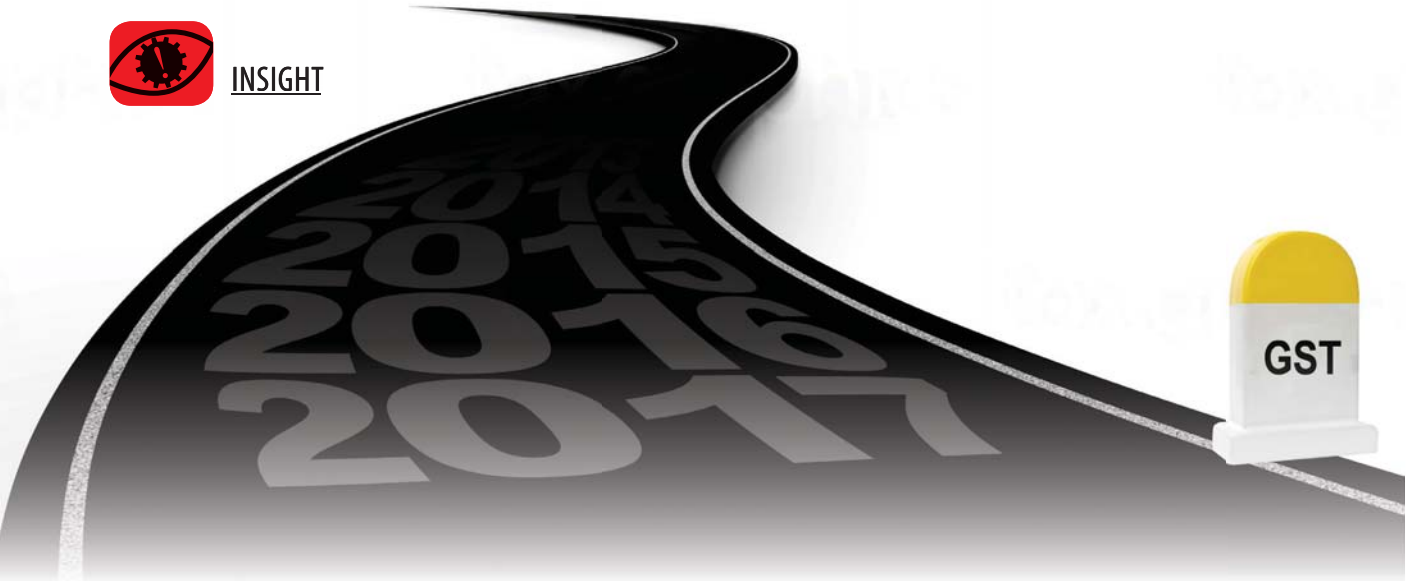

New year, **new hopes**

The year 2016 has been satisfying for the industry. However, the industry is optimistic about the time to come and ready embrace GST.

By Swati Deshpande

After the sluggish business environment faced in the previous year, the industry seems to be satisfied with its performance in 2016. Speaking on the same Tarang Jain, Managing Director, Varroc Group says, "2016 was a turning point for the Indian automotive industry as we saw signs of a sustainable revival in demand for the first time in five years." Seconding the same, D C Sharma, Group Chief Financial Officer, Minda Corporation says, "I am quite pleased to say that we exceeded our internal business targets, both in terms of the operational and financial performance. For six month ending September 2016, the consolidated topline grew by 29.1 perecent y-o-y to Rs. 1,477 crore and our operating profit expanded by 29.2 percent y-o-y to Rs. 147 crore. This growth was broad based across all the business divisions, including wiring harness, safety and security business and after-market."

"In India cross selling of our diverse portfolio to our key growth customers is yielding good results. The negative effects of demonetisation in the current quarter and the implementation of GST may dampen results a bit towards the end of the year, however, overall our strategy seems to be paying off."

Tarang Jain, Managing Director, Varroc Group

Racold Thermo as well registered a double digit growth in the year. Speaking on the same, Anil Bhamre, Head- Marketing, Racold Thermo notes, "The year 2016 was full of challenging opportunities for us. Our industry is still at a very nascent stage in terms of penetration compared to other consumer durable goods. We continue to focus on innovation, people, distribution, reach and consumer insights which have helped us at a double digit growth in 2016."

For Varroc Group, 2016 was a great year for business growth and the company may reach a milestone of INR 100 Billion this financial year. "Our international exterior lighting business continued it's momentum from last year and our Indian businesses have benefited from the market revival in India. Some of our key customers continue to outperform the market both in India and abroad resulting in sustained growth. The shift in exterior lighting technologies to LED for headlamps have favoured our technology strategy to position affordable LED headlamps as a viable alternative to Xenon

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lamps," Jain shares.

Effects of demonetisation

"Recent demonetisation drive by Government has become an alarming challenge for the automotive industry in the short term. The overall automotive sales volumes are expected to be adversely impacted on the account of demonetisation in the third and fourth quarter of FY2016-17. Impact is likely to be seen across segments including two wheelers, tractors industry, Passenger Vehicles (on account of deferment), luxury cars & SUV and commercial vehicles. With the on-going demonetisation drive, interest rates are expected to soften in the coming months and should benefit the overall automotive industry," Sharma projects.

Even after the negative effect of the demonetisation on the businesses, the industry is hopeful about the future. "It remains to be seen how long the cash crunch due to the demonetisation will continue, however the long term outlook continues to be positive," Jain thinks.

"We are closely watching the developments with respect to the full roll out of the Good & Services Tax (GST) and continue to be hopeful of its positive implications for the automotive and automotive component industries in mid to long term," Sharma adds.

GST: A welcomed change

Elaborating on the business environment, Jain comments, "The positive sentiment created by the Modi government's business-like approach to running the government has been a shot in the arm for the industry. Also, the announcement of various initiatives such as Make in India and Skill India, besides the announcement of GST implementation in April 2017 will continue to boost market sentiments in the medium and long term." Bhamre adds, "2017 will see a sea of changes being done in manufacturing industry due to change in taxation to GST. There will be changes in way organisations operate while working with their vendors, agencies, suppliers and customers. It will call in for more judicious and in fact invoice wise working, tracking and following. Every organisation will have to be more judicious, systems oriented and have tight filing/ monitoring / control systems to cope up with GST. There will be innovations in the way the manufacturing is conducted Vs future requirements."

"In India cross selling of our diverse portfolio to our key growth customers is yielding good results. The negative effects of demonetisation in the current quarter and the implementation of GST may dampen results a bit towards the end of the year, however, overall our strategy seems to be paying off," Jain says.

Plans for the coming year

Elaborating on the plans for the nest calendar year, Sharma says, "We are in the process of setting up first manufacturing plant in North America (Mexico), which is likely to commence commercial production by the end of FY2017. Additionally, the Spark Minda Technical Center in Pune which is close to being fully constructed and is expected to be operational in early 2017." Moreover, the company's JV in China is expected to start production in 2017 and also the company is setting up greenfield capacity in Pune for Die Casting. On the other hand Racold Thermo plans to continue to invest in R&D, innovations, brand, distribution reach and people. "2017 is full of challenges due to recent demonetisation (leading to consumers holding money not spending), GST implementation, and trend of increasing hot weather months across the globe and so on. We believe in our brand, innovation and people which we have been doing in last so many years which should help us tide over in 2017 too," states Bhamre.

Looking at the future optimistically, Jain mentions, "The global and domestic shift to LED technologies in exterior lighting will drive growth in our international business. At home in India, there are significant opportunities created by the future safety and emission norms for our Electrical and Lighting divisions and we plan to make the most of it."

"Recent demonetisation drive by Government has become an alarming challenge for the automotive industry in the short term. The overall automotive sales volumes are expected to be adversely impacted on the account of demonetisation in the third and fourth quarter of FY2016-17."

D C Sharma, Group Chief Financial Officer, Minda Corporation

"2017 will see a sea of changes being done in manufacturing industry due to change in taxation to GST. There will be changes in way organisations operate while working with their vendors, agencies, suppliers and customers. It will call in for more judicious and in fact invoice wise working, tracking and following.

Anil Bhamre, Head- Marketing, Racold Thermo

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The inauguration ceremony of SRM-ZOLLER Professional Training Centre for Tool Management Solutions was held at SRM University on 21st October 2016. The new center is established to serve the students, faculty members and manufacturing community in and around Chennai to learn about efficient tool management in order to reduce the cost of manufacturing and to make the nation prosperous.

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Hoping for **better future**

Anand Sundaresan, Vice-Chairman & Managing Director, SCHWING Stetter India speaks to The Machinist about the market and various aspects that are hampering growth. Read on to know more.

By Swati Deshpande

Q How is the construction equipment market faring in India currently?

The construction equipment industry could do better. In the second half of 2016, some road projects were awarded by the government of India. This has given boost to the industry to some extent. Although there is emphasis on the infrastructure development from the government, in reality there is nothing much happening on the front of other infrastructure projects such as ports, metros, railways, etc. Additionally, there is an uncertainty in the mining sector. It has not yet recovered and hence, this uncertainty is hampering our industry as well. Overall, apart from highways, no other sectors seem to be promising, which can be area of concern for us. We hope that the market revives in the near future.

Q How do you think implementation of GST will affect your business?

GST is a fantastic decision taken by the government of India. It will help the industry in various ways. First and foremost thing I expect to happen due to GST is reduction in the cost of construction equipment. The other taxes apart from GST will be eliminated. This would have direct effect on our equipment's pricing and we will pass on the advantage to the user as well. Secondly, since it will create one country, one tax environment, the cost of equipment would be same in all corners of the country. Currently, since the price structure depends on the state taxes, the cost of the same equipment changes in every state. Having the same price across the country is a huge advantage for users. Hence, I appreciate this move.

Q Demonetisation is another aspect that affected few sectors. How has it affected construction equipment market?

Of course, it has created temporary disturbance for the construction industry. There are many transactions such as workers' daily wages, truck drivers' allowances which are paid in cash. Due to demonetisation, some of the projects have come to stand still. Contractors seem to have the most affected by this. However, this impact seems to be temporary and things will come to normal in matter of some time.

> Since GST will create one country, one tax environment, the cost of equipment would be same in all corners of the country

Q Please tell us about your latest offerings

The company recently launched Smarttec Sludge Pump System which is useful to recycle sewage and sludge water for municipal applications. Schwing sludge pumps provide turnkey solutions for transport and storage of sludge as well as materials with high solid content. These pumps are useful for waste water treatment plant, waste recycling, construction industry, mines, refineries, power plant, etc.

I am looking forward towards BC India trade fair, where we will be displaying our latest products and solutions. We are hoping to have a better future for the construction equipment industry.

Higher payload, **reduced fuel consumption!**

With the use of a special plastic, Continental has created pistons that weigh 75 percent less than conventional steel pistons reducing fuel consumption while also adding 12–15 kg of payload capacity per axle.

With its innovations for commercial vehicles, international technology company Continental can achieve fuel savings of up to six liters per 100 kilometers. This value is a result of the systematic implementation of all the technologies available during series production and development. "We envisage great potential for future optimization in fleet consumption. Our innovations – some of which are currently in the design phase and some of which are undergoing preliminary development – offer additional potential for reducing consumption by as much as two liters per hundred kilometers," explains Nikolai Setzer, who is a member of the Continental Executive Board. This calculation takes account of more than 20 different technologies that either have recently been implemented in series production or are currently undergoing development. Continental is thereby improving the efficiency of commercial vehicles, cutting CO2 emissions, and improving the cost efficiency of goods transportation.

In 2007, the Member States of the European Union agreed to reduce primary energy consumption by 20 percent by 2020. Consequently, vehicle manufacturers have an interest in continuing to lower CO2 emissions. Fewer emissions, lower consumption, falling operating costs, increasing payloads, and stricter emissions regulations or exhaust standards such as EURO 6 are therefore constantly driving the development of innovations.

Replacing steel and aluminium

Modern commercial vehicles and buses are subject to exacting demands when it comes to efficiency. To improve the efficiency and cost-effectiveness of goods transportation, payload capacity is to be increased in compliance with statutory limits on axle loads. Reducing the weight is not just about reducing fuel consumption and, in turn, decreasing operating costs, but also brings other advantages, too:

> We envisage great potential for future optimization in fleet consumption. Our innovations – some of which are currently in the design phase and some of which are undergoing preliminary development – offer additional potential for reducing consumption by as much as two liters per hundred kilometres.
>
> **Nikolai Setzer,** Member, Continental Executive Board.

E.g., with the weight-reducing air spring family from Continental, forwarding agents can gain 12–15 kg of payload capacity per axle. With a service life of 400,000 km, CO2 emissions drop by 200 kg. In comparison with conventional steel pistons, tuhis means as much as 75 percent less weight thanks to the use of a special plastic.

75 percent lighter than conventional steel pistons thanks to the use of a special plastic: for example, with the weight-reducing air spring family from Continental, forwarding agents can gain 12–15 kg of payload capacity per axle. *Photo: ContiTech*

Close-coupled exhaust after-treatment

At the International Motor Show Commercial Vehicles, Continental will be unveiling an innovative solution for close-coupled exhaust after-treatment on heavy-duty commercial vehicles. By positioning the diesel oxidation catalyst (DOC) near the engine, its volume can be reduced by about 30 percent. Also, use of the newly developed catalyst substrate in a CS design (Crossversal Structure) enables a further 20 percent decrease the amount of materials used and the weight of the DOC.

Also, the diminished heat loss and high conversion efficiency of the innovative CS cell structure will help to meet future nitrogen oxide emission limits, such as the CARB 2023 regulation (CARB: California Air Resources Board) in the U.S. Due to the higher working temperature in the DOC, subsequent injection of urea solution can begin sooner. In addition to the DOC, the solution showcased will include the urea metering system integrated in the tank, the SCR controller and the metallic catalyst substrate for 100 percent evaporation of the urea solution.

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Toshiba, powering India by making in India

To achieve 'Power for All' - one of the promises made by the Government of India, leading power producers are joining hands with multi-national companies like Toshiba to bring in global technology and generate more power for the next India.

Toshiba has a history of over 50 years in India. Long before the government's initiative of Make in India, Toshiba identified India as its global manufacturing base and export hub. Currently, Toshiba is focusing on B2B fields such as energy, social infrastructure, storage solutions, power systems, railway systems, elevators, batteries and water treatment with a campaign 'FOR THE NEXT INDIA'.

In the power sector, Toshiba JSW Power Systems Private Limited (TJPS), is developing clean coal and highly efficient, eco-friendly thermal technologies. And it recently announced that the company marked a significant milestone in its endeavor to offer customers state-of-the-art power generation solutions with the shipment of its first 'Made- in-India' 800MW Steam Turbine Generator (STG) for Unit 2 of the Kudgi Thermal Power Project in Karnataka. This is Toshiba JSW's first large-scale generation system to be manufactured and assembled with locally procured parts and systems, which is tested in India. This reiterates TJPS' focus on providing designs, and manufacturing products that ensure sustainable levels of performance for its useful life.

"Toshiba has made huge investments to develop India as its global business hub for Thermal Power business, because India is not only an important market but also an important export and development base. And it gives us immense pride to announce that Toshiba has just shipped its first 'Made in India' Steam Turbine Generator from its Chennai factory, Toshiba JSW Power Systems Private Limited. Which means not only will we be offering complete EMPCS solutions, but also generating cleaner energy and meeting the surge in de
for the next India."

Mr. Yoshiaki Inayama MANAGING DIRECTOR, TOSHIBA JSW POWER SYSTEMS PVT. LTD.

From fiscal year 2006-2007, it was observed that majority of Independent Power Producers (IPP)

"PRECISION, PERFECTION AND COMMITMENT ARE THE REASONS WE CHOSE TOSHIBA. WE TRUST TOSHIBA AND ITS JAPANESE EXPERTISE."

Excerpts from a conversation with Mr. Subir Chakravorty, Chief Engineer, Uttar Pradesh Rajya Vidyut Utpadan Nigam Ltd.

"We aim to be the leader in providing reliable quality and affordable electricity most efficiently, with collaborative approach, by involving participation of technology providers. This approach helps us in our endeavor to provide electricity to the state and at the same time match the per capita power consumption of national level as first priority," said Mr. Subir Chakravorty.

While talking about the technology partners and their power plants, Mr. Subir Chakravorty stated, "Our evaluation reflects the high performance and reliability of Toshiba and its capabilities in integrating engineering and manufacturing functions.

> "We are happy to work with Toshiba once again and award them the Harduaganj Power Project."


