

THE MACHINIST

RNI No 71129/98

November 2019 • Rs 75

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**What India's jump
in rankings means**

Power play
**Disruption in the
energy sector**

Women in manufacturing
**Magnifying impact
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noun

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THE SIGNIFICANTLY BETTER HALF!

Since the March 2019 issue, The Machinist magazine has been consistently featuring a story on 'Women in Manufacturing'. A highpoint was the previous issue (October 2019), when we featured a woman leader on our Cover for the first time ever since we re-launched the magazine in January 2014. Okay, I admit, we should have done it earlier. But then, we did not want to do it for the sake of it. Only when we found a leader worthy of it that we decided to put her on the Cover. I am sure there are many such worthy leaders around and going ahead we will be looking out for them more carefully and diligently.

Another remarkable milestone in this journey was the 'Women Leaders in Manufacturing' panel discussion at this year's Super Shopfloor Awards in Bengaluru. We broke away from the tradition of having a CEO panel with all men and invited only women for this panel. Of course, the discussion received

**"I AM EQUALLY SURE THAT THE INDUSTRY WILL ALSO
COME AHEAD TO SUPPORT AND ENCOURAGE US IN THIS
INITIATIVE THAT WE HOPE TO BUILD INTO A MOVEMENT."**

overwhelmingly positive response from the audience that comprised primarily of male attendees. As a publication and a media house, we have always taken a lead in espousing just causes. This initiative is very much in line with that legacy. And sure enough, the women in manufacturing feature will continue to grow in the issues to come. I am equally sure that the industry will also come ahead to support and encourage us in this initiative that we hope to build into a movement.

Editor & Chief Community Officer

THE MACHINIST
ULTIMATE GUIDE TO PROFITABLE MANUFACTURING
Volume 14 Issue 11 November 2019



Chief Executive Officer **Deepak Lamba**

Chief Financial Officer **Subramaniam S**

Publisher, Print
& Production Controller **Joji Varghese**

Brand Publisher **Rishi Sutrave**
rishi.sutrave@wmm.co.in
+91 9820580009

Editor &
Chief Community Officer **Niranjan Mudholkar**
niranjan.mudholkar@wmm.co.in
+91 9819531819

Associate Art Director **Sanjay Dalvi**
sanjay.dalvi@wmm.co.in

Project Coordinator **Fiona Fernandes**
fiona.fernandes@wmm.co.in

ADVERTISING

South **Mahadev B**
mahadev.b@wmm.co.in
+91 9448483475

Prabhugoud Patil
prabhugoud.patil@wmm.co.in
+91 9980432663

West & North **Ranjan Haldar**
ranjan.haldar@wmm.co.in
+91 9167267474

Jangam G.
jangam.gangaram@wmm.co.in
+91 9820053063

SUBSCRIPTIONS

subscriptions.rmd@timesgroup.com
022 67427209 / 67427206

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CONTENTS



COVER STORY
In the right direction 38



WOMEN IN MANUFACTURING
Valuing differences! 28

Editorial 4
News 8
Event Calendar 12
Appointments 14
3-D Printing Updates 16
Facility Updates 20
Mobility: Cybersecurity for Future Connected Mobility 22
Skill Development: Bridging the gap! 44
Energy: Power play 58
Update 62
Products 64



Power Equipment
Updates 18
Energy storage and security 46



Automotive
Driving with data 26



Market
Enabling businesses 34



Technology
Formidable growth prospects! 52



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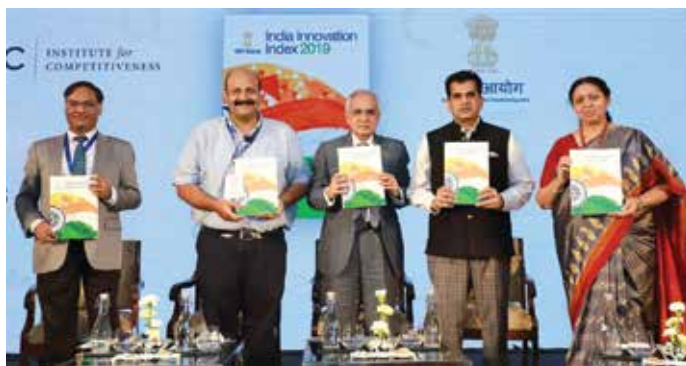
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YOUR GLOBAL CRAFTSMAN STUDIO

NITI Aayog launches India Innovation Index 2019

NITI AAYOG with Institute for Competitiveness as the knowledge partner released the India Innovation Index (III) 2019. Karnataka is the most innovative major state in India. Tamil Nadu, Maharashtra, Telangana, Haryana, Kerala, Uttar Pradesh, West Bengal, Gujarat, and Andhra Pradesh form the remaining top ten major states respectively. The top ten major states are majorly concentrated in southern and western India. Sikkim and Delhi take the top spots among the north-



ern & hill states, and union territories/city states/small states respectively. Delhi, Karnataka, Maharashtra, Tamil Nadu, Telangana, and Uttar Pradesh are the

most efficient states in translating inputs into output. Dr. Rajiv Kumar, Vice Chairman, NITI Aayog, expressed hope that “the India Innovation Index would create synergies between different stakeholders in the innovation ecosystem and India would shift to competitive good governance.” Amitabh Kant, CEO, NITI

Aayog added that “India has a unique opportunity among its myriad challenges to become the innovation leader in the world.”

DICV ahead of schedule on BS VI deadline



DAIMLER INDIA Commercial Vehicles rolled out its first Bharat Stage VI (BS VI) heavy-duty powertrain from its manufacturing facility at Oragadam. Having already received certification for BS VI back in July 2019, DICV's latest milestone comes just two and half years after the introduction of BS IV.

On the occasion, Satyakam Arya, MD & CEO, Daimler India Commercial Vehicles, said, “Daimler Trucks already has eight years of experience delivering over 14 lakhs BS VI-equivalent vehicles to customers. It is therefore no surprise we are again leading the industry in the transition to cleaner-emission commercial vehicles.”

DICV's start of production comes not only before the government's April 2020 BS VI transition deadline, but also ahead of their own internal schedule. In 2017, DICV joined a global partnership with Daimler entities in Brazil, Germany and the US with the goal of upgrading key components to BS VI standards by January 2020.

DAC approves Rs. 3300 crore for Make in India

THE DEFENCE ACQUISITION COUNCIL (DAC), chaired by Raksha Mantri

Rajnath Singh, met recently and accorded approval for Capital Procurement for the Defence forces amounting over Rs. 3300 crore of indigenously designed and developed equipment. Maintaining its impetus on the 'Make in India' initiative, the DAC accorded approval for three projects to be indigenously designed, developed and manufactured by the Indian industry. The first two projects include third generation Anti-Tank Guided Missiles (ATGM) and the Auxiliary Power Units (APUs) for the T-72 and T-90 Tanks. While the third generation ATGM would provide 'Fire and Forget' and "Top Attack" capabilities to the troops in an armoured battle, the APUs would enable incorporation of various upgrades to Fire Control System and Night Fighting capabilities of the Tanks. Both these projects will be progressed under the 'Make-II' Category and will provide a boost to indigenous research and development in the Private Sector.

DRDO signs 30 agreements on Technology Transfer

DEFENCE RESEARCH AND DEVELOPMENT ORGANISATION (DRDO) has signed 30 licensing agreements for Transfer of Technology (ToT) with 16 Indian companies, including three start-ups, at Vibrant Goa Global Expo and Summit 2019, which was held at Goa University, Taleigao, Goa between October 17-19, 2019. The DRDO develops technologies for the Armed Forces

and has been carrying out ToT of these technologies to the defence industry for end use of the Armed Forces. Indian Armed Forces are procuring ready-to-eat meals, survival ration and emergency flying ration products from companies which have acquired ToT from DRDO. These products cater to the requirements of the Armed Forces deployed in inhospitable terrain and hostile weather condi-

tions. These products have high nutrition value and higher shelf-life. These technologies are useful for the larger interest of society. Vibrant Goa Summit provided an opportunity for the companies to interact with DRDO scientists who have developed these technologies. The event was inaugurated by the Chief Minister of Goa Pramod Sawant yesterday and was attended by senior officials.

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Application Examples



Hirth Coupling



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India's interests will be protected in multilateral engagements: Piyush Goyal

UNION MINISTER OF COMMERCE AND INDUSTRY & RAILWAYS PIYUSH GOYAL recently

released the High Level Advisory Group (HLAG) report in New Delhi. In his address at the event Commerce and Industry Minister said that the report shows the way forward for India to become an attractive investment destination by grasping all the opportunities available so that India is able to achieve the target of exports contributing one trillion USD to the GDP. Commerce and Industry Minister



thanked the Advisory group for the bold report that has recommendations for industry both manufacturing and services and sectors like textiles, finances and

tourism so that India is able to take its manufacturing potential to 25 percent of the GDP. During an interaction with the audience after the release of the report Commerce and Industry Minister assured that India will always protect its strategic and economic interests while engaging in multilateral talks. He urged citizens to talk, argue and understand issues and not indulge in creating fear psychosis as the Government of India will never sign on any trade agreement without consultations.

Ministry of Railways signs MoU with ISB



MINISTRY OF RAILWAYS AND THE INDIAN SCHOOL OF BUSINESS (ISB) signed a Memorandum of Understanding (MoU) for a strategic partnership. It was signed by Vinod Kumar Yadav, Chairman, Railway Board and Professor Rajendra Srivastava, Dean, ISB, in the presence of Railway Board Members & faculty members of ISB. The comprehensive MoU covers several aspects including executive education programs, developing research opportunities, developing case studies and pedagogical materials, and creating of a future-ready leadership pool for the Indian Railways. Speaking on the occasion, Vinod Kumar Yadav, Chairman, Railway Board said "I am very pleased to formalize this partnership with the Indian School of Business. This strategic partnership will allow Indian Railways to build leadership talent in a rapidly changing competitive environment. The MoU will also facilitate research in areas of importance to the Railways and make the Railways an innovation and technology driven future-ready organization."

Engagement on IP issues to reinforce Indo-American partnership

NARENDRA SABHARWAL, Chair, FICCI IPR Committee, recently stressed on the importance of the India-US dialogue in ironing out bilateral issues on intellectual property (IP). Speaking at the second edition of 'IP Dialogue: Opportunities for US-India Collaboration', organized by FICCI, jointly with the US Chamber of Commerce, Sabharwal said, "The India-US dialogue, which was initiated last year, has proved very useful in understanding bilateral issues on intellectual property and indicating the resolve on both sides to identify, deliberate and find pragmatic solutions. The dialogue today carried forward this process, enabling the two sides to discuss several crucial areas in an open and transparent manner."

India has a robust and balanced IP system that takes into account national development priorities and concerns while conforming to international commitments. The National IPR Policy 2016 lays down a comprehensive roadmap for the overall future development of India's IP system.

Birla Cellulose using pre-consumer cotton waste

BIRLA CELLULOSE has achieved a breakthrough in manufacturing viscose fibre using pre-consumer cotton fabric waste. This new line of viscose, is already being adopted and is available for sale to interested brands and retailers. This innovation has the distinction of Recycled Claim Standard (RCS) and portrays Birla Cellulose's commitment to a more circular economy.

This innovation has been done through in-house R&D and uses a minimum of 20 percent pre-consumer industrial fabric waste. Fabrics from the fibre offer excellent attributes similar to virgin fibre. The business will work on further developing products made with more than 50 percent industrial fabric waste as well as post-consumer clothing as inputs in 2020.

"Launching of recycled viscose fibre is part of our commitment for circularity and sustainable practices. We are also working on developing fibres using post-consumer clothing as inputs, in collaboration with Technology providers and brands" said Dilip Gaur, Business Director, Pulp and Fibre Business Aditya Birla Group. The fashion industry which is at the cusp of transformation towards a circular economy has much appreciated this innovation. It adds to Birla Cellulose's stature as a leader in achieving "low risk" in its 2017 Canopystyle audits.

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FIG-200 SPL CNC
BIG BORE GRINDER

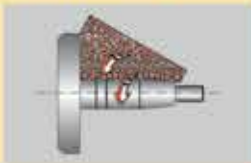


FIG-300 CNC
FOUR STATION TURRET



FIG-150 CNC
ID / OD GRINDER

CNC Cylindrical Grinding



AWH-1500 CNC
LONG SHAFT GRINDER



AWH-2000 CNC
HEAVY DUTY GRINDER



SWH-400 CNC
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Surface Grinding



SG-106 CNC
CREEP FEED GRINDER



SGR-60
ROTARY GRINDER



SG-63
HYDRAULIC / PLC

Automats



A15/25



T036
AUTOLOADING



A42/60

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

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4-8, 2019**

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www.kdclglobal.com

**DECEMBER
10-14, 2019**

Excon
Bengaluru, India
www.excon.in

**JANUARY
16-20, 2020**

Plastivision 2020
Mumbai, India
www.plastivision.org/

**JANUARY
18-22, 2020**

Elecrama 2020
Greater Noida
www.elecrama.com/

**JANUARY
23-28, 2020**

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

**FEBRUARY
7-12, 2020**

Auto Expo 2020
Greater Noida
<http://www.autoexpo-themotorshow.in/>

**FEBRUARY
26-28, 2020**

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Guangzhou, China
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**FEBRUARY 28
-MARCH 1, 2020**

IFEX 2020
Chennai
<http://www.ifexindia.com/>

**MARCH 31
-APRIL 4, 2020**

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**MAY 20-22,
2020**

Transport India 2020
New Delhi
<http://www.transportindiaexpo.com/>

APRIL 22-25, 2020

Die & Mould India
Mumbai, India
<https://www.diemouldindia.org/>

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14 -19, 2020**

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Carsten Knobel to be the new Henkel CEO



Henkel has announced that the current CEO Hans Van Bylen, for personal reasons, will not be available for a further term after about 35 years with the company, including about 15 years on the Management Board and four years as its CEO. He will therefore hand over the position as CEO to his successor Carsten Knobel effective January 1, 2020. Carsten Knobel joined Henkel in 1995 and has been on the Management Board since 2012, responsible for Finance, Purchasing and Integrated Business Solutions. His succession as Chief Financial Officer is still to be decided.

“After about 35 years with Henkel, I have decided that with the expiration of my contract next year it is now the right time to make an orderly change at the top of the company. For personal reasons, I will not seek a further term as Chairman of the Management Board. I would like to thank all employees and my colleagues in the Management Board for their dedication and commitment over the past years, as well as all members of our supervisory committees for their

support and advice”, said Hans Van Bylen. “I am also glad that we were able to appoint Carsten Knobel from within our Management Board as successor and CEO. I am convinced that Henkel will continue to develop successfully under his leadership.”

Castrol India makes leadership change



Castrol India Limited has announced the appointment of Sandeep Sangwan as the Managing Director with effect from 1 January 2020. Sandeep Sangwan will succeed Omer Dorman who will move into another role to lead Castrol's business in Europe, also effective 1 January 2020, after a successful tenure of four years in India.

Sandeep Sangwan has a prolific career extending over 29 years and brings extensive business, sales and marketing expertise with him. He is currently based in the UK as Programme Director leading a major transformation programme in BP Lubricants and has been instrumental in embedding the new Lubricants operating model across the business. Sandeep Sangwan joined BP in 2012 as a part of the Castrol innoVentures team and subsequently worked in Europe & Africa as the Regional Marketing Director and as the North Europe Sales Director.

On the announcement, R Gopalakrishnan, Chairperson of Castrol India Board said, “Omer Dorman has been instrumental in changing the trajectory of the Castrol India business over the last four years and leading the company in making noteworthy progress against key parameters of business performance, resulting in profitable volume growth. Our best wishes are with him as he takes on his next assignment with Castrol heading the business in Europe. On behalf of the Board, I warmly welcome Sandeep Sangwan to the Castrol India team.”

