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THE MACHINIST

ULTIMATE GUIDE TO PROFITABLE MANUFACTURING

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CONSUMER DURABLES
THE RISE AND RISE OF LAXMI REMOTE

E-MOBILITY
ELECTRIFICATION CHALLENGES IN INDIA

SUSTAINABILITY
GREEN MANUFACTURING POST COVID-19

LONG-TERM COMMITMENT

Making in India is core to Boeing's business strategy, says **Salil Gupte**, President, Boeing India


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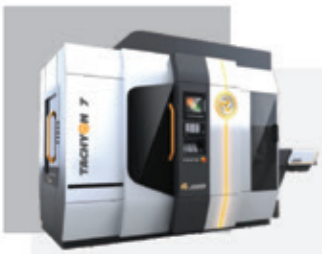

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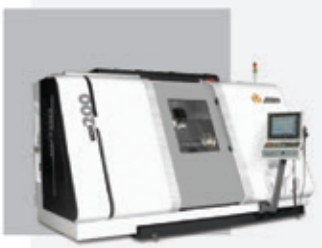
CNC Inverted Vertical Spindle Turn Mill Centre



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CONNECTING INDIA WITH EXCELLENCE & VICTORY

Can you tell me what is common with the following geographical locations – Jajpur, Surajpur, Tarapur, Solapur and Jamshedpur? (Well, if you said they all end with the suffix pur then that's not what I am looking for!). Okay, let me add some more places to the list - Thiruvallur, Noida, Chakan, Pimpri, Satara, Hinjewadi, Coimbatore, Mysuru, Sanand, Dharwad, Pune, Waluj, Hosur, Pithampur, Chennai, Sohna and Vododara! Well, quite likely that some of you have already guessed that these are manufacturing locations spread across the length and breadth of India. You are surely right! However, that is actually half the answer. The complete answer? These are the locations to which this year's winners of The Machinist Super

"WHILE THE MACHIE TROPHY DEFINITELY STANDS FOR MANUFACTURING EXCELLENCE, THIS YEAR IT ALSO SYMBOLISED THE NEVER-GIVE-UP ATTITUDE OF THE INDIAN MANUFACTURING FRATERNITY."

Shopfloor Awards belong. You heard it right! We have successfully and safely conducted this year's awards ceremony adhering to all the required protocols on November 3 in Pune. (Details of the awards function and the winners' list are available in this issue.) What makes this function truly special is the fact that we had representation for each of the location mentioned above. While the Machie Trophy definitely stands for manufacturing excellence, this year it also symbolised the never-give-up attitude of the Indian manufacturing fraternity. And importantly, it also symbolised the triumph of the human spirit against all odds! And in doing that, the Machie trophy has connected India with excellence as well as with victory. So, keep fighting for excellence and keep winning!

Editor & Chief Community Officer

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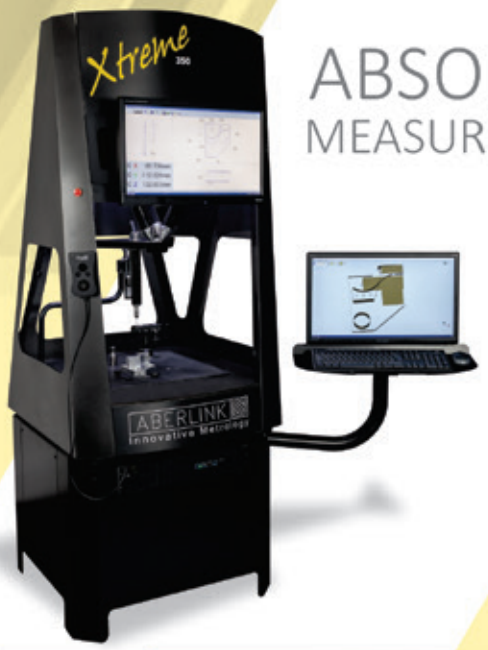

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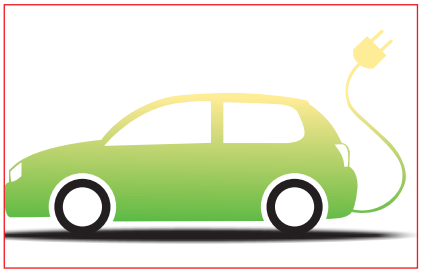

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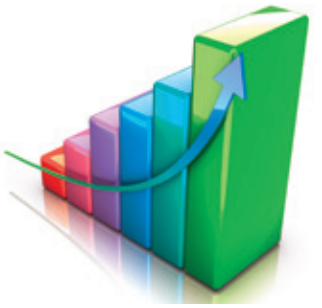
India amongst the top three investment destinations: Survey

INDIA has emerged as one of the top three choices for overseas investments in the next 2-3 years, according to the FDI survey released by the Confederation of Indian Industry (CII), in association with EY. The CII-EY FDI survey on the theme, 'How can India step up its game?" has been brought out to gauge the market sentiment amongst the Indian as well as non-Indian MNCs. According to the survey, more than two-thirds of the MNC respondents, India is the number one choice for future investments. 25 percent of the respondents, who represent non-Indian HQ MNCs, view India as the first choice for future investments. The survey shows that more than 80 percent of all the respondents and 71 percent of the non-Indian headquartered respondents plan to make investments globally in the next 2-3 years. About 30 percent of companies are planning to invest more than US$ 500 million. About 50 percent of respondents see India amongst the top three economies or leading manufacturing destinations of the world by 2025. The respondents have pinned down market potential, skilled workforce, and political stability as the top three reasons to make India their favoured destination.



Alstom Sricity successfully manufactures 500 metro cars

ALSTOM'S SRICITY FACTORY in Andhra Pradesh that manufactures Rolling Stock (Metro Trains) for Urban Metro projects, has successfully completed production of its 500th Metro Car. As Alstom's largest Urban Rolling Stock manufacturing unit in the Asia-Pacific region, this facility is delivering metro trainsets to not only Indian cities but also global ones – Chennai, Kochi, Lucknow, Mumbai, Sydney and Montreal. The currently operational metro trainsets built at this facility have clocked over 27 million kilometres cumulatively. So far, the site has recorded over 2 million manufacturing & testing hours and has a capacity to build 480 cars per annum. Alain Spohr, Managing Director of Alstom India and South Asia said, "Despite the global pandemic that has disrupted business across industries, our teams continue to work tirelessly, to ensure on-time deliveries to Metro Corporations who are working on upgrading urban mobility in various cities. We are manufacturing trainsets that incorporate the highest safety features along with enhanced passenger experience. Our commitment continues towards Make-in-India, and localization is over 75 percent for all domestic projects."

Enhanced Pinaka rocket successfully flight tested

ENHANCED PINAKA ROCKET, developed by Defence Research and Development Organisation (DRDO) has been successfully flight tested from Integrated Test Range, Chandipur off the coast of Odisha recently. Development of Enhanced Pinaka system was taken up to achieve longer range performance compared to earlier design with reduced length. The design and development has been carried out by Pune based DRDO laboratories, namely Armament Research and Development Establishment, ARDE and High Energy Materials Research Laboratory, HEMRL. A total of six rockets were launched in quick succession and the tests met complete mission objectives. Rockets tested have been manufactured by M/s Economic Explosives Limited, Nagpur, to whom the technology has been transferred. All the flight articles were tracked by Range instruments such as telemetry, radar and Electro Optical Tracking Systems which confirmed the flight performance. Enhanced version of the Pinaka rocket would replace the existing Pinaka Mk-I rockets which are currently under production.

Hyundai Academy for Technical Skills announced

HYUNDAI MOTOR INDIA FOUNDATION, the CSR arm of Hyundai Motor India Ltd. (HMIL) has opened a new chapter in Skill Development with the announcement of its upcoming 'Hyundai Academy for Technical Skills' situated in Irungattukkottai, near Chennai, set to foray into skill development for Indian youth. Speaking on the occasion, SS Kim MD & CEO, Hyundai Motor India Ltd. said, "Hyundai has undertaken many initiatives to help enhance the key skill sets of youth to ensure that they stay contemporary and industry ready. The State of Tamil Nadu has been leading industrial growth in the country and hence has always encouraged such initiatives. This Ground Breaking Ceremony holds a very special place for all of us at Hyundai as we envision the upcoming advanced and state-of-the-art training centre will provide yet another opportunity to greatly empower youth for future and will take Tamil Nadu & India to the forefront of industrial development for the automotive sector and beyond, on a global platform."

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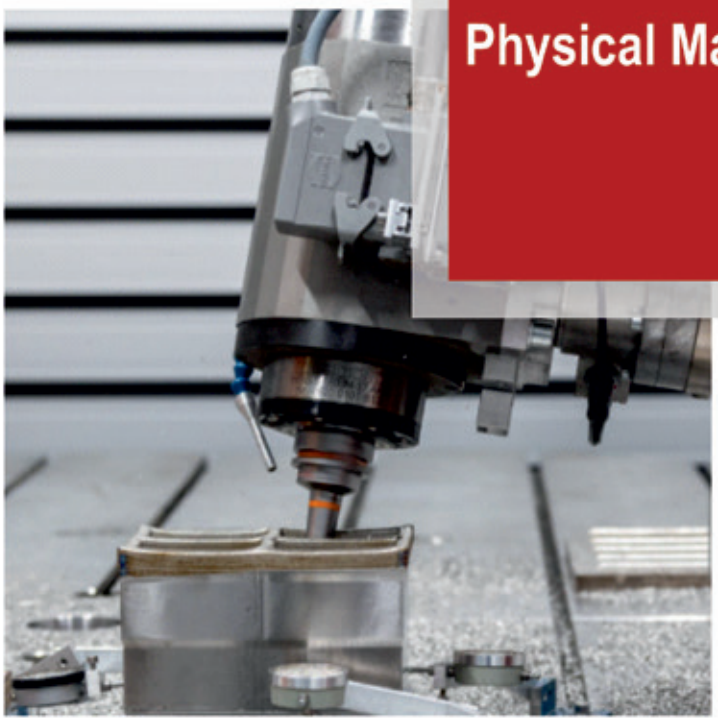

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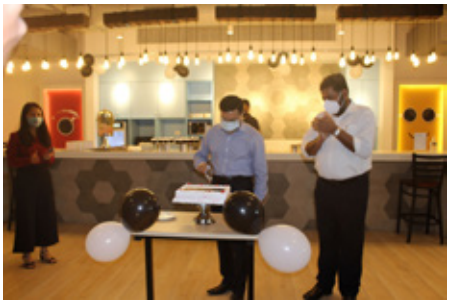
Tata Motors achieves production milestone

TATA MOTORS has announced a landmark achievement of producing four million passenger vehicles in India, since its inception. The company had achieved the one million production mark for passenger vehicles in 2005-06, three million in 2015 and the four million production milestone was achieved this month. Shailesh Chandra – President, Tata Motors Passenger Vehicles Business Unit said, "As India's home-grown automotive brand, we are delighted to have reached this prominent milestone for our passenger vehicles segment. Since its inception, Tata Motors' commitment to introducing products that have the best-in-class safety, design and performance has brought to life the vision of our Chairman Emeritus Mr. Ratan Tata. Over the last 30 years, we have rolled out icons that have not only catered to evolving customer needs but have also set new benchmarks in their respective segments"

Ather Energy raises fresh funding of $35 Mn

ATHER ENERGY has raised an investment of $35 Mn in its latest round of Series D led by Sachin Bansal's investment of $23 Mn. Ather Energy was one of the earliest start-up investments of Sachin Bansal when he invested $0.5 Mn in the firm as an Angel investor in 2014 and with this round, has made a total investment of $53 Mn. Hero MotoCorp has also invested $12 Mn as a part of the Series D round in Ather Energy. The continued investment by the existing investors is a manifestation of confidence in the brand and the sector. Ather Energy has been aggressively expanding, with the opening of 9 new markets - Pune, Ahmedabad, Mumbai, Delhi, Coimbatore, Kochi, Kozhikode & Kolkata in the coming days, and the installation of Ather Grid in all the new cities. To meet the projected demand in the coming years, Ather Energy is moving to a new manufacturing facility in Hosur, Tamil Nadu, which will be designed to produce up to one million vehicles a year. This round of investment will allow Ather Energy to accelerate its expansion plans and speed up the deliveries of the Ather 450X.

DICV opens Global Capability Centre



DAIMLER INDIA Commercial Vehicles (DICV) has announced the opening of their new Global Capability Centre in Perungudi, Chennai. Covering almost 20,000 sq ft and seating up to 165 people, the facility is designed to house the company's 'shared services' business stream. Shared services refers to the various services DICV exports to other Daimler entities around the world, including R&D, IT, Cost Engineering, Supplier and Quality Management, Human Resources and Customer Service. Satyakam Arya, CEO & Managing Director DICV said, "With our new Global Capability Centre, we look forward to attracting the best possible local talent and continuing to Make for the World."