Thermal Power Station, Anpara


Mr. Subir Chakravorty
CHIEF ENGINEER, PPMM, UTTAR PRADESH RAJYA VIDYUT UTPADAN NIGAM LTD.

Our long standing relationship with Toshiba started with its supply of two 500MW Steam Turbine Generators for Anpara-(B) Thermal Power Plant and the association got cemented with the other project for Meja Power for which Toshiba is supplying two units of 660MW Steam Turbine Generators."

"Precision, perfection and commitment are the reasons we chose Toshiba. We trust Toshiba and its Japanese expertise. For more than 22 years, the efficiency at which Anpara-(B) plant has been operating is an evidence of reliability of Toshiba's technology.

We are happy to work with Toshiba once again and award them the Harduaganj Power Project. We believe that this relationship of trust and performance will continue for years to come," concluded Mr. Subir Chakravorty.

placed orders in many foreign companies, which offered lower initial set up costs but did not derive the expected benefits as the operational efficiencies, operational costs and downtime on account of technical failures proved to be costlier even in the initial years of operation. Toshiba, on the other hand, has always offered its Japanese legacy of excellent performance, high reliability quotient, longevity and durability, which results in lower operating costs. This is an evident and sustainable benefit for the promoters of power plants and might be an answer to one of the biggest challenges of the present age, which is to maintain our economy's movement on a high growth trajectory and uplift the living standards of people with least carbon emissions.

THERMAL POWER CONTINUES TO LEAD THE POWER SECTOR IN INDIA

- For the 12th Five-Year Plan, a total of 88.5GW of power capacity addition is targeted; of which, 72.3GW constitutes thermal power, 10.8GW hydro power and 5.3GW nuclear power

An overview of **global heavy construction equipment** market

According a recent study, global heavy construction equipment market is expected to reach $193,245 million by 2022. Read on to know more about it market.

A report published by Allied Market Research, titled, 'Heavy Construction Equipment Market: Global Opportunity Analysis and Industry Forecast, 2014 - 2022,' projects that the global heavy construction equipment market is expected to reach $193,245 million by 2022. Earthmoving equipment segment dominated the global market in 2015, and is expected to maintain this trend from 2016 to 2022. Asia-Pacific dominated the global market in 2015, accounting for more than 44 percent share.

The global heavy construction equipment market is driven by factors such as improved involvement in private sector, tremendous growth in real estate sector, improved economic conditions, and residential & commercial infrastructure set-up in emerging economies. According to the World Urbanisation Prospect, about 54 percent of global population belonged to urban areas in 2014, and is expected to increase to 66 percent by 2050, thereby boosting the market growth. Increasing government initiatives towards infrastructure development supplements the market growth.

Moreover, growing public-private partnerships between government and private sector companies for the construction of public infrastructure systems in countries such as India and China have fueled the market growth. The Indian Government has heavily invested in the development of roads, railway tracks, airports, and overall infrastructure development, which involve the use of excavators, loaders, and other such heavy machinery. Designing and developing smart, internet-enabled, fuel & energy-efficient machinery by key market players have fueled the market growth.

> The global heavy construction equipment market is driven by factors such as improved involvement in private sector, tremendous growth in real estate sector, improved economic conditions, and residential & commercial infrastructure set-up in emerging economies.
>
> **Eisha Sukhija** (Research Analyst), Construction Equipment Research Domain, AMR.

Challenges

The growth of the heavy construction equipment market is hampered due to fluctuating prices of crude oil. Moreover, majority of the equipment that are used in the industry run on diesel, which release high carbon emissions and imposition of carbon regulations. This factor is likely to affect the growth of the market in the near future.

Increasing demand of heavy construction machinery in construction and manufacturing sectors would boost the growth of the excavator segment. Earthmoving segment accounted for around 45 percent share of the global market in 2015 owing to the increased use of these equipment in mining sector. This segment is estimated to witness significant growth during the forecast period due to increasing construction activities in residential sector, construction of roads, healthcare centers, and educational institutes. Increasing use of equipment in sectors such as construction, underground mining, and surface mining contributes to the market growth.

"The heavy construction equipment market is expected to grow due to increasing demand for leased and rented construction equipment by low- and mid-sized con-

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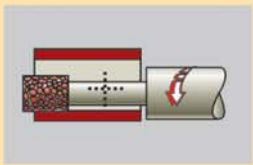
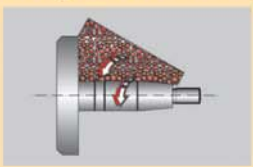


FIG-200 SPL CNC
BIG BORE GRINDER

FIGT-300 CNC
FOUR STATION TURRET

FIGE-150 CNC
ID / OD GRINDER

CNC Cylindrical Grinding



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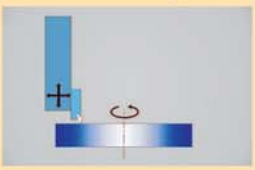

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struction companies. The development of new earthmoving equipment offering reduced operating costs, connect technology, and safety features are expected to have substantial impact on the market growth. European decision makers have invested in the building and construction industries to facilitate gradual improvement in this sector and boost the market for new constructions; thereby fueling the growth of the heavy construction equipment market" stated Eisha Sukhija (Research Analyst), Construction Equipment Research Domain, AMR.

Industry sectors

Based on application, the heavy construction equipment market is segmented into excavation & demolition, heavy lifting, material handling, recycling & waste management, and tunneling. Excavation & demolition segment accounted for the largest share in 2015, as these techniques are extensively used for cutting, trenching, and cracking purposes. Material handling segment is projected to grow rapidly, registering a CAGR of 8.4 percent during the forecast period due to increased usage of material handling equipment such as cranes and telehandlers in large building construction, and mining operations. Market players have launched new products with higher engine power and lifting capacity to cater to the emerging demands of customers. For instance, newly commercialized range of telehandlers by Massey Ferguson offers high engine power of up to 130 hp, and improved lifting capacity, which would increase the customer base of the company.

"The heavy construction equipment market is expected to grow due to increasing demand for leased and rented construction equipment by low- and mid-sized construction companies. The development of new earthmoving equipment offering reduced operating costs, connect technology, and safety features are expected to have substantial impact on the market growth."

Infrastructure industry is expected to be the fastest growing industry, owing to proactive government initiatives related to infrastructure developments projects, including dams, railway ballast, airports, expressway, and national highways in the Asia-Pacific region. Increased instances of renting and leasing of heavy construction equipment in both, developed and developing regions, is expected to fuel the market growth.

The Indian Government has heavily invested in the development of roads, railway tracks, airports, and overall infrastructure development, which involve the use of excavators, loaders, and other such heavy machinery. Designing and developing smart, internet-enabled, fuel & energy-efficient machinery by key market players have fueled the market growth.

Region-wise segment

Asia-Pacific region accounted for the maximum market share in 2015, and is expected to maintain its lead throughout the forecast period. This is attributed to increased usage of earthmoving equipment in construction application. Moreover, proactive government initiatives related to infrastructure developments in countries such as India, Indonesia, and others have resulted in upsurge in foreign direct investment (FDI). In addition, construction of new buildings and the refurbishment/renovation of existing buildings drive the growth of the European heavy construction equipment market. European building and construction industry is moving out of crisis and is showing a gradual improvement which will increase the market for new construction.

Key findings of the heavy construction equipment market

- In 2015, earthmoving segment accounted for the maximum market revenue, and is projected to grow at a CAGR of 6.9 percent during the forecast period.
- Infrastructure industry segment is expected to grow at a significant CAGR of 9.1 percent, owing to upsurge in government initiatives.
- Material handling application segment is anticipated to be the fastest growing segment during the period of 2016-2022.
- China is the major shareholder in the Asia-Pacific heavy construction market, accounting for around 48 percent share in 2015.

Source: Allied Market Research

Picture courtesy: JCB India

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Taking India's **manufacturing quality** to the **next level**

As Indian manufacturing industry is set to take a leap, here are few steps that will make the organisation a truly world-class in nature.

By Bharat Wakhlu

In an increasingly competitive global economy, Indi manufacturers may find it more challenging than ev to manage quality improvement initiatives especial with ever-changing risks, and customers who are mo informed and more demanding than ever. Howeve a new study provides a path that Indian manufactu ers and service organisations can take to improve their perfo mance and aim for world-class status.

According to a new Global State of Quality 2 Researc Discoveries 2016 report and compared to a similar study i 2013 that examined quality improvements in manufacturers worldwide, fewer organisations in 2016 view quality as simply a compliance activity. Both the 2016 and 2013 studies were conducted by ASQ. This research surveyed nearly 1,700 companies from 20 countries including India.

The latest data shows that more manufacturers now see quality as an opportunity to gain a competitive edge vs. just a 'check in the box' compliance activity. In fact, the research shows 45 percent of all Indian organisations who responded say their company views quality as a strategic asset.

The ASQ research also finds that manufacturers who are identified as 'world-class' have the strongest end-to-end quality practices: with visibility into investment, cost and resulting performance. They also view their suppliers as a source of strategic value. World-class manufacturers instill quality as part of their culture and use its practices to directly increase profitability through five major drivers:

- **Active Customer Engagement:** Understanding product/service performance through customers' eyes and developing visible metrics on performance against customer needs. For world class companies surveyed, 82 percent of the respondents confirmed that customers were the key drivers of their quality programs. More than 63 percent of Indian organisations surveyed say they 'highly agree' that customers are the key drivers of their quality programs.
- **Effective use of data:** Using quality measures to establish strategic goals that drive performance, measuring business processes and the cost of remediation, and supporting trending and/or predictive analysis. More than 82 percent of world-class organisations measure the financial impact of quality; however, 37 percent of Indian organisations surveyed don't know the financial impact of quality on their company's profitability. The importance of connecting a firm's quality practices with its financial performance cannot be over-emphasized. Performance metrics which are measured correctly and consistently provide a robust basis for managerial decision-making and actions.
- **Controlled Setbacks:** Identifying and managing setbacks that result in inefficiency, customer dissatisfaction and increased costs. While all organisations experience some quality-related setbacks, world-class organisations experience half the rate of setbacks as non-world-class organisations. More than 35 percent of organisations indicated that their setbacks resulted in service delays, overall inaccuracies, poor data quality and supplier-related issues.
- **Waste reduction:** Improving efficiency, ensuring standardisation and reducing wasted time and mistakes to build quality and achieve internal customer satisfaction.
- **Innovation:** Creating open and collaborative environments with a focus on idea-sharing and spurring innovation through the use of quality tools. 72 percent of Indian organisations surveyed use a combination of financial and non-financial incentives to encourage innovation.

Outlining the characteristics of those top-performing companies allows non-world class organsations to benchmark against and define an action plan to help advance toward world-class quality.

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India's quality challenges

According to the Government of India's Ministry of Statistics, 95 percent of the manufacturers in the country consist of micro, small and medium-sized enterprises (MSMEs) and 5 percent are large manufacturers. This diversity in size and capabilities means significant variations in the application of quality practices. Many large and small companies are well ahead of their peers in the deployment and use of quality practices, while quite a few others lag far behind.

Spreading quality capabilities to organisations throughout India poses a unique challenge. Typically, smaller firms with limited resources and talent are most in need guidance and 'hand-holding' to put them on the track to becoming world-class. Larger firms, or those MSMEs that export their output to markets overseas, often have a greater stake in pursuing 'world class' quality practices because their performance depends on how well their customers are serviced.

Raising the levels of quality across all enterprises in India calls for a collaborative, cluster approach, where groups of enterprises help one another to improve quality across the value chain.

The ASQ Global State of Quality study demonstrates that quality cannot be given short shrift if an enterprise is committed to offering superior products or services, providing shareholders a good return on their investments and assuring stakeholders that it is not undermining its collective value to society and the environment.

Progressive, world-class Indian organisations have to view the pressures from the market and regulators as opportunities that can be harnessed to stimulate innovations and mitigate risks in order to serve their customers and stakeholders even better. Indian enterprises consciously need to traverse towards becoming world class — or risk being overtaken by others.

Five Steps to World Class Quality

Indian enterprises — of any size or capability — that wish to become world class should undertake the following five steps to achieve world-class capabilities.

1. **Enlist upper management in the transformation**

   Enough evidence is available to demonstrate that senior leaders who understand that quality is a strategic asset and a competitive differentiator are better suited to transform their organisations. They lead the change process from the front, make available resources and personnel for 'critical to quality' initiatives, and use the necessary tools to spread the gains of improvements across the enterprise. Leaders cannot delegate this responsibility.

2. **Diagnose the current status and identify improvement areas**

   Manufacturers that are keen to transform themselves into world-class organisations need to assess the current status of their quality practices, metrics, procedures and standards and identify areas for improvement. Decision making will need to be more customer-centric and metrics, actions and rewards need to be aligned to promote overall business performance.

3. **Measure the financial impact of quality initiatives**

   Enterprises need to regularly and systematically measure and report the financial impact of quality improvement initiatives, customer loyalty programs, as well as remediation and the management of performance setbacks. These need to be reviewed by upper management, so that informed data-driven decisions can be made for new investments and process changes.

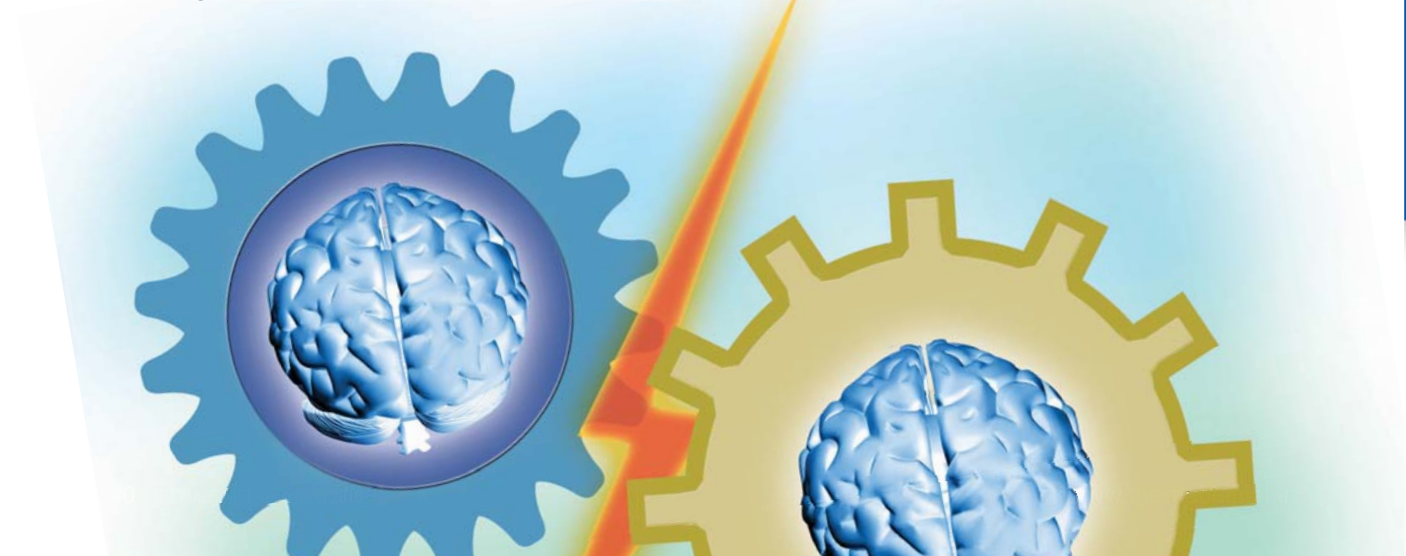
4. **Use technology to upgrade, preserve and share skills and knowledge**

   Provide the latest technologies to upgrade the capabilities of personnel and plan training and development interventions to enhance skills and keep the organisation change-ready. Simultaneously, tacit knowledge needs to be made available across the organisation with the help of platforms that can be readily accessed by all.

5 **Streamline Quality Processes and Management Systems across the Value Chain**

   Enterprises should continuously streamline their quality processes and management systems across the value chain, to ensure that any performance gaps or deficiencies are identified and quickly bridged. Gaining customer feedback in order to make improvements is an essential aspect of this process.

The author is President, The Wakhlu Advisory



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- Turning, gear hobbing, deburring / chamfering – including automation, all from one resource.
- Process example: Soft turning the 1st side, soft turning the 2nd side, gear hobbing. Turnkey solutions for the complete process chain.
- Modular machine integrated with automation.
- This concept leads to easy line set up.
- System requires less operators and provides easy maintenance.
- Cycle times are minimized due to short travel distances for loading and machining.
- The TrackMotion automation system performs the entire part transportation process, including turning the parts.
- The use of stacker pallets allows autonomous operation for hours.

