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ULTIMATE GUIDE TO PROFITABLE MANUFACTURING

THE MACHINIST

RNI No 71129/98

Volume 14 Issue 5 • May 2019 • Rs 75

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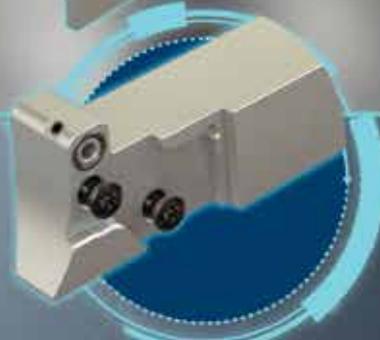
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THE MACHIE COMETH!

The Machie trophy and 'The Machinist Super Shopfloor Awards' platform are definitely about celebrating the excellence in the Indian manufacturing industry. But I would go a step ahead and say that this platform also represents the excellence of our entire economic value chain. Aren't we, as an industry, interconnected with every other sector? Think about it!

Why are we firing up our manufacturing engines? So that we can also till our lands. So that we can also build our cities and villages, and the roads that connect them. So that we can educate our minds, skill our hands and hold our heads high! So that we can play with innovation, grow with productivity and serve with efficiency. With this platform, we are celebrating all that, and more.

"WE ARE FIRING UP OUR MANUFACTURING ENGINES SO THAT WE CAN PLAY WITH INNOVATION, GROW WITH PRODUCTIVITY AND SERVE WITH EFFICIENCY."

When the winner receives the #Machie trophy on the stage, the team or the person receiving it knows that they truly deserve it. They know that it is a 'seriously top class' award. That's why they all come from the different corners of the country to take home the coveted 'Machie' trophy. And this will be happening for the Fifth year in a row with this year's ceremony.

Come May 29 and it will be my pleasure and honour to host the real 'Heroes of Indian Manufacturing'. This is definitely one of the best parts of my job! Looking forward to meeting you in Namma Bengaluru!

Editor & Chief Community Officer

THE ULTIMATE GUIDE TO PROFITABLE MANUFACTURING
MACHINIST
Volume 14 Issue 5 May 2019



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Printed and published by Joji Varghese for and on behalf of owners Worldwide Media Pvt Ltd (CIN:U22120MH2003PTC142239), The Times of India Building, Dr DN Road, Mumbai 400001. Printed at JRD Printpack Private Limited, 78, Resham Bhavan, 7th Floor, Veer Nariman Road, Churchgate, Mumbai - 400 020. Editor: Niranjan Mudholkar. Published for May 2019.

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GST collection for April 2019 sets new record

THE GST REVENUE collection for April 2019 has recorded the highest collection since GST implementation. The total gross GST revenue collected in the month of April, 2019 is Rs. 1,13,865 crore of which CGST is Rs. 21,163 crore, SGST is Rs. 28,801 crore, IGST is Rs. 54,733 crore (including Rs. 23,289 crore collected on imports) and Cess is Rs. 9,168 crore (including Rs. 1,053 crore collected on imports). The total number of GSTR 3B Returns filed for the month of March up to 30th April 2019 is 72.13 lakh.

The government has settled Rs. 20,370 crore to CGST and Rs. 15,975 crore to SGST from IGST as regular settlement. Further,

Rs. 12,000 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 and provisional settlement in the month of April, 2019 is Rs. 47,533 crore for CGST and Rs. 50,776 crore for the SGST.

The revenue in April 2018 was Rs. 1,03,459 crore and the revenue during April 2019 is a growth of 10.05% over the revenue in the same month last year. The revenue in April, 2019 is 16.05% higher than the monthly average of GST revenue in FY 2018-19 (Rs. 98,114 crore).

Successful Trial of 'Nirbhay' Sub-Sonic Cruise Missile



DEFENCE RESEARCH & DEVELOPMENT ORGANISATION (DRDO)

has successfully test fired indigenously designed & developed Long Range Sub-Sonic Cruise Missile "Nirbhay" from the Integrated Test Range (ITR), Chandipur Odisha.

It is the sixth development flight trial with objective

to prove the repeatability of boost phase, cruise phase using way point navigation at very low altitudes. The missile took off vertically turning horizontally into desired direction, booster separated, wing deployed, engine started, cruised all the intended waypoints. The missile demonstrated its sea-skimming capability to cruise at very low altitudes.

The entire flight was fully tracked by a chain of Electro Optical Tracking Systems, Radars and Ground Telemetry Systems deployed all along the sea coast.

India's GDP to be 7.5% in 2019-20: World Bank

ACCORDING TO THE WORLD BANK, India's GDP is forecast to expand 7.5 percent in FY2019/20. "Credit growth will benefit from relatively more accommodative monetary policy amid benign inflationary conditions. Support from delayed fiscal consolidation will partially offset the effects of political uncertainty on economic activity around elections in May," says the World Bank in its twice-a-year regional economic update.

South Asia holds on to its top spot as the world's fastest growing region, with growth set to step up to 7.0 percent in 2019, then 7.1 percent in 2020 and 2021, but the region needs to increase its exports to sustain its high growth and reach its full economic potential, says the World Bank.

The latest edition of the 'South Asia Economic Focus, Exports Wanted', finds that the region's growth, while still robust, is mainly driven by domestic demand, which in turn swelled imports and far outstripped exports, further widening trade gaps and current account deficits, and triggering currency depreciation in some countries.



"South Asia's exports performance has dropped in the last few years to languish at far below its potential and while growth still looks robust we are concerned about whether this can hold up over the longer term," said Hartwig Schafer, World Bank Vice President for the South Asia Region. "To ensure growth in the long run, the region needs to integrate further into international markets to sustain its upward growth trajectory, create more jobs, and boost prosperity for its people."

Softer increase in production in India

ACCORDING TO THE NIKKEI INDIA MANUFACTURING Purchasing Managers' Index® (PMI®), a softer increase in new orders created a domino effect in the Indian manufacturing industry, restricting growth of output, employment, input buying and business sentiment. The one bright spot in April was exports, which expanded solidly and at a slightly quicker pace than in March. The overall slowdown in the sector was accompanied by cooling rates of inflation. Broken down by sector, capital

goods was the key source of weakness, recording contractions in new business and output. Growth was meanwhile sustained at both consumer and intermediate goods makers.

PMI® declined from 52.6 in March to 51.8 in April. This indicated a slight improvement in the health of the sector that was the slowest in eight months and weaker than the average for the 14-year survey history.

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Anchor is now Panasonic Life Solutions India

ANCHOR ELECTRICALS PRIVATE LIMITED, a wholly owned subsidiary of Panasonic, today (April 10, 2019) announced the change in its legal entity to 'Panasonic Life Solutions India Private Limited' with effect from April 1, 2019. With this, the brand has also changed its corporate identity from 'Anchor by Panasonic' to 'Panasonic'. This alteration expresses its vision to 'Make a better, comfortable life with human oriented solutions'.

Vivek Sharma, Managing Director, Panasonic Life Solutions India Private Limited said, "We are one of the leading players in the manufacturing and selling of electrical and construction materials. Our products are made from cutting edge & innovative Japanese technology and occupy a unique positioning in the market. We are delighted to unveil our new corporate identity which will help us in strengthening our position in our segment.



With this change, we would position the brand as one that would take care of the expectation of modern India consumers".

Tata Sponge Iron Limited takes over steel business of Usha Martin

TATA SPONGE IRON LIMITED, a subsidiary of Tata Steel Limited, has acquired the steel business of Usha Martin Limited (UML). A meeting was organised recently (April 9, 2019) between the senior management of Tata Sponge and UML followed by a Town Hall meeting with all the officers of UML.

Addressing the gathering, Sanjay Pattnaik, Managing Director, Tata Sponge, welcomed the UML officers to Tata Sponge family and said: 'It is indeed a moment of great pride for all of us in Tata Sponge that today Usha Martin has become an integral part of the Tata Steel Group. India is on the cusp of growth and it is a great opportunity for all players in the steel industry to leverage this growth opportunity. Usha Martin is an established wire rod producer with significant equity in the market place.'

'It is my privilege to welcome all the employees of Usha Martin into the Tata fraternity. It is with tremendous pride and humility that I look forward to working with all of you and meaningfully contribute towards a sustainable future of Tata Sponge as a new extended enterprise', he added.

Indian Navy inaugurates Virtual Reality Centre (VRC)

ADMIRAL SUNIL LANBA, PVSM, AVSM, ADC the Chief of the Naval Staff, recently inaugurated the maiden state-of-the-art Virtual Reality Centre (VRC) at the Directorate of Naval Design (Surface Ship Group). This centre would provide major boost to the Indigenous warship design capabilities of Indian Navy, providing impetus to self-reliance and greater fillip to warship construction under 'Make in India' initiative of the Indian government.

During his address at inauguration ceremony, Admiral Lanba complimented the Directorate for their untiring efforts, foresight and initiatives to conceptualise design and execute the project. This project will facilitate collaborative design reviews for continuous interaction between the designers and the end users to improve design and ergonomics on-board warships.

Twelve more nuclear power plants to come up in India for uninterrupted power supply

INDIA will have 12 more nuclear power stations shortly to improve the power situation & also ensure there is free flow of uninterrupted power supply for both industries and residential usage. This statement was made by K. N. Vyas, Secretary, Department of Atomic Energy and Chairman, Atomic Energy Commission, India recently.

"Nuclear Technology helps in betterment of lives through varied usages & is an irreplaceable source of clean, pollution free energy," he added. Vyas said, "The Founder of Indian Nuclear programme, Homi Jahangir Bhabha had envisaged that nuclear technology is going to be 'very essential' & not just in the power sector but for other societal uses intended

for betterment of life."

"We believe that when it comes to clean energy, definitely, there is no substitute to nuclear energy as it is sustainable, and without interruption, one can have clean energy," the DAE Chief said in response to a query.



He cited the record run of Kaiga Nuclear Power station as an example. A small unit of indigenously-developed 220-250 MW reactor has completed 962 days of uninterrupted run at about 99.3 per cent of capacity. "The amount of electricity it has been able to give in tremendous," Vyas contended.

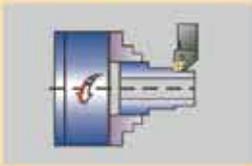
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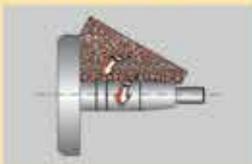


FIG-300 CNC
FOUR STATION TURRET



FIGE-150 CNC
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AWH-1500 CNC
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AWH-2000 CNC
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SWH-400 CNC
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SG-106 CNC
CREEP FEED GRINDER



SGR-60
ROTARY GRINDER



SG-63
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Automats



A15/25

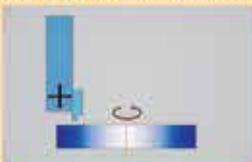


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A list of key events happening between June 2019 to September 2020, both nationally and internationally.

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6–10, 2019

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JULY
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Automotive Engineering Show India 2019 (Chennai)
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www.automotive-engineering-show.in

AUGUST 30
–SEPTEMBER 1,
2019

AgriTech India 2019
Bangalore, India
www.agritechindia.com

SEPTEMBER
16–21, 2019

EMO Hannover 2019
Hannover, Germany
www.emo-hannover.de

SEPTEMBER
20–22, 2019

TechIndia
Mumbai, India
www.techindiaexpo.com

SEPTEMBER
25–28, 2019

Automation Expo 2019
Mumbai, India
www.automationindiaexpo.com

OCTOBER
7–10, 2019

Motek
Stuttgart, Germany
www.motek-messe.de/en/

DECEMBER
10–14, 2019

Excon
Bengaluru, India
www.excon.in

JANUARY
23–28, 2020

IMTEX Forming 2020
Bengaluru, India
[//imtex.in/imtex2020/](http://imtex.in/imtex2020/)

FEBRUARY
26–28, 2020

Asiamold
Guangzhou, China
[cn.messefrankfurt.com](http://asiamold-china.cn.messefrankfurt.com)

MARCH 31
–APRIL 4, 2020

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SEPTEMBER
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Manish Mehan is the new CEO of thyssenkrupp Elevator (India)



thyssenkrupp has announced the appointment of Manish Mehan as the new CEO of thyssenkrupp Elevators (India) with effect from April 1, 2019.

thyssenkrupp Elevator (India) is one of the world's leading elevator companies with unique engineering capabilities. The company installs, maintains and modernizes elevators and escalators in India and Bangladesh. The company has a 20,000 sq.m Multi-Purpose Facility in Chakan, Pune - designed for an initial capacity of manufacturing 6,000 elevator units, extendable to over 10,000 units in the foreseeable future.

Manish was earlier the Chief Financial Officer (CFO) in thyssenkrupp Elevator (India), leading the finance and related functions for the Indian and Bangladesh Operating Units (OU) for the last twelve years. Additionally, he was also appointed as the Director of Operations to lead the OI-wide field operations including elevate India Project Management Office. Manish has the unique distinction of having sound financial knowledge and acumen by virtue of having been a CFO and gaining in-depth operational experience by managing the three critical business verticals i.e. Sales & Marketing, Installation, Service & Maintenance for India and Bangladesh OUs.

Gajanan Gandhe to lead Dana India's operations

Dana Incorporated has announced that Gajanan Gandhe is joining the company as country leader of Dana India, effective March 3, 2019. In this role, Gandhe will work across Dana, including the company's business units, functional teams, and joint-venture partners, to accelerate strategic and profitable growth. Included in his responsibilities is the implementation of the company's e-Mobility strategy in this important geographic market. He will also be an active member on each of Dana's India-based boards of directors.

"India is one of the world's largest industrial markets, and Gandhe brings proven leadership experience in the mobility industry in India, as well as globally," said Antonio Valencia, senior vice president, global electrification, China, and India for Dana. "In combination with our significant organic growth and the acquisitions of Brevini, TM4, SME, and Oerlikon Drive Systems, India is one of our largest regions. We are excited to welcome Mr. Gandhe to the Dana team as we continue to capitalize on this important growth sector."



MAIT appoints George Paul as its new CEO



Manufacturers' Association for Information Technology (MAIT), the apex body representing India's ICT & Electronics hardware manufacturing, R&D and training service sectors, appointed its new CEO, George Paul.

George Paul brings 30 years of industry experience in IT Hardware Products, Electronic Subsystems, Mechatronics, Avionics, Mechanical Engineering, Aerospace & IT Services. He has led operations in the functional domains of Marketing, Corporate affairs, Public Relations, Manufacturing, Hardware Product Engineering, Training & Capacity Building, Research & Development. As part of the Industry, he was actively involved with MAIT and other industry bodies towards fostering R&D and manufacturing in India. Prior to this role, Paul was the Executive Vice President of HCL Infosystems. At HCL, he has managed and lead a variety of roles in Marketing, Manufacturing & R&D. In his career, he has had stints with leading organisations including Larsen & Toubro, HCL-HP & HCL Peripherals.

Nitin Kunkolienger, President, MAIT said, "It's great to have Mr George Paul as the next CEO of MAIT. I have worked extensively with George and have the utmost respect for

his experience and accomplishments. George has demonstrated his ability to drive innovation and growth and delivered results, and it goes without saying that he will infuse new energy to the MAIT agenda."

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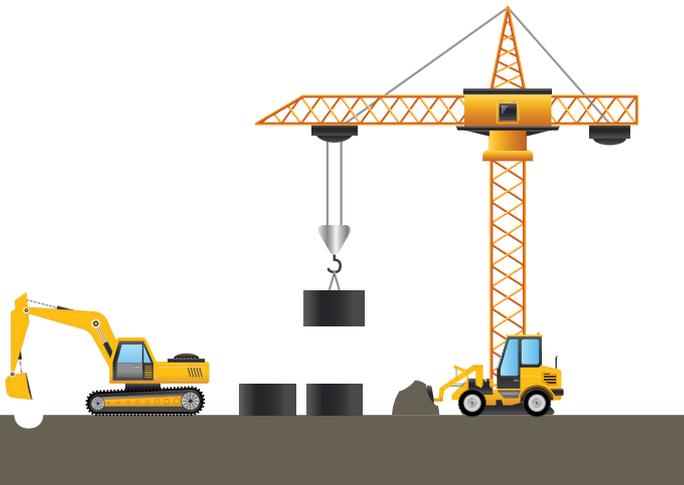
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ROBUST LONG-TERM OUTLOOK

General elections in mid CY2019 to however moderate growth and revenues in FY2020; recovery post elections will be contingent on the stability of the elected government.



“Following strong growth during FY2016-18, the Indian MCE industry (represented by a sample of nine large players) is expected to continue the growth momentum in FY2019 as well. The estimated growth of ~23% draws support from sustained demand push in key end-user industries like roads, railways, metro, etc.”