ReNew Power elevates Sanjay Varghese



Renew Power limited has announced the elevation of Sanjay Varghese to the position of Executive Vice President in the company. Sanjay will head the Solar Business for the company and report directly to Chairman and Managing Director, Sumant Sinha. Sanjay has been with ReNew for the past two years and has been responsible for executing key solar projects for the company. Sanjay joined ReNew from Lanco Solar, where he was the Chief Operating Officer. Sanjay was earlier reporting to the company's Chief Operating Officer Parag Sharma, who has decided to pursue interests outside the Company. Parag was with ReNew for the last 5 years and we wish him all the best for his future endeavours.

ReNew Power also announces the appointment of Vishal Sehgal as the head of its Corporate Affairs function. Vishal Sehgal has worked in multiple sectors of the economy including a long and distinguished spell with the German retail giant –Metro Cash & Carry, and has an MPA from Harvard's Kennedy School of Government. These appointments are meant to expand

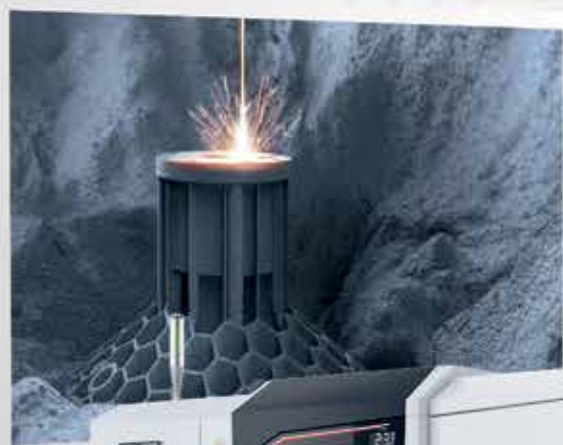
ReNew's leadership team to manage its growing portfolio and explore new growth opportunities in the renewable energy sector. ReNew had earlier announced the appointment of D Muthukumaran as its Chief Financial officer in August this year.

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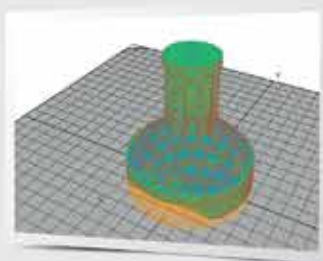


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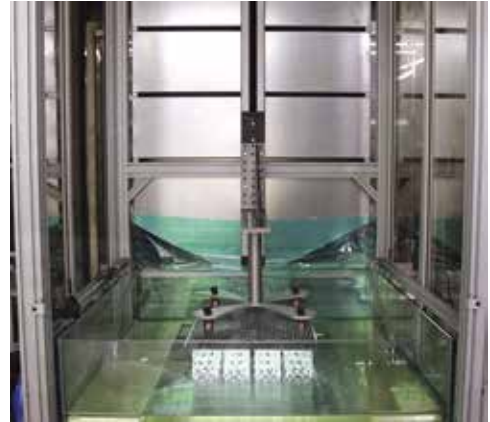
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Northwestern University researchers develop a futuristic 3D printer

Northwestern University researchers have developed a new, futuristic 3D printer that is so big and so fast it can print an object the size of an adult human in just a couple of hours. Called HARP (high-area rapid printing), the new technology enables a record-breaking throughput that can manufacture products on demand. Over the last 30 years, most efforts in 3D printing have been aimed at pushing the limits of legacy technologies. Often, the pursuit of larger parts has come at the cost of speed, throughput and resolution. With HARP technology, this compromise is unnecessary, enabling it to compete with both the resolution and throughput of traditional manufacturing techniques.

The prototype HARP technology is 13-feet tall with a 2.5 square-foot print bed and can print about half a yard in an hour — a record throughput for the 3D printing field. This means it can print single, large parts or many different small parts at once.



Power of brilliant design and productivity



Designed with designers in mind, the J850(tm) 3D printer from Stratasys allows users to save weeks on the design process with exceptional print quality.

(Photo: Business Wire)

Stratasys has unveiled the next-generation of its powerful, full-color, multi-material PolyJet™ solution – the J850™ 3D Printer. The J850 boosts speed and productivity for designers and engineers with greater material capacity and faster printing while continuing the J-series' reputation for extremely high print quality and reduced time-to-market. Compared to traditional modeling, the J850 can shorten the overall modeling time by up to 50 percent at significantly lower cost.

"Stratasys PolyJet technology gives designers endless possibilities. With this solution, there's no need to add or switch technologies throughout the design process"

Designed for designers, the J850 offers advanced settings that can produce concept models twice as fast as previous J-Series systems. This new Super High Speed Mode gives designers and engineers more time for part refinement by printing concept

models at double the speed. In addition, the J850's larger, seven-material capacity enables designers to print a full range of color, transparency and flexibility combinations in a single part.

Stratasys is also introducing two new PolyJet materials. The company's new VeroUltraClear™ material can deliver high clarity and finely detailed models that are similar in appearance to glass. VeroUltraClear can help designers visualize internal features and create concept models that verify the design of clear parts. Additionally, DraftGrey™ is a low-cost concept material that is ideal for fast, affordable iterations in the beginning of the design process.

"Stratasys PolyJet technology gives designers endless possibilities. With this solution, there's no need to add or switch technologies throughout the design process," said Alex Padwa, Founder of Padwa Design, a premier industrial design studio building solutions for consumer goods, high technology, and the household. "We can immediately achieve the exact design intent we have in mind – and bring it to life in our hands instantly. The J850 is truly designed for designers."

"The new J850 has been built to meet the needs of the full design process in industries such as consumer goods, consumer electronics, automotive, as well as education settings," said Shamir Shoham, Vice President, PolyJet Business Unit at Stratasys. "Typically, that process includes two separate streams: evaluating geometric shape with a physical single-color model, and considering color and texture on the screen. The J850 merges these two mediums into one full-color, multi-material model to make better design decisions, earlier."

The J850 also provides PANTONE Validated™ color - offering a universal language of color that ensures reliable, realistic decision-making across every stage of the design process. Fully supported by GrabCAD Print™ software, the J850 can 3D print directly from a user's favorite professional CAD format to avoid time and complexity associated with converting STL files.

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Envision and ZF announce strategic partnership

Envision Energy and ZF Wind Power have signed a strategic partnership agreement for the development and delivery of gearbox solutions for the next generation offshore wind turbines. With this partnership, both partners leverage their respective advantages in brand, technology and market, while jointly building high-reliable and cost competitive offshore wind turbines for the fast-growing wind market. Customers will benefit from more flexible and modular solutions, competitive lifecycle costs, high quality and reliable products and a fast integration in the customer roadmap.

The strategic partnership represents an important step forward for the well-established cooperation between Envision Energy and ZF Wind Power. "Operating under the principles of mutual



development, integrity and shared interests, we believe that the combined strengths of both companies will create exciting new possibilities and opportunities while jointly promoting the development of offshore wind power," says Mitja Schulz, Head of ZF Wind Power.

Senvion and Siemens Gamesa sign agreement

Senvion announced that its exclusive negotiations with SGRE concerning the sale of a large part of the company's European Onshore Services business and its blade production facility in Portugal have been concluded successfully. A corresponding agreement was unanimously approved by Senvion's creditors' committee on 11 October and signed today.

The transaction in respect of the European Onshore Service business is expected to close in Q4 2019 subject to regulatory approvals and other customary closing conditions. Business continuation costs, salaries and wages for employees are secured through ongoing business activities. For other parts of Senvion, the wind-down process has begun in order to secure socially acceptable solutions for remaining employees and an orderly liquidation of remaining assets. As announced earlier, some wind turbine continuation projects are being finalised, securing further jobs with some going until the middle of the next year. For other assets, including Indian operations and non-European Service operations, explorative talks with potential investors continue.

IndiGrid Q2 EBITDA up by 84% QoQ

IndiGrid announced its results for the quarter ended 30 September 2019. IndiGrid reported a consolidated revenue of INR 3,729 million for the quarter, up 81% QoQ. The consolidated EBITDA for the quarter was INR 3,476 million, up 84% QoQ.

The Board of Sterlite Investment Managers Limited acting as the Investment Manager of IndiGrid approved INR 3.00 distribution per unit for Q2 FY 20 payable as interest. With this, IndiGrid is well on track to achieve its stated DPU guidance of INR 12.00 per unit for FY20.

IndiGrid currently owns a portfolio of eight power transmission assets with a total network of 18 power transmission lines that span more than 4,900 circuit kilometers and 7,735 MVA of substations across 11 states. On the back of framework agreement with Sterlite Power, IndiGrid is on track to grow its AUM to INR 170 billion over next two years from its existing AUM of INR 110.56 billion. Harsh Shah, CEO, IndiGrid, said "This quarter has been transformational for IndiGrid. On one hand, we achieved the highest quarterly EBITDA for IndiGrid as NRSS and OGPTL acquisitions in Q1 contributed full quarter of revenue."

Tata Power to develop 150 MW of solar project

Tata Power, India's largest integrated power company, announced that Tata Power Renewable Energy Limited (TPREL), the Company's wholly owned subsidiary, has received a Letter of Award from Tata Power - Distribution on 31 October 2019 to develop 150 MW of solar project. The Power Purchase Agreement (PPA) will be executed upon approval and adoption of tariff by Maharashtra Electricity Regulatory Commission.

The energy will be supplied to Tata Power - Distribution (Tata

Power - D) under a PPA, valid for a period of 25 years from scheduled commercial operation date. TPREL has won this capacity in a bid announced by Tata Power - D in August 2019. The project has to be commissioned within 18 months from the date of execution of the PPA.

The Plant is expected to generate 360 MUs of energy per year and will annually offset approximately 360 Million Kg of CO₂.

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Wabtec Marhowra factory completes one year of manufacturing

Wabtec Corporation celebrated several milestones and accomplishments as it participated in IREE 2019. The event coincides with the completion of one year of operations at both its Roza maintenance shed and Marhowra factory, which will soon deliver its 100th locomotive. The facilities, constructed as part of the company's commitment to 'Make in India,' have been focal points of the historic project with the Government of India and Indian Railways.

Two years ago, at the same IREE event, legacy GE Transportation announced the arrival of its first 4500 horsepower (HP) locomotive at the Mundra Port. To date, there are 135 such locomotives in revenue service with the Indian Railways, including 85 that were fully manufactured in India with 70 percent local content. Wabtec's 6000 HP diesel-electric locomotive, the first in India, is currently undergoing test trials on Indian Railways track and is expected to enter revenue service soon.

The Marhowra factory is operated by a diverse and talented workforce, comprised of over 25 percent women. Wabtec's partnership with both global and local suppliers has helped establish



an integrated ecosystem, enabling a fast ramp up of local manufacturing and creating more than 5,000 direct and indirect jobs across India.

"As Wabtec continues to integrate as one company, we look forward to the meaningful impact we can have on India's future economic development," said Dr. Sujatha Narayan, Regional General Manager for Wabtec Corporation in India.

Tecumseh opens global technology centre in India to add to its network of global labs

Tecumseh officially opened its state-of-the-art Global Technology Center in India. The center adds to Tecumseh's network of engineering labs located in the United States, France and Brazil and further enhances Tecumseh's investment in global research and development of its next generation compressors and value-added system solutions.

The location near Delhi was strategically selected to strengthen partnerships and collaboration with other global, top OEM brands who have design and manufacturing facilities in the region. Doug Murdock, President and CEO of Tecumseh, followed the cutting of the ribbon with saying, "By expanding our engineering capabilities in India we are showing a commitment to the research and development of industry-leading cooling solutions and sustainable technologies." Murdock also added, "Not only is our new facility located close to the top OEM customers but also an excellent place to hire



great engineering talent. This center will be contributing to the design and development of technologies for our global products and customers, as well creating jobs and supporting the local economy in the process." Jegapriyan Govindarajan, Managing Director of Tecumseh India, said "Ever since Tecumseh started operations in India in 1997, we have been pioneering the industry with products that meet the requirements of local customers and partners." He also added, "The new Global Technology Center will leverage the local engineering talent to support customers across the world by developing products that meet rapidly changing market requirements and industry regulations."

Continental opens new tyre plant in Mississippi, US

Continental celebrated a major milestone for its new tyre plant near Clinton, Mississippi, with a grand opening event today. The celebration marked the completion of the construction process, which began in 2016. Approximately 300 guests, including state and local officials, community members, customers and supplier joined 250 Continental employees for the event. The new plant is located on a 1,000-acre greenfield site in Hinds County, approximately two miles from Clinton and 20 miles from Jackson. Continental has committed nearly \$1.4 billion and expects to employ 2,500 people when the plant reaches full capacity in the next decade.

Christian Koetz, member of Continental's Executive Board and Head of the Tire Division, added, "The completion of our new tire plant signifies a major step in our global long-term growth strategy for Continental Tires, called Vision 2025. Mississippi is a critical part of this strategy, providing the best options for us to grow the tire business in the Americas region."

The plant will produce large truck and bus tyres for the U.S. market. Production is set to begin in 2020.

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By Prashanth Doreswamy

CYBERSECURITY FOR FUTURE CONNECTED MOBILITY

Most cars made after 2010 have some elements of connectivity in the vehicle. However, as the amount of software content increases in a vehicle and we move towards increased levels of connectivity, it becomes imperative to explore the security aspects of such connectivity.



before we push autonomous vehicles onto the road, one of them being the scope, strength and security of the connectivity infrastructure. The internet has been in cars since the late 1990s. It began as a simple emergency services device that could send out notifications in case of an accident. Eventually, this technology progressed to sharing the specific location of the vehicle in an emergency, sharing vehicle diagnostics, help navigate and more.

Most cars made after 2010 have some elements of connectivity in the vehicle. However, as the amount of software content

increases in a vehicle and we move towards increased levels of connectivity, it becomes imperative to explore the security aspects of such connectivity.



"The automakers need to develop a holistic approach considering vehicle security from a wider, enterprise perspective. This includes the entire chain of manufacturing, starting from production, internal programming of the software, the supply chain and updating the software."

The automotive industry is bracing revolutionary transformation, heading towards a future where fully autonomous vehicles will be a reality. The specific point where this would be true is still not well defined because, apart from the advancements in the vehicle itself, a fully autonomous vehicle would require several changes in the surrounding ecosystem as well.

There are several issues that require to be addressed

FUTURE LEVELS OF CONNECTIVITY

Today connectivity comes in form of either allowing the driver to connect their mobile phones to the car and access it through the dashboard or directly through an inbuilt system. Advanced features like navigation, remote diagnostics that help in vehicle maintenance and multimedia streaming are being integrated into vehicles. While the focus should now lead to increasing the safety quotient of a vehicle by providing warnings at the right time

Some cars at the higher end of the price spectrum offer enhanced services that allow integration of services like calendars, messages and notifications from certain apps. These essentially turn the car into a mini-assistant. Gradually the assistance system will be upgraded to AI driven voice support systems into the car,

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allowing the driver to personalize their car to an extent never seen before. Everything from controlling the car's sunroof to switching on the television back home could be controlled by voice-activated system.

DISTRIBUTED RISK

As the quotient of connected cars increases on the road, there are also concerns about privacy and security of these vehicles. Cybersecurity is one of the major concerns of the modern world. As the connected car would contain much more detail about user habits, patterns of our life, banking information and more that leaves the user vulnerable to attack.

A connected vehicle exchanges data with multiple parties - other vehicles on the road (V2V), with the surrounding infrastructure (V2I), and with everything else (V2X). There are multiple points of access that can act as security threats and leave the end-user unprotected as the data exchanges happen outside the vehicle with multiple cloud-based platforms. Inside a connected vehicle, various individual components are responsible for their functioning mechanism. These are essentially mini-computers that control, coordinate commands

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The more we support automation with minimal human intervention, the deeper we dig into expanded possibilities of being cyber-hacked. Automation in automobile manufacturing has offered thousands of perks but everything comes at a cost, and here the risk is playing the role.

and respond with the necessary action. Electronic Control Units (ECUs) are connected via the central network of the vehicle. If a hacker gains access to the car's connected infotainment, the entire car can become vulnerable - which includes taking over car's steering control, manipulate engine and braking control systems.