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Wearable makes it **easy!**

A wearable glove has simplified processes and improved efficiency at CKD packing area at Audi. Read on to know more about it.

Scanner-gloves now make work easier for international logistics employees at the Audi-plant in Ingolstadt: For the worldwide dispatch of car components, they now use the 'ProGlove' by the name of 'Mark' with its embedded barcode scanner. This means they have both hands free and can work more ergonomically. After a four-week pilot phase, Audi employees are now using these wearables in five positions in the Ingolstadt plant.

An innovative scanner glove has now replaced conventional barcode scanners at selected workplaces in the international logistics of CKD (completely knocked down) in Ingolstadt. The scanner is integrated in the 'ProGlove.' The employees trigger the scanning function by pressing the thumb and first finger together. This means that they have both hands free for their work and save additional hand movements, to pick up and put down the scanner for example. It also minimises walking and makes the working routines in CKD Packing more ergonomic.

"For our employees, the scanner glove is a real help. It makes them more flexible; they can move freely and can scan and pack the cartons more easily," explained Hartmut Bartsch, Head of CKD Packing. "In addition, with the help of the glove, we design complex logistics processes to be more innovative and more efficient."

"The development of ProGlove follows the idea that wearable electronics have to support the employees. That's why we have developed a light glove for industry that is intuitive to use, and which can be deployed without any integration expense," stated Thomas Kirchner, CEO of ProGlove.

The scanner is integrated in the 'ProGlove.' The employees trigger the scanning function by pressing the thumb and first finger together. This means that they have both hands free for their work and save additional hand movements, to pick up and put down the scanner for example. It also minimises walking and makes the working routines in CKD Packing more ergonomic.

> "For our employees, the scanner glove is a real help. It makes them more flexible; they can move freely and can scan and pack the cartons more easily. With the help of the glove, we design complex logistics processes to be more innovative and more efficient."
>
> **Hartmut Bartsch,** Head of CKD Packing.

The intelligent glove has an ergonomically optimized trigger button on the index finger, which operates the scanner when it is pressed against the thumb. The employee doesn't have to focus on the barcode, because the scanning function is integrated in the natural hand movement. By means of optical (LED light), acoustical (buzzer) and tactile (vibration) signals, the commissioner knows that the article has been scanned.

The scanner communicates with the receiver unit by radio. This access point is connected via USB or a normal serial connector; the installation of additional software is not necessary. The battery charge is designed to last for the period of a working shift and can then be fully recharged within two hours.

Audi has successfully tested the ProGlove for four weeks and has now deployed the first gloves in the CKD Packing area. This is the first step towards widespread use of so-called wearables in production. The glove is also being tested in pilot phases in other areas of production at Audi.

Source: Audi

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Excel, Enhance, Expand

Inspired by 'Make in India', Indian manufacturers are aspiring to cater to global markets. In this context, The Machinist Global Manufacturing Summit was successfully conducted on December 7, 2016, in New Delhi.

The Machinist Global Manufacturing Summit (GMS), a one day conference program on the theme of Excel, Enhance, Expand was held at The Westin Gurgaon on December 7, 2016. The event was inaugurated by Nikhil Nanda, Managing Director & CEO, Escorts Ltd, Yatendra Kumar of MotulTech India and Sunil Mehta of Mitsubishi Electric India. On the occasion, Pratyush Kumar, President, Boeing India delivered a keynote speech on the topic of the theme of the event. Additionally, CEO Panel that consisted industry leaders — Dr. Andreas Lauermann, President & Managing Director, Volkswagen India Pvt. Ltd., Harsh Dhingra, Chief Country Representative, Bombardier Transportation India, Pankaj Dubey, MD, Polaris India, CEO and Director, Eicher Polaris and Harish Pant, Managing Director, Hampson Industries Pvt Ltd — threw light on the "Glocal Leadership: Going Global, Thinking Local". This panel discussion was moderated by Niranjan Mudholkar, Editor, The Machinist magazine and Chief Community Officer – B2B Division, Worldwide Media Pvt. Ltd.

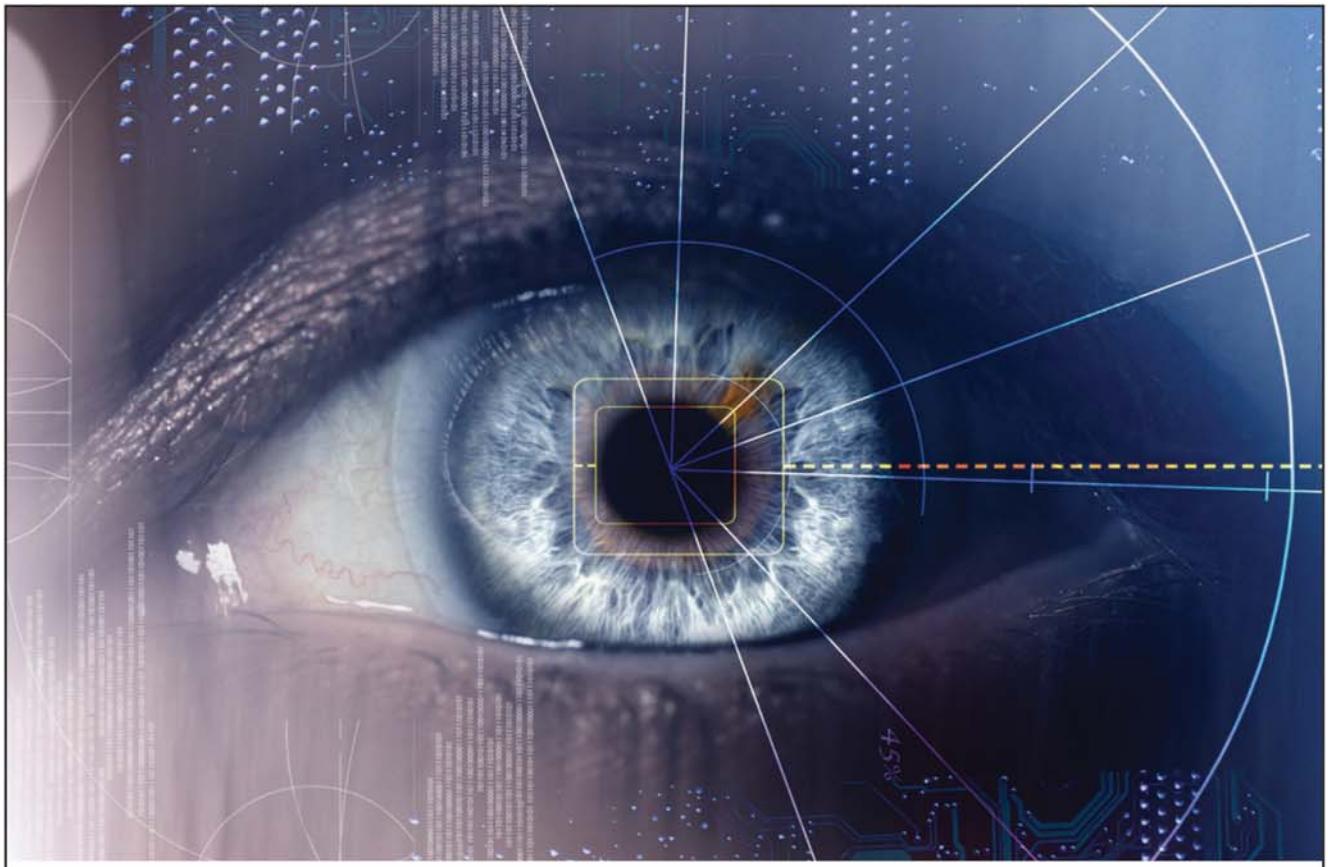
A presentation on "Marrying product innovation with market dynamics" by Ankur Rooprai, Executive Director, (Ops & Engg.) Landking G-Maan Group of Industries, was quiet well received. Other presentations including 'e F@ctory - Bridging shop floor to top floor' by Sunil Mehta of Mitsubishi, 'Industrial Robots' by Madhusudhanan, also of Mitsubishi Electric, and 'Role of lubricants in overall equipment efficiency' by MotulTech India's Yatendra Kumar too were quite insightful for the audience.

An Operations Panel Discussion on the topic of Achieving Zero Defect Zero Effect was also appreciated by the attendees. Ramesh Chander Khanna, COO, PPAP Automotive Ltd; Vinay Maheshwari, President - Corporate Projects, JBM Group; Vinay Maheshwari, President-Corporate Projects, JBM Group; Sushil Agarkar, AVP and Head of Manufacturing, Godrej Precision Engineering; Anuragam Vatsa, Plant Head, RSB Group, Pant Nagar were the participants.

> The event was inaugurated by Nikhil Nanda, Managing Director & CEO, Escorts Ltd, Yatendra Kumar of MotulTech India and Sunil Mehta of Mitsubishi Electric India

Increasing the knowledge quotient, Tata Strategic Management Group and The Machinist unveiled a knowledge paper on "Achieving Global Competitiveness".

GMS 2016 was powered by Mitsubishi Electric. Industrial Lubricant partner was MotulTech, Solar Energy Partner was Cleanmax Solar, Contest partner was Sandvik Coromant, Associate Partner was Hitachi Metals (India) Pvt. Ltd. and Knowledge Partner was Tata Strategic Management Group. Overall, the event was a great success.



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Hall of Fame 2016

Rajan Nanda, Chairman & Managing Director, Escorts Ltd

Leading a company and taking it to a new level is a challenging task. Mr Nanda has not only led the company but also has shaped up the Indian manufacturing industry. The Machinist salutes his work!

During The Machinist Global Manufacturing Summit 2016, the prestigious Hall of Fame was conferred to Rajan Nanda, Chairman & Managing Director, Escorts Limited. He was bestowed upon the award in the recognition of his enormous contribution to the Indian manufacturing industry. The Machinist believes that at a time when manufacturing wasn't considered to be the 'in' thing, this gentleman brought repute and fame to this industry. His excellent entrepreneurial skills and leadership abilities have resulted in the Company becoming a manufacturing brand par excellence in the global arena across sectors.

Taking over the mantle of chairmanship in 1994, Mr. Nanda has been instrumental in chartering the growth of Escorts as a leading agricultural and infrastructure solutions company with world-class manufacturing excellence.

Mr. Nanda was also instrumental in setting up Escorts' in-house research and development facility in Faridabad. Being a visionary leader, he has guided Escorts in forging several business strengthening collaborations with global technology leaders.

With his unrelenting focus on customer-centricity, innovation and operational excellence, the organisation remains committed to contributing towards India's growth story and bringing in quality change in the lives of people.

> "Thank you for honouring Escorts. This further builds our confidence and commitment to build a stronger India." - Mr Nanda

Mr. Nanda firmly believes that the welfare of business is intertwined with the welfare of the society. With this vision, he has been proactively engaged in the causes of education, health and welfare of the society at large.

Mr. Nanda firmly believes that the welfare of business is intertwined with the welfare of the society. With this vision, he has been proactively engaged in the causes of education, health and welfare of the society at large.

Besides being an active member of several apex trade and industry bodies, he has also played a pivotal role in promoting the cause of Indian Agriculture. In fact, his endeavours have resulted in the government announcing the long-awaited National Agriculture Policy. In his acceptance speech, Mr Nanda mentioned, "Thank you for honouring Escorts. This further builds our confidence and commitment to build a stronger India."

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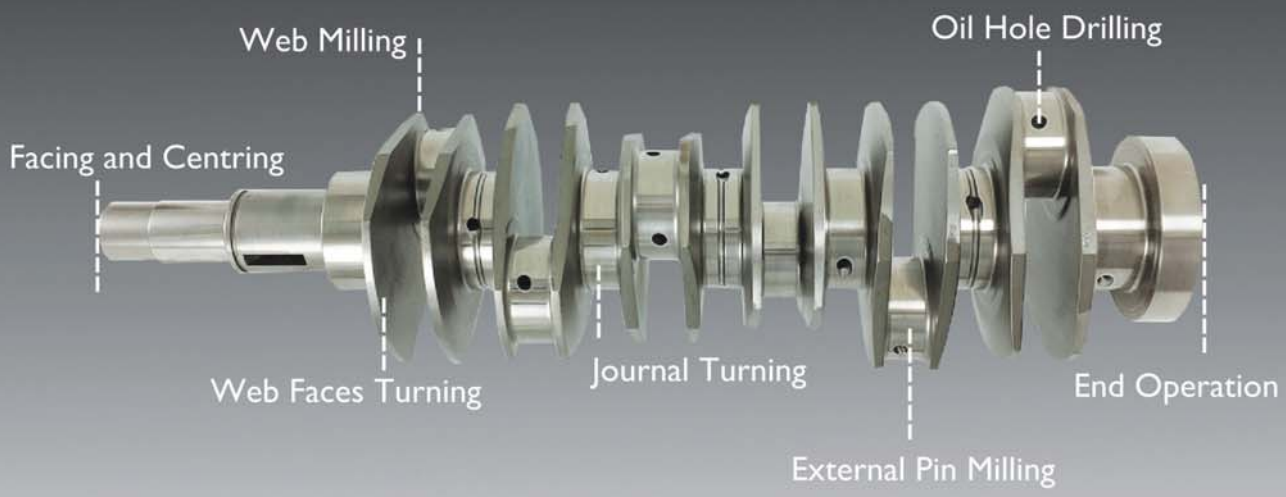

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Ready to **take off..**

Pratyush Kumar, President, Boeing India delivered a keynote address at the Global Manufacturing Summit 2016. Here are excerpts of his speech.

At The Machinist Global Manufacturing Summit 2016 Pratyush Kumar, President, Boeing India - the keynote speaker - spoke about Excel, Enhance, Expand, the theme of the event. Elaborating on the theme, he mentioned, "Much has been talked about the potential of the Indian manufacturing. And the center piece of that is the 'Make in India' initiative. India's track record in certain sectors of the manufacturing such as Automotive, Pharmaceutical and Chemical is well-established. However, this is not enough for achieving government's goal of increasing quotient of the manufacturing sector in GDP from 16 percent to 25 percent." According to Kumar, other thriving sectors that can boost manufacturing's quote in the GDP are electronics and aerospace & defence.

Speaking about the potential in the aerospace and defence sector, Kumar said, "The base that automotive manufacturing segment has prepared is very important to enter into aerospace manufacturing in a big way. In fact, currently many suppliers for the aerospace industry in India, have automotive in their DNA." Further, he underlined that, though, there could be some similarities, the manufacturing approach for the two industries is not the same. Highlighting this point he said, "The golden approach towards automotive manufacturing is six sigma or parts per million. On the other hand, the aerospace sector works under zero defect environment."

He concluded by saying the country has the potential to achieve golden figures that Government has put forth, provided the industry work towards it.

Achieving **Zero Defect Zero Effect**

Learn more about various aspects of the slogan that government has announced.

During The Machinist Global Manufacturing Summit, the operations panel discussion was held on the theme of "Achieving Zero Defect Zero Effect". Ramesh Chander Khanna, COO, PPAP Automotive Ltd, Vinay Maheshwari, President - Corporate Projects, JBM Group, Rakesh Grover, Vice President -Engineering and Product Development, Eicher Polaris Pvt Ltd, Sushil Agarkar, AVP and Head of Manufacturing, Godrej Precision Engineering and Anuragam Vatsa, Plant Head, RSB Group, Pant Nagarand Sunil Mehta from Mitsubishi Electric participated in the discussion. Shripad Ranade, Senior Principal – Automotive, Engineering and Infrastructure, Tata Strategic Management Group moderated the panel dicussion. The panel discussed various aspects of the mantra "Achieving Zero Defect Zero Effect, one of them being the company culture that plays an important role. Speaking on the same Grover said, "It encompasses lot of aspects and one has to internalise this slogan to achieve it." Highlighting the quality aspect of the slogan, Agarkar mentioned, "It is very important for SMEs to deliver zero defect products having zero effect on the environment when we aim at India being manufacturing hub." Seconding the same Vatsa said that quality is the step forward towards the growth of the company. And while achieving zero effect, we need to stick to our basics. Adding further Maheshwari noted "A decade ago cost was the primary factor for buying the equipment however, now customers have realised the value of the quality and ask for value for money product." Taking this point further, Khanna said, "Nowadays customers are not only looking at the products but also look at the whole manufacturing process. Customers have become conscious about the process as well."

