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ULTIMATE GUIDE TO PROFITABLE MANUFACTURING

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14th ANNIVERSARY ISSUE

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Deepak Kumar Hota, Chairman & Managing Director, BEML Ltd., says indigenization is key in making India a better place to live in.

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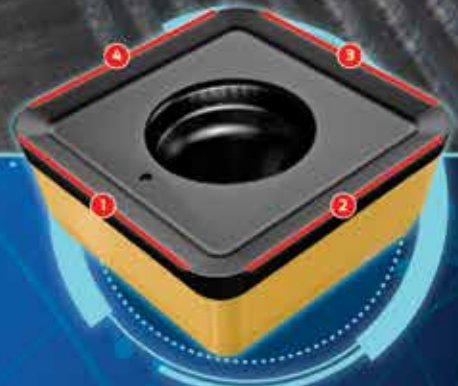

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For example, www.themachinist.in is today much more than an extension of the print format. It has become the industry's one-stop online source for news, articles, interviews, videos and product write-ups. Similarly, 'The Machinist Super Shopfloor Awards' platform has acquired both prominence and prestige. All set to enter the fifth edition in May 2019 with the coveted Machie Trophy,

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it has been hailed as 'the Oscars of Manufacturing' by industry stalwarts. And with four consecutive annual editions across the country, 'The Machinist Global Manufacturing Summit' has become the definitive knowledge-based networking forum for manufacturing professionals.

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Editor & Chief Community Officer

THE MACHINIST
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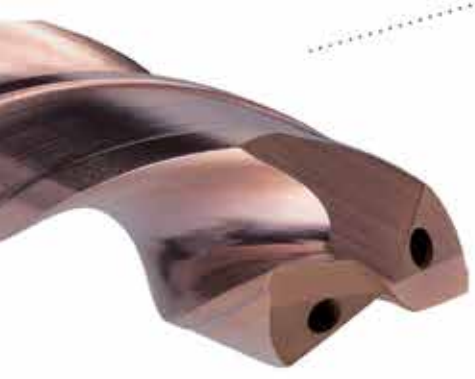

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GE to provide turbines to ReNew Power

GE RENEWABLE ENERGY announced that it has been selected by ReNew Power to provide 120 GE 2.5-132 turbines for the Gadhsisa Wind Farm in Gujarat, India. The wind farm will have a total installed capacity of 300 MW, making it the largest full turnkey EPC project by GE Renewable Energy in India. The project will power the equivalent of 1,100,000 homes in India with clean and reliable electricity. ReNew Power successfully bid for this project in the third round of auctions conducted by the Solar Energy Corporation of India (SECI) in February 2018. The 2.5-132 turbines have been designed primarily at GE's Technology Centre in Bangalore, and built on learnings from more than 22,000 GE wind turbines around the world. This turbine is a significant improvement over previous version,

with improved rotor diameter, wind capture and 30% more Annual Energy Production (AEP) than GE's 2.3-116 turbine. Today, GE's footprint expands across 37 wind farms in India, and 1.8 GW of capacity across the country. The company is also continuing to drive innovations specific to the region, and recently introduced its 2.7 MW low wind speed machine turbine which included the largest rotor ever installed in India and is currently being tested in Gujarat.

Hind Rectifiers Ltd. wins orders of Rs. 88.05 crore

HIND RECTIFIERS LIMITED, popularly known as HIRECT, has announced that the company has bagged orders of Rs. 88.05 crore in December 2018.

This includes substantial orders from Diesel Locomotive Works worth Rs.61 crore. With these order wins, the company has a strong all time high pending order book of Rs. 292.92 crore.

Commenting on the new order, Suramya Nevatia, Chief Executive Officer, Hind Rectifiers Ltd. said, "The orders booked are for a new product which was launched last year. Through backward integration, the company is able to substantially reduce import cost for the product, thereby helping the product margin to be upwards of 10 percent."

Escorts, Kubota to form joint venture

ESCORTS LTD AND KUBOTA CORPORATION have announced their global joint venture to manufacture high end technology tractors for domestic and export geographies. The JV will leverage leading Japanese technology from Kubota and Indian engineering excellence of Escorts to cater to an expanding market for higher efficiency, value-oriented utility tractors for a global leadership position.

With an initial investment of 300 crores, the 60:40 manufacturing joint venture between Kubota and Escorts respectively will enable both partners to optimize their current and future capabilities in the segment globally. The JV will aim to take leading position in domestic and export markets in medium to long term.

Speaking on the occasion, Nikhil Nanda, Chairman and Managing Director, Escorts Ltd., said, "Escorts is evolving in to a global organization through strategic technology & manufacturing collaborations. Our global Joint Venture with Kubota is aimed at a technology led collaborative growth in domestic and export markets. With our inherent strengths, distribution and engineering benchmarks, together, we will access global opportunity markets and take a journey to global leadership."

New Industrial Policy to be comprehensive

ANAND SINGH BHAL, Principal Economic Adviser, DIPP, said here today that the New Industrial Policy, to be announced soon, will address the challenges faced by the manufacturing sector encompassing of adoption of standards and quality control to impart competitiveness and take Indian manufacturing to the next level of technology to make the country's industrial base strong.

Speaking at the 'India - Korea Technology & Education Exchange Forum' organised by FICCI jointly with Korea India Business Centre (KIBC) and Korea Productivity Center (KPC), Bhal said that India has moved from an agrarian economy to service dominated one. The manufacturing sector has lagged and the time is opportune to give primacy to this sector. "India is not a very strong manufacturing nation and only contributes to 16 per cent of our GDP which is not very good," he added.

Under the 'Make in India' initiative, the Government of India aims to increase the share of the manufacturing sector to the gross domestic product (GDP) to 25 per cent by 2022.

He also said that India had a lot to learn from South Korea in terms of innovation in the manufacturing sector and creating a robust industrial base. The learnings and their implementation will also create large avenues for employment, the burden of which is currently borne by the services sector.

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Ace Micromatic Group Pavilion

Machining Solutionsat **Hall 5**
IoT & Additive Solutions at **Hall 6**

NEWS

IAF flies first military flight using blended bio fuel

RECENTLY EXPERIMENTAL TEST PILOTS and Test Engineer from IAF's premier testing establishment ASTE, flew India's first military flight using blended bio-jet fuel on the An-32 transport aircraft. The project is a combined effort of IAF, DRDO, Directorate General Aeronautical Quality Assurance (DGAQA) and CSIR-Indian Institute of Petroleum.

On 27 July 2018, Air Chief Marshal BS Dhanoa, Chief of Air Staff had announced IAF's intention to promote biojet fuels. Addressing the CII-SIDM seminar on promoting indigenised technologies, the CAS had stated that IAF intended to fly the An-32 with 10% biojet fuel on 26 Jan 2019 Republic Day flypast.

Indian Air Force carried out extensive engine tests on the ground. This is now followed by flight trials using 10% biojet blended ATF. This fuel is made from Jatropha oil sourced from Chattisgarh Biodiesel Development Authority (CBDA) and then processed at CSIR-IIP, Dehradun. IAF intends to fly the An-32 transport aircraft using biojet fuel on 26 January 2019, in the Republic Day flypast.

Revenue of Rs. 94 thousand crore collected through GST

THE TOTAL GROSS GST revenue collected in the month of December, 2018 is Rs. 94,726 crore of which CGST is Rs. 16,442 crore, SGST is Rs. 22,459 crore, IGST is Rs. 47,936 crore (including Rs. 23,635 crore collected on imports) and Cess is Rs. 7,888 crore (including Rs. 838 crore collected on imports). The total number of GSTR 3B Returns filed for the month of November up to 31st December, 2018 is 72.44 lakh.

The government has settled Rs. 18,409 crore to CGST and Rs. 14,793 crore to SGST from IGST as regular settlement. Further, Rs 18,000 crore has been settled from the balance IGST available with the Centre on provisional basis in the ratio of 50:50 between Centre and States. The total revenue earned by Central Government and the State Governments after regular settlement in the month of December, 2018 is Rs. 43,851 crore for CGST and Rs. 46,252 crore for the SGST.'

SAIL to supply 10 lakh tonnes steel for railways

STEEL AUTHORITY OF INDIA LIMITED (SAIL) expects to supply 10 lakh tonnes of steel in 2018-19 and 12 lakh in 2019-20 to the Indian Railways for doubling of rail lines, gauge conversion, new lines and track renewal works. Railways have indicated its demand of approximately 14 lakh tonnes during 2018-19 and 17 lakh tonnes in 2019-20. SAIL has established Universal Rail Mill (URM) in its Bhilai Steel Plant to enhance the manufacturing capabilities of Rails to cope up with increasing demand of railway requirements. The production from the 1.2 MTPA capacity URM has commenced from November 2016.

Bhilai Steel Plant undertook modernisation and expansion plan along with other integrated steel plants under SAIL with capacity enhancement of crude steel from 3.93 MTPA to 7.0 MTPA. This included the installation of URM.

Titagarh Wagons launches research vessel for National Institute of Ocean Technology

TITAGARH Wagons Limited (BSE: 532966|NSE: TWL), a flagship company of the Titagarh Group, has successfully launched Sagar Tara, the first of the Coastal Research Vessels being built for National Institute of Ocean Technology, Ministry of Earth Sciences, Govt. of India. This vessel was launched three months ahead of schedule despite being a very complex platform which will enable scientists to conduct various oceanographic research missions aboard her. 'Sagar Tara' will house state of the art laboratories equipped with modern scientific instruments. The vessel features a Drop Keel which is designed and manufactured for the first time in the country. The vessel is equipped with auto pilot and is DP1 capable.

In February 2017, Titagarh had signed a contract from National Institute of Ocean Technology under the Ministry of Earth Sciences, Government of India for design, construction and delivery of two high end coastal research vessels valued at Rs.100 crore. In the next few months Sagar Tara will undergo outfitting of accommodation areas as well fitment of scientific instruments in the laboratories. TWL aims to deliver the vessel to NIOT by May 2019 again almost 3 months ahead of schedule. The work on the second NIOT vessel is also under progress and TWL aims to launch it around mid 2019. TWL has already obtained new orders from Government of West Bengal for building small vessels.

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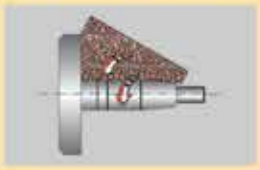

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• MARK YOUR DIARY •

A list of key events happening between January to December 2019, both nationally and internationally.

IMTEX 2019 **January 24–30, 2019** Bengaluru, India *www.imtex.in*	**Taipei International Machine Tool Show** **March 4–9, 2019** Taipei, Taiwan *www.timtos.com.tw*	**International Engineering Sourcing Show (IESS)** **March 14–16, 2019** Chennai, India' *www.iesshow.in*	**Hannover Messe** **April 1–5, 2019** Hannover, Germany *www.hannovermesse.de*
Bauma **April 8–14, 2019** Munich, Germany *www.bauma.de*	**BLECH India 2019** **April 25–27, 2019** Mumbai, India *www.blechindia.com*	**intec Coimbatore** **June 6–10, 2019** Coimbatore, India *www.intec.codissia.com*	**Automotive Engineering Show India 2019 (Chennai)** **July 4–6, 2019** Chennai, India *www.automotive-engineering-show.in*
AgriTech India 2019 **August 30–September 1, 2019** Bangalore, India *www.agritechindia.com*	**EMO Hannover 2019** **September 16–21, 2019** Hannover, Germany *www.emo-hannover.de*	**Automation Expo 2019** **September 25–28, 2019** Mumbai, India *www.automationindiaexpo.com*	**Excon** **December 10–14, 2019** Bengaluru, India *www.excon.in*

OUR INHOUSE UPCOMING EVENTS

The Economic Times POLYMERS Awards 2019 – Excellence in Plastics
February 12, 2019
Mumbai

The Economic Times BPB Best Plastics & Polymers Brands 2019
February 12, 2019, Mumbai

Machinist Super Shopfloor 2019 Awards
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VIVEK BHATIA TO HEAD THYSSENKRUPP INDUSTRIES INDIA

thyssenkrupp has announced the appointment of Vivek Bhatia as Managing Director and Chief Executive Officer of thyssenkrupp Industries India effective from 01 January 2019. Vivek was earlier CEO - Asia Pacific at thyssenkrupp AG, driving group activities for all thyssenkrupp companies in the region. Prior to that, he led Strategy, Markets and Development for the Asia Pacific region for the Group and was based in Singapore.

Vivek has extensive business experience across mining, metals & mineral processing, cement, power and engineered/capital goods. He has worked across multiple business functions including strategy, operations and organization in the areas such as growth/diversification, joint ventures & technology transfers, business turnaround/transformation, working capital management, operations design and re-engineering, organization design and performance management systems.

Commenting on the appointment, Ravi Kirpalani, CEO, thyssenkrupp India said, "I am pleased to welcome Vivek to his new role and thrilled to have his leadership at thyssenkrupp Industries India. Vivek brings unparalleled domain and technical expertise to thyssenkrupp. We wish him all the very best in his new role."

BHEL APPOINTS NEW DIRECTOR – POWER

On his appointment as Director on the Board of Bharat Heavy Electricals Ltd (BHEL), Manoj Kumar Varma, 57, has assumed charge as Director (Power) of the Public Sector engineering and manufacturing enterprise.

Prior to this, he was heading the company's Power Sector - Southern Region (PSSR), Chennai as Executive Director. Significantly, PSSR is executing major power projects in the southern region, contributing substantially to BHEL's Power Sector business segment.

Varma is a Mechanical Engineering Graduate from SGSITS, Indore and an MBA in Marketing from Bhopal University. He has 35 years of holistic and hands-on experience in the field of energy, industrial systems and infrastructure industries, covering major value chain functions viz. production, commercial management, marketing & business development, contract management, planning & development, information technology and strategic management.

TATA MOTORS APPOINTS NEW CHRO

Tata Motors has announced the appointment of Ravindra Kumar G P as the President & Chief Human Resources Officer, Tata Motors.

Ravindra will oversee all human resource operations for Tata Motors, effective December 17, 2018. He will report into Guenter Butschek, CEO Tata Motors and will be a member of the Executive Committee.

Commenting on the announcement, Guenter Butschek, CEO & MD, Tata Motors, said, "We are happy to welcome Ravindra to the Tata Motors Family. Ravindra's vast experience at GE and Asian Paints will further strengthen our resolve towards building an employee focused organization. We are extremely confident that his energy will help further drive the Turnaround culture and the Tata ethos."

An alumnus of Tata Institute of Social Sciences, Ravindra brings with him a rich global experience of over 20 years. In his most recent role, Ravindra Kumar was CHRO, GE, South Asia and prior to GE, he worked with Asian Paints where he began his career in 1998.

SANDIP SOMANY TAKES OVER AS PRESIDENT OF FICCI FOR 2018-19

The Federation of Indian Chambers of Commerce and Industry (FICCI) has elected Sandip Somany, Vice Chairman and Managing Director, HSIL Ltd as its President for 2018-19, after the conclusion of its 91st AGM. With this, Somany will be working closely with Government & business leaders towards spearheading the country's economic growth. He was previously working as the Sr VP, FICCI. Sangita Reddy, Jt. MD, Apollo Hospitals Group has now been elevated as the Sr VP of FICCI for 2018-19. Uday Shankar, currently Chairman & CEO of Star India & President of 21st Century Fox Asia-Pacific (Only Asia), who has recently been appointed Chairman, Star and Disney India, and President of the Walt Disney Company, Asia-Pacific, a role that he will take over after the takeover of 21CF by The Walt Disney takes place, has joined the FICCI leadership as VP of the apex industry chamber.

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The Indian Manufacturing PMI indicated that the sector ended 2018 on a high, with growth stronger than seen at the start of the year.

The health of India's manufacturing economy improved further at the end of the year, as companies continued to scale up production and employment in response to strong inflows of new business. December data also brought news of a notable slowdown in input cost inflation, to a 34-month low, which translated into broadly no change in factory gate charges.

Posting 53.2 in December 2018, from 54.0 in November 2018, the Nikkei India Manufacturing Purchasing Managers' Index® (PMI®) was consistent with a further improvement in operating conditions across the sector. The latest figure was the second greatest in 2018 and contributed to highest quarterly average since Q3 FY 2012.

Growth of new work remained robust at the end of the quarter, with the upturn the second-quickest since December 2017. Companies that experienced greater inflows of new orders mentioned expanded client bases, stronger demand and fruitful advertising. International markets contributed to sales growth, with exports rising for the fourteenth month in a row. Despite easing from November, the rise in production was among the quickest seen in 2018.

Firms suggested that greater sales and technological progress supported the increase in output. Growth was curtailed by competitive pressures, labour issues and challenging public policies.

Employment continued to expand in December, but companies still signalled increased volumes of work-in-hand. The upturn in jobs was the slowest in four months, while backlogs were accumulated to the quickest extent since May. Holdings of manufactured goods in India decreased again at the end of the year as firms sought to fulfil orders from stocks. The pace of depletion was solid and the joint-fastest in three months.

In contrast, input inventories rose for the tenth successive month. The key factor enabling companies to rebuild their input stocks was another increase in quantities of purchases. The upturn matched the solid pace noted in November, to be the joint-quickest in 11 months. At the same time, suppliers' delivery times were broadly unchanged in December. Goods producers reported that higher prices for materials, especially steel, resulted in another increase in overall cost burdens. That said, the rate of inflation eased to a 34-month low. The rise was marginal and much softer than seen on average over the survey history.

Easing cost inflationary pressures translated into unchanged selling prices, thereby ending a 16-month sequence of charge inflation. Efforts to boost sales were also reported as a reason preventing firms from hiking their fees.

Looking ahead, companies predicted that marketing initiatives, capacity expansions and forecasts of further improvements in demand will boost output in the coming year. That said, the level of confidence moderated from mid-quarter and was subdued in the context of historical survey data.

> "Looking ahead, companies predicted that marketing initiatives, capacity expansions and forecasts of further improvements in demand will boost output in the coming year."

Commenting on the Indian Manufacturing PMI survey data, Pollyanna De Lima, Principal Economist at IHS Markit and author of the report, said: "The Indian Manufacturing PMI indicated that the sector ended 2018 on a high, with growth stronger than seen at the start of the year. Output continued to rise strongly, in line with a robust upswing in sales. Companies benefited from rising international demand for Indian goods, as export orders expanded for the fourteenth straight month. "It's particularly encouraging to see the quarterly PMI average climb to its highest mark since Q3FY2012, suggesting that the sector made a robust contribution to GDP.

"Spare capacity was evident, with vendors' delivery times unchanged and input cost inflation softening. These signs of easing inflationary pressures indicate that we're likely to see the RBI adopt an accommodative monetary policy stance in early 2019.

"Meanwhile, job creation weakened, with companies perhaps cautious about making hiring decisions ahead of next year's elections and a less upbeat optimism towards the outlook."

Sources: Nikkei, IHS Markit.

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Tracking it right!

Alain Spohr, Managing Director, Alstom India & South Asia reveals the company's approach towards metro manufacturing.

By Swati Deshpande

Alstom India has been playing a key role in helping the country in the mission of creating infrastructure of metro lines in various cities. Currently, the company is executing metro projects in several cities including Chennai, Kochi, Lucknow, etc. where it is supplying Rolling Stocks. These projects are being executed from the company's plant in Sri City, Andhra Pradesh. While introducing the plant, Alain Spohr, Managing Director, Alstom India & South Asia says, "This plant became operational in 2014 and since then it has been working on numerous domestic and international projects." The plant comprises of three main shops namely Car Body Shell Shop, Fitting Shop and Bogie Integration Shop. Detailing on the manufacturing processes, he says, "The Car Body Shell shop predominantly takes care of all exterior fittings including doors and windows. Also, the bogie is tested for any leakages before it moves ahead in the manufacturing process."

We will begin work on our second export order for the light metro project in Montreal from early 2019 while production for Mumbai Metro Line 3 will also begin in this year.

Alain Spohr, Managing Director, Alstom India & South Asia

Alstom Sri City Plant: At a glnce

- Plot area: 2016000 sqm
- Built up area: 32845 sqm
- Employees: 500+
- In operation since: 2014
- Annual production capacity: 240 cars
- Key domestic customers:
- Chennai Metro Rail Ltd
- Kochi Metro Rail Ltd
- Lucknow Metro Rail Corporation
- Mumbai Metro Rail Corporation Ltd
- Key international customers:
- Sydney Metro
- Montreal Metro

Continuing further he says, "The next stop for the bogie is the Fitting Shop. The scope of work here includes mostly electrical & electronic equipment fittings. Again, testing and quality checks is a part of day-to-day routine tasks in the Fitting Shop as it is of paramount important to have all cables and wires to be connected properly. Lastly, bogie is taken to the Body Assembly Shop for rest of the fittings are integrated."

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Of course, the process is not as simple and calls for expertise. "Metros manufacturing is a specialised job. More specifically, welding required for the metros manufacturing is very peculiar and calls for welders having specific skill sets. Hence, any new welder that joins our team undergoes rigorous training for three months." Also, the plant is EN Welding certified. Speaking on certification and awards, this plant is ISO9001, ISO14001, OHSAS 18001 certified and had also bagged The Machinist Super Shopfloor Awards 2018 in the category of Productivity (Large Enterprises).

Some of the other key features of the Sri City facility include energy efficient design, double insulation, heat recovery systems, a geothermal heating and cooling system that consumes less energy and rainwater recycling.

Apart from environment-friendly manufacturing processes, yet another aspect that the plant gives importance to is maintenance. "Unexpected breakdown of any machine may cause for downtime for the entire plant. To avoid such situation, we regularly undertake preventive maintenance," informs Spohr.

In the Asia Pacific region, we have workforce of around 5,000 people out of whom 4,000 employees are located in India. This situation explains the importance of India for Alstom. In fact, India is the second largest manufacturing base after France for the company

Ling Fang, Senior Vice President Asia Pacific, Alstom

Alstom's facilities in India

- Madhepura, Bihar
- Bengaluru, Karnataka
- Coimbatore, Tamil Nadu
- Sricity, Andhra Pradesh

Localisation

"In addition to it, highlight of the plant is its localised supply chain. Around 70 percent our supply chain is localised," he adds. In line with Government of India's Make in India initiative, Alstom has been expanding its wings in the country. Speaking about the importance India in the company's global footprint, Ling Fang, Senior Vice President Asia Pacific, Alstom says, "In the Asia Pacific region, we have workforce of around 5,000 people out of whom 4,000 employees are located in India. Thats states the importance of the country for us. India is the second largest manufacturing base after France for the company," Fang underlines. "Good infrastructure and good network of suppliers make us spread our wings here," she adds.

With these features, the Sri City plant caters to the domestic as well as international market. "The products that this facility produces are at par with international standards. There is no difference in the manufacturing process of our plant in France and India," she adds.

New orders

Recently, the plant successfully completed 22 Metropolis trains for Sydney Metro. "Speaking of the domestic market, the site has delivered metros for the cities of Chennai, Kochi and Lucknow. It will begin work on its second export order for the light metro project in Montreal from early 2019 while production for Mumbai Metro Line 3 will also begin in this year," adds Spohr. Speaking about its future plans, he says, "We will begin work on its second export order for the light metro project in Montreal from early 2019 while production for Mumbai Metro Line 3 will also begin next year." Is the company looking at expanding the facility? Answering this question, he says "Currently the plant produces around 20 cars a month and gradually, we plan to increase it to 24 cars."

The yet another highlight of the plant is its localised supply chain. Around 70 percent our supply chain is localised

Other plants

Besides the Sri City Plant, the company also has facilities in Bengaluru, Karnataka which acts as a rolling stock engineering site, TIS/ADM engineering site, Global shared services for HR and Finance and global IS&T operations centre. Additionally, Alstom has a facility in Coimbatore, Tamil Nadu which manufactures rolling stock components. It specialises in designing, manufacturing & testing of traction and electrical components. Besides manufacturing metros, Alstom is also working closely with Indian Railways. The duo has a joint venture that is set up to manufacture 800 units of electric locomotives for freight transport (Prima twin-section WAG12). These locomotives are located manufactured in Madhepura plant in Bihar.

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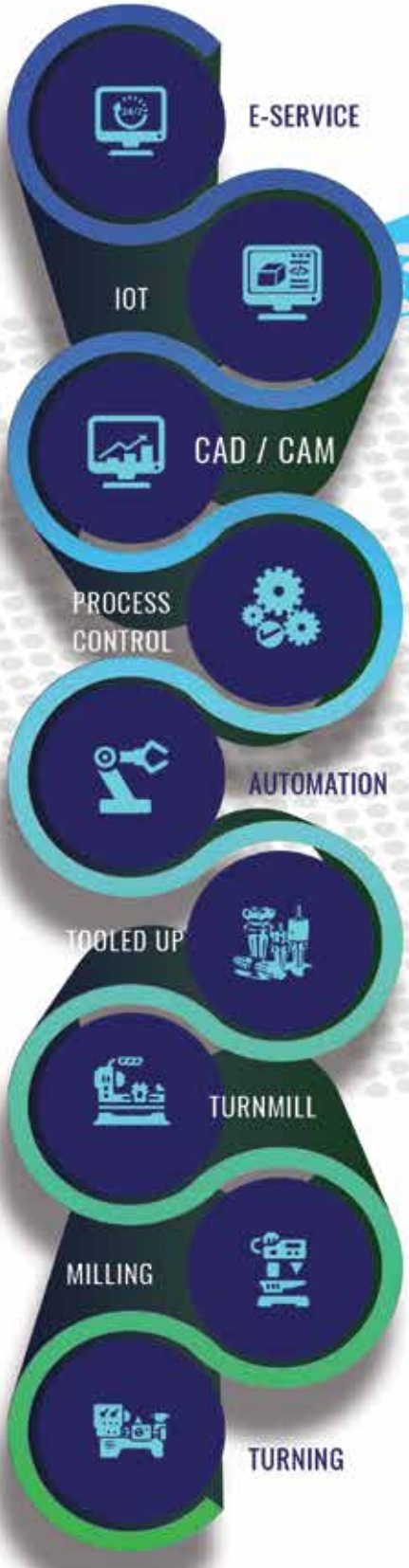

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A **promising future** for **EVs**

The future is electrifying as it will reduce fossil fuel dependence and pollution and prove beneficial for both consumers and the nation in the long run.

By Ayush Lohia

The future is electrifying as it will reduce fossil fuel dependence and pollution and prove beneficial for both consumers and the nation in the long run. As per the FICCI-Rocky Mountain Institute report titled 'Enabling India's Transition to Electric Mobility', "Switching to a fully electric fleet can help ease one giga ton of carbon dioxide emissions by 2030 and save India $330 billion by cutting oil imports".

Hence, future for the Electric Vehicle industry seems promising as these machines not only help users save money, but also promote a safe and clean environment which is the biggest health concern today in India. Moreover, future of EVs shows potential for electric cars, electric bikes, e-auto and e-rickshaws plying on Indian roads with government's aim to make India a 100 percent electric vehicle nation by 2030.

"The government has also levied heavier taxes on petrol and diesel vehicles. Furthermore, there are companies which have come forward and are setting up charging infrastructure in India, which is good for the electric vehicle industry."

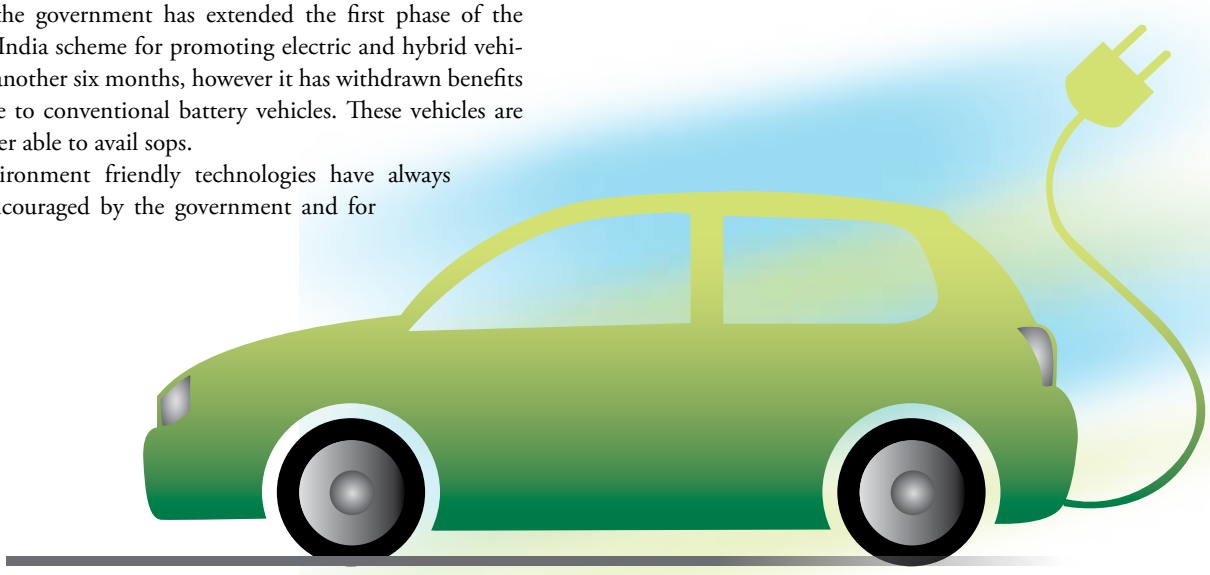
Hurdles in the current scenario

While the government has extended the first phase of the FAME-India scheme for promoting electric and hybrid vehicles by another six months, however it has withdrawn benefits available to conventional battery vehicles. These vehicles are no longer able to avail sops.

Environment friendly technologies have always been encouraged by the government and for reducing emission of green house and reducing carbon emission therefore, this move by the government has been rather discouraging for EV players, who have invested in these technologies. The government is requested to relook at this and consider electric two-wheelers and three-wheelers powered by conventional lead-acid batteries, eligible for incentives under FAME-I, this will give a major boast to sales push, consumer experience and help build a customer base.

"EV manufacturers and sellers were hoping for a single policy that would lay out a road map for creating an EV ecosystem, including charging stations as well as EV manufacturing and incentives for buying."

Another challenge is that customers still don't foresee the benefits of buying these electric vehicles, due to lack of proper infrastructure. And capital required to create charging infrastructure requirement to meet the demands of mass market EV adoption is another challenge. Hence, lack of infrastructure poses big challenge as this leads to poor consumer inter-



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"Automakers are aware of the fact that electric vehicles are the future and have started making moves in that direction and are also investing in all seriousness."

est. Also, the EV Industry needs a long-term policy for investment in the sector and incentive as customer inventive scheme is extended for six months only from the last two instances.

More government support required

While there have been initiatives in the favour of the growth of the EV Industry. However, more can be done by the government. In 2018, Prime Minister Narendra Modi has launched the policy on 'Faster Adoption and Manufacturing of Hybrid and Electric vehicles' (FAME-II) but this was expected to be for a longer duration and not just six months.

Also, EV manufacturers and sellers were hoping for a single policy that would lay out a road map for creating an EV ecosystem, including charging stations as well as EV manufacturing and incentives for buying.

Initiatives in 2018 has pinned positive hopes for the E-vehicles in 2019

Initiatives taken in 2018 have infused a positive environment for the EV players. India seeks to turn 30 percent of vehicles battery-powered by 2030 to cut oil import bill and improve air quality. Also, Delhi Government has been consistently coming out with policies to curb Pollution. The government has also levied heavier taxes on petrol and diesel vehicles. Furthermore, there are companies which have come forward and are setting up charging infrastructure in India, which is good for the electric vehicle industry.

Importantly, automakers are aware of the fact that electric vehicles are the future and have started making moves in that direction and are also investing in all seriousness.

Conclusion

As per the reports of J.P. Morgan it is estimated that by 2025, EVs will rise close to 8.4 million vehicles or a 7.7 percent market share. While this jump is significant, it doesn't compare to the kind of growth expected in HEVs - cars that combine a fuel engine with electric elements. This sector is forecast to swell from just 3 percent of global market share to more than 25 million vehicles or 23 percent of global sales over the same period. This leaves pure-ICE vehicles with around 70 percent of the market share in 2025, with this falling to around 40 percent by 2030, predominantly in emerging markets.

The author is CEO of Lohia Auto

UPDATE

Bombardier's automated rail control begins operation on Delhi Metro Line 7

Recently, Bombardier Transportation, along with Delhi Metro Rail Corporation Ltd (DMRC), celebrated the opening of the final major section of the new, automated Delhi Metro Line 7, equipped with Bombardier's advanced rail control. The latest 9.8-km stretch of line to open runs from Lajpat Nagar to Mayur Vihar and is providing new rail links between the south and east of the city.

S.S Joshi, Director Rolling Stock and Signalling, Delhi Metro commented, "The opening of this last section of our new, fully-automated Line 7 is a major milestone in the expansion of integrated public transportation in Delhi. The line is already easing pressure on the existing network and is improving travel for millions of commuters."

Rasmi Ranjan Ray, Head of Rail Control Solutions India, Bombardier Transportation added, "It has been a momentous experience to see the start of services on Delhi's first fully-automated metro line. This latest section to open marks a major milestone for DMRC in its introduction of driverless, high-capacity services. Moving Delhiites together for over a decade, Bombardier remains committed to supporting the expansion of the city's metro network."

All four phases of Line 7, or the Pink Line, which have opened since March this year, are equipped with the BOMBARDIER CITYFLO 650 communications-based train control solution to support safe and reliable automatic train operations. CITYFLO 650 uses modern radio networks and moving block operation to provide centralised train supervision. The complete 58.5-km circular route from Majlis Park to Shiv Vihar Station will run alongside the city's Ring Road and is the only line to intersect with all other six Delhi Metro lines. A final 600-metre section will connect the two sections in service. Able to support train speeds of up 85 km/hr and frequency as low as just over one and half minutes, this line opening will further support Delhi Metro's vision to move four million passengers daily on the network.

Source: BOMBARDIER

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Building India's Mettle

Deepak Kumar Hota, Chairman & Managing Director, BEML Ltd., says indigenization is key in making India a better place to live in.

By Swati Deshpande

Q How has been the last year for the company in terms of new projects and delivery of in-hand projects?

I am happy to share that BEML has just been awarded Mumbai Metro line 2, 2A & 7, which is around Rs. 3,000 cr. order, the biggest ever order for BEML that takes our order book value to almost Rs.10,000 cr. It also has provision for an optional order on additional 126 cars worth Rs.1000 cr. Besides the Mumbai Metro, presently we are executing orders for Kolkata and Bangalore Metros. We are also expecting further orders from Bangalore Metro. In Defence, we have a big order of Rs. 1400 cr. for supply of Armoured Recovery Vehicles, Rs 500 cr. order for Sarvatra Bridge system. In addition, order worth Rs. 500 cr. is in the pipeline for supply of Armoured Repair Recovery Vehicles. There is a continuous surge in the demand for Defence spares to almost double compared to last year and we are gearing up to meet the requirements. Further orders worth

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Rs 200 cr. are expected shortly. As far as Mining & Construction is concerned, last year was a notable one for BEML since we supplied newly developed, higher capacity dumpers to Coal India Ltd. on trial cum sale basis apart from our regular supplies. Since the mining segment is migrating towards deployment of higher capacity equipment to meet the higher production requirements, BEML has taken initiative to design and manufacture of higher capacity mining equipment such as 190-205 ton range and 150 ton electric dump trucks, 180 class electric and diesel versions of excavators and 850 hp bulldozers with in-house R&D strength.

Q How do you foresee Indian market growing in the railways manufacturing segment?

At present, Indian Railways is primarily focusing on various infrastructure augmentation viz., electrification of railway routes, track doubling for capacity augmentation and enhancement of safety & amenities for passengers. Also, infrastructure maintenance has been considered as forefront requirement for providing better services to the people.

The rail policy talks of strengthening the existing corridors and new corridors. There is also a market for sub-urban trains to move into IGBT 3 phase to run like a metro, instead of being pulled by a locomotive, which is another option for us. This is aided and buoyed up by the 'Make in India' policy of the Government of India.

Q BEML is working closely with Indian Railways. Kindly tell us about how are you helping Indian Railways in modernisation?

To support 'Mission Electrification', BEML has designed and manufactured OHE Inspection & Maintenance Vehicle, which will be put up for trials soon. Currently, BEML is working on localization of 'Wiring Train', Inspection & Maintenance of track vehicles contributing 'Make in India' policy. We are also working with global players for localization and supporting Make in India policy for various equipments viz., wiring train, track grinding & maintenance, track inspection, etc.

BEML is using its state-of-the-art manufacturing facility, for the first time in manufacturing 20 sets of LHB car body and bogies which will be delivered soon. Railway's thrust for augmenting LHB design coaches for its fleet will have big opportunities for BEML.

Considering our experience in coach manufacturing including the capability of manufacturing stainless steel coaches, we are executing Railway Board's order for 300 MEMU coaches with 3 Phase Propulsion system. Keeping in view the emerging requirements, new products like Light Rail Metro Cars, Medium & High-Speed Trains, Track laying machines & Safety & Maintenance related equipment have been planned. BEML is working in close co-operation with Indian Railways in their mission to make the Railways safe, secure and to offer better amenities, riding comfort, punctuality & efficiency.

Infrastructure development such as urban rail transit systems in 2 tier-cities and expanding existing metro lines are encouraging and we envisage huge requirement in Metro business segment fulfilling our production capacities in near future.

Q How is India's emphasis on creating infrastructure encouraging the company?

Infrastructure development such as urban rail transit systems in 2 tier-cities and expanding existing metro lines are encouraging and we envisage huge requirement in Metro business segment fulfilling our production capacities in near future. With this, BEML expects consistent metro coach orders to the tune of more than 800 metro cars in next 2-3 years.

Q Can you please tell us about some of the prestigious projects that BEML is carrying out in the construction equipment and defence sectors?

Since the mining segment is migrating towards deployment of higher capacity equipment to meet the higher production requirements, BEML has designed and developed higher capacity mining equipment such as 190-205 ton range and 150 ton electric dump trucks, 180 class electric and diesel versions of excavators and 850 hp bulldozer with in-house R&D strength.

In our defence portfolio, we have developed the new products in the recent past, they include the Arjun Armoured Repair and Recovery Vehicle (ARRV) and the Medium Bullet Proof Vehicle (MBPV). ARRV trials have been successfully completed and order for 10 units worth Rs. 500 cr. is in the pipeline. The supply of Sarvatra Bridging System and 204 units ARVs to Ministry of Defence (MoD) will add substantial revenue to the defence business vertical.

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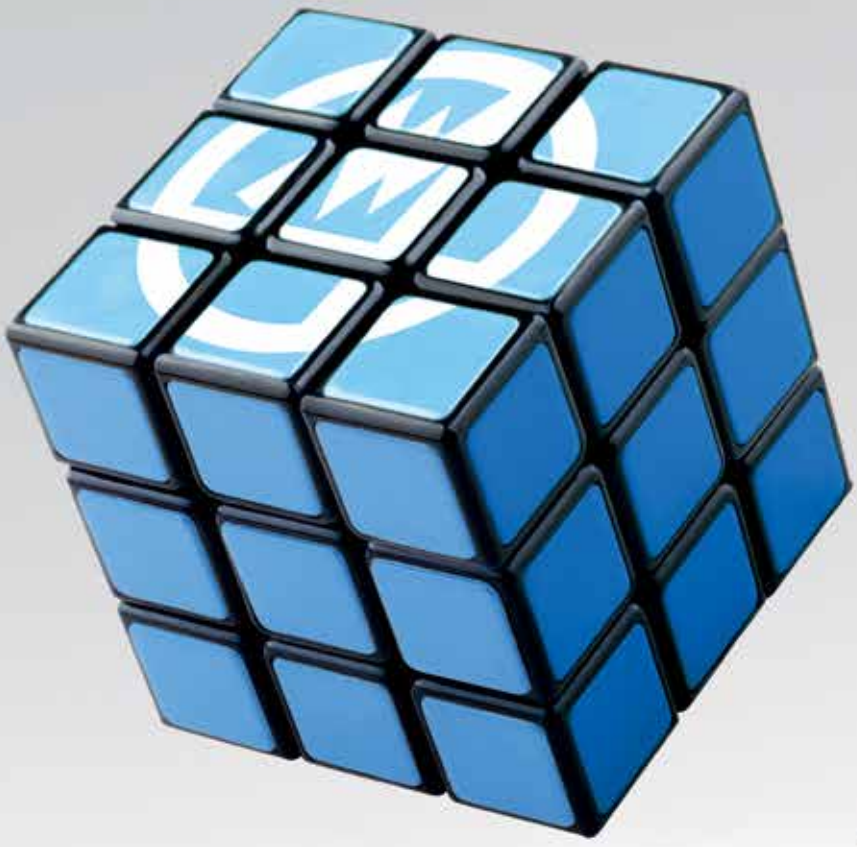

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R&D is central to our operations where in over 56% of the turnover comes from R&D developed products in an environment where 80% of orders are secured through competitive bidding.

BEML's defence business is venturing into new platforms viz., Combat Vehicle Segment, Mounted Gun Systems, Light/ Medium Armoured Vehicles, Futuristic Infantry Combat Vehicles (FICVs) etc. as listed below:

- Integration of Missiles from the current activity of manufacture of modules for Missiles.
- Overhauling of Armoured Recovery Vehicles & BEML Tatra vehicles.
- Manufacture of Bullet proof and Mine Protected Vehicles to meet the requirements of Armed forces and MHA.
- Manufacture of variants of Main Battle Tank to serve the needs of the Indian Army.
- Development of 1500 HP engine for Defence application

As a part of future business potential and to supplement the production of OFB, BEML is developing critical aggregates for battle tanks like Hull, Transmission, Engine, and other aggregates. Further, BEML has signed MoU with OFB for development of Mounted Gun Systems.

Presently, discussions are ongoing with global aerospace companies for manufacture of Ground Support Equipment and Aerospace components against offsets. MoUs are expected to be signed with a couple of companies in the near future.

Q There is huge competition from foreign players in the segment of railways & metros and construction & mining equipment manufacturing. How do you look at it?

We believe that boost in competition is beneficial for the Nation's development. Government's focus on infrastructure development and 'Make in India' policy enables BEML to work on par with the global suppliers and enhances the localization of global technology in Rail & Metro segment.

Similarly, stiff competition from overseas suppliers for Mining equipment like High capacity Dumpers, Dozers, Rope Shovels and Walking Draglines. Coal India has projected huge demand for the next 3 to 4 years for high capacity equipment.

BEML is operating in intense competitive business environment across all its business verticals and is pitted against MNCs to win sale orders.

Q Can you please tell us about BEML's global footprint?

BEML has sizable market share in export market with more than 1200 units of mining and construction equipment to 68 countries across the globe.

The company has exported Railway products to Bangladesh and Sri Lanka and Defence products to Suriname and Honduras. BEML has exported its equipment to various projects under Indian Line of credit including Buyer's Credit NEIA (National Export Insurance Account) Scheme of EXIM Bank to Malawi, Srilanka, Senegal, Bangladesh, Zimbabwe, Ethiopia and Honduras.

Our focus is on Africa, Middle East and SAARC market segments for mining and construction segments that have contributed to around 85% of the total export business of BEML. In order to scale-up revenue from exports and the thrust given by the Government of India for exports performance by CPSEs, recently new distributors have been appointed by BEML in 10 countries viz., Nepal, Ghana, Syria, Bangladesh, Zimbabwe, Oman, Kenya, Tunisia, Myanmar & Angola. BEML has plans to export the following new products:

(a) ***Defence:*** High Mobility Vehicles, Air craft towing tractor, Armoured Personnel Carrier vehicles, Crash Fire Tenders, Mine Ploughss, Backhoe Loaders, Excavators, Bulldozers

(b) ***Rail &Metro:*** Rail coaches, Stainless Steel EMU, Catenary Maintenance vehicles., Wagons, Metro cars

c) ***Mining & Construction:*** Bulldozers, Wheel Loaders, Excavator, Dump Trucks, Motor Graders, Pipe Layers, Water Sprinklers.

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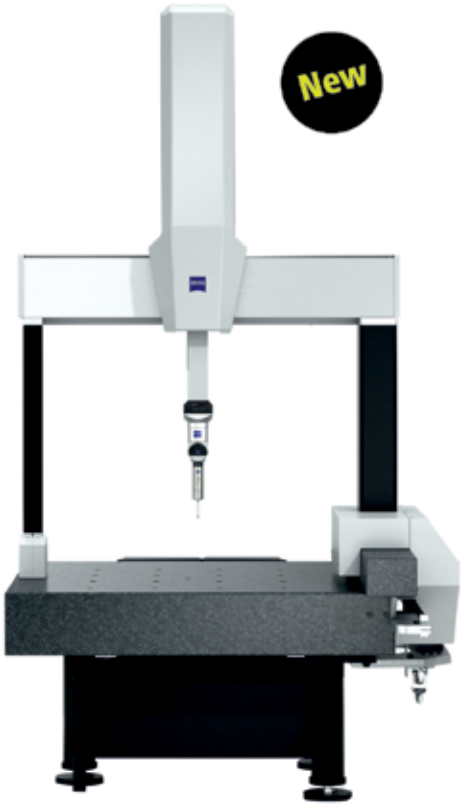

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BEML is concentrating on export of defence equipment to neighbouring countries such as Sri Lanka, Myanmar, Bangladesh, Nepal, Bhutan, etc. to increase the export turnover as well as meet the demand in those countries.

Q Can you please tell us about BEML's manufacturing capacities & capabilities facilities?

We have plants located Bangalore, Kolar Gold Fields, Mysore and Palakkad manufacturing equipment for Defence land systems, Rail & Metro rolling stock, Construction & Mining equipment. The capabilities cover the entire spectrum including production of engines, transmissions, axles, hydraulics and structures. The complexes are equipped with Plate shop, Fabrication shop, Machine shop, Gear shop, Heat treatment shop, Tool room and assembly shops. Laboratories for material testing and Metrology are available to support the production activities. Test track and testing grounds are available for evaluation assembled equipment.

We also have one of the best infrastructures for manufacturing stainless steel rail / metro coaches with the installed capacity exceeding 300 vehicles per annum. Specifically, we have trained manpower resources, streamlined manufacturing processes with facilities such as Laser cutting machines, Robotic welding machines, Jigs & fixtures, Electro-mechanical testing, etc. Also, BEML has well maintained regional / district offices to enable easy networking and services.

Highlights of BEML's R&D efforts

- R&D expenditure has been increased from 2.01% in 2015-16 to 3.08% in 2017-18.
- Major products developed by in-house R&D namely BH150E & BH205E electric drive dump trucks bagged trial orders from customers and are working at customer site.
- Major R&D product - BE1800E electric excavator has successfully performed at customer site and was awarded Raksha Mantri award for design effort during May 2017. Further orders for supply of BE1800E from Coal India Ltd. are in process.
- R&D products developed against customer specifications having latest features that are at par with global players have performed well during trials by customer agency i.e. DGBR & have been qualified for future supplies.
- R&D successfully completed the ARRV prototypes for CVRDE and were delivered after testing. This opens up the possibility for more orders for ARRV for which BEML will be the production agency.
- Developed Medium Bullet Proof Vehicle (MBPV) for inland security applications for agencies like CRPF & CISF, etc. and show cased at DEFEXPO 2018.
- Developed Mounted Gun system prototype jointly with Ordinance Factory Board and showcased at DEFEXPO 2018.
- Developed BL30-1 Wheel loader, which opens up the market for 5 ton class wheel loaders for the company.
- Developed Diesel Electric Tower cars (DETC) for Indian Railways.
- Was awarded one patent each during the years 2015-16, 2016-17, 2017-18 and eight patents have been filed during 2018-19 so far.

Q Research & development plays an important role in the manufacturing sector. Tell us about your R&D efforts?

BEML has well established Research & Development (R&D) centre to provide complete technical solutions for supplying the Rail & Metro vehicles. R&D is central to our operations where in over 56% of the turnover comes from R&D developed products in an environment where 80% of orders are secured through competitive bidding.

Innovation cell in BEML has galvanized the Intellectual property related awareness among the R&D engineers and training has been organized on patenting which has led to filing of eight patents till date. Another ten patents are under drafting to secure the IP rights for the company.

Structured discussions with leading academic institutions like IISc are in progress for engaging them in the development of new technologies required for Noise reduction, Explicit analysis, Computational fluid dynamics, Clutch simulation, etc. This is expected to yield significant breakthrough in development of critical aggregates and import substitution products. IIT- Kharagpur have been engaged for cooperation in the areas of bogie design, three phase propulsion system controls, EMC/EMI studies, alternate car body material.

BEML has entered in to MoU with ARAI, Pune for execution of projects in the area of Emission reduction and Noise control and has become a member of ARAI with access to their test facilities. Close cooperation with research laboratories of DRDO like CVRDE, VRDE and R&D Engineers is maintained for joint development of products and systems.

Q How do you foresee Indian market in the defence manufacturing sector growing in coming years?

Make in India policy aims to strengthen the defence-industrial base through measures like reforming the cap on FDI. Public-private partnership in defence in the country is being encouraged to step up arms exports and licensing system has been liberalized. Our proactive and concerted approach has resulted in indigenization level of 100% in Pontoon Bridge System, to more than 80% in case of high mobility heavy duty trucks.

BEML's overall business strategy is to transform itself into a system integrator by outsourcing a substantial part to Indian vendors by leveraging the strengths especially of the MSMEs. The indigenization drive aims to gain competitive edge by moving towards the goal of 'pushing the boundaries with innovation, technology and indigenization'. The growth of BEML vendor base in the last 3 years has been to the tune of 5–6% annually.

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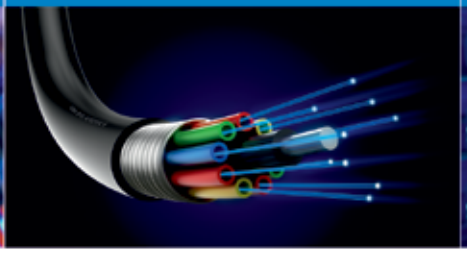

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Need of the hour!

Indian manufacturing SMEs need to raise their standards really high if they want to survive, sustain and succeed in today's globally competitive environment. Adapting right practices will help them gain momentum.

By Ranjit Bhide

Manufacturing forms only 17 percent of the Indian national output. Let's compare this with some other countries like Taiwan (31 percent), South Korea (29 percent), China (27 percent), Germany (23 percent) and Indonesia (22 percent) – (a two-year-old data). Obviously, we can see that India has a large scope of improvement on this front. While efforts are being made to increase the manufacturing's contribution to the Indian economy, there are quite a few challenges. Let us try and understand what these various challenges are.