Security threat analysis test, post developing the central software system of the car, is highly-required to maintain the end-point security of the vehicle. The automakers need to develop a holistic approach considering vehicle security from a wider, enterprise perspective. This includes the entire chain of manufacturing, starting from production, internal programming of the software, the supply chain and updating the software.

MITIGATING RISKS ON EARLIER STAGES

A vehicle has approximately over 10 million lines of

//


Today connectivity comes in form of either allowing the driver to connect their mobile phones to the car and access it through the dashboard or directly through an inbuilt system. Advanced features like navigation, remote diagnostics that help in vehicle maintenance and multimedia streaming are being integrated into vehicles.

code today, a multi-fold increase in the last decade. This heightens the importance of software engineers and cybersecurity experts even in the automotive industry, and OEMs across the world are gradually building their teams that are equipped in addressing such issues.

Modern manufacturing involves artificial intelligence, data analytics, and machine learning. The more we support automation with minimal human intervention, the deeper we dig into expanded possibilities of being cyber-hacked. Automation in automobile manufacturing has offered thousands of perks but everything comes at a cost, and here the risk is playing the role.

High-skilled expertise is required to detect, analyze and take action as per the component security demands. We need to keep in mind that the majority of the cyber-hackers start attacking from the basic notches of our systems, and mostly targeting the flaws at the production stage.

Also, for the post-stage cybersecurity, software integrators are available to detect and respond to day-to-day malicious threats. In the growing world of BYOD (bring your own device), it becomes important for the users to keep their devices safe which they are connecting to their car's Bluetooth or internet-network. They do have access to their corporate classified data through them, and one single intrusion can hamper their entire database. In return, this could have resulted in millions of dollars of loss to the company's assets.

Today, the connected technology has emerged as a blissful hand for our automobile industry, pushing it towards high-tech deliverables. The tremendous consumer response from the neo market of connected cars has positively signaled about the future potential of the market towards growth and sustenance. However, securing it from the external cyber-attackers should be the foremost approach in embracing the world of connectivity. 

The author is Country Head India, Continental Corporation, Managing Director, Continental Automotive India

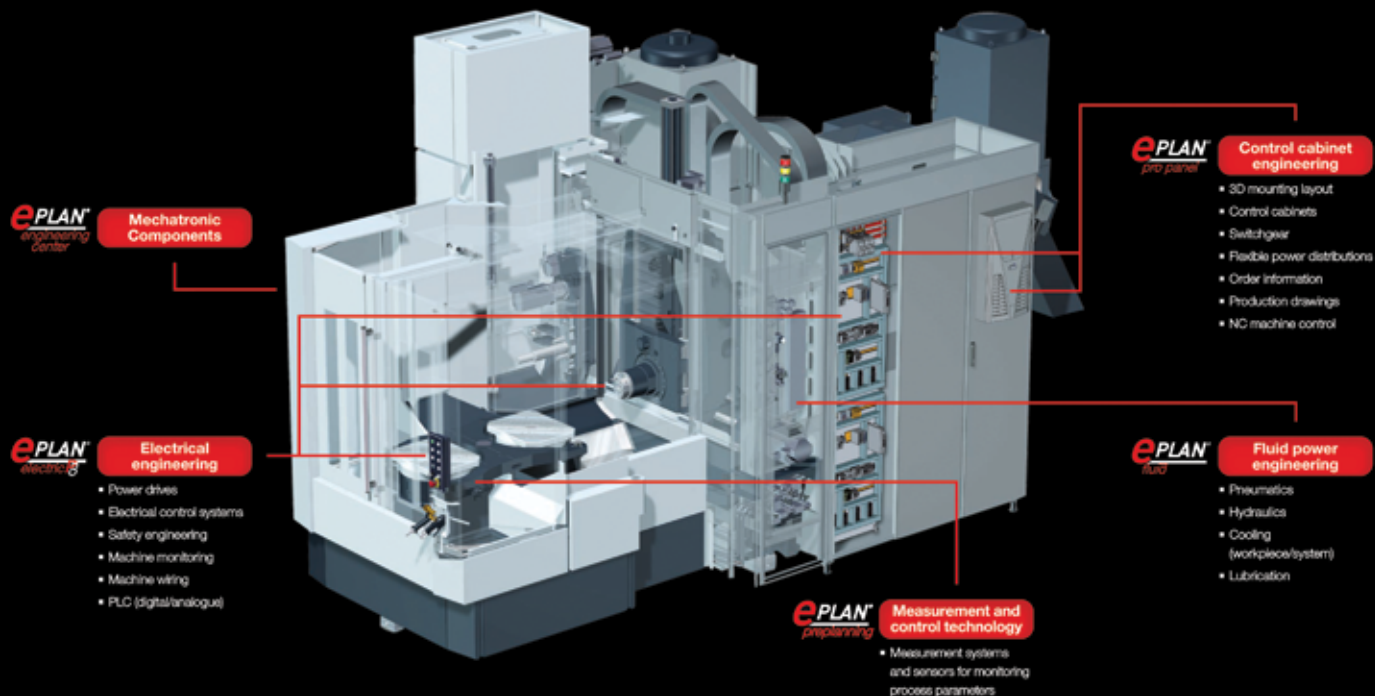
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By David le Douarin

DRIVING WITH DATA

Machine learning and artificial intelligence allow you to fully benefit from the wealth of data generated before, during and after the sales process



Presently a key event in the automotive industry, private sales are an avenue to reward and reconnect with customers by inviting them to take advantage of exclusive offers. Traditionally, a sales team will select and invite customers without really knowing whether the client is presenting purchase intention. Machine learning and artificial intelligence allow you to fully benefit from the wealth of data generated before, during and after the sales process, in order to ensure the success of Private Sales operations.

SALES LEADS IN DATA

Customer data are valuable sources of information that can be fully valued through the processing and computing capabilities of artificial intelligence. Marketers can then build on the activation of completely individualized campaigns. The key success factor for private sales clearly depends on the ability of marketing teams to identify qualified leads within their databases and personalize each communication to encourage the concerned persons to make an appointment.

GOOD DATA USAGE


We identify individuals within the CRM database who are most likely to renew their vehicles and get them to engage in private sales. Artificial intelligence algorithms analyze all data pertaining to customers to determine the verifiable indicators of an imminent vehicle change.

A predictive model can serve to determine the estimated mileage of the vehicle owned by each customer, but not solely, because it is a variable among hundreds of others that can be correlated with each other, such as the end date of a bank loan, the birth of a child or moving to a rural area ... Once identified using these intelligent algorithms, these details are then transmitted to sales teams, who can then directly contact each customer to confirm a possible vehicle-renewal project.

Through the implementation of auto-specific model recommendations, AI can identify among the stock of vehicles available in Private Sales, those who are closest to the one currently owned by the targeted individual. Sales can then push the most appealing vehicle to the individual. The platform's algorithms analyze in real-time individuals browsing on the Private Sales website. It is essential to be able to draw from hot navigation data, which can be analyzed and interpreted in real-time with the aid of artificial intelligence. With a comprehensive intention scoring model, a score is assigned to each individual with regard to their browsing behavior (page views, configuration, bookmarking, time spent on certain pages ...) This score reflects their purchase intention and its intensity: the higher it is, the stronger the intention.

NAVIGATING CUSTOMERS

E-mail, display, Facebook, Google ... Data reconciliation within the same customer repository and the association of browsing cookies with CRM identifiers opens access to new points of contact with customers and allows you to communicate with them where they are and where their purchase decision is being made.

Finally, to prepare for future private sales, it is best to identify individuals who are most likely to participate. By analyzing your database, the platform's algorithms identify hundreds of characteristics common to all individuals who have acquired a vehicle during private sales, or those who have registered to participate. 

The author is co-founder and CEO of Advalo, a French predictive marketing platform operating in Paris



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By Nirranjan Mudholkar

VALUING DIFFERENCES!

Empowering women makes sense for our business because their inclusion in the economic cycle has a magnifying impact on growth and the health and progress of their families as well, says **Anjali Pandey** – Vice President Engine Business and Component Business, Cummins India ABO.

Based on your experience, would you say that acceptance for women is increasing in the manufacturing industry in India?

Yes, in the Indian manufacturing industry, I truly believe that the acceptance of women is increasing.

What is your organisation's approach towards gender diversity?

Cummins has begun this journey long before, for Cummins one of our five core values is Diversity & Inclusion - Valuing and including our differences in decision making is our competitive advantage. There have never been any challenges in Cummins for male staff members to accept women supervisors or women leaders. The best way to change the approach is to truly accept Diversity as a core in everything you do.

Diversity and Inclusion: This is not just a theme but a Core Value at Cummins. Cummins India diverges in age, gender, race, nationality, language, differently-abled, other underrepresented, personality, behav-



iour, sexual orientation, religious beliefs, gender identity and expression. Cummins in India believes that a diverse population develops a collective behaviour and as a result, encourages all individuals and employees to best use their talents.

At present, how many women are employed by your organisation in the manufacturing segment?

We have a diversity of ~33 percent and at Cummins, we have set steep targets to reach 50 percent in the coming years.

What are the various opportunities available for women in the manufacturing industry today?

At Cummins, there are a plethora of opportunities. We pride ourselves on being the 'keepers' of Cummins core values of Diversity and Inclusion.

Do you think women can play a bigger and better role in improving the work environment for the manufacturing industry?

Diversity is something that is always on my mind and in many facets of my job. Understanding the value of diversity helps me excel in my roles as a leader, manager, recruiter for my function, volunteer leader and sponsor of a number of a great place to work initiatives. Additionally, understanding the value of diversity allows me to help create and manage the right environment. I attempt to



"Some of the values that are most important to me include integrity, compassion, dedication, diversity, inclusion, equality, mentoring and coaching. I own and lead several of the technical lane deliverables, which are all about finding and fixing problems for our customers, identifying and reducing reliability risk."



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be conscious of invisible diversity as well when I lead teams, to try to build inclusive environments and elicit diverse perspectives.

Some of the values that are most important to me include integrity, compassion, dedication, diversity, inclusion, equality, mentoring and coaching. I own and lead several of the technical lane deliverables, which are all about finding and fixing problems for our customers, identifying and reducing reliability risk. So, every day I am coaching teams to make the right decisions for Cummins and the customer to give them a product that works. It's often challenging to balance competing

//

The responsibility lies with us to create apt platforms and identify relevant areas for skilled women employees to be recruited, especially at the grassroots level like shopfloors. In the last few years, we have witnessed an overall increase in women workforce who are keen on being part of the shopfloor and the trend is definitely growing in India.

objectives, but it's bringing those varying perspectives and objectives together to enable teams to make the best decisions they can. Focus on strengths, treat people as they would like to be treated, hold yourself to high standards, and persevere – you are making a difference! I feel privileged that I work for a company that allows me to use my strengths to grow, to learn, to help others, and also work to change our community and our culture.

What should be done more to encourage the participation of women in manufacturing? Tell us about the strategies implemented by your organisation.

Career development and networking have been long-standing initiatives throughout our existence; it's something women very clearly wanted from the group. Mentoring circles, for example, have been a very successful initiative offered by the group, bringing together successful women at Cummins and newcomers to the Company. In a

Five major affinity groups

To embrace, the core value of Diversity and Inclusion beyond just gender, Cummins has five major affinity groups i.e.

WAG – Women's Affinity Group – Launched in 2010, WAG is the oldest ERG in Cummins India. WAG focuses on three pillars - Safety (Physical/Emotional), Health/Wellness and Development of women employees of Cummins India.

Ekam – Ekam will contribute to developing a work culture which is suitable for diverse cultures by adding and sustaining diverse perspectives to gain a competitive advantage.

India Pride – The India Pride ERG aims to create a safe, inclusive and productive workplace for LGBTQ+ employees.

neXus – neXus aims to connect and leverage different generations to enhance competitive advantage and cultural synergy.

WINGS – In WINGS, members will work together to create a safe and comfortable workplace for the differently-abled to grow to their full potential and leverage their talent.

From a Corporate Responsibility standpoint

- At Cummins, engineering solutions that build prosperous communities has been part of who we are since our company's founding. We continue this legacy of community problem-solving with Cummins Powers Women, our most ambitious community initiative ever. Cummins Powers Women unites our leaders and employees around the world in finding solutions to gender inequality in our communities, reinforcing Cummins' commitment to the advancement of women everywhere. Cummins Powers Women represents a multi-million-dollar investment in proven programs designed to create large-scale change in the lives of women and girls globally.

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Graduation ceremony of India Engineering Development Program.

mentoring circle, the protégés are paired with one male and one female mentor, allowing more women to have access to company leaders than with one-on-one mentoring. Career development and networking have been long-standing initiatives throughout our existence. It's something women very clearly wanted from the group.

How easy or difficult is it for male staff members to accept women supervisors or women leaders? What can be done to change their approach to this issue?

As mentioned earlier, Cummins began this journey long before, for Cummins one of our five core values is

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Focus on strengths, treat people as they would like to be treated, hold yourself to high standards, and persevere – you are making a difference! I feel privileged that I work for a company that allows me to use my strengths to grow, to learn, to help others, and also work to change our community and our culture.

Diversity & Inclusion - Valuing and including our differences in decision making is our competitive advantage. There have never been any challenges in Cummins for male staff members to accept women supervisors or women leaders. The best way to change the approach is to truly accept Diversity a core in everything you do.

Let me share with you an example from Cummins:

In a progressive move to strengthen the gender diversity, Cummins Turbo Technologies (CTT), a wholly-owned subsidiary of Cummins in India announced the introduction of B shift (late evening shifts) for women employees at the Dewas facility. With an objective to enhance gender representation at Cummins, the


company initiated this project on pilot basis in April this year at their Dewas facility and successfully conducted a dry run with 50 women employees working in the B shift (4 pm- 12 am) on 26th and 27th April 2018.

Post receiving positive feedback from all employees and other stakeholders and re-

viewing all arrangements, B shift for women employees was officially launched on 25th May with grand celebration. All the women employees were welcomed by male colleagues and the occasion was celebrated in a grand manner.

The responsibility lies with us to create apt platforms and identify relevant areas for skilled women employees to be recruited, especially at the grassroots level like shop floors. In the last few years, we have witnessed an overall increase in women workforce who are keen on being part of the shop floor and the trend is definitely growing in India. At Cummins, we have always been at the forefront of creating a diverse work culture by ensuring adequate representation and Inclusion by fostering the right working environment that is psychologically safe, inclusive, respectful and performance-oriented.

At Cummins India, we truly believe in embracing the diverse perspectives of all people and honouring them with dignity and respect. The introduction of B shift for our women employees at Dewas facility is one such step towards improving gender representation. There is a need to enhance opportunities for women, particularly at the shop-floor employee level. Within the Cummins, we pride ourselves on being the 'keepers' of Cummins core values. Empowering women makes sense for our business because their inclusion in the economic cycle has a magnifying impact on growth and the health and progress of their families as well. This initiative is already showing results with gender representation improving at the site from 8 percent to 26 percent in a short duration.

The roll-out of this initiative is backed with all necessary steps like legal compliance requirement, ensuring women safety, door to door pick up and drop bus facilities, women security guards, doctor and medical assistance and other steps, making shop floors more gender-inclusive and a Great and Safe Place[®] to work. 



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By Niranjan Mudholkar

ENABLING BUSINESSES

India has jumped 14 places to move to the 63rd position in this year's global ease of Doing Business rankings. The Machinist presents a quick analysis.



India earned a place amongst the world's top ten improvers for the third consecutive year in the World Bank Group's Doing Business 2020 study. While

India was ranked at the 77th position last year (2018) in the Global Ease of Doing Business rankings, sustained business reforms have helped India jump 14 places to move up to 63rd position this year. The Machinist believes that this is a commendable achievement and also spoke to some industry leaders to understand their perspective on this improvement.