Putting forward an important point, Mehta said, "Digital revolution will play an important role here. We can achieve the quality by analysing and comparing data."

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Glocal Leadership

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At the CEO panel discussion on the theme of "Going global, Thinking local" held during The Machinist Global Manufacturing Summit, Dr. Andreas Lauermann, President & MD, Volkswagen India Pvt Ltd, Pankaj Dubey, CEO & Director, Eicher Polaris Pvt. Ltd., and Country Head & MD, Polaris India Pvt. Ltd., Harsh Dhingra, Chief Country Representative, India, Bombardier Transportation, and Harish Pant, MD, Hampson Industries Pvt Ltd threw light on various aspects. Dr. Lauermann mentioned, "India is not one market; it is many different markets in one. There is big diversity. What we have learnt is that when a global company comes to India, we have to adapt our technologies and products to suit this market. This means that we require not just manufacturing in this country but also engineering in this country. It also means making use of the supplier base in the country." Agreeing to the same Dubey noted, "It is very important to understand the local market as well as its needs, and then act accordingly. Nothing that you have learnt globally can necessarily work in India. In fact, it will not. You obviously cannot change the DNA of your company but you need to understand the Indian market and then marry the two – the Company DNA and market understanding." Dhingra stated "Our mantra for long term success has been localisation. We have done this by way of creating a vendor base in India; localisation by way of developing the skill sets of our workforce." Pant argued, "Developing capabilities for an advanced sector like aerospace and defence is a long journey. Thankfully, OEMs and Tier 1 players are ready to invest and ready to hand hold and transfer capabilities as well as technologies to Tier 2 players."

'God in the **Digital' Contest**

The interesting and entertaining contest added an element of fun to the conference program. Here is a report on the contest and its winners.

The Machinist Global Manufacturing Summit 2016 held at The Westin Gurgaon on December 7 was a runaway success. Besides being a meaningful and topical knowledge sharing platform, the event also saw an engaging and relevant contest in the form of 'God is in the Digital' contest, partnered by Sandvik Coromant.

The contest was open to all the registered delegates attending the Summit. Delegates had to answer a simple question to qualify for the contest - Will digital machining be considered a blessing for your workplace? The maximum word was 20 and they also got an opportunity to get themselves photographed with their messages.

Every participant also took home his photographed in custom made frame highlighting the contest. While Anuragam Vatsa, RSB Group's Plant Head from the Pantnagar plant bagged the first prize with his relevant message, the two runner ups were Satyan Chadha of BHEL and Gaurav Kumar Saxena of PPAP Automotive Limited. Congratulations to all three of them.

The contest now enters its second edition immediately in January 2017.

Next edition:

The next edition of this contest will be held at IMTEX 2017. The venue will be the Sandvik Coromant stall (B121 in Hall 3A) at the Bangalore International Exhibition Center (BIEC), Bengaluru. The contest will run from January 26 to January 30, 2017. It is open to all trade visitors at Imtex 2017. The contest partner is of course, Sandvik Coromant.

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Ushering in the future!

3D printing technology is a perfect fit to address the changing aerospace manufacturing landscape, says **Donald G Godfrey,** engineering fellow, Honeywell Aerospace

By Niranjan Mudholkar

Q Which are the key aerospace parts or components that can be manufactured using additive manufacturing?

Additive manufacturing is one of the emerging manufacturing technologies to come to the aerospace industry, which helps save time and deliver safer and more reliable parts for its users. This advanced technology allows companies to produce prototypes and tooling and to develop material properties for several materials. It also allows us to 3D print metal turbine blades which are used in a prototype or test rigs, saving production time and labor. Even more, it enables the production of components for aircraft engines and other Honeywell products.

The manufacturing of radio-frequency component hardware for satellites was made possible for the first time with 3D printing. This process was first implemented by Honeywell for the ABS-2A satellite, which was successfully launched in June 2016 by a SpaceX Falcon 9 rocket. The ABS-2A satellite is the second of two all-electric propulsion communications satellites manufactured by Boeing Satellite Systems.

Q What are the advantages of using additive manufacturing for the production of the above parts/components?

The aviation industry is growing at an unprecedented rate globally. This development calls for more efficient and high-volume production processes to meet customer expectations and manufacturing deadlines. 3D printing technology is a perfect fit to address the changing manufacturing landscape as it helps reduce manufacturing costs and shorten production and delivery times. It also enables the production of complex shapes that can be difficult to create using traditional methods. Finally, this development greatly enhances the supply chain for the company.

In the aero engineering sphere, 3D printing, or additive manufacturing, helps to significantly speed up the manufacturing process for essential aerospace hardware like engines and auxiliary power units. For example, with the help of 3D printing, Honeywell can efficiently produce metal equiax turbine blades, which are used in prototype or test rigs. Initially, the manufacturing of this hardware took between one to three years. However, with the use of 3D printing, it is available within a few days.

> "3D printing allows design engineers to produce prototypes of metal parts before actually making the final version of them."

Q Aerospace engineering uses a variety of materials like steel, aluminum, titanium as well as different plastics. How is additive manufacturing addressing this material complexity?

Metals and metal powders are very expensive when considered as an alternative to polymers. But with the help of recent advancements in additive manufacturing, materials such as titanium could lead the way to strong, durable 3D printed components and help improve the strength, durability and weight of products.

In aerospace, it is impossible for an engineer to develop or design a component if he or she doesn't know the material's life cycle or mechanical properties. Even the cost of getting such information is very high (about $1.5 million). With the adop-

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tion of 3D printing, companies will soon begin to develop the mechanical property data for the material itself while addressing issues such as the complexity, weight and sustainability of the material. This will enable them to deliver the right mechanical knowledge and metal properties to its customers, thereby ensuring the component's quality design and performance.

Continuing from the above question, how can one be sure of the structural integrity of a metal component made using additive manufacturing? Also, is it true that many components (made with additive manufacturing) require post-process machining? How does this impact the manufacturing process from the cost and time perspective?

3D printing allows design engineers to produce prototypes of metal parts before actually making the final version of them. This gives the design engineer and the test engineer a good idea of how the parts are going to perform in terms of structure, weight and other important properties before making an actual one.

Components made with highly complex material result in increased costs, time and labor for the manufacturing company. With 3D printing, these components that might take six or seven weeks to manufacture can be printed in a day or two. This technology will also help save tens of thousands of dollars in schedule and program costs.

What are the key safety concerns that you have encountered while using additive manufacturing for aero-engineering? How are you addressing the same?

Currently, 3D printing cannot compete economically with designs that facilitate simple casting technology. It's important to understand that casting and machining technology will remain important techniques. However, over the next few years, companies such as Honeywell will move to printing low-volume, high-value components instead of casting them. Also, for the near future, various stakeholders such as regulatory bodies and customers will need to get more comfortable with 3D printed technology.

In the aviation industry, technology has to earn its way onto an aircraft. At Honeywell, we rigorously test every technology that is used for manufacturing hardware, and 3D printed parts are no exception. In most industrial markets, inspection is completed after the part is produced and is subject to human error.

However, at Honeywell the Objective Evidence of Compliance to Design Intent is used to test the success of a newly adopted technology. It is an automated process which involves no human interaction and is achieved only when in-process dynamic features and post-process features are linked.

"The aviation industry is growing at an unprecedented rate globally. This development calls for more efficient and high-volume production processes to meet customer expectations and manufacturing deadlines."

In the context of the above two questions, how do you see additive manufacturing changing the manufacturing ecosystem for aero-engineering in the times to come?

Additive manufacturing is an ideal solution for rapid production and improved product design that can be used to make complex engine components in the aero-engineering sphere. It's not only easier to produce products with this technology, but also easier to draw flaws out of a product design and increase efficiency.

It will eliminate the current time-consuming supply chain process to track inventory components and replace it with a rapid supply chain management process in which companies will start to print parts on-demand and on-site.

Even though additive manufacturing is a new technology, it has become a reliable option for many companies in the aerospace sphere. For manufacturing industries including Honeywell, 3D printing helps to shorten supply chain lead times and reduce manufacturing program costs. Looking ahead, the next big push will be to use this technology for tooling, which can be defined as manufacturing aids.

What has been the best project undertaken by you using additive manufacturing for aero-engineering?

When it comes to 3D printing, our's greatest achievement has been our ability to be the first to make specific developments. We have always been a front runner in delivering innovations in aerospace that enhance aviation hardware and software.

In additive manufacturing, Honeywell was the first aerospace company to achieve several key developments including:

- Flight testing components made with high temperature nickel alloy materials
- Producing rotating turbine engine blades by using a high temperature nickel alloy material and validating the manufacturing process and the material properties via cyclic spin testing
- Using the electron beam technology to produce the components that were made from nickel material

In 2010, we were the first to flight test components manufactured with Alloy 718. In 2015, Honeywell was awarded the patent for developing an approach to chemically machine the internal passages of complex, cooled components using 3D technology. The same year, Honeywell became the first company to produce an aerospace component using the electron beam melting (EBM) powder bed fusion system as part of an experimental design for an existing tube used on the HTF7000 jet engine.

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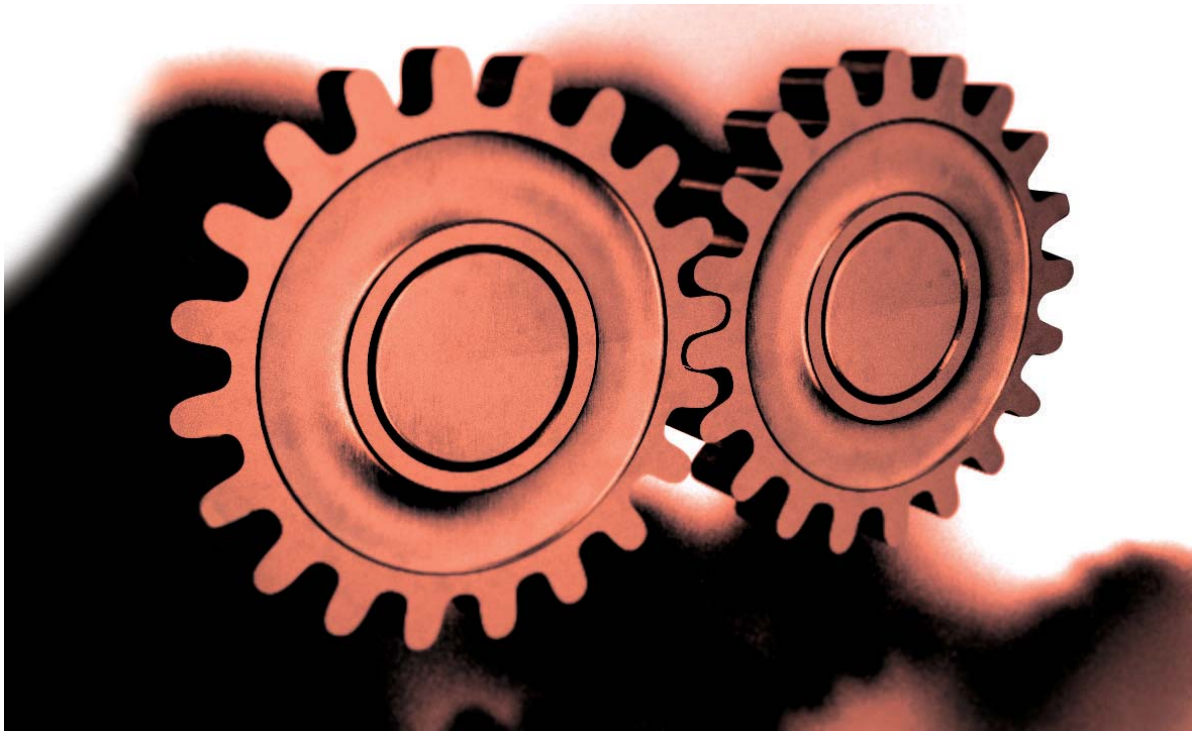

Heading towards the "Super Shopfloor"

Making continuous efforts to improve process and practices on the shopfloor, can turn it to be the supershopfloor. For that, what is required is consistent efforts and clear vision. Here is how Racold Thermo is heading towards the aim.

By Swati Deshpande

To turn the shopfloor into "super shopfloor", each company has its own rules and guidelines. Racold Thermo works in various aspects of the shopfloor to achieve this dream. Speaking on the company's shopfloor with regard to quality, Mahesh Bhangale, Head Manufacturing, Racold Thermo said, "With an introduction of World Class Manufacturing Concept in addition of ISO:9001 certification, the plant is being audited by ISO:9001 certification body, World Class Manufacturing Audit Team (Internal & External) as well as Product Certification bodies like BIS, IEC, etc., which is an assurance of the Product and Process Standard sustainability. This will surely meet customer expectations and will enable us to enhance customer satisfaction via Continuous efforts by well-trained and competent team."

Productivity

Elaborating on the productivity in the plant, Bhangale mentioned, "As a continuous productive measure, we have full-fledged SPM and Machine Building Project Department attached with our Maintenance Department, via which we could implement various productive Processes and SPMs / Fixturing to enhance the Productive standards."

In result of above focussed strive, the company could develop following automation solutions on the Shopfloor in co-ordination with concerned vendor for integration of in-house built machines:

1. Dome Flange Welding SPM.
2. Inner Tank Mig Welding Automation
3. Robotic Pipe Welding
4. Solar Collector Auto handling
5. Motorised Conveyor line for Eterno FG

Describing the processes further, he noted, "In addition of Kaizen culture and effective automation projects following measures have been taken for productivity improvements in last Year

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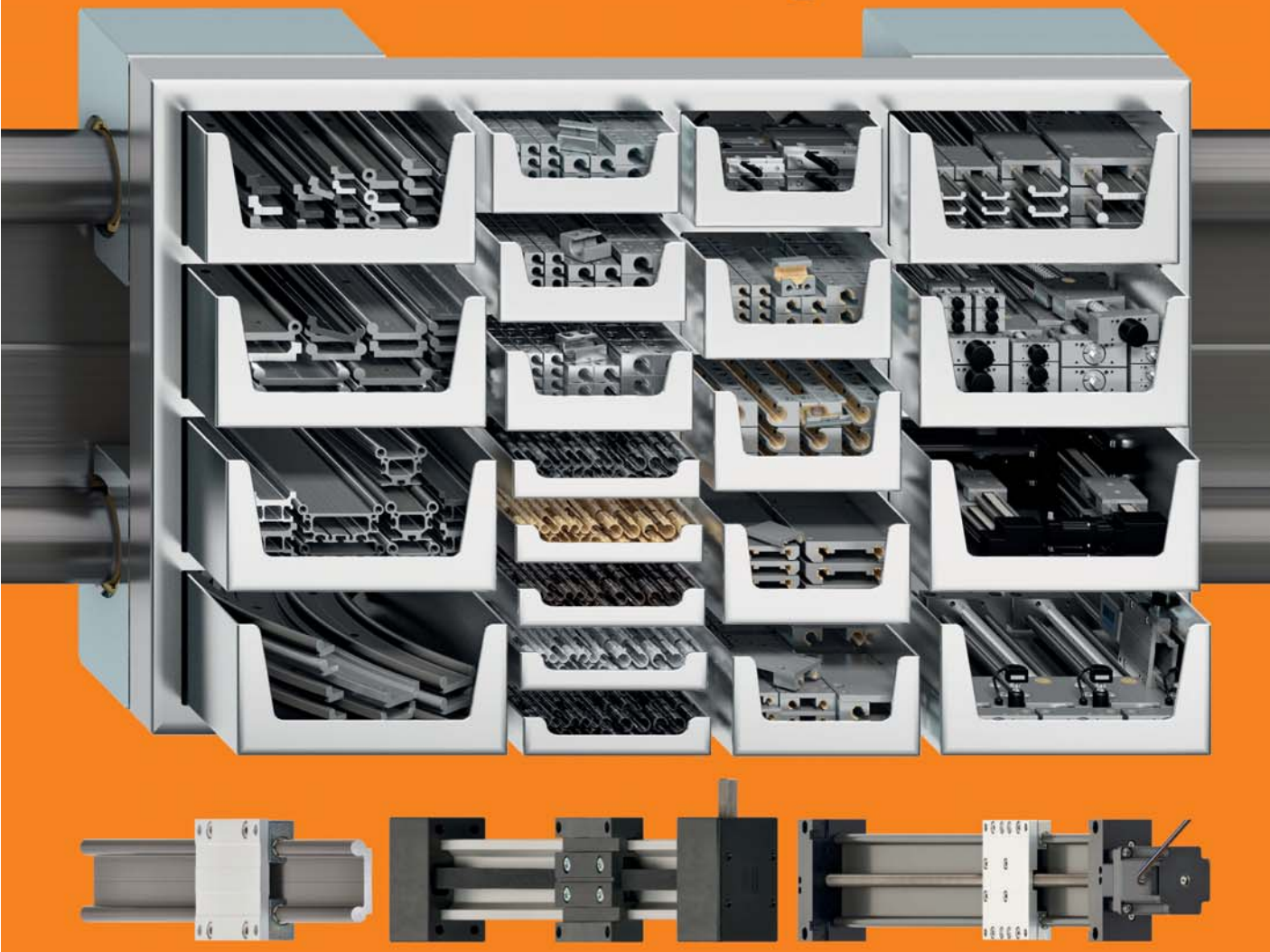

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Parameters	Initial Stage	Target 2015	Results
Productivity (Pcs/person/hr)	2.08	2.42	2.43

Green

Going green is nowadays mantra of manufacturing and of course, conserving resources has been an essential part. In order to be softer on the nature, the Racold Thermo takes number of steps. These include regular compliance checking, minimise use of natural resources, minimise uses of electricity, natural gas, diesel and water, reduce generation of waste, etc.