Pavethra Ponniah, Vice President and Sector Head, ICRA

The Indian Mining & Construction Equipment (MCE) industry is likely to see a moderation in demand growth which is expected to fall to 4-6% in the medium term, more particularly during CY2019. The basic reason, policy paralysis and diversion of liquidity during Central elections which generally leads to slow progress on projects. As per ICRA report on the industry, demand for MCE post-elections will be a function of a stable government and continued focus on infrastructure investments.

This apart, the likely impact of the emission norm changes in off-road equipment during October 2020 on prices of CE is another headwind for CY2020 that may affect demand growth.

Elaborating further on the trend, Pavethra Ponniah, Vice President and Sector Head, ICRA says, “Demand growth was a robust 24-27% during CY2018 (as against ICRA’s July 2018 expectation of ~20% growth), supported by road work throughout the country. Growth stayed strong through the initial 9M of CY2018, barring seasonal lows. However, growth started tapering off in Q4 CY2018 and has been relatively muted in Jan-Feb’19, impacted partly by the NBFC liquidity crisis, and the consequent impact on loan-to-value (LTV) ratio and interest rates during Q4CY2018. Further, the ensuing general elections will have a bearing on growth and the stability of subsequent government thereof will determine growth trends in the medium term.”

Within the MCE industry, the construction equipment (CE) segment has been growing at a rapid pace over the past three years (CAGR of 17% CY16-18E), while the mining equipment (ME) growth has been relatively muted, between 5-10%. The outlook for ME from late CY19 onwards is expected to be positive but will be largely contingent on Coal India’s massive equipment ordering plans. Coal India has already floated tenders and factoring in a 9-12 month period for delivery of these large capacity equipment, demand for mining equipment should increase in CY2020. This demand spike also includes pent-up demand of the past three-four years, when Coal India’s ordering was delayed due to some procurement hurdles. Mining equipment manufacturers ICRA interacted with have also corroborated this improving outlook for mining equipment with demand coming from coal; and quarrying and aggregate demand for roads.

As for CE demand, for a large part of the current up-cycle which started in CY2016, road work has

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largely been a single legged demand driver, followed by railways which also supported growth briefly during CY2017. Notwithstanding the general slowdown in public/private infrastructure work during the election period, the road sector has an adequate pipeline of projects for development/up-gradation in national highways and state highways which can keep execution high during CY2019. Nevertheless, ICRA expects a brief period of decline in execution and demand for new equipment during mid CY2019. Recovery post elections will be contingent on the stability of the elected government.

Although new stringent awarding guidelines for road projects have reduced awards in FY2019, the major contribution to execution in FY2019 came from projects awarded up to H1FY2018 and not those awarded in last 12 months. Given this premise, weak awarding in CY2019, given the election period could impact execution and consequently demand for equipment in CY2020.

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As for CE demand, for a large part of the current up-cycle which started in CY2016, road work has largely been a single legged demand driver, followed by railways which also supported growth briefly during CY2017.

Supported by public sector spending on infrastructure, construction activities witnessed healthy Y-o-Y growth during 9M FY2019. Road remained the growth engine for the sector, however there has been some challenges in land acquisition and arrangement of funds for PPP projects. Overall, construction sector is expected to continue to witness healthy order inflow and pace of execution, in the backdrop of increased investments in the infrastructure sector. This is expected to boost financial performance in FY2019.

On the financial front, MCE industry-wide revenue growth has been strong in the last three years (ending FY2018) supported by sharp recovery in demand across most of the

Going forward, ICRA expects the trend to continue with likely improvement in accruals and cash flow position. Several players have announced capex plans, in line with the expected demand trend.

product categories. With better utilisation of capacities and improving bargaining power of OEMs aided by favourable demand, the industry profit margins and RoCE have expanded sharply, reaching highs of 14% and 40% respectively during FY2018. Higher operating margins coupled with lower interest costs (on the back of sizeable reduction in debt) has resulted in strong net profit margins. Steady increase in earnings has resulted in generation of strong cash surplus, which was used to reduce debt levels sharply.

Accordingly, the industry credit metrics has improved in the last three years. The working capital intensity too continues to be comfortable at less than 10%.

Adds, Ponniah, "Following strong growth during FY2016-18, the Indian MCE industry (represented by a sample of nine large players) is expected to continue the growth momentum in FY2019 as well. The estimated growth of ~23% draws support from sustained demand push in key end-user industries like roads, railways, metro etc. However, ICRA expects the revenue growth to moderate sharply in FY2020 with likely contraction in demand, especially from segments like road. The industry margin, however, is expected to remain range-bound benefiting from the higher capacity utilization, scale economies and relative easing of pricing pressures."

Given the robust cash accrual build-up over the years, dependence on debt (to fund capex or working capital) has been limited in recent years. Going forward,

ICRA expects the trend to continue with likely improvement in accruals and cash flow position. Several players have announced capex plans, in line with the expected demand trend. However, with strong accruals, industry credit profile is expected to improve. Moreover, improving accruals together with reducing debt is expected to enhance credit metrics of the industry, expanding interest cover and reducing gearing. 



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Airbus and ZF collaborate on autonomous driving

Airbus Defence and Space and ZF Friedrichshafen AG are collaborating to enrich and complement ZF on-board system to enhance autonomous driving by using Airbus satellite derived information.

Under this collaboration, Airbus and ZF are combining their capabilities and expertise to offer a reliable end-to-end solution for self-driving and self-positioning vehicles. To answer the extreme level of accuracy required, Airbus provides its unique high precise Ground Control Points (GCPs), calculated using radar satellite imagery, to support the fusion of ZF sensor data such as Lidar and Radar. In addition, the GCPs serve as independent data source to improve and validate the accuracy of mobile mapping data.

Furthermore Airbus investigates generation of High Definition maps (HD maps) based on aerial and space borne approach, to complement ZF semantic cards. HD Maps are key to ensure the guiding route, as they build an important link between mobile mapping data and global positioning systems. They contain more information than just the road itself, as lanes, the radius of curves, lane widths, street signs, bridges, and buildings, as well as their distance from one another. Both remote sensed information GCPs and HD maps will be integrated as foundation layers into the “ZF AD Environment” – an enhanced HD maps solution ZF will present soon – where all needed information for autonomous driving will be implemented in a cloud based system.

Mahindra & Ford to co-develop a midsize SUV

Mahindra Group and Ford Motor Company have recently taken the next step in strengthening their ongoing strategic alliance in India with a definitive agreement to co-develop a midsize sports utility vehicle (SUV). Under the new agreement, Mahindra and Ford will work together to introduce a benchmark product for India and emerging markets.

The new agreement reinforces the steady progress made since the announcement of the strategic alliance between the two companies in September 2017, followed by an announcement on powertrain sharing and connected car solutions in October 2018.

The new midsize sports utility vehicle (C-SUV) will have a common Mahindra product platform and powertrain, thus driving engineering and commercial efficiencies.

Dr Pawan Goenka, Managing Director, M&M Ltd. said, “I am happy with the significant progress we have made and synergies we have created since the announcement of our strategic alliance with Ford in 2017. This announcement is another significant step in the collaboration between our two companies. Having identified several areas for joint development, both companies will continue to work together to develop products using common product platforms. This will reduce product development costs and gain economies of scale for both companies.”

“With this announcement, we not only strengthen our ongoing partnership with Mahindra but also sharpen our competitiveness in an important emerging market like India,” said Jim Farley, President of Ford New Businesses, Technology & Strategy. “Ford’s technological leadership combined with Mahindra’s successful operating model and product prowess will surely help us deliver a vehicle that will meet the expectations of customers in India as well as other emerging markets.”

Toyota to establish Joint Research Institute in China

Toyota Motor Corporation (Toyota) and Tsinghua University have announced that they have agreed to establish the Tsinghua - Toyota Joint Research Institute (Joint Research Institute). Through the Joint Research Institute, the two plan to conduct various research together over the next five years.

By establishing the Joint Research Institute, Toyota and Tsinghua University sees an opportunity to further contribute to the development of China and become a mobility company capable of meeting the needs of Chinese consumers through the development and popularization of vehicles equipped with new technology. By equipping new technology, the aim is to excel in solving environmental problems and in reducing traffic accidents.

Toyota and Tsinghua University have engaged in research projects together since 1998, conducting technology courses and pursuing other related activities.

The establishment of the Joint Research Institute will enable the two to cooperate in research not only related to cars for Chinese consumers, but also in research related to active utilization of hydrogen energy that can help solve China’s energy problems and other certain social issues.

Toyota’s policy regarding initiatives leading to social development is based on openness, and, to promote the popularization of electrified vehicles, Toyota has recently decided to provide licenses royalty-free on patents it holds related to vehicle electrification.

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JLR India starts manufacturing Range Rover Velar

Jaguar Land Rover (JLR) India has announced the start of local manufacturing of Range Rover Velar. The Range Rover Velar will be available in 2.0 l Petrol (184 kW) and 2.0 l Diesel (132 kW) powertrains and priced at ₹ 72.47 Lakh (ex-showroom India).

Rohit Suri, President & Managing Director, Jaguar Land Rover India Ltd. (JLRIL), said: "We continue to focus on providing the best of British design, luxury and technology at highly competitive prices and we are sure that local manufacturing of the Range Rover Velar will make it even more desirable. This also reaffirms our commitment to the Indian market and to our customers."



Royal Enfield enters South Korea

Royal Enfield has announced its entry into South Korea, with Vintage Motors (Kiheung International) as its official distributor-partner in the country. The iconic British motorcycle manufacturer arrives in Korea with its first flagship store in Seoul at Hannam-daero 42-gil, commencing its full operation, including after sales, spares and service. This strategic announcement is in line with Royal Enfield's focused international thrust of leading and expanding the global mid-sized motorcycle segment (250-750cc). The brand launch press conference was addressed by Vimal Sumbly, APAC Business Head and Pablo Lee Junior- Chief Executive Officer, Kehung Motors.

Commenting on the launch of Royal Enfield at the exclusive store in Korea, Vimal Sumbly, APAC Business Head, said, "Our focus is to sustain and expand our reach in International markets especially in Asia Pacific region. Royal Enfield has seen consistent growth in the APAC region with a 20% year-on-year growth. Korea is an important chapter in the growth story and we are thrilled to commence business here. We fully committed to focus all our energies on becoming part of the fabric of this country's rich motorcycling culture."

Denso plans to invest \$1.6 billion for e-mobility over three years

Denso plans to invest approximately 180 billion yen (US\$1.6 billion) over the next three years to support its aggressive development & production of electrified automotive products, systems & technologies. To achieve its long-term business goal to create & inspire new value for the future of mobility, Denso is focused on increasing its performance in the area of electrification.

"We are committed to advancing automotive innovation & anticipating changing needs of customers in the transportation industry. EVs are increasingly becoming the norm throughout the world, and to meet the rising global demand for automotive electrification technologies & products, Denso will strengthen its ability to develop & produce them," said Yukihiro Shinohara, Sr. Executive Office, Denso.

To accelerate business execution around electrification, the company is establishing Electrification Innovation Center at its Anjo Plant in Aichi, Japan, in May 2020. The Center will conduct advanced R&D, develop & test prototypes, & launch newly developed electrification products, systems & technologies.

Tata Motors join hands with Nirma University for technical skill upgrades

Tata Motors has partnered with Nirma University to provide B. Tech degree to its employees working at the Sanand Plant in Gujarat. Aligned with the company's strategic objective, the programme aims at enhancing employees' technical skill at multiple levels in the organisation, thus bridging skill gaps that prevail in the automotive industry and creating a future-ready organisation.

This B-Tech degree programme will impart knowledge & skill requisite for the automotive manufacturing industry. Employees, enrolled for the B-Tech programme will undergo comprehensive training that is designed in two parts – technical orientation de-

livered through classroom and lab sessions at Nirma University campus.

According to Ravindra Kumar G.P., CHRO, Tata Motors, said, "At Tata Motors we believe by enabling our employees achieve their full potential in their functional areas we will be able to build an engaged and competent employee base which is key to our continued success. Our partnership with Nirma University is another step in this direction and will enable our employees in Sanand to push the boundaries of their technical capabilities and emerge as future-ready and world-class technical talent."

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By Swati Deshpande

PUMPING ENERGY!

U. Lakshmi, Plant Head – Coimbatore, Kirloskar Brothers Limited
says work-life balance is extremely important.



Kirloskar Brothers Ltd's Coimbatore plant has been in the limelight for various reasons. One of them is that it is an all women plant that is led by U. Lakshmi. As she spoke about spearheading operations of the plant, it occurred to me that it is not a simple task. In fact, it's an adventure in itself. Even small things such as introducing a second shift in the plant turned out to be a challenge because of the odd shift timings. In short, when a woman works – her entire family has to be convinced about her work profile and work environment. And in Lakshmi's case, there were more than 200 families that she had to convince. She overcame all of them with a smile. And her enthusiasm and energy complements it very well.

Traditionally, manufacturing has been a male dominated industry, how has been your experience in spearheading operations of a manufacturing plant?
Definitely, it is a male dominated industry and more so it was 25 years ago, when I entered into this field.

When I was doing Mechanical Engineering, my peers doubted if I would stay in the hard core manufacturing for long. Proving them wrong, I am here. Fortunately, wherever I worked, I received support from my seniors and management.

Now situation is changing and more women are entering into the field of manufacturing. Take an example of our plant – it's an all women plant. So I am hopeful that women's contribution towards the manufacturing industry will increase in the years to come.

Can you please tell us about your all women plant?
Firstly, I will give you a brief background. KBL has



This is one of the youngest plants of KBL that was established in 2011. Until 2017, the plant ran only single shift. The operations went smoothly till then. Turmoil began when we decided to introduce second shift.

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always emphasized on the women empowerment. The company had launched a magazine named Stree back in 1930, which worked towards women empowerment. Also, Kirloskars established Mahila Udyog, a charitable organization in 1965 to help needy women to earn respectable livelihood. On this backdrop, it was no surprise that the company established an all women plant.

This is one of the youngest plants of KBL that was established in 2011. Until 2017, the plant ran only single shift. The operations went smoothly till then. Turmoil began when we decided to introduce second shift. Workers were hesitant to work in shift having odd timings. After understanding their problem, we came up with various solutions and introduced multiple initiatives. GPRS tracked transport services having a lady guard on-board, Annual Family Day, etc. are amongst these initiatives. Additionally, to gain more confidence amongst workers' family members we introduced an

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To add a feather in our cap, the plant has set a record in the Limca Book of Records by reducing the assembly time for pumps to around 17 seconds. Now that's the magic of my girls.

initiative wherein HR representatives (and occasionally me) pays casual visit to employees' homes. This initiative turned out to be beneficial for us. Confidence level amongst family members of the employees increased. It ensured them that the plant was a safe place for their wife/sister/mother to work. Also, it added a personal touch. We have various other initiatives as well for our employees. To give you an example, we have formed a committee that addresses issues employees have. This committee has no representation from company's management so to create open environment to speak about their problems. We also arrange workshops on work-life balance, etc. so that they live better life on both fronts.

Tell us about the plant's manufacturing capacity and capabilities.

Although, the plant has capacity to produce 90,000

pumps in a month, as of today the highest number of production that we have achieved is 76,000 in March 2019. We are planning to cross the magic number of 90,000 in May 2019. The plant's turnover is 200 cr. And nearly 250 women work here.

To add a feather in our cap, the plant has set a record in the Limca Book of Records by reducing the assembly time for pumps to around 17 seconds. Now that's the magic of my girls. This is absolutely error free process that produces highest quality pumps. Our highest priorities in the plant remain safety and quality. Productivity takes third place after these two.

What are the challenges facing today's plant leaders?

Speaking about me, one of my foremost challenges today is capacity constraints from our suppliers. We want to increase capacity however our suppliers need to align themselves with increasing demand. We are meeting our suppliers and trying to resolve this issue. Also, we are trying to create another pipeline of suppliers to enable us to increase capacity.

In the recent years, role of plant heads is changing. Advanced technologies such as Industry 4.0, AI, etc. are no more a distant dream. What is your take on it?

Adaption of technologies such as automation, robotics, Industry 4.0, depends on various aspects including nature of the plant, need of technological changes, results it would offer, etc. I have already spoken about the record that our plant has created and entered in the Limca Book of Records. My colleagues are doing an exceptional job and I see no need to adapt such technologies right away. However, going ahead if the need be, we may look at it.

Skill-gap is one of the buzzing issues in the field of manufacturing. What has been your observation in this regard?

First of all, let me tell you that skill level is not related to education or degree that a person holds. Most of our workers at the shopfloor are school drop-outs. But they are skilled and worthy for the jobs that they are doing. Moreover, training is a continuous affair at KBL.

For the new comers, we have a program called Bodhi. It is an extinctive 2-weeks training program comprising of theoretical as well as practical sessions. Some of the machines on the shopfloor are replicated in the training room to give them hands-on training. The training is followed by evaluation process.

Moreover, for the existing employees, refresher training is done. Of course, it is important to keep up with the time. In addition to this, few other tanning workshops such as time management, work-life balance, etc. are also regularly conducted. 