NOTEWORTHY JUMP

Anil Verma, Executive Director & President, Godrej & Boyce says, "An improvement of 79 places from 142nd in 2014 to 63rd in 2019 is indeed noteworthy and speaks a great deal about how the government has focused its energies in improving the business environment in the country." Harsha Kadam, CEO & President -Industrial Business, Schaeffler India calls it a remarkable achievement for our country. "It is a reflection of the persistent efforts of the government to drive the business reforms agenda, not only at the central level but also

at the state level." Abhyuday Jindal, MD, Jindal Stainless, acknowledges the government's push on reforms saying that they have reaped benefits. "It's a win-win situation for both economy and industry. These reforms have increased transparency levels, which have boosted the confidence of investors and businesses in India. However, the vast untapped potential of the Indian economy will be fully realized once policy enforcement on the ground is implemented in its entirety."

Schaeffler's Kadam also highlights that the jump is a tremendous achievement, especially for an economy that is as large and complex as ours. "The development puts India in the rank of the most-favoured investment destinations, indicating an environment that encourages foreign investors to become part of the Indian growth story. It will also help international companies identify attractive markets for their expansion, looking at alternatives to China for investment amid Beijing's trade war with the US. The focus now needs to be on further improvement in the ease of doing business through additional reforms and policies and aim to rank within 50 in the ranking for the coming years."

THE IMPACT

Jindal believes that this will act as an enabler for budding entrepreneurs to set up new businesses and scale-up the existing ones. "This will hopefully attract domestic and foreign investments, thereby creating fresh



"The creation of a single electronic platform for trade stakeholders, upgradation of port infrastructure and improvements in electronic submission of documents will facilitate both imports and exports thereby enhancing foreign trade."

Anil Verma, Executive Director & President,
Godrej & Boyce



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AVIATION



AUTOMOTIVE



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Process / Machine Development

- Material: Nickel-based alloys / Titanium / Titanium Aluminide



TURBO CHARGER

- Turbine wheel
- Turbine casing
- Thrust bearing
- Valve disk, etc.



INJECTION SYSTEM

- Fuel injector
- Valve plate
- Pump casing & Injector
- Rail, etc.



DISC

Process / Machine Development

- Material: Nickel-based alloys



DIFFUSOR

Process / Machine Development

- Material: Nickel-based alloys



VALVE TRAIN

- Connecting rod
- Camshaft & Cam piece
- Cam
- Piston, etc.



TRANSMISSION

- Synchronizer body
- Synchronizer ring
- Drive shaft
- Parking lock, etc.





"There is much scope to further enhance the 'Ease of Doing Business' with proactive policy action, such as in the domain of enforcing contracts, registering property and starting a business. It should then be eminently possible to move into the top 50 of the global Index, and, in the foreseeable future, to the top 30."

Harsha Kadam, CEO & President - Industrial Business, Schaeffler India.

employment opportunities. India needs more wealth creators, and as the processes for entrepreneurship in the country eases, the nation will be a US \$5 trillion economy as envisioned by the Prime minister," he says.

Kadam of Schaeffler India also feels that the new ranking enhances India's perception as a global business destination and will provide a much-needed thrust to India's GDP growth by attracting foreign investment.

Verma of Godrej & Boyce also believes the improvement will augur well in luring multinational companies towards India as an attractive business destination. "The cost of obtaining all permits and authorization to build a warehouse has now come down and will thus boost investments in the warehouse space. The creation of a single electronic platform for trade stakeholders, upgradation of port infrastructure and improvements in electronic submission of documents will facilitate both imports and exports thereby enhancing foreign trade."

Kadam also points out that the improvement in the rankings is largely due to the government introducing norms to simplify the process of starting a business, better access to construction permits and easier trade across borders through electronic submission of documents for import and export audits. "This has significantly reduced logistics time, making it more efficient. The recent decision in reducing the corporate income tax rate to 22 percent for existing domestic companies and 15 percent for new domestic manufacturing companies also helps India become more competitive compared to other emerging markets," he adds.

Kadam also states that all these factors will collectively help attract foreign investment in the country, particularly at a time when global investors are looking at alternative locations for their manufacturing operations, to counter trade war risks. "Besides, the improvement in rankings should also encourage the start-up ecosystem in the country, thereby driving forward the government's 'Make in India' scheme," he adds.

THE WAY AHEAD

Jindal says that the way ahead is faster implementation of the reforms. "In today's dynamic age, we need all arms of the government - administrative, judicial, and legislative - to respond to changing times with agility and work for improved hand


holding between industry and government. Further, as global majors resort to protectionism to save their markets, we need our government to ensure a level playing field for domestic players as well."

Verma also emphasises on the implementation aspect when he says that it is imperative that ease of doing business which encourages a rule-based environment is practiced in spirit on the ground. "This will largely depend on the state's ability to implement the subscribed rules and regulations. We have to ensure that there are no slips between the cup and the lip," he cautions.



"India needs more wealth creators, and as the processes for entrepreneurship in the country eases, the nation will be a US \$5 trillion economy as envisioned by the Prime minister."

Abhyuday Jindal, Managing Director, Jindal Stainless

Jindal has a word of advice: "The industry would also do well with energy security in a sustainable manner. We also need to enhance India's cost competitiveness in logistics and transportation by bringing our infrastructure at par with the developed economies." "Indian companies should increasingly focus on exports and becoming a part of the global supply chain," adds Verma of Godrej. Kadam of Schaeffler India also notes that there is much scope to further enhance the 'Ease of Doing Business' with proactive policy action, such as in the domain of enforcing contracts, registering property and starting a business. "It should then be eminently possible to move into the top 50 of the global Index, and, in the foreseeable future, to the top 30. India needs to move faster on the reform front, to be seen as a more attractive destination for savings and investments," he believes. 

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IN THE RIGHT DIRECTION

Greaves Cotton has been optimistically cautious about the overall market scenario and expects positive movement banking on its diversification strategy and focus on new business, says **Nagesh Basavanhalli, the company's MD & CEO**

Congratulations on your re-appointment as MD and CEO of Greaves Cotton Limited for a period of five years with effect from 27th September, 2019 to 26th September, 2024. How's your personal journey been with the organisation so far?

Thank you very much. With the support of colleagues and the larger team, my journey with Greaves has been pleasant and I have had the privilege to work with some very talented executives here. The board, other business heads and the organization have been grateful to believe

in me right from the beginning which enables me to drive the company and its people in the right direction.

Greaves Cotton Limited reported a four percent growth in revenue for Q1FY20 despite the industry slowdown. What is driving this growth?

Greaves Cotton Limited is a diversified engineering company and a leading manufacturer of Cleantech Powertrain Solutions (CNG, Petrol and Diesel Engines), Generator sets, Farm equipment, E-Mobility,



//

Greaves Cotton has been known for its services in the automotive sector so far. However, we are now carefully diversifying into both - automotive and non-automotive industrial sectors such as agriculture, construction etc. thus exploiting the company's full potential to achieve better business results.

Aftermarket spares and services. Greaves Cotton is a multi-product and multi-location company with rich legacy and brand trust of over 160 years and has established itself as a key player impacting billion lives every day. As part of its diversification plan, Greaves has expanded its operations into non -auto engines business focusing on Marine, construction and farming industry. High HP Greaves engines have found successful usage in firefighting, cleaning applications as well.

The new Multibrand venture into the 2-Wheeler and 3-Wheeler segments has opened new avenues of business with customers wanting reliable and affordable post purchase solutions.

Understanding the need for clean affordable mobility for last mile and riding on the strategy of providing fuel agnostic powertrain solutions and services, Greaves has started the Electric Mobility business. This includes:

Wide range of energy efficient scooters from Ampere electric vehicles for personal mobility,

Rugged, reliable & affordable range of e-rickshaws for commercial mobility.

Lastly, the company has invested in expanding footprint via Greaves Retail, creating enriching customer experiences – offline & online and strengthening the value ecosystem for future.

Greaves Cotton operates various business units including engines, power, agri, aftermarket, care and global. How is each one of these businesses doing and which is driving the highest revenues for you?

Greaves has been optimistically cautious about the overall market scenario and expects positive movement banking on our diversification strategy and focus on new business. We have continued our growth momentum despite tough market conditions. Our new business in CNG, E-mobility solutions, Greaves Retail, Multibrand Spares, non-auto industrial applications business along with existing business has shown positive growth. We have been growing consistently each





quarter with a focus on driving business opportunities for various sectors. As for Q1 FY20, the company has performed well and grew at four percent. We have a significant increase across our businesses - 41 percent growth in E-Mobility sales further increasing the market share to 18 percent.

Greaves has agreed to increase its stake in Ampere Electric. What prompted this investment and how is it evolving?

This is part of strategic initiative to strengthen and expand presence in last-mile e-Mobility space. Today it is sensible to look at the EV space going forward with the automotive industry evolving at a fast pace and government policies changing. Considering the rise in pollution and importance of sustainable environment for the future, electric vehicles are going to have a major impact. The in-principle decision to acquire 100 percent stake in Ampere is part of Greaves' long-term growth strategy to deliver superior products and services in last-mile e-Mobility space, which is seeing significant interest from government and commuters alike. Performance has been good; Q1 growth by 41 percent Q-o-Q, 35 new dealers added in Q1 and we have also started expanding channels. We are also enhancing accessibility of affordable finance to allure more customers adopt Ampere electric. We recently launched a high-speed e-scooter Ampere Zeal with subsidies that allow end customers to purchase it at lower costs. Initial response is very encouraging with regards to the product performance, styling and appearance. In addition to this, we have tied-up with one of India's largest online marketplaces Amazon and with PayTM for customers to experience online and offline shopping at the same time.

Tell us about the overall manufacturing capacities and capabilities of Greaves Cotton.

As mentioned earlier, Greaves Cotton Limited is a diversified engineering company and a leading manufac-

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The in-principle decision to acquire 100 percent stake in Ampere is part of Greaves' long-term growth strategy to deliver superior products and services in last-mile e-Mobility space which is seeing significant interest from government and commuters alike.

turer of Cleantech Powertrain Solutions (CNG, Petrol and Diesel Engines), Generator sets, Farm equipment, E-Mobility, Aftermarket spares and services. Greaves Cotton is a multi-product and multi-location company with rich legacy and brand trust of over 160 years and has established itself as a key player impacting billion lives every day. The company has seven manufacturing units and continues to support progress of the nation under Make-In-India program. The company today manufactures world class products and solutions under various business units - Greaves Engines, Greaves Power, Greaves Agri, Greaves Aftermarket, Greaves Care, Greaves Global and is backed by comprehensive support from 325 Greaves big retail Centers & 5000+ smaller spare parts retail outlets across the country.

In the mobility segment, the company manufactures four lakh plus engines annually; almost one engine per minute and provides the most affordable mobility solutions to the majority of population in India, moving more than one crore passengers and five lakh tonnes of cargo every day. In all, the company has crossed five million engines, three million pumpsets and one million gensets. Greaves Cotton augmented its clean technology portfolio with entry in the last mile affordable 2W personal Mobility segment with Ampere Electric Vehicles.

In August 2019, Greaves Cotton Limited (GCL) registered a remarkable growth of 33 percent in the CNG market with its new 400cc water-cooled engine despite the downturn in the automotive markets. What is helping you grow in this segment?

On CNG 3W front, Greaves has been able to carve out a niche for itself with its home-grown, powerful, water-cooled 400cc CNG engines that provide better carrying capacity at much lower costs. Greaves has registered a much faster growth than the industry average due to its well accepted value proposition. With more and more cities getting covered with CNG network, GCL is confident of spreading our value proposition to



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smaller towns and attaining higher volumes.

Greaves Cotton also has been on a Pan-India retail expansion drive. What's the strategy behind this initiative?

As one of the leading players in the last mile mobility segment, Greaves has always believed in creating superior ownership experience across the lifecycle of the customer. With this in mind, Greaves has expanded its footprint across the nation, near the customer to ensure quick availability of post purchase solutions – reliable & affordable service and company certified spares. This is to ensure that customers move non-stop and vehicle

//

We have been growing consistently each quarter with a focus on driving business opportunities for various sectors. As for Q1 FY20, the company has performed well and grew at four percent. We have a significant increase across our businesses - 41 percent growth in E-Mobility sales further increasing the market share to 18 percent.

What more do you think should be done both by the industry as well as the government to bounce back?


While the Indian government is taking required measures for fostering the adoption of electric vehicles, there is a lot of ground to be covered in terms of awareness, sustainable infrastructure, charging stations and most importantly cost-efficiency for both customers and manufacturers. It will be a gradual transition and it is imperative for auto component manufacturers to start preparing for the ensuing disruption. The government has setup new policies and schemes for the switch to EVs which can surely benefit the industry.

Now there has to be significant adoption from prospective buyers & that will help.

Greaves Cotton has partnered with the Mahindra Group to supply BS-VI emission norms compliant powertrain solutions. How is that partnership evolving?

The partnership is evolving as per the plan. As a part of this partnership, Greaves Cotton Limited will provide affordable last mile mobility solutions through BS-VI powertrain solutions to Mahindra. These powertrains will be used in Mahindra 3 wheelers, which in turn will serve millions of customers and help them save "more with every kilometer" they travel, thereby helping them improve everyday earnings.

What is your vision for Greaves Cotton and where do you see it three years down the line?

Greaves Cotton has been known for its services in the automotive sector so far. However, we are now carefully diversifying into both - automotive and non-automotive industrial sectors such as agriculture, construction etc. thus exploiting the company's full potential to achieve better business results. This will help us tap into the B2B and B2C segment. Our solutions portfolio not only caters to the industry at large but provides additional value and services to our customers. 

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While the Indian government is taking required measures for fostering the adoption of electric vehicles, there is a lot of ground to be covered in terms of awareness, sustainable infrastructure, charging stations and most importantly cost-efficiency for both customers and manufacturers.

uptime is high ensuring better productivity & earnings to the owners & drivers.

Apart from 5300+ small aftermarket outlets, the company has opened up 350+ retail outlets with some having full-fledged 3S facility – sales, service & spares, thus strengthening the last mile ecosystem. We are expanding our retail channels both online and offline to leave no stone unturned in this journey towards sustainable living. Now our customers can even buy Ampere Electric scooters on Amazon and Paytm at the convenience of their home.

While the Government has announced a slew of measures to provide a boost to the industry and economy the situation is far from back to normal.



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BRIDGING THE GAP!

An automotive OEM is upscaling its efforts to make ITI students industry ready.



"With the ever-evolving customer needs, dynamic regulatory environment, emerging technology trends like electrified, automated, connected, shared technology, these cusps of changes demand for advanced skill levels."

Nikunj Sanghi, Chairman, Automotive Skill Development Council

In line with its consistent efforts to contribute to the skill development mission of India, Toyota Kirloskar Motor Pvt Ltd has announced its partnership with Automotive Skill Development Council (ASDC). This partnership is a part of Toyota's mission to upscale quality technical training in the Indian Auto Industry. This initiative is focused at bridging the skill gap between ITI and industry need.

This initiative is targeted towards ITI and Diploma students with an objective of creating qualified manpower that will result in enhancement of service levels at dealerships. In the first phase, TKM will extend this ASDC association with already associated 49 ITI/Diploma TTEP Institutes. This is in-tune with Toyota's concept of enhancing skill-levels of students and encouraging future entrepreneurs with a goal to provide well-trained, competent work force for the automotive industry. T-TEP will curate a cutting-edge training module, educate and mentor the aspirants on various facets of the automotive system and give them on-job training at their dealership. Based on the training garnered during the course, ASDC will certify the students enhancing their employability quotient.

In phase two, the Dealership Centralized Training Centres (DCTC) across Toyota dealerships in major


metros in the country will offer a month-long crash course. Local students can get a first-hand experience and in-depth knowledge of Toyota standards, tools, engine composition etc. at a ground level. The objective of establishing such centres at various dealerships is to demonstrate high quality skill standards and make aspirants future-ready by providing expert training, facilities, advanced curriculum and equipment. At the end of crash course, get opportunity to work for dealerships

Nikunj Sanghi, Chairman, Automotive Skill Development Council said, "With the ever-evolving customer needs, dynamic regulatory environment, emerging technology trends like electrified, automated, connected, shared technology, these cusps of changes demand for advanced skill levels. It is important that we provide such avenues for providing specialized trainings, apprenticeship opportunities and quality facilities to make the workforce industry ready. We hope all industry stakeholders come forward to work in an integrated manner."