Safety

In any plant, the safety of the workers, machines and the plant is utmost important. Underlining the safety initiatives, Bhangale stated, "Ensuring safe working condition is paramount importance to us. We believe that a safe working place instils a sense of security & confidence among our work force which enhances our productivity. Our strong implementation & assessment measures help us to achieve our objective of minimising workplace injuries & occupational diseases. All employees go through a health check-up of regular intervals as direction of The Factories Act 1948."

"We find out the physical, mechanical, chemical, biological & physiological hazards & take corrective & preventive action on it by identifies, evaluate & control principle," he added.

Additionally various safety training programs are conducted at the plant. Moreover, the company has formed a safety committee in July 2012 with equal members from staff & workers. This committee continuously works on the improving safety measure for the workers. Also, the company has prepared an Emergency Response Team that conducts mock drill (evacuation drill) with specific intervals.

Sharing the impact of the safety measures taken by the company, Bhangale said, "We have observed decrease in accident level, increase in safety awareness and improvement in self-discipline in employees."

Furthermore, he added that the company follows seven safety pillars in systematic & scientific approach. Steps in this approach include Analysis of accidents, Countermeasures & horizontal expansion, Setting tentative standards for safety, General inspection for safety, Autonomous inspection, Autonomous Safety standards and Fully implemented safety management.

Various training programs

- Compulsory safety induction training to all new joiners.
- Basic safety, Fire Fighting & Emergency preparedness training to 191 nos. of employees.
- Fire fighting training to 110 nos. of employees
- CNG safety training to 70 nos. of employees
- First aid training to 110 nos. of employees.
- Training on Public addressable system – 30 nos. of employees.
- Mock drill/ Evacuation drill conduct once in every year.
- Employee health check-up once in every year.

> "While working with a principle of participative Management, we have already introduced a Suggestion Scheme to motivate the people working in various processes to give suggestions to improve in focussed areas like safety, quality, productivity, value engineering, etc."
>
> **Mahesh Bhangale,** Head Manufacturing, Racold Thermo

"We believe in improvement in safety measures via this type of proactive participation in routine work, which will surely help us for 'ZERO ACCIDENT' as per our expected goal," he shared the vision of the company.

Innovation

As a part of continual Improvement culture that Racold Thermo foolows, the company has innovated concepts related to products manufacturing. Highlighting these concepts, Bhangle mentioned, "We have introduced thickness reduction and standardisation of the Inner Container Domes. Also, we have reduced operations for processing of the Domes via Two Station Toolset Concept. Design Change and clubbing of Operation for Solar Tank Cylinder Processing has helped us to reduce the overheads."

Conclusion

Alongside continuous improvement in the process and practices, what is more important while operating a plant is involving its people. Racold Thermo is also taking steps towards this. Elaborating on the same, Bhangale mentioned, "While working with a principle of participative Management, we have already introduced a Suggestion Scheme to motivate people working in various processes to give suggestions. This will further lead to improvement in focussed areas like safety, quality, productivity, value engineering, etc.

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Indian aerospace industry to **fly high**

India is sure to witness an intense activity in the aerospace manufacturing sector in the next five years, says Ranjan Sen, MD, Trelleborg Sealing Solutions India

By Swati Deshpande

Please tell us about Trelleborg India's operations emphasising on the aerospace business of the company?

Aerospace is one of the strong areas of Trelleborg Sealing Solutions (TSS) worldwide, with almost all major OEMs being our customers, and a sunrise segments in India. As the 'Make in India' movement gains momentum, we see significant impact in this segment. It's always been our priority to deliver world-class products to the customers in India matching our footprint in the Global aerospace industry. This is an area where performance is the key and we thrive under such situations. TSS has already established a formidable footprint in the aerospace industry in India and our seals are used in helicopters, aircraft aggregates as well as in sealing applications of space launch vehicles. In fact, TSS featured on the Mangalyaan project and also is one of the sealing partners for the satellite launch vehicles.

Tell us about your manufacturing capabilities in India.

TSS has invested constantly in India. As a result of these prudent investments over the years, we now have a state-of-the-art facility in Bengaluru, which manufactures plastic & elastomer products. These products serve the exacting needs of capital intensive industries like agriculture, aerospace, automotive, fluid power, oil & gas as well as the OHW and construction sectors. The products of the Bengaluru plant meet Trelleborg's global quality standard and is certified for many critical industries & applications. Most of the products are exported to customers in Europe and the USA through Trelleborg Sealing Solutions distribution centres worldwide.

"The Make in India initiative, coupled with the Government's emphasis to bring in private technology players in the aerospace segment, has given a much needed boost to this segment."

According to you, how is the Indian aerospace market doing and where do you see it in next five years?

The Make in India initiative, coupled with the Government's emphasis to bring in private technology players in the aerospace segment, has given a much needed boost to this segment. New investments & tie ups plans have set the first phase for the advancements. While some of the plans will take time to reach the implementation phase, we are sure to witness an intense activity in the next five years. Our local manufacturing skills along with the design expertise of the leading names is sure to create a significant impact on this quality as well as cost-conscious segment. That day is not far off when Indian products will feature in Boeing and Airbus aircrafts as critical equipment.

How important is the role of polymers in the aerospace industry?

The role of polymers is very critical in the aerospace industry especially when seals are an integral part of components like engine, landing gear, wheel, brakes & flight control. It's important for us to provide the best solutions that meet the different working requirement of these components. Trelleborg Sealing Solutions innovates to develop material that performs exactly as per the critical needs of the industry. As we all understand, there can be no chance of error when one is flying 30,000 ft

above the sea level. These seals have to perform at sub-zero conditions every time an aircraft takes off and are subjected to very harsh atmospheric conditions.

Q Can you please tell us about one of you latest innovations in plastics that is wholeheartedly accepted by the aerospace industry?

Trelleborg Sealing Solutions recently developed a new seal material like Turcon M12 , Turcon T19 , and Turcon M30. Turcon M30 stands out to great extent with higher extrusion, deformation and wear resistance specifically to work on the new surface finishes such as HVOF (Tungsten Carbide) that are new replacing the traditional hard Chrome coatings, due to the REACH demands for environmental friendly processes. It has proven its uniquely long service life in Primary flight controls on the A350 and the B787, and well as in several Main Landing Gear shock struts.

Q How important is R&D for your company? Can you tell us more about Trelleborg's polymer laboratory?

Innovation is one of the core values of our company, almost 2 percent of the turnover is spend on R&D. Keeping in mind the performance criticality of the aerospace segment, Trelleborg has invested a significant amount of its R&D resources specifically on this segment. We have just commissioned a Primary Flight Control Seal Test Bench that will enhance your capabilities in this field. It will enable us to develop and test the next generation sealing systems - Sealed for life hydraulics!

The **old ways**

A case study on how Italian company is using old ways to make best of it for the future.

Some of the most commonly employed manufacturing techniques have been used in industry for decades, sometimes centuries. Take, for example, induction heating. The phenomenon was discovered by French physicist Leon Foucault in the mid-nineteenth century – 'induce' an alternating current in a conductive object, such as a ferrous metal component, and it heats up! The applications, especially in modern manufacturing, are myriad.

Based in Piedmont, Italy, Termomacchine Srl, has been perfecting induction-heating systems for industrial use for more than 40 years. The company is run by its founder, Bruno Gili, who, despite being camera shy, is never reluctant to take the spotlight for the sake of his business and its 80 employees.

"We try to do as much manufacturing in-house as possible," Gilli says. "Quality is everything for us – and for our customers, most of whom are very well-known companies, in Italy and overseas. We have departments for engineering electrical and electronic systems, mechanics, metallurgy, and quality assurance, of course."

Most of the company's orders are for one-off, bespoke, turnkey machines and systems. So, there's little call for large batches of parts or, therefore, three-shift machining.

"We need versatile, simple, reliable machine tools," says Gili. "Speed is not particularly important. And, we're not competing with China or low-cost countries; we have a great deal of expertise, which we apply at all stages of a project, from sales to design, through to service and support."

Bruno Gili has worked with machine tools his entire professional life. In that time, he, like many of his peers, has seen the technology change beyond all recognition – from the advent of tape-based control, to primitive NC, to full multi-axis CNC. When he sings the praises of a particular piece of equipment, he doesn't do so lightly or without good reason.

"We bought a Haas DT-1 Drill/Tap machine," he says. "It runs 10 to 12 hours a day cutting aluminium, copper, stainless steel, and even plastic. It's a truly excellent machine: always reliable, always accurate. It's a real jewel!"

The company also has a Haas TL-2 Toolroom Lathe – which it bought for one particular order. Its latest acquisition is a Haas ST-30Y.

> "Quality is everything for us – and for our customers, most of whom are very well-known companies, in Italy and overseas. We have departments for engineering electrical and electronic systems, mechanics, metallurgy, and quality assurance, of course."
>
> **Bruno Gili,** Founder, Termomacchine Srl

"That machine has very useful capacity," he states. "Although I said we try to make everything in-house, there are some parts we still subcontract. With the ST, we can, hopefully, bring them back so we have more control over quality and delivery."

The ST-30Y is designed to provide heavy cutting ability, extreme rigidity, and high thermal stability. It has a maximum cutting capacity of 457 x 584 mm, with maximum swings of 806 mm over the front apron and 527 mm over the cross slide.

The ST-30Y also has high-torque live tooling and a servo-driven C-axis for 4-axis cutting. Gili repeats that versatility is key at Termomacchine, where each new order is different to the last: "And, we don't make spare parts for stock," he adds. "We'll make a new part when the need arises. It's about speed and the part being right the first time. We have 2,000 machines already in the field, so keeping a stock of spares would be impossible, very expensive."

Thankfully, Italy is a country with many companies just like Termomacchine: specialist, quality-obsessed, with an eye on the future but, just as importantly, with a trust in 'old,' reliable techniques that may be uncelebrated, but never cease to be vital in modern manufacturing.

Source: HAAS CNC

KENSTAR APPOINTS NEW COO

Kenstar has announced the appointment of Rajiv Kenue as its Chief Operating Officer with immediate effect. In his new role, Kenue will be responsible for contributing to the company's strategy for establishing it as one of the most preferred premium brands in India. The brand is offering its patrons an extensive portfolio of products ranging from air coolers, water heaters, microwave, mixer grinders & host of other kitchen appliances. In his role here, he will supervise brand building, product development and distribution expansion for Kenstar. Speaking on the occasion, Kenue stated "I feel honoured to be a part of Kenstar, a company which has a great heritage and goodwill across the country and offers consumers' an international quality product. I believe there is an incredible scope for expansion of all product category in Kenstar and our focus would be to drive secondary sales by widening our distribution network and further strengthening the brand's image"

AMAR KAUL: NEW CHAIRMAN OF THE BOARD OF INGERSOLL RAND

Ingersoll Rand has appointed Amar Kaul as the new Chairman of the Board of Ingersoll Rand India Ltd. Previous to his new role, Kaul was the Territory Leader for Compression Technologies and Services in India and he has taken over this additional responsibility as the Chairman of the Board of Ingersoll Rand (India) Ltd. He was appointed earlier as MD of the Company and his election as the Chairman will help provide a strong leadership to the Ingersoll Rand public company Board in India. Over the years, Ingersoll Rand has built a solid foundation in India with an endeavour to create markets "In India; For India; By India". The organisation has built a strong India leadership team and is successfully delivering on products, services and solutions to customers locally. Kaul's appointment is a step further to reinstate the commitment to building a robust line of local leadership in India.

NEW EXECUTIVE DIRECTOR AT DALMIA BHARAT GROUP

Dalmia Bharat Group has announced the appointment of Jorge Irusta as Executive Director – Steel Business Unit, under its refractory business. In this role, he will be responsible for growing the market share and revenue of refractory sales in the steel industry, across domestic and international markets. Jorge brings 28 years of rich experience in refractory sales, manufacturing and technical services focused on the steel segment. He joins Dalmia Bharat from Vesuvius, where he last held the position of Vice President-Flow Control Refractories for Europe, Middle East and Africa (EMEA) region. Speaking on the appointment, Sameer Nagpal, CEO-Refractories, Dalmia Bharat Group said, "Refractory demand for steel constitutes over 60 percent of total refractory demand worldwide and Jorge's joining is part of our focused approach to grow this segment. With his deep knowledge of application and usage of refractories in the steel industry, we will be able to develop new business opportunities and scale the steel business internationally."

GORDEN WAGENER IS DAIMLER'S CHIEF DESIGN OFFICER

The Daimler AG Board of Management has created the position of Chief Design Officer. At the same time the Board appointed the Head of Design, Gorden Wagener, as Chief Design Officer at Executive Vice President level. With this step the Board is strengthening the significance and the responsibility of the role of design for the company, its products and the global brands.

Gorden Wagener has been at the helm of the globally operating Design unit of Daimler AG since mid-2008 and with his international team he is responsible for the design of all the company's brands and products. His team is not only based in Sindelfingen but also operates in Advanced Design Studios in California, Italy and China, and in five more of the Grop's sites.

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BOEING NAMES NEW SENIOR LEADERS

Boeing Chairman, President and CEO Dennis Muilenburg named Kevin G. McAllister President and CEO of Boeing Commercial Airplanes, succeeding company Vice Chairman Ray Conner in that role. Muilenburg also appointed Stanley A. Deal president and CEO of Boeing Global Services, a new business unit to be formed from the customer services groups within the company's existing commercial airplanes and defense, space and security business units. McAllister joins Boeing from GE Aviation. Deal is a veteran Boeing executive.

McAllister, 53, joins Boeing after 27 years with GE Aviation, where he served since 2014 as president and CEO of GE Aviation Services. Before that, as vice president and general manager of global sales and marketing since 2008, he was credited with delivering record backlog growth for the nearly $25 billion GE business.

Deal, 52, brings three decades of broad aerospace experience to his new leadership role. Since 2014 he has served as senior vice president of Boeing's Commercial Aviation Services business, delivering consecutive years of record performance. Previously, he was vice president and general manager of Supply Chain Management and Operations for Boeing Commercial Airplanes, responsible for Supplier Management, Fabrication, Propulsion Systems and Quality groups.

ADB APPOINTS YASUYUKI SAWADA AS CHIEF ECONOMIST

The Asian Development Bank (ADB) has appointed Yasuyuki Sawada, a professor at the University of Tokyo's Graduate School of Economics, as Chief Economist. Mr. Sawada is expected to assume office in the spring of 2017 after going through formal procedures at the University of Tokyo. Sawada, a Japanese national, has over 20 years of experience as an economist, researcher, and academic. He has worked at the ADB Institute in Tokyo and served as a consultant for various projects at the World Bank Group. A leading figure in development economics and applied microeconometrics, he has also served as a visiting professor at Stanford University's Stanford Center for International Development, and adjunct professor of economics at Korea University. "I'm humbled and excited to join ADB at this pivotal moment in Asia's development journey," Sawada said. "As the key knowledge institution in the region, ADB strives to provide its developing member countries with the best research and policy advice it can offer to promote their development agenda. I look forward to contributing to this effort."