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HHV Pumps sets up new facility at Bangalore

HHV Pumps Pvt. Ltd. has announced the setting up of its new state-of-the-art manufacturing facility, spread over an area of 52,000 sq.ft., at T.Begur, Nelamangala Taluk, Bangalore. This new facility, which is set up at an initial investment of Rs. 10 crore, was officially inaugurated by S.V. Narasaiah, the Founder and Chairman of the HHV Group. The Group was established in 1965 to develop Indian self-reliance in high vacuum technology. Narasaiah is considered to be the pioneer of vacuum technology in India.

“HHV aims to be a global leader in vacuum pumping solutions, by ensuring the lowest cost of ownership for our customers through the use of indigenously developed technology as a part of our ongoing ‘Make in India’ philosophy,” said Prasanth Sakhamuri, Managing Director of HHV. “The existing unit of HHV Pumps located at Peenya, Bangalore, which had commenced manufacturing operations in 2009, will be shifted to the new facility. The new facility, with employee strength of 65, will manufacture vacuum pumping solutions of international standards including the two-stage rotary vane vacuum pumps, single stage rotary vane vacuum pumps, roots boosters, multi-stage dry vacuum pumps and multi-stage dry vacuum pumping systems.”



“The new unit will have 90% of the machining activity located in-house. The target markets for our products would be air conditioning and refrigeration, chemical/pharma, electrical and power, general/ industrial (including packing), research and development, solar for lamination and others. We expect a turnover of Rs. 38 crore for the current financial year from this unit,” added Sakhamuri.

Dana Incorporated adds five facilities in China in 2019

Dana Incorporated has announced that the company had added five facilities in China since the start of the year. The increase is the result of Dana's recent acquisition of the SME Group, as well as the Drive Systems segment of Oerlikon Group, including the Graziano and Fairfield brands. The added facilities expand Dana's engineering, manufacturing, testing, and aftermarket service in China. They also strengthen the company's capabilities for electrification and hybridization across the passenger car, commercial-vehicle, and off-highway markets throughout the region.

The recently added facilities are located in:

- Shanghai, which engineers and manufactures SME AC electric motors, inverters, controllers, and accessories;
- Changshu, which produces planetary gear reducers for e-Drives;
- Baoding, which will make e-Axles for new energy buses;
- Suzhou, one which produces city bus axles; and a second that produces drives, axles, and gears primarily for off-highway mobile equipment and industrial machinery.

Dana's footprint in China now encompasses more than 6,750 employees at 23 operations, including those in which Dana holds an interest.

“Dana has been operating in China for more than 25 years, & we see a strong opportunity to accelerate our growth in the Asia-Pacific region,” said Jim Kamsickas, President & CEO, Dana. “The addition of these facilities shows how Dana will continue to invest in expanding our capabilities for vehicle manufacturers in China – especially for those that are bolstering their electrification initiatives.”

Airbus China opens H135 final assembly line in Qingdao



Airbus Helicopters has expanded its industrial footprint and partnership with China with the opening of the H135 final assembly line (FAL) in Qingdao. The factory is the first helicopter FAL built by a foreign manufacturer in China, as well as the first H135 FAL outside of Europe.

The opening of this FAL follows a cooperation agreement signed between Airbus Helicopters and China in 2016 for the purchase of 100 H135s destined for the Chinese market. Ninety-five of these 100 helicopters will be assembled on this FAL from 2019 onwards. Main components including the main fuselage, main gearbox kits and rear fuselage will be shipped to Qingdao from Donauwörth, Germany and Albacete, Spain respectively.

The 6,500sqm Qingdao plant is composed of four working stations, a paint booth, ground and flight test areas, and a delivery centre. The site will employ around 40 people, 23 of whom received on-the-job training in Donauwörth.

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Dongfeng Honda opens new plant in China



Dongfeng Honda Automobile Co., Ltd., a Honda automobile production and sales joint venture in China, held an opening ceremony to commemorate the completion of construction of its third automobile plant in Wuhan, Hubei Province, China. The ceremony was attended by approximately 400 attendees in-

cluding representatives from the governments of Wuhan, Hubei Province, Mr. Zhu Yanfeng, Chairman of Dongfeng Motor Group Co., Ltd., as well as Takahiro Hachigo, President, Representative Director & CEO of Honda Motor Co., Ltd., and Yasuhide Mizuno, Chief Officer for Regional Operations (China) of Honda Motor Co., Ltd.

As a new plant capable of responding flexibly to the advancement of products, including the acceleration of electrification, this plant will accommodate production of electrified models. Moreover, this new plant is equipped with a water recycling system and emission treatment equipment which makes it more environmentally-responsible and realizes high efficiency through proactive adoption of automation in each production process. With such state-of-the-art production technologies, the plant will begin production before the end of this month.

Groupe Renault opens a new design center in Shanghai

Groupe Renault's Design Department, already present in France, Romania, South Korea, Brazil and India, is pursuing its strategy of international expansion with the opening of a new design center in Shanghai. The new Renault Design Center Shanghai will imagine and design future Groupe Renault models directly addressing the expectations of Chinese customers.

"Our new design studio in Shanghai fully supports Groupe Renault's strategy to win over new customers in China. We plan to hire some 20 local designers in the coming months. These talents will help us to anticipate the expectations of Chinese customers. Renault Design Center Shanghai will play a major role in the design of future local products. It will also contribute to global Groupe Renault projects," said Laurens van den Acker, Executive Vice President, Corporate Design.

Renault's design center in Shanghai will cover all automotive design sectors, including exterior and interior design, colors and materials, UX design and UI design.

Based in the center of Shanghai and drawing on the city's creative momentum, the designers will explore the latest trends with a view to responding to the expectations of Chinese customers both in terms of styling and technological innovation.

Evonik opens new plant for Activated Metal Catalysts in India

At Evonik Catalyst's manufacturing site in Dombivli, India, the company is commissioning a new plant initially for the production of KALCATTM and in the long-term also Metalyst® Activated Metal Catalysts. This new state of the art production facility allows Evonik to fully utilize its capacities in Dombivli while establishing significant synergies with the Activated Metal Catalyst production site in Germany.

Activated Metal Catalysts are used in the food industry for the production of sorbitol, the manufacture of active pharmaceutical ingredients (APIs) and in the production of fine and industrial chemicals, for example in the polyurethane value chain. The benefit to customers will be increased supply security of high-quality catalysts which are critical raw materials for most industrial processes. The growth rate for India and the rest of Asia in the catalyst market, is forecasted to be significantly higher than in other regions of the world. Therefore, this expansion and upgrade of operations will safeguard the supply of the established product range as well as allowing Evonik to expand the portfolio targeting new markets and applications.

Honda of Mexico CVT Plant celebrates one million transmissions

Honda of Mexico's CVT Transmission Plant of the manufacturing complex in Celaya, Guanajuato, has produced its one millionth unit on March 20. This took less than four years since the plant started manufacturing operations in July 2015.

The Transmission Plant is part of the manufacturing complex that the company has in Celaya; its construction began in 2013 with an additional \$470 million investment to the new car man-

ufacturing plant that was already under construction on the site. This plant started operating in July 2015 and is a key part of operations in Mexico, since it provides CVT transmissions not only for vehicles manufactured in Mexico, but also for several plants in the US, EU & Canada. It has an area of more than 65,000 sq. mtr. and more than 1,000 highly trained associates work there to produce with high quality this precise piece of engineering that is key to the performance and efficiency of vehicles.

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METALLIC 3D PRINTING: A COMPLETE SUCCESS

Joint project demonstrates huge potential for the production of replacement parts and series-production components



The secret lies in an ingenious & scalable additive production chain, which is fully automated right through to the point where the printed parts are mechanically sawn off the build platform.

What began as a promising vision in 2017 has now reached a successful conclusion: the project 'NextGenAM' will work on the development of a pilot production line for a next-generation automated 'Additive Manufacturing' (AM) process for partners Premium AEROTEC, EOS & Daimler.

The 3D printing process has become more interesting as a complementary or alternative process to conventional manufacturing techniques. Along with plastics & ceramics, it is also possible to produce metal components in a 3D printing process.

The aim of the pilot project was to develop a digitalised next-generation manufacturing line, which

would be able to produce aluminium components for the automotive & aerospace sectors more cost-effectively than is currently possible. The successful outcome of NextGenAM: in terms of the overall production process at Premium AEROTEC, manufacturing costs could be reduced by up to 50% compared with existing 3D printing systems. "As far as the aircraft industry is concerned, Premium AEROTEC is already an international pioneer in the field of metallic 3D printing. The aim now is to build further on this expertise & to bring it to bear in other sectors as well," said Dr Thomas Ehm, Chairman, Executive Board of Premium AEROTEC. "The successful conclusion of NextGenAM represents another important building block in our strategy."

FULLY AUTOMATED PRODUCTION

The secret lies in an ingenious & scalable additive production chain, which is fully automated right through to the point where the printed parts are mechanically sawn off the build platform. This means that no manual work is now required at any stage of the process, from the data preparation & central powder supply through to the AM build process itself & including heat treatment, quality assurance & separation of the components from the build platform. The technical heart of the system is the EOS M 400-4 four-laser system for industrial 3D printing using metal materials. A driverless transport system & robots ensure smooth movement of the parts through every stage of the production line. The entire production process runs itself, without operating personnel, from a central, autonomous control station. Fundamental to the system is the way all the machines used are networked. The order data are transmitted to the control station, which then prioritises the various build requests & allocates them to an AM system. During the build process, the manufacturing status can also be retrieved on a mobile device, independent of location. Once the full production chain has been completed, the quality reports are sent back

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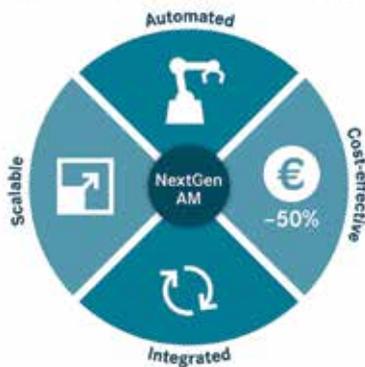


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NextGenAM – 3D printing with metal materials



centrally to the control station. All the necessary data for the production of a digital 'twin' can be accessed here, allowing complete traceability & other things.

Dr Adrian Keppler, CEO, EOS, says: "The NextGenAM project has provided a tangible demonstration of how industrial 3D printing can be used cost-effectively in series production as part of an automated process chain. In combination with the possibilities for digitalisation as used here, the pilot plant represents nothing less than a milestone along the way to digital manufacturing."

CAPACITY CAN BE EXTENDED

A continuous 3D data string with integrated quality management makes this production system one of the first examples of the benchmark for the future, Industry 4.0. The production lines can be duplicated to extend the capacity of the plant. This brings the prom-

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The 3D printing process is particularly useful in the replacement part sector since, in the event of a tool problem, infrequently required parts can often be reproduced cost-effectively than with conventional casting processes.

ise of further substantial savings in the future as the numbers rise. Today, the pilot facility is already capable of the automated manufacturing of components to series-production quality standards. Parts for Daimler are already being produced on the new technology line at Premium AEROTEC.

REPLACEMENT PARTS FOR CVs

The 3D printing process is particularly useful in the replacement part sector since, in the event of a tool problem, infrequently required parts can often be reproduced more cost-effectively than with conventional sand or pressure casting processes. The first requests for 3D-printed replacement bus parts in aluminium are currently being examined at the Centre of Competence

for 3D printing at Daimler Buses. The analysis team in the passenger car area is also currently considering suitable potential applications.

OPPORTUNITIES FOR SMALLEST SERIES

"AM is suitable for smallest-series production of new vehicles (limited editions). Systematic development of the parts specifically for 3D printing means that production costs can be reduced & the quality optimised," says Jasmin Eichler, Head-Future Technologies, Daimler AG. "AM also makes sense during the advance development of vehicles. The low numbers required can often be produced cost-effectively & faster, with AM than with conventional production processes." And this applies as much for vehicles with a combustion engine as for EVs.

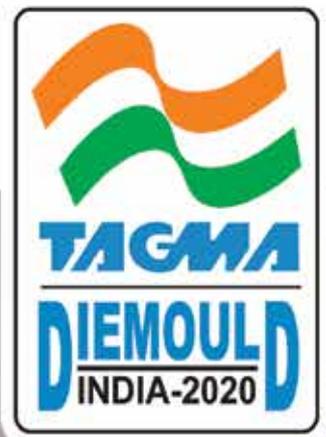
HIGH PRODUCT QUALITY AS STANDARD

High product quality comes as standard in the pilot facility: there is also provision for the use of a high-strength aluminium/magnesium/scandium alloy (also known as Scalmalloy®) for parts used in aerospace sector. For the automotive, a classic aluminium alloy (Al-Si10Mg) is used, the material properties of which have been continually improved over the course of the pilot project. The material strength & finish quality, amongst other factors, have been significantly improved compared with two years ago when the cooperation started.

OUTLOOK

Now that all the quality checks so far have been passed with promising results, preparations are under way for an audit according to the requirements of the industry standard VDA 6.3. This is one of the prerequisites at Daimler for the supply of series-production components by contract printing suppliers. The automation of the entire AM production chain will in future make it possible to manufacture larger batches in series production – with the same reliability, functionality, durability & economic efficiency as conventionally manufactured components. Components for new vehicles can be optimised for 3D printing during the design phase, bringing the promise of further advantages in terms of cost. AM delivers weight benefits, which are of interest for EVs. When it comes to replacement parts, 3D brings the advantage of saving warehousing costs – because parts can be produced 'on demand'. This vision for the future is known as 'Digital Stock' at Daimler, in other words the centralised availability of digital manufacturing data to allow the decentralised production of replacement parts using 3D printing. 

Source: Daimler



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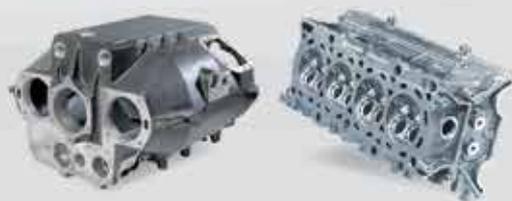
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By Niranjan Mudholkar

THE ŠKODA BET!

The Volkswagen Group in India is merging three group companies into one legal entity with Škoda taking the lead, says **Gurpratap Boparai**, MD, Volkswagen India Private Limited and MD, Škoda Auto India



Volkswagen Group is investing one billion euros into the implementation of the 'India 2.0' project, primarily between 2019 and 2021. Which are the different areas into which this investment is being made and in what proportion?

This investment is purely on upgradation of the factory here as well as for supporting our suppliers to make the new cars. In addition to this amount of one billion dollars, there is another roughly 300 million dollars that we are spending on the development of the new cars, some of which will happen in Europe and the rest here in India. So, basically the platform itself is going to be developed in Europe, in the Czech Republic, whereas the interiors of the car and some elements of the top half of the body of the cars will get developed here.

As part of the 'India 2.0' project, the Volkswagen Group in India is implementing a restructuring programme. What are the key highlights of this programme and how is it progressing?

In the passenger car business, we have three group companies in India: Škoda Auto India Private Limited, Volkswagen India Private Limited and Volkswagen Groups Sales India Private Limited. So, we will make one company out of these three; merging them into one entity. This would obviously allow us to leverage

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The integration of the three group companies is driven by the fact the group has taken a decision to have Škoda lead the India region. Škoda is best placed to address requirements of the Indian market and of the Indian customers and therefore Škoda was given the responsibility here."



our synergies - the synergies that exists amongst these three companies - in a much better than we have done it before. Already, a lot of things have been done at the individual levels but beyond that, when you have one legal entity a lot more can be done.

So, what was the logic behind integration at this point of time?

To answer the question why now, it is driven by the fact amongst other things besides what I mentioned about having this unity is because the group has taken a decision to have Škoda lead the India region. So, Škoda has been interested globally in two regions; one is the Russia region and the other is the India region. Other brands are responsible for other regions; this has been primarily done to address regions where the group as a whole is not very strong. Where the group is already pretty strong, there each brand continues to operate like they were earlier operating.

Škoda is best placed to address requirements of the Indian market and of the Indian customers and therefore Škoda was given the responsibility here. Same logic applied in the case of Russia.

Škoda Auto CEO Bernhard Maier has said that the Group is aiming for a combined Volkswagen and Škoda market share of up to five percent by 2025 in India. That's a fairly aggressive target given the highly competitive nature of the market. How are you going about it?

That is all the group put together. So, we are at roughly two percent now. We were in some months last year at two and a half percent, so I think it's a tough target, but it's not an impossible target.

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Today, we do not have a medium sized SUV and that's a growing segment, so we will have a couple of products in that segment. We will have other body styles on that platform. We will start with two cars each for Škoda and Volkswagen and then we will keep adding.

So, how are you going about it? I mean, what would be the product strategy for this?