North-east to be New Engine to Indian economy: Dr. Singh

UNION MINISTER OF STATE (I/C) Development of North Eastern Region (DoNER), MoS PMO, Personnel, Public Grievances & Pensions, Atomic Energy and Space, Dr Jitendra Singh has that the North East region is going to play a very vital role in reviving the Indian economy post Covid-19 and its development will work as a "New engine" to the economy. While addressing a Webinar on "Economic Revival through Capital Markets post covid-19", he also said that under the able leadership of PM Modi India will emerge as the global leader in post-Covid-19 world economy. He emphasised that North-Eastern Region will be one of the favourite business destinations of India post COVID-19 and Bamboo is going to be the key pillar of the economic activities. Describing Bamboo as a silver lining in the dark clouds of pandemic, Dr Jitendra Singh said, it will help in shaping the economy of North East in Post COVID era.

Hitachi ABB Power Grids India shows recovery in Q3

Hitachi ABB Power Grids in India (listed on the Indian stock exchanges as "ABB Power Products and Systems India Limited") has recently announced its third quarter results for the July - September period. "Our performance in the third quarter shows our steady progress towards normality and demonstrates that the fundamentals remain intact," said N Venu,

Managing Director, Hitachi ABB Power Grids in India. He continued, "Rigorous business continuity and liquidity improvement measures are paying off. Our resilience in this unusal period has helped us to achieve higher revenue and order growth." N Venu added, "As the market regains its footing, our solid order backlog will ensure continuity in the new norm."

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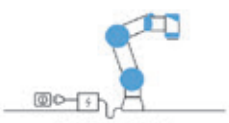
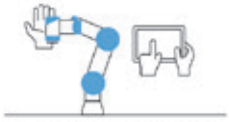
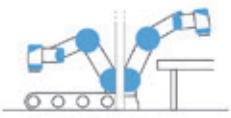


FAST SET UP



EASY PROGRAMMING



FLEXIBLE DEPLOYMENT

COLLABORATIVE AND SAFE

Being an MSME didn't stop Suhas Pitke of Shruti Engineers from taking a bold step in the direction of Industry 4.0 and deploying a collaborative robot. A single UR10 used for CNC machine tending has increased efficiency from 300 to 400 parts per day, ensuring that quality line items reach his customers on time. Despite no prior experience with robots, Mr. Pitke and his staff were able to learn the programming of a cobot from Universal Robots within a day, and the cobot has empowered the 10-person Indian business to stay ahead of the manufacturing game.

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Basavanhalli back as Greaves Cotton Group CEO & MD

Greaves Cotton Limited has announced that Nagesh Basavanhalli will resume executive duties as the first Group CEO, with immediate effect. Basavanhalli will play an active role in the future growth of overall business (Greaves Cotton Limited and Greaves Mobility) and other strategic initiatives like Greaves Finance. Speaking on his new role, Nagesh Basavanhalli, Group CEO & MD, said, "As a diversified engineering company, Greaves Cotton has the opportunity to play a significant role in the rebuilding of India's economy with its strength in local manufacturing, as we have a play in critical sectors like last mile mobility, energy, agriculture etc. We also want to be a significant contributor to the vision of Make in India, and the country's transition to a green economy with our clean technology portfolio." Karan Thapar, Chairman, Greaves Cotton Ltd., said: "Nagesh has played a pivotal role in the transition of Greaves with new strategic focus towards fuel agnostic technologies and e-mobility. We are confident Greaves will achieve many milestones under his new role as the Group CEO."

PVG Menon appointed CEO of ESSCI

The Electronics Sector Skill Council of India (ESSCI), an organization setup to provide a skilled workforce for the Electronics industry, announced the appointment of PVG Menon as its new Chief Executive Officer (CEO). Menon is an industry leader with vast experience in the ESDM sector. He brings with him an excellent combination of domain knowledge, and business and consulting experience. In his role as CEO of ESSCI, Menon would be responsible for overseeing the operations of ESSCI, and will work closely with its Governing Council on strategic issues related to the growth of the Electronic Systems Design and Manufacturing (ESDM) industry in India. The appointment follows the superannuation of the previous CEO. "Our search for the new CEO was focused on ensuring we have the right leadership to achieve all our goals for the ESDM sector. We are also looking at raising the bar for skill development for this sector, so as to achieve global quality training, and make it available in India. We welcome Mr. PVG Menon on board and wish him the best as he assumes this important mantle," said Dr. Ajai Chowdhry, Chairman, ESSCI and Founder HCL.

Karin Rådström to head Mercedes-Benz Trucks

Karin Rådström will start her appointment as Member of the Board of Management, Daimler Truck AG, responsible for Mercedes-Benz Trucks, on 1 February 2021. Rådström most recently has been responsible for sales and marketing at Scania as a member of the Executive Board. Sweden-born Rådström started at Scania as a trainee in 2004 after graduating with a Master of Engineering in Industrial Management from the Royal Institute of Technology in Stockholm. Since 2007, she has held various managerial positions within Scania's sales and service organization including the Head of the company's bus and coach business as well as starting up the connected vehicle business.
Rådström succeeds Stefan Buchner, who retired in October 2020.

Dual leadership for Romaco Kilian

Romaco Kilian will be under new dual leadership from now on: Stefan Krömer has just been appointed as the new Managing Director of the Cologne-based tablet press manufacturer. He will run the company together with Jens Carstens, who has been Managing Director of Romaco Kilian since 2013. Stefan Krömer has just been appointed by Romaco Holding GmbH as the new Managing Director of Romaco Kilian GmbH. In his new role, he is responsible for all aspects of the Cologne tablet press manufacturer's operations and administration. Krömer will share the running of the company with Jens Carstens, who has been at the helm since 2013. Jens Carstens, already Managing Director Technology, has additionally been made responsible for Sales and Customer Service. Krömer's area of responsibility will include the Finance, Human Resources, Technical Purchasing and Quality departments as well as Assembly and Production. "With Stefan Krömer, we have gained a highly qualified manager with extensive top-level experience for the management of Romaco Kilian", emphasised Jörg Pieper, CEO Romaco Group.

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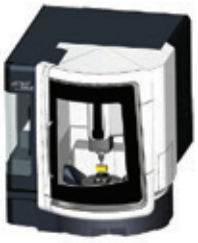

Hourly Machine Cost $
(total burden)

0 50 100

Number of Machine Tools

5

Weekly Machining Hours

80

Estimated Reduction in Machining Time
Reduce machining time by as much as 15-25% or more

25% (typical reported savings)

ANNUAL MACHINE SAVINGS
$520,000

FORCE OPTIMIZATION - CUTTER SAVINGS CALCULATOR

Hourly Cutter Cost $
(average cutter cost/cutter life hours
e.g. $100/1 hour)

0 50 100

Number of Machine Tools

5

Weekly Machining Hours

80

Estimated Increase in Cutter Life
Extend the life of your cutters up to 100% or more

+50% increase

ANNUAL CUTTER SAVINGS
$692,640

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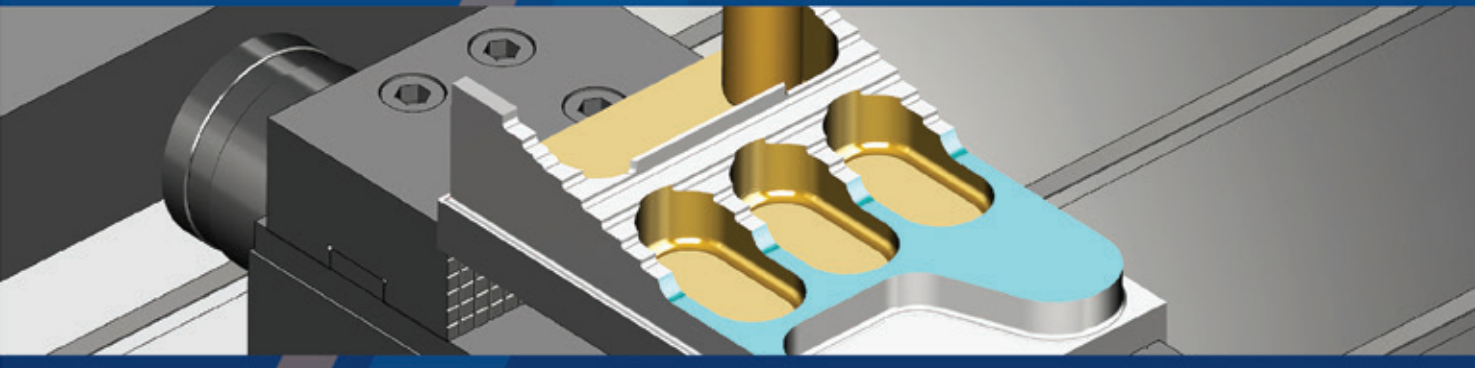

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A NEW RECORD

Climbing up from 56.8 in September 2020 to 58.9 in October 2020, Indian manufacturing's PMI has recorded its strongest improvement in the health of the sector in over a decade.

Manufacturing sector conditions in India continued to improve in October, with companies raising output to the greatest extent in 13 years amid robust sales growth. While firms purchased additional inputs for use in the production process, payroll numbers were lowered due to government guidelines related to the coronavirus disease 2019 (COVID-19). Inflationary pressures, meanwhile, remained subdued as seen by a modest increase in input costs and only marginal rise in selling prices. Rising from 56.8 in September to 58.9 in October, the headline seasonally adjusted IHS Markit India Manufacturing Purchasing Managers' Index® (PMI®) pointed to the strongest improvement in the health of the sector in over a decade. Growth was led by the intermediate goods category, but there were also robust expansions in the consumer and investment goods sub-sectors. Manufacturers indicated that the ongoing relaxation of COVID-19 restrictions, better market conditions and improved demand helped them to secure new work in October. Moreover, the upturn in sales was the strongest since mid-2008. New export orders likewise rose at a quicker pace, one that was the most pronounced in close to six years. In response to strong sales gains and softer containment measures related to the COVID-19 disease, firms lifted production at the strongest pace recorded since late-2007. Greater production needs led to another monthly increase in input buying among Indian manufacturers. Moreover, quantities of purchases rose at the quickest pace in just under nine years. Meanwhile, the compliance of government guidelines related to the COVID-19 pandemic caused a further reduction in employment. The fall was the seventh in consecutive months, albeit the weakest in this sequence. Commenting on the latest survey results, Pollyanna De Lima, Economics Associate Director at IHS Markit, said: "Levels of new orders and output at Indian manufacturers continued to recover from the COVID-19 induced contractions seen earlier in the year, with the PMI results for October highlighting historically-sharp monthly rates of expansion. "Companies were convinced that the resurgence in sales will be sustained in coming months, as indicated by a strong upturn in input buying amid restocking efforts. "Also, confidence towards the year-ahead outlook for production improved as firms hoped that fewer COVID-19 cases and the reopening of other businesses could boost output growth. "There was disappointing news on the employment front though, with October seeing another reduction in payroll numbers. Survey participants that noted job shedding mentioned having observed containment measures to halt the spread of the coronavirus disease 2019."

As a result of rising sales and falling employment, firms saw an increase in outstanding business. However, backlogs rose at the weakest pace in the current six-month period of accumulation. Pressure on supplier capacity subsided, as indicated by the slowest increase in delivery times for seven months. Where vendor performance deteriorated, panellists commented on labour shortages at their distributors. Trends for stocks diverged as an increase in input stocks contrasted with a further decline in holdings of finished goods. The former was associated with purchasing activity growth and the latter with strong sales. Finally, hopes of an end to COVID-19 cases and the reopening of other sectors in the economy underpinned positive sentiment towards the year-ahead outlook for production.

Source: IHS Markit

> "Levels of new orders and output at Indian manufacturers continued to recover from the COVID-19 induced contractions seen earlier in the year, with the PMI results for October highlighting historically-sharp monthly rates of expansion.
>
> **Pollyanna De Lima,** Economics Associate Director at IHS Markit

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By Shyam Motwani

TIME TO STAY GREEN

It is crucial that manufacturing based businesses do not get complacent and refocus on their sustainability goals.

With the outbreak of the COVID-19 pandemic, the global manufacturing processes have taken a hit and supply chains have been disrupted worldwide. However, the only good news for the world has been the significant reduction of carbon emissions globally due to reduced industrial activities. As per the annual IEA Global Energy Review 2020, the CO2 emissions have reduced by 8 percent globally, which is the lowest in the last decade. At this point, it is crucial that manufacturing based businesses do not get complacent and refocus on their sustainability goals. This can be achieved by introducing more green manufacturing practices at the shopfloor to continue the momentum.

The manufacturing industry is the third largest consumer of the total energy used worldwide. It is also one of the fastest growing sectors in the Indian economy. This puts the industry in a unique position to reduce significant carbon footprint in various phases of product life-cycles. The first step to getting back to business by becoming more sustainable is to have an audit of energy consumption at the site and understand the various functions which can undergo transformations in the near future.

Companies can look at several ways to reduce energy consumption. One of the most common ways is using alternate sources of energy like wind, biomass, geothermal, solar, ocean, hydropower, and landfill gas, among others, which are now cheaper than traditional sources of energy like coal or oil. This approach is beneficial as it leads to conservation of natural resources. This also limits the overall emission of carbon dioxide through energy efficiency measures to 15 percent - 30 percent on average.