N Raja, Deputy MD, Toyota Kirloskar Motor Pvt Ltd said, "As reports suggest, the auto sector may face the shortage of skilled manpower and only 45.6 per-

"We are constantly working towards enhancing our skill development initiatives keeping pace with the rapidly changing technology trends and emerging industry needs."

N Raja, Deputy Managing Director, Toyota Kirloskar Motor Pvt Ltd

cent of youths are employable as per the skill needed by 2022. The Automotive Mission Plan (AMP) 2016-26 aims to make the sector a significant contributor to the Skill India Program and one of the largest job-creating engines in the Indian economy. We are constantly working towards enhancing our skill development initiatives keeping pace with the rapidly changing technology trends and emerging industry needs. ASDC assessment and certification will help in boosting the competency and competitiveness of the ITI students. Good cars, quality cars are a result of good people, quality people who think in a sustainable manner." 

Source: TKM

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By Debi Prasad Dash

ENERGY STORAGE AND SECURITY

Whether the energy production is from a thermal power plant or wind power from a field of turbines, energy storage technologies can capture the energy and make it available when it is needed most.



Ever since the existence of an electrical grid, grid operators have been looking for ways to safely and efficiently store energy so that it can be supplied and consumed on demand. Over 170 grid scale energy storage technologies (excluding PHES) are either commercially available and / or are under development across different regions worldwide. The energy storage technologies landscape is distributed across a variety of systems to ensure we meet our everyday energy needs. This includes mechanical storage like pumped hydro storage, flywheels, compressed air and electrochemical storage such as lead acid, advanced lead acid, lithium ion chemistries, sodium-based batteries, nickel-based batteries and flow batteries. Advancements in fuel cells and traditional thermal storage are also relevant to various emerging applications. It is also worth noting that energy storage is resource neutral i.e. it allows us to use electricity more efficiently, regardless of the power source. Whether the energy production is from a thermal power plant or wind power from a field of turbines, energy storage technologies can capture the energy and make it available when it is needed most. It also provides quality and reliable power to the

end consumers.

The answer to our energy woes the traditional applications for energy storage are manifold. Energy storage is often used to improve power access and intermittent power. Energy storage can be used to help the grid return to its normal operation after a disturbance. In addition to stabilizing the grid after disturbances, energy storage can also be used to support normal operations of the grid such as injecting and absorbing power to maintain grid frequency in the face of fluctuations. At the transmission level, storage assets can provide power for up to two hours in response to a sudden loss of generation or an outage. Load shifting is achieved by storing energy during periods of low demand and releasing the stored energy during periods of high demand. There is a sizable potential

for advanced storage technologies in new applications apart from the opportunity for existing technologies to improve upon their performance for traditional applications. Emerging Energy Storage systems may provide several technical benefits. Advanced energy storage technologies have been making their entry into the market with Li-ion being widely implemented in telecom towers and portable electronics. Flow batteries are being favoured for diesel replacement; microgrid and solar integration while nickel-based batteries are gaining momentum in applications like standby support for Commercial and Industrial applications.

INDIA'S 175 GW OF RE BY 2022 AND THE ROLE OF ENERGY STORAGE

The Government of India has come up with an ambitious target of installing 175 GW of renewable by 2022 and 24x7 power for all by creating an efficient, resilient and financially sustainable power sector. Likewise, in COP 21, India has committed to generate 40 percent power from clean energy sources by 2032. This objective, along with clean energy access, has become the center of all plans around economic development and

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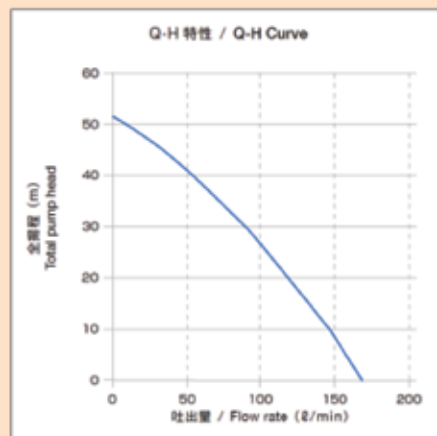


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"The current size of the energy storage segment in India is estimated at over 15 GWh which is expected to grow by 12 percent to 15 percent year on year."

environment. A major application of energy storage lies in the integration of intermittent renewable energy sources for applications including wind power and solar energy. In grids with a significant share of wind generation, irregularity and variability in generation output due to unpredictable changes in wind patterns can lead to imbalances between generation and load that in turn result in irregularities in grid frequency. Energy storage can provide a quick response to such imbalances and irregularities without the harmful emissions and negative environmental effects of most conventional solutions. Also, since wind power systems are often located in remote areas that are poorly connected by transmission and distribution systems, sometimes operators may be asked to curtail production, resulting in loss of energy production opportunity.

Alternatively, system operators may be required to invest in expanding the transmission and distribution infrastructure. An energy storage system located in proximity to wind generation can allow excess energy to be stored and delivered timely upon ease of transmission. It can also be used to store the energy generated during periods of low demand (and favorable wind conditions) and deliver it during periods of high demand. Battery-based energy storage provides the flexibility and agility to better integrate intermittent solar and wind energy resources into India's electric grid and ensure high-quality power for consumers.

INDIA'S ENERGY STORAGE MARKET

India's energy storage market is in a growing phase. According to the IESA estimates, India has the potential to integrate over 300 GWh of energy storage during 2018-25. This includes existing applications such as backup power but also newer applications like wind and solar integration, frequency regulation, peak management, transmission and distribution deferral, diesel replacement and electric vehicles. The current size of the energy storage segment in India is estimated at over 15 GWh which is expected to grow by 12 percent to 15 percent year on year. In recent months various tenders by SECI, BESCOM, NTPC, NLC, CEL, GEDA and others were floated in states like Andhra Pradesh, Himachal Pradesh, Gujarat, West Bengal and Andaman & Nicobar Islands.

The Indian energy storage market is currently flooded with multiple energy storage projects in the first quarter of 2019. Presently, India already installed 14 MWh of large scale storage for grid & renewable integration though pilot & demonstration projects at different locations. Apart from these commissioned projects, ~50 MWh of energy storage projects in India are on the verge of tender allocation or at the construction stage. Islands like Andaman & Nicobar and Lakshadweep are seeing a large number of the tender announcement on energy storage by difference agencies like SECI, REIL, NTPC, NLC and others. CEA and CERC have already recommended the inclusion of energy storage with solar and wind hybrids, so we also anticipate that in addition to the 3.6 GWh storage project, other hybrid tenders will also have an opportunity for storage technologies to be included.

India is expected to attract investment in three to five Giga factories for advanced Li-ion batteries, attracting over \$3 billion investments in the next three years. Already, over 1 GWh of annual assembling capacity is being set up for converting imported Li-ion cells into battery modules by various Indian and global companies in India. In this regard, many Indian companies are eyeing to enter India's storage market while a few Indian companies are also diversifying their existing business into energy storage space. Looking at potential India has to create a 10-15 GWh capacity by 2022. And as this happens, ancillary development including module development, containers, transformers, inverters could need an equal amount of investment, taking the total potential to \$6 billion.

India is also focusing on domestic manufacturing for all types of energy storage technologies including advanced lead acid, thermal storage and ultra-capacitors apart from Li-ion batteries. Ministry of Science and Technology is also keen to accelerate domestic R&D capabilities to support this growing industry through Mission Innovation. States such as Telangana, Andhra Pradesh, Tamil Nadu, Maharashtra and Gujarat are showing interest in attracting investments from companies to set up units in this space. In March 2019, GoI approved setting up of National Mission on Transformative Mobility and Battery Storage to drive clean, connected, shared and sustainable mobility initiatives in the country creation of the Phased Manufacturing Programme (PMP) valid for five years till 2024 to support setting up of a few large scale, export competitive integrated batteries and cell manufacturing Giga plants in India. This aims to provide a push to the entire e-mobility ecosystem that includes electric vehicle



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India is also focusing on domestic manufacturing for all types of energy storage technologies including advanced lead acid, thermal storage and ultra-capacitors apart from Li-ion batteries.

manufacturers, charging infrastructure development companies, fleet operators, service providers, etc. NITI Aayog is also working on PMP to catalyze cell manufacturing and EV component in India. Recently, India and Bolivia signed a Memorandum of Understanding (MoU) for the development and industrial use of lithium for the production of lithium-ion batteries. Bureau of Indian Standards efforts on generating energy storage standards will create the benchmark for quality and will boost the Indian energy storage and electric vehicle market.

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India is expected to attract investment in three to five Giga factories for advanced Li-ion batteries, attracting over \$3 billion investments in the next three years.

Currently, India has 1 GWh of Li-ion assembling facility and 4-5 institutions are in discussion to put up cell manufacturing facilities in the next 2-3 years. The current cost of the Li-ion battery pack is at 250-350\$ per KWh as compared to 1000\$ per kWh in 2011. Li-ion battery accounts for 40 percent- 50 percent of the overall cost of the EV and is the most expensive component of EV. Indigenous manufacturing will bring down the cost of Li-ion batteries and to further bring down the cost of EV's. All the foremost OEMs are currently importing batteries from China, Taiwan and Korea. Various Indian companies have already entered into the cell to pack assembling. But there is a huge opportunity in India for Li-ion cell manufacturing India.

Tata Power, The AES Corporation and Mitsubishi Corporation also inaugurated India's first grid-scale

battery-based energy storage system in February 2019 in Rohini, Delhi. The 10 MW grid-connected system, owned by AES and Mitsubishi Corporation will pave the path for wider adoption of grid-scale energy storage technology across India. Fluence, a market-leader supplier of energy storage technology jointly owned by Siemens and AES, supplied its state of the art Advancon Technology for the project. The 10 MW energy storage system at Tata Power Delhi Distribution's Rohini substation to provide better peak load management, system flexibility and reliability to more than 2 million consumers. Battery-based energy storage enables electricity to be stored and then delivered within milliseconds, reducing instability of the electric grid and enabling more energy to be captured and delivered on demand. Other utilities like BSES Rajdhani - Yamuna, Adani electricity, CESC-Kolkata are also planning to install energy storage systems at substation and distribution level in the electricity grid in India.

Indian companies have successfully built electric cars in the recent past and are lining up electric buses to be provided to state transportation. Batteries are a critical component for EVs and there is a big gap as currently there is no Li-ion cell manufacturing taking place in India. To encourage the adoption of eco-friendly mobility solutions, the GST council in July slashed the GST rate on EVs from 12 percent to 5 percent, whereas for EV chargers, it was reduced from 18 percent to 5 percent. The Council also exempted the hiring of electric buses by local authorities from the GST.

NITI Aayog has already recommended certain fiscal incentives to EV manufacturers; however, the major challenge lies in creating a robust infrastructure for charging facilities along with reducing the cost to make the solutions economically viable for the end users. With EVs gaining momentum in the last few years, both Indian as well as international investors, have shown interest in capacity building for the segment thus presenting an opportunity for Indian manufacturers to enter the segment and undertake research & development in the category.


Global companies are entering in the Indian market and Indian conglomerates are diversifying in the EV space. KIA Motors invested \$2bn in Anantapur, Andhra Pradesh spread across >500 acres. Mahindra, Tata motors already launched their 4 Wheeler EVs in India and others are in the race. TECO Electric will be investing \$50 million (approximately Rs 356 crore) in Devanahalli, Karnataka for the first phase of a project to develop engines for EVs and the second phase

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Advanced energy storage technologies have been making their entry into the market with Li-ion being widely implemented in telecom towers and portable electronics. Flow batteries are being favoured for diesel replacement; microgrid and solar integration while nickel-based batteries are gaining momentum in applications like standby support for Commercial and Industrial applications.

will have another \$50 million within two years. State-owned Indian Oil Corp (IOC) is looking to build-up India's capacity for developing indigenous batteries powered with new metals for EVs.

CONCLUSION

The falling costs and rising efficiencies of the supporting technologies, such as energy storage, are already making the generation of renewable power compete with conventional thermal power. Such technological advancement and cost reduction in both renewable energy and energy storage options will facilitate the exploitation of abundant renewable resources. Advanced energy storage technologies can play an important role in renewable integration, energy access, electric mobility and the smart cities initiatives of the Indian government. We are at a critical stage for building a manufacturing ecosystem for advanced energy storage technologies in India. Around the globe, over 200 GWh of advanced energy storage manufacturing capacity is already built and another 200 GWh of new capacity will be built within the next three to five years. IESA is very closely working with both state and central government bodies like NITI Aayog, MNRE, MoP, DST, MEITY, DIPP, DHI and other intergovernmental departments. With appropriate government support, industry participation, India will be one of the top markets for energy storage adoption and manufacturing. 

The author is Executive Director, India Energy Storage Alliance (IESA)

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By Niranjana Mudholkar

FORMIDABLE GROWTH PROSPECTS!

The Halma India hub has the capabilities to incubate, accelerate growth and scale and be a catalyst for Revenue Growth / Engineering Value Addition for its Operating companies, says **Inken Braunschmidt** Chief Innovation and Digital Officer, Halma Plc



Halma has been operational in India since 2008 with more than 25 companies operating under it. How would you describe the growth of the Group in this market considering that it is undergoing such huge changes for the last couple of decades?

I agree with you; the Indian economy has seen enormous change in the past two decades. But change can also signify huge opportunity and Halma, as a global group of life-saving technology companies, sees formidable growth prospects for some of our companies in the areas of infrastructure, safety, healthcare and the environment in India. Halma companies primarily focus on niche technologies within these highly regulated sectors.

Given the group's presence in diverse sectors with one vision, how do you see the role of the Halma India hub evolving?

We see the India hub as a strategic enabler for our companies who have invested sales and engineering resources in India or who are planning to invest in India. The hub has the capabilities to incubate, accelerate growth and scale and be a catalyst for Revenue Growth / Engineering Value Addition for Halma's Operating companies.

Disruption has become the new normal today. And while technology obviously has a role to play in it, it still remains just the tool (albeit a very powerful one). But would you agree that disruptions and digital transformations are more about mindsets first and then about their physical manifestations?

I would say mindset is perhaps even more important, without the mindset to want to embrace change, question the status quo and seek out new ways of doing things, there is no new technology.

Technologies are developing at an incredible pace and companies need to keep themselves at the forefront of these developments if they wish to remain relevant and ensure sustainable growth. For example, devices like Fitbits and other wearable tech that provide personal health data makes us more aware of our health and wellbeing, which can only be a good thing for the wider healthcare sector. The data might not be as good



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as data from clinical grade instruments but based on the higher amount of data and intelligent algorithms this might be neglectable in future. This technology is shaping mindsets and influencing human habits. And therefore, mindset of companies. Our own ophthalmic cameras from Halma company Volk Optical are connected tech, monitoring and screening for preventable and curable blindness in hard to reach rural communities from Ghana to Bolivia. Businesses should transition from hardware centric business model and adopt more data driven or insights-based business models or services.

Hardware may be commoditised, but the integration of digital technology including AI and predictive technology models is fast becoming the norm.

//

"Businesses should transition from hardware centric business model and adopt more data driven or insights-based business models or services."

The B2B space has been relatively slow and late in the adoption of digitization. However, that's where it is likely to be more impactful. Would you agree?

The B2B space is a vast category and includes an array of industries, which I don't think you can rule out just yet. Every industry these days is waking up to the significance of innovation and digitisation, and I strongly believe the concept is being well accepted in the B2B space. For example, we are seeing traditional sectors moving into more data driven service-based business models. Halma company HWM, a leading manufacturer of water and energy management technologies, works with their customers to scan water networks for leakages, with data loggers on every device. This is helping water companies predict and prevent water leakages and manage their business in a more efficient way. They are also helping to tackle the global challenge of water scarcity.


Halma's stated philosophy has been about working towards a safer, cleaner & healthier future for everyone. What role is digital innovation playing in this journey? Can you share a brief example?