Many SME manufacturing organisations do not know that a safe business is a successful business!

Barring a few dozen examples of high quality and world class facilities, lakhs of manufacturing factories (mostly in SME sector) fall woefully short of expectations of anything in the name of GMP (Good manufacturing practices). If you inspect thousand manufacturing units as a representative sample, you would find hardly a few dozen that would pass the muster. Rest all will have the tendency of 'chalta hai' and 'jugaad'. The façades of many factory buildings will tell you that they were never painted in the last 20 years (in Singapore they are mandated to paint buildings every three years). Most of them would have quality policies only for display.

> "Worker toilets are filthy, and canteens are non-existent or unhygienic. Most of the SME establishments have a large portion of contract workers who work 12 hours a day and mostly do not get even two cups of tea in a day, forget the lunch facility."

Current scenario

Manufacturing is a very wide term and includes all activities ranging from oil & gas, mining, electricity generation, pharma, leather, shipping, textiles, automotive, engineering, chemicals, food processing and so on. It will be pertinent to bring out a few pointers in the overall context of different segments of Indian manufacturing.

- India manufactures 3.5 million passenger cars in a year. All OEMs have adopted global work ethics and quality philosophies.
- India's contribution to total world manufacturing is about 2.5 percent.
- Many electronics components and defence equipment are still imported.
- Textiles and garments are outsourced to low cost countries like Bangladesh rather than to India by big global brands.
- Since China has banned the manufacturing of polluting chemicals and speciality chemicals, Indian manufacturers have benefitted from windfall, without having added any competitive advantage.
- Most of the sophisticated equipment and machinery required for Space programmes are imported. None of the controllers required for CNC machines are manufactured in India. Top of the line measuring equipment are still imported from Europe and Japan.
- India has very few foundries which produce top quality alloys and with high rejection rates. So, for such metals we still rely on imports.
- Best of the medical equipment, most of stents for heart or even hearing aids are still imported.

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"If you visit most of the industrial estates in various states, you will find that the last mile approach roads are so narrow, full of potholes or uneven levels and terrible up keep, that it takes many hours for the loading and unloading of goods and raw materials."

Cobwebs, dust and rust is often found everywhere even outside the CMM cubicle. Oil spills, coolant leakages and heaps of accumulated burr are omnipresent. High class, imported machines (expected to produce less than 10-micron accuracy) are placed in environment full of humidity and sometimes with room temp exceeding 45 degrees.

Air dryers, soft water or RO plants do not exist to maintain hygiene factors for such machines. Gardens (if at all) in front of the factory, are called so, because you find a patch of uneven grass and a couple of trees. 'Security' consists of a couple of harmless guys, with torn dirty uniforms, guarding a rusty gate, with a broken table and a bad chair with a worn-out book, passing for visitors register.

Worker toilets are filthy, and canteens are non-existent or unhygienic. Most of the SME establishments have a large portion of contract workers who work 12 hours a day and mostly do not get even two cups of tea in a day, forget the lunch facility. Safety is relegated to the back; there is no safety officer and the word is remembered only for the token "Safety Day celebration". Most of the contract workers wear chappals. Fire hydrants are not seen, and mock fire drills have hardly happened! You may not get an ambulance in a few square kilometres even in many of the old industrial estates. An establishment may have hundreds of workers but there is neither a doctor on the premises nor on the call. One wonders whether humans are 'resources' or simply headcounts?

India's contribution to total world manufacturing is about 2.5 percent. If we want this number to go up, then SMEs must raise their standards.

The bright side

Of course, it cannot be denied that we Indians have indeed come a long way in the last two decades and have also produced some brilliant stuff. We are very proud of our country and showcase our 'diverse culture', youthful population and huge demand even in the context of manufacturing.

On the other hand, government programmes like 'Make in India', Swachh Bharat, Start Up India and so on certainly reflect a wave of transformation.

"Barring a few dozen examples of high quality and world class facilities, lakhs of manufacturing factories (mostly in SME sector) fall woefully short of expectations of anything in the name of GMP (Good manufacturing practices)."

If you visit most of the industrial estates in various states, you will find that the last mile approach roads are so narrow, full of potholes or uneven levels and terrible up keep, that it takes many hours for the loading and unloading of goods and raw materials. Add to that, traffic jams or magical skills of over worked drivers of long trailers who still manage to manoeuvre through small lanes.

Quality and availability of power from EBs is a big concern reducing productivity, increasing wastages and sucking profit due to high cost DG sets. The other problem faced by the SMEs is the availability of credit with difficulties on both the fronts - high cost of credit and the time taken for disbursements. How can we be cost competitive when the cost of capital is north of 12 percent compared to near zero percent in Europe or Japan?

Can we not change all this? Well, of course we can. (In fact, many of these things can be done even at plant head levels, even without the involvement of the CEO or the owner.) They do not even require a lot of expenditures nor do they require technical expertise. Common sense and team work will do the trick. And that is a pre-requisite to become a world power in manufacturing. But do we have the intention? Well, that is something we need to address and answer with all seriousness!

The author is the head of Blue Sky Consulting.

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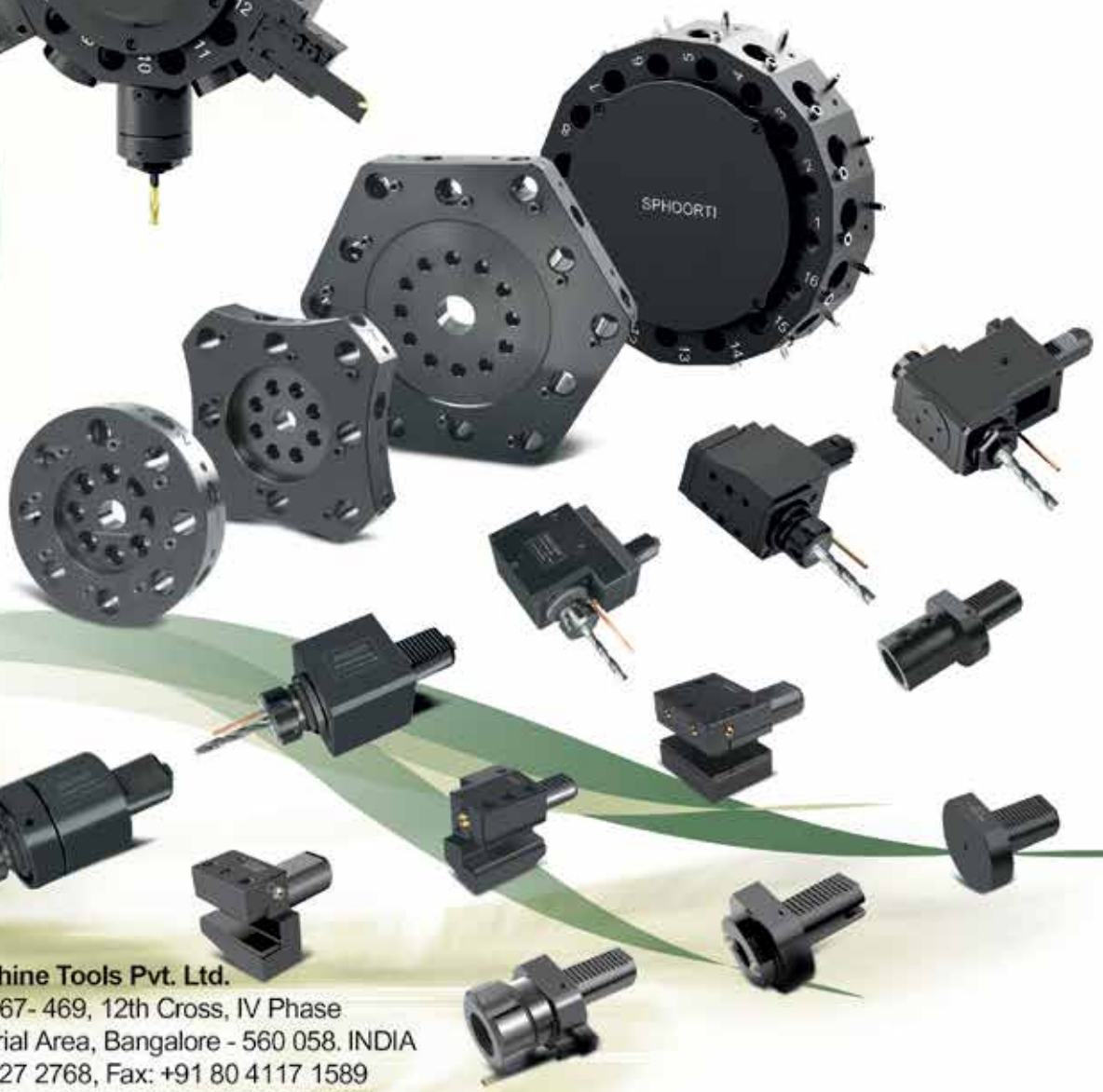

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THE MACHINIST
ULTIMATE GUIDE TO PROFITABLE MANUFACTURING

Star List 2019

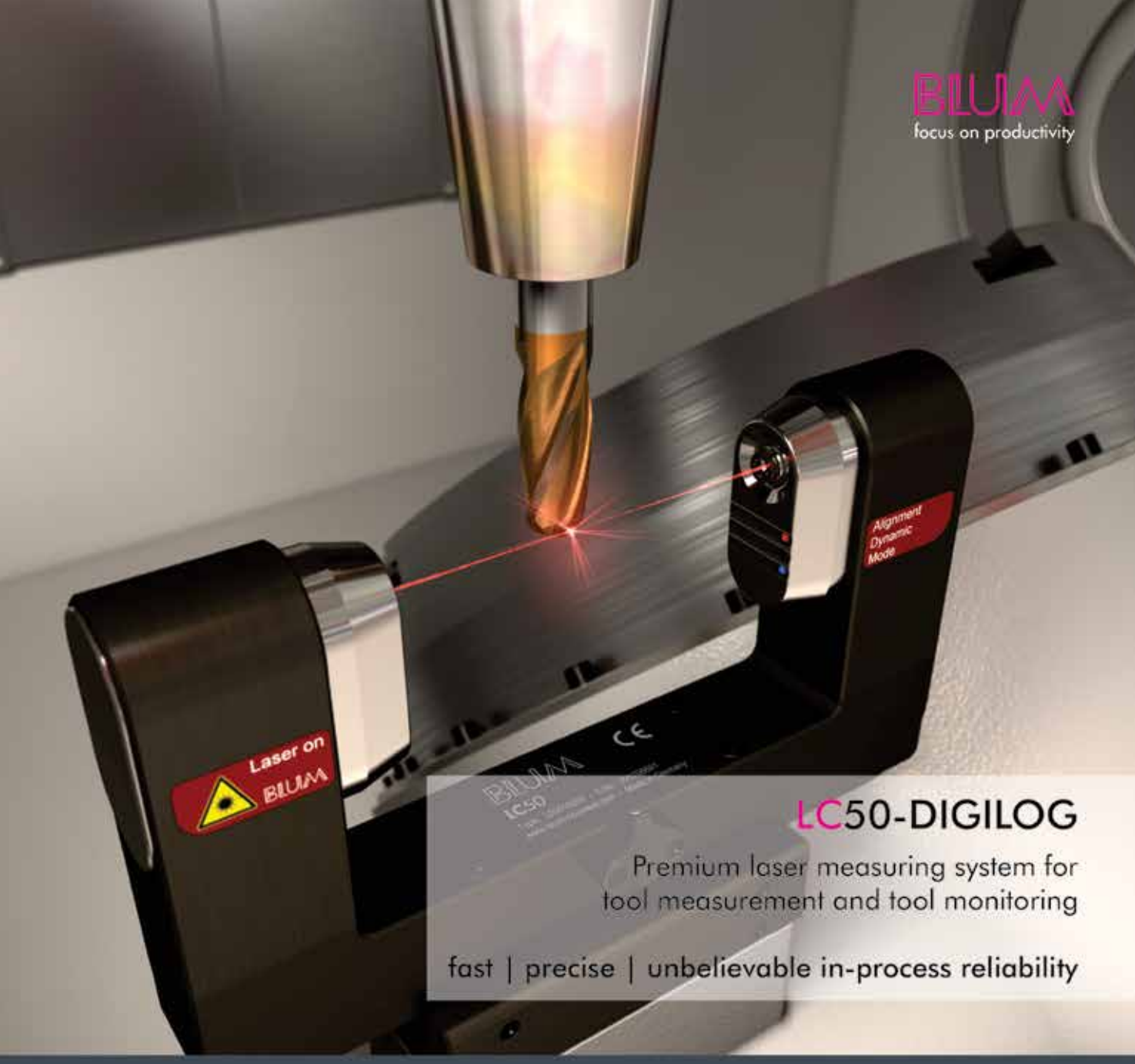
The Machinist Star List was created in 2015 with the aim of recognising the iconic leaders of Indian manufacturing. This year's list spans captains of diverse industry sectors like automotive, aerospace, defense, farm equipment, construction equipment, railways and beyond. In fact, some of them represent more than one industry segment. What brings them together is their sterling performance in 2018 and the even greater promise that they hold for 2019. What also binds them is their belief in excellence and their astonishing vision. Of course, there are many other great leaders out there. But this is The Machinist Star List 2019! Elite and Exclusive!!

**Names of the Leaders appear in the alphabetical order of their first names in the list. It does not denote any kind of ranking.*







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Alain Spohr

Managing Director,
Alstom India & South Asia

By Swati Deshpande

India's huge focus on developing infrastructure is creating opportunities for Alstom to contribute towards the country's upgradation. Alain Spohr who is heading operations of the company believes that "The railway sector has picked up a remarkable momentum over the course of the year. Spearheaded by the government, the improved policy guidelines, allocation of resources to overhaul the existing network and R&D to improve existing resources – the mainline railways has yielded splendid results. The scope of PPPs has been extended beyond providing tertiary support to now include redevelopment, research and manufacturing of better infrastructure. India has fully understood the true potential of the sector as a growth propeller and is tapping it to the fullest. In the next five years, the Indian railway market will be the third largest, accounting for 10 percent of the global market thanks to the impetus leveraged by the Government's push to localization initiatives." Speaking on the company's performance in last year, Spohr mentions, "We have had tremendous wins this 2018. They include the rolling stock and signaling wins for Mumbai Metro line 3, which is schedule to go on the floors in 2019, power supply order for Jaipur and the additional rolling stock contracts for Chennai Metro." Spohr is extremely proud of the Indian manufacturing. "We recently completed our first export order from India for Sydney Metro and are gearing up for the design and production of light metro project in Montreal from our centres in Bengaluru and Sri City." With this, he envisions to make India a bigger manufacturing hub for Alstom. "We are keen to invest and grow our Sri City manufacturing base and promote it as a centre of manufacturing excellence for orders across the world." A true example of Make in India!

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Aravind Melligeri

CEO and Chairman,
Aequs Pvt. Ltd.

By Niranjan Mudholkar

With a client list that includes names like Airbus, Boeing, GKN, Safran, SAAB, Honeywell, Fokker, ISRO and many more, it is not surprising that Aravind Melligeri's Aequs is India's fastest growing aerospace company. These global aerospace giants source their important components, systems and aerostructures from the Aequs SEZ located at Hattargi, near Belgaum in Karnataka.

Entrepreneurship in manufacturing is not something that comes easily to the young minds in India. And aerospace manufacturing is definitely a level above. But that's what Aravind decided to pursue and he has done it with great excellence. No wonder Aequs is today India's first and only full-fledged aerospace ecosystem, hosting separate facilities for fabrication, machining, treatment, assemblies, warehousing, and so on.

Today, Melligeri's wings of ambition are taking him all over the world! "With our acquisitions in US and France, we have now been able to establish the first global aerospace ecosystem in the world. Aequs also has the distinction of being India's fastest growing aerospace company, with a CAGR of 50 percent year-on-year for five years," Melligeri shares.

According to industry estimates, the global aerospace manufacturing market is worth a whopping US$ 10 billion -- of which India caters to only about US$ 250 million. The gap is enormous! But it also presents a magnificent opportunity. Melligeri is slowly building not just an organisation but also an ecosystem that should be able to claim a substantial part of this opportunity. In fact, today, Aequs already takes out a US$ 100 million share out of the US$ 250 million pie! But his vision is not just limited to his own share of the pie. He wants the pie to become bigger. "And that's why my efforts are towards building an ecosystem," he says.

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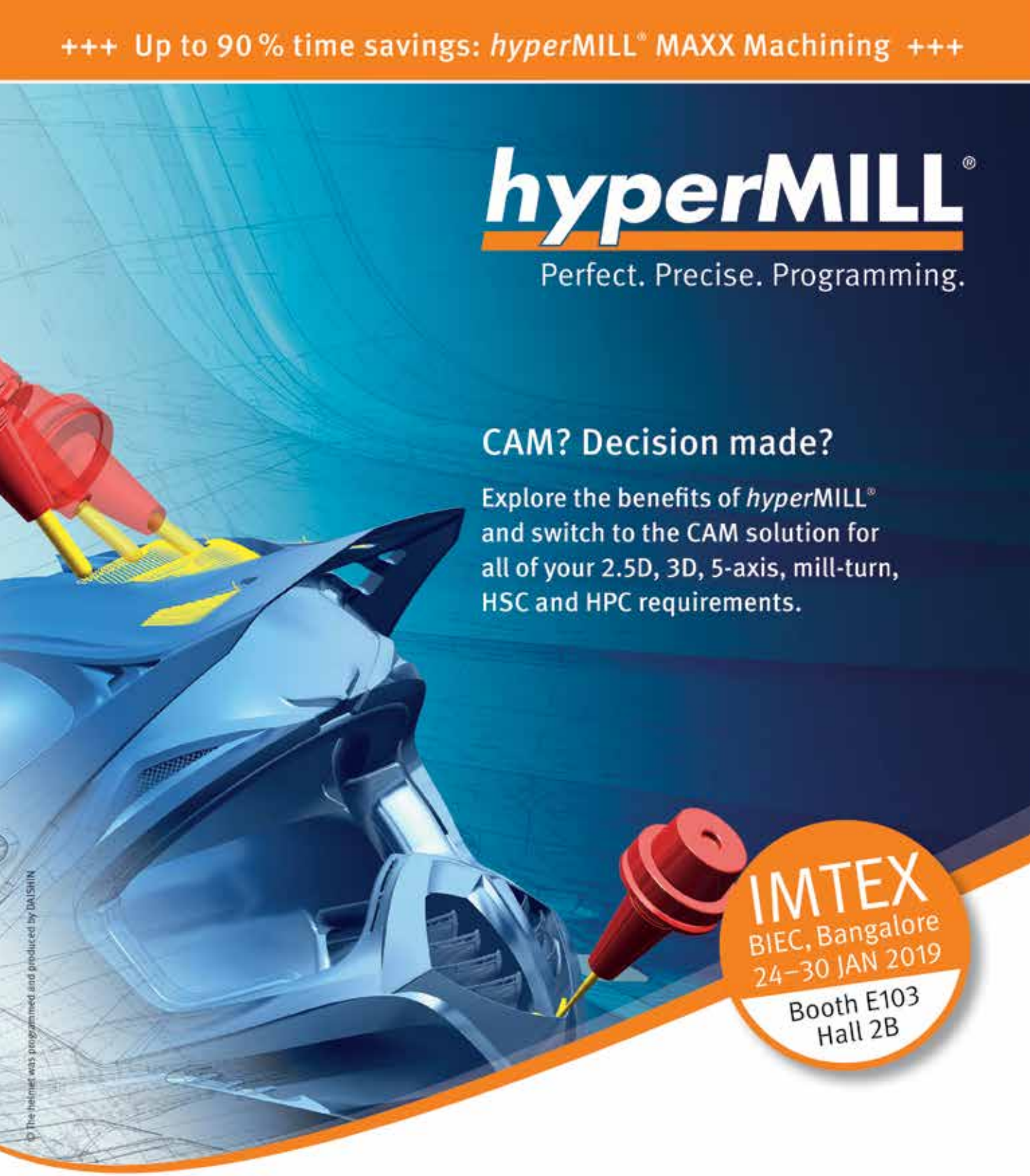

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MADE IN GERMANY

Deepak Kumar Hota

Chairman & Managing Director, BEML Ltd.

By Swati Deshpande

With the motto of New Frontiers New Dreams, BEML Ltd. has been at the forefront in transforming India's infrastructure industry. Deepak Kumar Hota, Chairman & Managing Director, BEML Ltd. has a vision to make the company market leader in supplying quality products and services to core sectors such as Defence & Aerospace, Mining & Construction and Rail & Metro and also to emerge as a prominent international player. "We want to continue to diversify and grow by manufacturing new products and reaching out to markets. We also strive to attract and retain people in a rewarding and inspiring environment by fostering creativity and innovation."

THE MACHINIST Star List 2019

Under his leadership, the company is targeting to reach at around Rs. 4,500 cr., and an order book position of over Rs.10,000 cr. Additionally, the company has plans to set up Make in India Park. "We plan to do this by by attracting potential collaborators with niche technology and consequently minimize import dependency while creating export opportunities," he says.

Hota also believes that Indian MSME sector has immense potential to build new age India. In order to encourage them, BEML plans to work with MSMEs more closely. "BEML's overall business strategy is to transform itself into a system integrator by outsourcing a substantial part to Indian vendors by leveraging the strengths especially of the MSMEs. The indigenization drive aims to gain competitive edge by moving towards the goal of 'pushing the boundaries with innovation, technology and indigenization'."

BEML HAS PLANNED TO SET UP 'MAKE IN INDIA PARK' BY ATTRACTING POTENTIAL COLLABORATORS WITH NICHE TECHNOLOGY AND CONSEQUENTLY MINIMIZE IMPORT DEPENDENCY WHILE CREATING EXPORT OPPORTUNITIES.

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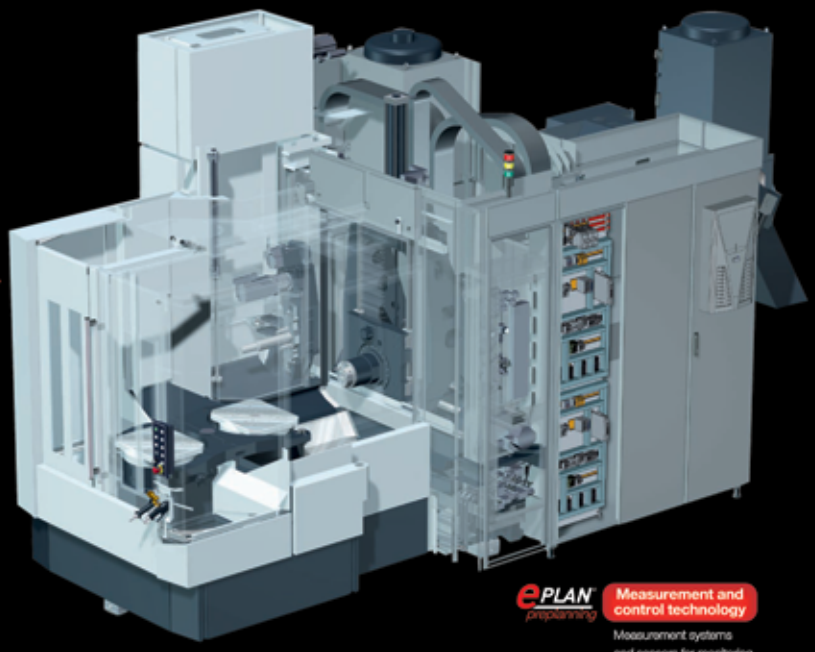

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Dharmesh Arora

CEO, Schaeffler India

By Niranjan Mudholkar

In October 2018, INA Bearings India and LuK India were successfully merged with Schaeffler India Ltd. The combined entity is one of the leading Indian automotive and industrial supplier with over INR 41.0 billion in revenues and around 3,000 employees. And the man at the helm of this bigger and stronger organisation is none other than Dharmesh Arora. "With the completion of merger, we are now one of the leading Automotive and Industrial Supplier in the country. Synergizing our operations, we stand to gain from the potential offered by the Indian market," he says.

The 'One Schaeffler' journey started with the inauguration of a new production facility at Pune, which will boost local manufacturing capabilities of Schaeffler Group in India. It will manufacture engine and transmission components, serving the domestic and export markets. "The new facility in Pune, once it starts production, will enhance our capability and capacity to serve our customers," said Dharmesh on the occasion.

Dharmesh, who joined Schaeffler in 2012, has obviously played a key role in the success of this 'One Schaeffler' entity with his leadership and that's why he is part of this Star List for the consecutive year. Under his guidance, Schaeffler India continues to grow positively. The company's revenue from operations (net) for the 3rd quarter (July – Sept'18 period) is Rs. 11,915 million. This is higher by 18.7 percent than the corresponding quarter of 2017 and PBT (before exceptional items) is Rs. 1,782 million, higher by 20.9 percent than the corresponding quarter of 2017.

Dharmesh, who started his 28-year old professional journey as a product engineer with Maruti, strongly believes that "It is important to understand what changes are forthcoming and invest into the future."

"IT IS IMPORTANT TO UNDERSTAND WHAT CHANGES ARE FORTHCOMING AND INVEST INTO THE FUTURE."

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Gunjan Srivastava

MD & CEO,
BSH Household Appliances

By Niranjan Mudholkar

BSH Household Appliances started its India operations in 2010. Back then, its major focus was on built-in appliances and washing machines with the premium brand – Siemens. "We started off by importing Siemens products to the country. However, after closely studying the Indian market, we launched Bosch appliances across categories and targeted the mass premium market. With Bosch, we entered the washing machines, refrigerators and dishwashers categories as well as developed India-specific appliances," Gunjan Srivastava, Managing Director & CEO, BSH Household Appliances.

Gunjan believes that BSH is in a sweet spot for growth in the Indian market for the next few years. And he has strong reasons to believe so. Under his able leadership, BSH has built a solid foundation in India. "In the past eight years, BSH has experienced colossal success in India and today we are experiencing approximately 40 percent growth in the country," says Gunjan, a veteran of more than two and half decades.

THE MACHINIST Star List 2019

"WE WILL CONTINUE TO LOCALISE PRODUCTS FOR INDIA WITH OUR BRAND BOSCH AND CONTINUE TO EXPAND OUR CATEGORY PORTFOLIO AS AND WHEN WE COME ACROSS A NEED GAP TO SUIT THE REQUIREMENTS OF EVERY INDIAN HOUSEHOLD."

The year 2014 represented the first milestone for BSH in India with the launch of a washing machine in the 7kg category, especially because it was manufactured at its Indian manufacturing plant at Chennai. This April 2018, the plant has completed the production of five lakh washing machines!

In the last 4-5 years, BSH has grown at 30 percent to 40 percent year on year. BSH's ambition is to be one of the leading home appliances company in India by 2025 - with a double-digit market share in the home appliances segment! "The year 2019 will be a year full of fervour for us at BSH as we will continue expanding and launch new and exciting categories and product portfolios," adds Gunjan.



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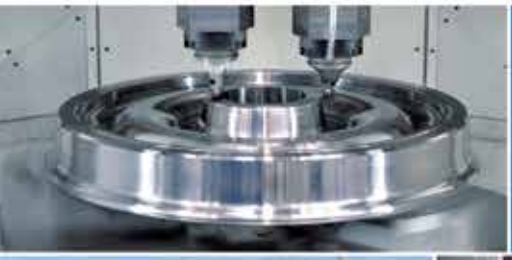

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Gurpratap Boparai

Managing Director, Škoda Auto India Pvt. Ltd. & Volkswagen India Pvt. Ltd. (VWIPL)

By Niranjan Mudholkar

With effect from January 1, 2019, Gurpratap Boparai, who has been the Managing Director of Škoda Auto India Private Ltd., has also become Managing Director of Volkswagen India Pvt. Ltd. (VWIPL).

This is part of the Volkswagen Group's 'India 2.0' project; a project aimed at sustainably strengthening its position in the Indian market. The Volkswagen Group in India is restructuring its management to use the existing synergies more efficiently to address the all important India market. All Group brands will continue their operations under the leadership of Boparai with a common strategy in the Indian Market. The restructuring of the Volkswagen Group companies in India is planned for 2019, subject to regulatory approvals.

The Volkswagen Group is placing the responsibility for implementing the 'India 2.0' project in the hands of the newly formed management team headed by Boparai. The aim of this measure is to make more efficient use of existing synergies and to establish more agile coordination processes so that decisions can be made more quickly and flexibly.

Boparai, who heads the 'India 2.0' project, adds: "With the introduction of the new management structure, we are laying the foundations both for the joint implementation of 'India 2.0' and for achieving our goals in India: we will secure employment in India, create new jobs, attract talent and launch high quality and attractive vehicles on the market."

All future models to be developed and produced locally in India will be based on the Volkswagen Group's modular transverse matrix (MQB). This platform already meets the stricter legal requirements in India, which will come into force in 2020.

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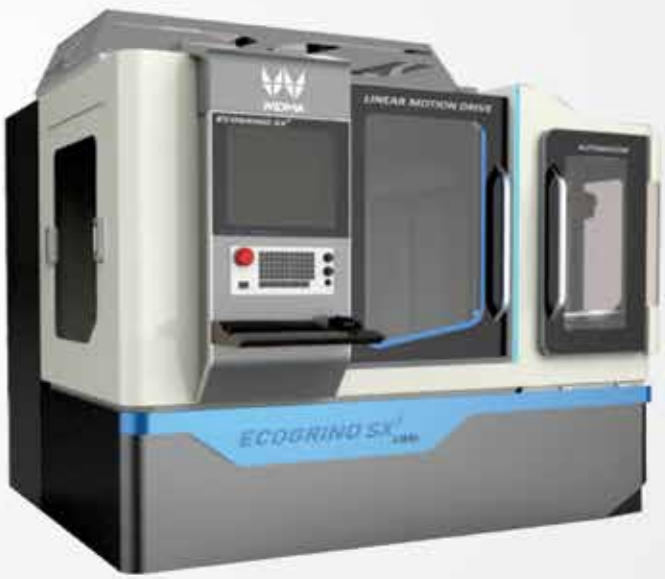

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Kevin Flynn

President & Managing Director, FCA India Automobiles Private Limited

By Niranjan Mudholkar

Kevin Flynn, President & Managing Director, FCA India Automobiles Private Limited, was inducted into The Machinist Hall of Fame in 2018. He's a great example of rising through the ranks. A veteran of the international automotive industry, Kevin started his journey as an apprentice motor engineer. Since then, he has steadily progressed through different functions and roles at different organisations and across different markets all around the world. Before joining FCA India, he was the Managing Director of Jaguar Land Rover, South Africa & Sub Sahara Africa region.

It's been a little over three years that Kevin has taken over the top job at FCA India with the primary objective of setting up and managing commercial operations for the Jeep brand. Of course, besides bringing to the Indian market some of iconic Jeep models, he has also been responsible for creating a benchmark in the Indian SUV segment with the Jeep Compass. This, he has also seen as a vehicle for the Make in India initiative as the Jeep Compass is exported from FCA's Ranjangaon plant to all right-hand drive markets across the globe including to the developed countries. "I want to highlight here that Make in India is a great initiative by the Government of India and we wanted to support it. On the other hand, we also wanted to redefine the brand Jeep. Jeep Compass is the finest example of amalgamation of these thoughts," Kevin says.

Kevin also highlights that Make in India is just not about making it in India for the domestic consumption, but it is way beyond that. "It is about manufacturing products in the India with global standards, that can be sold globally with pride and confidence. For me, this is an accolade for India not just for me or FCA India. I think it is the most amazing turnaround."

"MAKE IN INDIA IS JUST NOT ABOUT MAKING IT IN INDIA FOR DOMESTIC CONSUMPTION, BUT IT IS WAY BEYOND THAT. IT IS ABOUT MANUFACTURING PRODUCTS IN INDIA, WITH GLOBAL STANDARDS, THAT CAN BE SOLD GLOBALLY WITH PRIDE AND CONFIDENCE."

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Nikhil Nanda

Chairman and Managing Director, Escorts Ltd.

By Swati Deshpande

In 2018, Nikhil Nanda took charge as Chairman & MD of Escorts Ltd. Since then, he has been the driving force of the company. Under his leadership, the company has expanded its global footprint. In 2018, Escorts entered into JV with Japan's Tadano Group for higher capacity mobile cranes. Speaking on this JV, Nanda says, "Escorts vision has always been to bring the world's best to India & take India's best to the world. The JV with Tadano Group is a step towards catering to market demand for smarter, safer and bigger mechanized infrastructure solutions in the higher tonnage category. We are confident that the JV will enable us to tap the opportunity in these market segments & reinforce our leadership in the construction equipment space." Escorts further expanded the collaboration with Japan by joining hand with Kubota. Escorts and Kubota are forming a global JV to manufacture high end technology tractors for domestic and export geographies.

Nanda envisions to modernise and mechanise farming in the country. With this view, Escorts showcased it's unique Automated Farming Solutions with the launch of India's first Automated Concept Tractor that brings the power of next generation digital vehicle technologies aimed at precision-based farming.

The company recorded a strong growth of 32.5% in Q2 of 2018-19 with profit of 102.7 cr. "Escorts has a competitive and innovative product portfolio in domestic & export geographies. Our construction equipment portfolio with our recent collaborations have widened & offer product variability across applications. Railways business has a strong order pipeline & is developing technology for sector comfort & safety. We are aligned to the national focus on farming mechanisation and developing urban smart infrastructure," he mentions.

In this collaborative world, Escorts will definitely pave the path of success under Nanda's leadership.

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Dr. Pawan Kumar Goenka

MD, Mahindra & Mahindra Ltd
& Member of the Group Executive Board

By Niranjan Mudholkar

When Dr. Pawan Goenka's name was announced as 'The Machinist Super CEO of 2018', the entire gathering at the venue was on its feet even before he had reached the stage. It usually happens that a recipient of an award gets a standing ovation after he has accepted the trophy on the stage. But in this case, it happened even before he had reached the stage. Indeed, he is one of the few industry leaders whose name evokes both awe and respect. And rightly so!

The contribution of this man to his organization and to the overall automotive industry is unparalleled. Upon returning to India after an illustrious stint with General Motors' R&D Centre in Detroit (US), he joined the Mahindra Group as the General Manager (R&D). This is where he led a team that conceptualized and developed India's first indigenously built SUV – the Scorpio.

While he continues to steer the Mahindra Group as its MD, he is also currently a National Council Member of Confederation of Indian Industries (CII), and the Chairman of its Manufacturing Council.

"Those who know me know that I am very passionate about Indian manufacturing. Nothing pleases me more than Indian manufacturing getting recognised all around the world. Since the time I came back to India in 1993 the kind of change that I have seen on shopfloors is unbelievable. Then it was hard to imagine the fact that Indian manufacturing would be exported to the Western world. But it's the truth today. The work is not done yet. Indian manufacturing is not yet comparable to German manufacturing or Japanese manufacturing. Indian manufacturing should be at the top and not one amongst the top," he says.

"THE CHANGE THAT I FORESEE HAPPENING IN THE COMING FIVE YEARS IN THE MANUFACTURING WILL BE PERHAPS THE BIGGEST QUANTUM OF LEAP THAT THE INDUSTRY IS TAKING. THE DYNAMICS ARE ABOUT TO CHANGE, AND IT CALLS FOR SUITABLE LEADERSHIP."

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Pawan Munjal

Chairman, Managing Director & CEO, Hero MotoCorp

By Swati Deshpande

With the sale of more than 8 million units in a single calendar year of 2018, Hero MotoCorp Ltd. has maintained its position as the world's largest manufacturer of two - wheelers, based in India for yet another year. Also, it is the first two-wheeler company to cross 750,000 units in monthly sales (769,138 units in September '18). And one who has been spearheading the growth of the company from the forefront is Pawan Munjal, Chairman, Managing Director & CEO, Hero MotoCorp. The second generation entrepreneur has been thinking ahead of the time. "In order to cater to the growing demand, the company also started construction of its eighth manufacturing plant in Chittor, Andhra Pradesh. It will be operational by next year."

Munjal has been instrumental in driving the growth of the group with his strategic thinking. In 2017, Hero MotoCorp launched operations in two significant global markets — Argentina and Nigeria— thereby, spreading the global footprint to 35 countries.

Realising the need of the Indian users, the company launched three new two-wheelers. Xtreme 200R strengthened its presence in the premium motorcycle segment while with Destini 125, the company forayed into 125cc scooter segment. Additionally, the company also launched the new 'Passion PRO', 'Passion XPRO' and 'Super Splendor' to augment leadership in 100-125cc motorcycle segments.

Speaking on the global two-wheeler industry, he says, "2018 was a challenging year for the global economy. While the continuing volatility in currency and commodities slowed down the pace of growth, the global geopolitical and trade conflicts also affected sentiments in markets and industries across the world."

Further he hopes that "With an improved liquidity in the market, and the upcoming festive season in many parts of the country, the industry is expecting a positive turnaround in the fourth quarter."

WITH AN IMPROVED LIQUIDITY IN THE MARKET, AND THE UPCOMING FESTIVE SEASON IN MANY PARTS OF THE COUNTRY, THE INDUSTRY IS EXPECTING A POSITIVE TURNAROUND IN THE FOURTH QUARTER.

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Satish Nadiger

Managing Director & CEO,
John Deere India

By Niranjan Mudholkar

It is not very often that experts in accounts, finance and taxation are known to play direct roles in transforming manufacturing businesses. Satish Nadiger, Managing Director and Chief Executive Officer of John Deere India, is definitely an exception to this rule. John Deere recently completed 20 years of successful operations in India. Satish, who has also done a long stint with Larsen & Toubro Limited, is an industry veteran of more than three decades. He joined John Deere in 2000 (in the finance function!) and has been at the helm of things since September 2012.

"The journey has been both fascinating and exciting," he says. Satish has played an important role in establishing and growing the John Deere operations in India, which now include four manufacturing operations, a Technology Center, a parts distribution centre and financial services business.

"Our journey in India began 20 years ago with the introduction of advanced product features such as power steering, oil immersed disk brakes, planetary reduction, force feed lubrication and high torque machines," Satish says. "John Deere was the first to introduce these features in India and they have now become industry standard."

THE MACHINIST Star List 2019

Satish believes that John Deere's role in helping lead India from subsistence farming to Agri-entrepreneurship is something he is proud of. "We have partnered with crop value chain partners for a wholistic farm solution and have also introduced important safety features such as roll over protection and seat belts. Our product advances have been immensely valued by our farmer customers."

Under his leadership, John Deere is also meeting the need to bring new technologies to tractors and farm equipment that lower the overall cost of farm operations, reduce the number of operations needed in the field, and improve the speed of seeding and fertilizing equipment.

"JOHN DEERE'S INVESTMENTS OVER THE PAST 20 YEARS HAVE BEEN SUCCESSFUL. IN FACT, TRACTORS AND HARVESTERS MADE IN INDIA ARE EXPORTED TO MORE THAN 110 COUNTRIES WORLDWIDE."

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Tarang Jain

Managing Director, Varroc

By Niranjan Mudholkar

The year 2018 has been a significant year for the Varroc Group as Varroc Engineering became a publicly listed company in July 2018. This was another feather added to the already heavy cap of Tarang Jain, the Managing Director of Varroc who also heads all the companies within the group. Indeed, it has been a very fulfilling three-decade old journey for Jain, who established Varroc in the year 1988, starting operations from the Polymer Division. Under his leadership, Varroc Group has become one of the leading automotive lighting manufacturers in the world and a leading two-wheeler component supplier in India. Now, he is ready to take things to the next level.

Today, Jain is obviously happy with the fact that Varroc has delivered a strong growth in India business in H1FY19 despite of increase in fuel costs and regulatory changes impacting the automotive industry. "In the near term, additional emission and safety related changes are expected. At the same time, we believe that the industry is expected to grow as two-wheeler continues to be the major mode of transport and the penetration has further scope for expansion," he says.

Varroc's growth in India is driven by addition of new customers as well as cross selling some of the existing products. "We plan to increase our share of business with leading OEMs as well as leverage on the opportunities created by the introduction of new safety and emission norms especially in our Electrical/Electronic business," Jain further says.

Varroc has already made a reasonable capital investment over the past few years in its India business. "This is broadly aligned to our growth aspirations. In addition, we will selectively be targeting strategic organic and inorganic opportunities to scale-up our India business," he adds.

"A REASONABLE CAPITAL INVESTMENT HAS HAPPENED OVER THE PAST FEW YEARS IN OUR INDIA BUSINESS. THIS IS BROADLY ALIGNED TO OUR GROWTH ASPIRATIONS. IN ADDITION, WE WILL SELECTIVELY BE TARGETING STRATEGIC ORGANIC AND INORGANIC OPPORTUNITIES TO SCALE-UP OUR INDIA BUSINESS."

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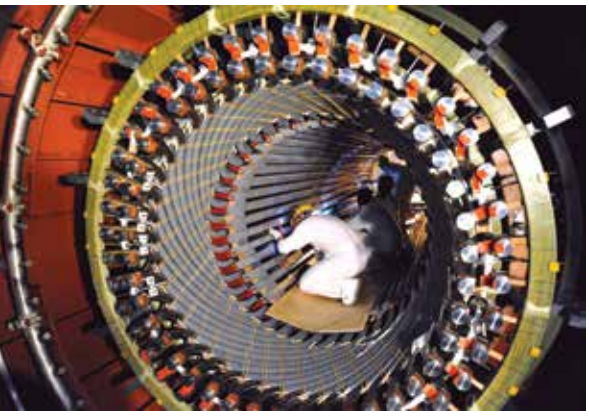
Tomohiko Okada

Managing Director,
Toshiba India Pvt. Ltd. (TIPL)

By Swati Deshpande

Tomohiko Okada takes Toshiba's commitment of 'For the Next India' very seriously. With this motto, the company is working in India in the areas pf Power Systems, Water Treatment, Railway Systems, Elevators, and Batteries. "Looking ahead at the era of electric vehicles, Toshiba is playing an important role in contributing the stable supply of lithium-ion batteries in India for promoting sustainable cars in the country and will support 'Make in India' initiative," he says.

Continuing the efforts towards cleaner environment, Toshiba is also helping India to reduce carbon footprint in the power sector. Speaking on it, Okada says, "Thermal power in India continues to be the main source of energy. To offset the biggest challenge that thermal energy pose, Toshiba has been continuously striving to develop technologies that can reduce the carbon footprint by not only reducing the emission levels, but also improve efficiency. One such technology is the Advanced Ultra-Super Critical (A-USC) that uses steam at temperatures above 700°C."



Okada thinks that Railways is yet another sector that is thriving in India and the company also has expertise in this. He is proud of the company's heritage in this segment. "With over 115 years of R&D in railway technology, the company has worked to improve every requirement of railway transportation, like environment adaptation, safety, punctuality, comfort & reliability. Toshiba with its advanced energy-saving solutions promotes technologies that contribute in reducing electricity consumption & greenhouse gas emission, leading to improved city environment."

However, his vision is not restricted to the Indian territory. Okada thinks that the manufacturing base here can help the company achieve new heights. "With strong alignment between India, Japan and many other countries, we are in a unique position to serve as a gateway to countries globally, especially Middle-East and Africa from our Indian base."

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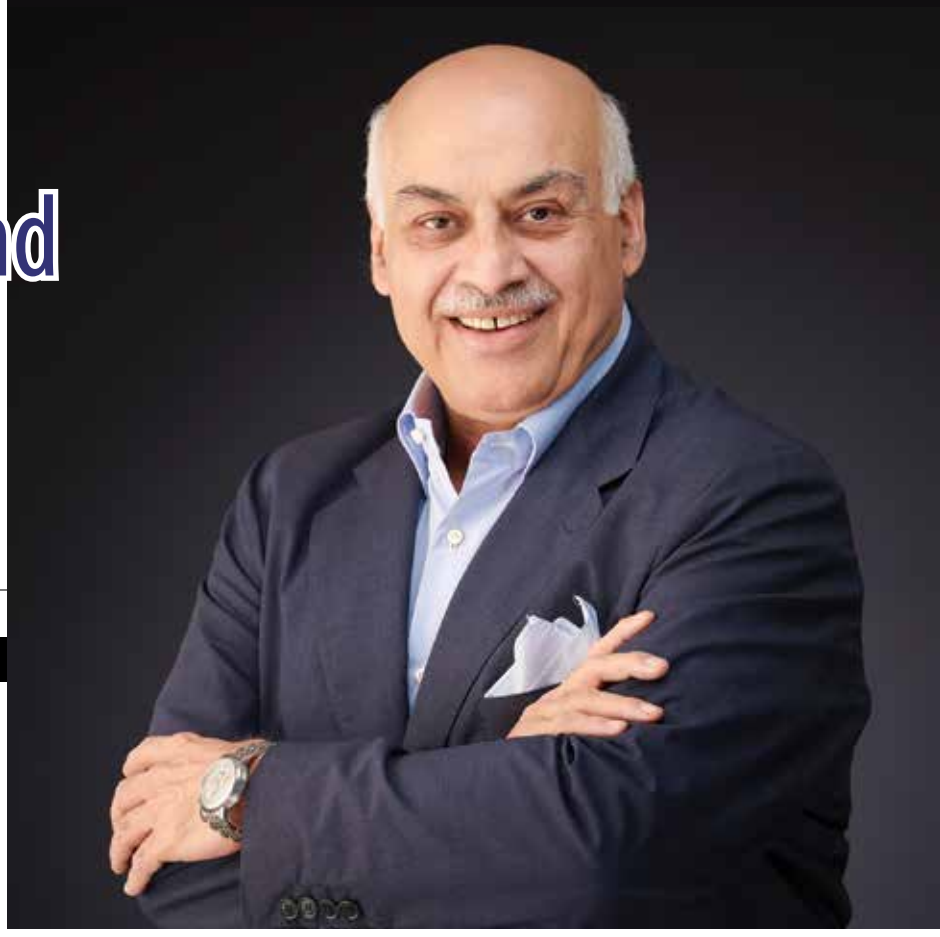

By Swati Deshpande

What was established by a mother & son duo four decades ago is now grown into a USD 11.5 billion group spread over 41 countries. Vivek Chaand Sehgal, Chairman of Samvardhana Motherson Group (SMG) has been spearheading operations of this giant establishment that has over 250 facilities across the globe. Motherson Sumi Systems Ltd (MSSL), the flagship company of the Group, is one of the largest auto ancillary companies in India.

Lately, the group acquired Reydel Automotive, which is the 21st acquisition from SMG. Speaking about it, Sehgals says, "With world class development capabilities and strong customer relationships, we found great alignment with our existing offerings at Motherson."

He firmly believes that right acquisitions pave the way for future. Some of the other companies that the group has taken over previously are Visiocorp (March 2009), Peguform (November 2011), Stoneridge Inc – Wiring Harness Business (August 2014), Scherer & Trier (January 2015), PKC Group (March 2017).

If looked at the financial results, Reydel's acquisition has definitely helped the group grow. Results for fiscal 2018-19 second quarter, which ended on September 30, 2018 suggests that the company continued to post strong growth with Quarterly Revenues of INR 14,854 crores. This is up by 11% and while Q2 net profit is INR 426 crores. "The operational integration of Reydel with polymer business of the group has started on a positive note in this quarter. The company has maintained it's growth momentum and Reydel's contribution has further enhanced our growth and product offerings. Teams across the geographies have done well."

Sehgal has already set trajectory for the group. He has few more acquisitions on the pipeline, which will strengthen the group's capabilities. Speaking about the future, Sehgal remarks that the group should not restrict itself to the auto sector. In fact, he finds synergy between auto and other segments like aerospace and also defence.

Sehgal's clear vision to establish SMG as a full system solutions provider and a preferred vendor to all customers has propelled the expansion of the Group in new business areas. Firmly believing that "We are a NOT YET company", Sehgal is always open to new ideas and has successfully spread this philosophy of openness down the line in SMG.

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Wu Song

Managing Director,
LiuGong India

By Niranjan Mudholkar

Wu Song, Managing Director, LiuGong India is a big believer in the 'Make in India' initiative. In fact, while consolidating LiuGong India's manufacturing base for the domestic market, he is equally focused to expand it for the exports market as well. "After many years of business expansion and success in India market, our next big stage is to build up India manufacturing hub for the whole world, especially for the emerging markets, such as SAARC countries, Africa and Middle East," he says.

Song believes that the industry is currently riding on Government's stimulants and investments to fast forward infrastructure projects primarily development of roads and highways. "Big ticket projects like Sagarmala and Bharatmala will also give a leg up to development of rural roads and rural infrastructure. The sector is pegged to grow at CAGR of 20 percent. Although 2019 is election year, which may disrupt the speed of project execution, however there would not be any negative growth," he says.

The year 2018 has ended up on good note with LiuGong India growing at about 50 percent YOY. As per industry experts, the industry is pegged to grow at 20 percent CAGR in the coming years. "We at LiuGong are quite optimistic about this. We plan to grow our new business of excavator, compactor and forklift apart from other existing strong product lines like wheel loader and Motor Grader," Song shares.

LiuGong India, which has completed 16 years of business, is now planning to invest further in India to increase its current plant capability and expand for its new product line businesses especially for excavators. "Besides, we will complete the update of all current existing product lines to their new generation with high technology in the next two years," he adds.

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- Connect which will join companies with students on a common platform to source talent for machine tool industry.
- Jagruti which will connect students from various cities with institutions.
- A Buyer-Seller meet will also be organized which will give a platform for companies to sell machines and explore mutual business opportunities.

Since its conceptualization IMTEX has played an enabling role for manufacturing growth in India. From small beginnings in 1969 the show has grown exponentially over a timeframe of 50 years bringing the most advanced manufacturing technologies from across the globe under one roof. This has benefitted Indian manufacturers immensely. IMTEX is today recognized as a "must attend" show for manufacturing and technology enthusiasts.