With the pandemic, the world has realised the importance of setting up local supply chains that are self-sustained. Domestic sourcing reduces transport involvement, thus further reducing fuel consumption. Choosing domestic partners who also have their own sustainability goals in place is a great way to develop an ecosystem of green manufacturing. Furthermore, recycling waste efficiently can help in reducing usage and also discharge of these wastes which is a significant source of environmental pollution.

Beneath all these processes, lies technology, which can efficiently manage and help reduce energy. Technology like artificial intelligence (AI) and the internet of things (IoT) can be deployed in various phases of automation. Industrial IoT has the potential to capture data accurately based on which production efficiency along with energy and design can be optimised. Without going into a complete overhaul, some simple choices like retrofitted LED lighting and sensors can reduce energy consumption to a great extent, simultaneously bringing down overheads.

While some manufacturing companies in India are leveraging such sustainable and green practices in the manufacturing process, a conscious effort is needed by the entire industry to bring down these emissions considerably. For instance, at Godrej Locks' eco-friendly manufacturing unit in Goa, we have adopted the technique of Green Chemistry for manufacturing locks. A process of ion exchange has been installed for selective heavy metal removal, making it extremely energy efficient. It also has an online automated effluent treatment plant. Eco-hazardous materials have been replaced with more bio-sensitive alternatives. The green chemistry technique utilises trivalent chrome, which is non-cyanide based, instead of environmentally hazardous hexavalent chromium. Similarly, alkaline copper system is utilised in the plating process rather than the hazardous cyanide copper. Most of the materials that are used are recycled. The processed scrap is sent back to the smelter to convert into raw material again for further use.

Given the growing importance of green manufacturing and sustainable footprint, companies that adopt environment-friendly measures receive high brand recognition and goodwill amongst key stakeholders, greater ability to attract talent and higher investor interest. However, sustainability requires a long term commitment and making constant changes to short term goals. This is a chance for manufacturers across India to transform their vision of sustainability and consider it as a business strategy rather than just something good to showcase.

The author is EVP and Business Head, Godrej Locks and Architectural Fittings & Systems.

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TOUCHING THE SKY IN LESSER COSTS

The buy to fly ratio is ~ 28 just in case of a conventionally factory-made AISI-316L bracket. Additive manufacturing will bring down the get to fly ratio to ~ 1, leading to significant value and time savings.

Additive manufacturing or 3D printing is perceived as an innovative processing method to replace traditionally produced parts, including castings and multi component parts. 3D printing helps to create parts in a brief timeframe, with least material wastage and permitting more elevated level of customization. In this case two brackets were made using AISI-316L grade for aviation applications using laser powder bed fusion technology. A thorough analysis was performed on the powder, to check for structural integrity to qualify the component for functional testing. A large amount of material was removed, extreme machining time and related issues, for example, residual stress and warpage conceived which would happen in conventional methods have been eradicated by taking up Additive Manufacturing. The mechanical properties meet the prerequisites of ASTM F 3184-16 norm resulting in similar or better part built. Despite the successful built a minor contortion was noticed in the thin wall region which was resolved by adding extra stock in the thin section and later post processed by machining. The brackets were found to be free from any defects > 100 µm as non-destructive testing was performed by large macro CT. Furthermore, it has been identified that there is ample scope of Topology optimization which can lead to weight saving, thus increasing efficiency.

THE CHALLENGE

The conventional producing of AISI-316L brackets relies on casting and shaping of bulk feed stock materials, followed by subsequent machining to final shapes and dimensions. These ancient manufacturing processes forever inevitably end in an outsized quantity of fabric waste, high machine hours, high producing value and long lead times. The material needs for producing Type-I bracket of weight 3.5 kg was calculable to be a forged/rolled block of 100 kg and thickness 125 mm, wherein 96.5 percent of fabric is wasted throughout machining. The buy to fly ratio is ~ 28 just in case of a conventionally factory-made bracket. Additive manufacturing will bring down the get to fly ratio to ~ 1, leading to significant value and time savings.

THE SOLUTION

A reduction of lead time and cost will be achieved for parts thanks to a number of the characteristics of AM; shorter lead time from design to production, adaptability to design changes, complicated geometries at no additional price and significantly less post-processing as compared with the conventional production routes. For this case we found Powder Bed Fusion to be the most suitable and optimum option to ensure part-built quality and integrity.

PROCESS AND SPECIFICATION

Stress-relieving of 3D-printed brackets and was performed by soaking at 600 °C for two hours as per AMS 2759-4C. The temperature of 600 °C is adequate, as 3D printing doesn't generate any major residual stresses like thick section molded product. Also, a high-temperature stress-relieving would cause distortion of thin sections. Brackets were subjected to sandblasting for

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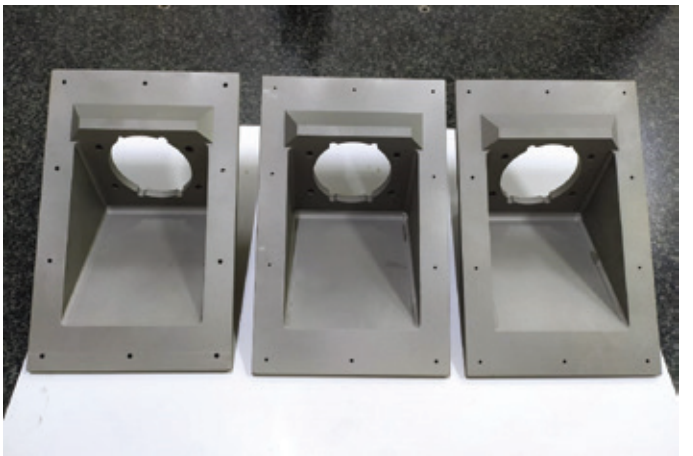
improving the surface finish.

The following activities were performed in the entire Additive Manufacturing process:

- Mechanical Property improved.
- Microstructural Evaluation at par.
- Computed Metro Tomography (CT) Inspection was successful.
- Dimensions and Geometrical Inspection ensured accuracy of the final part.
- Structural Testing resulted in real-time results.



TESTING AND APPROVALS

Computed metro tomography analysis confirms the soundness of brackets realized by 3D printing. The porosity level in this process is higher than that of wrought products and size approximated to be 100 µm; however, this will not affect the functionality of the products. It may also be noted that the porosity noticed in 3D printed components is less than the sizes resolvable by conventional NDT techniques such as ultrasonic testing and X-radiography.

COMPARISON

The tensile properties achieved by LPBF 3D printing process for AISI-316L have been compared with wrought products of 100 mm section thickness as shown above. It is observed that the yield strength achieved in the LPBF process is much higher than that achieved by wrought products, whereas percent elongation is on the lower side. Similar trend of mechanical properties has been reported. In this case, it may be noted that AISI-316L stainless steel wrought products are processed by hot working, followed by solution annealing at temperature ~ 1040 °C. LPBF being a layer by layer processing, stress relieving at 600 °C is adequate for relieving the residual stresses generated by the processing.

> "Most of the parts required in space research are made of plastic or some metal and Additive Manufacturing is the key to a future where all broken parts can be fixed with less labour, money, resource, and time.
>
> **Ankit Sahu,** Director, Objectify Technologies Pvt. Ltd.

MICROSTRUCTURE

Subsequent to tensile testing, the cross section of tensile specimen ends was prepared as per conventional metallographic polishing and then etched using 10 percent oxalic acid electrolytic reagent to reveal the microstructure as shown in Fig. 5a–d. The microstructures shown below revealed that the thickness of each melt pool layer was ~ 100 µm, indicating two to three layers of power are fused during each laser beam scan.

ORIENTATION

The 'standard specification for additive manufacturing stainless steel alloy with powder bed fusion as per ASTM F3184-16 in Class A condition (stress relieved condition)' was followed for 3D printing of these brackets. Test coupons in four directions (X, Y, Z and 45° to XY, YZ and ZX planes, i.e., body diagonal of an imaginary cube) were 3D printed along with the brackets for evaluating the tensile properties and impact strength.

TENSILE

To compare the mechanical properties of LPBF 3D printed AISI-316L test in solution-annealed condition, the specimens were subjected to solution annealing and tensile properties were evaluated. The comparison is shown above. These results confirm that the LPBF process can give better mechanical properties (including the minimum guaranteed percent elongation) as compared to the conventional wrought products even in solution-annealed condition.

TESTING

Functional acceptance tests of LPBF 3D printed brackets were performed by structural testing (test setup shown below) by applying four times the actual thrust and inertial loads. The brackets successfully withstood the test, and strains observed were very benign/negligible of ± 9 µε in tension and compression loading conditions. Thus, these brackets were qualified for the

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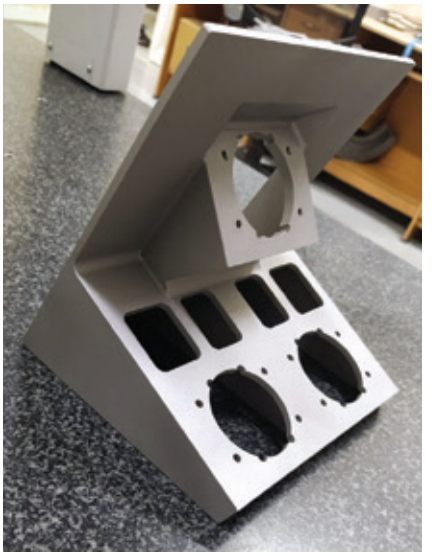
intended end use. Trial suiting of the brackets with the thrusters was carried out and found to meet the geometric requirements for the intended application.



CONCLUSION

Two kinds of brackets for aerospace applications were realized through the LPBF/ DMLS 3D printing, followed by stress-relieving heat treatment and subjected to careful characterization. the subsequent are the conclusions from this study:

1. The distortion noticed on thin wall regions was avoided by adding additional stock at thin sections and removing by post-processing.
2. The mechanical properties in stress-relieved condition meet the necessity as per ASTM F 3184-16 and also the achieved properties are akin to molded product. The LPBF method provides higher mechanical properties than standard molded product even in solution toughened condition.
3. In the early stages, failure ascertained in 45° specimens was attributed to incomplete sintering at these layers. the basis cause was established as improper spreading of powder at one amongst the layers.
4. Non-destructive testing was performed by macro CT and brackets were found to be free from defects. The porousness was approximated to be 100 µm, which can not affect the functionality of the product. The porousness noticed in Additively Manufactured components is a smaller amount than the sizes resolvable by standard NDT techniques such as ultrasonic testing and X-radiography.
5. If needed in the future, structural testing confirmed that enough margins are accessible within the designed brackets with laser powder bed fusion AM route and additional weight reduction are often achieved by topology optimization through design for additive manufacturing (DfAM).

Special Thanks
Indian Space Research Organization & Vikram Sarabhai Space Centre (VSSC)
Source: Objectify Technologies

UPDATE

MOTHERSON SUMI TO ACQUIRE BOMBARDIER EWIS BIZ

Motherson Sumi Systems Limited (MSSL), via its Mexican subsidiary, Motherson Rolling Stocks S. de R.L. de C.V. (MRS), has signed an asset sale and purchase agreement to acquire the activities of Electrical Wiring Interconnection Systems (EWIS) performed at Bombardier Transportation's manufacturing site in Huehuetoca, Mexico (BT Ensambles México). MRS is part of the Motherson Rolling Stock Division which designs and manufactures electrical cabinets, power packs and electrical distribution systems for leading rolling stock manufacturers. MSSL, through PKC Group (acquired in March 2017), is engaged in the manufacturing of wiring harnesses for rolling stock, mainly in Europe and the Americas region. In 2019, the company through its subsidiary Motherson Rolling Stock Systems GB Limited, UK (MRSS) acquired Bombardier's UK rolling stock electrical component and systems business in Derby. Now, with the execution of this definitive agreement between MRS and Bombardier, the relationship will expand to Mexico. The transaction includes the transfer of assets, employees and inventories, on a debt-free and cash-free basis and is valued at around US $ 10 million approx. (subject to customary adjustments). The transaction is subject to customary closing events and expected to complete in Q4 FY20-21. BT Electrical Wiring Interconnection Systems (EWIS) provides world-class harnesses and electrical assembly based on standard solutions. MRS will continue manufacturing the same electrical harnesses product as today at the Huehuetoca site in Mexico with enhanced efficiency in time-to-market, on-time delivery and cost structure. Both companies are now working on the smooth transition of employees and business, to mitigate any potential impacts and expect to close the transaction in Q4 FY20-21. Vivek Chaand Sehgal, Chairman, MSSL said, "Our focus is always on adding value to our customers' supply chain and catering to their requirements."

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BACKGROUND

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By Niranjan Mudholkar

LONG-TERM COMMITTMENT

Boeing continues to remain committed to creating the right conditions for a strong and indigenous aviation ecosystem in India, says **Salil Gupte,** President, Boeing India

You have been at the helm of Boeing India for almost 20 months now. How has been the journey so far?

India is one of the world's fastest growing aviation and defence markets and Boeing has had a presence in the country for over 75 years now. I have been privileged to be a part of this journey, which has seen several milestones in the last year alone.