Clearly, we need to get into segments where there are volumes. Today, we do not have a medium sized SUV and that's a growing segment, so we will have a couple of products in that segment. We will have other body styles on that platform. We will start with two cars each for Škoda and Volkswagen and then we will keep adding. Speaking on the exports front, exports will continue to be important for us as they help in faster recovery of investment. When you are able to produce cars with the same investment, obviously it helps the business case. But exports is not the primary reason why we are here; we are here to serve the Indian market and then in the process, if we are able also to export then it helps.

While the Volkswagen Group is doing a lot globally when it comes to e-mobility, it seems to be relatively quiet when it comes to the India market. What and by when can we expect some developments on this front in India?

The government policies in this regard seem to be addressed more towards the taxi and commercial vehicles segment. Traditionally, that has not been our strength; our products are more aspirational. And we would like to also continue to be like that. Obviously, when it makes economic sense for us to bring electrics, we will address that. We have a good product portfolio being developed right now and bringing those cars to India will happen when the volume will support the localization here. Unfortunately, the customs duties have been raised on batteries, on electric components and so on.

One of the key elements of the 'India 2.0' Project is creating new jobs while focussing on skill development. Tell us what the Group is doing towards this direction.

So, we have an idea that we have implemented, and we will probably be looking at replicating it. We have that in the curriculum, so defining what the curriculum and



Volkswagen Pune Plant rolls out one millionth car in the presence of Gurpratap Boparai, Steffen Knapp and the Board of Management

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Exports will continue to be important for us as they help in faster recovery of investment. When you are able to produce cars with the same investment, obviously it helps the business case. But exports is not the primary reason why we are here; we are here to serve the Indian market and then in the process, if we are able also to export then it helps.

also helping them upgrade their physical infrastructure. Other than that, we run an in-house training program for mechatronics that is based on the dual model from Germany. And those people are really very skilled once they complete their training. Some of them are absorbed by us and some of them are for the benefit of the rest of the industry.

The Volkswagen Pune Plant recently rolled out its one millionth car of the assembly line. How important is this milestone?

This facility remains the backbone of our growth narrative in India. The millionth car, an Ameo, is a fine example of how Volkswagen designed and built a car especially for the Indian market while considering the local customer and market requirements. This roll-out is an important milestone for us in our long term commitment to the Indian market. We would like to build further on this milestone and work towards higher localization, ramping up production and manufacturing world-class products for the country and several other markets around the world in the future.

Do you think the marketing strategy needs a relook because you have superb products but somehow the acceptance level is not that good in the market?

So, the acceptance level has to do not so much with how we market our products as much as to the perception that people have that our products are expensive to own. In the last year, the total cost of ownership of most of our cars, almost all of cars came down between 10 percent to 25 percent, which is a substantial decrease. We will continue down that road so that even on the total cost of ownership we are competitive with the rest.

How would you manage the cost?

It would mean more focus on localising. Then the other stress is going to be that today for production we get a whole sub assembly. So, right now for the next generation of cars we are already defining the sub parts of the sub-assemblies that we will require for spares. So, a good exercise has been done and that will make sure that our customers don't have to replace the whole sub-assembly and just replace part of that sub-assembly.

You come with a very strong manufacturing background with an equally good understanding of the market. So, what is Gurpratap Boparai's personal vision for the Volkswagen Group in India.

My personal vision is that in the next three to between three to five years that the India operations become sustainable; sustainable in the sense that we are making money and we are able to get further products without having to always doubt whether we will be able to the recover investments. So, we want to establish ourselves as a player that can bring in a lot of cars and not just a few cars and then stop and wait and then start again. That's something that we don't want to repeat because that really will not help us. 🇮🇳

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SUPER JURY MEET!

Twelve industry leaders evaluated nominations for the milestone edition of The Machinist Super Shopfloor Awards 2019.



This year Niranjan Mudholkar, Editor, The Machinist also assessed the nominations as a jury member

The fifth edition of The Machinist Super Shopfloor Awards 2019 received tremendous response in terms of nominations. Most of the leading manufacturing companies participated in this milestone edition of the awards. These companies sent entries across eleven categories in two segments (large and SMEs). In fact, nominations were pouring in till the last moment.

Maintenance was the new category that was introduced this year. Showcasing its prowess on the maintenance front, the industry enthusiastically sent entries that were well backed up by data.

These nominations were presented to the jury on April 25, 2019 in Pune. The jury, well respected professionals in the field of manufacturing, evaluated more than 600 entries.

Chandra Nataraja, MD, Knorr Bremsse Center India Pvt. Ltd., who has been an integral part of our Jury Team from the first edition, noted that he has seen considerable improvement in the participation of industry in The Machinist Super Shopfloor Awards over the period of five years. He further adds that participation is now wider and standards of the nominations have gone up. In other words – the competition is fierce. On the other hand, Raghavendra Deolankar who joined

the jury team for the first time said it was a learning experience for him.

With conclusion of the jury meet, fate of all the participating shopfloors is sealed, to be opened only on the day of the awards ceremony. So, be there to see who takes home the coveted Machie trophy. This year, the awards will be presented to the winning shopfloors at ITC Gardenia, Bengaluru on May 29, 2019.

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With regards to the nominations for The Machinist Super Shopfloor Awards, I have seen the transition from 2015 to now. I am extremely glad to say that the participation has been much wider this year. I must say that the competition is getting tougher with each passing year. With regards to industry standards, I have seen a lot of improvement in the companies' efforts, especially in safety aspects. The class of safety and processes followed by the industry are almost world class. Remarkably, home grown companies are also doing wonderful job in this aspect.

Chandra Nataraja, Managing Director, Knorr Bremse Center India Pvt. Ltd.



First of all, I congratulate The Machinist team for its consistent efforts in recognizing the manufacturing industry through such a platform. The Machinist Super Shopfloor Awards has now become a well-known brand in the industry. Participation is not only getting wider year on year but the quality of nominations has achieved a certain height. Over the years, I have seen tremendous improvement in the industry's efforts on various parameters. They are trying to work on their own competitive edge to stay at the forefront.

Dr. Dhananjay Kumar, MD (Electric Vehicle), Thor Power Corporation



I feel people are getting more and more aware about various aspects in manufacturing such as quality, productivity, etc. I will especially highlight the maintenance category here. Although it's a newly introduced category, all the critical parameters are well-covered. Also, the industry has responded well to this by sending their nominations supported by data. And I must appreciate The Machinist for including this important but usually neglected topic.

Vikas Kadlag, Managing Director, Morganite Crucible India Ltd.



It was a great experience to be a jury member for The Machinist Super Shopfloor Awards 2019. As I was scanning through nominations, I realised that the manufacturing industry is progressing quite well in the country. Last couple of years were phenomenally good for the industry and we are expecting this year as well to be good for the industry.

Rajesh Mandlik, Managing Director, Setco Spindles India



It has been a wonderful experience this year. I have seen progressive improvements right from the first year. I see much wider participation from large as well as small industries. Contribution of small medium enterprises towards the national economy is very important. And as the manufacturing industry progresses further, SMEs and MSMEs' contribution will play an important role. Hence, it is of utmost important for us to encourage them. This can be achieved through platforms such as The Machinist Super Shopfloor Awards.

Dr. Prof. Madhu Ranjan, Emeritus Professor, College of Engineering Pune

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I am very happy and satisfied to see the way the standards have gone up. Manufacturing industry in India is now catching up well with the international standards. This is especially true in the case of the auto industry. This sector is ready to take a leap as BS VI will be implemented in the coming year. Additionally, I would like to highlight that the participating companies have done exceptional job with regards to Innovation. I must say that innovation is need of the hour today.

Bireswar Mitra, Executive Director, Sharda Motor Industries Ltd.



It is a great platform for the manufacturing industry to showcase their technological prowess. I must say that the industry is definitely taking safety seriously. One of the unfortunate thing that I observed during assessment that there is a wide gap in the industry with regards to safety – some companies are at the masters level while some are just at the basic level. Having said this, I must also confess that Indian industry is heavily investing in the safety aspect and the cultural change that we are witnessing is tremendous.

S K Sinha, Senior Professional in the Automotive Industry



The Machinist Super Shopfloor Awards is a very good initiative. I have attended several award ceremonies that recognize styles and designs for the auto industry. However, I especially liked this initiative as it recognizes efforts behind these things, which generally go unnoticed. Moreover, it was a learning experience for me to assess these nominations. I could get insight of what is happening at the manufacturing front. After looking at it, I must say that future is very bright.

Mangesh R Saraf, Senior Deputy Director, ARAI



Over the past few years, not only numbers of nominations have increased but also their qualities have touched new heights. The industry is progressing with accelerating speed. The march towards Industry 4.0 is helping the companies especially at logistics and operations level. Additionally, I also gathered that the Indian manufacturing industry has tremendous focus on innovation. From this perspective as well, India is catching up with the international standards.

Sham Arjunwadkar, Chairman, IIF National Centre for Technical Services, Senior National Council Member of IIF



It was an amazing experience for me to be a jury member for The Machinist Super Shopfloor Awards 2019. In fact, it has been a learning experience for me. It was satisfying to know that the companies are coming forward to adapt green manufacturing practices. It is wonderful to see that awareness is created in this direction. This trend of adapting green manufacturing practices is expected to continue for a decade or so.

Raghavendra Deolankar, Head of Operations - India, ZF India Pvt. Ltd.

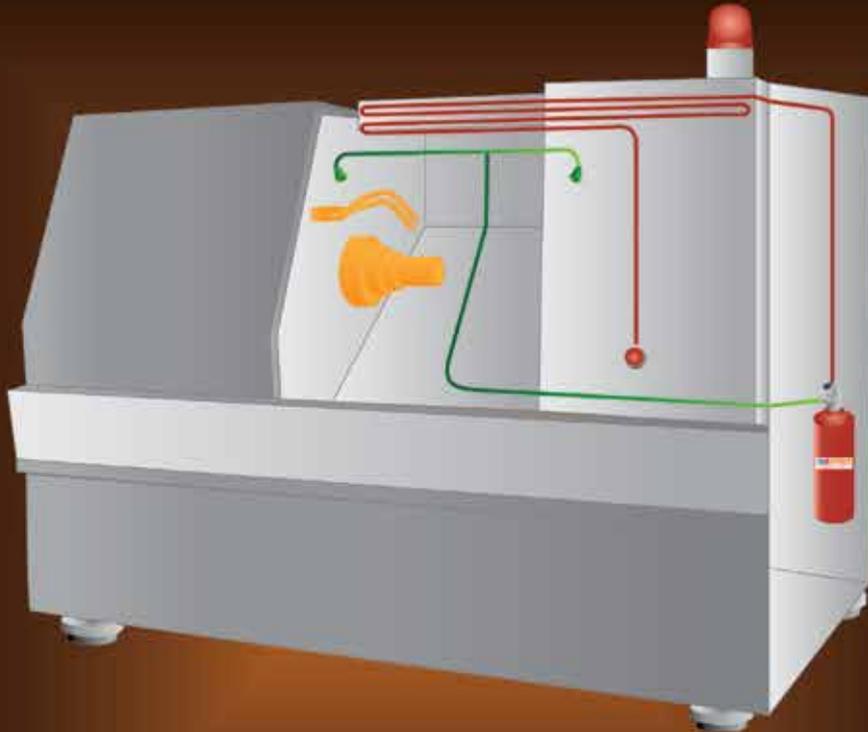


As always, it is an amazing experience to be part of the jury. I would like highlight the trend of digitalization here. Most of the large companies have anticipated & acted upon the trend of digitalization. Notably, even SMEs adapted to it quickly. Although, multinational companies are bit ahead of Indian SMEs but definitely home grown companies are catching up. The complete digitalization will help companies in increasing productivity, quality and in other aspects as well.

Abhijit Janugade, Head - Production & Maintenance, Draexlmaier Manufacturing India



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USHERING THE E-ERA!

The primary purpose of rolling out phase II of FAME scheme is the faster adoption of electric and hybrid vehicles throughout the country, says a report by SKP Business Consulting LLP.



“Through FAME India phase II implementation, GoI will be providing incentives & subsidies to roll out approx. 1 million e-2 Wheelers, 0.5 million e-3 Wheelers, 55000 e-4 Wheelers and 7000 e-Buses.”

By 2026, the Indian automotive industry will be globally ranked among the top three in the engineering, manufacturing & export of vehicles and auto components segments. The industry will provide safe, efficient & eco-friendly infrastructure for affordable mobility of people & transportation of goods in India, in line with global standards. The industry is likely to grow in value & contribute over 12% to India’s GDP by 2026 (from 7.1% in FY 2015-16) & generate 65 mn additional jobs. The automobile industry in India is expected to reach US\$ 250-280 bn by 2026 as per the Automotive Mission Plan 2026 (Vision 3/12/65).

In continuation of the vision 2026, the Government of India (GoI) has taken various initiatives, such

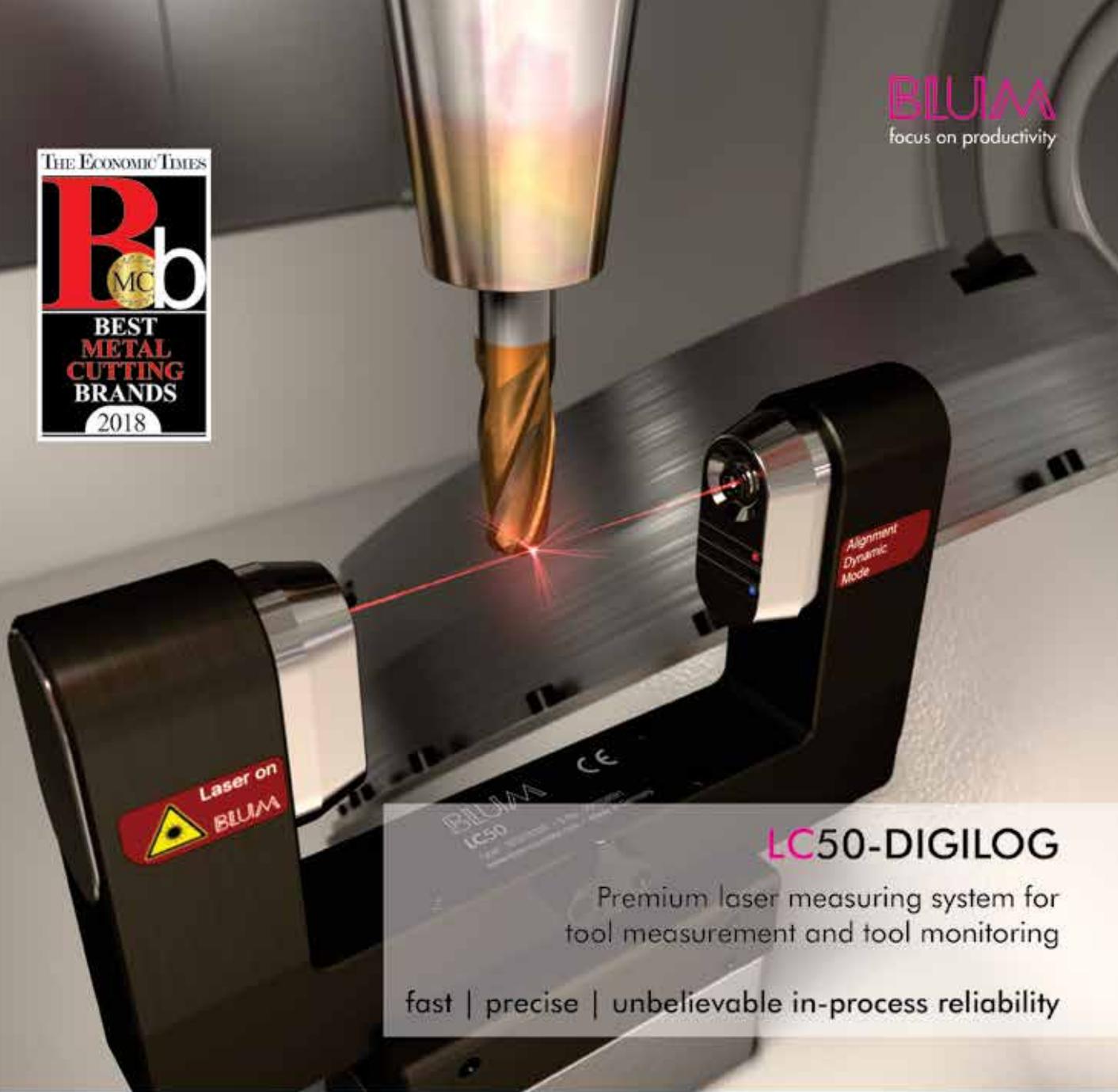
as the National Electric Mobility Mission Plan (NEM-MP). Under this, the Faster Adoption and Manufacturing of (Hybrid &) Electric Vehicles (FAME) scheme is focused on the development of the ecosystem of hybrid and electric vehicles (EV) in the country. FAME phase I was launched on April 1, 2015 with a total outlay of US\$ 128 mn for creating infrastructure & promoting the EV ecosystem in India. To aid the energy efficiency program, the World Bank has committed to provide support to the tune of US\$ 300 mn to India. The Ministry of New & Renewable Energy (MNRE) updated the Committee of Secretaries that the World Bank would route the aid to India through Energy Efficiency Services Ltd (EESL). This aid will supplement the Central government funds providing financial assistance to the e-mobility program.