A unique feature of IMTEX has been the presence of large buyer delegations from public and private sectors and key decision makers from various industries who have supported the growth of exhibition from the very beginning and is a must attend exhibition to some manufacturing solutions across industry sectors. The success of the show can be gauged from the number of footfalls that we are seeing in every show and a must attend exhibition to some manufacturing solutions across industry sectors. Visitors to IMTEX represent the

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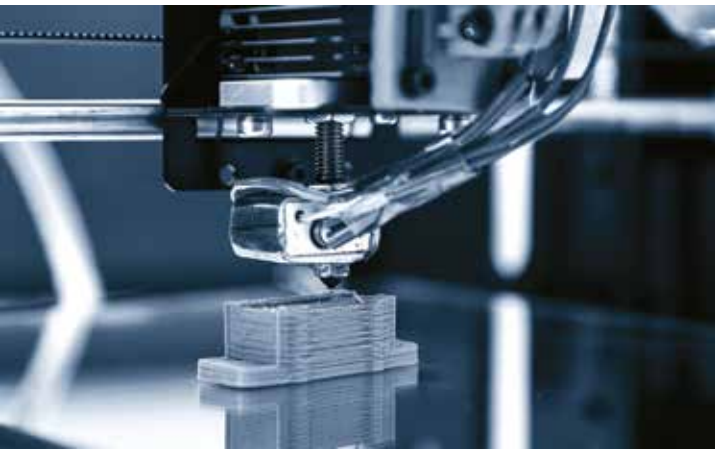

IMTEX is known for showcasing technologies 'Live' which will enable visitors take on the spot decisions.

"New Exhibition Hall at BIEC: A new state-of-the-art exhibition hall (Hall 5) measuring 17,500 sq m, which is the latest addition to BIEC infrastructure will be inaugurated during the first day of the show. IMTMA expects more show organizers to book space at this new hall."

entire spectrum of manufacturing industry such as aerospace, defense, railways, power sector, shipping, construction equipment, capital goods, and many more.

The horizons have been expanding with every show and as IMTMA (Indian Machine Tool Manufacturers' Association) celebrates IMTEX's 50 years journey, two new technology shows have been added in addition to the regular parallel events. The expo on additive manufacturing will help manufacturing fraternity familiarize themselves with the techno-commercial advantages of additive manufacturing. The pavilion on Industry 4.0 will shed light on technologies that are being adopted in smart manufacturing.

"IMTEX is playing the dual role of bringing technologies to the manufacturers and acting as an enabler for developing trade as well. Companies by adopting these advancements in technology and making their workforce competitive to use these technologies can establish themselves in the global marketplace."

IMTMA President **P. Ramadas**

Speaking on why IMTMA introduced the two new shows Jamshyd N. Godrej, Chairman-Exhibitions, IMTMA told The Machinist that manufacturing industry is today driven by technology and terms like Industry 4.0, additive manufacturing, artificial intelligence, robotics, among others, have all become buzzwords. Manufacturers are wanting to adopt these technologies in their product lines. IMTMA deemed it appropriate to launch these technologies in the show since IMTEX is known for showcasing technologies 'Live' which will enable visitors take on the spot decisions.

IMTMA President P. Ramadas concurring with Godrej's views stated that manufacturing growth always depends on advancements in technologies and solutions. IMTEX is playing the dual role of bringing technologies to the manufacturers and acting as an enabler for developing trade as well. Companies by adopting these advancements in technology and making their workforce competitive to use these technologies can establish themselves in the global marketplace.

IMTEX milestones – 1969 to 1989

IMTEX 69: Twenty-Six Indian companies all IMTMA members along with Central Mechanical Engineering Research Institute and Indian Institute of Technology participated in the first edition of the exhibition held at Godrej & Boyce plant in Vikhroli, Mumbai.

IMTEX 72: Organized over 7,000 sq m of gross space the exhibition coincided with IMTMA's silver jubilee. Focus was on advancements made by Indian manufacturers in the field of design and diversification. Over 350 metal-cutting and metal-forming machine tools, small tools, foundry equipment and accessories. Imported machine tools were also displayed.

IMTEX 75: Organized in a gross space of 15,000 sq m, 225 members of the Association participated in the exhibition which featured over 500 machines. Over 100 newly developed machine tool products by Indian manufacturers were on display.

IMTEX 79: Organized over a gross area of 25,000 sq m.

IMTEX 82: IMTEX was held in two large halls covering 31,000 sq m gross space. For the first time, 125 overseas companies from USA, UK, Switzerland, Japan and West Germany participated with well-known brands. Several functions and technical workshops were held alongside IMTEX 82.

IMTEX 86: Became the country's largest specialized show with 650 companies, including 240 firms from 18 overseas countries putting up their displays over a net space of 25,000 sq m. One major attraction was the 120 CNC machine tools.

IMTEX 89: All India Machine Tool Exhibition was officially re-christened as Indian Machine Tool Exhibition (IMTEX) in a gross area of 50,000 sq m displaying over 1,500 machines. IMTEX series completed 20 years existence and was for the ultimate time held continuously in the Godrej Industrial Complex in Mumbai.

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Manufacturing industry is today driven by technology and terms like Industry 4.0, additive manufacturing, artificial intelligence, robotics, among others, have all become buzzwords.

"Experience Zone: To celebrate the five decades of IMTEX journey IMTMA will be setting up an Experience Zone at the Conference Centre in BIEC. IMTEX's 50 years journey will be displayed for dignitaries in the form of images and a short film."

V. Anbu, Director General & CEO, IMTMA supporting the aforesaid views added that looking at the kind of trade which happens during IMTEX in terms of orders and enquiries generated one can understand that the potential of the exhibition supplementing the growth of manufacturing industry in India is immense. Firms by buying the technologies enhance their competitiveness. As a result, we are seeing many Indian companies from sectors such as automotive, power, electronics, aerospace, defense, and many others are making huge advancements to compete globally and are also gearing up to take export orders.

"Looking at the kind of trade which happens during IMTEX in terms of orders and enquiries generated one can understand that the potential of the exhibition supplementing the growth of manufacturing industry in India is immense."

V. Anbu, Director General & CEO, IMTMA

IMTEX has always been a pioneer in showcasing latest technologies and solutions from the global manufacturing industry. In 2019 as well when the exhibition celebrates its 50 years journey visitors will get to see some of the emerging trends in 5 axis machines, multi-task machines, new gear cutting tools, auto force control robots, and so on. IMTEX 2019 & Tooltech 2019 will primarily focus on productivity, precision and automation and will be a catalyst in bringing investment in manufacturing.

Concurrent show on Tooltech will showcase machine tool accessories, metrology, CAD / CAM cutting tools, tooling systems and current trends in the tooling industry. Tooltech manifests recent innovations in technology, design and product development with the aim to bring cost competitiveness in all metalworking operations.

IMTEX 2019 and Tooltech 2019 will provide LIVE marketing opportunities to participating exhibitors. It will facilitate business-to-business cooperation between manufacturers and users of all hues connected to metal-cutting manufacturing technologies.

Source: IMTMA

IMTEX milestones – 1992 to 2017

IMTEX 92: Moved from Mumbai to New Delhi. The exhibition displayed the vibrancy of the Indian machine tool industry, which had just been freed from the shackles of controls and closed-door regimes with participation of over 600 companies including 140 from 16 overseas countries.

IMTEX 95: High growth in all sectors of Indian engineering industry was the hallmark of 1995 when IMTEX was held for the second time at Pragati Maidan covering a gross space of 45,000 sq m. For the first time, there was group participation from Spain, Israel and Germany.

IMTEX 98: Five halls were earmarked exclusively for Tooltech exhibits which was unprecedented in any IMTEX show until then. The largest space was occupied by HMT Limited.

IMTEX 2001: Held for the last time in New Delhi, it further consolidated the close bonds between manufacturers and users.

IMTEX 2004: Once again entered Mumbai where it all began. With 1,150 exhibitors from 27 countries the exhibition lived up to its true image of being the most comprehensive exhibition of manufacturing solutions in South and South-east Asia.

IMTEX 2017 & Tooltech 2017: Held in BIEC attracted a footfall of 75,440 visitors. Orders worth Rs. 1,670 crores and enquiries to the value of Rs.18,989 crores were generated during the exhibition. Compared to IMTEX 2015 the booked orders increased by 16% whereas the enquiries generated increased by 21%.

India **Rising!**

The economic liberalisation in India is built upon reforms having the goal of making the economy more market- and service-oriented and expanding the role of private and foreign investment.

By Frank-Jürgen Richter

India has developed rapidly over recent decades – from an agrarian regime that had been restricted by what might be described as 'the heavy presence of British colonialists' to one that is rising up the ranks of international indices, like 'the Ease of Doing Business' produced annually by the World Bank. There are other indices with global reach, such as the Index of Economic Freedom and the Corruption Perceptions Index, to name only two. But in India, with its massive population (and still growing rapidly) and with many strong regional governments 'doing business' always exhibits several tensions – one is the lack of skills and the other is populism: both manageable by government reform programs.

> "So – to business – the $20m 'Clean India' aims to construct 111 million latrines in five years: it has initiated an 81 percent jump in sales of concrete building materials and 48 percent increase in bathroom and sanitaryware sales."

Aspiring to be better

It is good practice in business to review one's operational practice against others in the same sector, and indeed look to the 'best in class' no matter what sector that firm may operate in – simply to ascertain how 'we' do things and where 'we' can do better - since without aspiration one does not grow and achieve more. And while undertaking these reviews of one's business practice the firm can also look broadly at all the circumstances of the firm's operation including the degree of diversity compliance and the development of social well-being given to its staff and returning something to the community in which it operates. Such reviews were once rare but are becoming more mainstream as firms expand to regional, national and international operation. The norms and expectations of other people (suppliers, logistics providers and customers) at a distance are not the same as in one's home town and they may generate surprises to be absorbed as a new learning opportunity. Firms that have a global reach like Rolls Royce, or IBM were once dubbed as arrogant as they did not listen to customer's wishes – instead they proclaimed they were the experts and the customer was not correct at all. Both firms almost failed, and the once-proud saying of "… doing a Rolls Royce job", meaning a task very well done, lost all its meaning. Now we are again happy to ride in one of their cars or fly in aircraft propelled by their jet engines – but it took time and humility for them to learn to listen and to be able to assure the customer that their concerns were also the concerns of the business. Talking to each other ensures each side becomes clear about issues and about the supplier's capabilities.

Start up India

The large-scale Japanese FDI initially in south-east Asia, then into the US, followed in the early 1980s in Europe led to Japanese firms being dubbed as 'thieves of intellectual property' – but times change, and now China has this unenviable label. What is remarkable presently is that little is discussed about the nationality of tech-start-up innovators in the US with the Indian manager being so prominent. Analysts say 43

percent of the Fortune 500 firms with the highest revenues were started by immigrants or their children; and in 2012, although comprising less than one percent of the population Indians founded eight percent of US start-ups; and of the 241 US unicorn firms, 14 are headed by Indian-origin founders. Further, Indians head-up firms in every country – note Qualcomm, ArcelorMittal or Jaguar Land-Rover. It is not by chance – richer Indian families sent their bright young boys (usually not the girls) to be educated in English-language universities abroad as they did not consider there to be enough opportunity in the rare top-flight Indian education institutes. Those children blossomed, reaching their potentials; but so, did some of the families and children that remained in India (note Tata, Reliance, Mahindra & Mahindra, etc).

Laying the foundation

When I studied Japanese management practices in Europe and in Japan, I gathered some insights – one of which was about nemawashi. Wiki suggests this is '… quietly laying the foundation for some proposed change or project, by talking to the people concerned, gathering support and feedback, and so forth. It is considered an important element in any major change, before any formal steps are taken, and successful nemawashi enables changes to be carried out with the consent of all sides.' Thus, while the Japanese used this process as a norm, it was new to the US and Europe. Talking about the issues was something the typical US firm did not do – they preferred to '… catch the ball and run with it' – no matter which way, action was key! Sadly, there is too little time spent considering options today with markets and management being assailed by algorithmic decisions instead of engaging in deep discussions.

Re-educating the educators

There is a dire aspect to education in India which has arisen from many class-conscious ethnic decisions over a long period. Annual school achievement data shows few children benefit from their secondary years in school. And the OECD's PISA test, open to all 15-year olds, was taken by some pupils in India in 2009 who only achieved 72nd rank of 74 globally represented nations. But the Ministry now considers this international comparison might boost re-educating the educators, and to change curricula to meet modern needs: India will enter the 2021 PISA test (the application process takes three years). Before then we hope India can transform the education system by a value-driven and emotional process, which needs to be implemented strategically through a behavioural

"Yet for a democratic country like India with such a diverse population, implementation of a pan-India reform becomes a tough task owing to the varied political, economic and social situations."

"Although comprising less than one percent of the population, Indians founded eight percent of US start-ups; and of the 241 US unicorn firms, 14 are headed by Indian-origin founders."

change process. The best way could be using the strategies of the Swachh Bharat Mission('Make India Clean'—the globes' largest behaviour change programme) transplanting its notions to the education sector by asking 'product champions' to drive the reforms.

Clean opportunities

It is not a digression to comment on the Swachh Bharat Mission developed after Mr Modi promised to promote good sanitation following the 2011 census that indicated 70 percent of the population had no access to a private toilet and defecated unsafely outside. There are huge business opportunities in the total water sanitisation process (clean water delivery and treatment of dirty water, as well as providing safe toilets) and immense benefits to be gained by raising hygiene to cut illness for Indians as well as tourists. The World Bank estimates diarrheal diseases costs India 6.4 percent of its gross domestic product. So – to business – the $20m 'Clean India' aims to construct 111 million latrines in five years: it has initiated an 81 percent jump in sales of concrete building materials and 48 percent increase in bathroom and sanitaryware sales.

Skilling young Indians

Returning to education – as it is central to all global understanding – we note poor initial teaching standards invalidates the oft-quoted demographic dividend of India with its young workforce. But as many young people (both boys and girls) cannot read, write or calculate adequately they will not contribute fully in the work-place that demands people operated high-tech equipment and who must join 'nemawashi-like' problem-solving discussions using critical thinking skills. This

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is not only an Indian issue only, as globally there is a severe lack of international-standard culturally-aware managers, and especially managers with specific skills, like developing AI systems (it is thought only 10,000 expert staff exist).

Reforms that work

It is thus helpful to note "India's strong reform agenda to improve the business climate for small and medium enterprises" is bearing fruit – being reflected in the government's strong commitment to broaden the business reforms agenda at the state and at the district level. Further, opined Junaid Ahmad, Indian World Bank Country Director there is the need to reform the judicial processes, making them speedier in bringing justice to the fore, to be in-line with international business reforms. The economic liberalisation in India is built upon reforms having the goal of making the economy more market- and service-oriented and expanding the role of private and foreign investment. Yet for a democratic country like India with such a diverse population, implementation of a pan-India reform becomes a tough task owing to the varied political, economic and social situations.

"It is thus helpful to note "India's strong reform agenda to improve the business climate for small and medium enterprises" is bearing fruit – being reflected in the government's strong commitment to broaden the business reforms agenda at the state and at the district level."

Reform is delayed by nationalism and populism that affects many in India through its inter-regional rivalry. Populism revolves around a 'powerless-powerful' dimension where populists claim to represent 'the people against the current elite' that does not represent them, but they offer outcomes that are not sustainable. Often these are posited against foreign conspiracies which in an age of globalization seems plausible as things going on thousands of miles elsewhere in the global economy can have major impact at home.

Way ahead

Indian businesses at home or overseas are supported today by strong Indian managers who understand the need for globalisation as well as modernisation. They are aided by government reforms, especially in education, that develop an understanding among the people that 'Digital India' through the democratisation of Aadhar, digital money, and a desire to be democratic will ensure India rises up the global competitiveness indices.

The author is Chairman and Founder of Horasis, a global visions community.

PRODUCTS

Difficult milling made easier

Dormer Pramet's range of solid carbide milling cutters for difficult to machine materials offers a variety of options from roughing through to finishing. The S2 assortment includes a range of neck options for deep milling and multi-flute designs to support numerous applications in tough steels, titanium and nickel.

Its differential pitch cutters (S260, S262, S264) reduce chatter and offer fewer tool offset adjustments, providing effective chip removal at high feed rates. The trio of cutters - available in diameters from 3-20mm - feature an optimized cutting-edge to reduce chipping and prolong tool life. All have an AlCrN coating for improved wear and oxidation resistance.

In addition, the S264 milling cutter has a robust corner chamfer on the end teeth to further reduce chipping and a roughing profile for greater removal rates. Also, the S262's corner radius provides a more precise finish and optimizes performance, especially in ramping operations. Meanwhile, Dormer Pramet's six to eight-flute cutters (S225, S226, S227) feature a high helix angle to keep the cutting edges constantly engaged with the work-piece. This results in clean, efficient machining and a high-quality surface finish.

Several neck options are available to support pocket milling, up to 8.8xD, by preventing contact between the shank and work-piece, eliminating the risk of vibration and scouring. To support general milling applications, the company's range of four-flute cutters (S216, S217, S218, S219) offer a reach up to 9xD. This range also features an optimized cutting-edge design and an AlTiN coating for high hot hardness and oxidation resistance. A special edge treatment provides a smooth and quiet machining process, further prolonging tool life. Finally, an assortment of ball nose cutters (S229, S231, S233) are available in 1.5mm-16mm diameters, offering up to 8.3xD. As well as a special edge treatment to support smooth machining, its TiSiN coating provides improved wear and oxidation resistance in extreme cutting conditions.

Source: Dormer Pramet

Smart factory solutions

Renishaw showcases its technological prowess at IMTEX 2019

Renishaw, returns to IMTEX for the show's 50th anniversary, which is taking place at the Bangalore International Exhibition Centre, Bangalore, India. The show's 50th anniversary will be marked by the introduction of an Industry 4.0 pavilion. In line with this, Renishaw will showcase a complete automation cell, demonstrating to manufacturers how intelligent process control is key to the operation of a successful smart factory. Additionally, the company will launch several new products to address the industry's need for automated process control.

Intelligent process control

By exhibiting a high-productivity machining cell, Renishaw will demonstrate how integrating smart factory process control can transform a machine shop's production capabilities, improving speed, ease-of-use and flexibility. The cell highlights how CNC machining operations can benefit from high levels of automation and connectivity and demonstrates process control techniques that Renishaw uses in its own factories for automated precision manufacturing.

Hall 3A / B103 Stand for additive manufacturing: Hall 6 / D102

Renishaw will demonstrate intelligent process control for larger parts, by exhibiting the EquatorTM 500. The new, larger system enables the accurate gauging of larger parts due to a working volume of 500 mm in diameter and up to 400 mm in height, increasing the flexibility and range of applications for the EquatorTM system. Accurate between 5 ºC and 50 ºC at any rate of temperature change, the system can achieve scanning speeds above 200 mm/s.

The new EquatorTM 500 system is suited to applications such as the manufacture of car and truck transmissions, engine housings and drive train parts. Due to the introduction of Intelligent Process Control (IPC) software, manufacturers can automate process control and tool offset correction directly to CNC machines from any Equator gauge.

"IMTEX provides Renishaw with a global platform to launch several new products, as well as demonstrate many that are established," explained Paul Weaver, Vice President of Sales and Marketing of Renishaw in India. "For a manufacturer to remain competitive, they must be able to machine to close tolerances, provide parts for products with ever shorter lifecycles and adapt to changing consumer demands. Intelligent process control allows manufacturers to make checks and take measurements at all stages of the process to control variation."

"By combining automation with measurement and feedback, process control can be achieved throughout manufacturing to improve part quality," added Weaver. "Intelligent process control is a crucial part of the Industry 4.0 journey for companies in the metal cutting industry. Renishaw is a leader in automation for machine tool and will demonstrate to visitors a complete automation cell, so they can experience intelligent process control for themselves."

> "For a manufacturer to remain competitive, they must be able to machine to close tolerances, provide parts for products with ever shorter lifecycles and adapt to changing consumer demands."
>
> **Paul Weaver,** Vice President of Sales and Marketing of Renishaw in India

Additive manufacturing productivity

Renishaw will have a separate additive manufacturing stand, where it will exhibit the four-laser RenAM 500Q. The machine significantly improves productivity, speeding up the process by up to four times in the most commonly used platform size, without any compromise on quality. Renishaw will also demonstrate its software for metal AM, including QuantAM build preparation software, remote process monitoring appli-

cation, InfiniAM Central, and the InfiniAM Spectral application for the live feedback on energy input and emissions.

Increasing speed, without compromising on accuracy

The world's fastest workpiece set-up cycles on CNC machines are enabled by SupaScan and the latest OSP60 scanning probe, which will be on display at IMTEX. Exclusive to SupaScan, the QuickPoint macro cycle delivers market leading measurement speed. Differing from normal touch-trigger cycles because it measures using the analogue deflection of the OSP60 probe, SupaScan means there is no requirement to wait for the machine tool's trigger response – speeding up the process.

At IMTEX 2019, the company will also showcase a new version of SupaTouch, an intelligent optimisation routine as part of its Inspection Plus macro software for machine probing cycles, which leads to a cycle time reduction for CNC machine tools of up to 60 per cent. The updated software offers usability enhancements in the optimisation routing to give users full control of probing cycle feedrates. Visitors to Renishaw's stand can experience the multi-sensor capability of the REVO® 5-axis measurement system on co-ordinate measuring machines (CMMs). The system offers a multi-sensor capability to provide touch-trigger, high-speed tactile scanning and non-contact vision measurement on a single CMM. Renishaw will also highlight the SFP2 surface finish probe, which increases the surface finish measurement ability of the REVO system, combining surface finish measurement and dimensional inspection into a single platform to give unrivalled advantages in time, part handling and return on investment. Renishaw's new ultra-compact, highly repeatable radio probe, RMP400 will make its debut in India at IMTEX. Perfect for small 5-axis machine tools, particularly in mould and die and aerospace applications, the strain-gauge probe gives a reliable touch-trigger solution for part setting, feature measurement and machine performance checking.

Software suites

At the show, Renishaw will demonstrate the benefits of its new CARTO 3.0 software, which supports the XR20-W rotary axis calibrator to quickly capture and analyse data from rotary axes. This provides an easy-to-use and intuitive software solution for all Renishaw laser calibration products, reducing the calibration time of a 5-axis machine tool to several hours.

Visitors can learn more about Renishaw's popular smartphone apps including; GoProbe, which generates code for machine tool probing and the Trigger LogicTM app, which provides users with a simple way to customise their Renishaw probe settings.

Source: Renishaw

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DEUBLIN CO., USA, the largest manufacturer of Rotating Unions in the World offers an innovative series of Rotating Unions for supplying Through Spindle Coolant in any kind of CNC machines. The latest in the portfolio is the 903 Series.

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The dovetail pin allows flat workpieces to be clamped directly

For the first time ever, the SCHUNK VERO-S quick-change pallet system can be used to clamp flat workpieces directly in the SCHUNK VERO-S quick-change pallet system. This results in completely new possibilities for machining thin workpieces, mold halves or free-form parts in machining metalworking, in tool and mold making, as well as in structural and chassis components for the aerospace industry. While conventional quick-change pallet pins can only be used from a depth of engagement of 20 mm to 25 mm, a clamping depth of only 3.5 mm is sufficient for the dovetail pins. The required interface (60° angle) can be produced with a free-form milling cutter with minimal material removal. The clamping pin is then inserted and locked by means of a hexagon key through two hardened clamping slides. After machining, the clamping pin can be removed and used for other purposes.

Extensive modular system

The dovetail pins are available in three versions as centering, positioning or retaining pins with a size 40 centering clearance. They are suitable for use in SCHUNK VERO-S NSE plus 138 or 176 quick-change pallet modules, and can also be used together with the SCHUNK WDB modular system for direct workpiece clamping. Due to the special geometry of the SCHUNK VERO-S clamping pins, eccentric and thereby particularly easy loading of the modules is also possible. The direct clamping, free of interfering contours, with dovetail pins allows free access to the workpieces from five sides, a defined clamping situation, high repeat and positioning accuracy, as well as high pulling forces for demanding machining operations.

For more info, contact:
Satish Sadasivan
SCHUNK Intec India Pvt Ltd
info@in.schunk.com, www.in.schunk.com

New model for Tap Flute Grinding application

Tool grinding technologies Inc. has introduced new model for Tap Flute Grinding application.

V2 Advanced Futura (tap Flute Grinding) 5 Axes CNC Tool and Cutter Grinder gives better solution for Taps manufacturers, when they have mass volumes to be manufactured. With present Tap manufacturing, Flute grinding would be the bottle neck as grinding flutes will be difficult for achieving higher quantity and higher surface finish.

Axes Configuration

V2 Advanced Futura (tap Flute Grinding) 5 Axes CNC Tool and Cutter Grinder is configured with 3 Linear Axes and 2 Rotary Axes. With Satellite Type mounting for 3 Linear Axes, Carbide intervention is fully avoided and Provides higher ball screw durability and long term precision. 2 Rotary Axes are configured with Direct Drive Torque motor for eliminating backlash errors.

Internal Diamond Dresser and Automation

This machine also comes with Internal Diamond Dresser which enables regular interval of Dressing for grinding wheels and also different radius in the wheels can be dressed by programming. This enables in reducing cycle time in manufacturing taps with higher flute finish. Simple arm type automation is also provided for pick and place operation. This in turn reduces operator intervention and reduces man power for mass production line. As automation is configured within machine axes, overall cost of automation is also not very much expensive compared to robotic type automation.

Software

V2 Advanced Futura comes with User – friendly MTS – AG. Profile simulation, 3D simulation guides the operator to design the proper tool. Collision check feature helps to decide tool length, collet system, etc. to ensure trouble free running machine. ISO Programming with the help of user parameter is also possible.

Source: Tool Grinding Technologies

Fully automatic short bar feeder

Fenwick And Ravi's versatile Bar Feeder system—VerSys VF15 completely eliminates setup change over time like Pusher/ Pushrod manual changing , Bar stock centre adjustment, etc. This will tremendously save machine down time. The compact design of VerSys VF15 features versatility with improved speed and accuracy.

Salient features of VerSys VF15

- Ultra-fast automatic change over for round and hexagonal bar stocks, with in the whole diameter range
- Double axis Servo control
- Automatic diameter adjustment and Push rod changeover
- Fast, reliable and flexible
- Wide bar stock range and length

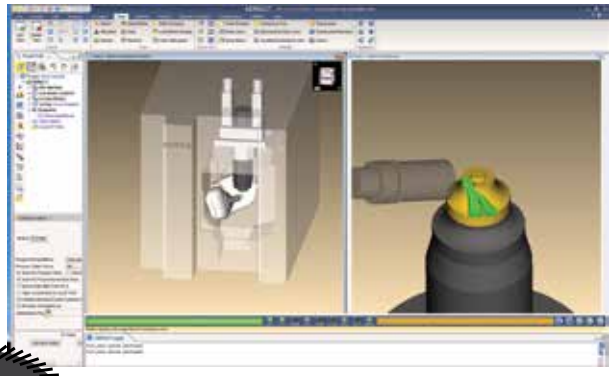
The user-friendly touchscreen HMI with cleverly organized menu system, guarantee effective communication between bar feeder, CNC lathe and the operator for safe and convenient working atmosphere. This is achieved by entering bar profile and diameter through HMI. The feeder VerSys VF15 will take care of all setup changes by itself, Our breakthrough bar feeder technology allow the Built- in Push rod to the machine center, based on the diameter entered in HMI, so on need to manually change the push rod. This will completely eliminate the setup change inside the bar feeder. By answering 'Bar profile' and 'Enter bar diameter', through HMI, the VerSys VF15 will self-setup the following:

- Automatic adjustment of bar picking system to pick one bar at a time.
- Automatically position the bar precisely to the machine center.
- Automatic positioning of appropriate push rod to the machine center .
- Automatic feeding force suitable for the bar stock.

Source: Fenwick & Ravi

VERICUT brings the Force to IMTEX 2019

CGTech is powering into IMTEX 2019 with its latest physics-based feed rate Optimisation module, VERICUT Force. The VERICUT remains at the heart of the CNC manufacturing process for many of the leading automotive & motorsport engineering businesses. The latest release, VERICUT 8.2, introduces a new optimisation module – Force Turning. Force is a physics-based NC program optimisation module that analyses & optimises cutting conditions to achieve ideal chip thicknesses, while managing the cutting forces & spindle power required. The latest module, Force Turning, optimise turning and mill-turn operations, when combined with Force Milling. Force Turning makes it easy for anyone to create NC programs for optimal cutting of inside/outside diameters, shoulders, as well as in corners & tight spaces – without the worry of encountering excessive cutting forces or high spindle power demands. Force provides NC programmers with detailed information about the cutting process that they never had before. NC programmers quickly and easily identify problems and unsafe cutting conditions lurking in their NC programs. With a single click, users can review problem-causing cuts, which if left uncorrected, could cause chatter, break the tool and damage the part or machine. Force optimisation automatically corrects these issues, like excessive cutting forces, metal removal rates, power, torque & tool deflection while simultaneously correcting underutilised cutting conditions by raising them to optimal performance levels. CGTech also offers Additive Manufacturing capabilities as well as VERICUT Composites application for programming and simulation of Automated Fiber-Placement & Tape-Laying Machines. See the entire VERICUT suite on (AMT Pavilion) at IMTEX 2019.

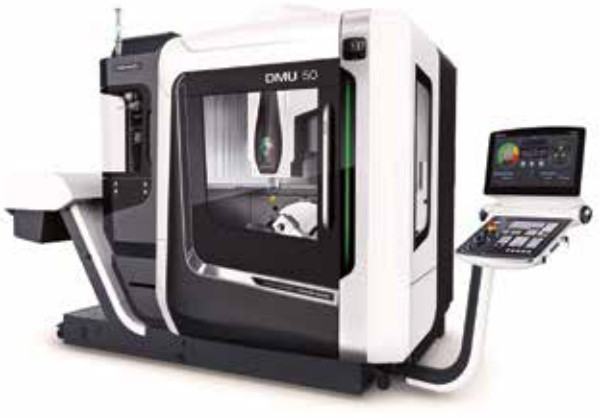


Hall no 1B / H106

Source: CGTech

For 5-axis requirements of tomorrow

With its high-quality equipment the new DMU 50 3rd Generation convinces price-conscious users from demanding branches.



The DMU 50 combines more than 20 years of experience, proven technology and low investment costs in the 5-axis portfolio of DMG MORI. On this basis and enhanced in all respects the bestseller has moved into the next round. This compact DMU 50 3rd generation sets new standards in 5-sided to 5-axis simultaneous machining. With its extended swivel range, more powerful spindle and its innovative cooling concept the world premiere guarantees a competitive edge in a multitude of branches. Its areas of application range from training, to general mechanical engineering, jig construction and on to include applications in demanding branches such as the aerospace, medical and automotive industries.

While redeveloping the DMU 50 3rd Generation DMG MORI has managed to harmonize the modern appearance of the design with user-friendly operation. The large, smooth opening door to the work area, for example, with a width of 876 mm ensures unrestricted access from the front, even in combination with automation solutions. The table also has an ergonomic loading height of 800 mm. The optimum accessibility of the DMU 50 3rd Generation even encompasses maintenance components such as the control cabinet, fluid box, oil mist separator, heat exchanger and cooling unit.

The DMU 50 3rd Generation achieves a unique degree of precision of less than 6 µm that is unbeatable in this segment.

Travel paths of 650 x 520 x 475 mm and workpiece weights of up to 300 kg mean the new DMU 50 3rd Generation covers a wide range of components. Its new NC swivel-rotary table with an enlarged swivel range of –35°/+110° boosts this versatility. A rapid traverse of 42 m/min and 30 rpm in the swivel-rotary axis ensure the dynamics for 5-sided to 5-axis simultaneous machining. In addition to the 15,000 rpm speedMASTER® motor spindle, the user can also choose between motor spindles with up to a 20,000 rpm. Also available as an option is an expanded tool magazine with up to 120 pockets. There are 30 tool pockets in the standard version.

The DMU 50 3rd Generation achieves a unique degree of precision of less than 6 µm that is unbeatable in this segment thanks to its one-piece machine bed on the one hand and on the other its innovative cooling of the guides, drives and table bearings. Directly driven ball screws and direct path measuring systems in all five axes round off the equipment with regard to the machine's high degree of precision. The DMU 50 3rd Generation can be expanded with coolant tanks and tool measurement as an option.

A 21.5" ERGOline® with CELOS® and Siemens 840D solutionline as well as a 19" ERGOline® with HEIDENHAIN TNC 640 are available as modern control options. DMG MORI also has diverse automation solutions in its program for the DMU 50 3rd Generation, such as workpiece or pallet handling systems. This enables the world premiere to master challenging applications in the future-oriented aerospace, medical, automotive and energy branches – a demand that was already taken into account during the practice-oriented development of the machine. In other words, the DMU 50 3rd Generation continues to fulfil all the requirements that ensure it will remain DMG MORI's bestselling 5-axis model.

Highlights DMU 50 3rd Generation

- 78% larger work area
- 40% higher rapid traverse speeds 42 m/min as standard
- 28% greater swivel range, Swivel rotary table with -35° / +110°
- Experience gained from morse than 10,000 machines already supplied
- 5-axis simultaneous machining as standard
- 36 months warranty for all master spindles with unlimited spindle hours for all new machines in 2018

Source: DMG Mori

A solution to reduce assembly time of machining centres

Due to ready-to-install readychain systems, process costs can be lowered and errors reduced

In its robotic machining centres, many companies use fully harnessed energy chain systems from igus. This cuts out many process steps for the manufacturer, reducing assembly time from several weeks to just half a day. Another benefit receives is from a single source and delivered onsite fully-tested for reliability and safety.

In very few industries our throughput times is as important as in the machine tool industry. Cutting out individual work steps means achieving considerable savings in process costs. In developing CNC equipment industry, precision and reliability are critical factors. Therefore, it was important to have a reliable means of energy supply from the switch cabinet to the moving parts, which include spindles and motors. At the same time, all the information regarding axis position and dynamics must be passed back to the control system without any interruption. All this happens at accelerations of up to 0.5 g and a maximum travel speed of up to 60 m/min.

As a complete system from one source, these so-called 'readychains' are harnessed to customers' requirements and then delivered as ready-to-install products. The advantage in using igus energy chains is the amount of installation space needed can be reduced considerably.

Reliable complete solution from a single source

Many engineering company's engineers turned to igus, the motion plastics specialist as igus is the only provider to develop energy chains that are configurable and predictable online, as well as specially designed, highly flexible chainflex cables tested for two billion cycles per year in a 2,750-square-metre test laboratory. As a complete system from one source, these so-called 'readychains' are harnessed to customers' requirements and then delivered as ready-to-install products. The advantage in using igus energy chains is the amount of installation space needed can be reduced considerably. One reason for this is that all chainflex cables on the machine have an oil-resistant PUR outer jacket. As additional protective hoses are superfluous because of this feature, the amount of space needed for the cables, and therefore the size of the chains, are reduced. The absence of these protective hoses reduces cost and helps ease maintenance too. 3D drawing of the readychain with assembly frame can be created in order to simulate the assembly procedure. The benefit could be seen straight away: The first energy chain fitted with all electrical cables was installed on the machine in an hour. The second chain with hydraulic hoses was installed even faster, taking just 40 minutes.

Work steps cut out for significantly greater productivity

Normally, machine tool manufacturers try to avoid too many different work steps being carried out on a system at the same time. A lot of manual work done by different employees does not necessarily enhance efficiency; on the contrary, it increases the probability that errors can occur. By using igus readychains, all four e-chains from igus can be fully installed in half a day. Readychain is able to cut out some work steps, reduce process cost and, at the same time, greatly improve productivity.

For more info, contact:
Harish Bhooshanan
igus (India) Pvt Ltd
hbhooshan@igus.net
Visit us on www.igus.in

Rear-facing connector assembly simplified

Flexible connectors for demanding industrial environments

HARTING now offers its Han-Eco® range in the industry standard Han® B size. This permits users to configure robust, flexible and corrosion-resistant connectors made of high-performance plastic for demanding industrial environments. The ability to snap contact inserts into the mounting housing from the rear simplifies equipping control cabinets with interfaces.

The Han-Eco® B differs from the Han B® industrial connector in a metal housing chiefly in the ability to perform assembly from the rear. While in the case of the Han® B standard housing, the cables are first routed through the assembly cut-out in order to take care of the inserts outside the control cabinet, Han-Eco® B allows the prefabricated inserts to be snapped-in directly from the interior. This facilitates the assembly of prefabricated units since the electrical cabinet and cable harnesses can be pre-assembled separately. The division of labour improves, working time and costs are saved. And, if necessary, processes can also be outsourced.

The new plastic connectors are plug-compatible with the respective Han® B metal variants. All contact inserts and modules that can be integrated into the Han B metal housing also fit into the plastic housing. This opens up numerous options for combining new units with existing equipment. Production planners and machine developers have the freedom to choose the material – metal or plastic – for interfaces in line with their needs. The compatibility of the mating faces enables the gradual introduction of the Han-Eco® B in an industrial environment. Existing testing equipment in production can be used for both variants.

The advantages of the Han-Eco® are also present in the Han® B size. The connectors are not only light and easy to install, but also corrosion-resistant – and offer numerous additional configuration options such as the integration of a PE module. The components are fire-resistant according to UL94 V0 (making them suitable for railway applications) and together weigh significantly less than the corresponding Han® B connectors in the metal housing. The contact inserts and modules that were previously used in the Han® B housings can also be attached to the Han-Eco® B plastic housing via hinged frames. This results in a considerably increased range of possible applications for connectors in plastic housings – driving forward the modernisation of production.

Source: HARTING India Pvt Ltd

5-Axis machine for high-speed multitasking

The DVF 5000, Doosan Machine Tools' next-generation 5-axis compact machining center, offers a diverse range of tailored options, automation, and maximum convenience, enabling unmanned machining. As such, it is part of the company's line-up of multitasking machines designed for machining diverse and complex shapes.

The table is designed for user-friendliness and consummate work efficiency, while the motor for turning the B and C axes features a spur gear for enhanced anti-abrasion and durability. Nodular cast iron has been applied to the entire structure to prevent structural sagging, while the addition of supports makes it possible to machine workpieces weighing as much as 400kg with great power and precision.

The machine can be fitted with 12000 r/min direct-connected and built-in spindles as optional features, while the built-in spindle offers a maximum speed of 18000 r/min, making it suitable for high-productivity machining of diverse workpieces.

The tool magazine with a maximum capacity of 120 tools can perform diverse machining with one setting, while the tool length measurement device (optional) can perform precision machining. In particular, there's only a short distance from the center of the DVF 5000's pallet to its door surface, enabling the operator to easily check the machining status. The multi covers designed for automated loading and unloading of workpieces enable the opening and closing of the center, allowing the crane to reach the center of the pallet.

In addition, the auto workpiece change system realizes fully automated, unmanned machining. The improved coolant tank filter facilitates the discharge of chips, thus offering an optimal solution for machining difficult-to-cut workpieces.

Source: Doosan Machine Tools

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India is important both as a market and as a manufacturing hub, says Satish Nadiger, Managing Director & CEO, John Deere India

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THE NEW INDIA

In 2018, India quietly overtook France to become the sixth largest economy in the world. It is further projected to overtake the United Kingdom by 2020 to become the fifth largest economy with a GDP of US$ 2.9 trillion. And manufacturing continues to be a driving factor behind India's economic growth. But the journey ahead is going to be tougher and the growth is easier to predict than to be actually accomplished.

The scale of manufacturing in India has to drastically go up and this can happen only when Indian SMEs start playing a big role in the overall scheme of things. In fact, they must develop capabilities to address and cater to the international markets consistently and on a larger scale. True, it requires stronger policies to incentivise exports, but they must also look inwards and keep improving.

INDEED, IF INDIA HAS TO EMERGE AS A WINNER ON THE GLOBAL MANUFACTURING BATTLEFIELD, IT HAS TO ALSO FOCUS ON PRODUCTIVITY, INNOVATION AND TECHNOLOGY WHILE CONTINUING TO BE DRIVEN BY THE FUNDAMENTALS OF QUALITY, COST AND DELIVERY.

Well, if India has to emerge as a winner on the global manufacturing battlefield, then our manufacturing companies must also focus on Productivity, Innovation and Technology while continuing to be driven by Quality, Cost and Delivery. That will be bring the bigger manufacturing facilities to India. And these large-scale plants in India could serve both the domestic as well as the international markets. While it is already happening, the momentum needs to catch up. Once that happens, it will have a positive and cascading effect on the entire economy as well as the nation. And that will lead us to the New India!

Editor & Chief Community Officer

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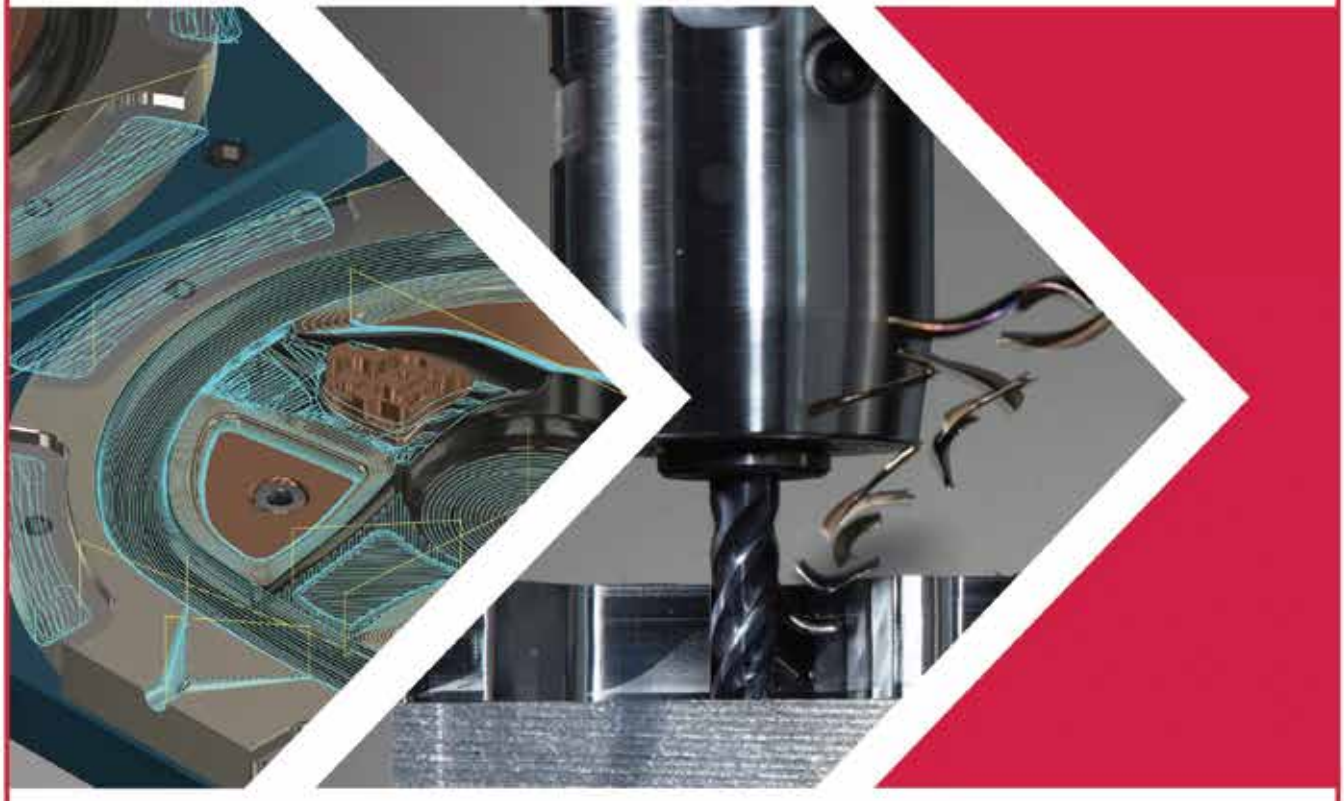

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Whirlpool opens new plant for dryers in Poland

Whirlpool Europe, Middle East and Africa (EMEA) Region recently marked the official opening of a new plant for dryers in Łódź, which represents the center of Whirlpool's new dryer manufacturing platform in the EMEA Region and the final step of the Industrial Plan.

The 2015-2018 Industrial Plan for Poland improved efficiencies and capacity utilization of the industrial sites in Wrocław, Łódź and Radomsko, supporting, at the same time, plant modernization and specialization, product innovation and process improvement. Significant resources were also devoted to Research & Development as well as to people development.

The initial planned investment of PLN 1 billion (EUR 235 million) was increased, over the years, to almost PLN 1.3 billion (EUR 293 million), further underpinning the country's crucial role for Whirlpool's business in the Region. With the integration process, more attractive and innovative products are now manufactured in Poland and then exported to the most important and competitive EMEA markets.

DNV GL launches its on-site solar lab in India

DNV GL, the world's largest independent energy advisory and certification body, has launched its first On-site Solar Lab, a new mobile laboratory service for the on-site testing of PV modules in India. The on-site solar lab was launched at Intersolar India, in Bangalore. The new service will allow asset owners to save time, reduce cost and minimize risk by enabling Flash test/I-V curve measurement and electroluminescence (EL) testing for their PV modules on-site, that would otherwise typically be conducted in a stationary laboratory. It will also provide cost effective post-delivery-pre-installation and post-installation quality assurance of Photovoltaics (PV) modules.

Sending modules to a stationary laboratory is often time consuming, expensive, and involves transportation related risks. For greenfield projects, successful implementation of a PV module quality assurance program in the field can significantly reduce technology and investment risk by detecting manufacturing issues or transportation related damage when modules arrive at a site. For operating projects, on-site measurements can assist in determining the sources of module performance issues.

The On-site Solar Lab is a state-of-the-art mobile laboratory which can be transported to project sites anywhere in the country. It will also be India's first mobile PV testing lab to use an advanced A+/A+/A rated LED flasher that can conduct tests with lab-grade accuracy.

thyssenkrupp India inaugurates Technology Center in Pune

thyssenkrupp has announced the inauguration of Technology Center Analytics and Software Engineering (TCASE) – a technology center in Pune, India. Aimed at establishing India as a knowledge hub for thyssenkrupp globally, the center will focus on providing high-end R&D services in the areas of Artificial Intelligence, Internet of Things (IoT), Data Analytics and Software Engineering.

TCASE will play a key role in thyssenkrupp's digital transformation journey by acting as a partner and supporting digitalization projects for the group's business areas globally.

TCASE was inaugurated by Donatus Kaufmann, Member of the Board, thyssenkrupp AG, Reinhold Achatz, Chief Technology Officer, thyssenkrupp AG and Ravi Kirpalani, CEO, thyssenkrupp India. Rohit Gupta has been appointed as Head of the Center.

Commenting on the launch, Reinhold Achatz said, "Our Company is going through a journey of digital transformation. I believe the Technology Center at Pune will raise the overall digital quotient of thyssenkrupp through its thriving ecosystem of talented engineers, repute universities and emerging start-up base."

Nissan opens Global Digital Hub in Kerala

The first Nissan Global Digital Hub was recently inaugurated at Technopark in Thiruvananthapuram, Kerala. Inaugurating the facility, Pinarayi Vijayan, Chief Minister of Kerala said, "Nissan coming to Thiruvananthapuram marks the beginning of a new era for Kerala IT. We will do our best to ensure Kerala proves to be Nissan's second home after Japan."

The state-of-the-art facility located in Technopark in Thiruvananthapuram will be the first-of-its-kind in a number of software & information technology development centers in Asia, Europe, North America & Latin America.

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Profile Projector User

We are using Nikon Profile Projector V12BDC, we impressed with Uniform Screen Brightness and Erect Image, Which are able to generate reliable and repeatable data for review and analysis of product design and performance.

Mr. Kumaravel V, Manager Standard Room - Titan


Video Measuring System User

Nikon Optical measurement and Inspection Systems offer clear and deeper insights into product's manufacturing detail with consistency. Thus High Resolution of the systems – VMZ R 4540 Vision Inspection System with Multi Sensor Capability and Thru the Lens Laser, provide us reliable and repeatabe results.

Mr. Senthil Nathan, Senior Manager - Titan


X-Ray User

We bought Nikon XT V 160 microfocus X-ray, it's open tube design helped us to run the machine very cost effective as filament cost is less than Rs 2,000 which runs for more than 300 hrs. It provide us clear in depth X-ray images, which helps us to improve the quality of our product.

Mr. Vivek Khanna, Managing Director- Indic


X-Ray User

The Nikon XT V is a proper inspection tool. With it, We will Definitely know that our manufacturing process is providing excellent results for all bottom terminated components." The Nikon XT V 160 will expose any hidden features allowing further examination into BGAs and other array style package as well as inspect heels of solder joints, fine pitch packages and internal characteristics of solder joints.

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Mahindra and Ministry of Steel launch India's first authorised vehicle recycler

CERO (Mahindra MSTC Recycling Pvt. Ltd.) is India's First authorized recycler for motor vehicles, having received accreditation by the Delhi Government on 21st December, 2018.

CERO, a joint venture between Mahindra Accelo and MSTC (a Government of India enterprise under the Ministry of Steel) has established India's first organized, fully compliant, pollution free recycling facility at Greater Noida. End of Life vehicles are are collected, depolluted and dismantled at this state of the art facility. The facility embraces a Zero pollution objective, (hence the name Cero which means 'Zero' in Spanish), and the automated plant has the capacity to recycle old Trucks, Buses, Cars, Two / Three wheelers and Consumer durables. The CERO facility follows Environmental compliances ISO 9001, ISO 14001, OHSAS 18001 and all international quality norms.

Zhooben Bhiwandiwala, President – Mahindra Partners and Group Legal, Member of the Group Executive Board, said "This accreditation recognizes Mahindra's leadership commitment in addressing issues of sustainability by focusing on the Reduce, Reuse, Recycle principle. CERO aims to organize the end of life vehicle eco-system which is currently entirely unorganized & inefficient. CERO's parent organization, Mahindra Accelo, has already signed up for the Science Based targets Initiative launched at the Bonn Climate Conference in May 2018."

Tata Motors partners with Zoomcar

Tata Motors recently joined hands with self-drive rental platform Zoomcar to offer Tata Tigor EVs in Pune. At a symbolic ceremony held in Pune, Shailesh Chandra, President- Electric Mobility Business & Corporate Strategy, Tata Motors and Greg Moran, Co-Founder and CEO, Zoomcar flagged-off the first batch of Tigor EVs from Concorde Motors in Baner.

Speaking on the occasion, Shailesh Chandra said, "The future of mobility will increasingly be connected, shared and powered by zero emission technologies. Tata Motors is strongly committed to this transformative journey and working with all like-minded partners to accelerate the enabling ecosystem. It is a great pleasure to announce our partnership with Zoomcar to offer shared electric mobility solution for the citizens of Pune. Tata Tigor EV will now be available on the self-drive rental platform, offered by Zoomcar, to enable zero-emission transport option for the citizens of Pune. We are confident that our customers will appreciate and enjoy the driving experience."