The Indian Air Force inducted their first Chinook and Apache helicopters in 2019 and we recently completed all deliveries, 15 Chinooks and 22 Apaches. We also delivered the 11th C-17 Globemaster in 2019. We delivered two technologically advanced 787-9 Dreamliner aircraft to Vistara this year, a first for India. We also modified and delivered the 777-300ER aircraft that will serve as India's Head of State aircraft. We delivered two 737-800 BCF (Boeing Converted Freighter) in 2019 to SpiceXpress, SpiceJet's cargo division, which is the first of its type to operate in South Asia.

Earlier this year, the Ministry of Defence signed the contract for the acquisition of six Apaches for the Indian Army. In line with our commitment to bringing the best of Boeing to India and Make in India, the Tata Boeing Aerospace Limited facility has been producing aero-structures for Boeing's AH-64 Apache helicopter for the US Army and international customers.

Boeing is also providing pilot training for the Indian Air Force fleet of the C-17 aircraft while construction is underway in another facility for training Indian Navy pilots on the P-8I.

Our wholly owned engineering and technology campus with future avionics manufacturing and assembly capability is coming up in Bengaluru. Last year, we

marked the 10th anniversary of Boeing Research and Technology in India, which has been leading research and development in aerodynamics, structures, materials, manufacturing, communication networks and artificial intelligence.

We are also working with the Airports Authority of India and airline partners to create a roadmap to modernise and optimise India's National Airspace System to safely accommodate the growth in traffic.

These are significant milestones and I am honoured to be a part of this journey together with 3,500 of my colleagues who are shaping Boeing's legacy in India.

Would you say the Covid-19 outbreak has been the toughest leadership challenge you have faced?

COVID-19 has impacted the entire aviation industry. It has changed the way we live and work. In these challenging times, we can draw lessons from previous economic crises. In the past, industries that made the quickest and most sustained recoveries post-economic shocks maintained their core operations through the crisis, focused on employees, customers and supplier relationships, and managed cash well. This has been Boeing's focus in India and around the world.

Business resilience has become as important as business productivity. We have to redesign our global operations and supply chains to protect against future aftershocks and crises. We expect to see rebalancing and a trend towards increasing diversity in industrial footprints and supplier bases.

We are also focused on working with our supplier base and customers to help them navigate this challenging period. We now have the benefit of what we've already been through, and a disciplined approach for how we will manage it going forward.

"Business resilience has become as important as business productivity. We have to redesign our global operations and supply chains to protect against future aftershocks and crises. We expect to see rebalancing and a trend towards increasing diversity in industrial footprints and supplier bases."

The Make in India initiative has wider connotations as it basically entails 'manufacture, design, engineer and research in India'. What is Boeing's approach in this context?

Boeing has always supported the development of indigenous aerospace and defence capabilities in India and has through the years invested in partnerships with the Indian aerospace ecosystem in skilling, research & technology, and manufacturing. Our growing partnership with India and our expanding supplier base makes it imperative for us to invest in, develop, and nurture talent in the country.

Making in India is core to Boeing's business strategy. Our sourcing from India stands at close to US$ one billion a year from 225 suppliers who are manufacturing critical systems and components for some of Boeing's most advanced products. We are working closely with our suppliers in India to support supply chain health, identify new ways to drive innovation, and deliver greater value to our customers. Boeing continues to grow a globally competitive supplier base in India, with strong partnerships that are aligned with the government's Aatmanirbhar Bharat vision.

Tata Boeing Aerospace Limited (TBAL) in Hyderabad, Boeing's joint venture with Tata Advanced Systems Limited, is manufacturing Apache fuselages for customers around the globe. TBAL marks a major step towards the co-development of integrated systems in

"We are also focused on working with our supplier base and customers to help them navigate this challenging period. We now have the benefit of what we've already been through, and a disciplined approach for how we will manage it going forward.

aerospace and defence in India.

Dynamatic Technologies manufactures the ramp and complex aft pylon for the Chinook heavy-lift helicopters and also power and mission cabinets for the P-8 platform. Similarly, Rossell Techsys manufactures wire harness for all major defense platforms and electrical panel for the AH-64 Apache, and the harness for V-22 Osprey. SASMOS HET Technologies manufactures electrical panel assemblies and wire harness for the F/A-18 Super Hornet and F-15 Strike Eagle. Hindustan Aeronautics Ltd. (HAL) manufactures F/A-18 gun bay doors. Tata Advanced Systems Ltd manufactures complex crown and tail for Chinooks. These are just a few examples of the work done by our Indian suppliers.

We are also working with Indian companies to develop capabilities in the country so they can perform maintenance locally, including heavy checks and supply of indigenous equipment. Air Works India Pvt. Ltd., in partnership with Boeing, successfully completed the first heavy maintenance check for the first P-8I in 2019. Further capability development planning is in the works to support the growing P-8I fleet, improving the local aviation ecosystem while ensuring quicker turnaround for the Indian Navy.

Moreover, we're accelerating our skill development and engineering involvement in India. Through our skilling and up-skilling initiatives, we are training hundreds of pilots, aircraft maintenance engineers, technicians and frontline factory workers across India with our industry partners like Tata, Rossell Techsys, Jaivel and Lakshmi Machine Works.

The Boeing India Engineering & Technology Center (BIETC), with a strong presence in Bengaluru and Chennai, is leveraging a talented pool of employees to contribute to global aerospace and defence growth. Our engineers in India undertake high-quality, advanced aerospace work that supports areas as diverse as test and evaluation; development of advanced, environmentally friendly coatings; data analytics for next-generation airplane health management; innovation on Internet of Things and Digital Transformation; and development of software tools that enable airlines to improve their operations and work with airports to enable de-congestion and navigation at reduced costs.

Boeing continues to remain committed to creating the right conditions for a strong and indigenous aviation ecosystem in India.

The Indian aerospace manufacturing ecosystem – although at a relatively nascent stage – has started showing a lot of maturity in the last few years. How would you analyse the industry from a global OEM perspective?

Boeing has been steadily increasing its sourcing from India for its global manufacturing and supply chain. Our investments in India are bolstering India's manufacturing sector, creating expertise in advanced manufacturing processes, delivering to an international supply chain network that adheres to global standards of production. We've quadrupled our sourcing from India that stands at close to USD 1 billion a year from 225 suppliers who are today manufacturing critical systems and components for some of Boeing's most advanced products. As I mentioned earlier, we have also been driving several skilling initiatives for Indian MSMEs. This integration helps suppliers improve their capabilities and move up the value chain, which benefits everyone. We are constantly looking at doing more here, with partners who have, or can build capability to deliver world-class quality, while maintaining productivity.

A key area of concern in India is the gap between industry and academia, which can be bridged with meaningful partnerships between the two. What is Boeing doing in this regard?

Boeing's industrial and academic partnerships are spurring entrepreneurship and innovation in India's aerospace industry. We have invested in Indian aerospace startups working on future aerospace technology and today marks 13 years of advanced research and technology partnerships in India with National Aerospace

Laboratories and leading research universities like the Indian Institutes of Technology and Indian Institute of Science. Our investments have spurred technology entrepreneurship, patents and research papers in aerospace manufacturing and wireless networks.

We work with partners such as Air India and Tata; Micro, Small and Medium Enterprises (MSMEs) like Rossell Techsys and SASMOS, to help meet India's skilling and training requirements for a fast growing sector. We collaborate with our partners to impart training to India's aerospace labor force on frontline techniques of aerospace manufacturing and help prepare the next generation of pilots and aircraft maintainers to enter the aviation industry.

We continue to invest in specialised training programs that enhance employability and bridge the skills gap in the aerospace sector. We have partnered with Lakshmi Machine Works to develop a training program to prepare a future-ready workforce in aerospace manufacturing. The program trains frontline workers on the technical skills required to work in the aerospace tool manufacturing sector.

Boeing's Accelerated Apprenticeship Program aircraft maintenance engineers (AME) in partnership with Air India Engineering Services Ltd and the Ministry of Civil Aviation, aims to improve the AME's employability through training and hands-on experience with actual aircraft. With the Boeing University Innovation Leadership Development (BUILD) program, we are creating a platform for students and entrepreneurs to not only benefit from our vast experience and partner networks, but also develop their ideas into innovations.

Partnerships like these that straddle the world of academia and industry can help develop an ecosystem that encourages innovation and skill training for the aerospace sector in India.

> "Making in India is core to Boeing's business strategy. Our sourcing from India stands at close to US$ one billion a year from 225 suppliers who are manufacturing critical systems and components for some of Boeing's most advanced products.

Boeing obviously has a lot at stake with the Indian civil aviation sector too. How do you see that business panning out on this front in the next two years?

Commercial aviation is facing historic challenges this year, significantly affecting near- and medium-term demand for airplanes and services, yet history has also proven air travel to be resilient time and again.

The 2020 Boeing Market Outlook (BMO) projects that the commercial aviation and services markets will continue to face significant challenges due to the pandemic. While near-term commercial services demand is lower, the BMO forecasts a $3 trillion market opportunity for commercial and government services through 2029, with digital solutions emerging as a critical enabler as customers focus on leaner operations to adjust to future market demand.

Operators are assessing business needs, passenger demand, and their fleets. In many instances, operators are taking advantage of opportunities to grow cargo capabilities to meet demand, by utilising dedicated cargo aircraft and at times repurposing passenger aircraft to carry more goods.

We do anticipate it will take several years for travel to return to 2019 levels and a few years beyond that to return to long-term trend growth. Yet the fundamentals that have driven air travel for the past five decades remain intact. We've always seen the industry innovate, respond, and grow over time because of its close connection to the global economy – and of course, the desire of people everywhere to fly, when they have the chance.

India is projected to spearhead economic growth in the region over the next 20 years, a fact that will be key to growing air travel. We have already seen a decade of remarkable passenger growth and the dominance of low-cost carriers in the Indian market, and we expect this to continue.

The Indian Government has also opened up the Indian space sector to private players. Will Boeing be exploring opportunities in this segment as well?

India's recent strides in space exploration and ambitions of human space flights before August 2022 are testimony to the spirit of innovation in the country. We are inspired by what India has achieved and its aspirations for the future. We look forward to partnering with ISRO in their endeavours.

By Niranjan Mudholkar

IN FULL CONTROL

We would love to maintain our position as the largest and most trusted remote control and set top box manufacturer in the country while also boosting our position as the leading OEM, ODM and EMS Company in the categories we deal in, says **Vijay Kumar Sachdeva,** MD & CEO, Laxmi Remote (INDIA) Pvt Ltd

Briefly tell us something about the beginning of Laxmi Remote (India) Private Limited (LRIPL). How has been the journey so far since the beginning and are you satisfied with the progress?

Laxmi Remote (India) Pvt. Ltd is a leading manufacturer of remote controls, set-top boxes, adapters, power supply, mobile chargers and AV cables. The company, formerly known as Remotec Industries, was rebranded in the year 2000 as Laxmi Remote India Pvt. Ltd. Our trading business came to a halt in 1998 and we debuted into the remote control manufacturing industry thereafter. We opened our first manufacturing plant in Bahadurgarh, Uttar Pradesh in the year 2001, and by 2003, we had established our in-house PCB designing and manufacturing unit along with a corporate office in Noida, Uttar Pradesh.

We established another manufacturing unit in Noida Phase II, in the year 2006, with a focus on manufacturing remote controls and set-top boxes for our business partners. After achieving tremendous success, we decided to further expand our portfolio by adding FTA set-top box and AV cables in our manufacturing capabilities to cater to end consumers as well as businesses. In 2018, we established our R&D centre at Hyderabad to drive innovation for setup box business and software division. Laxmi Remote has its own conditional access system (CAS) under the brand name of Pro CAS.

In the consumer segment, Laxmi Remote (India) Pvt. Ltd has a PAN India presence with a well-established supply chain and a network of over 500 distributors to reach retailers and end consumers. With four brands (LRIPL, EARTHMA, ONLY1 & Pro CAS), two manufacturing plants, three regional offices and more than 1200 employees working for us, we feel we are on the right growth trajectory and will continue to achieve the set goals with the same enthusiasm.

How has the Covid-19 pandemic affected LRIPL's business and operations and how are you dealing with the same?

The COVID 19 pandemic has pushed everyone in the world to go beyond their limits and explore new ways

to perform and achieve success. Industries are, naturally, disrupted due to the frequent lockdowns, supply chain breakdown, medical emergencies and workforce migration. Similarly our entire business came to a halt for about two months which impacted us and the business as it came abruptly.

We were strictly operating under government policies right from unlock one and the first priority for us was to ensure the safety of our employees and give them a proper working environment. At Laxmi Remote, we are taking all the necessary steps to ensure their safety and support them by offering insurance policies.

To ensure smooth production, we divided our workforce into two shifts and only 1/3rd of the workforce was allowed to resume work. In business operations, the unprocessed material availability and supply chains were the most affected areas. We have revised our collaborations and outsourced the raw materials from other substitute Asian countries to maintain the production and supply. We are making sure that we are able to deliver all the orders of our business partners and also of our channel partners on time so that they can serve their customers too.