FASTER ADOPTION & MANUFACTURING OF (HYBRID &) EVS (FAME) PHASE II

The Union Cabinet, chaired by the Prime Minister, has approved the implementation of FAME India phase II, for promoting electric mobility in the country, which is effective from April 1, 2019. The total fund disbursement for phase II is US\$ 1.4 bn for the period of the next three years (2019-22). Analysis of the fund allocation year-wise & activity-wise as per the details mentioned below.

Of the total fund allocated, 85% will be distributed over the final two years (2020-22) of the phase. Also, of the total fund, 86% has been allocated to demand incentives over the next three years (2019-22). Further from the demand incentives 90% is planned to be distributed in the last two years (2020-22). This can be a precursor to the country planning to achieve 30% e-mobility by 2030, thereby curbing the excessive use of fossil fuel and reducing petroleum the import bill. Through FAME India phase II implementation, GoI will be providing incentives and subsidies to roll out approximately 1 million e-2 Wheelers, 0.5 million e-3

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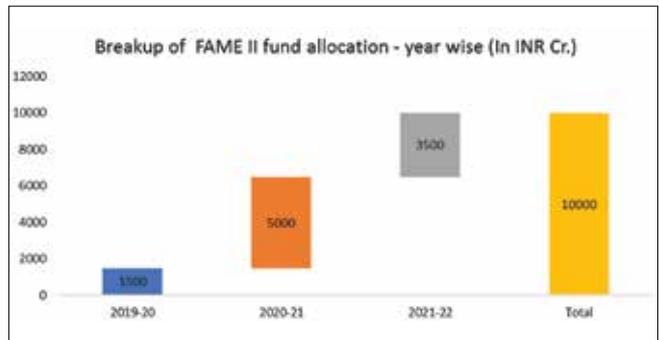
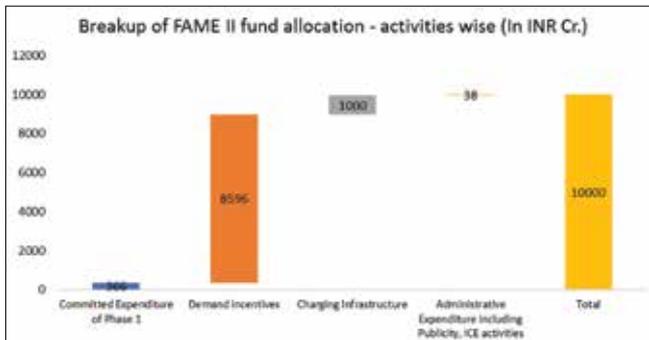
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Whealers, 55000 e-4 Wheelers and 7000 e-Buses. The focus of the FAME India phase II policy is the electrification of the entire public and shared transportation system. E-buses will be receiving demand incentives on an operational expenditure model from state/city transport corporations (STU). Electric 2-wheeler incentives will be targeted towards the private vehicle segment. All electric three-wheeler/four-wheeler vehicles, which are used for public transport or registered for commercial use, will be eligible for the incentives under the scheme.

Promotion of advanced technology for battery manufacturing is one of the focus areas under the FAME India phase II scheme. EVs fitted with advanced

2021 onwards. The transformative multi-modal mobility paradigm will facilitate setting up of giga-scale integrated cell & battery manufacturing facilities in India.

IMPACT OF THE SCHEME

The primary purpose of rolling out phase II of FAME scheme is the faster adoption of electric & hybrid vehicles throughout the country. The government is offering upfront incentives for purchase of EVs & hybrid vehicles. The scheme is expected to aid the reduction of environmental pollution issue in the country. As per the NEMMP, the sale of 6 to 7 mn EVs by 2020 would reduce fossil fuel consumption by 2.2-2.5 mn tonnes. This will lead to a reduction of CO2 emissions by 1.5% by 2020. It will also help reduce the burden of crude oil import by the country, which would aid the resolution of the current account deficit problem.

Recently, the Andhra Pradesh government has announced that the registration of petrol & diesel cars will be stopped by 2024. Further, it has indicated that it would put 10 lakh EVs on the road in the next five years. Similarly, the Delhi State government has decided to launch 1000 e-buses for public transport to curb the levels of air pollution in the state. In February 2019, the Delhi government also allocated US\$ 14.3 mn (INR 1 bn crore) to the state EV fund in its 2019-20 budget. Amidst all the developments at the centre & state levels, the Chinese EV manufacturing company Sunra is planning to set up a manufacturing facility in India. Cab aggregators like Ola & Uber are also actively contributing to the country's EV mission. In November 2018, Uber, in coordination with Mahindra & Mahindra, deployed EVs on their platform in many cities across the country. Ola had also launched an EV segment last year with a fleet of over 200 EVs in Nagpur.

FAME India phase II scheme has positively influenced the entire EV industry. The Society of Indian Automobile Manufacturers (SIAM) has appreciated the scheme for building a robust EV ecosystem in the country. The scheme is likely to provide a long-term support from the govt. as it guarantees spend incentives for next three years. The industry is expected to garner significant investments in manufacturing EVs in all categories thereby developing an indigenous supply chain. 

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Promotion of advanced technology for battery manufacturing is one of the focus areas under the FAME India phase II scheme. EVs fitted with advanced batteries that use newer technology are eligible for incentives.

batteries, i.e., lithium-ion battery or batteries that use newer technology are eligible for incentives. The FAME India phase II also focuses on EV-charging-station infrastructure development as well. The scheme proposes to develop around 2700 charging stations around various metros, smart cities & hilly areas across India. This is expected to make charging stations available on either side of highways at an interval of about 25kms.

To promote the domestic manufacturing of EVs, assemblies/sub-assemblies, parts/sub-parts, the government has a well-defined road map called the Phased Manufacturing Programme (PMP). The intention of PMP is the large-scale development of export-competitive integrated batteries & giga-scale cell-manufacturing projects in India. The government also aims to promote indigenous manufacturing of all components in the EV through the PMP scheme. As per the Govt. Circular, PMP for CBU/SKD/CKD will be effective from April 2020 onwards & PMP scheme will be effective for the lithium-ion cell battery, battery pack & other parts used in manufacturing EVs from April

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By Niranjan Mudholkar

AUGMENTING VALUE PROPOSITION

Elgi Equipment is investing in people and processes to further enhance its capability and value to the customer, says **Dr Jairam Varadaraj**, its Managing Director.



“Rather than try to ‘boil the ocean’ across all countries for all products & operate at a very veneer level. So, for the initial phase, we are focusing on India, Europe, US, Australia, Indonesia & Thailand.”

How would you analyse the global air compressor market? What are the key trends?

Demand for compressors is a function of industrial growth & capacity expansion. Industrial growth will necessitate upgrades (due to high maintenance costs or better efficiencies with new technologies) at one level & sustained industrial growth will result in capacity expansion that will generate demand for compressors. In most of the developed markets, a larger portion of the demand is from upgrades while in developing markets a larger portion comes from capacity expansion.

Which are the key regions where ELGi is focussed?

Besides India, we are focussing on Europe, US, Australia, Indonesia and Thailand.

Tell us about ELGi’s overall manufacturing capacities and capabilities.

ELGi’s manufacturing capabilities are architected to

augment the value proposition to customers. We integrate backwards to enable this. Our backward integration into the foundry & pressure vessel production is to significantly enhance the quality of our products. Our investment into our own motor production is to enhance the energy efficiency of our compressors.

ELGi’s goal is to be the No. 2 player in the global air compressor market by 2027. What is your strategy for achieving this?

On the market facing dimension of strategy (where to play) the focus is on specific product/market segments and go deep into specific countries. Rather than try to “boil the ocean” across all countries for all products and operate at a very veneer level. So, for the initial phase, we are focusing on India, Europe, US, Australia, Indonesia and Thailand. On the value proposition dimension of strategy (how to win), we are focusing on innovation centred around energy efficiency and oil-free and quality to be the best in the world.

Which are the key growth sectors for ELGi?

There are no specific industries that contribute disproportionately to our growth. In any given year, different industries exhibit different growth & thus the opportunity for us. In any case, even in the best of years for any specific industry, the contribution of such an industry to our revenue is not significant enough to single out.

Last year, ELGi acquired F.R. Pulford & Son Pty Ltd along with its wholly owned subsidiary Advanced Air Compressors Pty Ltd, in Australia. How are you leveraging on this acquisition?

Like I have mentioned, Australia is a strategic market for ELGi. While it may not be as large as the European or US market, the market demands high performance (across products and services) and correspondingly rewards companies that deliver this. With our high-performance products, the acquisition of Pulfords has given us an opportunity to substantially improve the service and support engagement with customers. We are investing in people and processes to further enhance this capability and value to the customer. 



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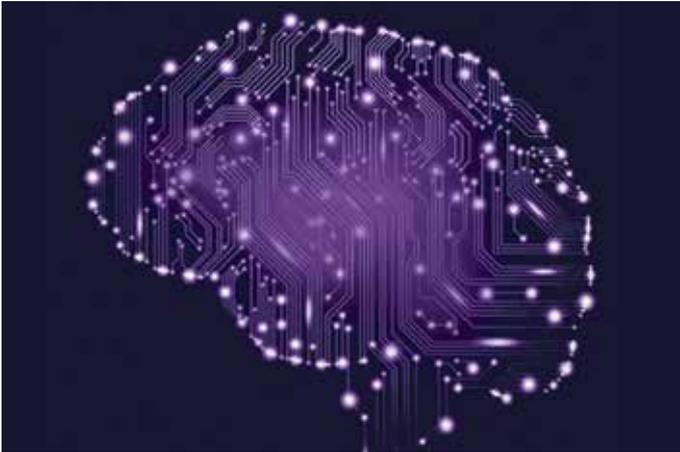
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The Machinist Magazine

By Dattaraj J Rao

ROLE OF AI

Artificial intelligence is still at the nascent stage in the manufacturing. Going ahead, it is expected to play a big role in the industry. Here is an overview of its benefits.



Using ML plant managers can use demand forecasting to plan production efficiently based on the anticipated orders. Technologies like neural networks and fuzzy logic work on several data sources like operation history, usage patterns and weather data to predict the demand and even allow what-if scenarios to be done to evaluate multiple options.

Artificial Intelligence (AI) in manufacturing domain is pretty much where Digitization was about 10-15 years ago. Very few people are actively doing anything with it, few folks have it on presentation slides and most people want to but don't know where to start. This is not just the story in India but also a global one. As manufacturing companies are starting to see value from digitization, AI brings the promise to increase that value exponentially. As per the National Artificial Intelligence strategy

drafted by NITI Aayog – the manufacturing industry is expected to be one of the biggest beneficiaries of AI based solutions, thus enabling the 'Factory of the Future'. General Electric has been one of the leaders in adopting state-of-the-art Software and Analytics to manufacturing with their 'Brilliant factory' initiative. This uses a combination of IoT (Internet of Things) and AI to maximize overall equipment effectiveness (OEE), improve production scheduling, and ensure product quality by leveraging real-time production data. Siemens has been investing heavily in the smart factory initiative as part of Industry 4.0. In my mind, digitization is just the first step with basic return on investment through automation. AI is where the true value lies for factories with potential to revolutionize their end to end process from inventory management, operations, maintenance, quality and logistics. In US and China due their aggressive AI strategy many industries including manufacturing have started seeing huge productivity and efficiency boosts. In short, your digitization journey is incomplete without AI and now is a better time than ever to draft your AI strategy.

Most of us have heard stories about AI and some of the cool applications but have difficulty applying it to our domain. AI applications have been on a rise in recent years and so have the news stories around it. From voice-enabled assistants to self-driving cars to automated photo tagging to facial recognition for unlocking phones – AI seems to be the headline story. There also has been news of some unthinkable outcomes of AI – like an AI that writes poetry or draws paintings – which was in fact auctioned out for \$420,000 at Christies. AI is basically a technology that makes computers think and reason like human beings. There are several sub-areas of focus in AI like robotics, computer vision, natural language processing, knowledge-based engineering – but ultimately the objective is to make computers think with data. This is the key differentiator for AI – we don't explicitly tell the computer what

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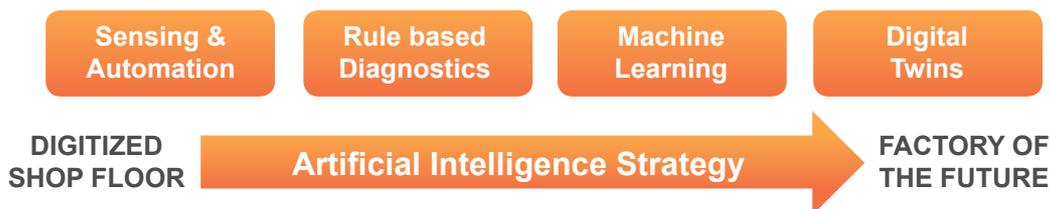


Fig. 1: From Digitization to Artificial Intelligence

to do – it decides for itself using what it has learnt from “experience”. Thanks to the Digitization wave, our factories are collecting huge volumes of data – of several different variety like sensor readings, text entries, video feeds from cameras, advanced sensors like acoustic and infrared, etc. We collect gigabytes and terabytes of data and often it resides untouched in our databases or data lakes. Many organizations don’t know what to do with all this data and how to convert this into actionable insights. They know that this data is valuable but do not have tools to extract useful insights from it – this is exactly what AI tries to solve for you. Figure below shows how a solid AI strategy can help guide you from digitization to the factory of the future. Core digitization and rule-based analytics will give you better insights from the shop-floor. However, using Machine Learning and Digital Twins you will be able to extract these insights from data and get a foresight of your fac-

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AI applications have been on a rise in recent years and so have the news stories around it. From voice-enabled assistants to self-driving cars to automated photo tagging to facial recognition for unlocking phones – AI seems to be the headline story.

tory. This foresight will help you plan operations and maintenance better and improve the overall effectiveness of your plant assets. Let’s see how. (Refer to Fig. 1)

Most people see AI as rows of industrial robots on a shop floor. Robotics is definitely a major category of AI and lot of work is happening here. Industrial robots can automate time consuming tasks that require high accuracy. Also, certain operations which are unsafe for humans should be transitioned to robots. India has shown a steady increase in robot units as per International Federation of Robotics (IFR), with the automobile sector contributing to more than 50% of the numbers. However, compared to Asian countries like China and Japan, the relative robot units in factories are considerably low for India – 3 robot units per 10,000 employees as compared to 68 for China (1).

AI goes way beyond robotics. There are several areas

where AI can greatly help manufacturing. The strength of AI is a rich set of specialized algorithms that can find unique patterns in data which are extremely difficult for humans to see even with best charting tools. One of the key AI techniques that has shown big benefits in this area is called Machine Learning (ML). ML can look at large volumes of data and extract actionable insights. The data may be in form of sensor readings (timeseries), text entries, audio samples, images or video streams – ML can be used to extract valuable knowledge from it.

Using ML plant managers can use demand forecasting to plan production efficiently based on the anticipated orders. Technologies like neural networks and fuzzy logic work on several data sources like operation history, usage patterns and weather data to predict the demand and even allow what-if scenarios to be done to evaluate multiple options. Similarly, ML can help factories with inventory management to plan their supply and delivery cycles. Many global logistics firms are actively using AI for route planning as well as some interesting experiments like drone-based supply deliveries. ML can help factories move from routine and preventive maintenance towards a solid predictive maintenance strategy. Using sensor data from critical equipment, a prediction of asset health and remaining useful life can be made. We can use this information to plan our scheduled maintenance cycles so we can make maximum utilization of these assets. Another area where AI can greatly help the factory floor is visual inspection. As industrial cameras are getting cheaper we could use these live video feeds to detect incidents like fire in the plant. We could use cameras and AI algorithms to inspect parts and improve quality. Also using special types of sensors like acoustic and vibration probes we can monitor the vibration of equipment. We can use AI algorithms to identify signatures of failure much before the equipment actually fails – giving us enough time to inspect and fix.