VASCO APPOINTS NEW PRESIDENT AND COO

VASCO Data Security International, Inc. has announced that Scott Clements, currently VASCO's EVP and Chief Strategy Officer, has been appointed as President and Chief Operating Officer, effective immediately. Clements will succeed Jan Valcke, who will retire from the company. Clements joined VASCO in 2015 from Tyco, where he was previously the President of the billion-dollar Retail Solutions business and the company's Chief Technology Officer.

"Scott is a seasoned executive with broadfunctional and operational experience and the right skills to help us take VASCO to the next stage of growth," said T. Kendall Hunt, VASCO Chairman and CEO.

"Since joining the company last year, Scott has proven himself to be a capable leader who has helped define our vision for future growth. He has proven success in identifying new market opportunities and bringing innovative solutions to market. Scott's background in transforming and running large global businesses, as well as in building new businesses, will be instrumental as we position VASCO to realize new opportunities in the security industry and deliver increased shareholder value."

Ushering **Industry 4.0!**

The convergence of information technology and operational technology is creating a paradigm shift with the industry experiencing the fourth industrial revolution, says **Ashish Dass,** VP and MD, South Asia region, Infor

By Niranjan Mudholkar

You have recently taken charge at Infor. How do you plan to leverage on your diverse experience, Infor's industry-specific applications and the on-going digital transformation to grow the organisation as well as to help customers enhance their businesses?

It's an exciting time for Infor in South Asia. In my opinion, the Indian sub-continent is in a very fast transition phase to go digital and it's a wave that everyone wants to ride. At Infor, we have been specialising in industry-specific applications on the cloud and the digital space for over a decade. We have had tremendous global success in this area and replicating this in India will strongly help all our customers in the region.

"With the implementation of the 'Make in India' initiative by the Government, the country is looking towards Industry specialists who have the experience in global mature markets to replicate that in India."

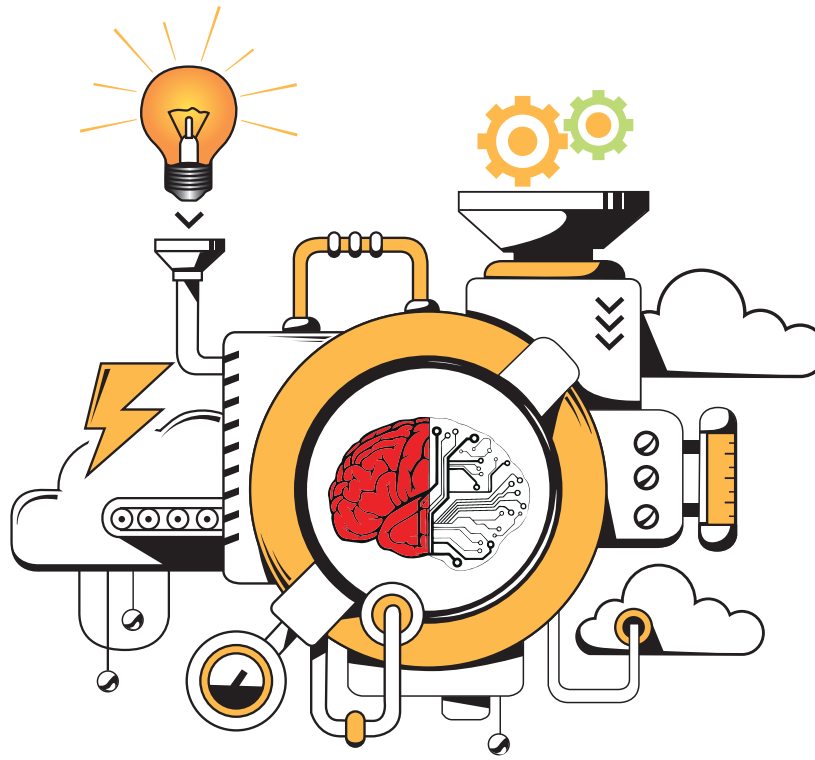
The three major concerns for the manufacturing industry – irrespective of the sector – are productivity, innovation and cost competitiveness. How is Infor helping companies address these issues in an extremely dynamic business environment?

Concerns of the manufacturing industry include pressures to improve performance owing to increasing competition. While technology adoption seems to be definitive choice, clear strategies remain elusive. Excessive hype around disruptive technologies often leads to decision paralysis.

Infor offers comprehensive, purpose-built solutions, especially in the manufacturing space and this gives us a strong competitive edge in the India sub-continent. With the implementation of the 'Make in India' initiative by the Government, the country is looking towards Industry specialists who have the experience in global mature markets to replicate that in India. We have industry-specific products which look beautiful, with consumer-inspired user experience, come with the cloud deployment which is very cost effective. Our solution helps get visibility across the company's global supply chain and system-wide transparency for all key stakeholders. One of our key pillars to success is innovation; we strive to aid in differentiation of brand and build customer loyalty with continually evolving technology that helps turn trends like the Internet of Things and mass customisation into a competitive advantage. We are seeing a lot of traction where our customers and prospects are wanting to upgrade and leverage our global experience in the region.

Today, the world is converging at common points. At the same time, local aspirations, local needs and local challenges vary from market to market. So how can manufacturing companies that are global in nature (or that are aspiring to be global) endeavour to reach out to their customers while understanding the local context but without compromising on their global vision?

Today, the local-global boundaries are blurring and the world is converging, forcing organisations to digitally transform. As a result, enterprises are transitioning the way they operate and manage their business spread across multiple geographies



and executed with multiple partners. Some very large, growing economies like India are not behind. It's important to have the "local" flavour of doing business in your respective regions and it's equally crucial to keep the global convergence in mind to ensure you do not lose out on the benefits that it offers. In the business applications space, software companies like us recognised this and are constantly helping customers as IT enablers to see through their potential. To tap newer growth opportunities, there is a need for manufacturing companies to create a multi-enterprise ERP, which includes a new generation ERP on cloud and business applications. Purpose-built software on cloud enabled with mobility and integrated with social platforms are best poised to cater to specific needs and challenges of a modern enterprise. Additionally, keeping an open mind, engaging with us, and learning from our global experiences will help the companies to make that transition faster.

Businesses are now increasingly moving to the cloud. How is Infor helping them with its industry-specific software built for the cloud?

With the early resistance to cloud solutions for critical manufacturing applications fast eroding, the deployment of cloud technology is quickly gaining traction among manufacturers. IDC says 52 percent of surveyed manufacturers are already seeing major impact from cloud technologies. Another 40 percent anticipate seeing major impact in the next five years, bringing the total to 92 percent by 2020.

Adopting cloud is the present now and not just the future. Every CXO-level decision maker wants to grow their business by increasing their top line and not increasing their cost in proportion to their revenue. That's a good business model. Deploying your IT solutions and applications on the Cloud is one big step in achieving these goals.

Infor is the early initiator and one of the largest now in the cloud applications space, globally. We are the leaders in industry specific, multi-tenant solutions globally and our customers recognise this and have greatly benefitted from deploying our applications on the cloud. Our approach is to work closely with our customers and show them how their specific business can get huge benefits of a cloud deployment and this is working very well for us.

"Purpose-built software on cloud enabled with mobility and integrated with social platforms are best poised to cater to specific needs and challenges of a modern enterprise."

Technology trends like big data, PLM, and Internet of Things (IoT) are propelling the industry towards a paradigm shift called Industry 4.0. Adoption of these trends is making factories 'Smart'. So how do you see these trends influencing the factory environment across different functions like design, development, production, marketing & sales, delivery, and services – in the context of your solutions?

Smart Factories or 'Factory of the Future' is the result of fast-changing disruptive technologies revolutionising the manufacturing space. The convergence of Information technology and operational technology is creating a paradigm shift with the industry experiencing the fourth industrial revolution. Many technologies that were considered disruptive only a few years ago have already received substantial traction and are largely considered "must have" capabilities. Mobility, Big Data and IoT are a few examples of such technologies. The impact promises to grow and be even more substantial as manufacturers deploy and integrate more technologies across the entire landscape. Greater speed, value, innovation, and closer alignment with demanding customers will be some of the many benefits. According to a report from SCM World, 40 percent of manufacturers they surveyed say that smart manufacturing along with its foundational technology—the Internet of Things—is within reach, and it's the right time to invest. Huffington Post reports that early adopters who have at least partially implemented smart manufacturing initiatives have documented measurable results –

- 82 percent reported increased efficiency
- 49 percent reported fewer product defects
- 45 percent reported customer satisfaction gains.

Mahindra opens a spare part warehouse in Jaipur

Mahindra & Mahindra Ltd (M&M Ltd) has inaugurated its state-of-the-art spare parts warehouse in Mahindra World City (MWC), Jaipur. As one of the largest, most modern warehouses in the country and the company's first in northern India, it will cater to the requirement of Mahindra customers in north and north western region of the country for both automotive and tractor spare parts. The warehouse was inaugurated by Dr. Pawan Goenka, Managing Director, Mahindra & Mahindra Ltd., in the presence of other senior company officials.

Spread over an 11 acre plot with an additional 5 acres for future expansion, this state-of-the-art spare parts warehouse aims to significantly reduce the order processing time for its customers based in North India. The processing time for the availability of spare parts and distance-to-market is expected to take less than 4 days. The company will procure spare parts from over 1,000 vendors and 9 plants for this new facility. With an investment of Rs. 150 crore, it will generate employment for over 450 direct and indirect employees. This Regional Distribution Centre (RDC) is one of the first such facilities to implement SAP – EWM for lean processes ensuring simpler, faster, more accurate and efficient warehousing. This is expected to be a major enabler in easing processes, enabling higher speeds through automation and reach world class benchmarks in process, scalability, flexibility, speed, infrastructure and quality.

Superior Essex, Furukawa to form European JV

Essex Magnet Wire, a division of Superior Essex Inc., and Furukawa Electric Co., Ltd. plan to form a joint venture to supply a new type of winding high-voltage wire (HVW) primarily to the automotive industry throughout the European Economic Area. The joint venture will manufacture, market, sell, and distribute HVWs that are used in electrical-driving motors, generators, and reactors for automotive vehicles.

This endeavour combines the global resources and technical expertise of Essex Magnet Wire and Furukawa Electric, i.e., Essex Magnet Wire's European sales force and manufacturing operations and Furukawa Electric's relevant technology, which Furukawa Electric will license to the joint venture, to supply a new type of HVW to automotive customers in Europe.

Based in Bad Arolsen, Germany, the joint venture will operate under the name Essex Furukawa Magnet Wire Europe. Although Essex Magnet Wire will be the majority shareholder of the joint venture, the parties expect to operate the joint venture in the spirit of a true commercial partnership. The formation of the joint venture is expected to close in 2017 Q1.

Scania opens a factory in China

Scania and Higer inaugurated a new, state-of-the-art bus and coach factory in Suzhou, China. The new factory will exclusively build Scania Touring and Scania-Higer dual-branded high-end buses and coaches. Scania and Higer started to cooperate in 2006. "Now, ten years later, the cooperation has grown into a successful project, although it has developed differently from what we first thought it would be. I think both parties expected that China would be the main market for our cooperation, but, as it has turned out, most of our joint products have been sold overseas. To date, we have sold close to 2,500 premium coaches to over 40 overseas markets and we are the leading exporter of premium coaches out of China," says Scania's President and CEO Henrik Henriksson.

In partnership, Scania and Higer are the leading exporter of premium coaches from China, and the new factory will strengthen that position, as well as sales of premium coaches in the Chinese market.

quattro GmbH rebranded as Audi Sport GmbH

Quattro GmbH, established in Neckarsulm in 1983, is now operating as Audi Sport GmbH. With Stephan Winkelmann at the helm, this fully owned subsidiary of AUDI AG currently has around 1,200 employees.

Since 1983 quattro GmbH, with its headquarters in Neckarsulm, has been building high-performance sports cars and delivering high-tech automotive concepts. And now the Audi subsidiary has changed its name to Audi Sport GmbH. It is built on four business areas.

In addition to developing and manufacturing the Audi R8* and Audi RS models, it is responsible for customer motorsport – Audi Sport customer racing. Other areas of business include car customization options via the Audi exclusive program, plus lifestyle articles marketed as the Audi Sport collection.

JLR to produce new Discovery in UK and Slovakia

Jaguar Land Rover has confirmed that the new Land Rover Discovery will be produced at two European plants, at Solihull in the UK and Nitra in Slovakia, following strong advanced orders for the new flagship in the Land Rover model range. Wolfgang Stadler, Jaguar Land Rover Global Manufacturing Director said: "The new Discovery is already a hit with customers, confirming our decision to launch this car as the lead vehicle in Slovakia, alongside manufacture in Solihull. This multi-plant approach mirrors the strategy taken for Range Rover Evoque and Land Rover Discovery Sport at our plants in Halewood, China and Brazil, ensuring our manufacturing output is able to keep up with strong consumer demand."

The Slovakian facility, which will open in 2018, will add to production from Solihull, which is operating at full capacity across three shifts, with 24-hour production to support global demand for Range Rover, Range Rover Sport and the recently launched Jaguar F-PACE.

Continental, Oxford University join hands for artificial intelligence

International technology company Continental and the University of Oxford are now conducting joint research in the field of artificial intelligence. The partnership between Continental and the Department of Engineering Science at the University of Oxford will focus on the possible uses and development of artificial intelligence algorithms, which have the potential to further enhance future mobility applications. These deep-learning algorithms have the potential to realise highly-reliable visual object detection and human–machine dialog in the future. The first phase of the envisaged three-year partnership began in early November 2016 and includes new postdoctoral research positions at Oxford. There are plans to extend the research scope and the time frame at a later date.

Continental expects the partnership to yield findings on the use of artificial intelligence methods, including in the areas of automated and autonomous driving, the improvement of future vehicle access systems, accident minimization through intelligent warning systems, and the sensitive dialog that will take place in the future between drivers and vehicles – between humans and their machines.

Perkins opens new engine manufacturing facility in Aurangabad

Devendra Fadnavis, the Chief Minister of Maharashtra, has officially inaugurated Perkins world-class engine manufacturing facility in Aurangabad, India. Located in the Shendra Industrial Estate in Aurangabad, Perkins has invested more than $150 million developing a state-of-the-art engine manufacturing facility which is also strategically located within the Delhi-Mumbai industrial corridor.

In operation since October 2015, the facility produces Perkins largest engines, the 4000 Series, which generate electric power for installations across India and the wider Asia Pacific region. End-to-end machining, engine assembly, test and finish – every step of which follows rigorous manufacturing processes, are undertaken on site, by more than 500 highly trained employees.

The Chief Minister said: "This facility encapsulates the Make in India dream of our Honourable Prime Minister, to produce world-class products with zero defects and zero effect. That resonates here. We could see the way the assembly line is designed – it's absolutely faultless. The best quality is ensured here."

Perkins Aurangabad Engine Facility has the capacity to produce 3,000 engines a year, serving customers in India and the wider Asia Pacific region with dependable power solutions.

Mercedes-Benz drives in the new CLA

Mercedes-Benz India recently redefined the compact luxury sedan segment, by driving in the stylish new CLA. The CLA embodies an intelligent combination of functionality and agility in a modern coupé design with several striking features. The CLA's stunning design elements and dynamic appearance make it one of the most stunning sedans on road. The CLA represents a landmark in automotive design, carving out a niche for itself. It features an Avant-garde coupé design with powerful lines, striking light reflections, soft nose and extremely low Cd value of 0.25 (the lowest drag coefficient of any production car in the world).

Putting **people first!**

Nirmala Behera Udgata, Head – Group HR, RSB Group, says that her organisation cherishes effective inter-personal relationship, team work and supportive leadership.

By Niranjan Mudholkar

How would you describe the overall HR policy at the RSB Group and what are its driving principles?

Our HR policy is not only all impersonal rules and regulations, but also consists of systems and procedures that have a humane connect and provides ample space for growth. It gives opportunity to our people to take ownership of their areas of work and responsibility. Innovation and empowerment are two driving principles followed in RSB in this ever changing business environment

The path to individual growth is open, unending and unhindered with focus on building and imbibing 'Quality and Customer Service' in all respects in their areas of operations; and opportunities for perpetual 'Learning and Training' to remain contemporary and compatible with needs of the emerging times. These traits have not only helped our company to emerge as a global player, but also have embedded the never-ending quest for excellence as the DNA of the organisation.

"Grievances and ideas are respectfully and seriously evaluated and implemented according to the merit. We are proud to say that many of our organisational and business improvements have their origin in these grievances and suggestions."

Many manufacturing companies in India have faced major challenges with regards to labour related issues. How has been the situation with RSB?