For our B2C segment, we have launched our online e-commerce website www.shop.lripl.com in the lockdown period to further facilitate our consumers to get the delivery of products at their doorsteps.

How was the last financial year for LRIPL in terms of business and what kind of target have set for the ongoing financial year?

We had a remarkable growth during the last financial year, where we reported our revenue at over Rs.125 crore for the fiscal. However, this year we witnessed the world fighting with the pandemic and trying to overcome with it. Our business too was hit hard by the pandemic and by the lockdown, but strategic decisions taken by our management and dedication of our employees has helped us fight with the crisis.

"We have now completely resumed our operations and working with our full capacity. We are positive for rest of the year and expecting at least 10-15 percent hike over the last year revenue."

We have now completely resumed our operations and working with our full capacity. We are positive for rest of the year and expecting at least 10-15 percent hike over the last year revenue.

What is your overview of the Electronics Manufacturing Services (EMS) segment in India? Where do you think LRIPL stands in the market in terms of its position?

Electronics manufacturing as an industry has been garnering a lot of interest from domestic and international players. It is expected to be a huge contributor to the growth of the manufacturing industry as the government also intends to promote the domestic manufacturing and increase its contribution to the GDP to 25 percent by FY2025 (according to an ASSOCHAM Report).

The recent initiatives such as 'Digital India', 'Make in India' and supportive policies such as FDI, M-SIPs, PLI, Electronic

Development fund (EDF), Scheme for Promotion of Manufacturing of Electronic Components and Semiconductors (SPECS), etc. for electronics manufacturing industries are streamlining the process of establishment and expansion of the manufacturing segment.

The measures by the government include the announcement of the National Policy on Electronics which aims to make India the centre of Electronics System Design and Manufacturing by targeting a turnover of US$400 billion in the next five years. As of now, India accounts for three percent of global electronic production with the biggest competitor being China, which accounts for 28 percent of the overall global manufacturing output. The electronics sector is estimated to grow at 30 percent for the next five years, generating Rs.11.5 lakh crore worth production during this period. This shows that EMS has a long way to go in the future.

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Laxmi Remote (India) Pvt. Ltd. in the recent past has made a considerable progress in establishing itself as the leading OEM, ODM EMS provider in the country. We are doing OEM as well as ODM in products like remote controls, set top boxes, SMPS, chargers, door bells, etc. for our partners with complete in-house manufacturing facilities such as mould design & development, tool & die manufacturing, PCB design & manufacturing, PCBA, as well as testing & reverse logistics to facilitate one stop solutions to our business partners for all their EMS needs. Today, we are manufacturing products for more than 60 electronics brands such as Daikin, Blue Star, Crompton, Intex, Sansui, Toshiba, Godrej, Eureka Forbes, Croma, Haier, Videocon, Hindware, Micromax, Mitashi, V-guard, Voltas, Havells, Orient Electric, Bajaj, Luminous, Livpure, Whirlpool, Lloyd, Amber, Usha, Halonix, Sun TV and Ricoh amongst many others.

What are the major challenges faced by your industry and how are you dealing with the same?

Scarcity of and high pricing of components and raw materials, lack of technological support, lack of skilled manpower, high infrastructure & logistical cost, irregular demands & fewer profit margins are some major challenges faced by the industry at the moment. These issues need to be addressed to further boost the growth of the Electronic manufacturing industry in India.

We are also dependent on other countries for raw material and components however we have complete in-house facilities to manufacture products at our premises which enables us to provide one stop solution to the clients and help us delivering the right products on right time and at right price.

For skill development of our employees, we keep on organising workshops and train them with required skills. We also offer our employees the opportunity to attend trainings & workshops abroad to nurture and upgrade their skills & adapt as per the new technological advancements.

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As of now, India accounts for three percent of global electronic production with the biggest competitor being China, which accounts for 28 percent of the overall global manufacturing output.

For components, infrastructure and logistical set up, the industry as well as the government need to work together to overcome these challenges. Although the government has come up with various schemes and initiatives such as 'Make in India and Atmanirbhar Bharat' to improve the business environment in the country, it further needs to set up a base which can scale up industries and facilitate ease of doing business in India. To further enhance the competitiveness of the Indian electronics manufacturing industry, these initiatives must be sustained with regular monitoring.

What are your expectations from the government in terms of providing a boost to your industry?

I have already mentioned the challenges faced by the industry. We are expecting infrastructural support from the government to nurture the manufacturing industry. Programs like the Skill India mission and Atmanirbhar Bharat initiative are already launched by the government in India and we believe, such skill development programs should be promoted further to increase their reach and make people more capable. Need of the hour is to reduce the import and minimise the dependency on other countries for raw material and components and the same can't be done without government's support to the industry. Government needs to set up a base for industry and provide boosters to further nurture and expand it.

How do you relate to initiatives like 'Make in India' and 'Atmanirbhar Bharat'?

We are glad that our honourable Prime Minister has brought the concept of Atmanirbhar Bharat and Make in India in the mainstream along with several supporting policies. We at Laxmi Remote (India) Pvt. Ltd were always focused on making ourselves a truly independent manufacturing company. Today, we are equipped with comprehensive in-house facilities from design & development to production and from tooling to testing and everything in between including an R&D lab, molding as well as assembly lines.

One of our major USPs is to provide end to end solutions to clients in the categories we deal in where we can take up any project and can work on making the final product as per the client requirements. Right from the development of molds to building sophisticated cabinets, design and development of PCBs to assembly, and to manufacturing the final products, after an appropriate stringent quality process, we have all the capabilities which help us in building these products.

We are in the process of bolstering our manufacturing capacities and increasing our product lines at the moment to support make in India and Atmanirbhar Bharat initiatives and are committed to it.

With our future product portfolio expansion, we are aiming to generate employment opportunities for more than 1000 people in 3-5 years, to accommodate our vision to increase the share of Made in India products in the electronics manufacturing industry.

Tell us about LRIPL's overall manufacturing strength in terms of product spread and capacity.

We have a vast product portfolio that allows us to explore diverse industries for business. Our in-house production capacities make us stand out in the industry. We are a one-stop solution for manufacturing remote controls, setup boxes, adaptors, mobile chargers, door bells, LED TV boards and many more products. We have an installed capacity of manufacturing more than three million remote controls and one million set-top boxes, adapters, and mobile chargers each in a month to cater to different compa-

nies in the Electronics Manufacturing segment.

In the consumer segment, we have a PAN India presence with more than 500 distributors to reach to retailers and consumers and for selling remote controls, free to air set top boxes, adapters and power supplies, mobile chargers and so on through the same channel.

What kind of R&D set up do you have?

Our R&D unit in Noida is focused on remote controls, mobile chargers, adapters & power supplies. It is dedicated to work on different technologies and develop products in sync with latest trends and advancements happening around the industry. The team is currently working on RF, touch screen, voice control along with Bluetooth technology in the remote control category.

> "The electronics sector is estimated to grow at 30 percent for the next five years, generating Rs.11.5 lakh crore worth production during this period. This shows that EMS has a long way to go in the future.

In 2018, we established another R&D center at Hyderabad for enhancing the set box and software business. This unit is a complete research and innovation lab that focuses on the research and implementation of new technologies in the cable and broadcast segment. The team is currently working on Internet based product categories like Hybrid box, IPTV box, and Android box along with a few other products.

Tell us about your client base.

Currently we cater to more than 60 electronics brands across the country. Some of these enterprises include Daikin, Blue Star, Crompton, Intex, Sansui, Toshiba, Crabtree, Johnson, Godrej, Eureka Forbes, Croma, Haier, Videocon, Hindware, Enhanced Living, Micromax, Mitashi, Amara Raja, V-guard, Voltas, Havells, Orient Electric, Bajaj, Luminous, Livpure, Whirlpool, Lloyd, Amber, Usha, Halonix, Carrier Midea, Sun TV, and Ricoh amongst many others. Apart from these clients, we are also the approved empanelled company for Doordarshan for making free-to-air setup boxes in India.

Does LRIPL also export? If yes, then tell us about the exports business.

Yes, we are already exporting remote controls, setup boxes and casings of single board computers and microcontroller boards to UK, Africa, and Dubai. While stepping into the next era of electronic technologies, overseas expansion is one of our key focus areas. Amongst the international markets that are high up on our list are United States of America, Europe, Middle East, Africa, and Argentina along with neighbouring countries like Bangladesh, Sri Lanka, Indonesia, etc.

Tell us about LRIPL's growth plans to expand business in India. Which vertical/product line will be its major focus?

As an electronics manufacturer, we are bidding high on the Indian market. The local manufacturers are expected to play a vital role in the government driven initiative like Make in India, Atmanirbhar Bharat and Vocal for local. For more diversified business, we have recently announced the expansion in our product portfolio by foraying into internet-based category products for the Broadcast & Cable industry such as IPTV, Hybrid Box, Android box and other products in the same categories. We are also working on technologies like RF, touch screen, voice control along with Bluetooth technology in the category of remote controls.

Additionally, we are also considering the possibility of entering in to LED TV manufacturing business with a manufacturing plant in the near future. Our future product line-ups selection is going to be focused on innovation and technology which will ensure that we deliver world-class technology at a competitive price.

Where do you see LRIPL three years down the line?

We would love to maintain our position as the largest and most trusted remote control and set top box manufacturer in the country while also boosting our position as the leading OEM, ODM and EMS Company in the categories we deal in. In the consumer segment, we are targeting to be No.1 brand in remote control, Free-to-air setup boxes and power supply categories.

By Niranjan Mudholkar

BEST TIME FOR THE INDUSTRY

The days ahead could see the Indian aerospace & defence industry growing by leaps and bounds, says **GK Pillai,** Director, Walchandnagar Industries Limited (WIL)

How has the Covid-19 pandemic affected the industry in general and your organisation in particular?

The Covid -19 pandemic had actually at first brought in a lot of uncertainty in the industry. In the initial phase the industry was not able to actually fathom what the repercussions could be. But thereafter, when things started becoming a bit clearer, the realities started hitting the industries. There was, at many places, a total shutdown and also closure of the supply chain mechanism which impacted and brought down the industry to a stand still for the first month. The second worry was whether the end customer will lift the goods if it is even manufactured and how the order inflow will be impacted.

"There is a need to build a strong and competent MSME base to support large companies involved in the defence equipment manufacturing."

Another most important issue was with regard to cash flow which all of a sudden came to a halt. Fortunately for WIL, apart from the initial one month of closure we did not have much issue starting our manufacturing activities on account of the fact that we had our own colony where we could ensure safe practices and most of the workers did not have to travel much to reach the factory. The supply chain did impact us a bit but with the available raw material, we could start the manufacturing activities in a month.

How would you analyse the Indian aerospace & defence ecosystem in the context of the 'Atmanirbhar Bharat' campaign?

As far as aerospace is concerned, a lot of indigenisation has been already done and Indian companies have been meeting the needs of ISRO in totality. With regards to the defence sector, the announcement of Atmanirbhar Bharat and the ban on import of certain 101 items in the first list is a great boost to the Indian companies, particularly for the private sector.

Do you think the overall aerospace & defence ecosystem in India is mature enough?

Definitely, as mentioned earlier, the Indian companies in the aerospace sector are fully capable of meeting the needs of ISRO and also its ambitious growth plans. As far as the defence sector is concerned, there are quite a few companies who have built large infrastructure and have actually been starving for orders. The Atmanirbhar Campaign will actually help the Indian companies to utilise the assets that are already set up for catering to the defence sector.

Which are the areas that we need to improve upon?

The areas where we have to put extra effort are as follows:

1. Build a strong and competent MSME base to support large companies involved in the defence equipment manufacturing,
2. Improve the quality standards both within and also that of the sub-vendors to international match quality,
3. Reduce the lead times and adherence to delivery commitments,
4. Adopt smart manufacturing. Implementation of Industry 4.0 will naturally address point 3,
5. Improve the design and engineering capabilities of Indian industries, as this will be needed to meet the challenges of Make in India.

What more do you think the Government should do to provide a further push to the industry?

The Government needs to look into the following areas very seriously:

1. Make the tendering process more transparent and flexible.
2. Visibility of orders should be clearly explained, which will help industries to invest in plant and machineries.
3. The present system of NCNC has to be removed.
4. There should be lower interest rates for plant and machinery Capex for industries catering for the defence sector.

By Niranjan Mudholkar

THE BEDROCK OF PROCESS TRANSFORMATION

Digitalisation as a means to improve customer connect and process efficiency was already well known. However, the Covid-19 pandemic accelerated the usage and adoption of digital systems, says **Prosenjit Sengupta**, EVP & Chief Digital Officer, Thermax Limited

Do you think the Covid-19 pandemic has accelerated the adoption of digitisation in the Indian manufacturing industry?

Digitalisation as a means to improve customer connect and process efficiency was already well known. However, the Covid-19 pandemic accelerated the usage and adoption of digital systems in many business and employee functions across the manufacturing industry not only in India but on a global level. The forced remote working that was induced due to the pandemic ensured that innovative means were adopted by many of the organisations to stay in business, whether for front end processes or the back end support. This called for systems that were enabled on cloud, that could be operated from anywhere and that provide a feel of touch and sense. Hence, the pandemic pushed organisations, including the manufacturing industry, to look towards digital technology to keep the business operations running during the physical lockdown of people and movement of goods.