Magna opens Mechatronics Engineering Center in China

To support the growing mechatronics market, especially in China, Magna has announced the opening of a new mechatronics engineering center in Suzhou in the Jiangsu Province, China. The Magna Mechatronics Engineering Center will focus on designing and developing the company's mechatronic product offerings for the China market as well as globally, including its SmartAccess™ power door experience. The center will hire more than 100 new engineers, including specialists in the development of software and hardware. These new hires will join the current staff of 110 engineers, who are moving from Magna's previous engineering center located in Kunshan.

"Our mechatronic products fuse the capabilities of mechanical systems with the intelligence of electronics controls to enable new ways of interacting with your vehicle," said John O'Hara, president of Magna Mechatronics, Mirrors and Lighting. "Without compromising safety requirements, our technology provides an innovative solution during door opening and closing and offers more space and freedom for design and styling."

Piaggio launches 3-wheeler range

Piaggio Vehicles Pvt. Ltd. has launched a water-cooled range of products in the three-wheeler category for its Gujarat Customers. The range includes Ape' Xtra LDX (+ CNG Water Cooled PU), Ape' Xtra LDX CNG Water Cooled PU and Apé Auto DX (CNG Water Cooled). These variants of Apé are the first of its kind in the industry with water-cooled engines. The new range of vehicles will meet the growing demand for commercial vehicle mobility solutions particularly suited to intra-city travel in Gujarat, where the CNG fuel availability is amongst the best in the country.

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Over 1500 participate in Volkswagen India's 'Hunt for Champions'

Volkswagen has announced the conclusion of its Fifth Season of 'Sarvottam: Hunt for Champions', an annual skill development programme. Started in 2012-2013 as RQWC-Retail Qualification World Championship, the programme aims to further invest in enhancing the skill sets of its dealership employees across Volkswagen network in India. This Season awarded a total of 24 finalists that participated under eight different categories such as - sales consultants, service advisors, lead CR Sales, lead CR Service, parts manager, master technician, body and paint technician. The Sarvottam Skill contest witnessed a total participation of 1500+ Volkswagen dealership employees across its network in India. The entries were filtered from the online round to the regional round wherein 288 champions were identified for the zonal round. Post competing in the rigorous competition, 72 contestants emerged eligible to compete for the coveted winner's trophy hosted at the Volkswagen training academy in Chakan, Pune. The winners were awarded by Steffen Knapp, Director, Volkswagen Passenger Cars.

Ashok Leyland, ELBIT Systems sign MOU

Ashok Leyland has signed a Memorandum of Understanding (MOU) with Israel's ELBIT Systems. As part of this agreement, Ashok Leyland will provide High Mobility vehicles (HMV) for mounting Elbit Systems' artillery guns and systems. The integrated systems are targeted for worldwide export markets. Ashok Leyland has expertise in design, manufacturing of logistic vehicles, combat support High Mobility Vehicles (HMV) and Armoured vehicles for the defence forces.

Speaking on this milestone partnership, Vinod K. Dasari, MD, Ashok Leyland, said, "Ashok Leyland is proud to be associated with ELBIT Systems and we are certain this partnership will expand our reach globally. It underlines our capabilities of making and designing in India, for the world. This step is also in line with our strategy of increasing contribution from our Defence Business which will help us de-risk our overall business."

Honda is the first two-wheeler to use inland waterways

Bringing the convenience in transportation services and fostering environment conservation, Honda 2Wheelers India has availed the newly launched 'Roll-on, Roll-off (Ro-Ro) Ghogha-Dahej' ferry service in Gujarat. Honda is the first 2Wheeler manufacturer in industry to utilise this service for promoting inland waterways as transportation channel & thus reducing carbon emissions caused by heavy vehicles on land. With the advantage of the services, Honda 2Wheelers India has first dispatched its shipment by road from its Narsapura plant in Karnataka to Dahej in Gujarat, where it was put on the ro-ro vessel & transported to Ghogha in Saurashtra. The shipment arrived at Honda dealership in Bhavnagar, Gujarat. The Ro-Ro Ghogha-Dahej ferry service will reduce the time of travel from Narsapura to Saurashtra by one day & the distance would be reduced to over 200 km. Contributing to environment conservation, the usage of this service will also cut down the carbon emissions by approx. 150 kg per trip.

JLR develops new car door concept

Jaguar Land Rover has developed a new car door concept that opens automatically as the driver approaches or can be operated by gesture control.

The mobility door prototype, currently being tested on a Range Rover Sport, uses motion sensors and existing keyless entry technology to detect the driver as they walk towards the vehicle before automatically opening the door to welcome them like an invisible valet.

The technology could help disabled people for whom a car is their main mode of transport – as many as a third of whom report practical difficulties in their daily usage. In addition, it has benefits for those carrying child seats or large items as the driver no longer has to struggle to free a hand to open the door.

Once on board, occupants can close the mobility door with an overhead button – without the need to reach out and pull the door shut. Software built into the infotainment system shows the status of each door and allows operation of the driver and passenger doors from inside the cabin.

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Material **Magic!**

The pace of materials development in the next few years will be rapid and exciting and hold many opportunities for those willing to take the lead.

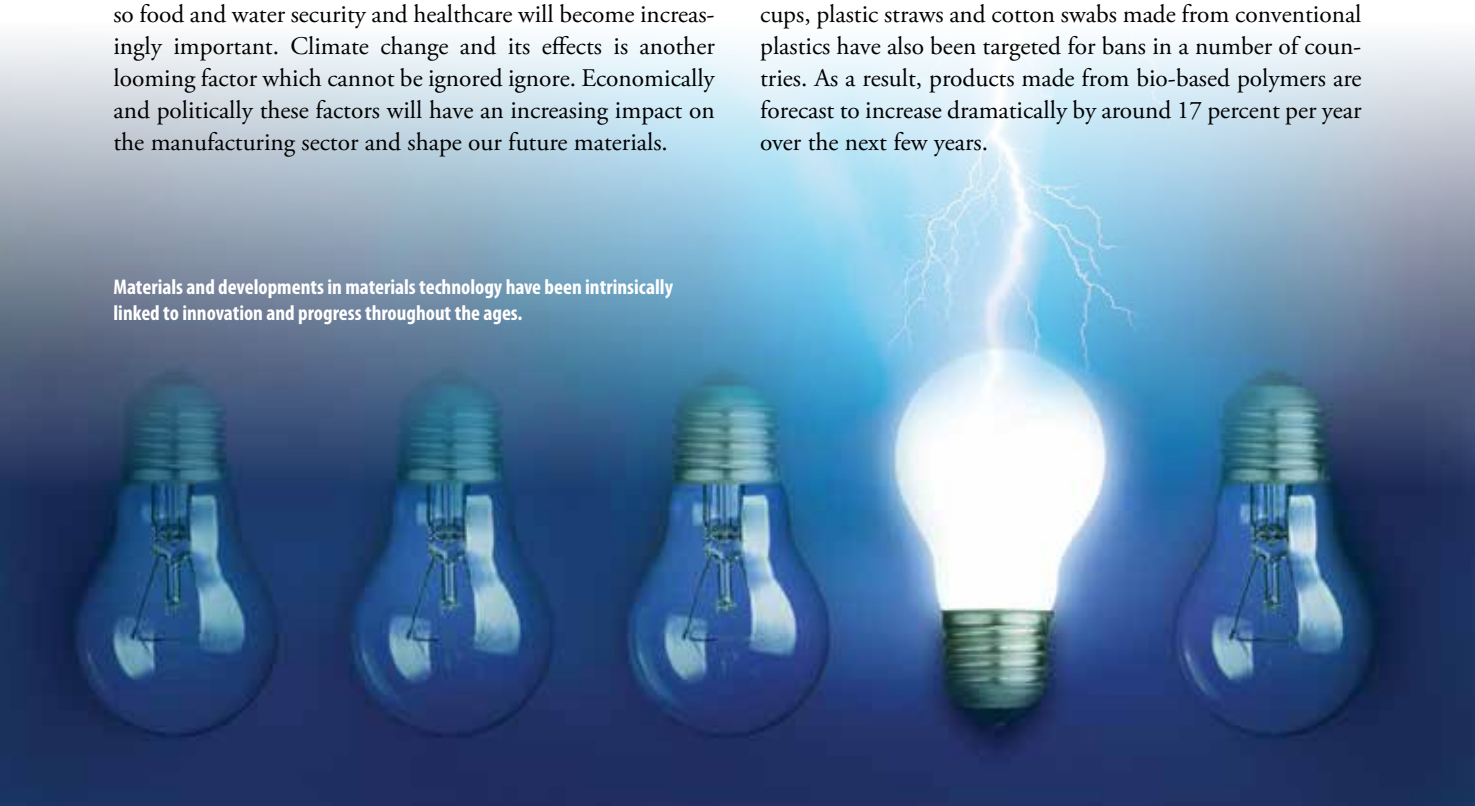
By Adrian Kelly

Materials are at the heart of the manufacturing industry. The processing, forming and assembling of materials into useful products is an integral part of manufacturing. Materials and developments in materials technology have been intrinsically linked to innovation and progress throughout the ages, from simple materials available from plants or animals to the first manufacture of useful objects from clay, copper and fabrics. Since then the complexity and range of materials has risen exponentially to encompass a wide range of alloys, composites, polymers and ceramics, paving the way for the digital revolution we have experienced in recent times.

Developments in materials science and technology will continue to drive innovation and industrial growth, although predicting exactly how these developments will occur is a difficult task, even in the short to medium term. It is first perhaps useful to consider what the primary drivers in materials development are. As widely discussed, as a society we face a number of growing challenges including diminishing fossil fuels and the realisation that our resources are not infinite. This drives the need for sustainable materials, improved efficiency and the demand for ever lighter materials with stronger properties. Coupled with this we face a growing and ageing population, so food and water security and healthcare will become increasingly important. Climate change and its effects is another looming factor which cannot be ignored ignore. Economically and politically these factors will have an increasing impact on the manufacturing sector and shape our future materials.

"The complexity and range of materials has risen exponentially to encompass a wide range of alloys, composites, polymers and ceramics, paving the way for the digital revolution we have experienced in recent times."

Perhaps one of the earliest significant changes likely to impact manufacturing will be in the field of plastics. In addition to dwindling supplies of oil-based feedstocks there is also widespread international concern about the amount of single-use plastic and its disposal. Over 300 million tonnes of plastics are produced annually, and this is expected to double again over the next 20 years. The amount of solid plastic waste entering the oceans has been conservatively estimated at eight million tonnes per year and growing, having a huge impact on marine ecosystems. This has led to governments starting to bring in legislation to force changes in consumer behaviour and in manufacturing, for example in China, where free provision of ultra-thin plastic bags was banned in 2008 and imports of plastic waste was halted at the end of 2017. Coffee cups, plastic straws and cotton swabs made from conventional plastics have also been targeted for bans in a number of countries. As a result, products made from bio-based polymers are forecast to increase dramatically by around 17 percent per year over the next few years.



Materials and developments in materials technology have been intrinsically linked to innovation and progress throughout the ages.

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In 2017, a total of 2.05 million tonnes of bio-based plastics were produced, of which 57.1 percent were non-biodegradable and 42.9 percent were biodegradable. These include Polylactide (PLA) and starch based biodegradable polymers, used predominantly for packaging applications. Increasingly, conventional polymers such as polyethylene terephthalate (PET), polyamide and polyethylene are being synthesised from bio-based sources; bio-based polypropylene is also under development and expected to be available soon. There are also new developments in the biopolymer market such as polyhdryoxyalkanoate (PHA) and polyethylene furanoate (PEF). PHA in particular is seen as an exciting material which after some time in development has fully entered the market at commercial scale. It is a 100 percent bio-based, industrially compostable and has good mechanical and barrier properties which make it well suited to packaging applications.

Materials such as NodaxTM marketed by Danimer Scientific is reported to perform favourably compared to many conventional thermoplastics in a range of applications including toys, cups, utensils, food storage and bags. PEF, which is produced entirely from vegetable raw materials, is described as a potentially game changing material which is expected to enter the market in 2020. Dutch company Avantium and BASF announced a joint venture in 2016 called Synvina with the aim of developing a manufacturing plant capable of producing

> "The primary use of graphene currently is in lithium batteries and super conductors, but it is expected to find uses in a wider variety of applications such as composite materials, wearables and energy conservation in the near future."

50,000 metric tons of PEF per year. The excitement surrounding PEF stems mainly from its impermeability to carbon dioxide and oxygen, making it suitable for food and beverage packing. Looking further ahead, there is a race to develop plastics from all manner of waste materials, such as chicken feathers, pine needles, milk protein and dairy effluent. There is even a project to develop a new biopolymer, AirCarbonTM, from captured carbon from greenhouse gases, which would be doubly beneficial.

Recycling of plastics materials is also forecast to experience resurgence in the coming years as economies are encouraged to recover the value and energy which has been invested in producing plastic products. The Ellen MacArthur Foundation, which promotes a Circular Economy, states that "the linear 'take-make-dispose' system which depletes natural resources and generates waste is deeply flawed" and argue that a new model needs to be created where waste exists only as food for the next cycle. The global plastics recycling market is projected to grow at a compound annual growth rate (CAGR) of over six percent to 2023 to reach a market size of nearly 54 billion US Dollars. Here, development will focus not so much

Climate change and its effects is another looming factor which cannot be ignored ignore. Economically and politically these factors will have an increasing impact on the manufacturing sector and shape our future materials.

on new materials but innovation in the collection, sorting and conversion processes to turn waste plastics into value added products.

Another rapidly emerging field is that of nanoscience and nanomaterials. Many developed countries are investing heavily in development of these materials which are seen as key to the electronics, communication, energy and life science industries of the future. Nanotechnology is the general term for science of materials, surfaces and devices in the order of nanometers (billionths of a metre). Graphene is the most widely produced nanomaterial, reaching a global market of nearly 200 billion USD in 2018. Graphene, which consists of a single layer of carbon atoms arranged in a hexagonal lattice has a number of extraordinary properties, such as high strength and electrical conductivity. The primary use of graphene currently is in lithium batteries and super conductors, but it is expected to find uses in a wider variety of applications such as composite materials, wearables and energy conservation in the near future. Related nanomaterials such as boron nitride are finding increasing uses in applications requiring high wear resistance and thermal conductivity. Nano silver particles are widely used for their antibacterial properties in films, packaging and medical devices, working by the release of sliver ions from the surface to destroy proteins present within bacteria or viruses. Nano structuring of surfaces can also be used to tailor surface properties such as antimicrobial or the ability to self-clean. All of these areas are likely to see a rapid expansion in coming years, along with the use of nano medicines and drug delivery, which is another huge market.

There is of course a vast array of additional materials currently being developed which may find their way into manufacturing in the next few years. These include nano-manipulated alloys, amorphous metals, super alloys and metal foams, self-healing materials, embedded sensors, wearable electronics and more. The pace of materials development in the next 2, 5 or 10 years will undoubtedly be rapid and exciting and hold many opportunities for those in the manufacturing sector willing to take the lead.

The author is Professor of Process Engineering, University of Bradford, UK.

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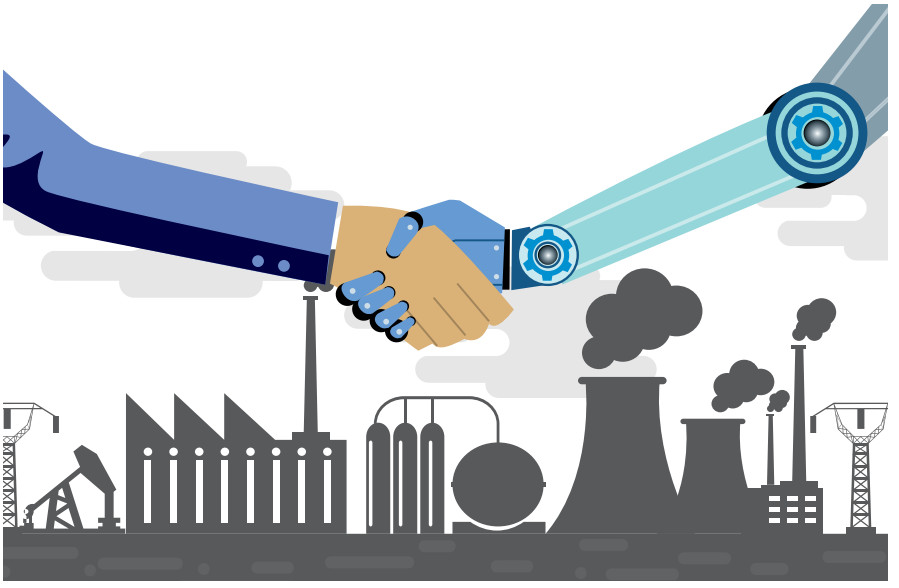
'Precision Manufacturing – What makes it so special'

The aim during the entire manufacturing process is to reduce variations to zero and working in the given set of tolerance with consistency across the process.

By Jayant Joshi

Precision manufacturing is the manufacturing of critical parts which can be used in different machines or individually that are built with extreme accuracy. Precision manufacturing commonly serves medical, aeronautical, automotive, heavy industries and any other industry that requires identical parts to be created in large quantities.

Just Imagine, a human hair's average cross-section size is about 50 microns, machines used in precision industries have a capacity of working on 2 to 3 microns. Remarkable to note is that a human eye cannot see anything smaller than 40 microns.



Industries will need to integrate a high level of traceability of variations, skilling and reskilling of workforce and inclusion of latest technologies from around the globe.

How the industries work

Precision industries work on tight tolerances where the monitoring of product starts from choosing correct grade of raw materials, knowing what needs to be manufactured and delivered, right treatment of raw material, hiring the right set of people and maintaining correct processes along with good packaging. The aim during the entire manufacturing process is to reduce variations to zero and working in the given set of tolerance with consistency across the process. We can say that precision manufacturing is not just a standard operating procedure, but it entails continuous process improvements and integration achieving customer satisfaction. The aim of 'Precision Manufacturing' is to get the customer back for a repeat order and not his complaints.

> Precision industry usually follows zero-rejection policy to ensure that customer gets what they desired. This, in turn, is a deciding factor which justifies the level of workmanship and machining.

> 'Precision Manufacturing' demands to have a core business area not only to improve flexibility in working conditions but deliver quality over just massive output.

Where India stands

India stands on the 12th position in production and on 8th position in consumption of machine tools in the world as per the 2017 Gardner Business Media survey. Indian precision tool industries are further categorized into machine tool producing industries and metal cutting tool industries. According to IMTMA's report, the composite production has reached Rs. 13,855 Crores in 2017-18 from Rs. 10,997 Crores in 2016-17 with a recorded y/y growth of 25.7 percent. There has been a major paradigm shift in thinking where the Indian machine tool industry is now considered as a provider of low-cost high-quality manufacturing solutions. Some of the major export destinations of Indian produce are USA, Brazil, China, Italy,

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Germany, Mexico, Canada, UK etc. Most of the Indian manufacturers have established their own in-house R&D labs but there still exists a huge scope for institutional collaboration for new technological developments.

Success of Make in India

Make-In-India campaign has certainly boosted manufacturing in India, though the sectors which are driving the growth for machine tool production industries are defence, electronics, automotive. TATA Advanced Systems Limited (TASL) has received a production order of F-16 Block of 70 single-engine fighter jets, Chinese phone manufacturer Xiaomi announcing four new smartphone production plants in India, Samsung inaugurated world's largest mobile factory in Noida, Korean car makers Kia motors would begin production in the second half of 2019 from Andhra Pradesh from which it would produce three lakh cars annually, and Volkswagen is investing one billion pounds to develop six new car models in India. These are some great examples of the success of this campaign.

"Ultimately what is important is to keep abreast of trends in markets whether it is with use of different machines, new machines, skill or reskilling requirements of the workforce are some of the decisive factors in the success of any precision manufacturing industry."

Key factors for success

The success of precision manufacturing industries can be determined by the following factors:

Skilled workforce

No matter how advanced your machines may be, they still need to be programmed by your people. Their quality, accuracy and overall productivity depends upon the skill of the person operating the machine as he must have pre-defined knowledge before, he begins to work on a machine. Reskilling the workforce in regular intervals determines how well the workforce handles day-to-day challenges in production and also keeps them in-sync with industry trends. Training workforce to know what can be delivered as an output from a machine is also an important aspect in 'Precision Manufacturing'.

Customer Satisfaction

Precision industry usually follows zero-rejection policy to ensure that customer gets what they desired. This, in turn, is a deciding factor which justifies the level of workmanship and machining. Just imagine if a company must import a certain pricy part from a distant country just because of quality, this highlights the importance of maintaining quality and not just delivering output.

"Reskilling the workforce in regular intervals determines how well the workforce handles day-to-day challenges in production and also keeps them in-sync with industry trends. Training workforce to know what can be delivered as an output from a machine is also an important aspect in 'Precision Manufacturing'."

Knowledge of machining markets

Ultimately what is important is to keep abreast of trends in markets whether it is with use of different machines, new machines, skill or reskilling requirements of the workforce are some of the decisive factors in the success of any precision manufacturing industry.

Lean Manufacturing- minimizing cost

Minimizing stock means utilizing raw materials in a defined time frame and not increasing the cost of production which is an important aspect of precision manufacturing.

Focus on core business area

Many manufacturers in the country prefer conducting all lines of businesses including hardening, turning, milling, grinding etc. under one roof. 'Precision Manufacturing' demands to have a core business area not only to improve flexibility in working conditions but deliver quality over just massive output.

Transportation, handling and packaging

Precision manufacturing begins with proper transportation, handling, packaging and diligent measurement of raw materials. Damage caused to the raw materials can be a possible cause of an increase in scrap giving rise to the overall cost of machining the product to make it more suitable before manufacturing. Precision manufacturing, therefore, requires vigilance at all levels and processes.

Conclusion

Precision manufacturing is setting an example to whole manufacturing industry where in order to remain competitive, industries will need to integrate a high level of traceability of variations, skilling and reskilling of workforce and inclusion of latest technologies from around the globe put together to bring about the final product to be identical.

The author is Managing Director, RUJ & SRM Mechanics Pvt. Ltd.

Maruti Suzuki opens Centre of Excellence for Skill Development initiatives

In a bid to enhance employability of youth Maruti Suzuki India Ltd., has undertaken various Skill Development initiatives under its CSR program. The Company took another major step by inaugurating a Centre of Excellence (CoE) at Government Polytechnic, Manesar in Haryana. Set up in collaboration with Government of Haryana, the CoE will be used to train and improve the level of technical education of polytechnic students in the state and effectively contribute to Skill India initiative. The state-of-the-art CoE is equipped with latest equipment and training tools. Facilities like Maruti Suzuki Basic training Lab, Safety Lab, and Finishing Schools for Weld/Paint/Assembly, Simulation workshop, Robotics Lab, AutoCAD (CAD/CAM/CAE) Lab, Electropneumatics Lab and Smart class rooms will be used to impart practical training.

The facility is expected to benefit over 5,000 polytechnic students annually. It will serve as a training centre for students from Government Polytechnic, Manesar as well as students from other polytechnics across the state and shop floor employees from automobile/auto component industry.

The land and building for the CoE at the Government Polytechnic, Manesar is provided by Government of Haryana, while Maruti Suzuki has set up workshops and labs with latest equipment and training tools. Maruti Suzuki has borne the initial cost of set up and will continue to maintain and run the CoE. To meet its objective of bridging the skill gap, Maruti Suzuki will also depute experienced trainers/industry experts to train and share the technical knowhow.

Kenichi Ayukawa, MD & CEO, Maruti Suzuki India Limited said, "Skill Development is an important focus area under Corporate Social Responsibility. We have been working with over 110 ITIs across the country. Our focus is to impart right technical skills with strong emphasis on inculcating the right values and attitude. These will help them find a job and build a career while contributing to Government of India's Make in India initiative."

Lanxess further expands production of HPM in Germany

Bond-Laminates GmbH is increasing its production capacity for continuous fiber-reinforced thermoplastic composites of the brand Tepex. The company, a wholly owned subsidiary of specialty chemicals company Lanxess, is currently building a new, fourth production hall of around 1,500 m2 at its Brilon site. Two additional production lines are scheduled to go into operation there in mid 2019. The company already produces innovative composites for the automotive industry and also for the electrical and sports industries on an area of around 5,000 m2. The investment, an amount in the single-digit-million-euro range, will significantly increase capacity to meet the growing demand for this forward-looking material. With this expansion, Bond-Laminates will create up to 30 new jobs.

Arvind and Top Glass of Italy join hands to bring new technology

Arvind Limited have recently announced a technology partnership with Top Glass Industries S.p.A. (Italy), a global leader in making composite products. The partnership aims at bringing together the world-class technology of Top Glass Industries S.p.A. and the manufacturing capabilities of Arvind's Advanced Materials Division (AMD) to India.

This partnership will give impetus to the Make in India campaign and thus enable Arvind AMD to bring down India's import dependence on products like antenna solutions used in telecommunication, parts and specialty products used in electrical equipment like transformers. Emerging areas like newer construction materials for window frames and blinds, telescopic profiles, etc. will also get a boost with this partnership. In addition to bringing newer capabilities and technologies into the country, this collaboration will help the economy save valuable foreign exchange by significant import substitution.

Top Glass Industries S.p.A: will now be a long-term knowledge partner for Arvind and together, the two will bring significant impact into the competitive telecom and electrical infrastructure market in India. Further, the partnership with Top Glass will help Arvind enhance its pultrusion technology and introduce new products in the Indian and global markets; thereby enabling both companies to serve their composite customers more effectively. Arvind will also be the licensee of "I Love Composites" trademark of Top Glass. Arvind AMD will now also export its specialty composite products to European markets through Top Glass.

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Ladies, let's **conquer manufacturing!**

Today, women are demonstrating what modern manufacturing offers – rewarding and fulfilling careers with limitless opportunity for growth.

By Nirmala Behera

Traditionally, men have been dominating manufacturing - perhaps for centuries. But with women empowerment now given due recognition, and gender diversity on a firm footing, the choice for women joining manufacturing has now gained momentum.

For women, managing shopfloors with diligence is now a career choice; they can give it an innovative and robust feminine touch. Today, women need to think differently as manufacturing offers lot of opportunities and recognition to challenge the "norm". Career in this field is interesting and rewarding with assorted choices across path. There is a lot of room in this field to grow and reach enviable heights irrespective of your gender.

Today, although women have excelled in other streams, we find less of them opting for this segment apparently due to the inherent notions regarding the nature of this job as well as for other factors like lack of flexible and span of working hours, logistic support, night shifts, safety and so on. Some male counterparts may also have an apprehension in delegation due to the traditional mind-set of women and the perception that they may not be capable of handling the shopfloor pressures. These issues need to be addressed and resolved at the apex level to attract women talent. Of course, many organisations have definitely taken positive steps towards addressing these issues and they are proving to be great role models.

Although women are joining the automobile industry specifically in the support and service department, we need to encourage more women to join in production and take this as a challenge and conquer the traditional mind set of people. Be an example for the women of tomorrow and be a role model for young women who want to break down the gender barriers. Research also shows that leadership diversity can be a key contributor to innovation by recruiting and retaining women in manufacturing industry.

"Today, many outstanding women leaders are making huge strides in developing and promoting the manufacturing industry."

I was fortunate enough to be in a fast-paced career in the manufacturing industry during my formative years. I used to work with the quality system, rolling up my sleeves. I also had hands-on experience in the shopfloor with fellow workmen and engineers. This has allowed me to play many different roles later and make best use of two qualities - people leadership and team work. I always loved challenges as well as problem solving, and these qualities have helped me grow in the manufacturing business.

Today, many outstanding women leaders are making huge strides in developing and promoting the manufacturing industry. They are demonstrating what modern manufacturing offers – rewarding and fulfilling careers with limitless opportunity for growth.

Meanwhile, a gender inclusive workforce has also helped the manufacturing industry to drive profit and get a higher return on equity and has brought about more innovation and creativity with varied perspective. With more talented women in the fray, manufacturing industry can overcome its major obstacle of skills gap. After all, the retention level of women in manufacturing industry is also quite consistent.

The latest trend is that corporate companies want the world within their business to reflect the world outside its business, and in order to make it a reality, they encourage more and more women to join the manufacturing and engineering careers. That is why, I urge every ambitious woman: "Without leaps of dreaming in venturing into fertile fields, we lose the excitement of possibilities turning into realities. So, take that leap of faith! Victory will be yours."

The author is Executive Director – Group HR, RSB Transmissions (I) Ltd.

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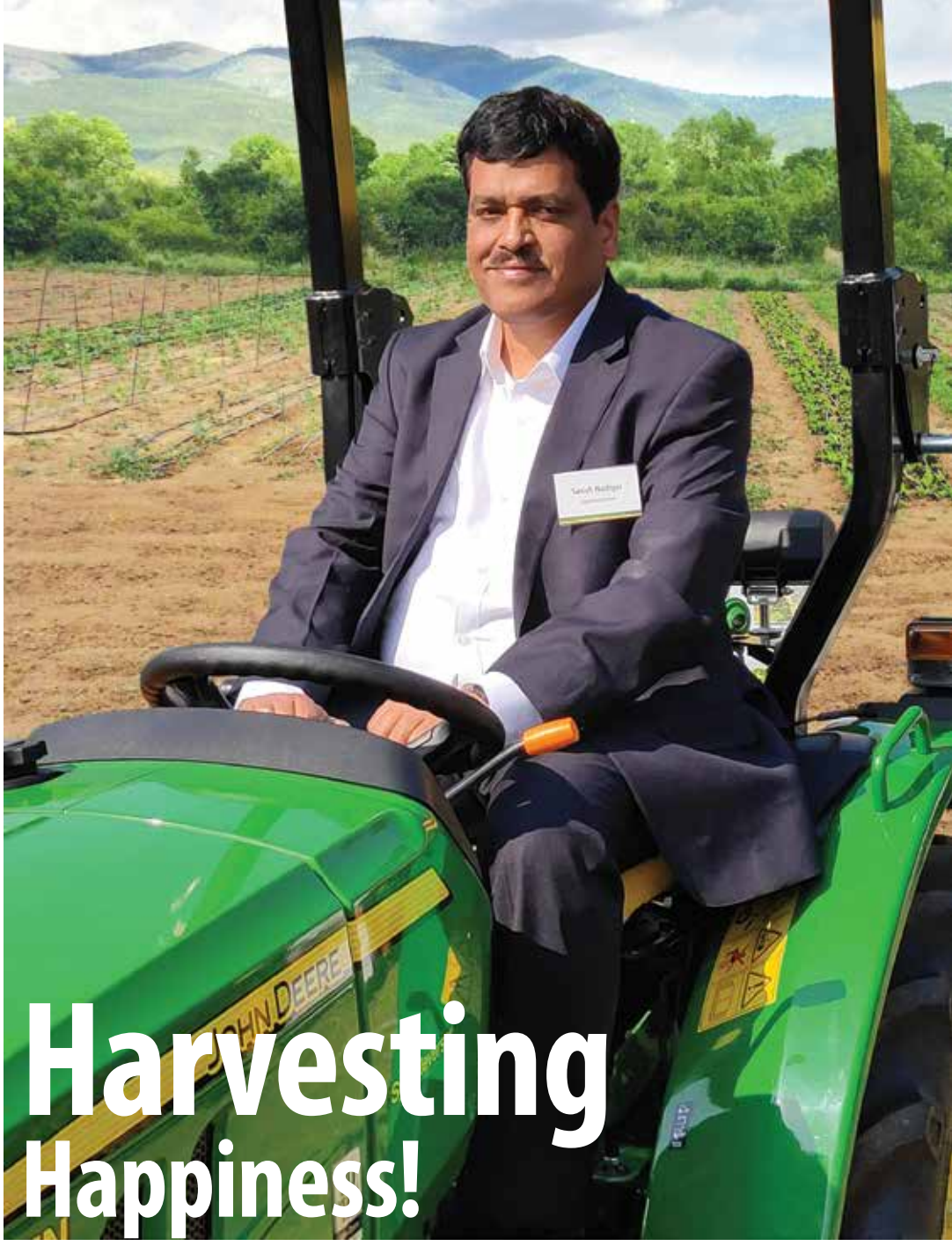

Harvesting Happiness!

While the India market as a whole is very important to us, we will also continue to leverage on the manufacturing capabilities in India, says **Satish Nadiger,** Managing Director & CEO, John Deere India

By Niranjan Mudholkar

John Deere India recently completed twenty years of operations. And Satish Nadiger is as excited as he was when he had joined the organisation about 19 years ago. Nadiger, who has been the Company's Managing Director and Chief Executive Officer since September 2012, describes his stint with John Deere India as a significant personal journey.

"In fact, everything is so well etched in my memory that I can remember exactly what happened when in the John Deere journey. It has been a journey of learning as well. And John Deere is a fantastic company to work for," he adds with a certain pride. When Nadiger joined John Deere India, it was a joint venture with Larsen & Toubro (L&T). "We were just operating out of an apartment complex at Koregaon Park. And then,

"John Deere Technology Centre Pune provides services and solutions, adding value in areas of product engineering, manufacturing, quality, supply chain, IT solutions and customer support services to various John Deere businesses globally. The Engineering Centre (also in Pune) has responsibility worldwide for Deere's design and innovation in utility tractors."

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the year 2005 saw a big turnaround. That's the year when we established a Technology Center and at the year-end, and we also bought out the stake of L&T," he recalls, adding that the Company is deep rooted in terms of its core values. "It's a company where the respect for each other is really practiced. Initially, we had a good period and then there was a challenging phase for some time. But, the last five years have been quite good."

John Deere's footprint in India

- Tractor manufacturing locations in Pune (Maharashtra) and Dewas (Madhya Pradesh).
- Harvester manufacturing in Sirhind (Punjab).
- Electronics system manufacturing in Pune (Maharashtra).
- Engineering Centre in Pune (Maharashtra).
- Technology Centre in Pune (Maharashtra).
- Parts Distribution Centre in Nagpur (Maharashtra).
- Captive finance company to provide financing solutions to John Deere customers.

"We also supply some of our manufactured components like engines and transmissions to our sister factories in different global locations. Then, we also have some of our vendors supplying to these plants as part of our global sourcing."

For India, in India

Over the past two decades, John Deere India has invested in manufacturing facilities and new products as well as new services to cater to the needs of the Indian farmer. In fact, on the occasion of its twentieth anniversary, a new tractor was launched. The new product is a four-wheel-drive 3028EN tractor. "It has been specifically developed for the India market with a focus on vineyard, orchard and paddy farming. Basically, this is targeted at grapes vineyards and the height is kept low so that it can enter the vineyards comfortable and do the spraying, which is an important activity for vineyards. This tractor has been developed in India and for India. The introduction of the new tractor is the latest example of Deere providing Indian farmers with technologically-advanced products that offer a wide range of farm solutions including tractors, harvesters and implements," Nadiger says.

"We are very excited about what's happening in this market. We have excellent support from the parent company when it comes to R&D and investments."

Nadiger is particularly proud of the introduction of new product features like power steering, oil immersed disk brakes, planetary reduction, force feed lubrication and high torque machines. "John Deere was the first to introduce these features in India and they have now become industry standard," he adds.

According to Nadiger, John Deere is also meeting the need to bring new technologies to tractors and farm equipment that lower the overall cost of farm operations, reduce the number of operations needed in the field, and improve the speed of seeding and fertilizing equipment. He also cites the example of the front PTO (power takeoff) and specially designed front farm implements, which he says have helped reduce the cost of some operations by more than 25 percent.

Nadiger says product features such as perma-clutch,

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"John Deere's presence in India was further strengthened in 2017 with the acquisition of the Wirtgen Group, which has a manufacturing facility in Pune. The Wirtgen Group is the one of the largest road construction equipment companies in the world."

front PTO, power reverser, telematics and airconditioned cabin have been welcome features for customers. 'Green System' farm implements, and combine harvesters have created wholistic farming solutions, he adds.

Acceptance of new features and technology

How did the market react to the new features and technologies introduced by John Deere? Nadiger shares an example: "When we introduced the 45 HP four-wheeled drive tractor in the paddy cultivation belt, it was very well received. This is a relatively expensive tractor compared to the normal two-wheeled drive. But the acceptance level has been good there. Also, it depends on the application. For example, we have the power reverser tractor where with a push of a button the tractor can go either further or backwards. So, these tractors are quite appreciated by the customers who have a genuine need for them. Similarly, the tractor mounted harvesters are quite popular in the southern parts of the country. When we introduced power steering tractors, there was some apprehension. But today, people have accepted them. The next feature that we are introducing is the wet clutch. Currently, customers have to change their clutch after about 500 hours of operations. But with wet clutch, they will need to change it only after 6000 hours."

"For the exports, it is about 80 percent to 85 percent of localisation because we still have some components on the emission that we need to source from outside India. But, I can say that we are on a very good journey of localisation."

Nadiger believes that the John Deere products have helped lead India from subsistence farming to agri-entrepreneurship. "We have partnered with crop value chain partners for a wholistic farm solution and have also introduced important safety features such as roll over protection and seat belts. Our product advances have been immensely valued by our agricultural customers."

Product portfolio

So, is Nadiger happy with the existing product portfolio in India? "I think our product portfolio is amongst the best right now. But I don't think we can ever be happy. We will continue to innovate and continue to bring new customer centric products on a regular basis. Of course, our existing portfolio is the strongest portfolio ever in terms of our offering. Our range is also very broad. Our tractor range is from 28 HP to 120 HP," he shares. John Deere's tractors with up to 75 HP are manufactured in India and the rest are imported. The made in India tractors have a huge localisation percentage of about 97 to 98 for the ones sold in India. "For the exports, it is about 80 percent to 85 percent of localisation because we still have some components on the emission side that we need to source from outside India. But, I can say that we are on a very good journey of localisation." John Deere India's domestic to export ratio is 70:30. Its tractors and harvesters made in India are exported to more than 110 countries worldwide and the company has been the recipient of the Export Excellent Promotion Council award for 15 consecutive years. "We provide our products for a

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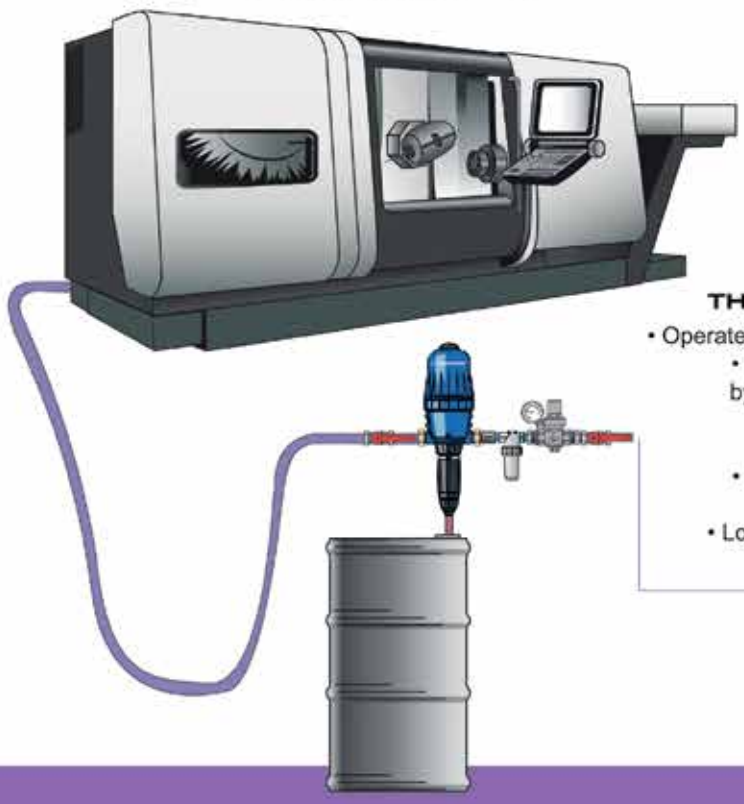

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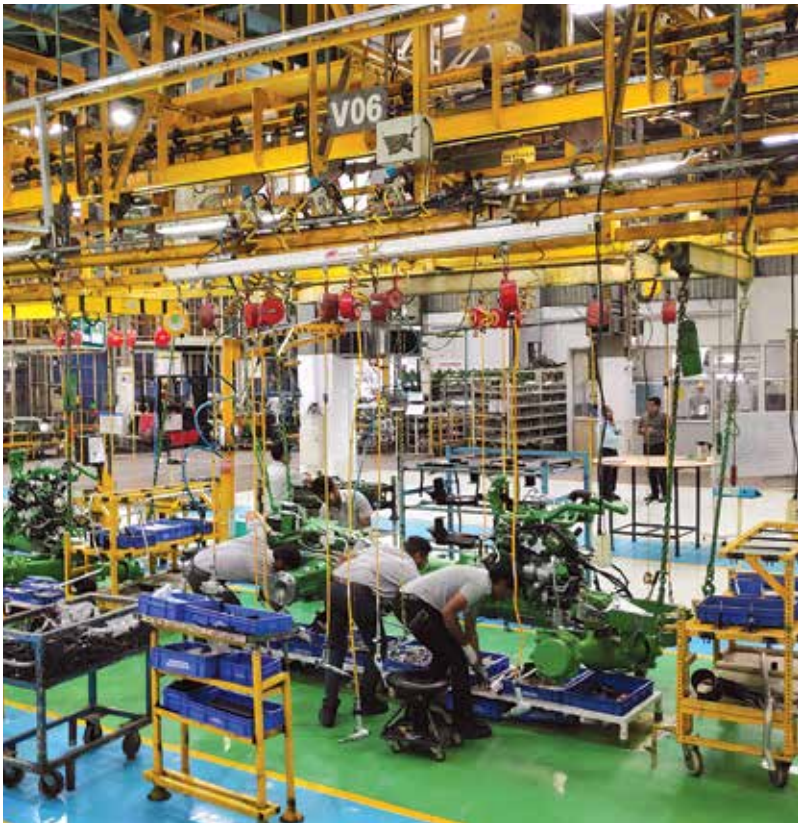

"John Deere encourages the youth to acquire skill on farm machinery operations and maintenance to meet their aspirations in the agricultural sector or run their own farms professionally as agricultural entrepreneurs."

variety of agro-climatic conditions and crop types, and this has been key to our growth in India. Our product portfolio serves individual farmers, contract farmers and entrepreneurs who are in the business of custom hiring."

Commitment to the society

Nadiger also speaks about John Deere's commitment to developing the entire agricultural industry for the long-term. It launched a program in 2011 with the Government of Gujarat to provide technologically-advanced equipment on a pay-per-hour basis for small farmers. Since then, John Deere has advocated for policy reforms in Central and state governments for establishing more private-public partnerships.

In addition, John Deere encourages the youth to acquire skill on farm machinery operations and maintenance to meet their aspirations in the agricultural sector or run their own farms professionally as agricultural entrepreneurs.

The company also promotes employee volunteerism and focusses on economic empowerment of women by sponsoring and supporting rural programmes such as Samruddhi, JIVA, Integrated Development project, Model School and STEM.

Pillars of growth

Elaborating on the reasons for John Deere's success in India, Nadiger identifies four pillars: technology, quality, manufacturing excellence and people. "We have been the best in terms of technology. It was the question of bringing the right technology to this market at the right price point. And we have been able to do that. Secondly, the quality of the products has always been strong, and we have always followed the diktat of Mr. John Deere, the company's founder. He said, "I will never put my name on a product that does not have in it the best that is in me." And that's what we have always believed in. That's our quality slogan," he says.

Nadiger is also quite proud about John Deere's manufacturing capabilities in India. "We can totally rely on the products manufactured here. Our design and engineering capabilities are well-proven. And importantly, the process adherence is to the core," he says.

Nadiger also points out that India has an excellent supplier base and that has always helped John Deere to bring in the right products to the market at the right price. John Deere has more than 250 supply chain partners for the regular parts in India. "We also supply some of our manufactured components like engines and transmissions to our sister factories in different global locations. Then, we also have some of our vendors supplying to these plants as part of our global sourcing," Nadiger says.

"And of course, people. People have always been the strength at John Deere. There are people who have been working with us for the last twenty years and have taken up very senior positions in the factory. So, those are the things that have helped us grow in these two decades."

Important market

Nadiger says that the parent company gives a lot of importance to the India market. "It is very excited about what's happening in this market. We have excellent support from the parent company when it comes to R&D and investments." India is obviously a growth market for John Deere. "What we have done in the last four or five years will help us grow in the times to come. So, we will continue to grow in the years to come. And while the India market as a whole is very important to us. we will also continue to leverage on the manufacturing capabilities in India," he concludes.

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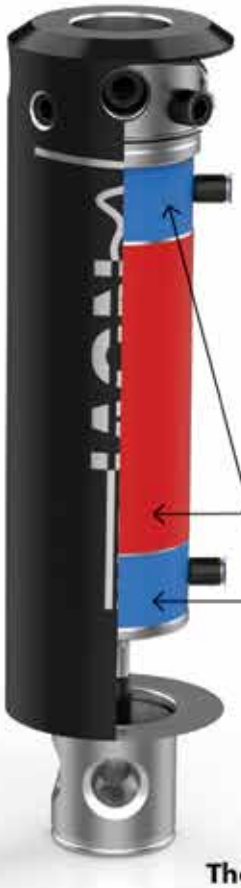

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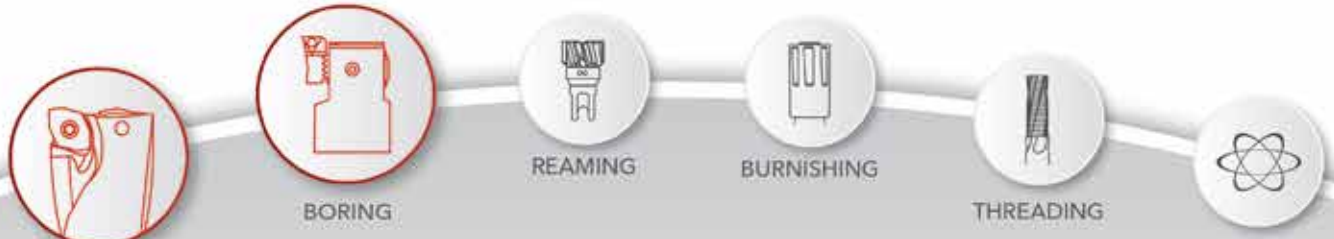

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Special

Participants Speak

As the trade fair marks the milestone of 50 years, key players are enthusiastic about their participation. They plan to show best of their technologies and are looking forward to meet and greet customers.

Being **optimistic**

Sandesh Kumar, Sr. Manager, Doosan Machine Tools talks to The Machinist about the company's expectations from IMTEX 2019.

What are your expectations from this edition of IMTEX?

As manufacturing in India is now getting momentum, we expect to see more and more customers at IMTEX 2019. The manufacturing industry is now looking to adapt new technologies like 5-axis, multi-tasking, automation, digitisation, etc. which will shape the future of manufacturing. Moreover, we expect customers using conventional machines will changeover to entry level CNC machines. Hence, our booth has a line-up of both high-end & entry-level machines. With these trends and our offerings to match these trends, we expect a huge footfall of visitors at our booth. We hope to convert as may potential enquiries to firm orders.

Tell us about your key product displays at IMTEX 2019

The key products on display at IMTEX will be:

1. Horizontal Machining Centre NHP5000 (High productivity & High precision with 60m/min rapids, 0.9G Acc)
2. DVF5000 — Simultaneous Compact 5-axis VMC for complex parts machining.
3. PUMA V8300 with ATC — Heavy duty Vertical CNC lathe with Automatic 12 station ATC (Capto C6) for storing long boring tools.
4. DEM4000 — Compact & Cost effective entry level 3-axis VMC
5. LEO1600 — Compact & Cost effective entry level 2-axis CNC lathe
6. SMX3100ST — Multi-Tasking CNC lathe with Capto C8 milling spindle with sub spindle & Lower Turret for machining large complex parts in single set-up
7. VC430 — Vertical Machining centre with Rotary pallet (Twin table) for High production parts.

How has been the least year for your company?

The year 2018 has been the most successful in the history of Doosan India (since 2008). We have shipped over 400 machines with over 500 machines booked. Due to our excellent product line-up of various types of machines & models customers have been able to pick & choose the machine as per their requirements. The reliability of our machines has also been a key factor in over 70% customers repeating the orders. Not to forget our Service network & support which have done a good job of keeping the customer machines up & running all through the year.

We expect the demand for CNC machines to continue upwards as India is now making a strong presence as precision engineering goods exporter on the global map.

The year 2018 has been the most successful in the history of Doosan India (since 2008). We have shipped over 400 machines with over 500 machines booked.

What are your expectations from 2019?

We expect the demand for CNC machines to continue upwards as India is now making a strong presence as precision engineering goods exporter on the global map. As technology is changing rapidly so is the demand. This situation is in turn benefitting the machine tool industry. As we say "Machine Tool Is the Mother of all Industries" hold true for the manufacturing segment as a whole. There may be some slowdown due to political & other external factors, which may cause a minor slowdown but overall we are still optimistic for 2019 & also for the future.

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Highlighting **technological prowess**

Himanshu Shaparia, VP – Sales reveals Jyoti CNC Automation Ltd.'s plans for IMTEX

Please tell us about your plans for IMTEX.
IMTEX 2019 is distinct as IMTMA is celebrating 50th successful year in servicing to the nation & manufacturing fraternity. Jyoti as always, tries to bring new energy & zeal to boost up growth in manufacturing sector by providing best solution to individual segments. For this edition, Jyoti is exhibiting 9 different clusters where one can find its requirements for automobile parts to aerospace applications.

Please tell us about your product display
Under NVU cluster five different Turning and VMC machines are projected with complete new energy. High precision Turn Mill Machines AX 200 M & MSY, smaller variant in Vertical Turning machine as VTL 400 along with larger version VTL 750. Keeping in mind the demand of automation in manufacturing, industries we have automation cluster displaying DXG 100i with auto loader, Twin Spindle Twin Chucker with gantry loader machine TS 120, Inverted Vertical Spindle Turn Mill center ATM 160 along and a variant in Vertical Shaft Turning center. VMC 1580, RDX 20 and RAX 20 will be under VMC cluster. The Tachyon cluster would be the showstopper for the event displaying most versatile combination along with robotics. One can be spectator of some finest yielding applications made possible with the Tachyon family machines. NX 3222 nvu, HX 500 would be displayed under large machine cluster along with new launch MX9 nvu. Exclusive Huron cluster will have K Mill 10 nvu, K3X8 (Five) nvu and handsome hunk Umill 5 for finest Die-Mould and 5-Axis applications. India's First Multi-Tasking machine MTX 300 with its peculiar application will be another big attraction of the exhibition.