The world population is 7.7 billion and growing, and Halma's core philosophy is to grow a safer, cleaner and healthier future for everyone, every day. To ensure that we achieve such ambitious targets, Halma and our companies are focused on providing customers globally with solutions that are data and insight driven in order to scale up and multiply our impact. One example that comes to my mind immediately Volk Optical's iNview camera. Volk is a Halma company and iNview is an innovative new ophthalmic camera device able to capture wide-angle digital colour images of the fundus using an Apple iPhone or iPod Touch. This will democratise access to sight-saving technology.

You have been recognized as one of the Top 100 most influential women in Engineering. How do you look at it?

It is such an honour to be recognised in this prestigious list with two of my fellow Executives Jennifer Ward and Danielle Barone Soares. I have many female colleagues across Halma, talented, entrepreneurial visionaries who will help us to grow a safer, cleaner, healthier future for everyone. They really do this every day – and I am proud to be one of them. I would like to see myself as a representative for women in STEM (Science, Technology, Engineering & Mathematics), both among my esteemed colleagues in Halma and in general.

Do you think women are more suited to take up engineering in today's world since it requires a blend of creativity, agility and multi-tasking?

I believe the emphasis should be on talent and on being inclusive to a versatile range of expertise that can contribute to higher team performance. At Halma, we encourage inclusivity and diversity across the board and across all functions. 

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GKN Powder Metallurgy acquires Forecast 3D

GKN Powder Metallurgy, the world's largest producer of metal powder and parts, has acquired Forecast 3D, a leading US specialist in plastic additive manufacturing offering a full range of services from concept to series production. The acquisition furthers GKN Powder Metallurgy's ambition to achieve global market leadership in industrializing additive manufacturing. The combination creates a geographic and market expansion for GKN Powder Metallurgy's conventional and additive manufacturing customers.

Forecast 3D, headquartered in Carlsbad, California and founded in 1994, serves a diversified target audience in the North American west coast. Prior to the acquisition, GKN Powder Metallurgy's primary market focus was in North America's midwestern region, as well as Europe and China. By combining both businesses, GKN Powder Metallurgy now serves all markets with a full range of 3D printing production technology and an expanded global footprint.

The US-based plastic parts provider adds 25 years of experience in polymers to GKN's advanced additive manufacturing production capabilities and market leadership in this high growth market.



"Forecast 3D is a perfect fit," said Peter Oberparleiter, CEO, GKN Powder Metallurgy. "They are everywhere we aren't – geographies, markets, technologies and base materials. Combining our individual capabilities will present unparalleled advantages to our customer bases and enable us to cross-promote additive manufacturing in metal and plastic over more diversified markets. It is an important step on our journey to become No. 1 in this high growth market."

Optimising engine design with metal additive manufacturing

Renishaw worked with engine manufacturing company Cobra Aero, based in Michigan, USA, to optimise its design processes for aircraft and motorcycle engines. After working with Renishaw to develop new manufacturing processes, Cobra Aero invested in the AM 400 system to increase its additive manufacturing (AM) capabilities.

To optimise the design of its engine cylinders, Cobra Aero worked with Renishaw to gain expertise in AM. The company visited a Renishaw Additive Manufacturing Solutions Centre, USA, and collaborated with Renishaw engineers to use AM to improve the design of a cylinder for an unmanned aerial vehicle (UAV).

Using AM technology allowed Cobra Aero to design a lattice structure to increase air flow, it also allowed them to produce one



solid, lightweight part.

"Staying at the cutting edge of manufacturing is important to Cobra Aero," explained Sean Hilbert, President of Cobra Aero. "Investing in AM allows us to develop tools and new products for high value, small volume applications, speed up the manufacturing process and produce designs that would not be possible using conventional subtractive machining."

"We decided to redesign the cylinder because of its importance in an engine," continued Hilbert. "Design changes to this part of the engine must happen rapidly and it is also a high value part, which is why we have chosen to additively manufacture this component. Improving the performance of the cylinder will also improve the overall performance of the engine."

"Investing in AM allows us to develop tools and new products for high value, small volume applications, speed up the manufacturing process and produce designs that would not be possible using conventional subtractive machining."

Sean Hilbert, President of Cobra Aero

"By using metal additive manufacturing, Cobra Aero was able to design a part that was unique to the application," explained Stephen Anderson, AM Business Development Manager at Renishaw Inc. "By using our laser powder bed fusion technology, Cobra Aero was able to produce a single part with complex lattice structures that performs better than conventional component manufacturing techniques."



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By Niranjan Mudholkar

POWER PLAY

Technology hitch hiking on the back of renewable energy is disrupting power sector,
Maxson Lewis, Managing Director - Magenta Power



Tell us briefly about Magenta's journey so far.

With a combined experience of more than 60 years in Power and Auto sector, the co-founders of Magenta Power started the company with a vision of providing clean energy solutions – generation, adoption and utilisation. This motto is evident in our business arms of rooftop power solutions, Power storage, EV charging and Battery swapping and Energy Infomatics.

We started in 2017 from a terrace outhouse and within a short span have been able to do some pioneering work in this space

What are some of the key challenges faced by the energy sector in India?

The Indian energy sector is beset with a couple of challenges. The sector by itself is asset heavy and requires extensive investment and regular upgrades especially in the generation capacity and in long distance transmission. While the generation capacity has been increasing on the back of large solar capacities coming online, it is the ageing grid which is the Achilles heel.

On the regulations, we need to move away from thinking of the power sector as a government largesse to be used for political gains. This has and continues to eat away on

the independence and profitability of the energy sector as a whole. Smart metering which was kicked off 10 years ago has still not covered more than 15 percent of the distribution network. Also, the power sector is still highly regulated and requires steady infusion of newer ideas moving towards a de-regulated market.

Are the dynamics of the power industry changing?

Absolutely, what we think of the power sector today will not be the same in five years. Technology hitch hiking on the back of renewable energy is disrupting this domain. Microgrid is already a big concept in many countries. At Magenta Power we call it 'democratisation of the power sector'. Given the ridiculously low level of efficiency, the move towards an open network is a writing on the wall. As the storage technology improves and comes upstream, without doubt, the DisComs of today will find themselves in a different role, more as a market manager rather than a market maker.

What is the scope for blockchain in power sector?

The new era of power management is driven by technology. The democratisation of power systems banks heavily on technology like blockchain. The Distribution companies' role as we see it today is providing power and billing for it. The blockchain allows for multiple entities generating and using power. The singular power producer to consumer approach which we



"As the storage technology improves and comes upstream, without doubt, the DisComs of today will find themselves in a different role, more as a market manager rather than a market maker."

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see today is already getting challenged by microgrids. Block chain allows this entire play to be hosted on a tech platform. Magenta Power has lined up plans to be in this space aggressively.

Tell us about your manufacturing capabilities.

Today, we are focused on EV charging infra for which we have developed our hardware and software. We are soon to launch the energy management console for individual homes and industries. We are setting up a manufacturing unit in Pune soon for these solutions.

Do you see the EV landscape changing?

More than change I call it establishment of the EV landscape. What is happening right now is spurts and sporadic work in this space. But as days pass, the infrastructure is slowly but steadily getting built up. There is a lot of learning happening now and two years from now we be less of learning and more of expansion.

Tell us about Magenta's plans to create the EV Corridor on the Mumbai-Pune Expressway.

We set up the Mumbai-Pune EV corridor in Aug 2018 by identifying and setting up charging points at key locations. This included locations which were most convenient for the EV owners and which allowed them to charge themselves while the vehicle was being charged. While everyone was waiting for the government to set up the charging infra, we decided not to wait. Now we have the support of HPCL and others in this initiative. We setup the charging infra on this highway long before India caught up to the fancy of EV this year.

Hindustan Petroleum Corporation Ltd (HPCL) has made a strategic investment in Magenta. Tell us about this partnership.

HPCL has been a great supporter of our work in this space and has supported us with seed funding and also technically and we take great pride in our partnership with HPCL. We also installed the EV charging facility at HPCL's Chembur colony last year and are working

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The singular power producer to consumer approach which we see today is already getting challenged by microgrids. Block chain allows this entire play to be hosted on a tech platform.

on initiatives together to support the EV ecosystem.

Do you have any technological collaborations?

We have technology collaborations with most of the dominant EV OEMs in India. We also have collaborations with multinational corporates in the core power sector. This is a growing ecosystem and we are aware that we need the support and backing of many entities to make this Drego' ecosystem a reality. Fortunately, we have got immense support of our partners and collaborators to make this happen.

Earlier in April this year (2019), Magenta announced the launch of its training academy called 'MITRA'. Tell us about it.

We launched 'MITRA' to support Individuals and Organizations, in their transition to a sustainable energy future, and also to serve as the principal platform; a centre of excellence, and a repository of technology, resource and knowledge on green energy. MITRA is a great first step for a career-focused individual to understand the world of green energy solutions. The training provides practical tools to accelerate green energy deployment, that shall facilitate knowledge sharing and technology transfer to provide clean, sustainable energy for the world's growing population. Aligned to this, there is a structured model imparting basics of solar power, electric vehicles and Informatics. We believe that the conviction to move to clean solutions comes from education and awareness and that is what MITRA aims to achieve. The academy of MITRA is a manifestation of our zeal that amplifies our belief that green energy is everybody's business

What is your personal vision for Magenta?

Magenta will be leading the vision of green energy, open, democratised and unshackled from the onerous regulations and challenges in the sector today. We are investing ourselves heavily to make it happen. In five years from now, we see Magenta Power as the dominant player in providing "open platform power solutions" in India, South East Asia and Africa. 

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NEW MILESTONE

CHIRON celebrated the official opening of its new Precision Factory on October 24, 2019 with a large number of guests from industry and politics.



The CHIRON Precision Factory: Ideally equipped for production of the new machine series on an area of 14,000 m².

CHIRON celebrated the official opening of its new Precision Factory on October 24, 2019 with a large number of guests from industry and politics. The building was constructed specially for the assembly of new machine series which combine productivity and precision in an unprecedented way. Optimized assembly and logistics processes also ensure shorter delivery times.

With a maximum annual capacity of 400 machines, the CHIRON Precision Factory in Neuhausen ob Eck, Germany, is currently the most modern machine factory in Europe. Costing more than €34.5 million, the new building on the take-off industrial estate is regarded as the biggest individual investment in almost 100 years of CHIRON's corporate history. "I am delighted that one of the most modern machine tool factories in Germany has been built by our company. In times when there is a great deal of talk about the impending economic downturn, this factory is an important signal for our town and the entire region," emphasized Michael Beck, Mayor of Tuttlingen.

CHIRON Precision Factory sets standards for the digital age: "With the opening of the new Precision Factory, CHIRON conclusively proves that it is actively meeting the challenges of the 21st century. That's because this factory combines the very best what our machine tool industry in Baden-Württemberg has to offer: Machines which combine maximum productivity with the highest possible precision and therefore set standards for the digital age," said Dr. Nicole Hoffmeister-Kraut, Member of the Baden-Württemberg State Parliament and Baden-Württemberg Minister for Economic Affairs, Labour and Housing Construction, in her speech during the official opening ceremony. In equipping the new factory, IT experts and production planners pulled out all the stops in regard to digitalization in order to achieve high productivity. Digital assembly folders and contactless


logistics bookings are important milestones on the road to a paperless factory. A pick-by-light system helps the order picker to access stored parts quickly and securely. For quality assurance purposes and as a reference point, the delivery state of the machines is documented by means of a digital fingerprint. Ultimately, the CHIRON Precision Factory also makes an important contribution towards climate protection. The waste heat produced by the machines during test runs is used in an environmentally-friendly way to heat the factory.

New CHIRON campus at the Neuhausen plant: The new building was constructed on a former base of the German Armed Forces in just 15 months. The new central logistics department

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"We built this factory specially for our new machining centers. The 16 and 25 series are already available on the market and others will follow." - Dr. Markus Flik, Chairman of the Board of Management of CHIRON

at the Neuhausen plant combines the CHIRON Precision Factory with the existing assembly halls to form a CHIRON campus. A large and future-oriented project was therefore successfully completed in Baden-Württemberg in a very short space of time - without any time delays or budget overruns whatsoever. The specialist for CNC-controlled, vertical milling and turning therefore impressively showed its guests that CHIRON has accepted and also understood the future challenges.

Path to the future: "Here at CHIRON, we are counteracting the currently difficult market environment through state-of-the-art machines and higher productivity," summarized Dr. Markus Flik, Chairman of the Board of Management of CHIRON. "We built the CHIRON Precision Factory specially for our new machining centers. The 16 and 25 series are already available on the market and others will follow." The highly modern factory will satisfy the special requirements relating to precise assembly of these highly accurate machine tools. Using the machining centers in the 16 series, CHIRON's customers produce, for example, battery cases for electric vehicles, aluminum and structural components for the automotive and aerospace industries, and implants for the medical technology industry. The new series are proving popular on the market and represent our path to the future," said Dr. Flik. 

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CONNECT: A GAME CHANGER

The increasing digitalization of the manufacturing sector means the era of the smart factory is now upon us. This digitalization trend is also commonly referred to as Industry 4.0. At Desoutter, we are committed to turning Industry 4.0 into products and services that deliver maximum benefit to our customers and partners.

The CONNECT, an Industrial Smart Hub from Desoutter is conceived and designed to strongly support and accelerate the transformation towards an industry 4.0 factory. This platform enables multi-asset management with more connectivity and flexibility than anything; and with less hardware required on the production line, installation is simplified, and cost of ownership is reduced.

Essentially, CONNECT offers a single point of connection for communications between the factory network and up to 20 cordless tools. It takes just ten seconds to pair a tool to CONNECT using RFID technology, which makes line rebalancing incredibly easy.

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ABHISHEK PADMAWAR, PRODUCT MARKETING MANAGER, DESOUTTER INDUSTRIAL TOOLS INDIA.

that figures strongly, offering a scalable and flexible solution which allows customers to add new features whenever the requirements on their production lines change.

“Choosing the CONNECT on your production line guarantees to Boost your

Flexibility, Boost your Uptime, and Boost your Productivity,” says Abhishek Padmawar, Product Marketing Manager, Desoutter Industrial Tools India. Supporting numerous applications from a single point, CONNECT will revolutionize ways of working.

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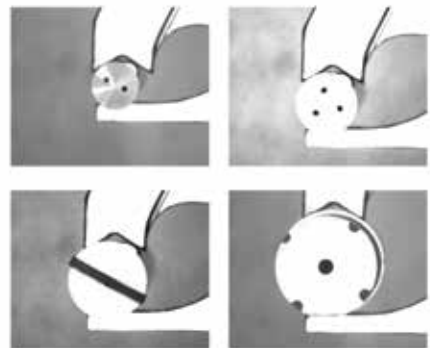
Automatic detection and alignment of tools and blanks with the Tool Vision System from Walter

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The Tool Vision System is permanently installed in the robot cell and available with two lenses. The one lens for tool diameter from 1.7 mm to 12 mm, the other



Tool Vision System from Walter



Blanks viewed from the camera perspective

lens for tool diameter from 6 mm to 32 mm.