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). Would you agree that disruptions and digital transformations are more about mind-sets first and then about their physical manifestations?

Digital technologies are the bedrock of process transformation. These technologies provide a platform to explore multiple and innovative options for carrying out the same functions. But, yes I agree with the suggestion that the technology platform is at the end an enabler and not a doer. The benefit has to be imbibed by the users and adopted in their daily routine for digital technology to succeed in delivering the results. The experience at Thermax has also been similar. Being a company whose process foundations are built on physical interactions, the apprehension before the lockdown was high. However, the quick turnaround of the entire company's modus operandi showed the agile mind-set in acclimatising to the new normal. Having said that, I would also like to point out that the newer technologies related to ML (Machine Learning), AI (Artificial Intelligence) and RPA (Robotic Process Automation) are areas that are becoming more and more popular. These technologies are adept at understanding and mastering the basic routine tasks as well as the adaptive intelligent tasks to a high degree of perfection, thus reducing the need of humans to intervene. Hence, over time I feel that even the human mind-sets of change will become lesser of a challenge to surmount.

"The newer technologies related to ML (Machine Learning), AI (Artificial Intelligence) and RPA (Robotic Process Automation) are adept at understanding and mastering the basic routine tasks as well as the adaptive intelligent tasks to a high degree of perfection, thus reducing the need of humans to intervene."

Can manufacturing companies use AI, machine learning and data analytics to predict disruptions and develop training simulations to mitigate risks related to the health and safety of their workforce to

increase organisational resilience?

Again the answer is yes. AI and ML thrive on data. The more the quantum of information, the better and more accurate the results. Hence, in an ideal scenario if all the relevant data points are available, then the technology can predict a similar occurrence to a high degree of accuracy. Given this, the predictive models can then be used in a variety of manner – from planning in advance, training of employees to modifying work conditions, which are more amenable to the predicted situation. But as these technologies become advanced, the best possibility will be if they are used by organisations to avert such catastrophes.

What kind of digitalisation projects have you undertaken at Thermax to make the company more efficient, agile and increase value to stakeholders?

The digital scope that has been undertaken is very comprehensive. It covers both front end as well as backend value streams. Apart from the business functions, it also focuses on the digital engagement and experiences of the employees, Health and Safety and various manual process automations prevalent inside the company. To give some examples, we have implemented projects and systems across CRM, PLM and MES for all businesses.

How are you using technology to enhance the overall employee management processes at Thermax?

Employee engagement using digital media has been a focus at Thermax. My firm belief is that a digitalisation program can only succeed with external stakeholders only when the employees have confidence in them. This is possible only by providing them with digital experiences that help them in improving their daily tasks. We at Thermax have implemented state-of-the-art employee, learning and claims processes that are available both as a portal as well as mobile apps. Apart from these, various mobile apps have been released that take care of project operations, business dashboards, health, safety and carbon footprint reporting.

How do you look at the role of analytics and cybersecurity in digitalisation?

With the increase in digital channels and ease of data availability, the areas of cybersecurity and analytics have gained importance. First, let me talk about analytics. Data collection across all platforms have increased manifold. The data becomes unwieldy if it is not sliced and diced properly. The analytical tools come in handy to collate, summarise and show the data in understandable trends to enable decision making. Cybersecurity, as a topic has equally assumed importance in the digital era. The reason is very simple. The very concept of digitalisation stems from the fact of connecting data

points across all process points and ensuring the transmission and access of information to people who want it, where they want it and when they want it. This ease of data transmission opens up the prospect of data theft and data misrepresentation tremendously. Data is really the new oil, and can play havoc in the wrong hands. Hence it becomes imperative to safeguard data access, data transmission, data storage and data interpretation. There are various safeguard measures available today, which not only talk about protection but also enable the entire concept of data leak prevention. As a summarising statement, digital success for any organisation is incomplete without adequate analytics and data protection.

Do you see blockchain technology coming to the fore in the manufacturing industry? Blockchain is a concept having a lot of potential but minimal used cases. The onus of proving the concept meaningful will lie in the testing of the technology in business processes more widely by not only the manufacturing industry but other industries as well.

What role will 'Smart Factories' play in the success of the 'Make in India' initiative, which aims to transform India into a global manufacturing power?

Smart Factory is a terminology used for describing a connected and intelligent factory. The hallmarks of a smart factory are having automated processes, which are able to provide operational information in real-time, and in turn can be analysed to improve the operating parameters. The more we compete globally, the higher will be the requirement to adhere to high quality and predictable outcomes. How well any organisation or factory is able to manage and perform within the acceptable matrices around them will decide the acceptance of goods manufactured in India. And, the best way to keep informed and be on top of operations will be to invest in Smart Factories.

By Aaditya Vidyarthi

BEING A DIGITAL MACHINE SHOP MATTERS

Leading edge machine shops, who wish to stay ahead of competition in Cost, Quality & Time, are adopting Industry 4.0 technology to integrate disconnected processes. This approach not only eliminates problems caused by the lack of data integration, but also creates new capabilities.

Aerospace manufacturing has been always a challenge for variety of reasons. With disruptions in supply chain across the world, India is being re-looked as a manufacturing destination. Our collective response to this question of scaling up Aerospace Manufacturing, will determine whether we will be leading or continue to being relegated to a follower status in the global arena.

Globally aerospace manufacturing has three distinct identifiers - High Technical Complexity, Low Production Rate and Higher Quality Standards. Profitability is never an issue if we can control the above three aspects with continuous orders. One of the earlier challenges was high barrier of entry related to Technology and Cost, and this prevented many new entrants to join the aerospace manufacturing.

Advancements in technology landscape have led to disruptive changes in the manufacturing industry. Digital technology has allowed companies, irrespective of their size, to scale up the technology at lower cost points. Digital Twins and Digital Threads have enabled companies to ensure Traceability and Scalability of operations.

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Globally aerospace manufacturing has three distinct identifiers - High Technical Complexity, Low Production Rate and Higher Quality Standards. Profitability is never an issue if we can control the above three aspects with continuous orders.

Unfortunately, at traditionally run machine shops, the knowledge resides in spreadsheets and multiple software systems, and is shared among process owners on USB drives, paper and other uncontrolled file systems. Worse, some of the most vital knowledge is "stored" in the minds of manufacturing experts who carry it home with them each evening. Many times this is lost when a person quits or retires from a company.

Leading edge machine shops, who wish to stay ahead of competition in Cost, Quality & Time, are adopting Industry 4.0 technology to integrate disconnected processes. This approach not only eliminates problems caused by the lack of data integration, but also creates new capabilities. These technologies start with the digital twin—digital representations of product, production system and their performance—and integrates them into a digital thread that weaves together every step of the manufacturing process, closing the loop between the virtual and real worlds of production. Capitalizing on this process of digitalization requires a fundamental change in how machine shops work.

What sets apart machine shops today is the ability to quickly turn around perfect products when and where the customer demands. This requires more than manufacturing expertise; it requires more effective knowledge sharing between and among people, systems and machines.

The traditional inward focus on manufacturing expertise and manipulating materials has been turned inside out. Machine shop owners must shift their focus from material handling and machining toward satisfying their customers' ever-more demanding needs.

Solutions that integrate functions and make data sharable across them create digital machine shops that achieve the following:

- ***Deliver more complex products faster:*** Perhaps nothing challenges machine shop owners more than customers' increasingly demanding turnaround times of complex and customized products. The traditional response, speeding up workflows, is stretched beyond its limits. Simply upgrading the

> Digital technology has allowed companies, irrespective of their size, to scale up the technology at lower cost points. Digital Twins and Digital Threads have enabled companies to ensure Traceability and Scalability of operations.

old, disconnected software and systems and working harder won't work and adds other risks, such as increased errors and lower quality.

- ***Work efficiently and effectively:*** With integrated systems, even more complex projects become easier to complete on-time and on-budget. Product engineers and operators can work concurrently, because they can access the information they need when and where they need it, and it's all accurate and up to date. They can also draw upon and reuse designs, analysis and best practices of previous projects, all stored in the digital thread.
- ***Strengthen existing customer relationships:*** Shops that reduce time-to-delivery and consistently hit promise dates keep customers coming back. Digitalization increases efficiency by reducing time-wasting variability and errors caused by knowledge transfers between processes.
- ***Expand capabilities:*** Digital machine shops are ready to quickly adopt the latest manufacturing technologies, like additive manufacturing, advanced robotics and automation as well as emerging technologies such as artificial intelligence. With these technologies, machine shops offer customers new products and services, as well as reap the efficiencies within the business.
- ***Diversify and expand:*** Digital machine shops are better equipped to grow the business. With knowledge collected, stored and always available in the digital thread, less experienced employees can do more. This frees up manufacturing experts to focus on higher-value-added work, such as attracting new customers, entering new markets and innovating new products and processes.
- ***Boost margins:*** As time-to-market shrinks and costly mistakes are avoided, digital machine shops capture the savings, converting them to bigger profit margins.
- ***Drive continuous improvement:*** With a unified, digital end-to-end technology system, machine shops more easily collect, adapt, re-use and build on their expertise. Everyone from designers, engineers and machine operators can access, act on and contribute to best practices.

For today's machine shops, being data-driven is necessary, but it is not sufficient to ensuring competitiveness. Only by becoming a digital machine shop, with connected and integrated data systems, will they effectively eliminate problems that occur with manual data hand-offs and enable the flexibility and responsiveness that customers demand.

The author is Business Head- APAC, PROLIM Solutions India Pvt. Ltd.

UPDATE

COLLINS AEROSPACE INKS MRO AGREEMENT WITH GKN FOKKER SERVICES

Collins Aerospace Systems, a unit of Raytheon Technologies Corp., and Fokker Services, a GKN Aerospace company, have recently announced the expansion of an existing 10-year FlightSense On-Site Support agreement for Collins Aerospace's Integrated Drive Generators (IDGs). The expanded contract will add new IDG part numbers for the Airbus A320neo, while Collins Aerospace will continue to manage Fokker Services' onsite inventory of IDG components, providing competitive rates for OEM-quality parts and improved shop efficiency. Fokker Services, in turn, will now be able to repair Collins Aerospace IDGs for the A320neo. The IDG provides primary electric power for the aircraft electrical system by converting variable engine input speed to a constant output speed, thus enabling the generator portion of the IDG to produce alternating current at a constant frequency. "Collins Aerospace is pleased to continue building on its longstanding relationship with Fokker Services," said Ryan Hudson, VP, Aftermarket, Power & Controls for Collins Aerospace. "This agreement will help Fokker Services streamline supply chain operations, increase repair reliability and lower operational cost to better serve its customers with quality repairs of Collins Aerospace components." Ben Scharrenberg, Director, Procurement for Fokker Services, said "We are proud to work with Collins Aerospace to provide MRO support for these components to operators. We bring added value based on many years of experience in supporting component MRO, our high quality standards, and our service expertise."

By Anurag Garg

ELECTRIFICATION CHALLENGES IN INDIA

We have a considerable number of challenges to address in India to ensure that the adoption of e-mobility happens successfully.

The vehicle industry in India is taking small steps for the past decade towards making electric vehicles a reality. We have seen considerable advancement over the last few years in particular towards achieving this goal. Government policies and schemes such as FAME II encourage manufacturers to invest in the R&D towards automotive electrification. Other programs are creating awareness among the customers about the benefits of an electric vehicle. Yet, we have a considerable number of challenges to address in India to ensure the adoption happens successfully.

INFRASTRUCTURE

A lot of the new petrol pumps are opting for an electric vehicle charging facility under the alternative fuel option. Having this option at the existing petrol stations would make an immense change in the transition of electric vehicles. Currently India has a lot less charging ports than required. There are some changes towards this in the last couple of years in the form of public-private partnerships with various state governments to develop the needed infrastructure. We have seen a lot of discussion going-on about the charging infrastructure and how the electric vehicles will be displacing the pollution to the suburbs from the cities where these plants are currently located. According to Brookings India, if we achieve our goal of electric e-mobility, the demand for electricity will increase significantly. This means 100TWH or 4 percent of the total power generation capacity. Thus, building up these power generations would be crucial and meeting these growing demands of electricity will be more problematic.

LOCALISATION & POLICY

While there are several government initiatives to encourage EVs, we also need to consider that India is a value-driven market. Currently, the cost of buying an EV is considerably higher than a petrol or diesel vehicle. Given the infrastructure challenges addressed earlier, the consumer needs a bigger incentive to buy a vehicle. Localisation would help in reducing some of the costs related to an EV. One of the biggest costs related to an EV is the battery. India requires to develop the manufacturing capabilities and invest further in battery technology R&D to ensure we have the best, cost-optimised batteries. Localising the manufacturing of batteries could help achieve further cost savings in the short-term. In the long-term, however, we need more solutions for battery technology in India.