After machine learning the next maturity level for your AI strategy is commissioning digital twins for the factory assets. Digital twins are data-driven models specific to individual assets which keep learning from new data and update themselves. They can provide the latest and up-to-date status of your asset. As shown in figure 2 above, a digital twin-based hierarchy of the plant can

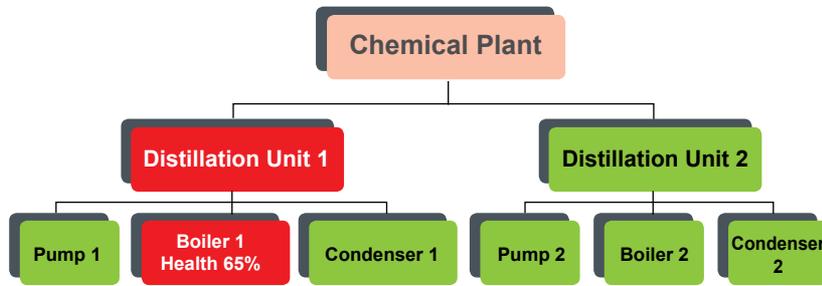


Fig. 2: A simplistic view of how a Digital Twin hierarchy helps plan maintenance

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After machine learning the next maturity level for your AI strategy is commissioning digital twins for the factory assets. Digital twins are data-driven models specific to individual assets which keep learning from new data and update themselves.

help plant managers quickly identify and resolve issues. Here the health is a metric for the twin that is calculated by AI based on latest data. Another area where AI can strongly contribute to is human-machine interaction. Just as more consumer products are leveraging chatbots, voice-assistants and virtual/augmented reality interfaces – we will also see the rise of these in manufacturing. Imagine a field repair Engineer interacting with a digital twin using a text or voice interface and asking questions about an asset and getting real-time response

including how to fix an issue. This all may seem something out of a science fiction book – but it is definitely closer to reality than you think.

Many people appreciate the value of AI but don't really know how to get started. My advice will be to start small and define a limited proof-of-concept with significant outcomes. Ideally this should be in an area where you already have significant historical data and engage a data science team (internal or external) to start analyzing this. A key to defining an AI project is setting the expectations right. There are specific areas in which AI is good at and you should clearly define the expected outcome of your AI project and how you will measure it. Hopefully a quick-hit AI solution like visual inspection, asset digital twin or logistics optimization will help you understand and drive a solid AI strategy across your factory floor. All the best! 

The Author is associated with General Electric

Reference: <https://ifr.org/ifr-press-releases/news/robot-density-rises-globally>

METHANE-POWERED WHEEL LOADER CONCEPT

CASE Construction Equipment showcased a sustainable, connected and technologically advanced future of construction at the Bauma trade show in Munich, Germany, with the unveiling of its methane-powered wheel loader concept – Project TETRA.

Jointly developed by the CNH Industrial international design and CASE engineering teams, this concept is a clear departure from anything seen to date in the construction industry. The concept reflects both the increasing importance of alternative fuels, and demonstrates their viability in the construction environment: the concept wheel loader is powered by a proven methane engine, produced by sister brand FPT Industrial, and delivers exactly the same

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The concept wheel loader is powered by a proven methane engine, produced by sister brand FPT Industrial, and delivers exactly the same performance as its diesel equivalent.

performance as its diesel equivalent. This is combined with cutting edge styling and an advanced operator environment, which makes extensive



use of touchscreen and voice control technologies. Furthermore, innovative safety features include biometric technologies together with an obstacle detection system, which is derived from CNH Industrial's autonomous vehicle research and development program.

CASE has demonstrated the feasibility of this concept in a range of real-world construction environments as well as proving the business case, in terms of sustainability, reduced overall total cost of ownership and operational viability. 

Source: CASE Construction Equipment

By Hussain bin Rajab

THE NEW FRONTIER!

As new technology offsets the limitations of resource dependency with unparalleled efficiency gains, the fourth industrial revolution offers visionary business leaders the chance to create lasting value across the Middle East, North Africa and Asia.



“By deploying AI together with high-speed connected machines and 3D printing extrusion facilities, a building material company, for example, could leapfrog its competitors by producing a new line finely calibrated to each market’s tastes and budgets – every day.”

The Gulf’s economies are well equipped to thrive as major new centres in the new global economy. Several states have already spelled out plans that embrace the infrastructure underpinning the fourth Industrial Revolution [4IR], from logistics to digital solutions. As key elements of national documents such as Abu Dhabi’s 2030 smart growth strategy and Bahrain Vision 2030, the strategies are already bearing fruit.

Last April, Mondelez International opened a \$90-mn ‘Factory of the Future’ in Bahrain to produce its iconic biscuits closer to customers in the Middle East

& Africa, thus reducing delivery costs & improving product freshness. The state-of-the-art 250,000-sq-mtr facility, one of several new units that saw the Kingdom’s manufacturing base grow by a staggering 491% in 2018, offers an example of how production offshoring can yield business efficiencies. Such a move increases operational flexibility & raises productivity, while cutting production, transportation & distribution costs, & securing competitive market advantages.

Imagine for a minute that such a manufacturer, instead of fabricating a product to specifications established R&D hubs elsewhere, had the technology to innovate locally across its product lines on site at the factory – without spending on a new local research unit. Perhaps the company could also test its new ideas and instantly recalibrate the product’s attributes with live user feedback while consultants in another country offered specific technical advice at every step to ensure brand compliance. Such product adjustments could even be recommended by an algorithm that synchronizes market demand with existing product lines and calls out significant market gaps.

INNOVATION AS STANDARD

This is the promise of the Fourth Industrial Revolution or Industry 4.0 (4IR), which is automating intelligence in the same way new inventions industrialised everything from the chocolate production to textile weaving in the 18th and 19th centuries. Digital-first approaches now being laid down could soon make industrial innovation an everyday occurrence in this era of shorter business cycles.

By deploying AI together with high-speed connected machines and 3D printing extrusion facilities, a building material company, for example, could leapfrog its competitors by producing a new line finely calibrated to each market’s tastes and budgets – every day.

These new items could be simultaneously replicated on the other side of the globe for quick board ap-

proval, before being packaged & sent to supermarkets by another set of machines, all faster than ever. Meanwhile, automated raw material inventory management could alert managers to low resource supplies within the factory, enabling a switch in manufacturing procedures & reduced downtime.

REGULATORY RELIEF

But technology is worthless without political will. More than a third of global CEOs (35%) cited over-regulation as the biggest threat to business in 2019 in PwC's annual Global CEO Survey. Government regulations



Mondelēz International's state-of-the-art 250,000-square-metre facility in Bahrain, one of several new units that saw the Kingdom's manufacturing base grow by a staggering 491 per cent in 2018, offers an example of how production offshoring can yield business efficiencies.

have been their top-cited business hazard since 2008, the first year PwC asked the question. The figures bear them out: In the US alone, complying with federal regulation and intervention cost companies \$1.9 trillion in lost economic growth in 2017, a staggering amount often described as a hidden corporate tax.

In contrast to protectionist rhetoric around the world, GCC governments have been opening up their markets and easing routes to business as they seek to diversify their hydrocarbon-dependent economies. Bahrain has led the region on this front, with some of the most liberalised regulatory frameworks in the region. Other GCC countries have followed suit, notably the UAE last year. Bahrain also maintains low cost barriers for business, whether in manufacturing or other industries, enabling the country to serve as a business process test bed. Setting up and operating a manufacturing business in Bahrain International Investment Park is between 17-49% cheaper than in other GCC countries, as per KPMG data, thanks to lower costs for visas, employment permits, infrastructure levies and utility bills. Established connections with the wider region means that goods manufactured here can be shipped to Karachi within a week, and to Kochi within seven days.

GCC governments understand that the manufacturing sector is vital to long-term economic security & have launched incentives accordingly. As new technology offsets the limitations of resource dependency with unparalleled efficiency gains, the 4IR offers visionary business leaders the chance to create lasting value across the Middle East, North Africa & Asia. 

The author is Executive Director, Manufacturing, Logistics, Tourism, Education & Healthcare, Bahrain Economic Development Board

TOYOTA, DENSO AND SVF TO INVEST IN UBER ATG FOR AUTOMATED RIDESHARING

Toyota Motor Corp. DENSO Corporation and the SoftBank Vision Fund (SVF) have announced that they will invest \$1 billion in Uber Technologies Inc.'s Advanced Technologies Group (Uber ATG). The investment, in a newly formed ATG corporate entity, aims to accelerate the development and commercialization of automated ridesharing services.

Under the terms, Toyota and DENSO will together invest \$667 million and SVF will invest \$333 million, valuing the new Uber ATG entity at \$7.25 billion on a post-money basis.

Toyota invested \$500 million in



Uber in August 2018, when the two companies announced their intention to bring pilot-scale deployments of automated Toyota Sienna-based ridesharing vehicles to the Uber

ridesharing network in 2021, leveraging the strengths of Uber ATG's self-driving technology alongside the Toyota Guardian™ advanced safety support system.

Today's further investment and expanded partnership builds upon the progress made to date, deepening the companies' collaboration in designing and developing next-generation autonomous vehicle hardware. It will also prepare the companies and industry for mass production and commercialization of

automated ridesharing vehicles and services. Toyota will also contribute up to an additional \$300 million over the next three years to help cover the costs related to these activities. 

Tata Motors domestic sales at 42,577 units

Tata Motors Commercial and Passenger Vehicles Business sales in the domestic market in April 2019 at 42,577 units witnessed a drop of 20%, as against 53,511 units sold in April 2018, as weak consumer sentiments continued. Tata Motors Commercial Vehicles (CV) Business sales in the domestic market in April 2019, at 29,883 units registered a drop of 18% compared to 36,276 units sold last April as the sentiments among transporters continue to be weak. The postponement of demand due to general elections have also impacted CV sales.

The M&HCV sales in the domestic market in April 2019 declined by 33%, at 9,403 units, compared to 14,028 units sold in April 2018. The I&LCV truck sales in April 2019 recorded a growth of 10% at 3,546 units as compared to 3,229 units sold in April 2018 as this segment has not been much affected by the low market sentiments. The SCV Cargo and Pickup segment in April 2019, witnessed a drop in sales at 13,996 units, lower by 4%, as compared to 14,620 unit sold in April 2018. The commercial passenger carrier segment sales in the domestic market in April 2019 at 2,983 units, were lower by 33% over last April. Due to continued low market sentiments, the Tata Motors Passenger Vehicles domestic sales in April 2019 at 12,694 units, witnessed a drop of 26%, as compared with 17,235 units sold in April 2018.

Hyundai Motor India sells 58,805 units

Hyundai Motor India Registers Cumulative Sales of 58,805 units for the Month of April 2019. The company registered the domestic sales of 42,005 units and exports of 16,800 units with cumulative sales of 58,805 units for the month of April 2019.

HMIL sales	Apr-19	Apr-18	%
Domestic	42,005	46,735	-10.1
Exports	16,800	13,009	29.1
Cumulative	58,805	59,744	-1.6

Daimler acquires minority stake in Sila Nano

Daimler AG has acquired a minority equity stake in U.S. battery material specialist Sila Nanotechnologies Inc. (Sila Nano) as part of its research and development activities.

Founded in 2011, Sila Nano is a leading developer of new battery materials, which outperform existing lithium-ion technologies. With its latest developments the company sets a new standard for battery performance, harnessing the potential of silicon to enable safe, scalable, high-energy density batteries, which can unleash

new possibilities in electrification from consumer devices to electric vehicles and beyond.

Along with the acquisition of the equity stake Daimler will get a seat in the Board of Directors of Sila Nano. The investment forms part of the latest round of financing, which was led by Daimler.

“We are on our way to a carbon free future mobility. While our all-new EQC model enters the markets this year we are already preparing the way for the

Mahindra's Auto Sector sells 43,721 vehicles

Mahindra & Mahindra Ltd. (M&M Ltd.) announced its auto sales performance for the month of April 2019, which stood at 43,721 vehicles, compared to 48,097 vehicles during April 2018. The company's domestic sales touched 41,603 vehicles during April 2019, as against 45,217 vehicles in April 2018. The Passenger Vehicles segment (which includes UVs, Cars and Vans) sold 19,966 vehicles in April 2019. In the Commercial Vehicles segment, the company sold 17,321 vehicles in April 2019, as against 18,963 vehicles in April 2018. In the Medium and Heavy Commercial Vehicles segment, M&M sold 474 vehicles for the month. Exports for April 2019 stood at 2,118 vehicles.

Commenting on the month's performance, Rajan Wadhwa, President, Automotive Sector, M&M Ltd. said, “The ongoing elections has subdued the purchase sentiment during April. This, according to us, is a temporary phenomenon. We believe, following the elections the auto industry will see a revival in consumer demand. Supported by a normal monsoon, we are confident of seeing higher sales in FY20”.

Toyota Kirloskar Motor sells 11,413 units

In the month of April 2019, Toyota Kirloskar Motor sold a total of 10,112 units in the domestic market. The company exported 1301 units of the Etios series this month thus clocking a total of 11,413 units. Toyota Kirloskar Motor sold a total of 13037 units in the domestic market this month of April 2018. The company exported 834 units of the Etios series this month thus clocking a total of 13871 units. Commenting on the sales performance, N. Raja, Deputy Managing Director, Toyota Kirloskar Motor said, “The industry is currently experiencing a slowdown due to uncertainty of upcoming general elections that looms over the market and this slow pace is expected to continue until the new government is formed. Consumer sentiments has currently dampened due to several factors like tight liquidity, high insurance, high costs. We hope the sales growth momentum to pick up in the upcoming months post-election results are out.”

ARMED RISING!

New data from the Stockholm International Peace Research Institute (SIPRI) shows that the five biggest spenders on military expenditure in 2018 were the United States, China, Saudi Arabia, India and France!



In 2018, India increased its military spending by 3.1 per cent to \$66.5 billion.

Total world military expenditure rose to \$1822 bn in 2018, an increase of 2.6% from 2017, as per the new data from Stockholm International Peace Research Institute (SIPRI). The five biggest spenders in 2018 were the US, China, Saudi Arabia, India & France, which together accounted for 60% of global military spending. Spending by the USA increased for the first time since 2010, while military spending by China grew for the 24th consecutive year. Total world military spending rose for the second consecutive year in 2018, to the highest level since 1988. World spending is now 76% higher than the post-cold war low in 1998. World military spending in 2018 represented 2.1% of GDP or \$239 per person. “In 2018 the USA & China accounted for half of the world’s military spending,” says Dr Nan Tian, Researcher, SIPRI Arms & Military Expenditure (AMEX) programme. “The higher world military expenditure in 2018 is mainly the result of significant increases in spending by these two countries.”

THE USA AND CHINA IN LEAD

US military spending grew by 4.6%, to reach \$649

bn in 2018. The USA remained the largest spender in the world, & spent almost as much on its military in 2018 as the next eight largest-spending countries combined. “The increase in US spending was driven by the implementation from 2017 of new arms procurement programmes under the Trump administration,” says Dr Aude Fleurant, Director, SIPRI AMEX programme.

China increased its military expenditure by 5.0% to \$250 bn in 2018. “Growth in Chinese military spending tracks the country’s overall economic growth,” says Tian. “China has allocated 1.9% of its GDP to the military every year since 2013.”

INCREASES IN ASIA AND OCEANIA

Military spending in Asia & Oceania has risen every year since 1988. At \$507 bn, spending in the region accounted for 28% of the global total in 2018, compared to 9% in 1988. In 2018, India rose its military spending by 3.1% to \$66.5 bn. Military expenditure by Pakistan grew by 11% to reach \$11.4 bn in 2018 while South Korean military spending was \$43.1 bn—an increase of 5.1% compared with 2017 & the highest annual increase since 2005. “The tensions between countries in Asia & also between China & the USA are major drivers for continuing growth of military spending in the region,” says Siemon Wezeman, Sr. Researcher, SIPRI AMEX programme.

GROWTH IN CENTRAL & EASTERN EUROPE

Many countries in Central & Eastern Europe made large increases in military expenditure in 2018. Spending by Poland rose by 8.9% while Ukraine’s spending was up by 21%. Spendings by Bulgaria, Latvia, Lithuania & Romania also grew (ranging from 18 to 24%).

“The increasing spendings in this region are largely due to growing perceptions of threat from Russia,” said Pieter Wezeman, Sr. Researcher, SIPRI AMEX programme. “This is despite the fact that Russian military spending has fallen for the past two years.” At \$61.4 bn, Russian military spending was the sixth highest in the world in 2018. Its spending decreased by 3.5% compared with 2017. 🇷🇺

Source: SIPRI

By Niranjan Mudholkar

SUCCESS IN LASER!

The Machinist caught up with **Vardhaman Shah**, Director and **Santosh Bhadoria**, Technical Director of Suresh Indu Lasers Pvt. Ltd. at a recent trade fair in Mumbai.



“Our focus is on indigenisation of products so that we can mass produce these products and make them cost-effective for the customers.” - Vardhaman Shah

Please give us a brief background about SIL.

Santosh Bhadoria: Suresh Indu Lasers Pvt. Ltd. (SIL) was started in 1990 by Dr Suresh T. Shah, who is a laser physicist with post doctorate from UK. Dr Shah is still active at the age of 75 in the factory & the business. Of course, he is more into the fields of R&D as well as electrical support. He is a role model for the young generation as he says that age doesn't matter. So, at 75 he says, I can work for another 15 years. That's the positive approach that SIL takes with it.