For info, visit:
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QUICK UPDATE

The Defence Research & Development Organisation (DRDO) recently inaugurated its Igniter Complex at the High Energy Materials Research Laboratory (HEMRL) in Pune. HEMRL is a premier laboratory of DRDO and primarily engages in developing Rocket and Gun Propellants, Pyrotechnic Devices, High Explosive Systems and synthesis of high energy molecules. HEMRL has created a state of the art facility for design, processing and evaluation of ignition systems. The facility

consists of process, assembly & storage buildings and a design centre. Remotely controlled sophisticated equipments such as Sieve Shaker, Planetary Mixer, Granulating Machine, Pelleting Machine etc are installed in the process buildings. Design, modelling and simulation laboratory; assembly and testing centre are also part of Igniter Complex. The noteworthy developments of the group in recent past are development of cap based ignition system and multipoint simultaneous ignition system

DORMER PRAMET UPDATES TOOLING DATA CLASSIFICATIONS

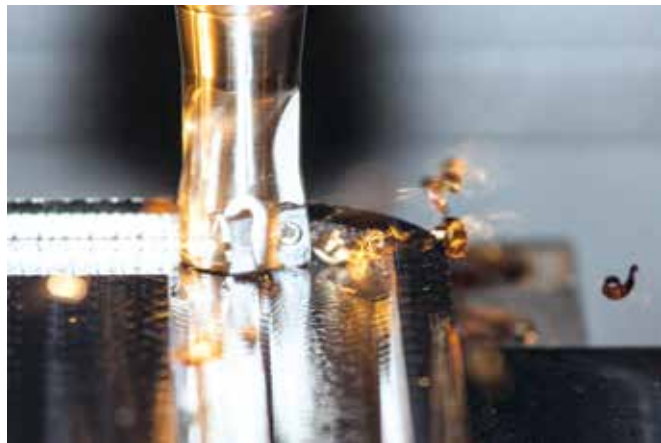
Dormer Pramet has upgraded the way it presents product data descriptions and Workpiece Material Groups (WMG) across all its assortment of cutting tools.

The global manufacturer is introducing standard tooling data, such as diameters and lengths, according to ISO 13399, allowing for easier and faster exchange of information between computer systems and software.

The ISO standard features a total of 133 parameters, covering a wide range of cutting tools, helping to support manufacturing planning, machining operations and product supply.

By supporting a common language in its descriptions, Dormer Pramet will save customers and partners a significant amount of time, providing an easier gathering of high-quality data across its 40,000 solid and indexable tools.

Meanwhile, the company is providing a greater level of detail than ever before on its Workpiece Material Groups (WMG). Helping customers to find the right tool for the application and supporting the machining process, this change is also based on the commonly used ISO standard. However, it is taken a step further as it includes recommended starting values for speed and feed. For each of its products, Dormer Pramet now provides three levels of data within the new Workpiece Material Group structure. It features the standard ISO



Dormer Pramet has upgraded the way it presents product data descriptions and Workpiece Material Groups (WMG) across all its assortment of cutting tools.

material definitions, based on the six coloured groups, plus additional classifications on material structure, composition, hardness and ultimate tensile strength. The new standard and improved WMG data will be implemented in all of Dormer Pramet's product material from

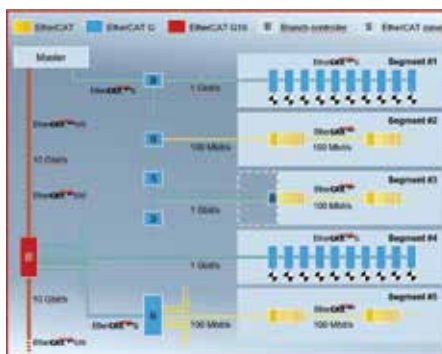
November 2019 onwards. ISO is the International Organization for Standardization and a worldwide federation of national standards bodies.

For more information please contact your local sales office or visit www.dormerpramet.com.

ETHERCAT TECHNOLOGY GROUP OFFICIALLY SUPPORTS ETHERCAT G

The Technical Committee of the EtherCAT Technology Group (ETG) has accepted EtherCAT G as an addition to the EtherCAT standard. Moving forward, EtherCAT G, which extends EtherCAT technology to 1 and 10 Gb/s, respectively, will be supported and promoted by the ETG. EtherCAT G was introduced by Beckhoff Automation

in 2018 as an extension of the EtherCAT standard. Beckhoff recently presented the gigabit technology addition to the ETG, and after thorough review, the organization's Technical Committee accepted it. Right now, the ETG is working to add EtherCAT G to the corresponding technology specifications. Dr. Guido Beckmann, Chairman of the ETG Technical Committee, explains why ETG welcomes the active integration of EtherCAT G into ETG: "EtherCAT is



already the fastest industrial Ethernet fieldbus, and will remain so due to its special functional principle. With EtherCAT G, particularly data-hungry applications, such as machine vision and high-end measurement technology, can now also be integrated. This extends the range of applications for EtherCAT technology and makes it even more viable for the future."

The well-known 100 Mb/s EtherCAT technology remains the proven solution for the majority of applications. However, EtherCAT G offers additional user advantages, especially in applications where particularly large amounts of process data must be transported per device. This can include, for example machine vision, high-end measurement technology or complex motion applications that go beyond the scope of classic drive control.

DMG MORI STARTS LOCAL PRODUCTION OF CMX 600 VI IN INDIA

The production has been outsourced to Lakshmi Machine Works of India, which makes possible a shorter lead time until delivery than domestic production in Japan.

DMG MORI CO., LTD. (hereinafter called DMG MORI) held a production launch ceremony for the CMX 600 Vi on October 29, 2019 at Lakshmi Machine Works Limited (hereinafter called LMW) in Coimbatore, India. At the ceremony, Masahiko Mori, President of DMG MORI, and Sanjay Jayavarthanavelu, Chairman and Managing Director of LMW, extended greetings and cut the ribbon with guests. The production has been outsourced to Lakshmi Machine Works of India, which makes possible a shorter lead time until delivery than domestic production in Japan. The highly-reliable machine contributes to boosting productivity of customers in the remarkably growing Indian market.

The Machine

Type	Vertical Machining Center
Model Name	CMX 600 Vi
Market	Automotive, aircraft, die & mold, industrial machinery, electric, medical, communication equipment
Monthly Production	10 units/month (Lakshmi Machine Works of India)

The CMX 600 Vi features are described below: 1. Wide Work Envelope; 2. High Rigidity; 3. High-Performance Spindle; and 4. Workability, Maintainability and Reliability.

Wide Work Envelope: The CMX 600 Vi ensures a wide work envelope despite a space-saving design. With the largest Y-axis in its class of 560 mm, it is capable of handling round-shaped large workpieces such as gear box housings which are difficult to cut on the machines in the same class. Because of its wide work envelope, interference can be reduced even when workpieces are rotated on the rotary table during machining.

High Rigidity: FEM analysis was used from the basic designing phase, and simulations of varieties of operational conditions and environmental changes were made to optimize the bed thickness, lib form and unit arrangement. The fundamental rigidity supports stable cutting performance to do heavy-duty cutting.

High-performance Spindle: The model is equipped with a high-reliability spindle with a max. speed of 12,000 min-1 to handle a wide range of machining. For machining that uses high-pressure coolant frequently, the labyrinth structure of the spindle was strengthened to prevent coolant from entering inside and increase spindle rigidity. As spindles are components that especially require a high level of accuracy and rigidity,



the model employs the spindles manufactured in-house. Every process from production and assembly of spindle parts to the final inspection is done in the Spindle Plant at the Iga Campus.

Workability, Maintainability, Reliability: The CMX 600 Vi was meticulously designed to details with a thorough focus on workability from perspective

on the front door to drastically improve visibility, which makes it easy for operators to check machining status. Furthermore, the model comes standard with the magazine door to facilitate daily maintenance such as replacement of tools inside the magazine. The CMX 600 Vi boasts high reliability, taking solid measures against chips which are one of the

Main Specifications

Item		CMX 600 Vi
X-axis travel	(mm)	600
Y-axis travel	(mm)	560
Z-axis travel	(mm)	510
Table size	(mm)	900 × 560
Table loading capacity	(kg)	600
Max. spindle speed	(min-1)	12,000
Rapid traverse rate	(m/min)	X:36 Y:36 Z:30
Tool storage capacity	(tool)	30
Spindle drive motor	(kW)	15 / 11
Footprint (width × depth)	(mm)	2,952 × 2,752

of operators who actually run the machine. Thanks to good access to the spindle and table, operators can smoothly do setup work such as attachment of tools and workpieces. A shallow dent in the front cover also allows them to move one step closer to the table. A big window is used

major reasons for machine stop and machining failure. The in-machine cover is tilted at an angle of 30 degrees to prevent chips from accumulating during machining. The ATC shutter also comes as standard to prevent chips from entering the magazine.

IMPROVING EFFICIENCY OF EDM APPLICATIONS

With industry 4.0 becoming a new norm along with scaled up manufacturing, the success of processes such as EDM relies to a great extent on the quality performance of the pumps. Hence, it is critical that efficient pumps coupled with the right digital solutions are to take it a step further.



Machine tool pumps play an important role in manufacturing processes today. Their primary purposes are to either cool the process, to lubricate the tools or bring the liquid to the filter and back. With the advancements in machining and greater focus on manufacturing, Electro Thermal Manufacturing (also known as Electrical Discharge Machining) has become a powerful and new-age manufacturing technique. EDM's relevance grew in areas where traditional methods of machining hard metals have not been successful, say the complex machining of materials such as titanium, Inconel, Ceramics, Hastelloy, and magnesium.

Application of pumps in EDM technique

EDM creates a shape by applying a large pulse of electrical potential difference between the work piece and an electrode, a spark flash will be created and remove material. During operation, the work piece is submersed in a bath of dielectric fluid, such as petroleum or demineralized water. This high-pressure liquid conducts

electricity and flushes particles, thus, the precision of flow rate becomes significant which is typically in the range of 10-200 l/m with pressure ranging from 5-25 bar. This process helps to maintain quick production and prolongs the tool life.

Pumps are typically involved in EDM to flush away the particles from the material and act as a coolant in these heat intensive processes. In the dielectric EDM process, they are used to prime the dielectric bath with liquid such as petroleum or demineralized water before the material is placed inside. They also help circulate the water through a filter to keep the medium clean and improve its reusability.

Thus, the choice of machine tool pumps plays a critical role in creating the best high-pressured pump systems.

Role of iSOLUTIONS in EDM

The pumps that are used for the cooling and lubricating purposes of EDM need to be able to discharge lubricant precisely and

react to real time changes. This will help the tool operate for a long period of time at optimum efficiency with minimal downtime.

Grundfos' iSOLUTIONS provide this critical advantage by creating intelligent, digitally strengthened pumps. iSOLUTIONS makes a pump dynamic and with the help of our MGE motor having integrated frequency converter meeting IE5 efficiency norms, the speed, flow rate and pressure of the water pump can be moderated on the basis of the machining requirement. With the right flow and pressure used on the tool, it exponentially increases the chances of an increased life expectancy. Speed control also helps reduce wastage and improve overall energy efficiency while reducing overall cost.

Meeting dynamic flow and pressure requirements

A digitized pump Grundfos MTRE is particularly useful in cooling, and in a dielectric liquid as it requires water to be pumped at various flow and pressure rates. Grundfos' pumps are equipped with an integrated Variable Frequency Drive (VFD) meeting IE5 efficiency norms that can manage the flow and pressure based on the different requirements.

Priming the bath through diffusers: Low flow is required in the beginning of this scenario to avoid splashing of the dielectric liquid and the flow rate is to be increased as the bath fills up. Grundfos VFD have a flow limit control function that in combination with setpoint

“WITH THE ADVANCEMENTS IN MACHINING AND GREATER FOCUS ON MANUFACTURING, ELECTRO THERMAL MANUFACTURING (ALSO KNOWN AS ELECTRICAL DISCHARGE MACHINING) HAS BECOME A POWERFUL AND NEW-AGE MANUFACTURING TECHNIQUE.”



“PUMPS ARE TYPICALLY INVOLVED IN EDM TO FLUSH AWAY THE PARTICLES FROM THE MATERIAL AND ACT AS A COOLANT IN THESE HEAT INTENSIVE PROCESSES. IN THE DIELECTRIC EDM PROCESS, THEY ARE USED TO PRIME THE DIELECTRIC BATH WITH LIQUID SUCH AS PETROLEUM OR DEMINERALIZED WATER BEFORE THE MATERIAL IS PLACED INSIDE.”

influence can handle this.

Flushing particles during operation: Flushing during operation typically require medium flow and pressure. This can be handled by giving it a fixed speed signal that gives you the duty point you require. If needed you can program up to 7 different duty points.

Water filtration: Filters are used to clean the discharged water and it is important to maintain the right flow and not damage the filters by assigning a

flow limit

Wire threading in EDM: This process requires water at high pressure to effectively machine the material.

In current scenario, that is usually done by several fixed speed pumps, adjusted to the required operating points by valves. By using a Grundfos VFD controlled pump, this can be reduced to less pumps, better control and no use of trimming valves.

Compact pumps

Compact physical size is needed for high performance pumps mounted in machine centres and cabinets. By operating the pumps at speeds up to 5900rpm the physical height of the pump can in some applications be reduced to 1/3 of a standard fix speed pump, without any reduction in performance, efficiency and lifetime.

Our special function, “Run at Power Limit” supports the compact design by making it possible to reach the wanted operating points with a reduced pump size.

Some of features of Run at Power Limit include:

- A specific pump can reach much higher pressure in the low flow range
- A specific pump can be equipped with a reduced size motor if it does not operate at high flow and high pressure at the same time.
- It is not possible to overload the motor in any operating point

With industry 4.0 becoming a new norm along with scaled up manufacturing, the success of processes such as EDM relies to a great extent on the quality performance of the pumps. Hence, it is critical that efficient pumps coupled with the right digital solutions are to take it a step further.

INDIA EXPLORING TRADE AGREEMENTS WITH US & EU

Union Minister of Commerce and Industry & Railways Piyush Goyal assured that India will never finalize any trade agreement in a hurry. During trade negotiations the focus will be on India first said the Minister while addressing a press conference, on the decision taken by India on the Regional Comprehensive Economic Partnership (RCEP), in New Delhi. He said that India's economic interests and national priorities come first and the concerns of the farmers, dairy sector, MSMEs and domestic manufacturing will be addressed and these sectors

will be protected. Commerce and Industry Minister informed that throughout the seven year long negotiations in RCEP India has consistently stood its ground to uphold its demands particularly over controlling trade deficit, stronger protection against unfair imports and better market opportunities for Indian goods and services. The opening up of the Indian market must be matched by openings in areas where our businesses can benefit and India will not allow its market to become a dumping ground for goods from other countries said the Minister.

HIGH IQ TOOLS OPTIMIZE METALWORKING IN A DIGITAL WORLD

New demands have affected and influenced almost every element of a technology process: from planning and communication (networks) to machinery and even cutting tools, which are arguably the most conservative element in a manufacturing system.

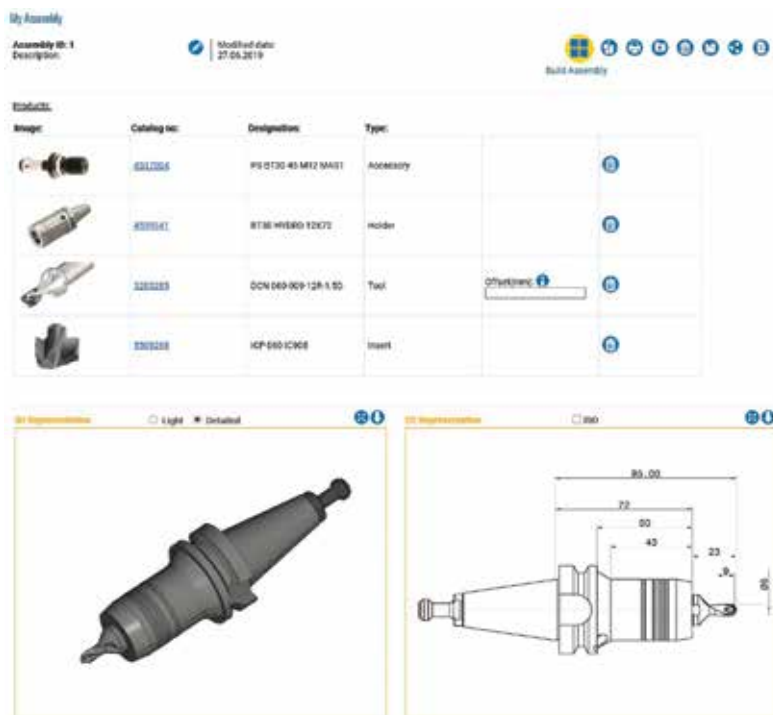


Fig 1 Tool assembly in ECAT

The digitization of manufacturing – a key element of Industry 4.0 – is redefining production methods and the metalworking industry is taking note, despite its characteristic traditionalism. Metalworkers have started to adapt to this new environment by building or overhauling systems to facilitate more efficient processes.