What are your expectations from this edition of IMTEX?
IMTEX is an international platform showcasing latest trend in the machine tool and its allied industry segment. For us, IMTEX is an occasion where we display our technological capability, strength & competencies to the global manufacturing world. This edition of IMTEX would be a technological delight for the industry.

Safety first

With changing mindset, safety is becoming important, says **Rohit Warrier,** Founder & CEO, Warrier Electronics

Tell us about your key product displays at IMTEX
We would be presenting our premium segment fire suppression systems. We also intend to soft launch our in-house brand WEFIRE. The launch of our in-house systems, which are partly made in India, is intended to penetrate and serve the cost centric markets. Being a safety product, we felt the urge that, any CNC machine produced or in use, should have an automatic fire suppression system. International brands often end up expensive, and not so pocket friendly for mass penetration. Thus, we started to make in India, matching international standards of quality and reliability.

What are your expectations from this edition of IMTEX?
This would be our first experience. We hope to reach as many potential CNC/EDM machine users as we can, to educate about the advantages of safety equipment like an automatic fire detection & suppression system within their CNC machines.

How has been the least year for your company?
We have been growing at the rate of 200% since several years and hence, we see a definite change in the attitude of people using CNC machines. Although in the minds of the users, an automatic fire suppression system is still an accessory and not a necessity yet, but they are showing real inclination towards having a fire suppression system on their machines. Be it retrofit users or new users. Mindset is changing, and safety is indeed becoming an important aspect while the things are planned, and not after the things have happened.

What are your expectations from 2019?
We intend to branch out and expand our footprint to new cities with dedicated office and a team, starting Bangalore and Mumbai within the next Fiscal year. We hope to continue spreading safety culture amongst our peers which will help not just save lives and property, but also avoid unwanted downtime and increase efficiency.

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Leading the market

Renishaw sees India as a growth market says **Sanjay Sangam,** National Sales Head of the company.

Q Tell us about your key product displays at IMTEX 2019

Renishaw, returns to IMTEX for the show's 50th anniversary, which is taking place at the Bangalore. The show's 50th anniversary will be marked by the introduction of an Industry 4.0 pavilion. In line with this, Renishaw will showcase a complete automation cell, demonstrating to manufacturers how intelligent process control is key to the operation of a successful smart factory. Additionally, the company will launch several new products to address the industry's need for automated process control.

IMTEX is hosted concurrently with Tooltech, where machine tool accessories, metrology and CAD/CAM cutting tools, tooling systems and current trends in the tooling industry will be on display. Renishaw's technology provides manufacturers with measurement data to enable intelligent decision making, a crucial part of Industry 4.0. By providing equipment for machine calibration, on machine measurement, off-machine gauging and verification, Renishaw enables manufacturers to improve their processes and quality, while reducing CNC machine stoppages.

Q What are your expectations from this edition of IMTEX?

IMTEX has grown not only in size, but in the overall scope of manufacturing. There are more compelling reasons for people to attend. Big Ideas Fueling Great Expectations – we have very high expectations form IMTEX 2019 and that's the reason we are running the first time ever live – AM (3D metal) four laser machine with titanium podwer at our AM stand – Hall 6 D102.

By providing equipment for machine calibration, on machine measurement, off-machine gauging and verification, Renishaw enables manufacturers to improve their processes and quality, while reducing CNC machine stoppages.

Q How has been the market faring for you?

Renishaw sees India as a growth market. With the current rate of change, India will be classed as a high tech, advanced economy in the near future & the Make in India Strategy will drive this through the domestic production of increasingly more complex and critical systems for Aerospace, Space, Defence and Automotive projects.

Renishaw has always heavily invested in Research and Development - this continues at pace. With the market conditions, our leading edge technology & a strong local team, my vision is to continue to lead the market in metrology and further strengthen this position through educating customers. 2019 begins with IMTEX and we are hoping to see more interactions with different industries and expect to increase our market presence.

Widening **customer base**

Rakesh Kumar, Tool Grinding Technologies speaks on the company's expansion

Q What are your expectations from this edition of IMTEX?

This edition IMTEX will give us the platform to consolidate our machine presence in Indian and global market. Also, we will demonstrate new features such as linear motor, automation and some addition software features, which are technology upgradation on our machine.

Q How has been the least year for your company?

The last year has been very busy for us. We added 14 new customers to our customer's base. Out of these 75% are first time buyers while the other owned machines of some other brands.

Q What are your expectations from 2019?

In this year, we plan to present new technology to the customers. This will help them make production efficient with enhance quality. With this, we expect a high level loyalty from our customer in TGT machines in the coming future.

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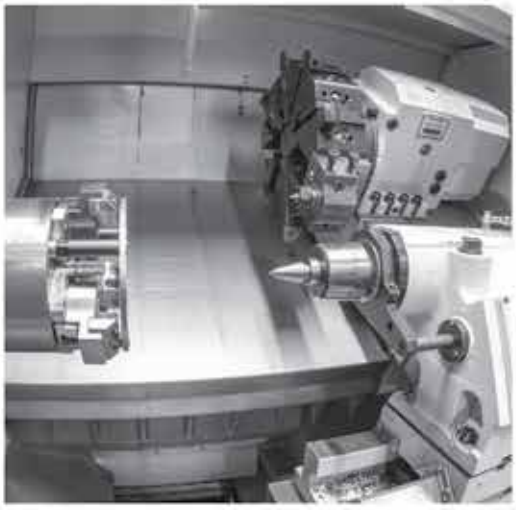

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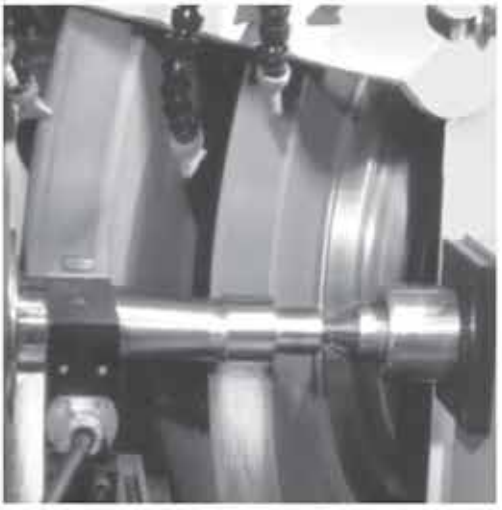

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Scaling the performance

With focused approach, we shall be able to overcome challenges says **Prashant Sardeshmukh,** Director, MMC Hardmetal India, a subsidiary of Mitsubishi Materials

Tell us about your key product displays at IMTEX

In the recent times Mitsubishi Japan has developed new products, like WJX, WSX445, FMAX & VPX Milling Cutters, New range of solid carbide drills for centering, chamfering & counter boring, CVD Diamond Coated Endmills for Graphite machining, GW Series Cutting Off & Grooving System, expanded range of iMX Exchangeable Head Endmill Series.

What are your expectations from this edition of IMTEX?

IMTEX has always brought up exciting opportunities for us. It attracts hundreds of globally acclaimed brands who display their technological prowess. Every time we have experienced overwhelming footfall and lot of prospective visitors. This time IMTEX is expected to offer more promise and something unique. We expect the seminars to be more pointed, highly insightful and interactive, with special emphasis on technological refinements and technological impact on ecological balance. This show will have spotlight on additive manufacturing and industry 4.0 and it will be helpful to remove many misconceptions associated with it, especially in Indian entrepreneurs. We look forward to put up very impressive show.

How has been the least year for your company?

Last year brought us equal amount of challenges and opportunities. I am not confining myself to our sales performance. I

Last year, we started our sophisticated manufacturing plant at Aurangabad to manufacture special tools and initiated activities to launch our state-of-the-art Tech-Centre at Pune.

am talking about comprehensive performance. We took conscious efforts to bolster our team with special focus on harnessing young talent. We could scale impressive sales graph, better than we had projected. Our state-of-the-art Tech-Centre at Pune will add to our technological muscle.

What are your expectations from 2019?

We have stepped into the year 2019 with great hopes. With our focused approach and positive and confident mindset, we shall be able to overcome the challenges and turn them into opportunities. The general election is likely to have social-political impact on the industry. But we will have to take it in our stride.We will be able to muster an impressive show.

Smart solutions

Rajesh T. Ghashi, Managing Director, Chiron India Machine Tools Pvt Ltd, says the company is showcasing its smart solutions at IMTEX 2019.

Please tell us about your key product displays at IMTEX 2019

At IMTEX 2019, we will be displaying our high precision high productive Twin Spindle Vertical Machining Centre with workpiece changer the DZ 12 W model of machine. It features spindle distance of 250mm, 15000 rpm spindle, 45 Nm Troque, rapids of 75m/min in all axis with acceleration of 1g in X and 1.5g in Y &Z axis. Additionally, the machine is equipped with 2x32 HSK A50 Automatic Tool changer and Fanuc 31iB5 CNC system.

What are your expectations from this edition of IMTEX?

We expect to meet our existing customers as well as prospective customers where we can discuss about the new technologies in machining, smart solutions that Chiron Group is capable of offering in terms of Industry 4.0.

What are your expectations from 2019?

For 2019, we are expecting to have much more order intake from the Indian market as the automotive industry's shift from BS IV to BS VI calls for high precision machining. Also, we see a good demand coming from the Turbo Charger parts like milled impellers, turbine housing etc.

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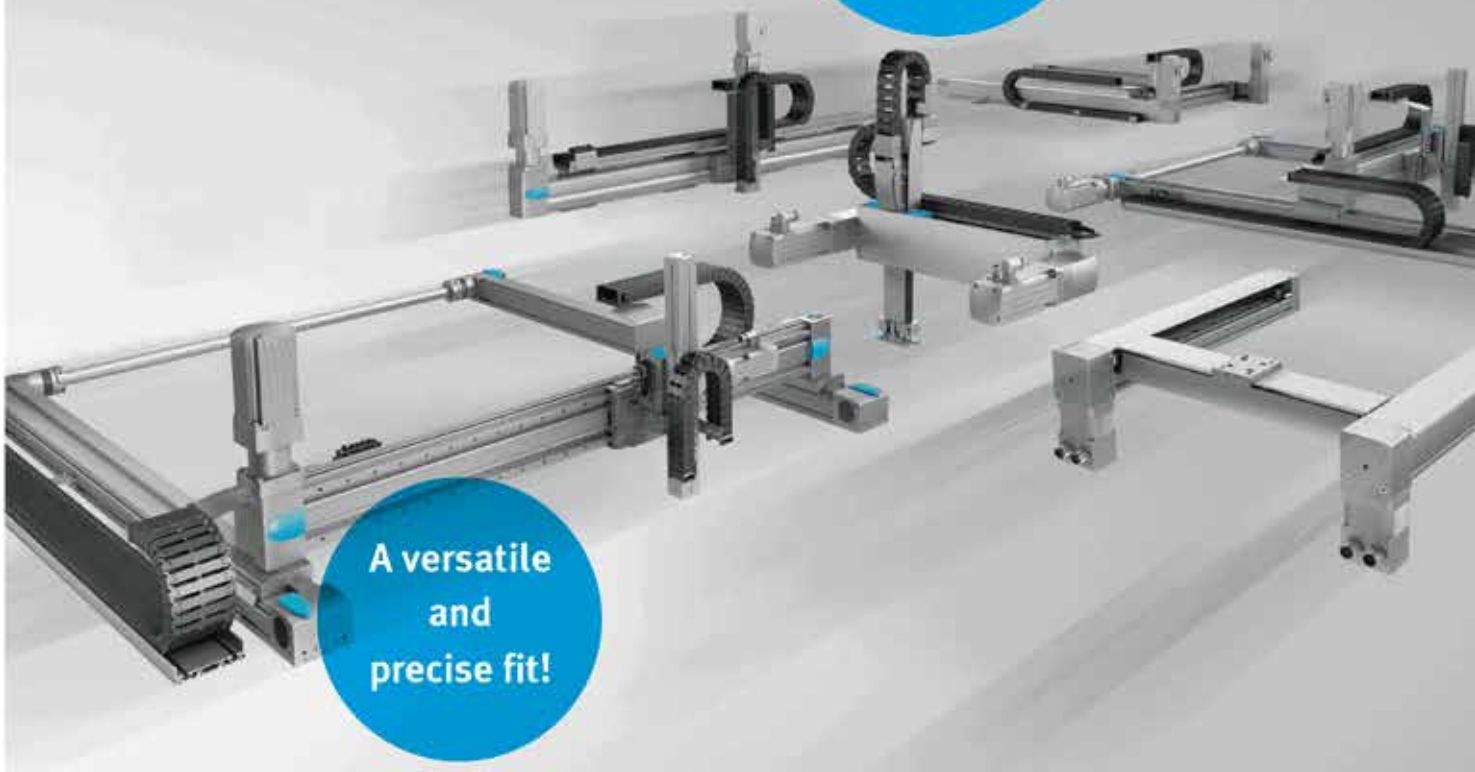

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Expanding **Horizon**

FIBRO India is optimistic about 2019, says Executive Director, **Vivek Nanivadekar**

Tell us about Fibro India.
FIBRO India is a 100% subsidiary of FIBRO GmbH Germany. This is the only manufacturing plant outside Germany. We have two product groups for two different market segments. Standard Parts, also known as Die components used in sheet metal forming tools and second is the Rotary Tables for Automation and Metal cutting application. FIBRO are the pioneers of Rotary tables in the world.

Tell us about your key product displays.
We will be displaying the indigenously manufactured cam driven Rotary Tables for Automation industry. It represents 'German Precision Crafted in India'. Every Rotary Table is custom built to suit the application need in terms of Mass movement of inertia, indexing speed, no. of indexing positions etc. In addition, there will be range of standard products for sheet metal industry.

What are your expectations from IMTEX?
FIBRO is a brand that is well recognised for rotary tables and standard parts in the world. We believe in offering solution and not the product. Therefore, we would like to understand customers' requirements, their bottleneck areas and their expectations from FIBRO India. Our experience of participating in IMTEX has been quite encouraging.

How has been 2018 for your company?
Last year has been very good for FIBRO India. Our theme has been 'Expanding Horizon'. We have expanded in every facet of business i.e. product range, customer base, manufacturing facility/capacity, IT infrastructure, manpower etc.

What are your expectations from 2019?
We expect to grow in domestic market by 10-15% and equally in export business. However, on the other hand economists have predicted world recession in 2019. The best strategy in recession is to launch the new product which helps you to keep the head above the water. We will be launching couple of new products in Rotary Tables as well in Standard Parts product range.

Doubling the **production**

R. K. Purohit, MD, Sphoorti Machine Tools Pvt. Ltd. speaks about new products

Tell us about your key product displays
We are displaying our new and latest products in IMTEX 2019. These products include — BMT static holders in BMT 45,55,65 & 75, BMT driven tool holders in BMT 45, 55, 65 & 75, VDI holders & VDI driven tool holders in DIN 5482, DIN 5480, 1809,TOEM, & OKUMA. We also plan to display VDI through coolant driven tool holders and Tool Discs in VDI Axial, Radial and BMT type.

What are your expectations from this edition?
As I mentioned before we are displaying new generation BMT holder. We plan to make our customers aware about our new products. Usually, these products are imported at a huge cost whereas they are available in the country at competitive price. IMTEX is a good opportunity for us to bring this fact to our customers and end users.

How has been the least year for your company?
Last year was a very good to all machine tool manufacturers. Indeed it was good for us as well. We have increased our production capacity. We are expecting more than 40 percent increase in our turnover by end March 2019.

What are your expectations from 2019?
We have increased our production capacity adding new machines. We have started Unit-2 specially for VDI tool holders DIN 69880. With new machines, we are expecting to double our production quantity by March 2019. We are participating in EMO-2019 at Hannover Germany. We are expecting new customers to our list in IMTEX-2019 and also from EMO-2019. We want to support our customers with ex-stock delivery for standard products. We also want to serve our customers with customised special tool holders to increase productivity & reduce cycle times.

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Precision Tool Holding System

Bilz, a leading supplier of tapping chucks/adaptors, shrink-fit system and cnc tool holders that are used worldwide in many different areas of application and on almost all types of machines. Bilz's success is due to a continual process of innovation, new product development and enhancement of existing product range.

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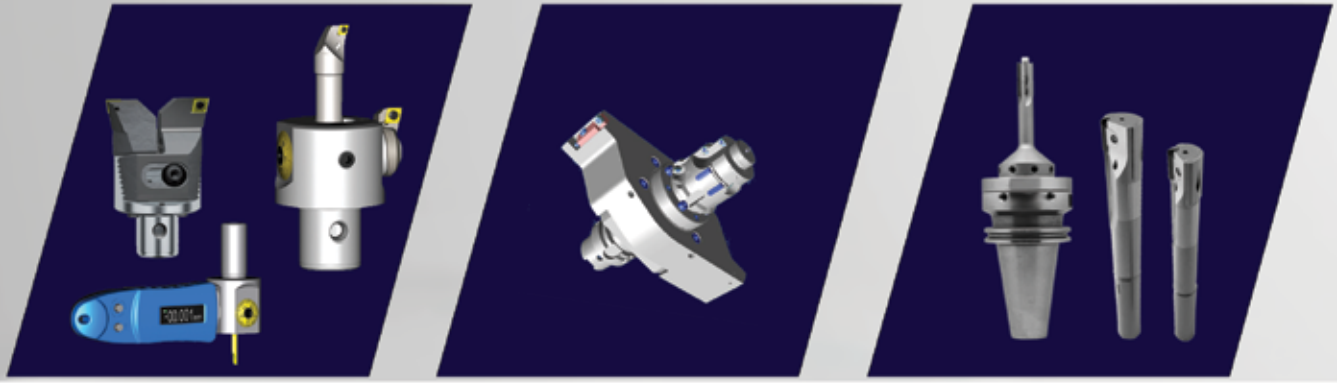

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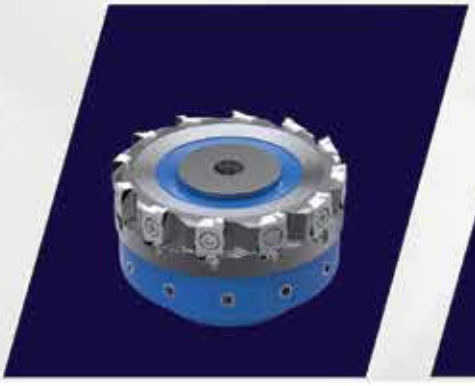

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Collaborating with customers

New industrial era puts emphasis on creating eco-system in manufacturing says **Punit Gupta,** Managing Director, Blaser Swisslube India.

We invest in our Research and Development (R&D) significantly, because that is the best way to keep our new and existing products on the cutting edge of technology.

Q Can you tell us more about the Liquid Tool concept?

Liquid Tool is our value proposition, which helps in increasing competitiveness of our customers. Doing it by driving their productivity has been a key success element of our company globally. It brings transparency and a holistic view on overall returns on their investments.

Productivity, cost-effectiveness and process quality are factors that critically depend on the selection of metal working fluid and the competence of the partner. Our extensive machining know-how & high expertise, customised services and high technology formulations allows us to work with customers in a deep basis. An area of metal working fluid, which was considered as a necessary evil has been completely turned around with Liquid Tool concept. It helps customers to exploit the potential of machines and tools to a larger basis and win.

Q Expectations from IMTEX 2019 & Market

New industrial era puts emphasis on creating eco-system in manufacturing and every element in manufacturing has to contribute for higher productivity and process security. The competence at suppliers and customers' end has to work together in a collaborative way to reach the higher standards of working. Customers need competent partners who bring the expertise in the projects and contribute in increased competitiveness. As a globally active and focused company, we have geared up to collaborate with our customers and we are excited to take up new projects, execute as partners and generate added value for our customers through Liquid Tool.

We want to meet customers in IMTEX and explore this unique aspect of Liquid Tool. It would be a pleasure meeting customers in IMTEX 2019.

Q Please tell us about your new launches.

Synergy 735: It an innovation at Blaser Swisslube. A crystal-clear, water-miscible and oil-free metalworking fluid that ensures spotless surfaces that are easy to clean thanks to its neutral pH and outstanding rinsing behavior. Synergy 735 has a neutral odor, excellent skin compatibility and offers a clear view of the machining process. High cutting performance in a variety of materials such as titanium and aluminum alloys as well as steel and stainless steel, copper alloys and composites. Titan Gilroy from Titans of CNC has switched all his machines to Synergy 735: "It's so clear – it looks just like water. The best coolant I've ever used. My guys love it."

Blasomill GTS 15: Blasomill GTS 15 is a high quality basic oil and is especially developed for grinding and honing of hardened steel, high carbon steel, (case hardened), high alloyed steel, HSS, PM-HSS and Cermet. It is a productivity booster in critical grinding applications like Gear Grinding. Some of the benefits are the reduced burning risk, extended dressing intervals and better surface quality.

Q How does product development activity take into account the latest technologies to cope with the market demands?

We invest in our Research and Development (R&D) significantly, because that is the best way to keep our new and existing products on the cutting edge of technology. More than 70 specialists in our R&D and customer service laboratory spend every day working together in various disciplines: analysis, chemistry, microbiology, metallurgy, physics, and manufacturing technology.

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APPLICATIONS

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IMTEX 2019

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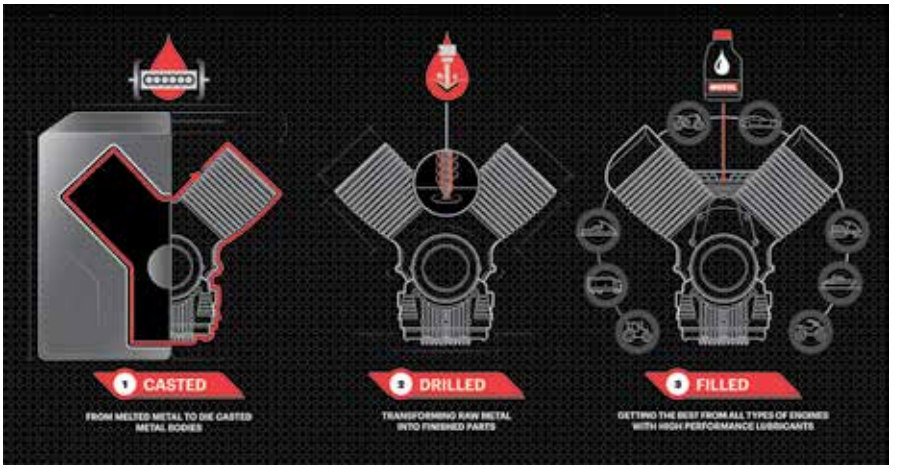
Showcasing **technological prowess**

Yatendra Kumar, Business Head, MotulTech India reveals the company's plans for IMTEX and talks about its display at the trade fair.

Tell us about your key product displays at IMTEX 2019

IMTEX is platform to showcase the latest technology products for metal working industry. Our focus is show two different products ranges:

Minimum Quantity Lubricants (MQL) – In today's highly competitive world, where technologies are changing very fast and we are finding the competition not only from known competitors but also from unheard competitors. Hence we need to for sustainable products, which are not only required for us to sustain but also for the sustainable for the environment.



MOTUL group expertise

Hence Our SUPRACO 13XX series MQL came to existence. These are futuristic products, since they offer heavy reduction in over all consumption of metal working fluid/cutting oil and also bio- degradable. SUPRACO 13XX MQLs not only save the direct cost of cutting oil but also help in reduction in carbon foot print, energy cost, disposal cost (as there is no disposal), cleaning cost and rust preventive cst. Inspite of the huge benefits these products are not very common not only in India but also in the world, as these products require specialised chemistry to manufacture these oils and also specialised machines (on which they can be used). There are very few companies who are using this technology in their machine shop today. Today all metal cutting operations (except grinding & deformation) can be done with MQLs.

Clean Hydraulic oil - Problems with hydraulic oil in today's industry. According to OEMs and industry research the following facts lead to more frequent problems in high performance systems: Hydraulic systems are getting smaller, Fluid residence times in reservoirs can be as short as 30 seconds, Oil reservoirs often not optimum in shape or size, Oil flow rates are very high relative to oil volumes, Hydraulic systems are designed to have higher power densities, Hydraulic oil temperatures are higher (> 130°C transients seen), Hydraulic oil pressures have generally increased.

With all of these tougher conditions, oil is being pushed to its limits on a daily basis hence they can finally lead to:

- Increased oil temperature
- Oil degradation
- Varnish and sludge buildup
- Valve sticking
- Excessive filter clogging
- Machinery downtime and excessive maintenance costs
- Varnish removal problems, HS&E issues with solvents, etc.

RUBRIC CLEAN, premium hydraulic oils, which are not just filtered to get the right cleanliness level as per ISO 4406:1999 (upgraded version of NAS 1638) and claimed as clean oils, but prevents varnish build-up and keeps your hydraulic systems running at peak efficiency. More importantly, RUBRIC CLEAN will extend the life of the system. Some of the key features of the product are: A fluid solution to keeping a hydraulic system free of varnish, High oxidation life to protect components, Excellent wear protection to extend equipment life, Outstanding filtration performance in presence of water, Excellent rust and corrosion protection and Separates water quickly.

MotulTech also offer RUBRIC R-CLEAN, a non-sol-

We are starting year 2019 with a positive note and have 10 products lined up for launch in metal working basket.

SIL FL-3015
Fiber Laser Metal Cutting Machine

- Ability to work with wide array of materials - Ferrous/Non-Ferrous.
- Expandable laser power upto 10kW.
- Exceptionally good positioning speed upto 180 meter/min.
- Cutting speeds upto 40 meter/min.

Accuwrite F - 20
Fiber Laser Marking Machine

- Fiber laser has the highest wall plug efficiency, small footprint and virtually no maintenance.
- Laser power from 10-100 Watt in pulsed mode, Air cooled.
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vent industrial system cleaner that removes existing varnish and contamination from hydraulic fluids. RUBRIC R-CLEAN is added to existing equipment and Machine continues to operate and produces parts while equipment is being cleaned (maximum cleaning time recommended is 48 hours). At end of cleaning, cleaner / hydraulic fluid is drained* and equipment is filled with our hydraulic oil RUBRIC CLEAN HM which keeps the system clean and avoids further downtime.

What are your expectations from this edition of IMTEX?

IMTEX is getting bigger and better in every edition. We are looking for more serious buyer and technology enthusiastic peoples to visits the IMTEX. However IMTMA also need to work more closely with all other stakeholders of the industry to take the lead for long term work like sustainable development, environment friendliness to name a few.

How has been the least year for your company?

Last year was very good for our company, we have grown 40% plus and plan to repeat the same in this year as well. We have launched many new products like SAFKOOL 6220 a high performance semi synthetic water soluble MWF for aerospace components (aluminium as well as titanium) machining. It can handle very high pressure in demineralised water with any foaming issue. Apart from this we have also launched Special Chuck grease which can not only sustain the water but also all type of coolants and provide long term lubrication inside the chuck.

What are your expectations from 2019?

We are starting year 2019 with a positive note and have 10 products lined up for launch in metal working basket. We always believe that we need to innovate continuously to make our customer successful and all these successful customers will keep us in the business and make us successful.

Forging new relations

R. Ravi, Business Partner, Fenwick & Ravi is excited about IMTEX 2019.

Tell us about your key product displays at IMTEX.

Fenwick and Ravi (FAR) is a leading machine tool company and manufactures Bar Feeders, Hydraulic Self Centering Steady Rest, Zero Point Clamping Systems, Angular Milling Head and other customized Work Holding Machines. Our products are used in various industries such as automobiles, defense, railways, aerospace, machine tool industries, etc.

FAR's Products are compatible with HAAS, Doosan, Takisawa, Morei Seiki, Mazak, Kia, CNC Takang, HNK, Alextech, Proking Lates, Leadwell, Okuma, YCM, DMG, Niles- Simmons, ECOCA, Landis, Schaudt, Toss and Indian machines. Also, out products are exported to all over the world.

What are your expectations from this edition?

Our strategy is to showcase all new technologies and products, reconnect with large customer base in India. We are also aiming at new customers and establish relationship with oversea visitors.

How has been the last few year for your company?

IMTEX has been a platform to showcase capabilities in the Indian machine tools space. It has helped the machine tool industry to benchmark its innovations and also have given international exposure to the participants.

It is very energetic and wondered that the domestic industry has clawed back well in the last 10 to 12 years to regain 50% of the consumption in an ever grain market. Today

For financial year 2019-20 and 2020-21, we are hoping to reach the total turnover of 23 Crores and 30 Crores respectively with the investment in high capacity machines and new technology.

Japanese or European firms based in India, have Indian made machines, which was not the case some time back.

IMTEX is continually evolving and pretty rapidly in CII respects, from organizing, number of participants, visitors, innovation and products, oversea visitors, oversea participants. It is about three times, what it was ten years back.

What are your expectations from 2019?

For financial year 2019-20 and 2020-21, we are aiming to achieve turnover of 23 cr. and 30 cr. respectively with the investment in high capacity machines and new technology.

We are a growing company. Every year, we are implementing some new changes in our manufacturing plant with some new technology. Our key products are well known in India as well as few foreign countries. For achieving these higher figures, we are focusing on export market for our key products. In the last two financial years, we have over achieved our targeted turnover. We hope to continue this trend.

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Achieving **new heights**

Vineet Seth, Managing Director – South Asia & Middle East, Mastercam APAC is looking forward to paving the path of success for the company.

Tell us about your key product displays at IMTEX 2019

We will be showcasing our most recent release of Mastercam – version 2019 along with our support for diverse Metrology hardware through the Verisurf product range. We will have experts from both India and USA demonstrating strengths and benefits of our technologies and through this, we hope to initiate productivity dialogues with our prospects and customers.

Mastercam 2019 was developed to streamline the manufacturing process from job setup to job completion. Not only does it increase machining productivity, it also reduces overall production costs with new 2D through multiaxis milling automation features, CAD and model preparation improvements, expanded 3D tooling, Accelerated Finishing™, and powerful turning and Mill-Turn enhancements.

Re-engineered chamfering and holemaking strategies, plus the new Multiaxis deburring provide new levels of time-saving automation and simplicity. New milling toolpath strategies, like the high speed Equal Scallop toolpath, offer both machining performance and surface finish improvements. The new release includes additional support for the Sandvik Coromant PrimeTurning™ method, enhanced

We nearly doubled our growth rate, in comparison with the previous year and we are delighted by the results. Globally, we have crossed the landmark of over 250,000 installations across diverse industry applications.

grooving, bar feed, and other features for turning and mill-turn applications, plus new lathe and Swiss-style machine support. Mastercam 2019 also includes enhanced CAD functionality and 3D model import support, improved part preparation and fixture setup tools, additional PowerSurface capabilities, and expanded support for Model-Based Definition (MBD). Mastercam 2019's expanded digital tool library capability delivers accurate, 3D tool assembly models, with access to the latest cutting tool technology and updates for Sandvik Coromant CoroPlus® and MachiningCloud™ platforms. Mastercam 2019 also expands Accelerated Finishing with support for taper and lens style tools aimed at 75% cycle time improvement for finishing operations with superior surface finish quality.

With improvements to toolpath and machine simulation, toolpath graphics, and other verification and analysis tools,

Overall political and economic stability in the region, the faith that the market has on our brand and the thrill of working on challenging customer requirements are top on our wishlist for 2019.'

Mastercam 2019 provides greater programming assurance and allows for better, more informed decisions before a job is run. These improvements include support for block drilling multiple holes simultaneously and better axis control in simulation, allowing you to easily check machine limits or collision checking.

What are your expectations from this edition of IMTEX?

As with all our trade show participation, we look forward to a good footfall and a great interaction with our prospects, customers, partners and industry colleagues.

Since this is the 50th year for IMTEX, we are hoping to see a lot of new entrepreneurs who will come to see new technologies with a view to adopt them in their processes. Mastercam has been associated with IMTEX for over two decades now and we look forward to the special edition this year. We warmly welcome visitors at our Booth – C101 in Hall 1B, from the January 24-30, 2019.

How has been the last year for your company?

We nearly doubled our growth rate, in comparison with the previous year and we are delighted by the results. Globally, we have crossed the landmark of over 250,000 installations across diverse industry applications. We are encouraged by the results and are hoping to better ourselves by a bigger margin in 2019.

What are your expectations from 2019?

Overall political and economic stability in the region, the faith that the market has on our brand and the thrill of working on challenging customer requirements are top on our wishlist for 2019. I am confident that our colleagues and partners across the region will take the Mastercam brand to greater heights in the year ahead.

Do you make complex parts?

So does the DVF 5-axis compact machining center. With a 500mm integrated rotary table, 30 tool ATC, and 40 taper BIG-PLUS spindle(HSK A63 spindle available as option), this is the 5-axis workhorse that your shop needs.

Interesting Specs	
DVF 5000	
Rotary Table Diameter	500 mm
Maximum Table Load Capacity	400 kg
Spindle Power	12000 r/min, 17 kW (18000 r/min, 30 kW)
Magazine	30 (40/60/90/120) tools

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Continual growth

Indraneel Bhattacharya, Vice President- Marketing & Sales, LMW says the company is aiming to have a successful year ahead.

Please tell us about your product display at IMTEX 2019

In IMTEX 2019, we plan to showcase 12 new ranges of products, which include the following:

a) High precision 5 axis machine for Complex profile Machining.
b) Vertical Machining Center with Automatic pallet changer.
c) New Vertical Machining Center up to 2m table size for larger components.
d) New Horizontal Machining Center with pallet changer up to 630mm pallet size.
e) New Compact Horizontal Turning Center with Integrated Automation.
f) Heavy duty Horizontal Turning Center with 15 inch chuck dia & upto 1200mm turning length.
g) Vertical turning Lathe with Live tool for Larger Components.

How do you plan to make best of the platform such as IMTEX?

We are expecting continual growth in the sectors such as aerospace, defense, oil & gas, medical equipment, locomotives & large component machining.

As I mentioned before, we plan to showcase our strength in VMCs & HMCs. We are aiming at increasing our market share for machining centers, automation & high precision machining.

How has been the last year for your company?

We were able to increase our sales turnover by 54% in FY 2017-18 as compared to FY 2016-17. So the last financial year has been very successful for us. To add into it, a large number of new customers have been inducted in our customer list.

What are your expectations from 2019?

We are expecting continual growth in the sectors such as Aerospace, Defense, Oil & gas, medical equipment, locomotives & large component machining.

UPDATE

Boeing to modernize Spanish fleet of Chinook

Boeing has received an order to upgrade all 17 of Spain's CH-47D Chinook helicopters to the F-model configuration, adding features such as the digital automatic flight control system, common avionics architecture system and advanced cargo handling to align that country's fleet with those of other nations.

This is the first order from a non-U.S. customer placed through a contract Boeing and the U.S. Army signed in July. That contract covers six new F-models for the U.S. and options for up to 150 more Chinooks for U.S. and international customers. Deliveries to Spain begin in 2021."The Chinook is a versatile aircraft flown by eight NATO nations, including Spain," said Chuck Dabundo, vice president, Cargo and Utility Helicopters and H-47 program manager. "With this contract, Spain's Chinook crews will enjoy the platform's current technology and capability, while the country gets an affordable upgrade that builds on its existing H-47 investment."

The CH-47F is a twin-engine, tandem rotor, heavy-lift helicopter. In addition to the U.S. Army and Special Operations Forces, Chinooks are currently in service or under contract with 19 international defense forces. It can fly at speeds exceeding 175 mph and carry payloads greater than 21,000 lbs. In 2017, Boeing and the U.S. Army announced development of CH-47F Block II, which will incorporate a new rotor blade, redesigned fuel system, improved drivetrain and structural improvements to the fuselage.

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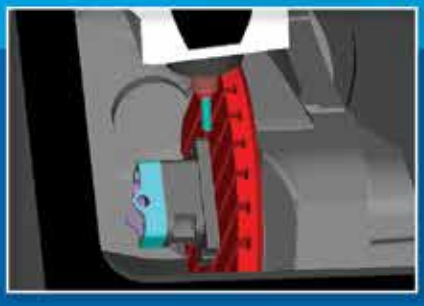

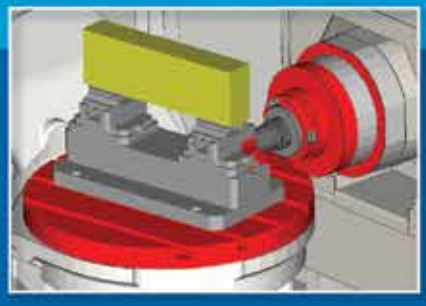

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Towards world-class manufacturing

GTW is aiming to grow the business through brand recognition, quality & reliability of its products says **Tosher G. Hormusjee**, Founder of the company.

By Swati Deshpande

Q GUSTI Tool Works LLP (GTW) was formed in 2015. Please tell us about the young company's journey since then.

GTW is based on our Global Unified Source for Technology Integration (GUSTI) vision. The foundation for this vision is built on the 'Technology Engine Creation' concept that brings together industry, academia, technology and entrepreneurs to develop skills and competencies, to deliver world-class manufacturing services and advances in technologies.

GTW had a challenging journey over the last four years from funding to setup. Phase I was completed by the end of 2017 with complete infrastructure and systems, and personnel, trained on Integrated Management Systems, conforming to global standards. We will take its standards higher in the first quarter of 2019 as we achieve Aerospace Standard AS 9001 rev. D, ISO 9001:2015 certification.

It is our aim to grow our business through brand recognition, quality & reliability of our products and services. GUSTI will prove itself on the Total Cost of Ownership (TCO) platform and not on L 1 pricing. The scope of supply is not limited to in-house manufacturing, but a robust supply chain of products and accessories outsourced from global leaders, which enables us to offer world-class solutions. Our product quality and performance is what manufacturers seek.

Q How has the year 2018 been for your company and what are your expectations for 2019?

We kicked off commercial production in 2018, which has set the stage for an exciting 2019. Our focus this year is to share our technologies and grow a viable market for quality conscious customers as a single source 'Complete Tooling Solutions' provider. While GTW has just entered the market, we are proud of our expert team and core members who bring in more than twenty years of industry experience to the table.

We are confident that our expertise and experience, along with our zero compromise philosophy (on quality materials and production processes) will hold strong.

During the past year, we have successfully implemented our OPTIMALER VORSCHUB programme at many client locations. This programme covers the entire machining process of a component and every single tool, including cutting parameters. The tool-life and re-sharpening cycle have been monitored with positive results which have extended individual tool usage and brought remarkable productivity to our clients. This on-going process will give us a sustained growth.

We plan to strengthen the team and intend to grow exponentially. We are confident that our expertise and experience, along with our zero compromise philosophy (on quality materials and production processes) will hold strong. Based on our performance so far and the momentum that we have built, we are very positive about 2019.

Q Which industries are driving the growth of the company?

The company's growth is driven by the servicing of high-precision and high-productivity manufacturing for aerospace, automotive, locomotive, die mould, energy, medical, and other precision industries. Most of our clients are export oriented, where quality is the primary factor. Our solution portfolio covers the entire range of cutting applications, including standard and special carbide tools, PCD tools, boring bars, milling cutters, holders and fixtures. To build our advantage, the company has tied up with many global majors. As high-quality manufacturing grows in India, we foresee greater customer demand for

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Our production is nearly paperless. RFID will soon replace even the one-sheet barcode printed process route card.

productive and efficient machining solutions to compete in the global market.

Please tell us about GTW's manufacturing facility.

Located in Bangalore, GTW's world-class facility features the latest and most accurate CNC machines and measuring equipment with automation. GTW products have 100% inspection and traceability. Our production is nearly paperless. RFID will soon replace even the one-sheet barcode printed process route card. Advanced processes and systems allow unmanned production even at micron levels for special as well as custom low-batch quantities.

The entire plant is connected to an industry-standard UPS system, in addition to a fail-safe generator backup. The shop floor space is designed in to install machinery at short notice with immediate plug-and-operate connections to air, power, coolant, exhaust, LAN and other IT infrastructure. The ergonomic layout ensures spacious pathways for smooth material movement to avoid damage, or disruption, or disturbing the flow of personnel traffic. We ensure fire safety is enforced in the first phase of training our teams. All workspaces, especially the shop floor, are brightly lit for safety and awareness.

Can you please throw light on some of the green manufacturing practices that you follow?

The GTW facility meets global standards in energy efficiency and eco-friendliness with active rainwater harvesting, centralized coolant, and airflow management systems to conserve our consumption and reduce our carbon footprints. GTW is in the final stages of certification for ISO 9001, 14001, OHSAS 18001, AS 9100 and other quality systems. We follow energy-efficient and conservative practices without compromising on any of our systems. Also, the plant maintains rigid noise discipline to help our trained professionals concentrate on their tasks.

Strengthening presence

Meeting customers is the priority at IMTEX says **Nisha Lobo,** Director, Alex Machine Tools.

Tell us about your key product displays at IMTEX

We are looking forward to IMTEX 2019. We will be displaying our full line of Surface Grinding machines - Reciprocating Table hydraulic Surface Grinding, Rotary Surface Grinding and Double Disk Grinding with NEW special features and specifications. We invite our customers and visitors to our booth and look forward to meeting them - this is always one of the most special benefits of participation.

Can you please tell us about one of the products that stand tall in the market?

One of the proven solutions that Alex Machine Tools provides is face grinding of Connecting Rods through Double Disk Grinding. Double Disk grinding is performed when both sides of a work-piece must be ground so that both surfaces are exactly plane and parallel. The work-piece is not fixed for this process, instead it is loosely placed in the 'pocket' of the work-piece carrier. Then both sides of the work-piece are simultaneously machined between two grinding wheels. The upper grinding wheel is adjusted with the 'tilt' setting, which allows the upper wheel to maintain the desired angle with the lower wheel. Thus, the gap between the grinding wheels is greater at the in-feed side than on the out-feed, resulting in the required amount of stock removal. Through regular dressing, the grinding wheels maintain their form and sharpness.

Year 2019 will be an exciting year for us as we will continue to strengthen our presence in the Surface Grinding market.

How has been the least year for your company?

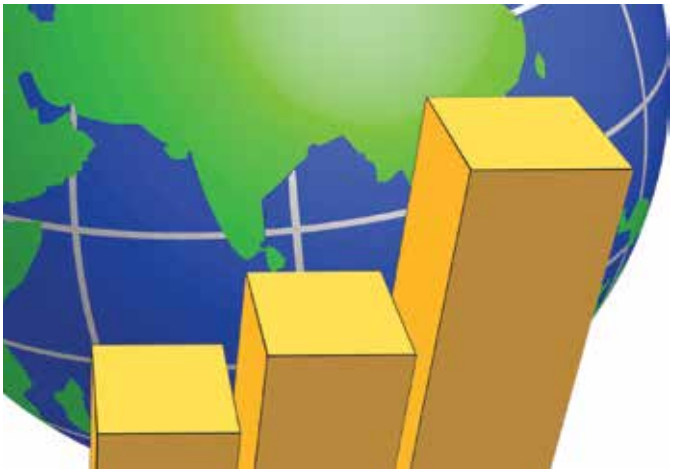
The last year has been exciting for Alex, as we have developed several Special Purpose machines successfully - examples include a 7-axis SPM for the bearing industry and a multi-spindle SPM for the Ferrite industry. Industry 4.0 and complete load, unload and gaging automation is an area that we have given special attention.

What are your expectations from 2019?

Year 2019 will be an exciting year for us as we will continue to strengthen our presence in the Surface Grinding market. The export market, new developments and extension of our full line of Surface Grinding will also be key focus areas for us in 2019.

Rising **confidence!**

India has the potential to grow at an average rate of seven percent or more in the next 12 months, says the FICCI-PwC India Manufacturing Barometer 2019



India Inc. is optimistic on the prospects for the growth of the economy in the next 12 months, foresees faster sectoral growth and expects future growth to be driven by export demand. This prognosis is held out by the FICCI-PwC India Manufacturing Barometer 2019: Building Export Competitiveness.

Puneet Dalmia, Chairman, FICCI Manufacturing Committee and MD, Dalmia Bharat Group, said "As Global trade has changed significantly in the last few years with new trade routes based on Global Value Chains (GVCs), we need to provide Indian exporters the opportunity to contribute to align with these global value chains. There are number of sectors where India can be truly global leader. India can globally lead in exports in number of sectors like textiles, automotive, chemicals, leather, metals and many more such areas."

The FICCI-PwC India Manufacturing Barometer survey was carried out from July to October 2018. The profiles of the personnel surveyed included chief executive officers, chief financial officers, chief operating officers and heads of strategy from the Indian manufacturing sector. The survey respondents represent a mix of companies engaged in exports with varied technology and human capital requirements. Large as well as medium-scale organisations were included in order to gain a balanced viewpoint on manufacturing and the export competitiveness of India's manufacturing sector.

The respondents contend one of the key reasons for faster growth is the focus on Ease of Doing Business and introduction of reforms such as GST that are opening new vistas for investments across the country.

"To cement India's status as a global export destination, India Inc. expects the Government to focus on business ecosystem reforms and the industry's integration with global value chains."

Most of the respondents believed that India has the potential to grow at an average rate of seven percent or more in the next 12 months. This is aligned with the projections of international development agencies such as the World Bank Group and the IMF.

The respondents contend one of the key reasons for faster growth is the focus on Ease of Doing Business and introduction of reforms such as GST that are opening new vistas for investments across the country. In the past, the manufacturing sector relied on the domestic market as the primary source of revenue.

The survey reveals the growing importance of exports to manufacturing companies in the future, with a focus on a good mix of parts - component trade along with end product trade, and the imperative to strategies for both types. Further, India Inc. seems to have begun placing greater emphasis on technology integration, including a renewed focus on R&D and innovation. To cement India's status as a global export destination, India Inc. expects the Government to focus on business ecosystem reforms and the industry's integration with global value chains.

Currently, over 65 percent of the companies whose CXOs participated in the survey have the Indian market as their major source of business. However, 85 percent of them believe that their future growth will be driven by export demand. This is in sync with India's export performance over the last 12 months. In FY 2017-18, India's exports grew by 9.8 percent, the fastest growth in the last five years.

An interesting observation from the survey is that the quality advantage being seen as the reason for driving export growth, ahead of cost advantage as the primary reason for exports. However, imports during the same period also grew by 19.6 percent.

The survey notes that to make export growth more sustainable, the industry requires an ecosystem that promotes manufacturing competitiveness and facilitates the production of goods of global quality standards at prices that are competitive. Stronger economic relations with certain countries in target sectors will enable the development of competitive supply chains beyond Indian borders.

Daimler Trucks to invest half a billion Euros in highly automated trucks

Daimler Trucks recently announced that it plans to invest EUR 500 million over the next years and create more than 200 new jobs in its global push to bring highly automated trucks (SAE level 4) to the road within a decade. Highly automated driving is characterized as automated travel in defined areas and between defined hubs without any expectation of the system that a user will respond to a request to intervene. In commercial trucking, level 4 is the natural next step after level 2, increasing efficiency and productivity for customers, cutting costs per mile significantly. In doing so, Daimler Trucks is skipping the intermediate step of conditionally automated driving (level 3). Level 3 automated driving does not offer truck customers a substantial advantage compared to the current situation as there are no corresponding benefits to compensate for the technology costs.

Highly automated trucks will improve safety, boost the performance of logistics and offer a great value proposition to the customers.

The new Freightliner Cascadia offers partially automated driving features (level 2), making it the first-ever partially automated series production truck on North American roads. Martin Daum, Member of the Board of Management of Daimler AG with responsibility for Daimler Trucks & Buses: "As a leader of our industry, we've been pioneering automated trucking. In 2015, our Freightliner Inspiration Truck got the first road license ever for an automated commercial vehicle. Now we take automated trucking to the next level: we're ready to launch the first partially automated new Freightliner Cascadia in 2019 – and next, we tackle highly automated trucks. Highly automated trucks will improve safety, boost the performance of logistics and offer a great value proposition to our customers – and thus contribute considerably to a sustainable future of transportation."

DMG MORI, INTECH sign agreement in the field of Additive Manufacturing; DMG Mori to acquire stake in INTECH

Recently, INTECH and DMG MORI signed an agreement in the field of Additive Manufacturing. DMG MORI acquired a 30% stake in INTECH, India, by integrating the SLM technology machines with the OPTOMET software from INTECH.

Committed to Additive Manufacturing and related software solutions, including machine learning and artificial intelligence for the Metal Additive Manufacturing industry, INTECH will soon release numerous solutions, aiding users with ease of machine operations and process control, producing quality components at optimized costs, thereby empowering customers to adapt this technology quickly.

Christian Thönes, CEO of DMG MORI AKTIENGESELLSCHAFT, says: "With INTECH we strengthen our global footprint in India and accelerate innovative development in Additive Manufacturing. First time right – that means being fast towards the first good part. We are actively pushing ahead with integrated series solutions along the whole process chain for generative manufacturing."

Commenting on the partnership, Sridhar Balaram, CEO of INTECH noted, "Leveraging synergies is key, and the collaboration is a perfect fit of hardware and software." He also added "OPTOMET can also be applied to other key AM technologies, such as Direct Energy Deposition and Binder Jetting. OPTOMET is a game changer for the whole AM market."

INTECH supplies software solutions not only for the LASERTEC SLM series from DMG MORI but also for other products and customers.

INTECH supplies software solutions not only for the LASERTEC SLM series from DMG MORI but also for other products and customers using powder bed technology. The new OPTOMET-software automatically calculates the optimal process parameters. This simplifies programming and results in a markedly improved surface quality as well as reproducible material properties. OPTOMET is a stepping stone towards accelerated industrialization of Additive Manufacturing.

Mercedes-Benz India records its best ever sales in 2018

Mercedes-Benz continued its lead in the Indian luxury car segment for the fourth year in a row by achieving its best ever sales number for the period January-December 2018. By registering a record sale of 15,538 units in the January to December 2018 period amidst strong macro-economic headwinds in H2, Mercedes-Benz sales volumes grew by 1.4 percent. Mercedes-Benz firmly maintained its strong lead on the dynamic Indian luxury car industry in 2018. Speaking on this occasion, Martin Schwenk, Managing Director & CEO, Mercedes-Benz India said, "We are satisfied with our sales performance in 2018 despite facing strong macro-economic headwinds in H2, resulting in low consumer sentiment that posed significant sales challenges. We however made a strong comeback in the Q4 period and were able to achieve a year-on-year growth. We are excited that we introduced new products and technologies in the market including India's first BS VI car two years ahead of the regulation, and also created new benchmark in the areas of customer service and retail experience, as underlined by the top ranking for Mercedes-Benz in the latest J.D. Power CSI & SSI studies.