You have come a long way from there. How's the scenario at the company today?

Bhadoria: Today, SIL is a brand in India as well as in the international arena. People look at China, but Chinese companies look towards SIL as a fast-growing company, as a company that has knowledge & as a company that is committed to providing services.

You cannot rely on customer losses and grow your company. You have to ride along with them & grow with those customers. So, if your customer is happy, definitely he will ensure that you are doing well.

Which are the key industry sectors that you are addressing right now?

Vardhaman Shah: We offer machines to industries from metal to non-metal sectors. Our machines are used by a wide range of industries like aerospace, defence, medical, automotive, textiles, sheet metal, machine tools, etc. We also cater to government projects like Chandrayaan. In fact, we are constantly supporting our government with knowledge that we have gained through the 30 years, and the backup as well as the support that we are enjoying from Dr Suresh Shah.

How's been the business for SIL in the last one year?

Bhadoria: For the last four years, we have been growing 100 percent year on year. In fact, we have already crossed the 100 percent mark in December 2018 itself. So, the next three months are bonus growth. It has been a good year. Taking a backlog of more than Rs. 40 crore, it is a good indication that the company can make big inroads in the international markets as well.

Your outlook for the future remains positive.

Bhadoria: Yes. For the engraving machine, we are looking at a number of 1,000 units. For the fibre cutting machines, we are looking at a target of more than 300 machines. With regards to our future plans, we are looking at expanding our presence in markets like East Asia, African countries & also Middle East countries.

Tell us about the various R&D activities at SIL.

Shah: We are investing in our R&D substantially. In fact, we have our in-house R&D lab. Our focus is on indigenisation of products so that we can mass produce these products & make them cost-effective for the customers. To retain our position as a leading Indian company in this sector, focus on R&D is necessary.

Tell us about your manufacturing plant.

Shah: We have 40,000, square feet factory in Hadapsar near Pune. It includes space for production, R&D as well as application area and for sales and marketing teams. The factory is well-equipped with all required machinery. 

By Dr. Pranjal Kumar Phukan

THE GAME CHANGER!

Artificial intelligence along with machine learning allows chemical manufacturers to engage autonomous equipment with the help of data, flagging the way for smarter processes and faster transactions.



“Implementing the digital technology improves the cost-effectiveness of companies by improving agility, productivity, and innovation.”

Big data is a captivating word to describe the exponential growth of new format of data including images, sensor, seismic, mapping and social exchanges that have the ability to provide with keen insights. Big Data is the prospect for IT to transition from driving business efficiency and reducing costs to driving business dexterity and mounting revenue. Organisations across sectors that quickly embrace ‘Big Data’ to renovate their business will distance themselves from the competition.

The exponential growth in big data is worth mentioning: As per the EMC IDC Digital Universe study, the digital universe in India is nearly doubling in size

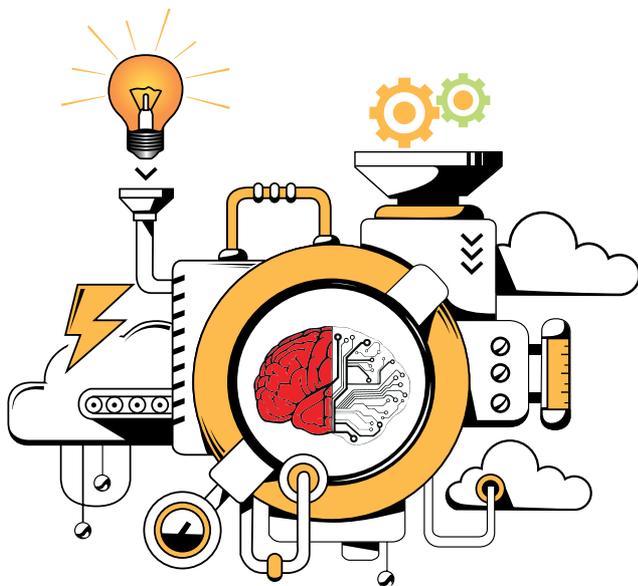
every two years & will multiply 9-fold between 2013 and 2020 - from 326 Exabyte to 2.8 zeta bytes. The digital information in India is discharging at a much faster pace than IT budgets or skilled manpower driving adoption of cloud computing. While two-third of the digital universe bits are shaped or captured by consumers & workers, yet enterprises have obligation or responsibility for 85% of the digital universe.

Moreover, big data is a game-changer and cannot be overlooked by industries including chemical industry. The chemical industry operates in one of the most multifaceted & high-risk supply chains in the world. It is characterised by volatile industrial markets, integrally hazardous & closely regulated products, feed stocks that often initiated in unstable conflict regions & inter-dependent logistics networks of rail, road, ocean & pipelines that must safely transport vast quantities of raw materials & finished product to producers & markets. These factors all meet to increase risk & add to the unpredictability of chemical production, transport & marketing. In such a scenario, we must discover why & how a big data roadmap is a must for organisations planning to remain competitive.

CURRENT SCENARIO

The chemicals industry is already facing noteworthy logistics and supply chain challenges as a result of the oil and gas boom, not to mention the continued pressure on companies and governments to decrease carbon emissions. Thus, applying a mixture of digital technologies can help companies counter to these market shifts by altering the technique they operate, becoming a digital enterprise while also improving the safety of their operations, driving efficiency and reducing costs.

Big Data Analytics (BDA) which is part of the popular tendency SMAC (Social, Mobility, Analytics and Cloud) is defining the industry landscape. It is no surprise that a study conducted by Accenture with more than 150 C-level & top management executives across



Companies need combined content value chains.

global chemical firms found that 94 percent plan to upsurge their digital spend, while 87 per cent said that those who do not spend money on digital will lose their competitive edge.

Chemical companies globally say they expect to attain highest Return on Investment (ROI) for every penny they spend on big data analytics & cloud computing within next three years, as per the research. This could ultimately drive growth & improve restrictions.

As the industry is realising that these solutions not



Properly managing big data does not only allow faster and more efficient decision making, it even enables business transformation or innovative business models.

only help them rationalize their operations, but also are very critical in improving their bottom line, the trend is changing. Today, chemical companies need combined content value chains because managing information efficiently enables safe, low-cost operations, rationalised compliance, and value-added products and services that boost the bottom line. Chemical companies use analytics to classify valuable opportunities. In such a scenario, big data is often talked about for its promise - to address a multitude of business problems and create a host of business opportunities.

DIGITAL TECHNOLOGY - A GAME CHANGER

Internet of things (IoT) enables the chemical industry to generate new standards & concurrently augment value from connected devices all around them. Artificial intelligence along with machine learning allows chemical manufacturers to engage autonomous equipment with the help of data, flagging the way for smarter processes & faster transactions. The use of enlarged reality

can have a profound impact on chemical companies.

Chemical companies are increasingly using this technology to drive innovation by applying it in fields such as computational chemistry studies, X-Ray diffraction data, 3D structure optimization, conformational analysis, and transition state search.

Implementing the digital technology improves the cost-effectiveness of chemical companies by improving agility, productivity, and innovation. For instance, by using complex analytics tools for collaborative research and development, companies can speedily accelerate innovation to gain competitive advantage. Companies are turning to predictive models to perform what-if simulations based on data to achieve strategic agility and operational brilliance. Also, big data analytics plays a huge role in managing the on-going volatility in energy and raw materials prices and catering to changing customer demand. Digital transformation enables the companies to simulate the effect of price change on consumer demand and final margin, which allows them to develop real-time pricing quotes for their prospects. Additionally, they can share the data with suppliers to collaborate & combat price and supply volatility.

Digitalization will drive a tremendous wave of innovation. Recent advancements in digital technology offer unprecedented levels of connectivity, granularity, and speed in accessing, processing, and analysing huge amounts of data. Besides mobility, cloud and in-memory computing, the Industrial Internet of Things, machine learning and blockchain will start acting as game-changers in the chemical industry. All three trends are coming together to challenge existing strategies and create a perfect storm for the chemical industry. Customer and feedstock proximity, intellectual property, and technology know-how may no longer secure a sustainable competitive advantage. Early adopters of innovative business models have the unique opportunity to act as digital disruptors.

As chemicals is quite an asset intensive industry and with today's advanced capabilities in capturing, storing, processing, and analysing data, a vast amount of plant, asset, and operational data can be used in conjunction with advanced algorithms to simulate, predict, and prescribe maintenance to increase assets' availability, optimize uptime, improve operational performance, and extend their life.

Also, there is a lot of untapped potential for new IIoT and machine learning technologies in supply chain. Think about using advanced analytics to increase forecast accuracy leading to improvements along the entire sales and operations planning process and related KPIs. Advanced analytics and machine learning

could also be used for mitigating risks of supply chain disruptions. For instance, in case of natural disasters shipments could be automatically re-routed to meet on-time delivery goals & customer commitments at minimum costs. From a supply chain perspective, some segments in chemicals (e.g., pesticides) are threatened by counterfeiting. Blockchains single ledger verifies the integrity of a product as the record can be traced back to the product manufacturer and even the manufacturer of its precursor agents. Also, in terms of ensuring the physical integrity of a product, Blockchain can help. BASF last year ran a pilot on 'smart pallets', (pallets embedded with active, battery-powered, wireless transponders). Those can record & transmit into the cloud all pallet positions and movements, as well as physical conditions to seamlessly track possible 'incidents' the pallet & its products have been exposed to on their journey to their final destination.



Big data and advanced analytics are hugely disruptive forces to our industry, but companies willing to embrace the challenge will create significant competitive advantage and growth opportunities.

BIG DATA CHALLENGES

BDA provide an obvious path to streamline & safeguard chemical supply chain management. When we say 'big data', we are talking about being able to deal with it effectively, to process it efficiently in real time, to understand it & to use it for impactful decision support. Other industries have already developed best-practice models, but we can see some key ways it would benefit chemicals:

- By shrinking product life cycles, mass customisation and expanding regulatory frameworks in product innovation and R&D
- Analysing valuable data spawned by manufacturing & asset management to predictively model performance
- Taking care of complex shipment & logistics transactions in supply chain management, tracking & tracing goods - and being able to respond to any potential issues in real time
- Understanding pipeline, customer & product profitability at any level of granularity in sales & marketing. With the right tools, you can carry out simulations to focus on the most profitable deals & respond to customer needs on the fly

Properly managing big data does not only allow faster & more efficient decision making, it even enables business transformation or innovative business models via processes which have not been possible before. That is what drives the need. Blockchain could have

an impact on almost any line of business in a chemical company. Just think about collaborating in an open or closed community in R&D (permissioned private or public blockchain), tracking and tracing engineering changes and maintenance activities on a manufacturing asset, ensuring full integrity of a multi-modal product shipment to a customer, or trading derivatives of a physical product and set the foundation for clear ownership, once the critical mass for building a physical plant has been reached.

THE FUTURE

Big data & advanced analytics are hugely disruptive forces to the industry, but companies willing to embrace the challenge will create significant competitive advantage & growth opportunities. The challenge that is now in the face is actually harder to quantify, & yet perhaps most important of all is the way that big data empowers people by removing the need for endless chains of approval. With real-time cloud-based relevant data in their hands, people can make decisions on the plant floor or at the customer site without having to wait to talk to their boss at the end of the shift or when they get back to the office. Ultimately, it is about total cost of ownership. The end game is that we have a convergence between online analytical processing & online transactional processing, obviating the need for middleware & reducing layers so we need less hardware, software & IT operational support. Sustainable innovation via smarter, faster & simpler business processes.

CONCLUSION

To leverage & scale aforementioned technologies across all of their business functions, chemical companies need to turn into "intelligent enterprises". Intelligent enterprises operate with visibility, focus, and agility to achieve game-changing outcomes. They do more with less and empower employees through process automation. They deliver a best-in-class customer experience by proactively responding to customer expectations. They invent new business models and revenue streams.

For companies to become intelligent enterprises, they must invest in three key platform areas:

- An intelligent suite bringing intelligence into applications used to manage customers, supply chains, networks, employees, & core business processes
- A digital platform to manage data from any source (first or third party) in any format (structured or unstructured), and support the development, integration, and extension of business applications
- Intelligent technologies to apply intelligence to data & processes through innovations like machine learning, blockchain, advanced analytics, and IIoT. 

The author is a Supply Chain Analyst based in Dibrugarh, Assam

INTELLIGENT & SMART FACTORY

Achieving Industry 4.0's goals of 'intelligent manufacturing' and the 'smart factory' still relies on accurate and effective process control systems.



"Our customers are needing to process work pieces of increasing complexity, however a lack of skilled labour means they are having to insist on machining centres that are even simpler to use."

Bruce Lin, Manager of Hartford's R&D Intelligent Technology Department

In the face of global skills shortages and rapidly emerging Industry 4.0 trends, Taiwanese CNC machine manufacturer Hartford undertook to develop an innovative, easier-to-use human machine interface (HMI) for its CNC machines. At the same time the company strived to ensure process measurement and inspection at its CNC machine manufacturing operations could keep pace with ever-improving product quality goals.

BACKGROUND

Established in 1965, Hartford is Taiwan's biggest exporter of CNC machining centres as well as being the country's largest machining centre manufacturer. It is recognised as one of the CNC machining industry's leading global brands with a reputation for technological advancement.

Hartford's comprehensive range of machine tools is used extensively by major manufacturers including Airbus, Boeing, CRRC Corporation, Ferrari, Ford, Foxconn, LG, Pratt & Whitney, Samsung, Siemens and Volkswagen.

Developments in Industry 4.0 technology and world shortages in skilled labour have meant that forward-thinking CNC machine manufacturers like Hartford

are placing greater emphasis on automation, connectivity, data transparency and ease-of-use.

However, achieving Industry 4.0's goals of 'intelligent manufacturing' and the 'smart factory' still relies on accurate and effective process control systems. They need to be easy-to-use and provide sufficient immediate data to enable self-correction and adaptation to any sources of process variation.

ACHIEVING THE GOAL OF 'INTELLIGENT MANUFACTURING'

For Hartford, a global company that has exported 46,000 machines to 65 countries across Europe, North America and Asia Pacific regions, maintaining the very high quality of its product in the face of rapid technological and economic change and fierce international competition is a key consideration.

At its manufacturing facility in Taiwan, the company produces a complete range of medium to large-sized three-axis and five-axis CNC machines for use in major industry sectors including aerospace, automotive, electronics and energy. Its product range comprises vertical machining centres, precision boring machines and gantry-type machines.

With more than 95% of Hartford's cast components being manufactured and machined in-house, a continuous and progressive approach towards quality



OMP40-2 machine tool probe



Hartford employee using XL-80 laser interferometer for machine calibration

inspection is essential for achieving the precision required for a wide range of machine components, including machine heads, spindles and automatic tool changers.

Helping customers cope with the widespread shortages of skilled labour presents Hartford with a further vital challenge to address, as Bruce Lin, Manager of Hartford's R&D Intelligent Technology Department explained: "Our customers are needing to process work pieces of increasing complexity, however a lack of skilled labour means they are having to insist on machining centres that are even simpler to use."

INTELLIGENT HMI WITH RENISHAW APP

Hartford has invested significant resources into the research and development of intelligent CNC controllers in recent years and developed Hartrol Plus. The Har-



Precise assembly and positioning of machine tools is also critically important, with five-axis machine tools needing to be positioned with a deviation of less than $\pm 6 \mu\text{m}$. An XL-80 laser interferometer is used to measure machine position and both linear and angular errors.

rol Plus intelligent controller is as simple to use as a smartphone.

The HMI provided by the Hartrol Plus CNC controller follows key design principles promoted by Industry 4.0 ideals and helps address skills shortages. It provides machine operators with all the information they need to make the right decisions. The way in which it visualises data helps operators to make more informed decisions and solve problems more quickly.

Renishaw's Set and Inspect on-machine app has been integrated with Hartford's new controller, enabling users to exploit advances in automated measurement and data collection, making machine tool operation and human-machine interactions simpler and more intuitive. Set and Inspect is a highly visual

graphical user interface (GUI) which leads the operator through every step of on-machine probing processes including workpiece set-up, tool setting and other measurement tasks.

Operators no longer need to commit machine code instructions to memory, reducing data entry errors and programming times, as well as increasing processing efficiency by as much as 20%.

Hartrol Plus has been well received by customers, with more than 1,000 units sold to date.

PRECISION MEASUREMENT FOR HIGH QUALITY CNC MANUFACTURING

Hartford began using Renishaw products more than 20 years ago. In order to meet its stringent high-quality objectives, the company has introduced a variety of Renishaw high-precision measurement systems.

The precision of all CNC machined components it manufactures is verified using Renishaw PH20 5-axis probes on co-ordinate measuring machines (CMMs). This happens before components enter the assembly line, to ensure that they are ready to be assembled.