A MIDDLE PATH

Expecting a complete transition to an electrified future will be difficult. It requires a complete overhaul of infrastructure, mindsets and awareness. While India strives to achieve the goal of exceeding the number of electric vehicles by 2025, we should also consider an interim path that can help ease the transition for both the consumer and the manufacturer. Studies have shown that by the year 2030, half of the cars will be partially or completely powered with electric drives. Since buyers around the world are opting for an environmentally-friendly automobile, the current option which is gaining much traction is the 48 volt electrification solutions. It is designed in a way that any automobile producer would not have to renovate their existing arrangements. The influential and cost-effective system in this day is the 48v engine with functions such as start-stop feature, electric boost save 13-20 percent of the fuel consumption. The functionality of the new 48 volt high power technology hybrid system is the same as previous full-hybrid vehicles. This new 48 volt high power technology provides all the benefits of a conventional full-hybrid vehicle with a high voltage system. The cost of this solution is relatively low.

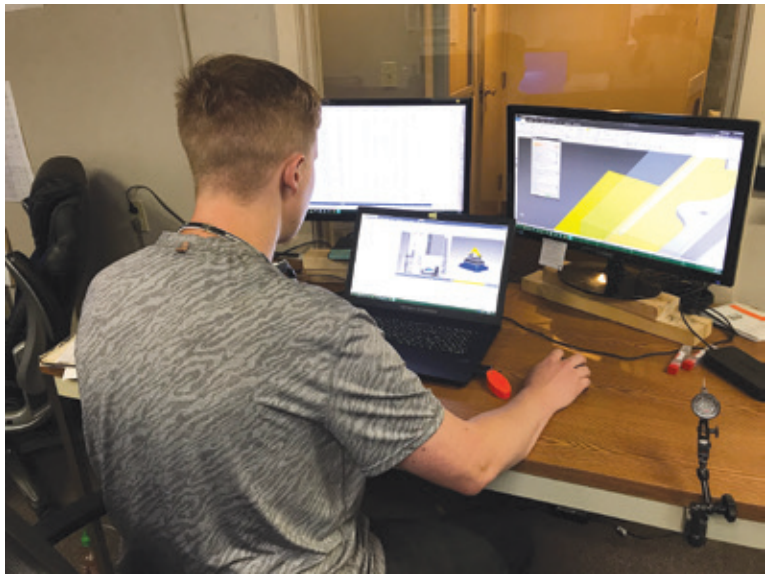
FUTURE OF EVS IN INDIA

The Indian EV industry confronts openly, that a lot needs to be done to achieve the ambitious 2030 target. For a country like India, considering the huge demographics and the population, there is a huge potential in terms of the growth opportunities within this market. It's also time to leverage on the special privileges provided in the new electrification policies & the self-reliance programs introduced by the government in shaping India's EV paradigm on a FastTrack basis.

The author is Managing Director and Country Head India, Vitesco Technologies

DOING BUSINESS THE RIGHT WAY!

Find out how King Machine is committed to growing its business based on relationships and customer satisfaction



King Machine, LLC. has more than 30+ years of manufacturing expertise in the Pacific Northwest. The original owner started King Machine in 1978 and ran it until 2013 when he sold it to a group of local machinists wanting their own company. King Machine had always done aerospace work, but for older airplane programs that were drawing based, like the Boeing 747 and 767. They didn't have the ability to work effectively with newer, digital only programs designed in CATIA. "The company needed an upgrade in technology and tools to compete on newer airplane programs," explains vice president and general manager Dale Lyski. "The first thing we did after the sale was complete was invest in technology. We purchased CATIA, VERICUT and a Brown and Sharpe CMM." For Dale and his partners these were the bare bone necessities needed to compete in the current marketplace. King Machine was an attractive purchase because it already had a Boeing supplier code, ISO certification, and a quality system. This was the foundation needed to grow the company without having the added hassle and expense of starting from scratch. "When we took over on August 6th, 2013 there were 12 people working here with barely enough work to keep them busy. We now have 42 employees on staff and our sales have grown at a similar pace."

> "With the complexity of modern aerospace components, and the speed of the machines it is 100 percent mandatory to have tool path verification to be able to do the work.
>
> **Dave Jennings,** Programmer

Dale and his partners all worked together for twenty plus years for a local privately owned machining business. That business was purchased by a private equity group, then sold again to large public company. "Going from a private, family run business, to a private equity, and then to a public company was a big transition," describes Dale. Within a year and a half of the last sale most of the management had left the organisation and gone off to do other things. They took away a lot of experience and applied it here. Each of the partners has their own expertise, so there are never too many cooks in the same kitchen. Keith Mehus is the president of King Machine and was the general manager at the previous company they all worked. Dale handled the operations and engineering at the old place and continues to do so at King Machine. Rick Huffman is down on the shop floor as production manager, while Mark Henderson handles business development. Mark formed good relationships with customers at the prior company and was instrumental in getting the ball rolling in the new direction at King Machine.

King Machine is primarily a milling shop, but they do mill-turn work when needed. "We don't actively pursue turning only jobs," tells Dale. "We focus on what we do best; high speed machining of large alu-

minium structures." Structural aerospace parts for the fuselage, leading edge, trailing edge and wing fill up the 13 CNC machining centres in the 26,000 sq.ft. facility in Mukilteo, Washington. The first new machine added to the shopfloor was a Matsuura MAM72-100H. It's a 5 axis high speed horizontal with 240 tools and a 42" work envelope. They also added a Fastems cell with 20 pallets and two loading stations. "We sold out the capacity on the Matsuura rather quickly," comments Dale. "So we added a second Matsuura MAM72-100H to the 20 pallet cell. The two machines share the Fastems system and there is room for a further expansion of ten more pallets and one more 5 axis machine."

> "King Machine uses VERICUT's machine simulation for all the machines and finds it especially useful on the high-speed 4 and 5 axis milling centers. They model every tool, every nut, every bolt, and every tombstone.

Bigger isn't necessarily better every time, and as the number of orders increased production manager Rick Huffman saw a need for a slightly smaller machine. "Not all the new orders were suited for the larger Matsuura 5 axis machines," explains Rick. "To achieve better machining efficiency on some of the smaller parts we purchased a 4 axis dual pallet Makino a51nx horizontal to take up the task. We are near reaching capacity on that machine already, but are ready to add a second one next to the first." The majority of parts King Machine produces are for Boeing Commercial. Since 2013 they've more than tripled the company's statement of work. "Most of the parts we build ship to tier 1 Boeing suppliers," describes Dale. "Our goal is to do more direct business with them in the future without sacrificing customer service to our existing customers."

One of the first calls King Machine's new ownership made was to CG Tech's Scott Michalek. "Scott is the local VERICUT rep and we've known him forever," tells Dale. "Our opinion is that VERICUT is the best of its kind on the market, and it is a product our programmers have experience using. We've always had great success using it and can't imagine using anything else. No investment in technology is complete without it."

John Madison and Dave Jennings started programming with pencils on pads of paper back in the early 1980s. They are King Machine's programming Gods and echo Dale's thoughts about VERICUT. According to Dave, "With the complexity of modern aerospace components, and the speed of the machines it is 100 percent mandatory to have tool path verification to be able to do the work." King Machine uses VERICUT's machine simulation for all the machines and finds it especially useful on the high-speed 4 and 5 axis milling centers. They model every tool, every nut, every bolt, and every tombstone. "Not all the tombstones are the same," tells John. "They are different shapes with a variety of different fixtures and dimensions, so modelling them is essential to preserve the equipment. When you are rolling stuff around on 5 axis you have to be aware of everything. A pretty standard practice in the estimating department is to put a part on a machine that is a tad larger than the machine's work envelope. With everything modelled out on all our machines we will know right away if it is even possible. We can spin the machine around manually and confirm it is good to go."

Nothing touches any of the machines without going through VERICUT first. Operators at King Machine won't even run a part unless they are 100 percent positive that it was proved out in VERICUT first. "VERICUT gives us a lot more confidence in what we do," explains Dave. "It makes me a faster programmer because I know it has my back and will catch any errors no matter how big or small. It allows us to do things like be more aggressive on our rapid clearance planes

without worrying about making a mistake that could cost time and money." VERICUT doesn't just assist the programmers, it instils confidence in the people operating and setting up the machines. "The guys in the shop never doubt that what we give them will work," continues John. "There is no trial and error only cutting on deliverable parts right out of the gate. The guys are doing setups on at least 8 part numbers a day. We would never be able to have that efficiency without using VERICUT."

Dave and John use VERICUT's simulation for more than just maximising cutting paths. Creating inspection sketches and reviewing run time budgets are easily done right from the VERICUT software. "It takes only a few minutes to generate an inspection sketch," describes Dave. "Click on a few features and it documents the dimensions of those features. It not only notes the feature dimensions, but also notes which tool generated that feature. So for example if the wall is oversized the shop knows tool 25 made that feature. They can then inspect tool 25 to see if it needs replacement." When King Machine quotes a job and is awarded a contract everything has a budget. Materials, outside processes, machine time are all based off the quote. John and Dave double-check those budgets by using VERICUT. "If estimating has 45 minutes in the budget, but our simulation proves out at 55 minutes we know to go back and see where the problem is. Sometimes the solution is to move it to another machine for better efficiency, but sometimes not. As programmers we always make it a point to beat the time given to us by the estimating department, and 90 percent of the time we do thanks to VERICUT."

> "Not all the tombstones are the same. They are different shapes with a variety of different fixtures and dimensions, so modelling them is essential to preserve the equipment. When you are rolling stuff around on 5 axis you have to be aware of everything.
>
> **John Madison,** Programmer

Going forward Dale, and King Machine's goals are to fill the current machining centers to capacity and manage a consistent growth rate. "We have enough space to continue at this rate for another couple of years," explains Dale. "After that we might need to expand on this site or find a larger building. When companies get larger they seem to let customer service falter. "We don't want to do business like that." King Machine focuses a lot of effort on customer satisfaction by supplying quality parts, on time, at the lowest possible cost. They take pride in actually answering the phone and email. "We are growing the business based on relationships and customer satisfaction," concludes Dale. "We want to do business the right way. We have no interest in selling out to a larger company. We are committed to growing this one and being a high quality, high precision shop with unbeatable customer satisfaction."

Source: CGTech

Ace Micromatic Group
Presents
THE MACHINIST SUPER SHOPFLOOR AWARDS 2020
Powered By MOTUL TECH

Cutting Tools Partner: TOTEM High Performance Cutting Tools
Associate Partner: igus
Supporting Partner: WE FIRE WARRIER ELECTRONICS

MACHIE BEATS 2020

With #SafetyAlways as its guiding principle, the sixth edition of The Machinist Super Shopfloor Awards was successfully and safely conducted on November 3 in Pune.

Yes, all the five editions of The Machinist Super Shopfloor Awards since the beginning in 2015 have been done in the month of May. But owing to the difficult circumstances that we are all aware of, it was just not possible to do it in the month of May or for the next five months after that in 2020. There were also talks about a virtual awards ceremony, but we knew that it would never come close to the charm or liveliness of an actual awards function. Having successfully concluded the Jury Meet physically in August, we had already set our eyes for a ground event. And as things started getting better and safer with Unlock 5.0, we decided to go ahead and organise a physical event.

The glorious day dawned on November 3rd in the great city of Pune; where else could we do it other than the manufacturing hub of India. That's where the best of Indian discrete manufacturing landed to get recognised, honoured as well as felicitated and take home the coveted Machie Trophy. Of course, it was only possible because of the industry's faith in this platform, which it has shown both by sending nominations as well as by joining us at the awards venue. Equal amount of gratitude goes to all our partners for their support to this coveted and robust industry platform. Not once did they blink their eyes and motivated us for the physical event. We are grateful to our Presenting Partner – the Ace Micromatic Group, our Powered by Partner – MotulTech India, our Cutting Tools Partner – Forbes & Company Ltd. with Brand Totem, our Associate Partner – igus India and our Supporting Partner – We-Fire. Thank you all. It would not have been possible without their support.

Full credit to all attendees, who adhered to all the required protocols related to safety, hygiene and social distancing. In fact, to maintain the protocol of social distancing, we divided the awards ceremony in two parts. The winners of the large enterprises were felicitated in the first half and the winners of the SME Segment were felicitated in the second half. The objective was to limit the number of people inside the hall as per Government regulations and thus ensure a safe environment for all.

The event started off with the auspicious traditional lamp lighting wherein we sought the blessings of the almighty. It was followed by the emotional opening remarks of Niranjan Mudholkar, Editor of The Machinist magazine and by the inspiring welcome address by T K Ramesh, Managing Director & CEO, Micromatic Machine Tools Pvt. Ltd.