Our product offensive strategy combined with our carefully crafted customer service and financial programmes bore fruits and helped us in winning over more customers to the brand, than ever before. We are also delighted to have crossed the mark of selling 15,000 units annually for the second consecutive year which underlines the trust and the loyalty of our customers across markets."

Jaguar Land Rover India grows by 16 percent in cy 2018

Jaguar Land Rover India has announced a growth of 16 percent for the period January to December 2018. With 4,596 units sold, Jaguar Land Rover India recorded its highest Calendar Year volume to date. The growth in Jaguar Land Rover sales in India has been driven by models like the Land Rover Discovery Sport, Range Rover Evoque, Jaguar F-PACE, XE and XF with over half of all sales in 2018 being driven by SUVs.

Rohit Suri, President & Managing Director, Jaguar Land Rover India Ltd. (JLRIL) said: "The auto industry faced strong headwinds in 2018, especially in the second half with tight liquidity conditions, increased upfront insurance costs and increased lending rates. Despite that, the growth of Jaguar Land Rover in India has been very encouraging for us and we continue to focus on strong product launches and an ever improving customer experience in 2019 for the two iconic brands, Jaguar and Land Rover. The year 2018 saw over ten product actions, chief among them were the launch of the Range Rover Velar, Range Rover Evoque Convertible, Model Year 2018 Range Rover and Range Rover Sport, Jaguar F-PACE in 2.0-litre petrol and the 50th anniversary Jaguar XJ50.

BMW Group India grows by 13 percent in 2018

BMW Group India delivered 11,105 cars (BMW + MINI) in 2018, registering a growth of 13 percent as compared to 2017. BMW India achieved highest ever sales of 10,405 units clocking 11 percent growth. MINI India accelerated with unprecedented growth of 66 percent with 700 units, further strengthening its position in the small-premium car segment.

By selling 2,187 motorcycles in the first full year of operations, BMW Motorrad India has successfully created a good demand. BMW 5 Series and BMW 6 Series Gran Turismo have contributed strongly to the growth story. BMW also saw significant contribution of upto 50 percent coming from the locally-produced Sports Activity Vehicle (SAV) range with strong contribution from the new BMW X3. Presently, BMW X1, BMW X3 and BMW X5 are locally-produced at BMW Group Plant Chennai. In 2019, the plant will also start local production of BMW X4 and BMW X7. The MINI Hatch and the now locally-produced MINI Countryman together commanded a share of over 60 percent in MINI sales making headway for its striking growth. BMW G 310 R and BMW G 310 GS led the outstanding growth of BMW Motorrad India with over 75 percent contribution to sales. BMW S 1000 RR, BMW R 1200 GS and BMW R 1200 GSA received good response.

The **Sunrise** sector!

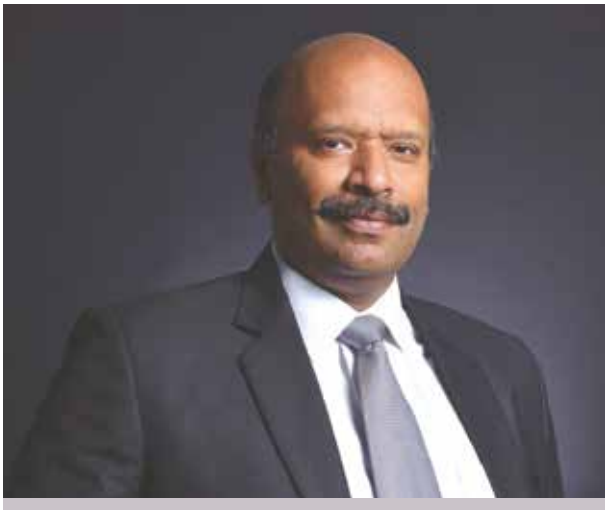
Agri-equipment domain is analogous to any other burgeoning gambit of business with persistent foreplay of product innovation and diversification; two constant factors defining the core characteristic of this industry.

By Srinivas P Kamisetty

Even from a tad bit retrospection into the history of human evolution, it is evident that the Agri-equipment industry is as old as civilization itself. Evidences of presence of farming equipment can be traced right from Stone Age. agri-equipment that were then a necessity have now developed into product specializations that have and will continue to evolve only to introduce their smarter generations. Hence this mechanization driven industry will remain a Sunrise-Sector, quite perpetually. As there will be a mere change in the techniques and the technology used from time to time. Similar to most other technology driven domains, the elementary factor bringing about this continuous progression will be 'Time'.

Progressing time brings forth fresh eyes that view technology or mechanization through a new perspective that is cognizant with their requirement; creating blue-print for innovation and technological advancements.

Several new perspectives will emerge and redefine the Agri-equipment industry for that particular point in time; a few prevalent trends that the millennial should watch out for are:



"Agri-equipment that were then a necessity have now developed into product specializations that have and will continue to evolve only to introduce their smarter generations."

Competitor Partnerships: Proliferation of technology has mandated changes in every sphere of business; behaving as an indirect catalyst to share knowledge and resources that were earlier safeguarded and almost considered criminal to exchange. Two different brands that would consider each other competitors less than a decade ago, are now cooperating and work together. A fine reference to this, is that of Toyota Motor and Suzuki Motor taking up cross-badging route in India. Under this agreement, the Japanese automobile majors have been manufacturing vehicles for each other in the Indian market enabling them to run their factories with better utilisation rates and therefore effectively reducing costs. Given that this trend has already made headway in the automobile industry, it is not far for its closest cousin, agri-equipment manufacturers industry to tread on it too.

The speed and the agility of agri-business in India has grown manifolds.

Cross Pollination: Departments and sectors that earlier had demarcation have shown inclination to blend with one another and adapt to best-practices or lead to the emergence of hybrids. GE (General Electric Co.) practices this very well.

> "Departments and sectors that earlier had demarcation have shown inclination to blend with one another and adapt to best-practices or lead to the emergence of hybrids."

It has a cross-company technical community at its research centres. One of their popularly quoted examples is that of the healthcare technology being deployed from their aviation factories to inspect new composite ceramic jet engine parts—without a human in the loop, among other such practices. With the increasing demand for agricultural produce that is directly correlated to mounting population growth, the speed and the agility of agri-business in India has grown manifolds. Hence cross-pollination of ideas, practices, technology and resources will be a game changing trend in the mushrooming Agri-equipment industry.

Technological Dominance: Unlike traditional agriculture that was human intensive the fresh leaf of this industry will predominately focus on Technology and highlight 'Ag-Tech' as the password to the New Age Agriculture. We see an emergence of Precision Agriculture and the usage of gadgets such as drones that are capable of monitoring and recording minute details such as stress on plants, irrigation, water management and plant population. This will further enable data collection by providing farmers insight into different areas of their farms need; rather than using a one-size-fits-all approach. Additionally, the task of applying fertilizer becomes more easy and efficient, for example, farmers can put resources where they are needed most and save on areas that may need less management. Considering that technological innovations are just at the onset, Agri-equipment players can now model or remodel their product offering to suit this new wave. It considers technology as the key pivot driving the agri industry, making tech-savvy amenities which were once a luxury, now a necessity.

In conjunction with the above trends several other events will feature in this budding agri-equipment industry such as job creation, mobilize investible resources, promote agricultural production, value- ads to farm products, attract start-ups, also play an active role in nipping the problem of rural immigration among the others.

To sum it up, agri-equipment domain is analogous to any other burgeoning gambit of business with persistent foreplay of product innovation and diversification; two constant factors defining the core characteristic of this industry. Such a dynamic industry which provides incessant scope for betterment and change will quite naturally reflect a surge in its life-cycle at any phase of time when it is being referred to.

The author is Founder, Paama Agrico.

Wohlhaupter India highlights new tools at IMTEX

Showcases two new cutting tools

Wohlhaupter India is excited to showcase two new cutting tool innovations at IMTEX: the NOVITECH vibration dampening intermediate module system and the 4TEX indexable insert drilling system.

Increase boring operations productivity, surface quality, and process reliability.

The NOVITECH vibration dampened intermediate module is the newest addition to the boring product line. The NOVITECH increases boring operations productivity, surface quality, and process reliability while extending the life of both the insert and the machine center's spindle. Mounted inside the patented NOVITECH system, the viscoelastically mounted damper modules reduce vibrations during the machining of diameters ranging from 50mm – 205mm (1.97" – 8.07"), with lengths up to 10xD. The NOVITECH intermediate modules feature Wohlhaupter's MultiBore system (MVS), making it simple to use with existing Wohlhaupter components while maintaining compatibility with any machine spindle.

Achieve higher penetration rates than standard twist drills for light duty machines.

Wohlhaupter India will also feature the new 4TEX drill, ideal for making shallow 2xD, 3xD, and 4xD holes in the 12-47 mm (.472" – 1.850") range. Industries working with a variety of materials – especially aerospace, heavy equipment, automotive, and energy industry applications – will benefit from the excellent chip formation provided by this drill's unique geometries. It is also an excellent choice for making interrupted cuts or drilling on angled surfaces. The new design even enables certain operations to be performed without initial milling of the surface.

Hall 1B / Booth B-102

The 4TEX drill's single effective cutting edge provides higher penetration rates than standard twist drills for light duty machines.

The 4TEX drill's single effective cutting edge provides higher penetration rates than standard twist drills for light duty machines. In this design, the center coolant outlet was eliminated to increase the drill's core strength, resulting in improved hole size and straightness. Instead, dual twisted coolant outlets were added to improve hole straightness and penetration rates by enhancing coolant flow and generating superior chip evacuation.

Insert geometries for standard ISO material categories improve hole quality and penetration rate, while eliminating issues from chips wrapping the tool.

4TEX inserts are 4-sided, lowering customers' cost-per-hole. The distinctive insert shape improves surface finish, hole diameter, and hole straightness by providing a superior balanced cut compared to ISO inserts. The drills are stocked in both imperial and metric shanks with standard fractional diameters, as well as every ½ mm diameter up to 26mm and every 1mm up to 47mm assuring fast delivery.

Wohlhaupter India Pvt. Ltd. provides engineering, technical support, and onsite application services within India for Wohlhaupter GmbH and Allied Machine and Engineering Corp., leading manufacturers of hole-making and finishing tooling systems.

Allied Machine and Wohlhaupter GmbH devote their advanced engineering and manufacturing capabilities to creating the widest selection of value-added tooling available to metal-cutting industries around the world. Allied Machine & Engineering's acquisition of Wohlhaupter GmbH in 2016 allows Wohlhaupter India to expand their product offering beyond precision boring solutions. This partnership empowers them to deliver the lowest cost-per-hole in a wide range of drilling, reaming, burnishing, and threading applications.

Source: Wohlhaupter India Pvt. Ltd.

Future of laser welding in industrial heavy applications

Now a days, Laser technology is widely used for welding of any materials. The fiber laser technology with stable high-power lasers from 4KW to 10KW has opened gate for the applications in thick metal welding of Stainless Steel (SS) & Mild Steel (MS). Even aluminium welding having applications in battery can be done successfully using laser technology.

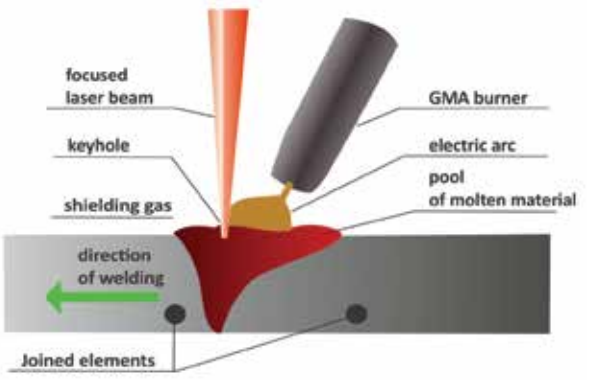
In fact, short wavelength laser welding systems enable us to weld the materials of more thickness than the conventional CO2 laser welding.

SIL has successfully developed applications of seam welding with no filler used for stainless steel with no porosity in weld material with 4KW fiber laser. Cut-weld-cut or weld-cut-weld system can be deigned as per application requirements.

SIL welding machine can weld 10 to 12mm thick metals with 10KW fiber lasers without filler material. However it is observed that autogenously weld require no or minimal gap between the two plates. If gap is uneven or more, the energy passes through the gap without heating the material. With this limitation comes a welding GTAW process or GMAW process with laser assisted welding.

SIL has developed systems that can weld thick materials, alloys & mild steel of 10 to 15mm of thickness.

Introducing the filler material into the weld area and laser



acting as a support to the weld pool make the welding process faster and smoother with minimal adjacent heated area. So for the applications that would require ten passes on weld tube, can be done with maximum of one pass or two pass welding.

Hybrid welding technology can be adapted to the areas of ship building, tank & pressure vessels, marine structures, pipeline and hydraulic power plant with technical expertise and application lab.

Source: SIL

Automation in fluid power engineering

In order to automate engineering processes in fluid power installations in hydraulics, pneumatics, cooling, and lubrication, there is a need for a solution with unique logic functions and automatic processes. A modern user interface with comprehensive drawing functions is required to keep the change an easy experience, to begin with.

The system needs to provide a connecting factor that generates all fluid connections automatically, can be given logical properties and analyzed. With an additional intelligence base, the process can become much smarter and faster. Since the association of connected devices remains even if individual symbols are moved, this could be the key to significantly ensuring safety– especially where numerous connections are in use.

The use of macro technology to bring together the symbols for a large number of variants or to save entire partial circuits – re-use, will ensure increased productivity, while separate symbol files for the various different fluid power engineering trades can assure ease of work and complete transparency.

Adding a fully automatic reporting process will add value in terms of the entire system being accessible real time. An efficient fluid system can generate separate reports for each discipline, once the parameters are set up for various criteria - pneumatics, hydraulics, cooling, lubrication etc.

Since most companies are now finding global expansion very desirable, localization of the processes in terms of easily translated foreign language terms is an added advantage. Maintaining and ensuring standards and compliances makes it globally standardized. To ensure interoperability, there is a need for it to be easily usable across Interdisciplinary applications in use. The system that provides all of these advantages is the workflow-based process of EPLAN Fluid, a perfect combination of 3D mechanical design, fluid power design and control technology.

For more info, contact: EPLAN
info@eplan.in

Drilling for profit

The innovative design of the SUMO3CHAM raises users manufacturing productivity to new levels

The global metalworking industry is driven by the relentless progress of high-end technologies that are becoming ever more sophisticated. The challenging requirements of advanced production equipment demands the provision of 'out of the box' advanced machining solutions. Innovative cutting tools release the latent productive capability of modern machine tools and deliver enhanced profits to users.

In order to comply with market demand, ISCAR recently exhibited its next generation, advanced indexable drill and further extended its comprehensive product portfolio with the launch of SUMO3CHAM – an advanced three flute indexable drill.

The innovative design of the SUMO3CHAM raises users manufacturing productivity to new levels by reducing machining cycle times by up to 50 percent when compared to the conventional two flute drills.

The new product's pocket configuration is constructed on a 'close structure' design with three contact areas based on a dove tail joint. This rigid clamping configuration divides the forces applied to the tools' pocket into three segments. This arrangement dramatically reduces harmful influences on the pocket's life and also substantially prolongs tool life.

In a similar way, the cutting forces are equally divided across the three cutting edges of the drilling head. The application of less pressure to each of the contact surfaces further extends the life cycle of the drilling head.

The combination of the self-centering geometry, along with a robust and accurate clamping system results in SUMO-3CHAM providing ultimate performances relating to hole cylindricity, roundness and enhanced productivity.

The entire machining process becomes much easier as the cutting forces are spread across 3 cutting edges, the drilling process is more stable and the penetration into the part's material is more balanced. Thus, users can work up to twice as fast, as the feed per tooth can be increased significantly. Alternatively, users can maintain the same feed per revolution as with a two flute drill and achieve much longer tool life.

The SUMO3CHAM clamping, which relies on three points of positioning, provides high levels of repeatability when replacing the drilling head. Three radial and 3-axial stoppers secure the drilling head and ensure a reliable drilling process in high feed machining environments. Furthermore, due to its sharp edges and the low axial force it applies, the SUMO3CHAM is very efficient when drilling a through-hole when the drill breaks through a slanted surface, also creating fewer burrs on the hole exit. Since the material work hardening is low, a reamer or a tap which may be used for a subsequent operation will gain from extended tool life and accomplish improved results.

The combination of the self-centering geometry, along with a robust and accurate clamping system results in SUMO3CHAM providing ultimate performances relating to hole cylindricity, roundness and enhanced productivity.

The unique geometry of the SUMO3CHAM self-centering head shapes the produced chips optimally to allow smooth evacuation throughout the three high helix polished flutes.

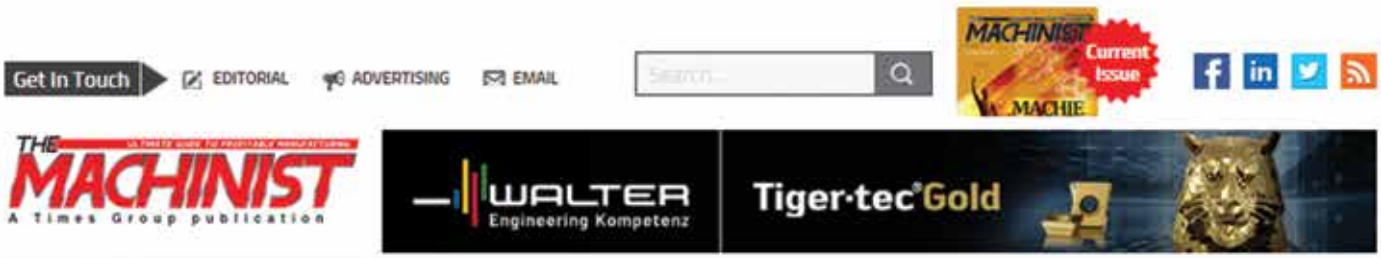
ISCAR maintains its proud tradition of designing user-friendly drilling systems for easy handling. These unique drilling systems eliminate the use of tightening screws to clamp the drilling head in accordance with the company motto 'No Set-up Time'.

SUMO3CHAM is now available for machining alloy steel, carbon steel, soft and gummy low carbon steel as well as cast iron.

ISCAR's vision is to remain the global metalworking market leader by the continuing work of its prolific R&D department and remaining aware of its customers evolving needs. Innovative developments allow the launch of products that bring manufacturers an array of efficient drilling solutions based on uncompromising quality.

Source: ISCAR

www.themachinist.in



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Augmented reality: The future of field service

By David Harris & Billy Hackett

Hall No. C, Booth No. C101

Phillips Machine Tools India is now utilizing the potential of augmented reality technology to improve training to its worldwide team of field service engineers, including initial training of new engineers and supporting seasoned engineers, while also directly supporting customers working on their own equipment.

The current challenge of training and supporting field service engineers is a perfect storm of increasing equipment complexities and a younger, less experienced workforce.

Phillips Corporation was founded by Albert Phillips in 1961 and was one of the original distributors for Haas Automation. Phillips now has more than 400 employees covering the territory from southern New Jersey south to the Florida border and west to Oklahoma, as well as the entire country of India. Phillips employs more than 100 field service engineers servicing equipment on site at customers' locations across these locations. More recently, Phillips has established two training facilities for field service engineers, one in Knoxville, Tenn., and another in Pune, India. Phillips has plans to meet the challenge of providing an ever-increasing competency development platform for all of their field service engineers.

The challenge: Provide the most effective service in the least amount of time

Phillips' training & support centers are hubs of knowledge faced with a constant challenge of seeing what is happening in the field today, with a variety of machines and customers, and then properly advising engineers and customers in real time as to how a machine can be serviced. The company understood that augmented reality technology had the potential to reduce machine downtime by reducing the need for onsite service visits and making the necessary visits more effective. AR can allow Phillips to directly see a machine in need of service & allow Phillips' technicians to instantly provide live guidance (through text & visual aids), resolving issues in far less time, even with less experienced engineers or customers.

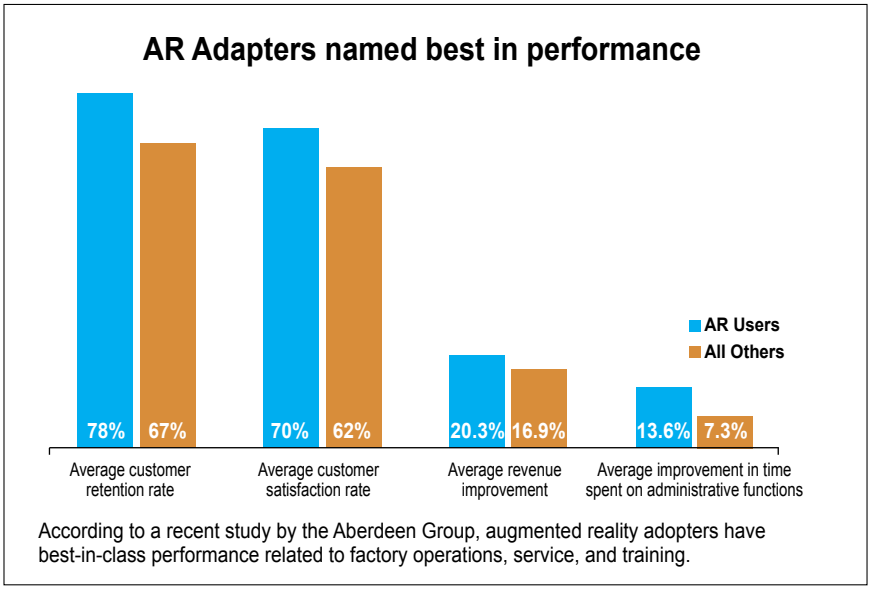
Augmented reality as a key part of the solution

Having studied all the AR options available in the market, it was clear to Phillips that no existing AR/VR program had all the functionality Phillips required until it was introduced to SimInsights, an award-winning software and services company based in Lake Forest, Calif. SimInsights develops education and business software by leveraging unique skills in software, math, simulation, visualization, and design. SimInsights transforms training, sales, service, production, and design by leveraging virtual and augmented reality, simulation, sensing, artificial intelligence, and machine learning across the totality of employee, customer, and product life cycles.

One of the innovative functionalities in Phillips Vision by SimInsights is the ability to define scripted procedures with text and images that can be downloaded into devices and wearables, such as smart glasses, and used offline when there is no phone signal or WiFi connectivity. The concept was introduced and field tested at the Smartforce Student Summit at IMTS 2018, where the idea was proven effective by utilizing a Haas simulator with students downloading a program, editing that program, setting the work coordinates and tool length offsets and verifying the program in graphics mode.

The company is excited to continue to explore the possibilities of what augmented and virtual reality technology has to offer in educating field service technicians, providing real-time, on-site service applications that create a positive ROI. Phillips Corporation will display this new technology at IMTEX in Bangalore, India, in January 2019.

David Harris is the Vice President, Service of Phillips Corporation and Billy Hackett is the Vice President, Business Development at SimInsights INC.



According to a recent study by the Aberdeen Group, augmented reality adopters have best-in-class performance related to factory operations, service, and training.

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Cut Clean Protect & Pack

Chemical Process Optimisation, Global HSE Norms & Next Generation Technologies

By Balwant Bains

Chemical Process Optimisation & CCPP Solution Engineering

Chemical Process Optimization is a methodology in which all the interlinking chemical process steps of a plant are optimally coordinated with each other all the way from the design and development to actual implementation. CCPP (Cut Clean Protect & Pack) Solution Engineering is a unique approach, which harmonizes technologies and expertise to create value. Typically in manufacturing, a component journeys through various stages of operations right from raw material to finished goods. The first and foremost common step is actual component manufacturing by metal cutting/removal or forming. Before dispatch to the customer, these components are rust protected and packed. To ensure efficient protection, the components surfaces need to be as clean as possible. All these operations involve usage of chemicals of diverse chemistries and at times several suppliers. Harmony between all these chemicals is crucial but often neglected till the time failures and rejections occur

The impetus is on the chemicals partner to provide a systematic approach in identifying and developing suitable solutions in tune with today's quality and environmental responsibilities.

Health, Safety & Environment (Global HSE norms)

Chemicals industry is one of the most regulated (REACH, GHS/CLP, OSHA) in terms of health, safety and environmental protection, as well as climate change and energy issues. The impetus is on the chemicals partner to provide a systematic approach in identifying and developing suitable solutions in tune with today's quality and environmental responsibilities. It can be seen in the metal working fluids technologies moving to products based on natural gas, the cleanest-burning fossil fuel which is affordable, available and environmentally acceptable.

Next Generation Technologies

Zavenir Daubert ensures that each CCPP (Cut-Clean-Protect-Pack) Solution results in tangible benefit to its customers in terms of Productivity & Value. Additionally, 100% elimination of performance & quality problems which have high costs associate with them. While these products meet the requirements of present times and near future, manufacturing technologies are evolving at a rapid pace. Market experts foresee rise in the demand for more environment friendly products, efficient process optimizations, maximum economy and globally consistent quality. Zavenir Daubert in collaboration with its international technology partners is committed to keep processes of its customers upgraded to the latest state of the art chemical technologies & processes. A few of the next generation technologies being introduced in India simultaneously with Europe & US are:

1. HAKUFORM® L Series NEAT CUTTING OILS based on NATURAL GAS, the cleanest-burning fossil fuel which is affordable, available and environmentally acceptable. These next cutting oils are designed to reduce hydrocarbon emission and increase efficiency with premium performance additives completely free of sulphur, organic nitrogen & aromatic compounds.
2. HAKUFLUID® WATER SOLUBLE CUTTING FLUIDS, water based fully synthetic - 100% oil free metalworking fluids with variable viscosity for different range of applications. These products are designed to give even better lubrication and tool life than neat oils.

Market experts foresee rise in the demand for more environment friendly products, efficient process optimizations, maximum economy and globally consistent quality.

To ensure efficient protection, the components surfaces need to be as clean as possible. All these operations involve usage of chemicals of diverse chemistries and at times several suppliers.

Balwant Bains, General Manager – Product Management & Marketing, Zavenir Daubert

The author is the General Manager – Product Management & Marketing at Zavenir Daubert

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Crankshaft Grinding

Highest precision for every crankshaft

The JUCRANK takes care of all grinding operations on crankshafts in a single clamping set-up. Whether single-stroke ultra-small or multi-stroke large-scale crankshafts – rough and finish grinding of crankshafts in all series sizes and wide-ranging geometries is possible using differently dimensioned platforms.

Highlights:

- High process reliability due to complete grinding in a single set-up.
- Optimum grinding quality due to automatic compensation of disturbance variables
- High dimensional stability due to in-process measuring system
- Flexible use for wide-ranging different cylinder numbers by CNC resetting
- Extreme smooth running due to dir ectly driven grinding and work piece spindles
- Optimum support provided with self centering thr ee point steady rests

Workpiece Spectrum

JUCRANK pendulum grinding machines take care of almost every conceivable crankshaft grinding operation. The main and pin bearing (cylindrical, concave, convex), thrust bearings as well as flanges and journals can all be ground in a single clamping set-up. Flat surfaces and radii can also be ground

The crankshaft is used wherever piston movements are converted into rotary movements. This means that there is a significant variation in size. Crankshafts ground using JUCRANK are used in applications such as:

- Vehicles
- Pneumatic and refrigeration compressors
- Power generation units
- Ships' motors and power plant generators

JUCRANK pendulum grinding machines take care of almost every conceivable crankshaft grinding operation.

- LARGE CRANKSHAFTS

Large Crankshafts

The JUCRANK 8 grinds crankshafts with a peripheral diameter of 470 mm and a clamping length of up to 4800 mm completely in a single clamping set-up. The crankshaft is supported by CNC-controlled steadies, measured following rough grinding and then selectively finish ground with the aid of the WK axis – all ensuring that only GO parts ever leave the machine.

Used-crankshafts

In the interests of sustainability: Used crankshafts can be reground. Using an automatic work cycle, whereas the crankshafts are measured in the machine and subsequently ground without operator intervention.

Coolant tracking

When using large grinding wheels, a CNC-controlled swivel motion of the coolant nozzles follows the pin along the grinding wheel at a constant distance. This guarantees optimum cooling, as the coolant is directed permanently towards the grinding zone.

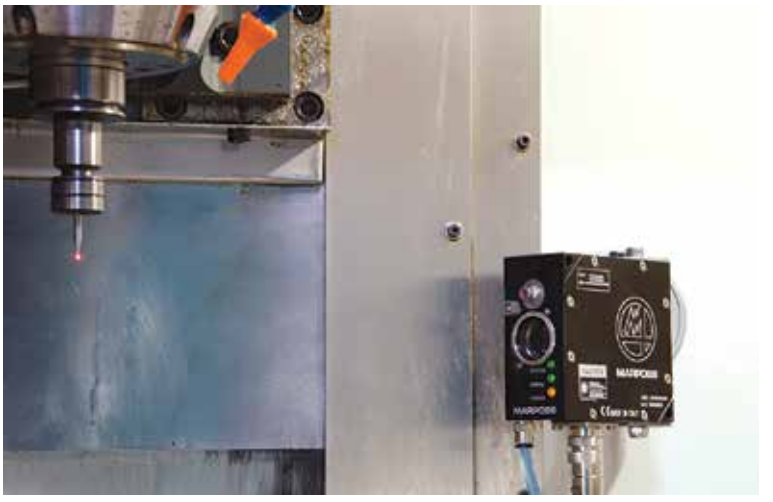
Source: Erwin Junker

Programmable system for non-contact high speed tool breakage detection

Fast and reliable detection achievable by the TBD allows to reduce production time

Industrial realities, where productivity represents the priority to achieve, aim to implement tool measurement solutions, which prove to be quick, accurate and reliable. Aware of such need and willing to develop an application that could avoid affecting production efficiency, Marposs presented TBD, the Tool Breakage Detector, a time-saving laser-based solution for broken tool detection on machine.

TBD on milling machines and machining centres permits to keep under control the process, thanks to a very short tool checking cycle. Fast and reliable detection achievable by the TBD allows to reduce production time and to avoid expensive work-pieces scrap due to wrong cutting process by damaged or broken tools. All functionality is contained within the TBD unit compact housing, which can be mounted outside the machine area, saving space on the table.



Fast and reliable detection achievable by the TBD allows to reduce production time and to avoid expensive work-pieces scrap due to wrong cutting process by damaged or broken tools.

It is possible to choose among different working modes, which endow TBD with a great flexibility. Switching the power to the maximum gives TBD the chance to recognize a tool placed at a longer distance (up to 2 meters), with a standard capability to check the breakage. If a smaller tolerance is required, the reduced power can be set obtaining a smaller beam. Furthermore, an user can choose the filtering level of the signal. In fact, during the checking cycle, some coolant drops could interrupt the beam or coolant stuck on the tool could create variation in the signal received. Setting "Hi Filter" makes the software of the TBD more restrictive in order to give the more reliable response. On the other hand, choosing "Low Filter" TBD responds in a faster way, as the filter is less severe.

Lastly, it is possible to choose the appropriate range of spindle speed, up to 5000 rpm.

The new TBD HS

Marposs S.p.A. has recently introduced the new TBD HS, High Speed, on its wide range of products for tool checking on milling machines and machining centers. The new TBD HS is a programmable system for non-contact checking hi-speed tools, particularly committed to those applications where there is the need for hi-speed spindles, up to 80.000 rpm.

Thanks to its rotary switch selector, the TBD HS is able to recognize the tool in two different ways, depending on the actual rotational speed, thus minimizing cycle times, generally crucial in this kind of process. Selecting "Quick Recognition", the tool checking is performed for 10.000 rpm spindle speed and its multiples; on the other hand, it is possible to choose "Hybrid Recognition" if the speed is 1.000 rpm and its multiples or 10.000 rpm and its multiples. With a reflective, clean tool an impressive 150 msec checking time is achieved, approximately half the time compared to the standard TBD.

High spindle speeds and small tool dimensions lead to the need for a fine adjustment for positioning the TBD HS in a very precise way: that is the reason why an effective system has been designed to make accurate and easy the searching procedure of the tool verification position. Once TBD installed and tool approximately pointed, now is even more quick and simple to optimize the laser beam and to find the checking position.

The tool breakage detection performed by the TBD HS is improved by the presence (upon request) of a blower for cleaning the receiver glass: taking advantage of the usual standard inlet, both in terms of air flow and pressure, it has been developed a solution able to protect the glass from swarf and scraps without increasing the air consumption. Moreover, when the conditions are particularly harsh because of the aggressive presence of shavings, there is the chance to substitute the standard protection glass with one in sapphire crystal: being 9 out of 10 its hardness degree on the Mohs scale, this kind of protection lets the receiver performance always at its maximum, no more damaged by the extreme machine conditions.

Source: Marposs S.p.A.

New requirements for machine safety in Industry 4.0

Industry 4.0 would be inconceivable without functional machine safety. But the digital transformation poses new challenges for experts in safety technology.

By Siegfried Rüttger

One of the key objectives of Industry 4.0 is improved efficiency, which can be achieved through predictive maintenance, for example. This should also enable improved production planning, longer running times and increased machine availability. This requires the components used in the machines to be able to generate data and information. Based on the machine and production data read on an ongoing basis, predictions can be derived on the status of the system. As a rule, these are used to plan service intervals, avoid or minimise production downtime and maximise production turnover. A prerequisite for this is that safety switches can also pass on diagnostic information. This is already happening, one example is RFID-based safety sensors which allow high levels of tolerance to door offset. If the offset limits are reached, the sensors issue an electronic warning signal before the machine shuts down, thus providing information which can be used for preventive maintenance.

Networking is another important element of Industry 4.0: machines and intelligent workpieces will be able to cooperate. Machines and transport systems should be able to make autonomous "decisions" as to whether a subsequent production stage should be delayed or if another welding robot should take over in the event that one fails, for example. Converting production systems or machines to manufacture different product variants should also be possible on an automated basis without interrupting production processes. New safety engineering solutions need to be developed for these changing production methods.

Networking is another important element of Industry 4.0: machines and intelligent workpieces will be able to cooperate.

Dynamic safety solutions

While production previously involved integral system, the safety technology of the future needs to respond to dynamic production units by providing solutions which are just as dynamic. Machine safety functions will therefore increasingly be implemented using programmable safety controllers.

The modular safety controllers in the PSC product range from Schmersal provide the option of configuring flexible custom safety systems on a software basis. There is also safe communication between different PSC controllers via Ethernet SDDC (Safety Device to Device Communication). This simplifies the design of complex, multi-part plants with interconnected safety sub-systems. In these systems, individual production cells can communicate with one another for safety purposes.

Another advantage of the PSC range is the option of forwarding additional non-secure diagnostic signals via a standard bus system to another automation controller or the IT environment. This means, for example, signals can be evaluated which are relevant to the avoidance of downtimes and increasing plant availability.

Economical solutions for small and medium-sized machines

Of course, the economic viability of safety solutions also needs to be taken into consideration, and not all machines are complex systems. For small and medium-sized systems where the user does not wish to use a bus system at the sensor/actuator level, the Schmersal Safety Installation Systems with an SD interface are a simple installation solution for series connection. This means that non-safety-related diagnostics signals can be transmitted to a standard

PLC via the conventional fieldbus system such as Profibus. The new multi-functional relay modules in the Protect SRB-E range from Schmersal offer cost-effective solutions which can be used in a wide range of applications. Each module has multiple functions, so the customer can simply select the application or function they require. At the same time, Schmersal has a comprehensive range of safety components with built-in AS-i interface. All the major ranges from Schmersal are available with AS-i safety hubs. The benefit of the AS-i safety solutions is that they enable extensive diagnostics options despite minimum cabling.

Standardisation: Safe data via OPC-UA

In the future, machines will be able to send safety-related data to a cloud on a predictive basis. The problem lies in the fact that different protocols have been used in the past for communication between two devices in industrial automation, and these protocols are not compatible with one another. In order for controllers to be able to exchange data with one another and with the cloud, companies are working on integrating OPC UA as the standardised protocol for data exchange in the next generation of their products.

The Schmersal Group also considers OPC UA will be the future standard for M2M communication protocols, as it not only transports machine data but also allows a semantic description of the data. Although the exchange of non-safety-related data has largely been successfully standardised in line with the OPC-UA model, there is still a need for standardisation for the transfer of safety-related data via the OPC UA protocol. Schmersal is in favour of a joint approach by all manufacturers in the machine safety sector.

In the future, machines will be able to send safety-related data to a cloud on a predictive basis.

The benefit of primarily software based safety solutions are clear: in the future, all safety-related data can be transferred to a cloud and collected there, for example, technical data from sensors, reaction times, safety-critical failure rates, etc. This allows a higher-level computer to analyse the current risk based on this data and determine the measures to be taken to reduce this risk. This will allow future safety solutions to be simply adapted to flexible, dynamic production units and machines.

Adapting the standards to Industry 4.0

But all this is still in the future. There are some hurdles to be overcome first. For example, increases in software-based safety solutions will lead to another group of personnel, the programmers, having to get to grips with the subject of safety. Many design engineers have already been trained in the current hardware solutions in the safety technology sector. This has led to a reduction in error frequency. Machine manufacturers and users implementing safety-driven software solutions also need to familiarise their IT experts in the safety requirements. Clear standards and regulations are helpful in this respect. The amended DIN EN ISO 138491-1:2016 does not include detailed quantifiable aspects such as error prevention in development and in software. However, further development and adaptation of the standards is necessary in order to take the new requirements of Industry 4.0 into consideration. In all cases, strong knowledge transfer is necessary around the topics of machine safety and Industry 4.0. The Schmersal Group has considered this development with the foundation of its services division: "tec.nicum" offers machine constructors and operators not only training and manufacturer-neutral advice, but also programming of the safety software.

Knowledge transfer and use cases

In order to support machine manufacturers and users on the introduction of digital future technologies with automation and safety-driven solution strategies and provide expert advice, Schmersal has set itself the objective of permanently expanding its own expertise. It is especially important for experts in machine safety to be at the cutting edge of technology. In order to achieve the best possible safety solution from an economic perspective, machine safety specialists should be involved as early as the design phase of machine and plant construction. As a member of the ZVEI, the VDMA and the initiatives "Mechanical Engineering Future Alliance" and LNI4.0 Labs Network Industry 4.0, the Schmersal Group can benefit from information exchange in these interdisciplinary expert and working groups made up of representatives from mechanical engineering, applied research and the supplier industries. The companies in these networks also work together on specific use cases.

The author is the Project Manager for Industry 4.0 at the Schmersal Group

SmartLine modules

High-performance edge computer as standard with new series

Recently The CHIRON Group presented the latest modules in its SmartLine range – TouchLine, ConditionLine and ProtectLine. "In so doing, we are pushing forward resolutely with our concept of modular software solutions, which are aimed at utilizing the full potential of digital manufacturing," explained Dr Claus Eppler, Head of Research and Development at CHIRON. "Here, economic added value for our customers is our main focus."

TouchLine offers context-sensitive information

The new TouchLine operating system guides the user step by step through the use of their machine, adapting its interface depending on the task and the context. If required, the full machine documentation can also be called up on the 24" panel. TouchLine can be operated intuitively and interactively with the same familiar motions as for smartphones and tablets: Press, drag and swipe. The user receives further support in the form of condition messages, which display critical parameters, detect causes and suggest rectification solutions. Visitors to the trade fair can experience and trial TouchLine on the new CHIRON FZ16 S five axis and DZ16 W, as well as the MT 733 two from STAMA, directly at the trade fair stand.

ConditionLine monitors the machine condition

The ConditionLine software module monitors and analyzes all machine components that are required for reliable operation. This means that atypical operating behavior and signs of wear are detected early on. The advantages of this are that maintenance and repair work can be systematically planned, a preventative measure which helps to avoid costly production downtimes.

Collision prevention with ProtectLine

ProtectLine employs preventative measures to protect against collisions in all types of operation. To achieve this, the new FZ16 and DZ16 machining centers have a "digital twin" which exactly replicates the real machine. During operation, the digital twin runs 0.8 seconds ahead of the real machine. Any threat of collision is detected and the machine is brought to a controlled stop, preventing any potentially significant damage.

The current modules are additions to the SmartLine range from the CHIRON Group, comprising process- and machine-oriented solutions. "In contrast to traditional software companies, we take a line of action known as the 'relevant data' approach," explained Dr Claus Eppler. "Our expertise in machine engineering and our many years of experience were key to our developing SmartLine software solutions. We are coming out with tailor-made solutions that help our customers to keep on increasing productivity and machine availability," he added.

The new "TouchLine" operating system guides the user step by step through operation, adapting its interface depending on the task and the context.

The SmartLine modules ensure process reliability, higher productivity and production optimization

Edge computing supports local processing and platform connections

The new machining centers come with high-performance in-

dustrial PCs as standard, meaning that data can be collected, stored and processed locally – without an external connection. In addition, customers gain further added value through an option to connect to conventional production control systems or global cloud-based platforms. For example, a user can create an overview of their different production sites or carry out statistical analyses, which enable them to plan systems maintenance and repairs even more effectively. In every situation, the user has complete control over the data that is generated and they can decide what data is released to whom and for which machines. The combination of these ideal SmartLine modules, plus the option of connecting to local systems or global platforms, offers the right solution for every application.

Active player in digitalization initiatives

Aside from developing in-house software solutions, the CHIRON Group is actively engaged in digitalizing machine tool construction. This is why it is a central member of an initiative for networked production run by the German Machine Tool Builders' Association (VDW). The objective is to achieve a standardized connection between different machines and control units. In addition, the Group is also a founding member of a user organization initiated by Siemens, known as "MindSphere World", for the cloud-based open IoT operating system "MindSphere".

"We are pushing forward resolutely with our concept of modular software solutions, which are aimed at utilizing the full potential of digital manufacturing."

Dr Claus Eppler, Head of Research and Development at CHIRON

Source: CHIRON Werke GmbH & Co. KG

UPDATE

Godrej delivers world's tallest CCR Reactor

Godrej Process Equipment, a unit of Godrej & Boyce Mfg. Co. Ltd., has shipped one of the World's tallest Continuous Catalytic Regeneration (CCR) Reactor to Dangote Oil Refinery, Nigeria. With its height measuring a gigantic 95 meters, the CCR Reactor weighs approximately 703 metric tonnes, nine times heavier than a space shuttle.

With the completion of this order, Godrej has further strengthened its position as a technology and innovation driven company that has been continually contributing towards making the nation.

CCR is the key process in oil refinery converting low value naptha to high valuable products like Petrochemicals and Gasoline through various reactions such as Dehydrogenation, Aromatisation, Isomerisation, Dealkylation, Dehydrocyclization. The CCR Reactor is a tall column like equipment with continuous moving catalyst. Very stringent tolerances are required to be maintained for installation of reactor internals. The equipment being in Hydrogen service, calls for a very critical metallurgy viz. Chromium Molybdenum Steel, which leads to a very complex fabrication requirement.

Speaking about the achievement, Jamshyd Godrej, Chairman and Managing Director, Godrej & Boyce stated, "We have always been in the forefront of adopting technology to offer the best-in-class solutions to our customers. The manufacturing of this complex reactor, the tallest in the world, and the shipping of it in a single piece is a matter of immense pride for us. It is a testimony to our company's vast technological expertise and also showcases Indian engineering capabilities. The successful manufacture of this equipment only adds to the achievements of Godrej & Boyce and its global footprint."

"The CCR Reactor is a tall column like equipment with continuous moving catalyst. Very stringent tolerances are required to be maintained for installation of reactor internals."

Adding to this, Allen Antao, Executive Vice President and Business Head, Godrej Process Equipment said, "Godrej Process Equipment is a leading global fabricator of high end critical static equipment for the Process Industry. For several decades now, customers from around the world have come to rely on Godrej for their operationally demanding equipment needs. The CCR Reactor built for Dangote's Refinery in Nigeria is the latest in the long list of capability challenging equipment built by Godrej."

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Issue 04 January 2019

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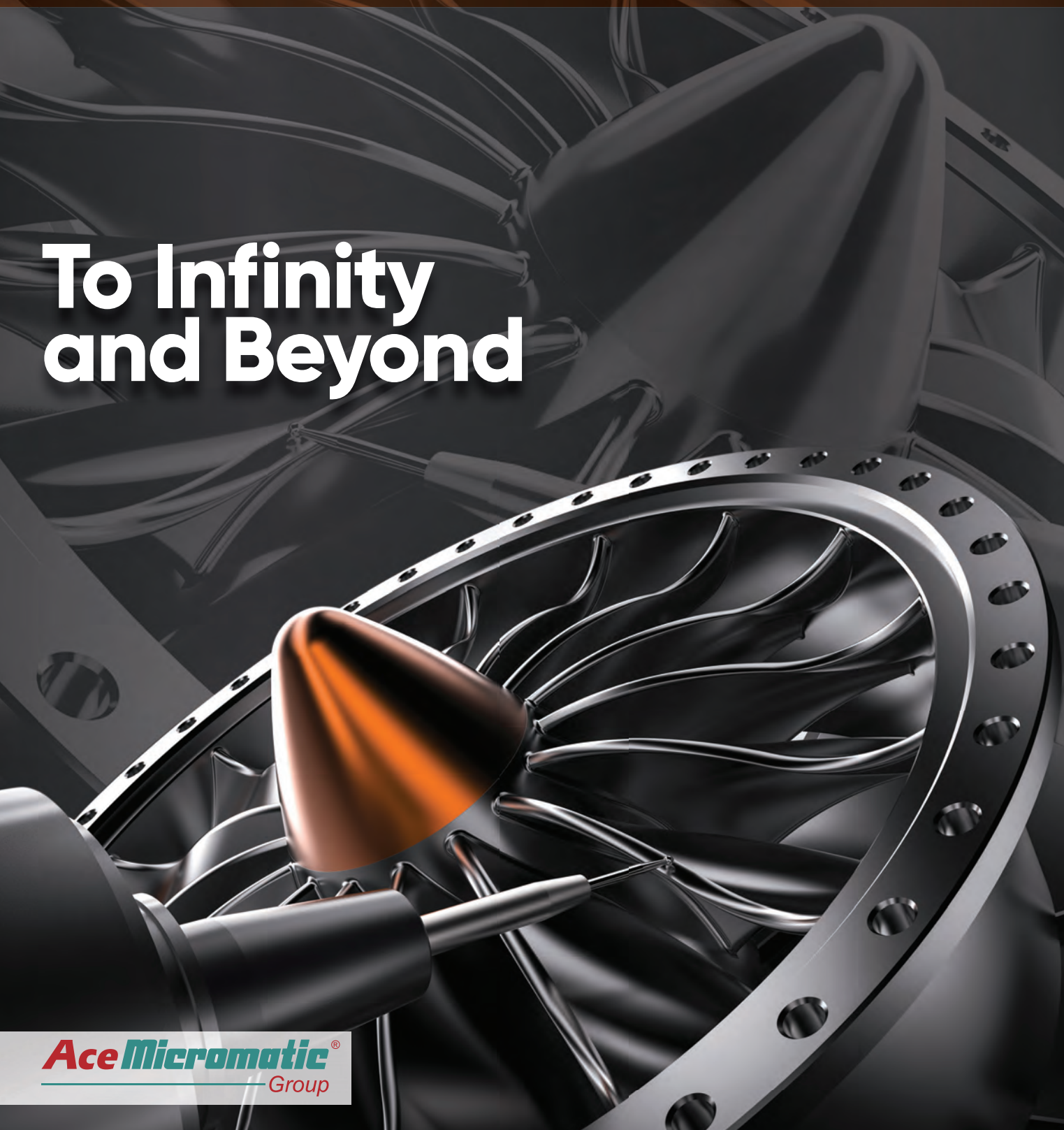
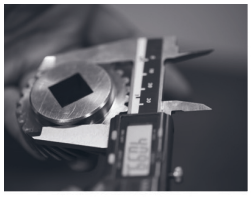
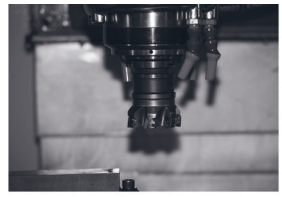
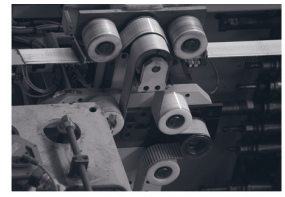
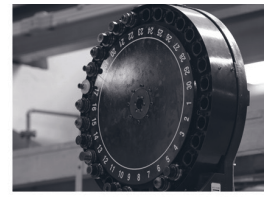
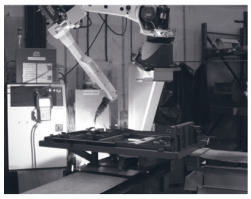


Ace Micromatic® Group

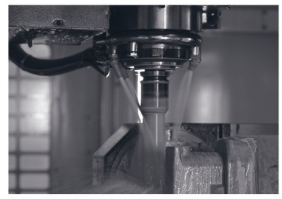




ACE® DESIGNERS

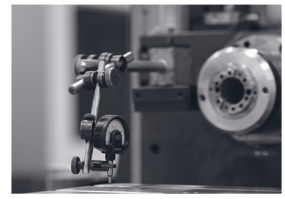
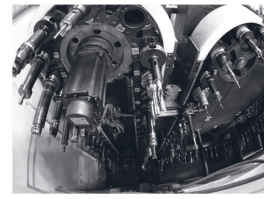
Turning solutions



AMS®
In Pursuit of Excellence

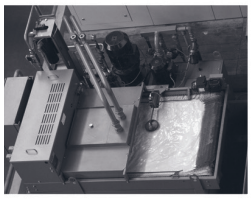
Milling solutions

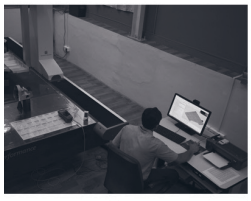


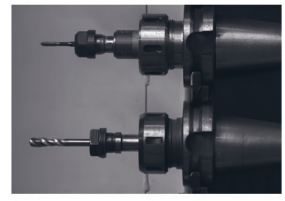




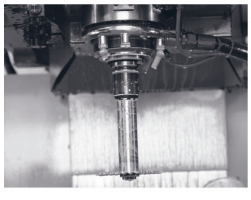

ALL YOU NEED IN MACHINING





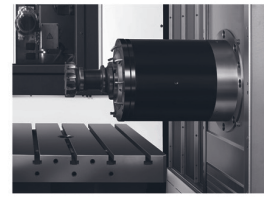



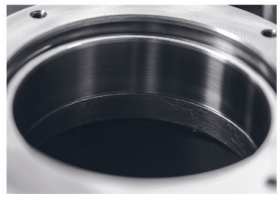
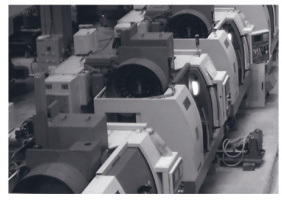
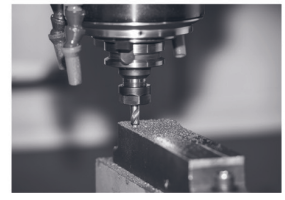
AmiT

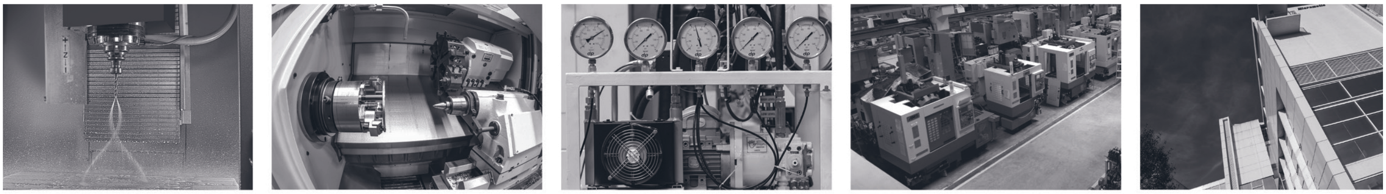
Industry 4.0
& IoT solutions

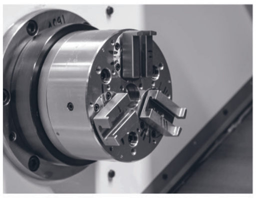
PRAGATI

Automation solutions





Micromatic Grinding TECHNOLOGIES LTD.