New demands have affected and influenced almost every element of a technology process: from planning and communication (networks) to machinery and even cutting tools, which are arguably the most conservative

“CUTTING TOOL MANUFACTURERS WILL NOT ONLY IMPROVE THEIR OWN PRODUCTION BY IMPLEMENTING ADVANCED TECHNOLOGIES BUT WILL REPRESENT AN ESSENTIAL LINK IN AN INDUSTRIAL INFORMATION CHAIN PROVIDING DATA FOR SMART FACTORIES AND ENGINEERING COMPANIES.”

element in a manufacturing system. Cutting tool producers need to react appropriately and provide products according to these new requirements.

Digitization in the cutting tool field has two emerging trends. The first trend is to enable the cutting tool to communicate with advanced machinery and cyber physical production systems in order to advise about tool wear, predictable tool life, total time of the tool involved in cutting etc.

The second trend relates to information about the tool that should be provided by a cutting tool manufacturer. Manufacturers are expected to supply data about their products, and catalogues and guides have long been an

integral part of the product itself. The challenge now is to include digital information as a necessary essential element of a cutting tool, which ensures applying tools in various steps of a production process, starting with virtual manufacturing.

A good illustration is the ISO 13399 standard, which specifies computer representation and data exchange for information about the cutting tools and their holders – a first step for making the tool digital data platform-independent. Only tools digitally specified in accordance to this standard will be utilized by smart factories, making comprehensive digitized data sources an important direction for cutting tool manufacturers; this integration of data will form an inseparable part of a cutting tool.

Cutting tool manufacturers will not only improve their own production by implementing advanced technologies but will represent an essential link in an industrial information chain providing data for smart factories and engineering companies.

ISCAR recognizes the central importance of developing and adopting digitized solutions for metalworking operations. MATRIX, an automated tool dispenser that is an integral shop-floor-level element of a smart factory, tool assembly options in 3D and 2D formats in E-CAT, ISCAR's electronic catalogue – these are a few examples of products intended to unify the material and virtual worlds of smart manufacturing.



Fig 2: ISCAR 4PRO

Virtual assembly

In addition to the existing milling tool assembly option, E-CAT has enriched its instruments for virtual manufacturing by introducing a new assembly option that relates to drills and taps. This new function allows creating the twin representation of a drilling or tapping tool assembly based on the ISO 13399 standard (Fig. 1). The assemblies are accessible in both 3D and 2D files, which can be downloaded from E-CAT on the ISCAR website and incorporated directly to a user's CAM system. As a result, various simulations of cutting operations, collision checking, finding an optimal tool configuration etc. can be performed. The simulations prevent or significantly diminish possible errors on the shop floor and help to save time and cut costs in process planning.

Smart scan

Data on ISCAR's tool dimensions, inserts, appropriate tool holders and recommended cutting data is accessible via the ISCAR 4.0Pro mobile application, developed for maximizing tooling utilization. ISCAR 4.0Pro is a smart 2D Matrix barcode scanner (Fig. 2) that acts as a digital gateway to advanced tooling resources of the company, so that customers can make better decisions regarding tool selection and their realization on the shop floor. The application provides quick access to technical data for each ISCAR product. The information corresponds to the ISO 13399 standard and to the tool assembly, cutting conditions, tool material grades, weight, user manuals, and other items. The data is accessible by scanning the 2D Data Matrix barcode, which appears on

"SMART MANUFACTURING IN THE INDUSTRY 4.0 ERA FEATURES A COMBINATION OF REAL AND VIRTUAL WORLDS, BASED ON NETWORK TECHNOLOGIES, FOR EVERY LINK OF THE MANUFACTURING CHAIN INCLUDING CUTTING TOOLS."

ISCAR tools and product packages.

A world of information

ISCAR recently launched ISCAR WORLD, an expanded application that embraces all ISCAR's online apps, interfaces, and product catalogues in a single space (Fig. 3). The app gives instant access to E-CAT, ISCAR 4.0Pro, E-Commerce (an online tool ordering system), a media channel, ISCAR Tool Advisor – an expert system for tool selecting, technical data, machining calculations, frequently asked questions and more, enabling users to review, compare, check, and select the tooling solutions that are right for their needs. The application constantly updates and expands its store of knowledge by collecting new data, opening a virtual doorway to a whole world of updated information.

Smart manufacturing in the Industry 4.0 era features a combination of real and virtual worlds, based on network technologies, for every link of the manufacturing chain including cutting tools. Advanced manufacturing systems require cutting tools to "possess" a rich world of relevant data – a high IQ – as a necessary condition for incorporating the tool into their intelligent machining processes.



Fig 3: ISCAR WORLD app

A SOLUTION FOR AUTOMATED MASS 3D PRINTING

TRUMPF TruPrint 1000 3D printer automatically changes substrate plates // Machine handles several print jobs overnight, on its own // Solution prevents bottlenecks when job orders spike // Retrofits to earlier models



Equipped with Multiplate, the TruPrint 1000 3D printer's recoater pushes the substrate plate into the overflow container after printing.
(Source: TRUMPF)

T RUMPF is set to present a new solution that automatically changes substrate plates on the TruPrint 1000 3D printer. The high-tech company intends to unveil it at Frankfurt's Formnext, the world's leading trade show for additive manufacturing. A function TRUMPF calls Multiplate prompts the system's recoater to push the substrate plate into the overflow container at the end of the print run. The 3D printer then automatically goes to work on a new substrate plate. The system can immediately start the next print job without an operator having to open it and insert a new plate. This saves time, costs and resources. It also helps manufacturers avoid bottlenecks when job orders peak, because the machine can run overnight. This solution is particularly well-suited for industries where orders tend to fluctuate greatly. One example is the dental sector, where employees often have to restart 3D printers in the middle of the night to meet delivery obligations. Many smaller dental labs lack the capacity for this, and have no choice but to decline orders. The Multiplate function solves that problem, helping them to avoid bottlenecks and remain competitive. "With our solution, we are making a significant contribution to the industrialization of additive technologies in the dental industry," says Florian Krist, product manager at TRUMPF Additive Manufacturing.

Goodbye handiwork, hello recoater
The construction cylinder, overflow

"WITH OUR SOLUTION, WE ARE MAKING A SIGNIFICANT CONTRIBUTION TO THE INDUSTRIALIZATION OF ADDITIVE TECHNOLOGIES IN THE DENTAL INDUSTRY." **FLORIAN KRIST, PRODUCT MANAGER AT TRUMPF ADDITIVE MANUFACTURING.**

container and recoater all have a part to play when the TruPrint 1000 automatically changes

substrate plates. The cylinder and container sit below the process chamber. The machine prints the component on a substrate plate in the construction cylinder, while the overflow container collects excess powder. In a Multiplate setup, the recoater that distributes the powder in the build chamber during printing handles what is usually the machine operator's task. It pushes the substrate plate on which the previous component was printed into the system's overflow container. A spring support mechanism

ensures that the overflow container lowers the substrate plate evenly. The next substrate plate is standing by in the TruPrint 1000's construction cylinder. After printing a component, the system lifts the new plate up into the process chamber. The TruPrint 1000 immediately starts the next printing job without an operator having to intervene.

A solution that saves time, resources and labor costs

Multiplate saves companies time and labor costs. Smaller companies can use it to run their systems at full capacity without additional personnel, so it takes the pressure off when job orders spike. This solution also conserves resources, as the machine operator does not have to replenish the shielding gas. TRUMPF customers who already own a TruPrint 1000 can easily retrofit Multiplate. With its machine base, the TruPrint 1000 is the world's best-selling small-format 3D printer. And the Multilaser function, which uses two lasers simultaneously to print the component, makes it one of the fastest in its class. "We will be in an even better position to tap the market potential of the TruPrint 1000 with the Multiplate solution," says Krist.



With its machine base, the TruPrint 1000 from TRUMPF is the world's best-selling small-format 3D printer. (Source: TRUMPF)

For more information go to www.trumpf.com

3D PRINTING THE FUTURE OF E-MOBILITY TOOLS

Kennametal develops 3D printed lightweight stator bore tool, that meets accuracy, roundness, and surface finish requirements.



Weight reduction through additive layer manufacturing. 3D-printed, total weight of 10.7 kg. Cutting the weight in half, meeting surface quality, roundness, and accuracy requirements for stator bores.

Kennametal has developed a 3D printed stator bore tool specifically designed to meet growing customer demand for lighter weight tooling solutions used to machine components for hybrid and electric vehicles.

E-mobility components are typically machined on smaller, low horsepower CNC machining centers that require lighter weight tooling solutions. Kennametal's 3D printed stator bore tool weighs half that of the conventionally manufactured version, while still meeting accuracy, roundness, and surface finish requirements for aluminum motor body boring.

"The main bore, that houses the stator of an electric motor measures approximately 250 mm in diameter (9.84") and approximately 400 mm (15.74") in length, with a smaller bearing bore at the bottom," said Harald Bruetting, Manager, Program Engineering. "When manufactured using conventional means, a reamer for this type of application would weigh more than 25 kilograms (55 lb.), far too heavy for the existing machine tool or for an operator working with the tool."

Bruetting and Kennametal's Solution Engineering

"WHEN MANUFACTURED USING CONVENTIONAL MEANS, A REAMER FOR THIS TYPE OF APPLICATION WOULD WEIGH MORE THAN 25 KILOGRAMS (55 LB.), FAR TOO HEAVY FOR THE EXISTING MACHINE TOOL OR FOR AN OPERATOR WORKING WITH THE TOOL."

HARALD BRUETTING, MANAGER, PROGRAM ENGINEERING.

"BY USING METAL POWDER BED 3D-PRINTING TOGETHER WITH FINITE ELEMENT ANALYSIS SOFTWARE, WE WERE ABLE TO DESIGN AND BUILD A TOOL THAT BROUGHT THE MOMENT OF INERTIA VERY CLOSE TO THE SPINDLE FACE, INCREASING ITS RIGIDITY WHILE MEETING THE CUSTOMER'S WEIGHT RESTRICTIONS."
WERNER PENKERT, MANAGER, FUTURE SOLUTIONS.

Group turned to the company's in-house additive manufacturing capabilities to 3D-print a strong but lightweight indexable tool, equipped with proven Kennametal technologies including fine adjustable RIQ reaming inserts for high precision finishing and a KM4X adaptor for maximum rigidity.



Leveraging proven Kennametal technologies. High precision RIQ reaming inserts, and KM4X adaptor for highest possible rigidity.

The tool also features internal 3D printed cooling channels that help maximize productivity and tool life.

"By using metal powder bed 3D-printing together with finite element analysis software, we were able to design and build a tool that brought the moment of inertia very close to the spindle face, increasing its rigidity while meeting the customer's weight restrictions," said Werner Penkert, Manager, Future Solutions. "It is an excellent example of how Kennametal is using advanced manufacturing technology to help meet our customer's unique challenges."

Two versions of the tool were built, one with a carbon-fiber tube, the other using a 3D-printed metal tube. The results were impressive. The tool with the 3D printed tube weighed in at 10.7 kg (23.6 lb.) and the carbon fiber version at 9.5 kg (20.9 lb.), less than half of their conventional counterparts.

*For more information, write to:
bangalore.information@kennametal.com*

FROM THE 'ROHBOT' TO THE ROBOT!

Low Cost Automation with igus plastic arm and online marketplace model

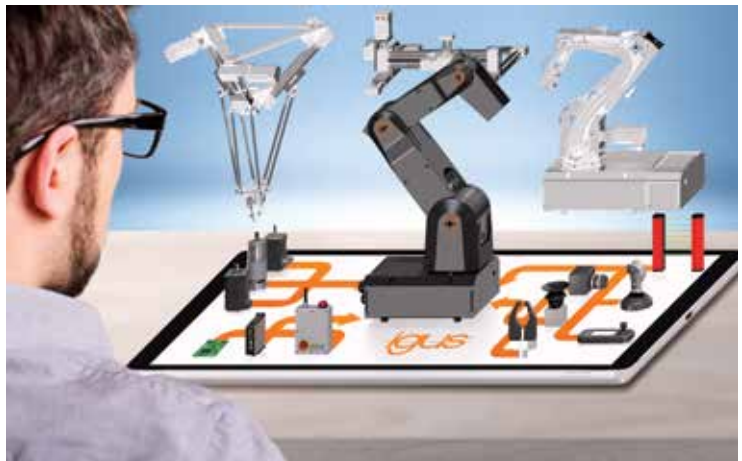
Low cost automation less than the price of the established automation suppliers for just a few thousand euro – this is exactly what many users want. But making wishes a reality is often a difficult task: What products go together? How good is the solution? Who can support me? At the Hannover Messe 2019, the motion plastics specialist igus presented two new approaches: A new 4 to 5-axis "rohbot" (h for half-finished) made of plastic and a model of the online marketplace for suppliers and users.

The reasons for using low cost automation are as varied as the applications. Mechanical engineering companies and robot manufacturers want to build their own products with a few cost-effective parts; production plants with their own automation systems choose "half-finished" robots (as "rawbots") and adapt the control system and components to their standards. Small companies, in contrast, want to use ready-made systems easily and, above all, very cost-effectively. igus takes these different requirements into account and presents new hardware components in the form of the "rohbot" concept as well as a digital marketplace model for the first easy steps in the world of cost-effective automation.

Articulated arms with new design

The basic "rohbot" that igus is offering for this growing market segment is the underlying electromechanical framework in the form of a robolink 4- or 5-axis articulated arm, a delta robot or a Cartesian robot. Thanks to a modular kit principle, tailor-made lubrication-free and maintenance-free robotic systems can be assembled. Motors, gears, power electronics, control system, GUI – Everything can be freely chosen. At the Hannover Messe 2019, igus presented the latest range of its articulated arm robot. The compact and lightweight articulated arms make comprehensive use of the advantages offered by igus motion plastics: light, lubrication-free and maintenance-free, durable and more cost-effective in production. As a result, small, configurable quantities can be created as well as large quantities for mechanical engineering companies and robot manufacturers. The clearance of the new arms

"PRODUCTION PLANTS WITH THEIR OWN AUTOMATION SYSTEMS CHOOSE 'HALF-FINISHED' ROBOTS (AS 'RAWBOTS') AND ADAPT THE CONTROL SYSTEM AND COMPONENTS TO THEIR STANDARDS."



At the Hannover Messe 2019, igus presented a marketplace model that helps a wide variety of customers online to quickly find and configure or build the automation solution that suits their individual needs. Among other things, the "rohbot" basic framework is a new, lighter and more precise robolink DC articulated arm made of plastic. (Source: igus GmbH)

"CUSTOMERS WITHOUT ANY ROBOTICS KNOW-HOW WHO WANT TO AUTOMATE MANUAL TASKS EASILY, AS WELL AS PROFESSIONALS WHO PUT TOGETHER THEIR OWN SPECIFIC SOLUTION PROFIT FROM THIS."

has been further reduced as a result of the plastic design, an innovation that enables greater precision of the robolink. Thanks to integrated cable conduits, the cables are routed inside the latest housed version. This reduces the installation space needed and prepares the articulated arms for general use as well as in the area of human-robot collaboration (HRC). The new DC articulated arm can be configured individually and, depending on the type of application, can be equipped with grippers, cameras or sensors of a wide range of manufacturers.

From the individual component to the complete automation solution
The digital marketplace is

intended to help the customer to find and integrate exactly the right low-cost automation solution that he needs for his application. Irrespective of whether he wants to build something himself with individual components or is looking for a cost-effective ready-made solution. Customers without any robotics know-how who want to automate manual tasks easily, as well as professionals who put together their own specific solution profit from this. For suppliers, the marketplace model offers easy access to a rapidly growing market segment.

For more info, Ragesh Kumar, Product Manager, igubal®, xiros, bar stock, igus (India) Private Limited. Email: ragesh@igus.in or visit www.igus.in



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