We have an open door policy with walk-in access to members irrespective of rank and file to air grievances and to offer ideas and suggestions. Grievances and ideas are respectfully and seriously evaluated and implemented according to the merit. We are proud to say that many of our organisational and business improvements have their origin in these grievances and suggestions.

We look upon our employees as our prized assets that constantly change and grow. People, without any fear of reprisal, can question old ways, challenge old ideas for betterment and move beyond their ambit. No barriers hinder the development of their skills as we want to tap untapped potential and resources. Everyone is made to learn and unlearn through a chain of unending training so that they excel and grow higher and higher. We cherish effective inter-personal relationship, team work and supportive leadership. We give authority and responsibility, which always go hand-in-hand, and we allow people to take calculated risk.

We have mass meetings at all our plants every month, which are chaired by the Plant Head. At these meetings, our shopfloor colleagues are open to voice their grievances and spot solutions are given. Such meetings are also chaired by our Vice Chairman & Managing Director at planned intervals where every shopfloor associate gets an opportunity to talk directly without protocol or fear.

Participatory approach of shop-floor representatives is encouraged in weekly or DWM (Daily Works Meeting) where issues/grievances are thrashed out on the spot. Besides, we have regular employee satisfaction survey, where our colleagues are encouraged to speak up openly without bias or hindrance and feedback is taken by HR in a positive sense.

We ensure that our counselling extends beyond the ambits of the organisation to the family members of our people as well. Through annual get-togethers, we connect with the family members and also understand their well being and get valuable feedback.

Acronym "RSB Parivar" runs through every communication channel and stream of HR, which makes RSB an IR-free unique entity.

How can an effective HR team help a manufacturing company's bottom line, including developing a positive and engaging work environment for the company?

Every individual should be respected, trusted and governed by self-discipline rather than constant vigil and monitoring through external control. Self regulation and discipline assume paramount significance. Believing in individual or collective

ideas and suggestions should precede the policy formulation on any issue.

Regular 'Heart to Heart' interaction across rank and file, encouraged from the top, should form a part of HR process, which keeps a tab on pulse of people for gaps, if any, and consequent corrective course, with targets and regular review of its impact. Such approach, in its wake, brings ideas and suggestions for umpteen improvements in various shopfloor practices like Monthly Suggestion Scheme, Improvement Projects and QC Stories. Inculcating Deming's PDCA (Plan Do Check Act) cycle approach in every activity, sense of ownership in every individual, pat-at-the-back, awards/accolades for live and implemented ideas/suggestions, felicitation through 'Employee of the Month' awards/rolling trophies, for the best Kaizen projects, etc improves the bottom line, as we at RSB Group have seen live.

Besides positive work environment, individual and group accountability with defined KRA (Key Result Area) and review at planned intervals, multitasking with robust IT systems in the competitive scenario play major role in improving the bottom line.

Attracting and retaining talented people has always been a big challenge for the manufacturing industry. How have you been tackling this issue?

Our attrition rate is hardly in the single digit pan India! With open culture across rank and file inculcated in the HR system, every employee - right at the time of induction/orientation - is given clarity of role, career progression, culture, code, ethics of the organisation and sense of ownership, dignity as a family member of RSB Group and the opportunity to speak-up. An RSBian remains an RSBian, in many cases, right up to superannuation.

Training and skill upgradation are very important in today's competitive environment. What are you doing on this front?

Training and skill up-gradation is in-built in our system through TQM (Total Quality Management) process which focuses on individual skill matrix, where training need identification is done and accordingly training, whether technical or otherwise, is given in a phased manner, while keeping a tab on training effectiveness at planned intervals.

"Training and skill up-gradation is in-built in our system through TQM (Total Quality Management) process which focuses on individual skill matrix, where training need identification is done and accordingly training, whether technical or otherwise, is given in a phased manner, while keeping a tab on training effectiveness at planned intervals."

The RSB Group has a fairly wide geographical foot print including a couple of plants outside India. How do you bring about a cohesiveness in terms of implementation of HR related policies and strategies?

RSB Group's India and overseas plants have separate policies moderated in line with respective countries' culture, ethics, work style, statutes, rules and regulations. At the same time, we ensure that our basic HR philosophy speaks across with one tone.

How big is the RSB work force and what do you think differentiates it from other players?

We have 3000+ strong and motivated work-force whose career moves up in consonance with RSB's growth. We have an open culture and people empowerment. We respect every one's feeling, coming out of differences and close the gap by logical improvement in relationship. While Group encourage 'Speak Up', we expect the issues involved are brought up with a sense of responsibility and maturity. We understand that all cannot be always right; what we impress on every one is 'What is Right'.

Besides, a personal rapport at planned intervals from the top across rank and file, gives us a unique niche.

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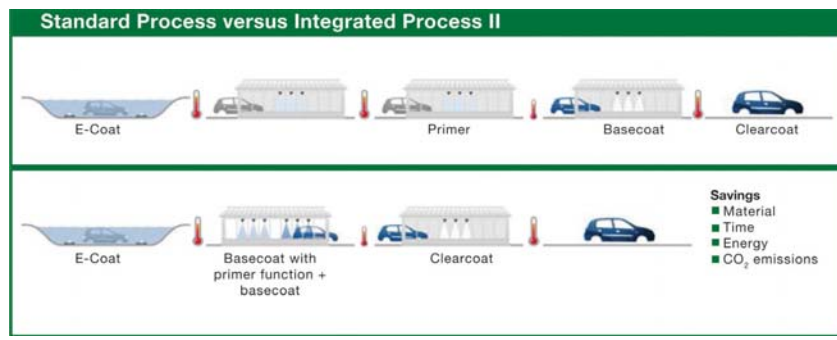
Conserving resources during automotive production

An eliminated step in the paint process saves huge amount energy. Read more about the new approach towards automotive production.

The BMW Group saves 12,000 tons of CO2 annually during automotive production at its Munich plant by eliminating one step from the paint process. This means that compared to a conventionally coated vehicle, a car coated with the shortened process can drive the first 420 km with a net zero carbon footprint. In addition, the process saves as much energy as the amount needed by 250,000 Munich residents to wash one load of laundry every week.



These are the findings of a new TÜV-certified study conducted by the BMW Group together with the mechanical and plant engineering firm Dürr and BASF's coatings experts. They aimed to find out how the eco-efficiency of the OEM coating process can be improved allowing resources to be conserved at the same time. "The paint process is one of the most energy-intensive process steps involved in industrial automotive manufacturing," said Dr. Hans Schumacher, Head of Dürr's Application Technology division. "We have consolidated the expertise of three companies in order to make paint processes even more environmentally friendly in the future," said Lars Nigge, Account Manager BMW at BASF's Coatings division.

The study specifically compared two primer-based coating processes to the integrated paint process without primer. In conventional systems the primer smoothens surface irregularities and protects the cathodic e-coat, the undermost paint layer, from UV radiation. BASF was able to substitute the primer by integrating its protective properties into a newly developed waterborne basecoat layer. In all categories included in the study, the "Integrated Process" proved to be the most beneficial. Compared to the current primer process, the Integrated Process reduces energy consumption and CO2 emissions by around 20 percent and saves costs.

In conventional systems the primer smoothens surface irregularities and protects the cathodic e-coat, the undermost paint layer, from UV radiation. The Company was able to substitute the primer by integrating its protective properties into a newly developed waterborne basecoat layer.

> "We have consolidated the expertise of three companies in order to make paint processes even more environmentally friendly in the future."
>
> **Lars Nigge,**
> Account Manager BMW at BASF's Coatings division.

Eco-efficiency analysis

The study was based on real-life data from 2014 evaluated with the Eco-Efficiency Analysis developed by BASF. The analysis will help BASF and its customers decide which products and processes are the best choices for a defined benefit, both ecologically and economically. The study has been validated by TÜV (German technical inspection and certification organisation) and NSF (National Sanitation Foundation).

When it comes to sustainability in automotive, the focus is directed more and more to manufacturing processes. In addition to the utilization phase, the production phase is now being examined more closely. "It is no longer just a question of whether a product is sustainable in consumption but also whether it has been manufactured sustainably," said Nigge. "The study's findings provide compelling evidence that the Integrated Process is one of the most eco-efficient solutions."

Source: BASF

A new **platform!**

CSP HQ. *Courtesy: CSP*

Through the acquisition of Continental Structural Plastics, Teijin intends to establish the foundations of an automotive composite products business in North America, and to accelerate its expansion as a tier 1 supplier of high-performance composites to the global automotive market.

Japan based Teijin Ltd. has agreed to acquire Continental Structural Plastics Holdings Corporation (CSP), a leading automotive composite supplier in North America, for US$ 825 million. CSP will become a wholly owned subsidiary of Teijin. Through this acquisition, Teijin intends to establish the foundations of an automotive composite products business in North America, and to accelerate its expansion as a tier 1 supplier of high-performance composites to the global automotive market.

CSP is a leading manufacturer of thermoset composites in the automotive industry and is the world's largest sheet molding compound (SMC) manufacturer for automakers. Since its establishment in 1969, CSP has provided leading-edge technologies in lightweight materials and composite solutions such as glass fiber reinforced plastic (GFRP) for the automotive industry. The company provides full-service engineering support, and holds more than 50 patents covering materials development and manufacturing processes in composite materials formulation and design. Its Class A surfaces produced by its SMC technology have been adopted by various automakers in the US, Europe and Japan. The company has 14 facilities in the US, Mexico, France and China and approximately 3,200 employees. Teijin will benefit from CSP's established sales channels in the North American automotive market, which will enable the combined business to provide a broader range of solutions that meet automakers' demands for weight reduction and durability, utilising the company's thermoplastic composite technologies.

> We are confident that the platform for automotive composite products business we will gain through the acquisition of CSP's complementary technical expertise in thermoset composites and GFRP know-how will trigger further development of our integrated high-performance materials business, one of our key strategic fields.
>
> **Jun Suzuki,** President and CEO of Teijin Limited

The combination of CSP's thermoset capabilities, especially its GFRP technology, and Teijin's high-performance composites such as carbon fiber reinforced thermoplastic (CFRTP), will help reduce weight and component count in finished products. This will in turn improve recycling efficiency and offer automakers value-added solutions that meet their requirements for more environmentally friendly components at lower cost. Teijin will also utilise CSP's European Center for Advanced Technology in France and Teijin's own composite production facilities to enhance its global development capabilities to better address the requirements of European, Japanese and Asian automakers. The automotive composite products business of the Teijin Group is targeting annual sales of US$ 2.0 billion by 2030.

CSP Showroom. *Courtesy: CSP*

Jun Suzuki, President and CEO, Teijin Ltd, commented, "Since being appointed as Teijin's president in January 2014, I have pursued business models that help provide value-added solutions by combining and integrating our own materials, healthcare and IT technologies. We are confident that the platform for automotive composite products business we will gain through the acquisition of CSP's complementary technical expertise in thermoset composites and GFRP know-how will trigger further development of our integrated high-performance materials business, one of our key strategic fields."

Senior UK Minister visits Renishaw during India-UK TECH Summit

Renishaw, the global engineering technologies company, hosted a visit to its Pune, India facility on by The Rt Hon Liam Fox MP, British Secretary of State for International Trade. During his visit he toured the 80,000 sq ft building where he saw a state of the art metal 3D printing facility, a manufacturing unit that services the Renishaw Group, and a large R&D software facility. The Secretary of State was also presented with a unique metal gift produced on a Renishaw additive manufacturing (3D printing) system and planted a commemorative tree.

The visit coincided with the India-UK TECH Summit, held in New Delhi from 7 to 9 November, which marked a celebration of India and UK's partnership across business, technology, science, innovation, education and design.

Hosting the visit was Rhydian Pountney, Renishaw's Director and General Manager – UK/ROW Sales Division, who is responsible for the company's sales and marketing activities in India. He is also co-chair of the Advanced Engineering Working Group of the annual India-UK Joint Economic and Trade Committee (JETCO) which met in New Delhi as part of the Summit.

Pountney co-chaired 'The Future of Manufacturing' workshop with Dr Gopichand Katragadda, the Group Chief Technology Officer at Tata Sons.

The workshop brought together a wide cross-section of industry, academia and R&D institutions with an interest in Advanced Engineering and Manufacturing collaboration between the UK and India.

"Renishaw has been operating in India for over 30 years and I was able to show the Secretary of State how our long-term commitment to India has been beneficial to both Renishaw and the Indian economy," said Mr Pountney. "Today we employ 350 skilled people in India, the majority based at our Pune site in Maharashtra, who directly contribute to the R&D and manufacture of our world leading innovative precision measurement, 3D printing and healthcare products."

PRODUCTS UPDATE

Laser cutting machines

LVD Company nv expands its fiber laser portfolio with the Phoenix FL 4020 and Phoenix FL 6020, two new laser cutting machines designed to handle sheet dimensions of 4000 x 2000 mm and 6000 x 2000 mm respectively. Available in 3, 4 and 6 kW versions, the new Phoenix models offer high versatility as all-round machines able to deliver first-class cut quality in both thin and thick materials in standard steels as well as non-ferrous materials and process large sheets quickly and economically. Phoenix Series machines provide the highest energy efficiency and productivity benefits of fiber laser technology.

Phoenix FL machines achieve superior cut quality through an advanced cutting head design that allows automated adjustment of focus position and focus diameter, known as 'zoom focus.' To achieve the highest possible speed in every material thickness, focus position and diameter are automatically controlled and adjusted by the CNC controller. This advanced technology makes the Phoenix FL the most flexible fiber laser cutting machine – able to cut different sheet thicknesses with high productivity and excellent cut quality.

Phoenix 4020 and 6020 models feature uprated drive systems to achieve the same dynamic performance as 3015 models allowing fast processing of large format sheets.

Phoenix lasers provide high dynamic processing and fast cutting speeds thanks to the 1µm fiber wave length. Acceleration and overall accuracy is further supported by the machine's rigid welded steel frame construction. An integrated control and drive system ensure the highest reproduction of programmed contours at fast processing speeds.

Phoenix machines keep uptime high with an integrated automatic shuttle table system that allows one table to be loaded while the machine is cutting on the other table.

A touchscreen control and LVD's TOUCH-L user interface make the Phoenix easy to use and operate, further increasing machine uptime. The 19-inch touch screen and icon-driven user interface guide the user through all necessary man-machine interactions. TOUCH-L also incorporates a part programming and nesting feature so users can import drawings directly into the control, applying cutting technology and nesting sheets at the machine.

Flexible assistance system

Expertise in tools and processes ensures efficient production. Customers can select the functions of according to their requirements and can also operate the system using mobile terminals. Read more about the machine

With ToolScope, the KOMET GROUP has developed an assistance system, which does much more than simply monitor tool breakage and wear. It ultimately turns a machine into a production system with Industry 4.0 capability. The tool manufacturer presented the latest version, which is particularly impressive due to its flexibility and user-friendliness, at the AMB 2016. For instance, customers can select the functions of KOMET ToolScope entirely according to their requirements and can also operate the system using mobile terminals.

KOMET BRINKHAUS GmbH has been part of the KOMET GROUP for more than three years. As a result of the interaction between tool experts and process monitoring specialists, it was possible to further develop the ToolScope process monitoring system into an integrated assistance system in terms of Industry 4.0.

During the process, KOMET ToolScope monitors and records the machine's internal signals, such as the torque of a spindle or the feed force of an axis. It also detects events such as tool changes and machine stoppages.

During the process, KOMET ToolScope monitors and records the machine's internal signals, such as the torque of a spindle or the feed force of an axis. It also detects events such as tool changes and machine stoppages. Using its knowledge of process identifiers such as range, tool, sequence number, etc., which can be read from the control system, the software is able to calculate parameters and deduce trends after the process is complete.

With ToolScope, the KOMET GROUP has developed an assistance system, which does much more than simply monitor tool breakage and wear. It ultimately turns a machine into a production system with Industry 4.0 capability.

In order to design ToolScope that offers the user as many added benefits as possible, KOMET has developed a number of apps. The range includes an automatic shift log, a tool change log, a solution for adaptive feed control and an independent cloud database function. Customers can put together their ToolScope entirely according to their requirements and can license the individual elements separately.

Operation of the system has also become more flexible: As of autumn 2016, users will additionally be able to view and operate their custom assistance system on mobile terminals such as tablets and smartphones.