Reliable customer friendly grinding solutions

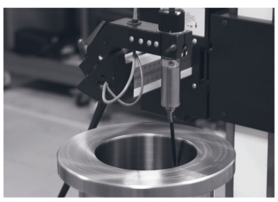
Grinding solutions

Micromatic

Sales & service

TAURUS

Special purpose machines



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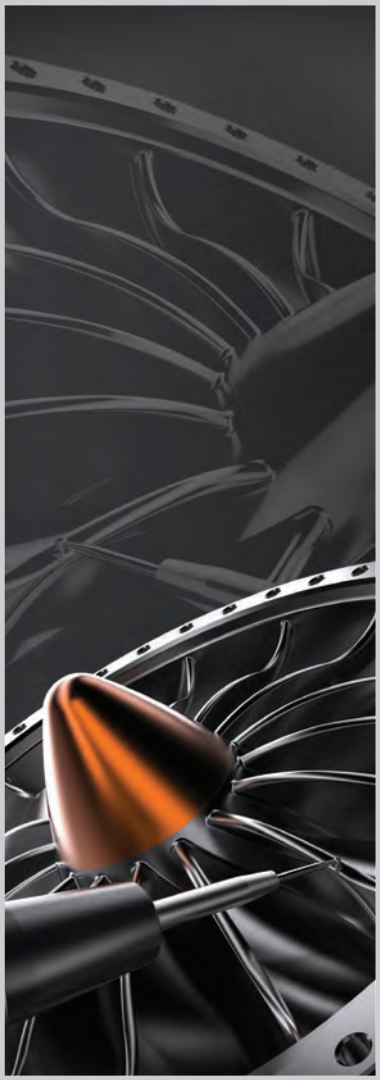

Ace Micromatic Group is constantly striving to raise its bar in its endeavour to aid its customers from the Aerospace sphere to achieve the extreme precision the industry demands. Its stellar products and services are a reflection of its consistent innovation and the intention to go beyond the infinity and reach the unreachable.

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New Beginnings are in Order

Hello!

2018 was a great year for the manufacturing industry in India that presented us with many possibilities to integrate globally. However, there remains a lot to catch up with and meet the challenges strewn along the way. For this, it's crucial that we break away from our usual ways and adopt a fresh perspective on manufacturing. IMTEX 2019 offers just the right opportunity to do so.

Smart manufacturing is also people-oriented and helps people do their jobs better.

This IMTEX, the Ace Micromatic Group has its presence in two halls – the new Hall 5 houses all our metal cutting solutions in turning, milling and grinding and Hall 6 showcases our additive and IoT solutions.

Smart manufacturing, estimated to become the next industry revolution or Industry 4.0, is slowly being embraced by the Indian manufacturers owing its multi-fold benefits. It helps companies set up traceability in the supply chain to provide the information needed to ensure suppliers are operating in a productive, transparent and sustainable way. By faster data gathering, processing and communication, smart manufacturing also enables agility, leading to faster decision making.

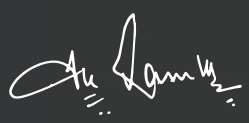
Smart manufacturing is also people-oriented and helps people do their jobs better. For example, providing factory operators with machine interfaces that deliver production and quality data allows them to act in real-time to address slowdowns or quality variances. Delivering information to procurement executives about a hitch in a critical supply chain enables them to quickly ramp up alternative sourcing.

When you provide everyone in your company with access to the data they need to solve problems and empower them to use it, you change the mindset of everyone in your company. They no longer simply do what they're told to do. Rather, they engage in continuously improving work practices to eliminate waste and drive value.

With these aspects in mind we are working on the theme of "Smart Manufacturing is Smart Leadership" in our endeavours with our customers this year.

This CNC Plus, we spotlight on Ace Micromatic Group's progress with the growth of Indian aerospace industry. The domestic aerospace component manufacturers are scaling up, offering us an opportunity to serve them and test our capabilities. We extend our gratitude to them with a promise to continue doing our best going ahead.

Hoping to meet you at our booth at IMTEX 2019 and wishing you a very happy, healthy and prosperous new year!



T K Ramesh
Managing Director and CEO
Micromatic Machine Tools

Source: Magic Wand Media

Auto sector to attract $8-10 bn FDI by 2023

New Delhi – The country's automobile sector is to attract around $8-10 billion in local and foreign investment by 2023 predicted the Ministry of Heavy Industries & Public Enterprises in the 'Year End Review 2018'. The sector attracted $16.5 billion in foreign direct investment (FDI) between April 2000 and December 2016.

"The growth of the automotive industry in India since the early 1990s is a shining example of how industrial prowess supported by progressive policies and national economic growth can yield rewards to all stakeholders," the review statement said.

"The advantage of experience, scale and expertise of Indian automotive companies along with the stimulus of high domestic demand provides the domestic industry with a unique opportunity to achieve global leadership in both manufacturing and engineering, especially in emerging areas," it added.

As per the review statement, the sector's contribution to the total GDP is 7.1 per cent and it provides employment to about 32 million people, directly and indirectly.

India needs indigenisation in Aerospace electronics

Hyderabad – Aerospace and Defence sector electronics consumption is high in India but the domestic production is negligible, particularly in the advanced or specialised electronics space, said Venugopal Menon, Senior Director, Society of Indian Aerospace Technologies & Industries (SIATI).

"Most of the material needed to make electronic systems is all imported and small and medium enterprises (SMEs) in India cannot afford to procure such expensive material to make electronics. So, only large Indian companies are in this space. ISRO is looking at ways to address this in order to enable SMEs to get into electronics manufacturing," he added.

The import component in many of the systems and sub-systems that the Indian defence wings use is estimated to be over 60 percent at present. SIATI has been encouraging Indian companies for tie ups within the country and also with overseas companies.

Manufacturing continues upward trend

Mumbai – According to the RBI, the manufacturing sector, particularly textile and iron and steel segments, has maintained a steady pace of sales growth in the second quarter of 2018-19 as compared to the period in the previous year. Demand condition in the manufacturing sector retained the pace in the September quarter of 2018-19 as supported by strong sales growth (year-on-year) as per the RBI analysis of 2,700 listed private sector non-financial companies. The data of abridged financial results of 1,734 companies indicate that the manufacturing sector posted a net profit of ₹47,100 Cr in the reported quarter, up 29.4 percent from the same period last year. "The manufacturing sector sales growth was mainly supported by robust demand conditions in chemical and chemical products, iron and steel, and petroleum products industries coupled with significant improvement recorded by textile industry," the RBI said.

Innovation is in the Air

Expert Opinion

S Sekhar Vasan, Chairman & Managing Director, Sansera Engineering Pvt Ltd, the leading manufacturer of high-end aeronautical parts, proffers his take on the opportunities and advantages India has to become one of the major destinations for the Aerospace sector.

To meet the stringent demands of aerospace sector, right talent and training is highly crucial and so is a strong ecosystem to strengthen the entire value chain. Kindly share your views on this.

Mr Vasan: The standards and requirements of OEMs and Tier 1s in the Aerospace sector are different from Automotive or other sectors. It again varies from one OEM / Tier 1 to the other. It is a huge challenge to meet these requirements where a complete ecosystem has to be in place like special processes such as surface treatment or heat treatment with the necessary approvals from the respective OEMs or Tier 1s. Today machining is not a big challenge to the Indian companies because we can import best of the machines for the right application. Machining knowledge is also well advanced in the country. The biggest challenge is developing and retaining the right skill set, which involves training, technology transfer and decades of experience. Added to this is the sourcing of the raw materials from the approved mills. This is mostly imported today because we do not have any approved mills in the country to source these raw materials which is again a factor where we lose our competitiveness. All this makes it more sensible to form a cluster to develop a complete ecosystem.

Source: AMG

As a manufacturer of high-end aeronautical parts / products please share your thoughts on what kind of technological upgradation is required by the Indian machine tool builders to subsequently facilitate meeting your high-precision requirements?

Mr Vasan: There are a number of things that can help us move up to the next level including high-speed machining with required accuracy levels; large stroke 5-axis machines; better spindle technology to ensure continuous machining; accuracy; reliability and special purpose high-end machines.

What are the emerging trends in the Indian industry?

Mr Vasan: Going green is a growing trend. Hence, there is an increasing adoption of environmentally friendly practices in facilities such as fluid-free cutting. Smart manufacturing is another trend which will help us compete with our global peers on an equal footing. The advantages that it offers will help us significantly.

> The business opportunities are quite promising in the Aerospace sector in India because most OEMs and Tier 1s are looking at low-cost countries as the drivers for cost reduction and capacity build up.
>
> **S Sekhar Vasan**
> **Chairman & Managing Director**
> **Sansera Engineering Pvt Ltd**

How do you foresee the growth of aerospace machining in India?

Mr Vasan: The business opportunities are quite promising in the Aerospace sector in India because most OEMs and Tier 1s are looking at low-cost countries as the drivers for cost reduction and capacity build up. This is a big task for them today because the aircraft run rate is increasing. India, known for its engineering capabilities, fits well into this requirement with an advantage of huge engineering man-power available to encash this opportunity. Major OEMs and Tier 1s have already started tapping this resource and reaping its benefits. Going forward India is going to be one of the major destinations for the Aerospace sector. CNC Plus

Cover Story

To Infinity and Beyond

Counted among India's sunrise industries, the Aerospace industry is well known for its stringent aesthetic, functional and design requirements. In their endeavour to fulfill them and make the best of the opportunities, the component manufacturers of the industry have found an ally in the Ace Micromatic Group, owing its slew of cutting-edge machining tools.

Source: Magic Wand Media

Source: AMG

An AMG Machine at work at Sansera Engineering Ltd

The Aerospace industry of India is brimming with opportunities and undergoing transformation of a colossal kind. The rapid growth of airlines and passenger traffic in the past five years has led to an unprecedented demand for new airplanes. In India alone, it is at over 15 percent per year, increasing from around 70 to 200 million passengers in the past 10 years in domestic and international air travel.

With the positive trend consistently on the rise, the Aerospace and Defence (A&D) market is estimated to reach around $70 billion by 2030.

Components manufacturing

A single commercial aircraft needs around 2 to 4 million components. Hence, the rise in the number of airlines and aircraft spells favourable opportunities for Aerospace component manufacturing for India.

With its gamut of advantages comprising low production costs, developing infrastructure, the Government's investor-friendly policies, leading information technology and engineering services, manufacturing expertise, and a huge pool of semi-skilled manpower, the country is being viewed as a competent player in the global supply chain for Aerospace components and parts. We have become an attractive destination for the foreign Aerospace component manufacturers such as Mach Aero and the Trelleborg Group to forge alliances with Indian firms for the manufacturing of Aerospace related parts and assemblies for commercial and defence aircraft and helicopters.

Sensing opportunities, our home-grown automotive component manufacturers such as Maini Precision Products and Sansera Engineering Ltd have also forayed into Aerospace sector, developing India as a preferred location for aero structures, components, sub-assemblies and complex system assemblies.

Optimism among Indian machine tool builders

The proliferation of Aerospace manufacturing companies in India has provided impetus to the local machine tool builders such as the Ace Micromatic Group (AMG) who have upped their game to deliver world-class high-productivity, high-accuracy yet cost-effective machining solutions. They have the capability to adhere to stricter norms in the Aerospace safety, where quality control takes the driver's seat.

Having incorporated state-of-the-art technologies to bring in the requisite efficiency, precision and quality, the local players are equipped with the tools specifically designed to machine light and strong components made of exotic materials and special alloys such as Aluminium, Titanium, Inconel and Waspaloy that can withstand extreme temperatures and pressures.

Furthermore, their proximity helps in procuring faster after-sales and maintenance service of their machines.

Source: AMG

Trelleborg team with AMG machine

❝We started with buying two Turning Centres from AMG in 1997. Today, we have 59. We too have scaled from two machines to several hundred machines. We have grown together. AMG is an integral part of our growth story.❞

Raghavendra Nagaragadde
General Manager
Trelleborg Sealing Solutions, Bengaluru

Partners in growth

The Ace Micromatic Group, comprising Ace Designers, Ace Manufacturing Systems (AMS), AmiT, Micromatic Grinding Technologies (MGT), Pragati and amace solutions, is making the most of this opportunity by catering to the growing Aerospace sector's complex needs with its wide range of CNC cutting tools including CNC Turning Solutions, CNC Machining Solutions, and Grinding Solutions etc.

Among its awe-inspiring long list of customers come Mach Aero Components Pvt Ltd, Sansera Engineering Ltd, Maini Precision Products and Trelleborg Sealing Solutions, Bengaluru to name a few.

Incorporated in 2005 and based in Bengaluru, Mach Aero Components manufactures precision machined components for aircraft. The company has bought a wide range of machines from the Group – Vertical Machining Centre (VMC) Acer and Turning Centres from AMS and Turnmill Centres from Ace Designers.

"Our journey with AMG began in 2006. They are one of the best in the industry. Every year we buy Turning Centres and Milling Machines from the Group. We now have a total of 35 Machining Centres comprising 3-, 4- and 5-axis says Raghavendra Hebbar, COO, Mach Aero Components. "The machines are just right for machining Aerospace materials including Stainless Steel, Inconel, Titanium and other exotic materials," he adds.

Mach Aero Components' products get exported to the Principal company Mach Aero France and from there they are supplied to leading aircraft OEMs including Airbus SAS, Embraer SA and The Boeing Company.

The Bengaluru-based firm, Sansera Engineering, is an engineering-led integrated manufacturer of complex and high-quality precision components for the automotive and Aerospace sectors.

"We forayed into the Aerospace sector in 2010 and by 2012 we had a dedicated plant for Aerospace with AS 9100 certification. Luckily, we grew more than we expected and by 2015 we started supplying to leading OEMs and also Tier 1s. At the Aerospace plant, we manufacture precision machined components and mechanical assemblies which go into the cargo, seating and lighting system. We also supply flight safety critical parts which go into the actuation system of the aircraft," explains Rakesh SB, Associate Vice President, Sansera Engineering.

"We have been using AMG machines since 2004 for our automotive business. In 2012, we got the first AMG's machine for the Aerospace division. We choose machines depending on the accuracy, power, torque and the complexity of the part to be machined," he states. The Aerospace company's manufactured products are all exported and supplied to OEMs like Boeing and Tier 1s like Collins Aerospace, Magellan Aerospace, Meggit.

Today, the Sansera Group has 66 Turning Centres, 42 Machining Centres and 16 Grinding Machines from AMG. For Aerospace particularly, the company has bought six VMCs from AMS.

The more, the stronger

The Swedish polymer group, Trelleborg's business in India,

❝It was in 2004 that we started off our journey with AMG. They have been highly receptive to our ideas and been successfully fulfilling our ever-changing demands. That's the reason we have more than 120 machines from them.❞

S Sekhar Vasan
Chairman & Managing Director
Sansera Engineering Ltd

❝We have a total of 35 Machining Centres from AMG and have never resented the decision to procure them. The best part is we can have two AMG machines at the cost of one imported machine without any compromise on the quality front.❞

Raghavendra Hebbar
COO
Mach Aero Components Pvt Ltd

❝We machine the structural parts on AMG machines. I really appreciate the design part on the coolant management systems on these machines because chips and coolant is one of the biggest concerns in machine tool designing.❞

Rakesh SB
Associate Vice President
Sansera Engineering Ltd

Trelleborg Sealing Solutions, Bengaluru has been manufacturing seals and sealing systems for the last 20 years to cater to Industrial, Automotive and Aerospace sectors. TSS, Bengaluru forayed into the Aerospace around seven years ago and caters mainly to the American market.

Raghavendra Nagaragadde, General Manager, Trelleborg Sealing Solutions, Bengaluru, talks about the company's long association with AMG: "It was in 1997 that we bought two CNC Turning Centres from the Group. Today, we have 59 machines that include a wide range of CNC Turning Centres, Turnmill Centres, Turnmill Subspindle Machines (Ace Designers) and CNC Grinding Machines (MGT). We have also scaled from two machines to several hundred machines and from 10 people to 350 in two decades. So we have grown together. AMG has been a prominent part of our growth story."

Maini Precision Products is yet another of AMG's leading partners. The company is a significant player in both Auto and Aerospace sectors and owns a total of 130 AMG machines: CNC Turning Machines – Jobber (Ace Designers); VMCs – Acer and MCV 400 (AMS), Gemini Twin Spindle Machining Centres (AMS), Grinding Machines – SM 40, SM 63 (MGT). The Aerospace facility of the company has OD and ID Grinding Machines from MGT.

"We are into mid-range component manufacturing and mainly manufacture commercial aircraft parts related to engines, structures and systems," states Ramachandra R, Vice President, Aerospace Operations, Maini Precision Products.

Raising the bar

With the increasingly rising demand from the domestic and offshore markets, India has become one of the key players in the global machine tools scene. The 'Make in India' initiative has further bolstered the growth of the industry.

AMG, with its strength in metal cutting tools, has been offering stellar products and services. However, realizing the needs of a volatile market, the Group relentlessly tries to up its game through constant innovation.

"We have never resented the decision to procure AMG machines. The best part is we can have two AMG machines at the cost of one imported machine without any compromise on the quality front," says Hebbar.

"We find our AMS machines highly reliable and a complete value for money. We have selected them to machine components for the structural parts. "We machine the structural parts on AMG machines. I really appreciate the design part on the coolant management systems on these machines because chips and coolant is one of the biggest concerns in machine tool designing," Rakesh points out.

Nagaragadde has high regards for AMG's CNC Grinding Machines, "It is a very good product of the Group; we have about eight of them. These are sophisticated machines which not many players in the market can provide. These machines have actually helped our business grow."

For even Ramachandra, AMG's Grinding machines are of the highest order, "It requires highly precise and accurate machine tools to manufacture components that

Source: AMG

Mach Aero Components team is happy with AMG's machine standards

❝The top management has fostered a culture of 'customer first'. They are competent and thorough professionals who do not discriminate. They meet our managers personally and hear them out to suggest the right solutions.❞

Pavithra
Manager - Head of Purchase
Secretary - Founder
Mach Aero Components Pvt Ltd

require stringent specifications. In Aerospace, the accuracies are many times below 10 micron which can be achieved only through a reputed brand of machine tools. When it comes to grinding, we have no second thoughts in procuring their machines. They give the desired accuracies expected on Aerospace components."

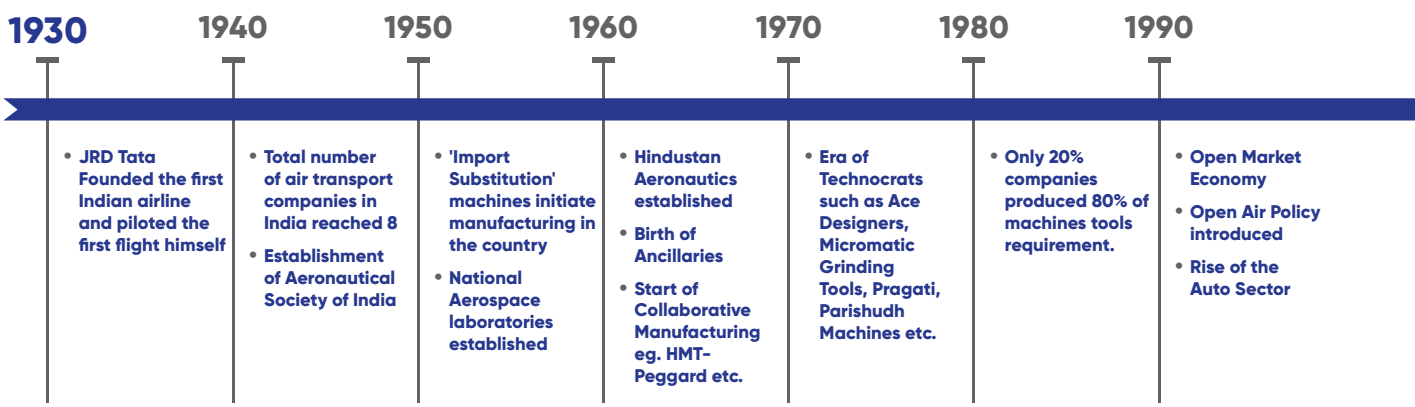
'Customer First' attitude

That AMG's customers have repeatedly bought their machines from the company is a testimony in itself of the machines' world-class quality. But where the customers find each other exactly on the same page is their review on AMG's after-sales services. "We are extremely satisfied with the Group's service. The major advantage is that since they are just 30 km from us, it takes us just a phone call for them to reach us in no more than four hours and diagnose the issue," says Hebbar.

"The top management has fostered this culture of 'customer first'. They are competent and thorough professionals and do not discriminate when we send our managers there. They make it a point to meet them personally and hear them out to suggest the right solutions," notes Pavithra, Manager – Head of Purchase, & Secretary of Jean Malonda - Founder, Mach Aero Components.

"They do not limit us to technical solutions, there have been cases where we have had human relations solutions from them. This is the kind of synergy we share," Hebbar adds.

Rakesh puts forth his view on the



❝We have been using AMG Grinding Machines for the last five to six years. When it comes to grinding, we have no second thoughts in procuring their machines. They give the desired accuracies expected on aerospace components.❞

Ramachandra R
Vice President
Aerospace Operations
Maini Precision Products

service team of AMG, "They are excellent team. We are extremely happy with their approach towards the customers."

"Since we have a wide range of AMG machines, we keep needing the team for customisation. What makes them different is their speed of response. Even the new machines are delivered within two to three months," says Nagaragadde.

Recounting great experiences

Experiences become lasting impressions. Hence, AMG ensures it offers only the superior ones to its customers and prioritizes customer experience improvements. The Group listens to the voice of the customer and iterates based on their feedback. In doing so, it examines the customers' evolving needs and identifies their pain points.

Customers have endless options and it's easy to find an alternative if a company is not meeting their needs. "It has never happened that they have not paid heed to our requirements. We keep needing modifications as per specifications from our Mach Aero France unit. Their cooperation in customisation is absolute. They are extremely thorough in their products and hence, their 5-axis machines have a broad customer base," says Hebbar.

Debashish Sheel, Chief Admin. Officer, Mach Aero Components, narrates an incident to drive this point home, "There was an additional requirement of their machines for our production unit, the opening of which was preponed by a month. We urgently needed four machines since the Chairman of the Group and the Founding Chairman had to inaugurate and press the start button as per the tradition. AMG was highly co-operative and delivered the machines at an extremely short notice. They saved our day and it's something that we cannot forget."

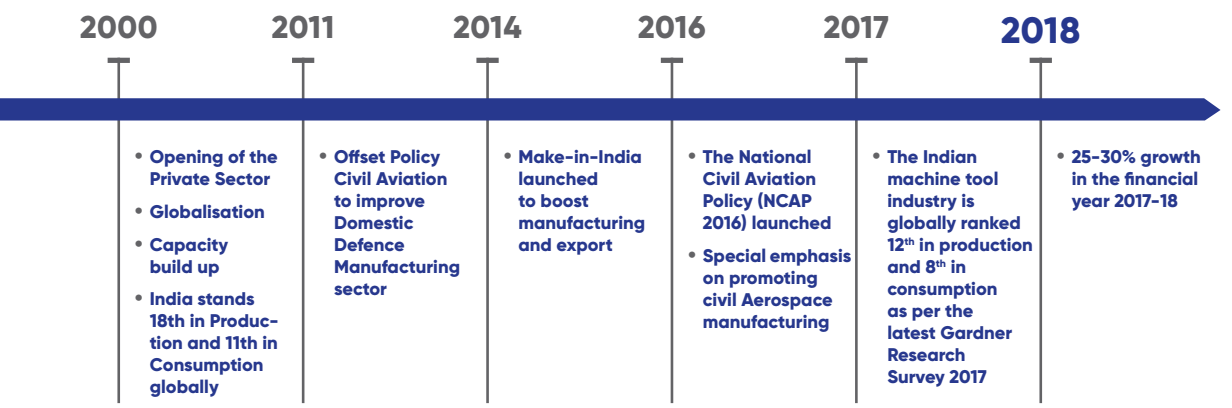
Rakesh shares the sentiment, "They always go the extra mile. The service team tends to a machine repair even if it's late evenings. Recently, we had issues with a spindle, which was taken care of by them rather very quickly. What's amazing is that they even welcome our suggestions and try to incorporate them in either their machines or their service."

It needs special skills to operate the machines

Talking of the challenges that the Indian Aerospace industry is currently coping with, the dearth of skilled manpower deserves a special mention. The all-pervasive manufacturing industry issue becomes all the more crucial in the manufacture of Aerospace components since it requires a unique set of skills, know-how, precision and technology-intensive focus.

Hence, companies such as Sansera and Mach Aero are taking the initiative of training their employees before they are assigned to machine operations.

"We cannot take 0.1 percent chance. It's people's lives at stake. Every operator who gets placed in Sansera must undergo three months of rigorous training and then we put him onto the machine.



Source: https://www.slideshare.net/PrincePatni1/indian-aerospace-market

We have a special training team for that," informs Rakesh.

For this, the company maintains a calendar and the training programmes are scheduled throughout the year. The workforce has a three-hour training sessions twice every week for the routine work. "We start from the basics and we do not just teach them the technical part of the work, we also work on their personal skills. Working on their soft skills changes their attitude, which has led to the overall change in the culture. One needs a different approach for working in the industry where there is no room for error," he adds.

Employees at Sansera are groomed in a way that they develop a sense of ownership. "The person who produces a part is made responsible for that particular part. We have brought in the concept of self-certification. Based on their experience, the operators check the parts themselves and escalate if any issue. If all things right, they certify them," reveals Rakesh.

"Since they lack it, we need to give machine operators on-the-job training. The spirit and approach of the Aerospace sector is unique and the consequences of non-quality are grim. We impart not just technical but also behavioural training."

Debashish Sheel
Chief Admin. Officer
Mach Aero Components Pvt Ltd

Earlier the company made use of simple machines like V-axis. "It was easier to train the operators on those machines. With our progress we have scaled up our operations with the 3-, 4-, and 5-axis," he adds.

Mach Aero in India too offers training to its employees. "We need to give on-the-job training because the spirit and approach of the Aerospace is unique and consequences of non-quality are grim. It's not just technical but also behavioural training," says Sheel.

Towards improvement

AMG firmly believes that no matter how happy or satisfied customers are, there will always be something that will provide the clue to what needs to be worked upon and step up the game. This feedback system is a way to earnestly listen to their demands and identify the gaps to fill in. It helps to take stock of AMG's present standing and build and improve tools to keep up with the changing marketplace. CNC Plus

We extend our heartfelt thanks to our customers for their support and valuable contribution to our magazine:
Sansera Engineering Ltd, Maini Precision Products, Trelleborg Sealing Solutions, Bengaluru, and Mach Aero Components Pvt Ltd

CNC Plus
Ace Micromatic Group Newsletter

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CSR Activity

Road to Opportunities

The Ace Micromatic Group believes in paying back to the society which has been a paramount part in its growth story. To this end, Ace Designers' aid in constructing road and drainage facilities in a rural village in South India has significantly enhanced the quality of life of the villagers, opening up doors to growth.

Source: AMG

Before

Source: AMG

After

It's unfortunate that India's rural hinterlands have largely remained impervious to its progress. Despite the enormous government efforts, a daunting number of distant parts of the country still suffer from the lack of all-weather connectivity, limiting their mobility and depriving them of any access to employment, social, health and education services.

Connectivity helps

Taking heed of the issue, Ace Designers, an Ace Micromatic Group company, has come to the aid of providing the basic of infrastructure facilities to Minnapura Village in Nelamangala, a Bengaluru rural district in the state of Karnataka. The company has built a road in the village, which the residents consider to be of immense help in their connectivity to the surrounding areas of amenities and opportunities.

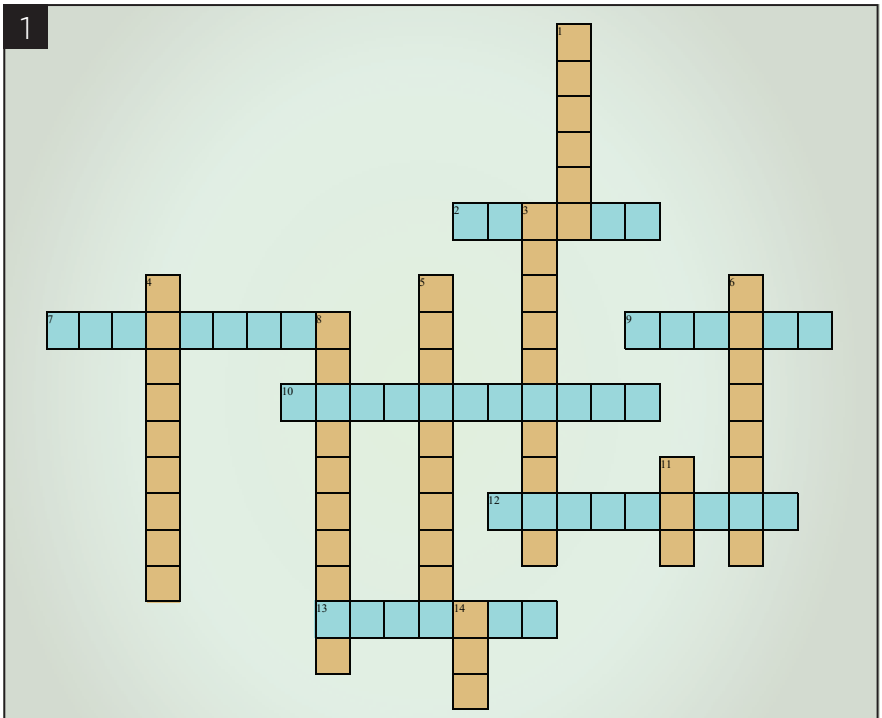
Fixing drainage issue

Additionally, poor drainage system is the biggest sanitation issue plaguing not just rural, but also urban India with severe health hazards such as diarrhoea, which is the third leading cause of childhood mortality in India. Contributing its bit to address the problem in Minnapura Village, Ace Designers has made provisions to improve the state of drainage facilities. CNC+Plus

We thankfully acknowledge the contribution of Ace Designers. To know more contact us: connect@acemicromatic.com

Brain Teaser

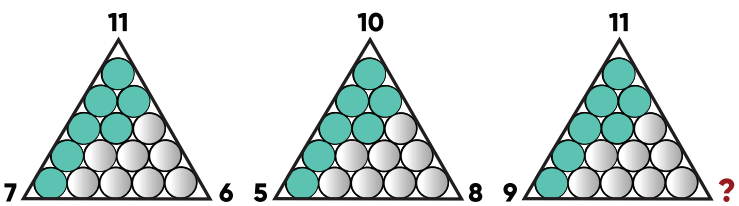
1



Across
2. Extra items meant for replacement **7.** A technology and applied science using engineering, chemistry, and other sciences involving the mechanical properties and use of liquids **9.** _____ interpolation is smoothly moving multiple axes of the machine so the tool follows a straight line as closely as possible. **10.** The process of preserving optimum condition of machine or item **12.** A part that is being worked on. It may be subject to cutting, welding, forming, or other operations **13.** A manufacturing process involving the shaping of metal using localized compressive forces

Down
1. Restore back to original condition **3.** The technology by which a process or procedure is performed with minimum human assistance **4.** The first version of the new product **5.** Finishing of an intricate or unique part **6.** A return signal that confirms the position of the tool or worktable **8.** Related to crank—is a mechanical part able to perform a conversion between reciprocating motion and rotational motion **11.** A type of custom-made tool used to control the location and/or motion of another tool **14.** The network of devices that contain electronics, software, actuators, and connectivity which allows these things to connect, interact and exchange data

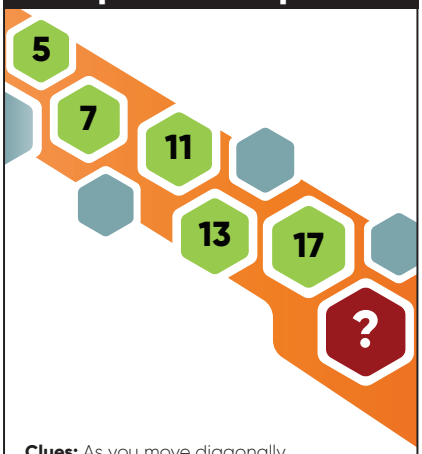
Which number replaces the question mark?



Clues: In each triangle, add together the lower two digits and subtract 2 for the left hand triangle, 3 for the middle and 4 for the right hand triangle, putting the result at the apex of the triangle.

2

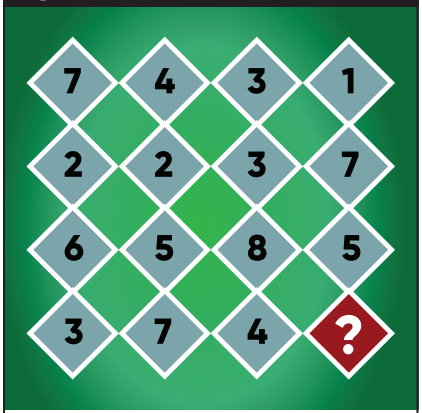
Which number completes the puzzle?



Clues: As you move diagonally down, numbers follow the sequence of Prime Numbers.

3

Which number replaces the question mark?



Clues: Working in columns, the sum of the numbers in each column equals 18.

4

Answers

1 **Across:** **2.** Spares **7.** Hydraulic **9.** Linear **10.** Maintenance **12.** Workpiece **13.** Forging
Down: **1.** Repair **3.** Automation **4.** Prototype **5.** Contouring **6.** Feedback **8.** Crankshaft **11.** Jig **14.** Iot

2 6 3 10 4 5

Spotlight

This edition, our focus is on machining for the Aerospace industry, hence we present to you some of our best machines from our principals that are perfectly crafted to meet the industry's complex needs to a T.

ACER

Source: AMG

Acer, the high-performance Vertical Machining Centre from Ace Micromatic Systems, promises high accuracy and enhanced productivity. The machine has a rigid structure and ergonomic design, and is loaded with a high-speed spindle, high-precision roller guideways and ball screws. A wide door opening fixture allows the components to be easily loaded and unloaded from the machine.

Specifications

- The machine is ergonomically designed for outstanding dynamic rigidity.
- It offers a maximum RoI.
- 40 / 40 / 32 m/min rapid traverse rates on X/Y/Z axes are able to meet high-speed machining requirements.
- It comes with a twin arm tool changer.
- The machine offers 24 tool ATC and 15/11 kW spindle power.

LT 2 LM 500 MSY

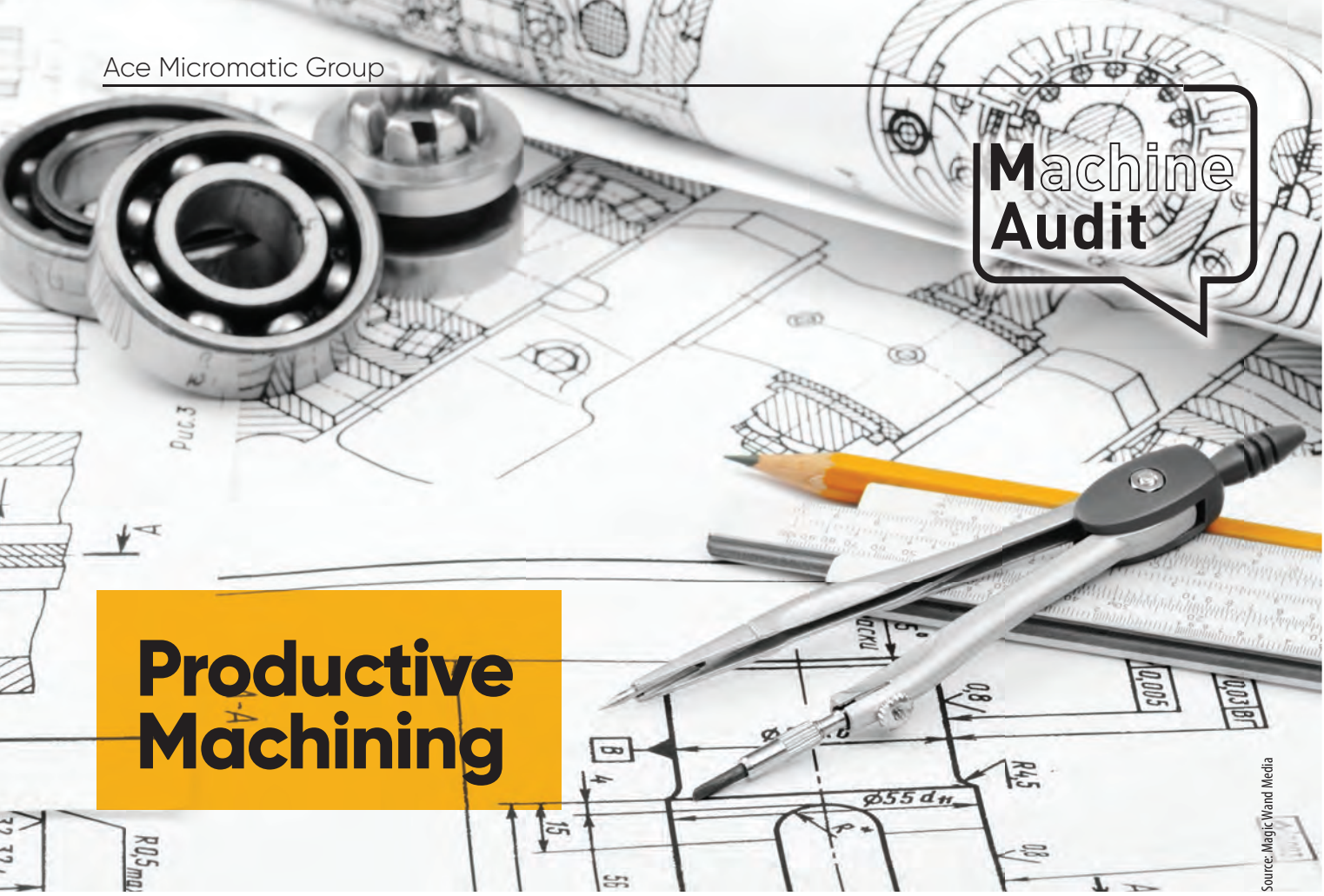
Source: AMG

LT 2 LM 500 MSY is a versatile Turnmill Centre from Ace Designers, offering a powerful main spindle and a substantially capable motorised sub-spindle. Perfect for machining complex components, the X and Y axes interpolation helps this turnmill centre perform machining above and below the centre line. Double end radial live tool holder helps perform axial applications on main and sub-spindle without the need of two different tool holders. Seamless synchronisation of main and sub-spindle speeds help on the fly component transfer between spindles.

Specifications

- Y-axis
- Main spindle with 9/11 kW power
- Motorised sub-spindle with 5.5/7.5 kW power
- 12-station live tool turret with 2.2kW/5000 rpm live tool motor
- Optional Bar Feeder and Parts Catcher arrangement

Machine Audit



Productive Machining

Source: Magic Wand Media

Far from being a theoretical exercise, Machining Audit studies and upgrades CNC machining methods to produce components more efficiently and at an optimum cycle time and tool cost from the existing state of things.

In mass production, every second saved or an increased tool life is a part produced. The higher your production quantities, the more important it is that your CNC machine runs as efficiently as possible. Machining Audit serves as a third party inspection of your part programs and operations. Their periodic reviewing and revamping eliminate any accumulated inefficiencies. The main objectives of Machining Audit is to tighten and shorten machining cycle times, and as a result increase the number of parts produced and the tool life. Following is the way it's done:

Resource

Team:

- Identify the team members who are all involved in the given component manufacturing – Machining process, Tooling, Material handling, Deburring and Inspection;
- Discuss the project, individual roles and their availability with a tentative schedule and a target date;
- Identify if any training is required;
- Prepare skill matrix and a training plan.

Machines:

- Whoever develops the part must know about the machine and its features, limitations and capacity.

Resource

Bill of operation and technique:

- Each operation for the given part must be defined with a sustainable machining technique;
- Record the Dos & Don'ts;
- Make a freehand sketch for the tool movement;
- Name the operations to help the team members to identify them easily;
- Identify CTQ's (Critical to Quality) and write comments on how they can be achieved.

Cutting tools and parameters:

- Make a freehand sketch of the tool with the identified overhang and clamping;
- List tool specifications and make;
- List VC, Feed, and depth of cut;
- Use surface finish formulae for feed rate;
- Check machine maximum and minimum RPM and also maximum programmable feed. (mm/rev & mm/min)

Work holding:

- Make freehand sketch of the holding area;
- Identify work holding devices. Write a comment on why this work holding has been chosen.

Documentation:

- Prepare documents which will be useful for the team members;
- These documents can be other than ISO. If useful we can regularise later.

Method

Machining Adapt:

- Target "1st right OK";
- Produce a few parts at lower parameters;
- List safety / setting requirements;
- Operators must be aware that running at low parameters is intentional.

Establish:

- Establish machining with the recommended parameters;
- Inform the operators about the changes in CIP;
- Do continuous improvements;
- Record KAIZEN and continuous feedback.

Expectations

Safety:

- Development engineers must record the safety requirement for the given component machining.

Quality:

- Development engineers must discuss and record the quality requirements such as dimensions CTQs, aesthetic, and application of the part;
- Convey the essential information to all the team members.

Quantity:

- It is a number indication of the quantity needed in the required time.

Efficiency:

- Establish that by doing things systematically, how much efficiency can be achieved and how much can be enhanced from existing state of things;
- It can be team efficiency or equipment efficiency.

Throughput:

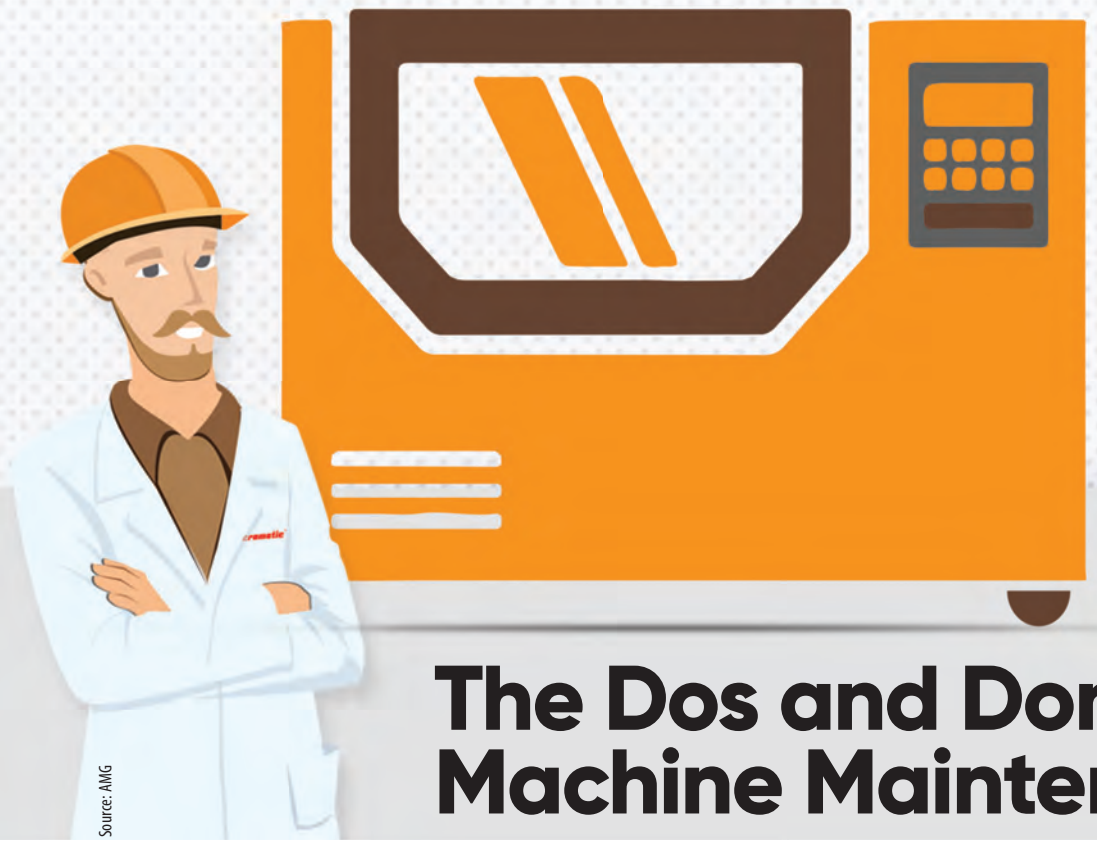
- It is a number indicating the quantity produced in a time frame;
- If the production is less, take the corrective action to improve;
- If the required production happens in the right time frame, make action plans to sustain and improve.

Cycle time:

- After observing 2-3 sets of machining, we can arrive at a cycle time.

Kashinath M Patnasetty, Head – VAS & Application Support Group, Ace Designers E: kashinathp@acedesigners.co.in

KYC
KNOW YOUR CNC



Source: AMG

The Dos and Don'ts of Machine Maintenance

We, at AMG, are believers in the age-old adage of prevention being better than cure. In the industry it amounts to keeping your machines in the best condition that prevents untimely shutdowns and saves time and expense. Here is a checklist for ensuring a smooth running shopfloor...

DOs	DON'Ts
General	
• Clean electrical cabinet, operator panel-interior and exterior	• Do not weld any extension to the bed
• Clean the interior and exterior of all sub assembly areas like Limit Switch Bed, LM, Box Guide, Tailstock Telescopic cover, Wiper and Spindle so they are free from swarf, coolant, dust and muck etc.	• Do not attempt to grind / any machining on the bed
• Check for any leakage of coolant and hydraulic oil, and correct the same	• Do not keep the machine close to the pressing or forging machine
Head Stock	
• Encode belt and spindle tension	• Do not use direct compressed Air jet or Coolant jet over the spindle
• Clean spindle labyrinth holes	• Do not run the spindle above the specified max rpm
• Overhaul workholding - CHUCK (clean & grease)	• Do not exceed the recommended max clamping force

DOs	DON'Ts
X – Axis	
• Check wiper condition • Clean LUB drain hole • Inspect turret oil level • Check turret alignment	• Do not dissemble the ball screw for any reason • Do not run the machine without cover • Do not disturb the proximity sensor for any reason
Tail Stock	
• Operate the quill once a day • Ensure wiper condition • Ensure tightness of base screws	• Do not use the tailstock at pressure higher than the recommended max value • Do not loosen the base screws for any reason
Hydraulics	
• Maintain system pressure 30 bar • Inspect oil level • Check accumulator functioning • Look out for leakage at different areas	• Do not dismantle the pump assembly • Do not disturb the pump setting for flow, noise and pressure • Do not disturb the system pressure setting for any reason • Do not over-tighten the fittings
Lubrication	
• Check oil level and fill • Ensure proper functioning of metering cartridge	• Do not dismantle the pump assembly • Do not disturb the pressure switch setting • Do not disturb the ON / OFF time for motor
Coolant	
• Look out for Y - Strainer blockagel • Check impeller condition • Inspect coolant level	• Do not run the pump without a coolant
PCC	
• Check for PCC drain hose routing of Hyd & Coolant • Check for V seal condition • Check for PCC runout	• Do not over-tighten the fittings • Do not use length bars • Do not run the machine without V seal
A/C Unit	
• Ensure proper functioning of temperature • Clean filter	• Do not run the machine with keeping the cabinet door open • Do not disturb the thermostat setting for any reason
Electrical	
• Take the data backup • Check CNC system battery - voltage • Check servo drive - battery - voltage • Check current % of axis/spindle • Inspect drive and heat sink cooling fan working condition	• Do not remove the cable with the machine ON • Do not remove the battery with the machine OFF • Do not run the machine without a stablizer or ELCB

We trust that you have found the above details useful and wish to assure you that compliance will help your team to ensure better reliability and machine uptime. If you need any further assistance, please do not hesitate to contact our local service support.
Email: customercare@acemicromatic.com • www.acemicromatic.net • To know more contact us: connect@acemicromatic.com

Source: AMG

Additive Manufacturing or 3D Printing has arrived as a revolutionary technology in the manufacturing space offering innumerable benefits. Ace Micromatic Group has made its foray into this sphere with a state-of-the-art facility for 3D Printing – amace solutions.

3D Printing or Additive Manufacturing (AM) has caused quite a stir in the manufacturing industry. To keep pace with the technological changes and cater to complex market demands, the manufacturers are now embracing this highly precise way of manufacturing and reaping in gains that are too good to pass up.

amace solutions pvt ltd, the brainchild of two leading machine

Source: AMG

With cutting-edge 3D Printing technology, amace solutions produces components with highly versatile and intricate designs for various sectors including General Engineering, Medical, Aerospace and Automotive

Source: AMG

"amace solutions is one of India's few organisations that specialises in 3D Printing of metal alloys. With a strong technical background, our engineers are capable of providing services in design, engineering, analysis, simulation, optimisation, manufacturing (3D Print) critical components and parts, using in-house technologies and advanced software applications."