Precise assembly and positioning of machine tools is also critically important, with five-axis machine tools needing to be positioned with a deviation of less than $\pm 6 \mu\text{m}$. A Renishaw XL-80 laser interferometer is used to measure machine position and both linear and angular errors. The XL-80 generates an extremely stable laser beam with a wavelength that conforms to international standards. Linear measurement accuracy of $\pm 0.5 \text{ ppm}$ can be guaranteed, thanks to a precision stabilised laser source and accurate environmental compensation. Hartford uses the Renishaw QC20-W ballbar measurement system to perform cross-validation at different operating speeds to ensure that X- and Y-axes of the machine tool are correctly matched, and errors are kept down to less than $5 \mu\text{m}$.

Every Hartford CNC machine not only undergoes 100% laser verification and ballbar testing before dispatch, it can also use the customer's own workpiece for processing verification, with Renishaw OMP40, OMP60 and RMP60 machine tool measurement



Hartford uses the Renishaw QC20-W ballbar to check machine positioning performance



Hartford produces a complete range of medium to large-sized three-axis and five-axis CNC machines

probes used to measure the precision of the processed work piece.

AXISET™ CHECK-UP FOR ROTATION CENTRE COMPENSATION

Hartford also uses Renishaw AxiSet Check-Up to analyse the performance of machine rotary axes. Compatible with common 5-axis and multi-axis machines, it provides CNC machine users with a fast and accurate way to check the location of rotary axis pivot points and automatically compensate if necessary.

Importantly, AxiSet Check-Up does not need to rely on operator experience, as the operator can simply call up the relevant program and press 'Cycle Start' to complete the test process in just a few minutes. Data is automatically recorded into parameters for use in analysis, further guaranteeing the standardisation of every machine tool produced.

Lin said, "We also recommend that users use AxiSet Check-Up to test the machines' rotary axes after they are installed, as factory conditions may differ significantly from Hartford's manufacturing conditions, in terms of foundations and how level surfaces are. Shipping and installation can also cause precision

errors, so AxiSet Check-Up's automatic compensation allows machine tools to maintain high levels of precision and quality."

He continued, "All machine tools can suffer from wear and drift after a certain period of usage, with the level of precision of their positioning declining over time and causing a correspondingly poor level of machining precision. We therefore recommend that users perform scheduled checks on machine tools using AxiSet Check-Up every 6 to 12 months, in order to ensure that the level of machining precision remains consistent and productivity remains high."

In the manufacture of its world-leading brand of CNC machines, Hartford's on-going commitment to stringent quality inspection has seen the company continuously embrace the latest thinking in process measurement techniques.

Its imaginative use of leading-edge Renishaw measurement solutions over time has helped sustain its global competitive edge and reflects Hartford's bold corporate philosophy: "We are here to make the best machines to the highest standards." 

Source: Renishaw

SANDVIK ACQUIRES OSK THROUGH SECO TOOLS

Seco Tools, a division within Sandvik Machining Solutions, has reached an agreement to acquire the Chinese company Kunshan Ousike Precision Tools Co., Ltd (OSK), a leading supplier of solid carbide round tools. The acquisition will particularly strengthen the position and product offering to the fast growing Chinese electronics industry.

"The acquisition is aligned with Sandvik Machining Solutions' focus on growing the round tools business. We are already today well positioned in



China but OSK will bring us even closer to customers," says Klas Forsström, President of Sandvik Machining Solutions.

"I am very happy that we have reached an agreement to acquire OSK and include them in the Seco family. OSK serves customers in the electronics and die and mould industries and this is an important step for Seco to improve its position in the fast growing Chinese market. Our combined expertise will strengthen the product offering to customers," says Lars Bergström, President of Seco Tools.

PARTING 4 PRODUCTIVITY WITH TANG-F-GRIP

A revolutionary system for parting and grooving operations



A REVOLUTIONARY PARTING SYSTEM DESIGNED FOR INCREASED PRODUCTIVITY, TANG-F-GRIP COMPRISES A ROBUST TOOL BLOCK CARRYING SQUARE BLADES THAT FEATURE FOUR POCKETS, WITH A UNIQUE PARTING CONCEPT CAPABLE OF PARTING OFF UP TO 120MM BAR DIAMETER TO OPTIMIZE PERFORMANCE.

Parting and grooving are essential aspects of the turning process and the metalworking industry faces a constant challenge to integrate methods that will increase efficiency and decrease downtime for these popular operations.

ISCAR fully understands the importance of parting and grooving operations in the turning process and that multiple factors need to be considered for every application, including machine tool selection, the type of material being parted/grooved, required depth of cut, and feed and speed rates. ISCAR has responded to these complex needs by developing a comprehensive range of highly effective parting and grooving solutions that include an extensive choice of insert geometries, chip breakers, and carbide grades - and the range continues to expand.

With Industry 4.0 demands and standards fueling industry development at extraordinary rates, ISCAR has introduced new parting and grooving technologies capable of integrating seamlessly with the new wave of machining centers that work with incredibly high feeds. TANG-F-GRIP has been designed to answer these needs and to achieve high productivity and lower costs.

A revolutionary parting system designed for increased productivity, TANG-F-GRIP comprises a robust tool block carrying square blades that feature four pockets, with a unique parting concept capable of parting off up to 120mm bar diameter to optimize performance.

TANG-F-GRIP is simple to mount and operate on all machine types, including multi-task and machining

centers on X-AXIS, without any need for special adjustment. The system enables the mounting of both TANG-F-GRIP and DO-GRIP blades on the same blocks.

The square blades possess a support system that provides totally vibration-free grooving and parting. TANG-F-GRIP also saves on setup time as, in cases of pocket damage, the block's configuration allows a blade to be rotated to a new pocket without setup.

TANG-F-GRIP is intended for high feed parting. It extends insert life, improves surface finish and part straightness, and features high stability - especially when parting large diameters. The new patented blades reduce cutting time and also enable significant material savings - for instance, a 120mm bar can be cut with a 3mm blade with HF (high feed) inserts at

a feed rate of up to 0.4 mm/rev (.0157ipr).

The HF tangential single-ended insert was developed to enable highly efficient parting at very high feed rates, by use of a unique chipformer technology. The insert features a new insert chipformer to allow unobstructed chip flow, which increases insert and blade tool life and leads to very high productivity gains.

All TANG-GRIP inserts can be integrated into the TANG-F-GRIP system, which is also compatible with DO-GRIP DGN double-sided twisted geometry parting inserts, to provide an extensive choice of parting widths for all application ranges. ISCAR offers a wide variety of chipformers and advanced grades to ensure unbeatable performance and extended tool life.

A revolutionary secure clamping method using a tangentially orientated pocket facilitates pocket life that is three times longer than that of any other conventional self-grip system. The robust clamping method enables machining at high feed rates and provides excellent straightness and surface finish characteristics, while the flat top configuration prevents chip obstructions under all possible machining conditions.

The JETCUT system incorporates ingeniously designed through coolant channels to deliver coolant close to the cutting edge, which improves chip formation and slashes flank and cratering rates.

When





WHEN MACHINING MATERIALS SUCH AS STAINLESS STEEL OR HIGH TEMPERATURE ALLOYS, THE TEMPERATURE NEAR THE CUTTING EDGE AREA BECOMES EXTREMELY HIGH. IN ADDITION, THESE MATERIAL TYPES TEND TO ADHERE TO THE TOOLS CUTTING EDGE, CAUSING BUILT-UP EDGE.



machining materials such as stainless steel or high temperature alloys, the temperature near the cutting edge area becomes extremely high. In addition, these material types tend to adhere to the tools cutting edge,

causing built-up edge. These problematic phenomena can be moderated by targeting high pressure coolant directly to the cutting zone.

ISCAR maintains its unrelenting progress as a result of the company's continuous development of innovative, high-quality products, based on the talented work of the company's R&D Department and prompted by the evolving needs of global industry. This desire to provide customers with the very latest, most efficient metal cutting technology is reflected in the introduction of TANG-F-GRIP solutions to ISCAR's comprehensive GRIP range of parting and grooving tools.

Source: ISCAR

ASSOCHAM- REPA SIGN MOU FOR HYDROPOWER, NEW & ALTERNATE ENERGY

The Renewable Energy Promotion Association (REPA) and leading Apex Industry body, The Associated Chambers of Commerce & Industry of India (ASSOCHAM) today inked a Memorandum of Understanding (MoU) in New Delhi.

As per the MoU, both ASSOCHAM and REPA would collaborate together to promote substantial and tangible actions to increase the co-operation between the two associations. These are some of the win wins, the newly signed MoU would seek to achieve for both the organisations.

Under the Memorandum of Understanding (MoU), the co-operation between ASSOCHAM technical committees and REPA standing committees and Task Forces develop and harmonize Indian and International RE standards. Organize jointly training and educational seminars and other educational activities when appropriate.

To promote, encourage, manage, assist and organize an



integrated and efficient development of solar energy, wind energy, biomass energy, geothermal energy, tidal and wave energy and energy generated from Non-Conventional / Renewable Energy Resources in India and abroad including planning, investigation, research, design and preparation of preliminary, feasibility and definite project reports for construction, generation, operation and maintenance, renovation and modernization of power stations and projects, transmission, distribution, sale of power generation at stations in India and abroad.

The MoU was signed by ASSOCHAM Deputy Secretary General, Saurabh Sanyal and Prof. A G Iyer, President & Promoter Director, REPA in presence of M M Madan, Chairman ASSOCHAM National Council on Hydropower and Mr. Rajiv Kumar Srivastava, Asst. General Manager- Exports, WAAREE Energies Limited held in New Delhi today held in New Delhi

ROBUST HIGH-PERFORMANCE SWIVEL UNIT

The device defines new benchmarks in power density, durability, commissioning and maintenance



THE HIGH POWER DENSITY OFFERS THE PERFECT PRE-REQUISITES FOR PARTICULARLY COMPACT AND AT THE SAME TIME EFFICIENT SOLUTIONS.

The high-performance swivel unit SCHUNK SRM has what it takes to become a new standard in pneumatic swivelling of up to 180°. Compared to the existing pneumatic swivel units on the market, the powerful module scores with a hitherto unique combination of high torques and moments of inertia at short swivel times, large center bore, robust bearings, and at the same time slim interfering contours. For the development of the high-performance module, SCHUNK has used the latest simulation technologies enabling for the first time that data such as reaction forces, pressure sequences, impact speeds, kinetic energies, and drive energies are entered. New dampers and special piston seals, and a Viton-/FKM seal form the basis for the hitherto unique performance package and high robustness. The rotary module is therefore also suitable for use in environments with aggressive media. Both in axial and radial directions, the bearing is pre-tensioned without any

clearance, enabling particularly high torques and transverse forces to be absorbed. As the inner dampers have already pre-adjusted, usually only the restrictors need to be set during commissioning before production can begin. When the inner shock absorbers are changed, both the swivelling angle & the damper stroke adjustment remain intact, meaning maintenance work is carried out with exceptional speed.

Optionally with media feed-through

With the SCHUNK SRM, systems can be made smaller, cycle times reduced and both precision and service life increased. The high power density offers the perfect pre-requisites for particularly compact and at the same time efficient solutions. The consistent structure of the swivel unit provides a customized design at an unrivalled price-performance ratio.

The exceptionally large center bore allows the feeding through of pneumatic, as well as pre-assembled cables with integrated connectors. The pneumatic or electric media feed-through

makes it even more convenient: If the pneumatic media feed-through is used, the large center bore keeps fully intact. For the electric media feed-through, the sensor cables can be inserted directly into the module. In so doing, coloured coding on the plug connector simplifies commissioning and allocation of the signals. If despite every precaution the cable should break, individual cables are also replaceable without having to replace the entire media feed-through.

The high-performance SCHUNK SRM swivel unit will initially be available in the sizes 14, 16, 25, & 40 for swivelling angles of 0°/180° and 0°/90°. The end position is adjustable (+/- 3°). In size 40, torques of up to 24 Nm & moments of inertia of up to 7 kgm² can be achieved. That is 25% higher torque than the previous top model the SCHUNK SRU-plus. Additional sizes and options are already in planning.

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FICCI SIGNS MOU WITH SIGNIFY INNOVATIONS INDIA ON SAFETY PRACTICES

Recently, FICCI signed a MoU with Signify Innovations India Ltd (erstwhile Philips Lighting India Ltd) in the area of Workplace Safety where both would carry out series of activities to further the cause of safety at workplace and also highlighting the importance of lighting in workplace safety.

The MoU was signed by Dilip Chenoy, Secretary General, FICCI and Sumit Joshi, Vice Chairman and

Managing Director, Signify Innovations India Limited.

On the occasion, Dilip Chenoy said, "FICCI has been working in the area of workplace safety for the last many years to promote best practices. One of the key aspects of this safety is lighting and our collaboration with Signify marks a significant milestone in our continuous engagement with Netherlands as a country too".

Sumit Joshi said, "We are happy to

collaborate with FICCI as knowledge partner for promoting best safety practices at workplace. Signify shall be happy to share how lighting can improve the safety at workplace and improve the productivity of the workforce".

This comes as initiative of FICCI Taskforce on Manufacturing Excellence which is already working in the area of workplace safety.

Source: FICCI

HOW 25 E-CHAINS HELP PREPARE PLANES BEFORE THEY FLY

Friction-free operation of a fully automatic maintenance system for aircraft enabled by e-chains and igubal pillow block bearings



IT REDUCES THE DE-ICING TIME TO SEVEN MINUTES AND THE WASHING TIME TO TWENTY MINUTES. THE SYSTEM CONSISTS OF THREE BEAMS, ATTACHED TO EACH OF WHICH ARE TWO TELESCOPIC ARMS AND BARS. THERE IS A NOZZLE SYSTEM IN THE BARS AND ON THE FLOOR.

De-icing and washing aircraft is still a very manual process. To reduce time, delays and therefore costs, MSG Production AS developed a fully automated all-in-one concept that can de-ice and wash aircraft. The Norwegian company relies entirely on the advantages of motion plastics from igus: energy chains of the E2 and E4 series ensure reliable cable guidance and igubal pillow block bearings for mounting of cleaning nozzles. The de-icing of aircraft is expensive and time-consuming, since multiple steps here still require manual intervention. As many aircraft have to be freed of ice simultaneously, the de-icing becomes the bottleneck at the airport. The same situation applies to cleaning. The washing of a Boeing 737 takes place manually – and that can take up to ten hours. MSG Production AS took on these challenges and for the first time developed a stationary, fully automatic system, which

fulfils two purposes: de-icing and washing. It reduces the de-icing time to seven minutes and the washing time to twenty minutes. The system consists of three beams, attached to each of which are two telescopic arms and bars. There is a nozzle system in the bars and on the floor. When an aircraft enters the hangar, it is pulled by an electric carriage and cleaned or de-iced by the system similar to that in a car wash. Since this must work reliably despite humidity, chemicals and cold, the manufacturer makes special demands on the system components. The developers therefore rely on energy chains from igus for safe guidance of hoses and cables.

Cable routing made easy with igus energy chains

In total, there are 25 energy chains in the system. In addition to 19 e-chains of the E4.1 series, MSG Production AS also installed six 2400 series energy supply systems. The material igumid G ensures that the chains are insensitive to moisture and chemicals. Even temperatures down to -40 degrees Celsius is no problem. Both energy chains are dirt-resistant and do not require lubrication, which makes them ideal to use in de-icing or cleaning equipment.

Lubrication-free nozzle movement due to igubal pillow block bearings

In addition to cable guidance, MSG Production AS also relied on igus products for mounting the nozzles. The igubal pillow block bearings reliably ensure the mobility of the individual nozzles. Their position on the floor and the bars, also permanently expose them to chemicals and moisture. Like all products of the motion plastics specialist igus, the bearings are lubrication-free and corrosion-free, wear-resistant and have low-friction. Another advantage is that the service life of the bearings and the e-chains can be calculated quickly and easily using online tools. The forecasts are based on more than 12,000 tribological tests and 10 billion test cycles a year in the company's own 2,750 square-metre test lab. This gives the customer a reliable statement about the service life of his used bearings as well as e-chains and cables. This helps to avoid unplanned machine downtime.

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JV FOR 'HYUNDAI HYDROGEN MOBILITY' SIGNED

Hundai Motor Company and H2 Energy AG has signed a contract for a JV, Hyundai Hydrogen Mobility, aimed at taking a lead across Europe's burgeoning hydrogen mobility ecosystem. To begin the JV's operations, Hyundai Motor will deliver 1,600 fuel cell electric heavy-duty trucks to Hyundai Hydrogen Mobility from 2019 through 2025.

The venture will then lease a large portion of these fuel-cell powered trucks to the H2 Mobility Switzerland Association, which comprises



major refuelling station operators, transport & logistics companies, also to various other industry players that promote hydrogen mobility in Switzerland. The joint entity will further expand its market presence to other European countries beyond Switzerland.

Hyundai Hydrogen Mobility also plans to penetrate the hydrogen sales market through a subsidiary firm that produces & supplies hydrogen in Switzerland, with prospects for entering other countries.

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