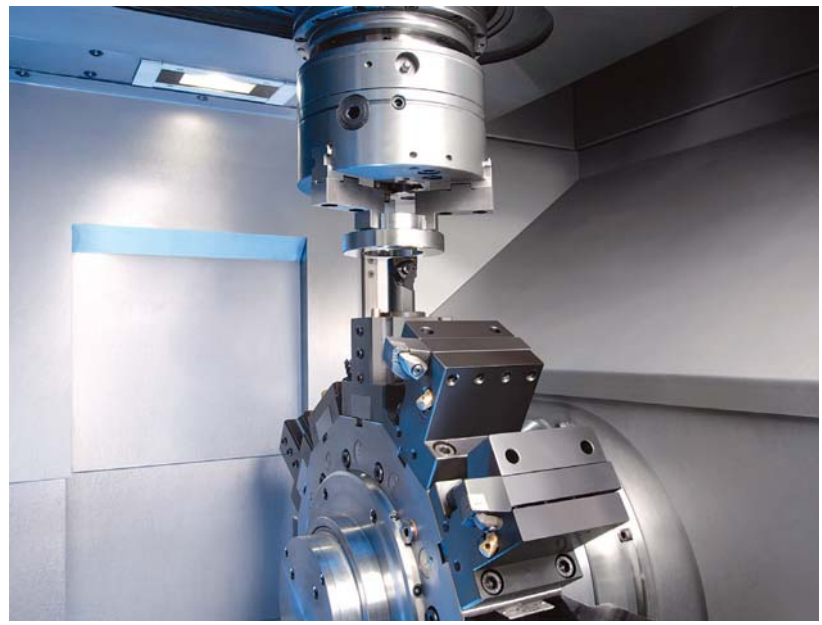
The following example demonstrates just how successful the use of the KOMET ToolScope assistance system can be: KOMET GROUP tool and process experts managed to triple the tool life of an indexable insert face milling cutter using ToolScope apps. The cycle time for preparation was also significantly reduced. As a result of these savings, the payback time for the KOMET® assistance system was less than one year.

For more information contact KOMET Precision Tools India Pvt. Ltd.
E-mail: info.in@kometgroup.com

Modular system for line production

Read more about the VL Series from EMAG that the company plans to showcase at IMTEX 2017.

Vertical production machines are EMAG's territory. It all began with the VSC series, which laid the foundation for the successful machine concept of the vertical pick-up turning center. This machine concept runs through nearly the entire product range of the manufacturer, and it takes on its latest form in the VL series. EMAG will be presenting the modular standard machines this year at IMTEX in hall 2b, booth A108.



VL machines are part of EMAG's modular standard series. As the term suggests, these machines are built on a common machine base but allow the use of an extremely wide range of technologies, similar to the modular platform systems seen in the automotive industry. There are now modular machines available for turning, gear hobbing, and chamfering processes; for grinding (chucked parts and shaft parts); for induction hardening; and also in special designs for laser welding or PECM technology. Essentially, they are available for virtually all the technologies offered by the EMAG Group.

Automation included

The machine base of these modular machines is made out of Mineralit polymer concrete. This material has exceptional vibration damping properties, which is the basis for the machines' excellent process quality. The machine base supports a compound slide rest equipped with an X-axis and a Z-axis, which allows the working spindle to move. The working spindle is the heart of the pick-up automation system which is an essential part of every modular machine. It includes a parts storage unit in every machine, from which the pick-up spindle loads and unloads itself independently. This lowers non-productive time to an absolute minimum as there are only a few seconds between the machining processes. An optional measuring probe can be installed directly alongside the loading position, allowing time-optimized measuring of the parts. The designers have thought of everything to make these machines as efficient as possible.

The VL Series—the modern approach to turning

The vertical pick-up turning centers of the VL series were developed particularly for the production of precise chucked parts. There are now five versions of the VL machine to cover the widest possible range of parts. The smallest machine is the VL 2, designed for chucked parts with a diameter of up to 100 mm. It is followed by the VL 4, VL 6, and VL 8 machines which allow for an increase of 100 mm in diameter with each model increase (see image). These additional models allow the VL series to cover workpieces up to 400 mm in diameter. Each VL machine is equipped with a tool turret with up to twelve (driven) tools for the machining of chucked parts. This turret is exceptionally dynamic; it's very fast indexing cuts non-productive time to a minimum, which in turn reduces cycle times. The machines can also be equipped with a Y-axis in the turret for the machining of complex shapes. This greatly expands the number of possible applications of the machines. The fifth machine in the set is the VL 3 DUO with dual spindle.

The working spindle is the heart of the pick-up automation system which is an essential part of every modular machine. It includes a parts storage unit in every machine, from which the pick-up spindle loads and unloads itself independently. This lowers non-productive time to an absolute minimum as there are only a few seconds between the machining processes.

This NC gripper, which is programmed directly through the machine's control, provides the transportation of parts between the machines, as well as to and from the storage unit for raw and finished parts. The gripper has a Z-axis so it can also store the parts three-dimensionally, on top of each other, in stackers. This allows a huge number of parts to be stored in a very small space. The gripper also functions as a flip-over unit, turning the TrackMotion into a genuine all-purpose solution for the automation of modular machines.

Modern manufacturing with VL machines

EMAG's VL series of vertical pick-up turning centers offers a whole range of machines where everybody can find the perfect tool for their application. Whether as standalone machines, or linked with other modular machines, the VL series promises state-of-the-art production of chucked parts with top of the line quality, at rock-bottom unit cost.

VL 3 DUO—Two machining areas ensure productivity

The VL 3 DUO is the first dual-spindle machine in the VL series. Its parts capacity places it between the VL 2 and VL 4, allowing high-productivity manufacturing of chucked parts with a diameter of up to 150 mm. It's no coincidence that the majority of transmission gearwheels fall into this size category. Every aspect of the VL 3 DUO has been designed for high-volume production, which makes it the ideal solution for the machining of gear blanks that have to be churned out by the millions. The VL 3 DUO is pure performance. Including the parts storage unit, the VL 3 DUO has a footprint of no more than 13 sq mtr. That space houses the automation system, the parts storage unit, and two complete machining areas, each with its own working spindle and its own 12-station tool turret. This machine is ideal for production in two clamping operations – machining both sides of a workpiece in OP 10 and OP 20, respectively. Of course, the part needs to be flipped over between the two operations. With the TrackMotion automation system, EMAG has found an ingenious solution for this problem.

TrackMotion—Modular automation solution for modular machines

The TrackMotion automation system has been specially designed for modular machines and drastically simplifies the connecting of multiple machines. The example of the VL 3 DUO makes this very clear. The TrackMotion automation system is made up of two components: a track, which is a kind of rail routed behind the work area of the machines, and the TransLift, a gripper system that runs along on that rail.

Anyone visiting the EMAG booth in hall 2b at IMTEX will quickly realize that EMAG's promise of being able to construct complete manufacturing systems on a modular basis can be easily achieved with the products presented there. The simplicity with which the modular machines can be linked using the TrackMotion automation system, the wide range of technologies offered, and the high productivity and quality of the individual machines make EMAG one of the most innovative suppliers of turnkey manufacturing systems in the marketplace.

Anyone after this kind of manufacturing solution will find what they're looking for at EMAG's booth A108.

For more information: EMAG GmbH & Co.KG
e-mail: misgro@emag.com; www.emag.com

Fit & go - simplifies parallel guidance of e-chain and corrugated tube

With the new side plates for the E4.1 energy chain, corrugated tube clips can be fastened quickly and without tools. Learn more about the E4.1 TUB energy chain series that offers a solution for the guidance of e-chain and corrugated tube in the same system.

The motion plastics specialist igus has expanded its modular kit for the E4.1 energy chain series and now offers a solution for the guidance of e-chain and corrugated tube in the same system. Named E4.1 TUB, this system ensures flexibility, ease of assembly and long service life in a low-wear double system.

Individual hoses and cables, which have a significantly shorter service life than the other media, are often guided outside the energy supply chain in a corrugated tube. Thus their replacement can be carried out quickly, without having to open the e-chain. To simplify and strengthen the connection of e-chain and corrugated tube, igus has developed new side plates for the universal E4.1 modular kit. The side plates of the outer link of the e-chains are provided with special rails, on which you can simply slide in clips to hold the hoses. You can thus combine the energy chain with the tube in a very short time. Until now, the corrugated tubes had to be bolted to the chain using clamps. The so-called clip system holders are available in all four E4.1 sizes in combination with 8 different sizes of high-quality corrugated tubes. The side plates can also be easily retrofitted on existing E4.1 energy supply systems as clip system holders.

Neither screws nor tools are required for their attachment to the e-chain and the assembly of the corrugated tubes. Both assembly and disassembly are therefore very fast and easy. The e-chain and corrugated tube are joined together in the E4.1 TUBs, so that the whole system works very harmoniously offering a long service life. The entire system was extensively tested at igus in the test lab with a floor area of 2,750 square metres.

The E4.1 modular system for the perfect use of installation space and cable protection

Like the corrugated tube, the e-chain is characterised by easy and quick attachment to the machine. To this end the E4.1 e-chain allows the easy fitting of cables or hoses due to the removable crossbars on both sides. Moreover users can benefit from the high strength, robustness and low-noise characteristics of E4.1 even in small installation spaces. The new side plates can also be combined with the enclosed R4.1 version. In this way, the user can combine the user can combine: side plates, different crossbars, lids and shelves, separators, brackets, straps and now even clip system holders as needed.

Neither screws nor tools are required for their attachment to the e-chain and the assembly of the corrugated tubes. Both assembly and disassembly are therefore very fast and easy. The e-chain and corrugated tube are joined together in the E4.1 TUBs, so that the whole system works very harmoniously offering a long service life.

The external parallel guidance of corrugated tubes in the E4.1 TUB smoothly extends the potential for cable guidance without a costly retrofit or even replacement of existing systems and without a significant increase in installation space. For machine builders, igus delivers a useful system that is already available from stock in interior heights 32-56 mm - even up to 80 millimetres on request.

For more details,
E-mail: Harish@igus.in
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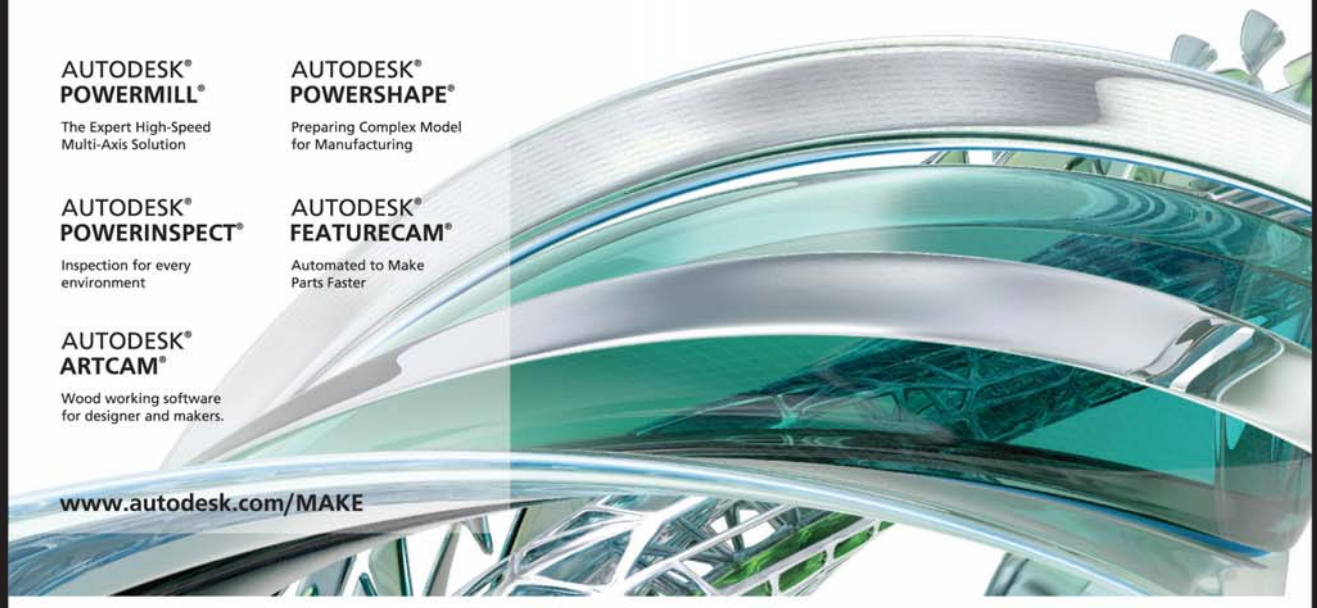

Superior powerhouse

Learn more about SCHUNK's TENDO E compact CAPTO that allows unprecedented performance in a hydraulic expansion holder, while providing brilliant surfaces and significantly reducing wear.

SCHUNK, the competence leader for clamping technology and gripping systems continues to expand the position of its high-performance hydraulic expansion toolholder TENDO E compact: for the first time the innovative family-owned company presents the world's most powerful hydraulic expansion toolholder with the SCHUNK CAPTO interface. SCHUNK TENDO E compact CAPTO combines high clamping forces and excellent vibration damping with extraordinary bending and torsional strength. The precision toolholder ensures high stability even in the case of abrupt load alterations and allows unprecedented performance in a hydraulic expansion holder, while providing brilliant surfaces and significantly reducing wear.

SCHUNK TENDO E compact CAPTO combines high clamping forces and excellent vibration damping with extraordinary bending and torsional strength. The precision toolholder ensures high stability even in the case of abrupt load alterations and allows unprecedented performance in a hydraulic expansion holder, while providing brilliant surfaces and significantly reducing wear.

Higher torque than conventional hydraulic expansion toolholders

As part of the long-standing partnership with Sandvik Coromant SCHUNK manufactures all toolholders with a SCHUNK CAPTO interface, including the very attractively priced SCHUNK TENDO E compact CAPTO, produced in-house at the company headquarters in Lauffen/ Neckar. The main feature of the interface is a polygonal taper, which ensures stable holding without play. The expansion sleeves and oil-filled expansion chambers damp the vibrations that occur during machining and absorb peak loads. This stabilizes the engagement of the tools.

The main feature of the interface is a polygonal taper, which ensures stable holding without play. The expansion sleeves and oil-filled expansion chambers damp the vibrations that occur during machining and absorb peak loads. This stabilizes the engagement of the tools.

In addition, the more even load profile increases the life of the spindle and spindle bearing. With its permanently precise run-out accuracy of < 0.003 mm at an unclamped length of 2.5 x D, and a balancing grade of G 2.5 at 25,000 rpm,

SCHUNK TENDO E compact CAPTO perfectly enhances the line of time-tested hydraulic expansion products from SCHUNK. Its clamping forces are about 20 percent higher than those of conventional hydraulic expansion toolholders.

Fast tool changing with an Allen key

In 2014, at the wbk Institute for Production Technology in Karlsruhe, a series of tests showed that users of SCHUNK TENDO E compact benefit from a tool life of up to 300 percent longer than with other clamping systems. With an identical material removal rate, about two thirds can be saved on tools. SCHUNK is now further expanding these advantages with the new SCHUNK CAPTO interface. Like all SCHUNK TENDO hydraulic expansion toolholders, TENDO E compact needs no additional peripheral equipment, which can be expensive.

An Allen key is all that is needed for fast tool change. All standard shank types can be clamped, including Weldon or Whistle Notch shanks. Intermediate sleeves can be used for flexible reduction of the clamping diameters.

SCHUNK TENDO E compact CAPTO is available for the interfaces C4 (ø 12 mm, 20 mm), C5 (ø 12 mm, 20 mm) and C6 (ø12 mm, 20 mm and 32 mm). In addition, SCHUNK has standardized the high-performance hydraulic expansion toolholder for the HSK-A63, HSK-A100, SK40, SK50, JIS-BT30, JIS-BT40, and JIS-BT50 interfaces.

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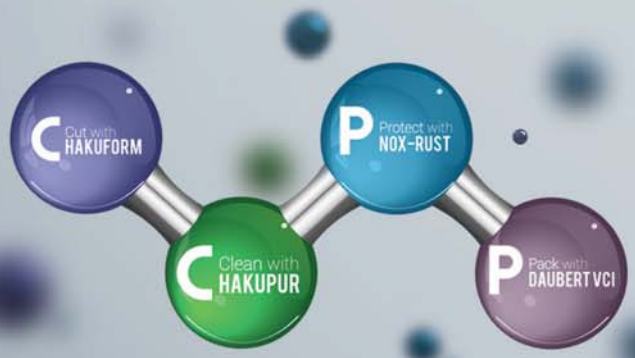

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