Dr Vishwas R Puttige
Head, Business Development
Ace Manufacturing Systems Ltd

tool manufacturing companies in India – Ace Designers Ltd and Ace Manufacturing Systems Ltd (AMS), the integral part of the larger Ace Micromatic Group – is trying to step up the manufacturing game in the country through this groundbreaking technology.

The new company commenced its operations in September 2018 and is currently based out of AMS' new facility in Bengaluru. Leveraging some of the best available tools in 3D modelling, simulation, analysis, additive design, topology optimisation, and CAM software, the company provides a wide spectrum of solutions to its customers from diverse industries ranging from Aerospace to Medical and General Engineering.

amace solutions is managed by Mr TP Shridhar, CEO, Ace Designers; Mr LS Umesh, Director & CEO, AMS; and Dr Vishwas R Puttige, Head, Business Development, AMS.

What makes Additive Manufacturing unique

Unlike subtractive manufacturing, 3D Printing offers unlimited design freedom to engineers. Almost any design can be produced in a short period of time and cost-effectively. The technology also enables the construction and manufacturing of highly stable light-weight structures that cannot be produced using any conventional technologies.

What is more, 3D Printing is subjected to very minimum scrap rate and wastages compared to conventional methodologies. It also offers increasing supply chain efficiency by printing parts on demand with the available CAD files of a specific component without the need to carry inventory.

Serving the aerospace industry

3D Printing is currently being explored and heavily applied in the Aerospace industry. Applications range from brackets, hinges, heat exchangers, combustion chambers to new component production.

It is believed that aero companies are willing to spend up to €1,000 to reduce 1 kg of weight from aircrafts and for space projects this value can go up to €10,000. Light weighting and reduction in part count is one of the most popular applications in this industry.

In many cases, 3D Printing of parts has proven to be more cost-effective than machining them from solid blocks of expensive material such as Titanium and Inconel. Multiple instances of part consolidation have been successfully demonstrated and have been productionised.

amace solutions possesses the capability to design and analyse parts for AM, print them in metal and perform post-processing operations on them meeting the desired specifications. CNC+Plus

We thankfully acknowledge the contribution of amace solutions pvt ltd. To know more contact us: connect@acemicromatic.com

Case Study

CMH-400 XL

Source: AMG

Boosting Productivity

Ace Micromatic Systems' (AMS) column moving type Horizontal Machining Centre, the CMH400XL mitigated a customer's woes by enhancing accuracy and performance and reducing the cycle time in aerospace component machining.

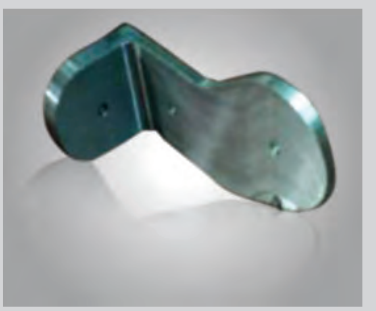
Materials used for Aerospace Components are expensive and generally are imported. Defects that arise during the machining of components result in the rejection of the complete part and the consequential loss of material and time. Further, unlike automotive components wherein the material removal is less as we use cast / moulded raw material, in the case of Aerospace application, the component is carved out of a single block of raw material. Thus, in many cases, we have to scoop out more than 80 percent of the material to obtain the finished part. Also, the parts are of thin wall sections which make machining more difficult. All these complexities lead the customer to opt for expensive imported machines for machining of aerospace components.

CMH400XL Specifications
Spindle BT-40 Taper 10,000 rpm with Direct Drive
Spindle Power 11/7.5 kw with Spindle Chiller Unit
Traverse 500/480/480 mm

Outcome with AMS' CMH400XL
Significant reduction of cycle time freeing up manpower and machines, and thus improving productivity phenomenally; the older process was done on 3 machines with 6 operators.
Excellent surface finish with no tool marks, drastically reducing the time needed for buffing and polishing
Enhanced machine accuracy and performance

OUTPUT

C-Max with pair



C-Max

Source: AMG

Challenge

Machining of Aerospace Components, C Max and C Min, with a non-AMS machine was a longer time time for the customer, requiring multiple set-ups and the finish obtained was sub-optimal. The components' material was Imported Grade Aluminium 2024 (T735).

Solution

AMS, with its strong design background and application knowhow, understands the critical needs for the machining of Aerospace Components. One of the important requirements for ensuring high surface finish and accurate machining is the high rigidity of the machine and low spindle run-out which ensures vibration-free machining. The CMH400XL – column moving type horizontal machining centre from AMS – incorporates the features. With machining done on the machine, the cycle time was reduced from 20:55 min to 5:35 min, in addition to significant improvements in accuracy and surface finish. CNC Plus

We thankfully acknowledge the contribution of Ace Micromatic Systems' (AMS. To know more contact us: connect@acemicromatic.com

Exhibitions
Domestic and International

Events

Pune Machine Tool Expo 2018

Organiser: Indian Machine Tool Manufacturers' Association

Venue: Pune, Maharashtra

Date: Sep 27-30, 2018

AMG was an active participant at the second edition of the Western India's most prominent B2B exhibition, Pune Machine Tool Expo showcasing an entire gamut of metal working machine tools for both metal cutting and metal forming including automation and robotics, tooling systems, CAD/CAM and other technologies essential for today's manufacturing.

Source: AMG

Metalex 2018

Organiser: Reed Tradex Co., Ltd

Venue: Bangkok, Thailand

Date: Nov 21-24, 2018

Metalex 2018, the most important gathering of the ASEAN metalworking community, presented AMG an opportunity to get close to their existing and potential customers of the South Asian region. The platform is ideal for new networks and new ideas and to inspire industrialists to optimize their competitive advantages.

Source: AMG

Rajkot Machine Tools Show 2018

Organiser: K&D Communication Ltd

Venue: Rajkot, Gujarat

Date: Nov 28-Dec 01, 2018

The Rajkot Machine Tools Show is an international trade fair for engineering, machine tools, automation and automotive technology. AMG exhibited its products with the latest technology including Linear Tooling CNC Lathes, Compact CNC Lathes, Compact VMCs, Smart Manufacturing IoT and Industry 4.0 Solutions.

Source: AMG

Customer Meets & Interactive Seminars

Events

Customer Meet and Interactive Seminar

Venue: Indore, Madhya Pradesh

Date: Nov 17, 2018

Topic: New Products and Facilities

Source: AMG

Customer Meet and Interactive Seminar

Venue: Bangalore, Karnataka

Date: Nov 23, 2018

Topic: Latest Developments in CNC Turning Technology & Industry 4.0 – IoT

Source: AMG

Technical Seminar in Association with TaeguTec

Venue: Coimbatore, Tamil Nadu

Date: Dec 15, 2018

Topic: High Productive Machine Centres and Industry 4.0 for an Efficient Shop Floor

Source: AMG

Events

Awards & Recognition

Awards and honours mirror the fact that we are doing all things right to ensure our and our customers' growth. These accomplishments act as a pat on our back, build credibility among our customers, and help us stay focused to keep getting better and stronger.

The Economic Times Best (Plastics & Polymers) Brands 2018 Award

Ace Designers bagged the coveted award for Plastic Turning / Machining. The remarkable achievement marks our foray into the non-metal turning segments.

Date: March 07, 2018

Source: AMG

The Economic Times Best Brands in Metal Cutting Industry 2018

The Ace Micromatic Group won the esteemed award that endeavours to highlight brands that have gained customers' confidence and maintained their positions. Our four principal companies have been felicitated with the award in following machine tools categories:
a. Turning Machine – Ace Designers
b. Machining Centres – Ace Manufacturing Systems
c. Grinding Machines – Micromatic Grinding Technologies
d. Smart Manufacturing Software – Ace Micromatic Manufacturing Intelligence Technologies (AmiT).

Date: Sep 21, 2018

Source: AMG

Karnataka Rajyotsava Award 2018

Mr P Ramadas, Managing Director, Ace Manufacturing Systems, was honoured with this prestigious award for his immensely valuable contribution to the manufacturing and machining domain. Felicitation by **Shri H D Kumaraswamy, Hon. CM of Karnataka.**

Date: Nov 29, 2018

Source: AMG

The Annual CII EXIM Bank Award for Business Excellence

Ace Designers received Platinum recognition for Business Excellence at the CII Quality Summit. It was honoured as one of India's best performing organisations for the category 'Large Organisations / Operating Units'.

Date: Nov 23 - 24, 2018

Source: AMG

KASSIA 'U CAN V CAN AWARDS'

Mr LS Umesh, Director & CEO, Ace Manufacturing Systems, was felicitated with the KASSIA 'U CAN V CAN AWARDS' for his significant contribution to the machine tool industry.

Date: Dec 2, 2018

Source: AMG

The CII Southern Region 5S Excellence Award

Micromatic Grinding Technologies won the prestigious CII (The Confederation of Indian Industry) Southern Region 5S Excellence Award for Medium and Small Scale Manufacturing Sector.

Date: Dec 11, 2018

Source: AMG

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In a machine shop, time is money. And downtime is no money. To see how Mobil™ can enhance your profitability with its cutting-edge range of industrial lubricants, visit **mobil.com/industrial**

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The world of Machine Tool is changing. Now,

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igus® solutions for machine tools
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Increase reliability, confront challenges, avoid expensive downtime

e-chains®:
- Chip-resistant
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www.igus.in/e-chains

chainflex® cables:
- Specifically developed for highly dynamic applications
- Oil-resistant (UL-/EAC-/CTP compliant)
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- Tested & guaranteed!
- For smallest installation spaces
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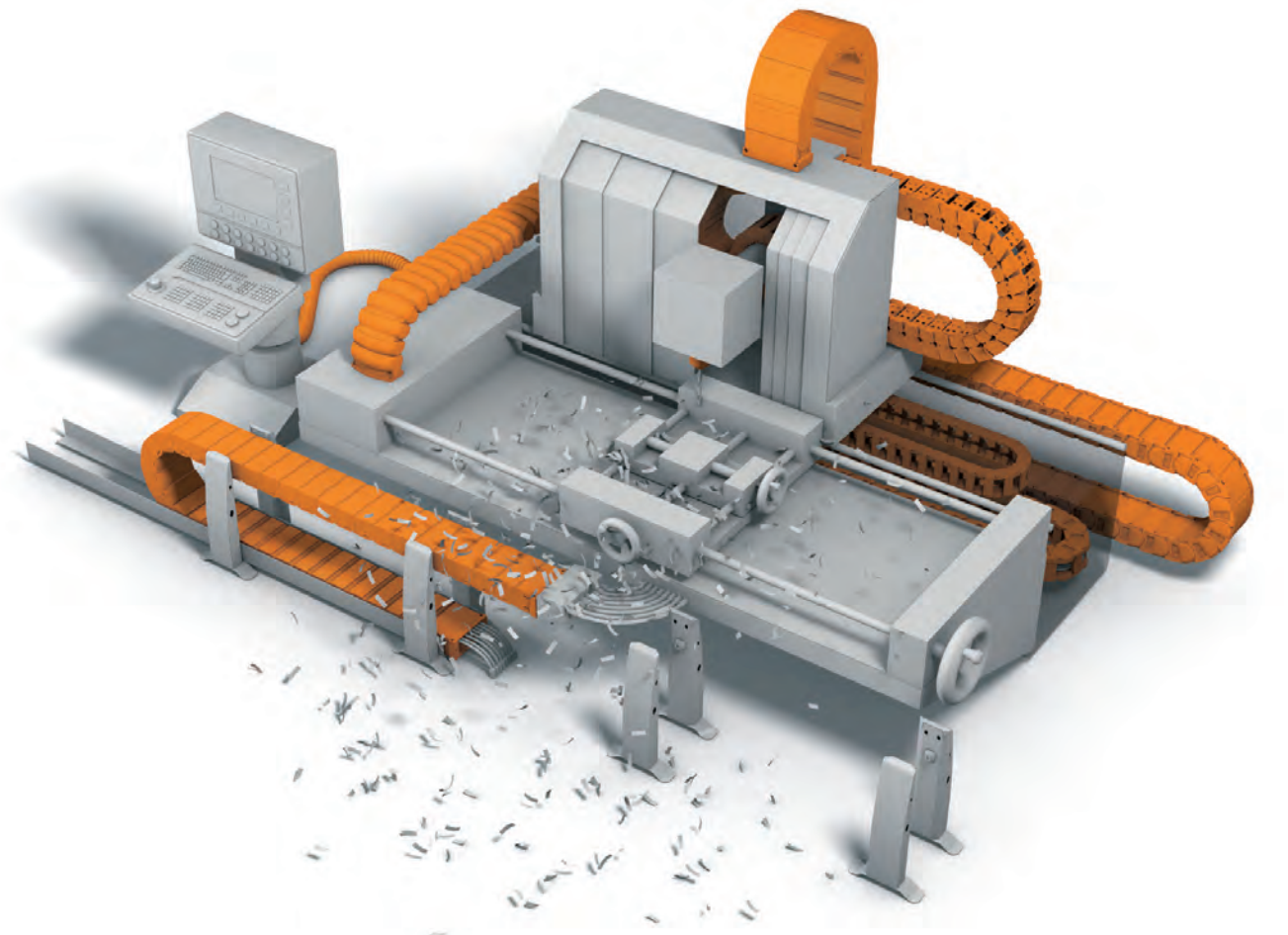
dry-tech® bearing technoloy:
- Lubricant-free
- Dirt resistant
- Maintenance-free
- Predictable service life

www.igus.in/dry-tech



Ready-to-install, maintenance-free, reliable and cost-effective – igus® solutions for machine tools.

Particularly for the machine tool industry, high machine productivity is the basis for sustainable competitiveness in world markets. You depend on suppliers who can guarantee high process reliability under challenging operating conditions.
igus® provides lab-tested solutions for any challenge in the machine tool sector that will increase the reliability of your machine.

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Industry Manager – Machine Tools
South Zone

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Email: jvidyacharan@igus.net

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N.E.W Zone

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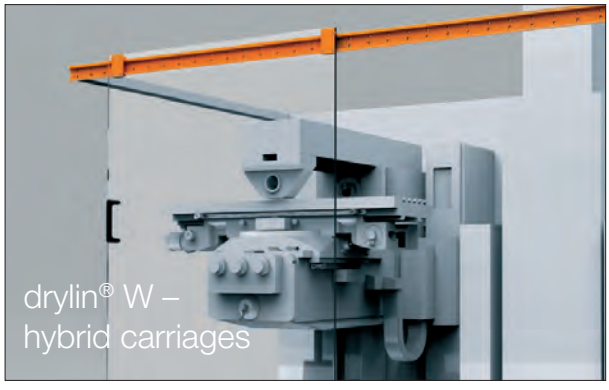
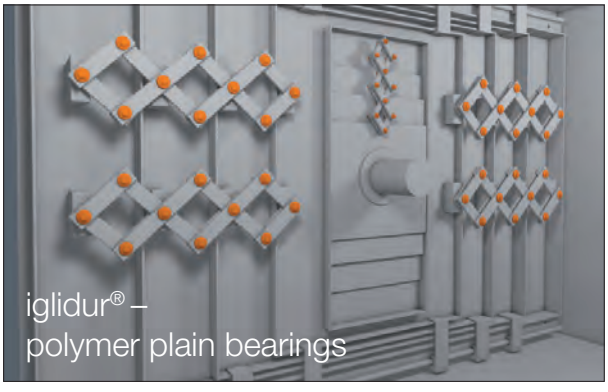
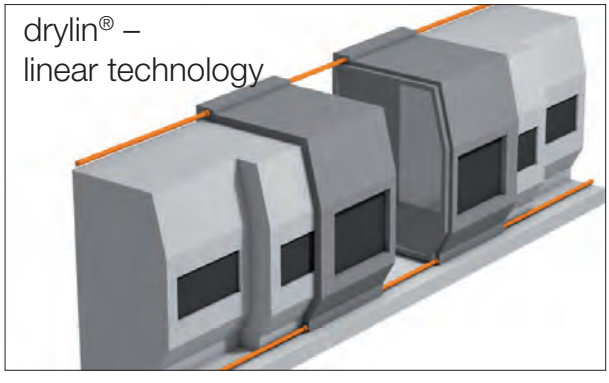
Polymer plain bearings.

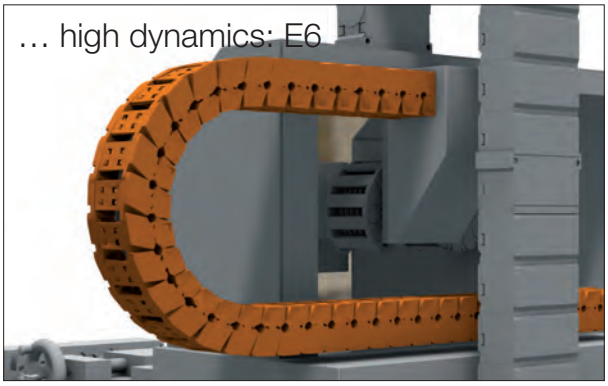


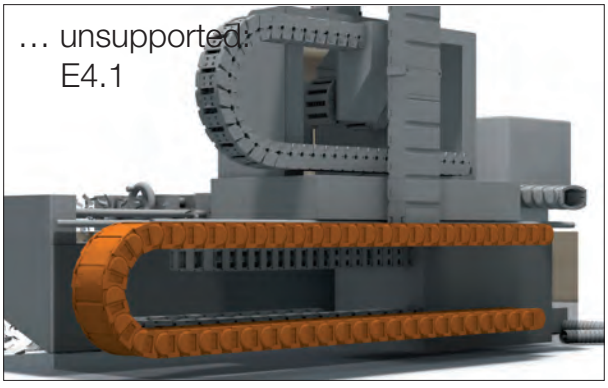


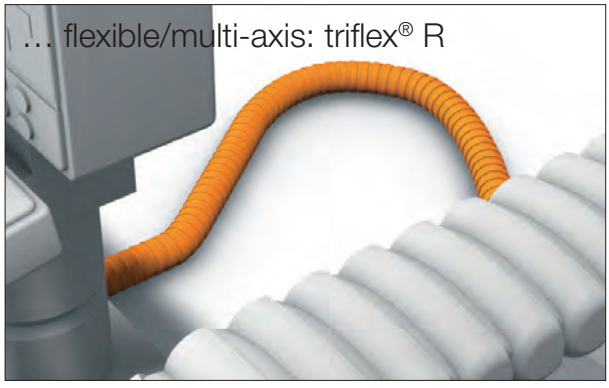


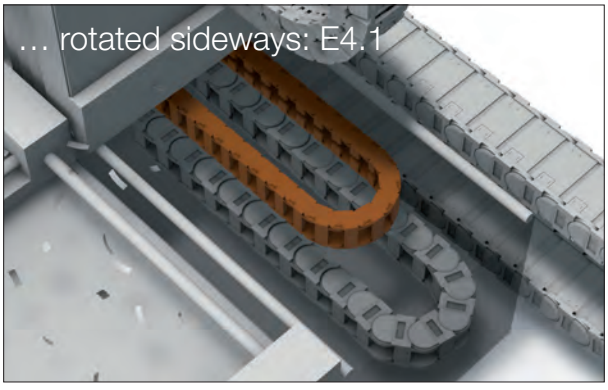
igus®.in/machine tools

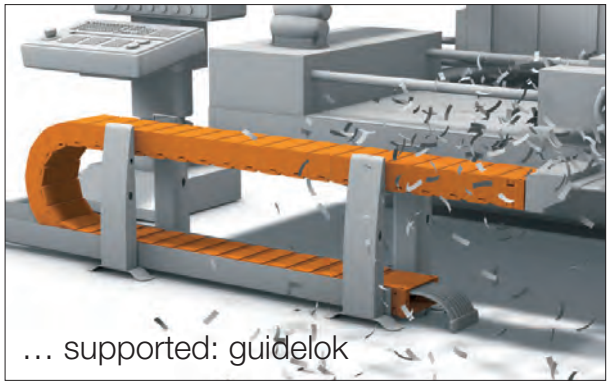
energy chains® and cables.

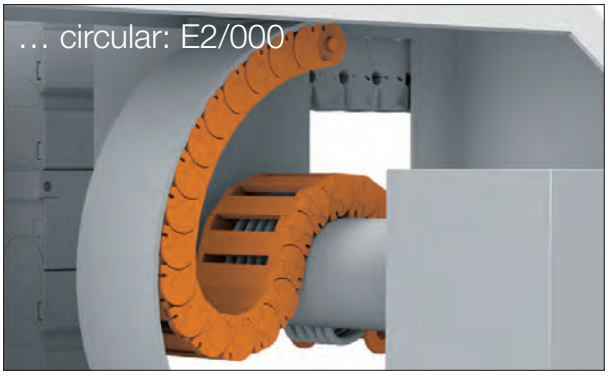


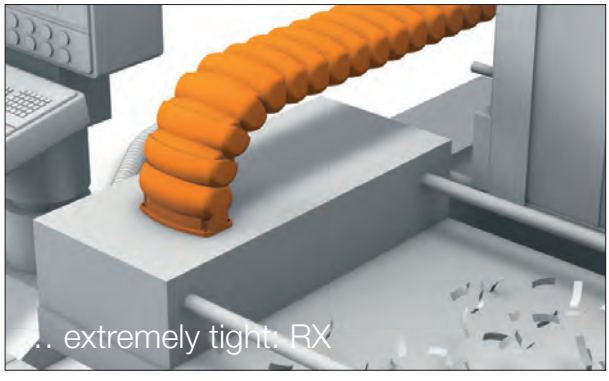












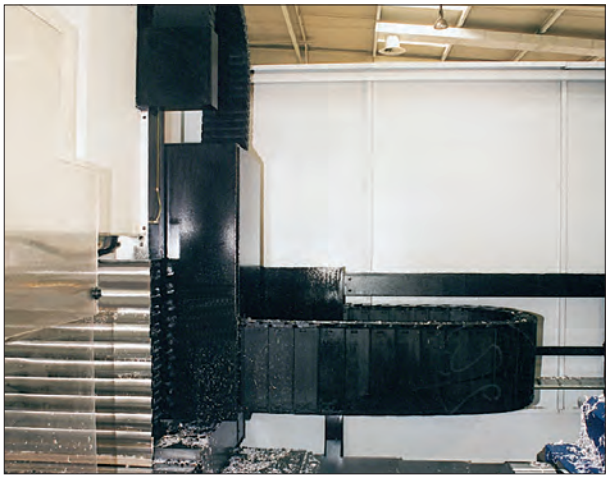
... in machine tools

igus® RX e-tube – ideal in the direct chip area, IP protection class 40.

Dry-running igubal® plastic spherical bearings – no chip adhesion.

Brass chips and oil/coolant – igus® RX e-tube protects reliably.

For long travels in the chip area – guidelok horizontal guides up to 50 m.



igus® E2 e-tubes, upright and rotated by 90° in the chip area.

Holding chainflex®-cables in e-chains® for motion-control applications.

... even against hot chips

Chip tight igus® e-chain®, for example:

New R2.75: cost-effective e-tube with 75 mm inner height.

www.igus.in/R275

RX: extremely tight tube for the direct chip area.

www.igus.in/RX

R4.1 light: lightweight, tough, and snap-open e-tube.

www.igus.in/E41

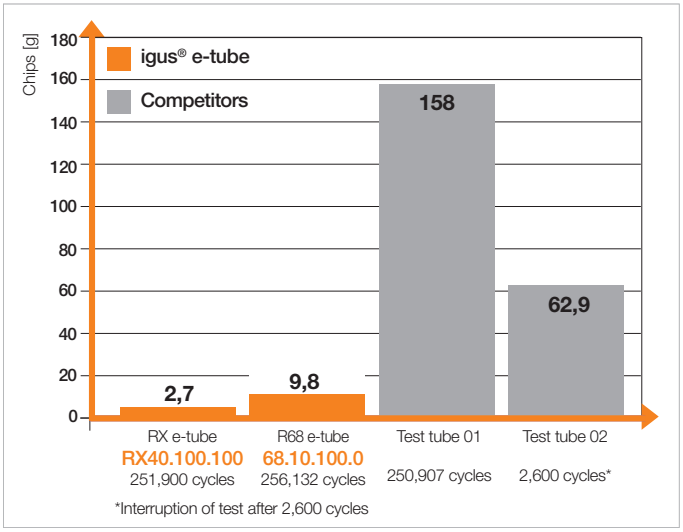
E2/000 e-tube: small e-tube, snaps open on both sides.

www.igus.in/E2000

Explore more e-chain® solutions for machine tools at:
www.igus.in/machinetools

Tested!

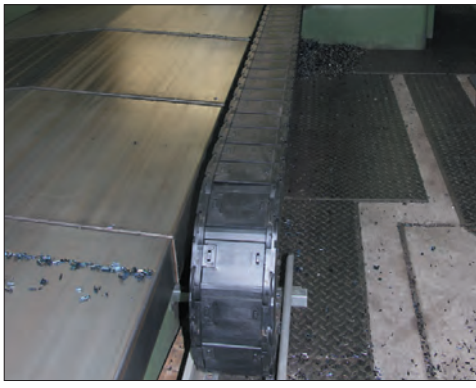
In the largest lab of its kind, igus® Cologne

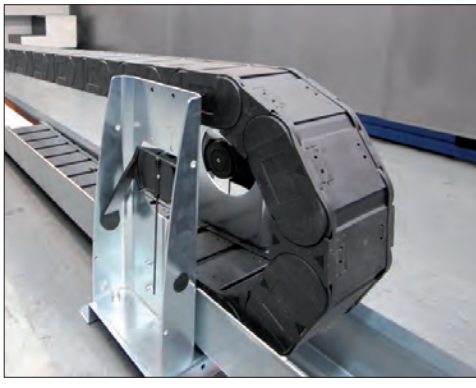


Extreme chip tightness

Reliable tightness under realistic environmental conditions – chip penetration test: various tube version were exposed to a defined chip volume. After 251,900 cycles, only 2.7 g of chips were found in the interior of the RX tube

From the field





... in oils and coolants

Media-resistant igus® chainflex® cables, for instance:

CF77.UL.D control cable for high load requirements, resistant to oils and coolants, flame retardant, notch proof, free of PVC and halogen, minimum bending radius up to 6.8 x d.

CF240.PUR data cable for high load requirements, shielded with 90% cover, resistant to oils and coolants, notch proof, PVC-free/ halogen-free, flame-retardant, minimum bending radius up to 10 x d.

CF111.D / CF113.D measuring system cable for high load requirements, shielded, resistant to oils and coolants, notch proof, flame-retardant, minimum bending radius up to 7.5 x d.

CF270.UL.D / CF27.D servo cable for high load requirements, shielded, resistant to oils and coolants, notch proof, flame-retardant, PVC-free/halogen-free, minimum bending radius up to 7.5 x d.

Explore more chainflex® solutions for machine tools at:
www.igus.in/chainflex

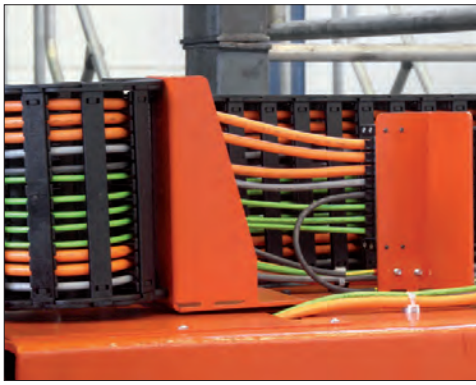
Tested!

In the largest lab of its kind, igus® Cologne

Test: chainflex® cables in oil

Service life and durability tests on various igus® chainflex® cables, moving in e-chains®, in a selection of oils.

From the field



High cycles and dynamics ...

High dynamics test on igus® chainflex® cables in e-chains®.

The economic use of machine tools depends on the speed at which the tool can be moved across the workpiece contour. The maximum attainable travel speed and acceleration determine the cycle time of the production process and therefore the production costs.

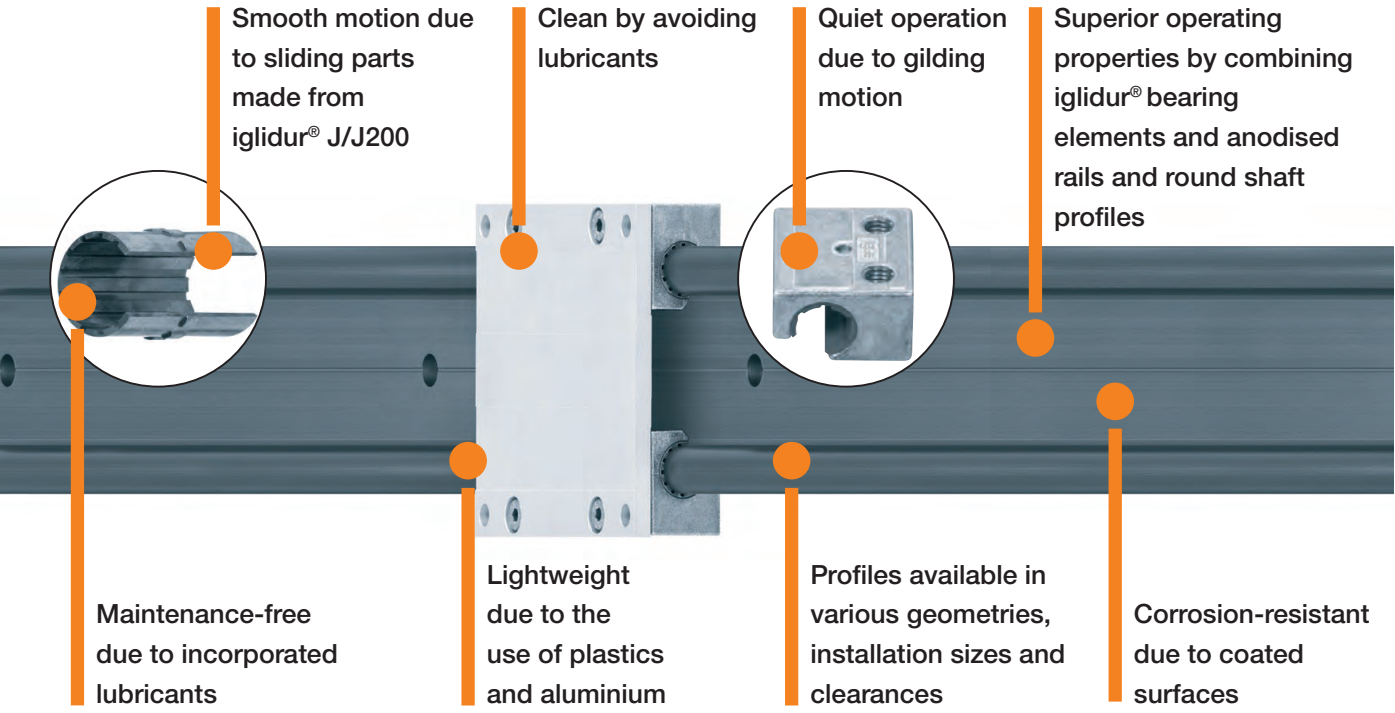
In addition to using highly dynamic and high-performance drive systems, reducing the moving mass by employing lightweight components is necessary to keep speeds high and machine vibrations as low as possible. The machine tool industry depends on lightweight products that can tackle highly-dynamic applications.

No corkscrew after 5 million double-strokes.

Competitive products:
corkscrewing after 145,000 double strokes.

igus® CF27:
no wear, even after 5 million double strokes!

Reduce maintenance effort ...



Maintenance-free drylin® linear technology solutions.

drylin® W

- Large linear construction kit
- Single and dual shaft profiles
- Many options of bearings, housings, functions, complete carriages

www.igus.in/drylinW

drylin® N

- Low-profile guide in 4 sizes
- Low installation height 6 - 12 mm
- Rail widths from 17 mm to 80 mm
- Numerous carriage options – also with camber

www.igus.in/drylinN

drylin® Q

- Torque resistant square linear guides
- Carriages with individually adjustable clearance
- Variable fastening options

www.igus.in/drylinQ

... avoid lubricating

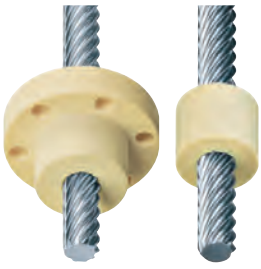
drylin® lubricant-free linear technology

drylin® is a product range of lubricant-free linear plain bearings based on the principle of gliding instead of rolling. Tribo-opimised iglidur® high-performance polymers are used as glide surfaces. drylin®linear systems travel in dry-running mode and are maintenance-free. Linear guides on rails or round shafts are available. drylin®-drive technology can supply ready-to-connect systems with lead screw drives or toothed belt drives, with or without motor. In addition to the lack of maintenance and lubricants, the focus is also always on toughness and resistance to influences, such as dirt, water, chemicals, heat, or shocks.

- Insensitive to dirt due to dry operation
- Insensitive to impacts and vibrations
- High static load capacity
- Suited for short-stroke applications
- High speeds possible up to 10 m/s and accelerations up to 100 G
- Low magnetism

www.igus.in/drylin

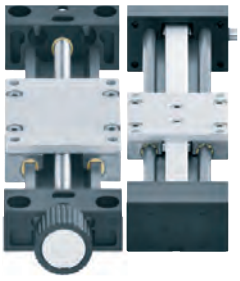
From the field



drylin® SD

- Systems consisting of lead screw nut and lead screw
- dryspin® high-helix threads, efficient and long-lasting
- Self-locking trapzoidal and metric threads

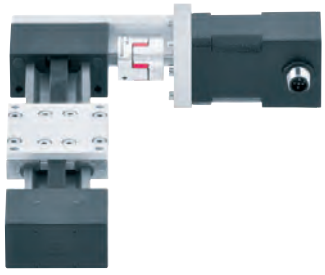
www.igus.in/drylinSD



drylin® drive technology

- Linear modules with lead screw drive or toothed belt
- For manual or electrical adjustments
- Can be configured with custom stroke lengths

www.igus.in/drylinSHT

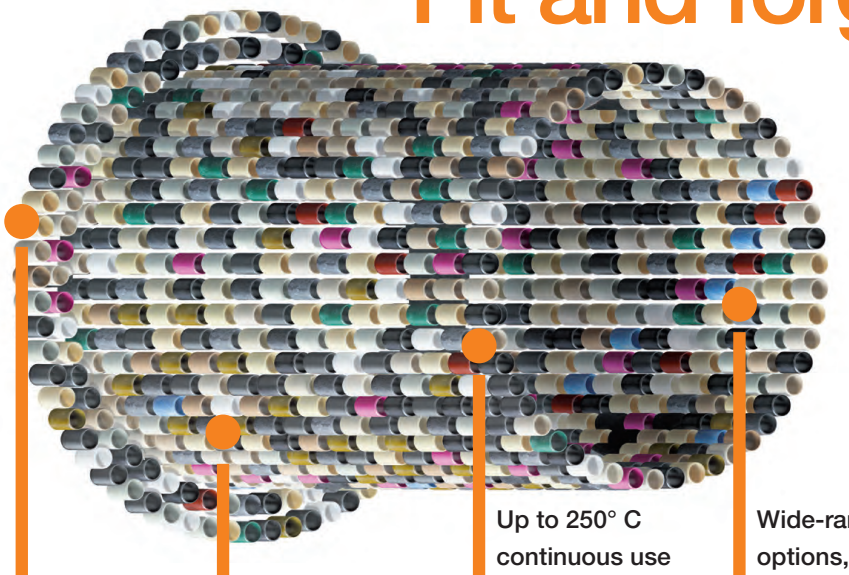


drylin® E drive technology

- Linear axis with stepper motors/ DC motors
- Fail-safe due to the use of encoders and limit switches
- Can be combined for gantry configurations

www.igus.in/drylinE

Fit and forget ...



Predictable service life

More than 8,500 dimensions from stock

Up to 250° C continuous use temperature (depending on material)

Wide-ranging design options, as injection-moulded or machined parts, to your specifications

iglidur® G – the allrounder.
The best-selling iglidur® plain bearing world-wide.

iglidur® J – fast and slow motion.
Low friction, low wear.

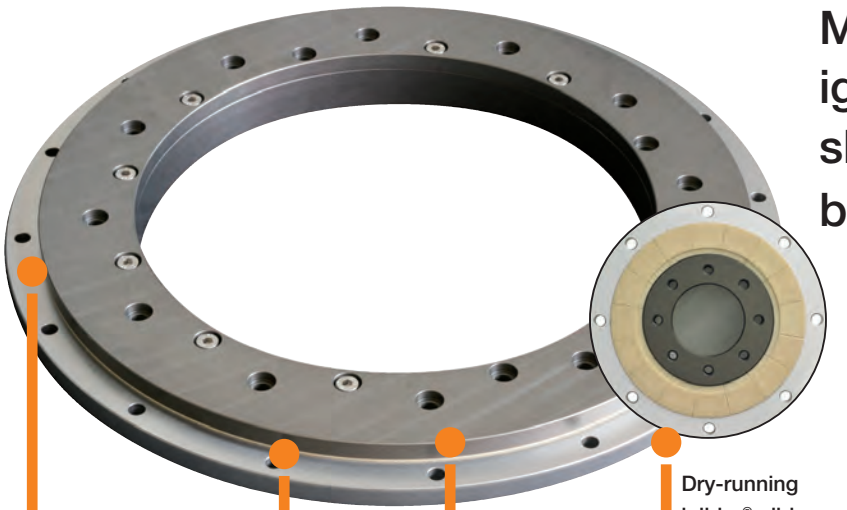
iglidur® Q – suited for high loads.
Plain bearing solution for long service lives at high to extreme loads.

iglidur® M250 – heavy and rugged.
Excellent vibration damping.

iglidur® W300 – the endurance runner.
Low wear on all shafts.

iglidur® X – The high-tech problem-solver.
High resistance to temperature and chemicals.

Maintenance-free iglidur® PRT slewing ring bearing solutions.



Simple installation, replaceable sliding pads made of iglidur® materials

High resistance to wear

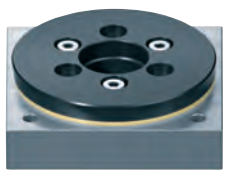
For very high loads and high stiffness.

Dry-running iglidur® glide elements instead of balls, etc. Completely avoid luricating

Slewing ring bearing - design 01

Slewing ring bearing - toothed.

Slewing ring bearing - design 02.



Slewing ring bearing with square flange.

... increase service life

Lubricant and maintenance-free plain bearings made from high-performance plastics – iglidur®.

No lubricating and reduced maintenance effort, while cutting costs and increasing service life, everything from stock and delivered promptly - that is the essence of the idea. iglidur® plastics have been extensively tested with respect to wear and friction values, including other relevant material properties. iglidur® polymer plain bearings from igus® represent the step from plastic bushings to tested and therefore predictable machine component.

- Highly wear-resistant polymers, improved with fine-tuned additives of reinforcement materials and solid lubricants
- Tested by the thousands, proven by the millions
- Lubricant-free, maintenance-free, cost-effective, predictable, and versatile

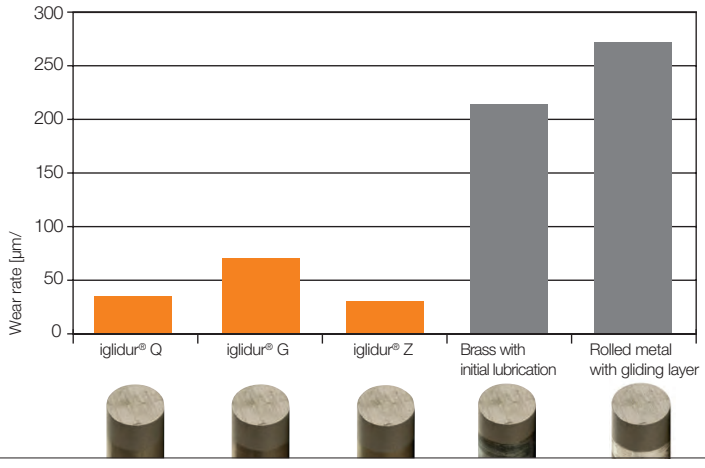
www.igus.in/iglidur

Tested!

In the largest lab of its kind, igus® Cologne

Wear test results on St52 / gas nitrified

Wear in µ/km; p= 30 MPa; v= 0.01 m/s; pivoting



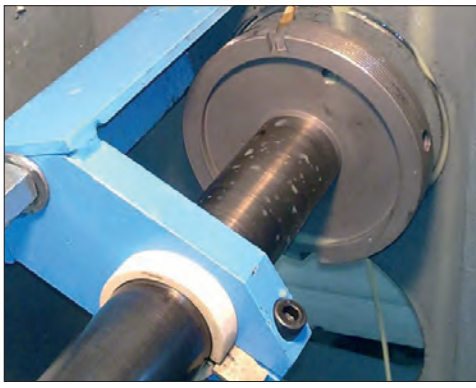
"Swivel" test

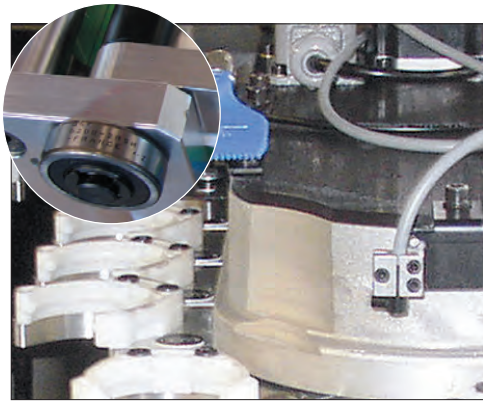
Objective: wear test for iglidur® plastic plain bearings against metallic plain bearings.

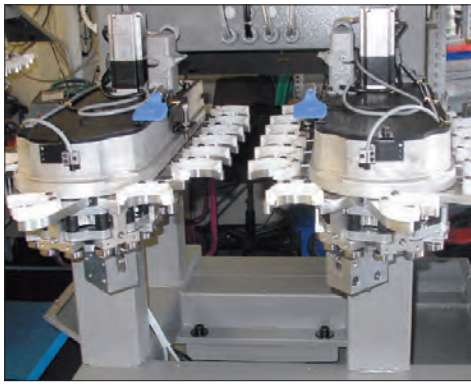
Test setup: swivel test on a shaft with a weight of 1,200 kg.

Result: all tested iglidur® materials exhibit significantly lower wear than metal plain bearings. The shafts of the metal plain bearings exhibit significant wear and are therefore unsuited for further use.

From the field







... Save time and reduce costs

igus® solutions from a single source.

readychain® – fully harnessed energy chain systems in 3-10 days.

700 systems per week in 11 readychain® factories around the world – assembly time optimised to raise your cash-flow

- Eliminate storage costs for cables, e-chains® and connectors
- Cut turnaround times in half
- Flexibility when orders vary
- Reduce the number of suppliers and orders by 75%
- Minimise your machine downtimes
- System guarantee - depending on application

www.igus.in/readychain

readycable® – fully harnessed cables from 24-48 hrs. or same day.

igus® provides more than 2,830 harnessed cables for drive technology pursuant to 20 different manufacturer standards. Professionally produced, 100% tested.

- Servo, power and signal/encoder cables
- No cutting charges, no surcharges for small quantities and packaging
- Cable length accurate to the centimetre per customer spec
- Smallest bending radius from 7.5 x d
- Reduce storage costs and increase cashflow

www.igus.in/readycable

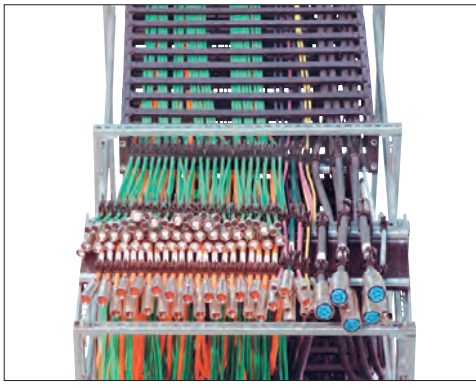
Tested!

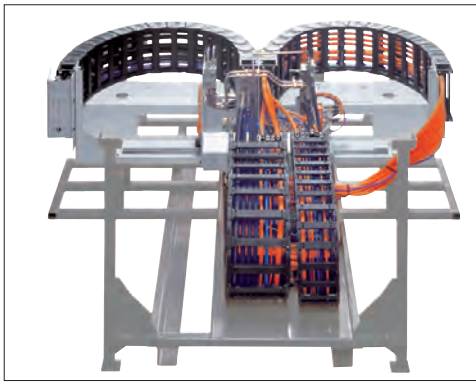
In the largest lab of its kind, igus® Cologne

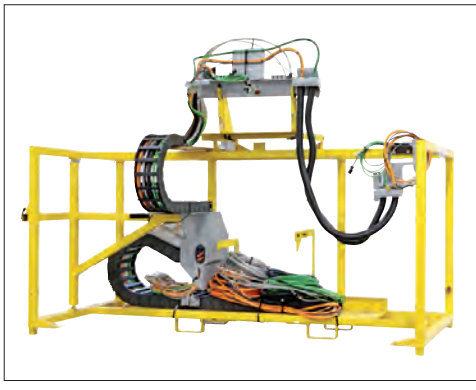
Cable testing

100% testing of all harnessed cables – extensive quality assurance during assembly.

From the field







Research & Development

The igus® lab and field experience

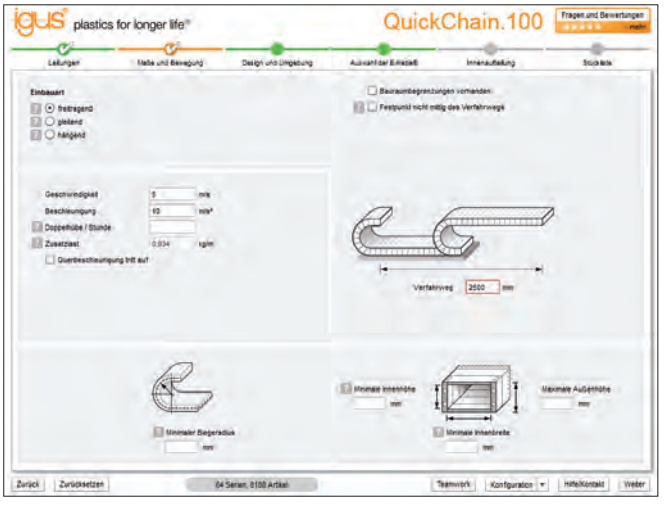
Better products for less - a key element: the industry's largest test lab. 1,750 m² lab, more than 15,000 tests and 2 billion test strokes per year.

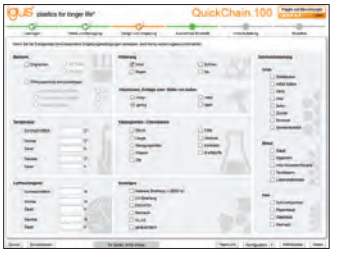
Tribology testing in the plain bearing lab, igus® Cologne.

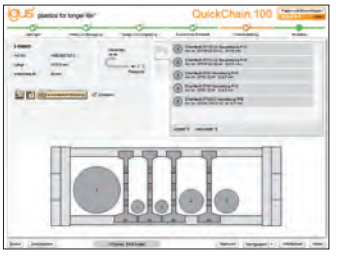
Cutting costs while also guaranteeing maximum pro-cess reliability – only those who conduct intensive research and testing will successfully bridge this gap. The industry's largest test lab conducts more than two billion test cycles per year on a total of 107 test rigs.

Our mechanical engineering components pass the litmus test presented by production reality, because they have already passed this test before leaving the igus® warehouse.

Find and calculate faster



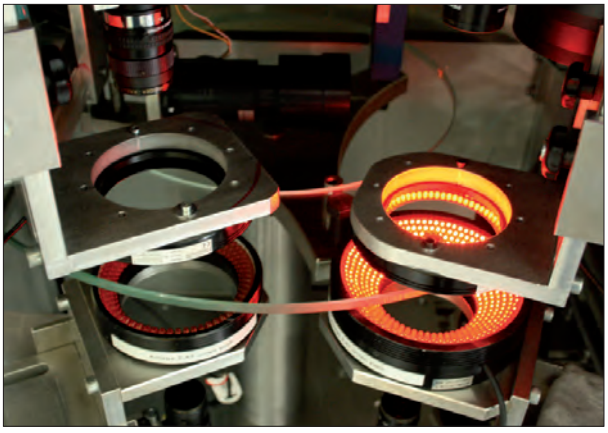




Expert for system design and calculations for travels up to 100 m

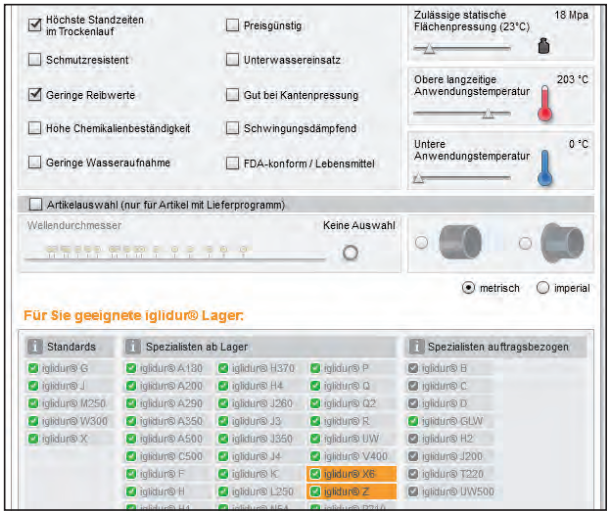
Simply enter your application's environmental parame-ters into the e-chain® expert. The expert will propose the matching solution. You can find a wide range of other online tools, such as configurators, service life calculators, and product finders at **www.igus.in/onlinetools**

15,000 tests per year



The igus® quality assurance

The quality policy of igus® is based on the objective to identify and meet customer needs, and to always be a competent and reliable supplier. igus® has always been committed to produce products at the best available quality level, and to consistently develop innovative solutions.



Extensive test database

What is probably the world's largest database was created from more than 15,000 test.
This database gives us the ability to select the right product for your specific application.

Better for the environment

Because iglidur® is free of lubricants, no contaminants are discharged to the environment. Even the low weight of iglidur polymer plain bearings render it ecologically valuable.

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For 50 years, we have been driven by a single vision – motion plastics®: innovations from plastics that move machinery.
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