One of the highlights of The Machinist Super Shopfloor awards function has been a brief but very en-

And the winners are…

Category	Large Enterprises Winner	Large Enterprises Runner Up	SME Indian Winner	SME MNC Winner
Digital Manufacturing	Hyundai Motor India Limited, Kanchipuram	Varroc Engineering Limited, Plant III, Chakan	Premium Transmission Private Limited, (Unit 1- Pune and Unit 4- Shendra)	Kalyani Rafael Advanced Systems Pvt. Ltd., Telangana
Covid-19 Innovation	Joint Winners - Tata Motors Limited, Dharwad & Tata Motors Limited, Sanand	No Runner Up	Airific Systems Private Limited, Noida	Duravit India Private Limited, Tarapur
Green Manufacturing	Jindal Stainless Limited, Jajpur	SKF India Limited, Pune	No Winner	Duravit India Private Limited, Tarapur
Safety	Bajaj Auto Ltd., Chakan	Varroc Engineering Limited-VIII, Waluj	Precision Camshafts Limited, Machine Shop, Solapur	Eaton Fluid Power Limited (EFPL), Pimpri
Human Resources	Case New Holland Construction Equipment (India) Pvt. Ltd., Pithampur	Faurecia Emissions Control Technologies India Pvt Ltd, Chakan, Pune	Roop Automotives Ltd, Sohna Plant	Steelcase Asia Pacific Holdings (I) Pvt Ltd., Chakan, Pune
Maintenance	SKF India Limited, Pune	Tata Motors Limited, Pune – CVBU	PPAP Automotive Ltd, Noida	Burckhardt Compression India Pvt. Ltd., Pune
Machining Excellence	Tata Motors Limited, Pune – CVBU	Jindal Stainless Limited, Jajpur	Cooper Corporation Pvt Limited, J1, Satara	Stanadyne India, Thiruvallur Plant
Supply Chain Management	Faurecia India Private Ltd., FIS Chakan Plant	Bombardier Transportation India Pvt. Ltd., Savli Site, Vadodara, Gujarat	Supreme Treon Pvt Ltd, Irungattukottai, Chennai	Stanadyne India, Thiruvallur Plant
Quality	Fiat India Automobiles Pvt. Ltd, Pune, Powertrain Division	Varroc Engineering Limited-VIII, Waluj	Precision Camshafts Limited, Machine Shop, Solapur	Argo-Hytos Private Limited, Coimbatore
Corporate Social Responsibility	Faiveley Transport Rail Technologies India Private Limited, Hosur	Jindal Stainless Limited, Jajpur	Roop Automotives Ltd, Sohna Plant	Argo-Hytos Private Limited, Coimbatore
Productivity	Joint Winners - India Yamaha Motor Pvt. Ltd., Surajpur Plant, and Bombardier Transportation India Pvt. Ltd., Savli Site, Vadodara, Gujarat	No Runner Up	Roop Automotives Ltd, Chennai Plant	Shangdong Heavy Industries India Pvt. Ltd., Hinjewadi
Innovation	Mahindra and Mahindra Ltd. – Two-Wheeler division, Machine Shop, Pithampur, Madhya Pradesh	India Yamaha Motor Pvt. Ltd., Surajpur Plant	No Winner	Stanadyne India, Thiruvallur Plant
Super Shopfloor of the Year	Tata Motors Limited, Jamshedpur	No Runner Up	PPAP Automotive Ltd, Noida	Automotive Axles Limited, Mysuru

gaging CEO Panel Discussion with a pertinent theme. This year's CEO panel discussion focused on 'Redefining leadership in the New Normal'. Moderated by Editor Niranjan Mudholkar, the esteemed panellists included Hemant Watve, Managing Director, WILO Mather and Platt Pumps Pvt. Ltd., Vikas Kadlag, MD, Morganite Crucible India Ltd., and T K Ramesh, Managing Director & CEO, Micromatic Machine Tools Pvt. Ltd. The discussion not only struck an emotional chord with the audience, but also inspired with insightful and honest comments.

Post the CEO panel Discussion, the awards ceremony for the Large Enterprises conducted with complete professionalism as well as discipline. The Machie Trophy for the Super Shopfloor of the Year 2020 in the Large Enterprises was won by Tata Motors Limited, Jamshedpur! The first half function was rounded off with a cool vote of thanks by Yatendra Kumar, Business Head, MotulTech India. It was followed by a safe and healthy lunch. The first half also set standards and the ball rolling for the Part 2 of the awards ceremony that happened in the second half with the felicitation of the winners of the SME segment as well as the People Award winners. The ultimate vote of thanks of the day was delivered by Rishi Sutrave, Brand Publisher, The Machinist magazine. All in all, it was a day that will be etched in the memories of all with golden letters!

People Award Winners 2020

Super Next Generation Leader
Nishant Jairath, *Director, Metalman Auto.*

Super Entrepreneur
Sulajja Firodia Motwani, *Founder and CEO of Kinetic Green and Vice Chairperson, Kinetic group*

Lifetime Achievement Award
Suresh KV, *Head of the ZF Group in India.*

Gold Partners

Supporting Partners

Industry Partner

TOWARDS AN ATMANIRBHAR BHARAT

The Machinist Aerospace & Defence Summit 2020 (ADS 2020), a virtual event with conference & exhibition that was organised on October 29-30, received overwhelming response from the industry

The Machinist magazine has successfully organising several events since 2015, including many on the virtual platform during the Lockdown Period. However, with the Aerospace & Defence Summit 2002, it was the first time that we have focussed on this all important sector. The Indian aerospace & defence manufacturing sector has seen exponential growth in the last few years. In this light, The Machinist Aerospace & Defence Summit 2020 (ADS 2020) aimed to bring together industry experts on one platform to deliberate on the growth opportunities while dealing successfully with the challenges. The theme of the event was 'Towards an Atmanirbhar Bharat'.

Today, the sector is on the verge of transformation, powered by important Government initiatives like 'Make in India' and 'Atmanirbhar Bharat' Abhiyaan (Self-reliant India campaign). Thus, ADS 2020 assumes substantial significance as an industry event. That is why we had the who's who of the industry participating on this platform that included a two-day conference as well as a five-day exhibition.

The event was obviously possible because of the strong support of our partners. The Gold Partners for ADS 2020 were Bharat Fritz Werner Ltd. (BFW) and ExxonMobil. The list of our Supporting Partners included Forbes & Company Limited, igus (India) Pvt. Ltd, LMW, SOLIZE India Technologies and Dassault Systèmes, Walter AG, DMG MORI India Pvt. Ltd. and WEFIRE. The industry partner was All India Association of Industries.

These partners were actively involved in the event through their respective virtual stalls as well, where the virtual visitors could discover some very useful and relevant solutions for their organisation. At these virtual stalls, delegates could learn what was useful for them through different mediums including a live chat. The event started off with the brief but interesting opening remarks of Niranjan Mudholkar, Editor, The Machinist magazine. He started off by talking about the inspiration that led to the conceptualisation of this event. "It was a simple looking but very meaningful quote from General Bipin Rawat, Chief of Defence Staff, Ministry of Defence. General Rawat said: "The industry must seize opportunities in defence manufacturing and make India net exporter of defence equipment." This thought that the Make in India initiative should be relooked with focus on import substitution, sustained domestic demand and creating global exports is quite motivating. Therein lie the roots of 'Atmanirbhar Bharat' as far as this industry is concerned. Today, irrespective of what our critics and rivals say, India is growing by leaps and bounds in its global stature. It is only natural that the national security challenges will rise proportionate-

> "While experiencing the enriching sessions at the Conference programme, the virtual delegates were also visiting the exhibition arena and were engaging with the partners of The Machinist Aerospace & Defence Summit 2020.

ly in the same direction. So far, India has always been one of the biggest importers of arms and ammunition, but the country's aspirations of becoming a formidable regional and economic power can no longer be dependent on arms import.

With an array of initiatives taken by the government of India to boost domestic defence sector, the time is now absolutely right for the industry to seize the opportunities and achieve strategic interdependence in defence manufacturing and make India a net exporter of defence equipment. And this cannot happen with only a few top players involved. This will require a robust ecosystem, and all components of this ecosystem must play their roles in taking the industry to the next level. This is also one of the thought processes behind the Aerospace & Defence Summit, the Editor explained

The Editor's remarks were followed by the quick and insightful welcome address by one of the esteemed partners, Ravi Prem, COO, Forbes & Company, who spoke about the growing significance of the industry.

The Machinist Aerospace & Defence Summit 2020 got off to an amazing start and the momentum was further built with the high-profile CEO Panel Discussion, where top industry leaders deliberated upon the event theme. The panel will be moderated by Editor Niranjan. The esteemed panellists included R Madhavan, Chairman & Managing Director, Hindustan Aeronautics Ltd (HAL), Dr DK Hota, Chairman & Managing Director, BEML Ltd, Dr Sudhir Mishra, MD & CEO, BrahMos Aerospace, S P Shukla, Group President-Aerospace & Defence, Mahindra Group, and William L. Blair, Chief Executive, Lockheed Martin India Private Limited.

> "Since the comprehensive list of the partners included major players from a wide ranging sectors like machine tools to cutting tools and software to lubricants as well as fire fighting systems to smart motion plastics, the exhibition arena at ADS 2020 was like a one-stop-shop for the virtual visitors.

The last session of Day one of the conference programme was an important presentation on 'Manufacturing Solutions for Aerospace/ Defence Segments'. The presentation was delivered by a veteran from the machine tools industry –Praful Shende, the Chief Sales and Marketing Officer at BFW.

After a very successful Day One, The Machinist Aerospace & Defence Summit conducted an equally exciting and energising Day Two Conference Programme. Since the CEO Panel Discussions at The Machinist events are truly special, for this event we planned not one but two of them. As always, we had a brilliant line up of speakers for this panel, which was moderated by Editor Niranjan Mudholkar. The amazing line up of esteemed panellists included Ashok Wadhawan, Head Land Systems, Adani Enterprises, Pavan G Ranga, Managing Partner, NR Group & CEO, Rangsons LLP, Rajeev Kaul, MD & CEO, Aequs Aerospace, G K Pillai, Director, Walchandnagar Industries Ltd., and Sunil Rao, MD, DMG Mori India.

The energetic CEO panel discussion was followed by an inspiring fireside chat with a seasoned campaigner from the Indian aerospace & defence manufacturing segment. Surendra Vaidya, Executive Vice President & Business Head, Godrej Aerospace engaged in a very stimulating one-on-one session with Editor Niranjan Mudholkar. The discussion focussed around the challenges and trends in the aerospace & defence sector from the manufacturing perspective. Vaidya made the chat very interesting and relevant by sharing pertinent experiences. The conference session was signed off with the vote of thanks by Rishi Sutrave, Brand Publisher, The Machinist.

While experiencing the enriching sessions at the Conference programme, the virtual delegates were also visiting the exhibition arena and were engaging with the partners of The Machinist Aerospace & Defence Summit 2020. Since the comprehensive list of the partners included major players from a wide ranging sectors like machine tools to cutting tools and software to lubricants as well as fire fighting systems to smart motion plastics, the exhibition arena was like a one-stop-shop for the visitors.

Amazing line-up of speakers at ADS 2020

Welcome Address
Ravi Prem, *COO, Forbes & Company Ltd*

CEO Panelists – Day One
R Madhavan, *CMD, HAL*
Dr DK Hota, *CMD, BEML Ltd*
Dr Sudhir Mishra, *MD & CEO, BrahMos Aerospace*
S P Shukla, *Group President-Aerospace & Defence, Mahindra Group*
William L. Blair, *Chief Executive, Lockheed Martin India Private Limited*

Partner Presentation – Day One
Praful Shende, *Chief Sales and Marketing Officer, BFW*

CEO Panelists – Day Two
Ashok Wadhawan, *Head Land Systems, Adani Enterprises*
Pavan G Ranga, *Managing Partner, NR Group & CEO, Rangsons LLP*
Rajeev Kaul, *MD & CEO, Aequs Aerospace*
G K Pillai, *Director, Walchandnagar Industries Ltd.*
Sunil Rao, *MD, DMG Mori India*

Fire Side Chat – One-on-One session – Day Two
Surendra Vaidya, *Executive VP & Business Head, Godrej Aerospace*

By Bill Butcher

EMPOWERING THE WORLD'S MACHINE ENGINEERING

Machine manufacturers must build smarter machines to compete globally with shrinking margins, expanding customisation and environmental and government regulations.

A recently published Siemens' ebook discusses how engineering is evolving from traditionally engineered products to digitally simulated designs. Consumers are demanding customisation to meet complex, specific needs for their products. Subsequently, a customer's machinery must support the need for flexible, smart connected machines via the Internet of Things (IoT).

Advanced machine engineering ensures the development of these next-generation machines, and a digital twin provides the machinery to excel in an industry that is demanding customisation. Moreover, collaborating with multiple disciplines allows these smart connected machines to reduce the time to market using virtual design and commissioning. This process results in improved validation, shorter commissioning times and faster productivity, leading to more significant innovation in highly competitive global markets.

Also, advanced capabilities are now available to manage the entire bill of materials for all options and variants for advanced machine builder support throughout its product life – from the engineering design through manufacturing and service life.

So, machine manufacturers must build smarter machines to compete globally with shrinking margins, expanding customisation and environmental and government regulations. Advanced machine engineering delivers a digital thread for engineering, enabling companies to develop sophisticated machines more rapidly while lowering development, production and operational costs.

Therefore, advanced machine engineering enables early design simulation of multi-disciplinary models for extensive use of innovative manufacturing automation technologies. Its sophisticated design solutions effortlessly support complex, optimised models for a considerable increase in design flexibility.

Advanced machine engineering delivers a multi-disciplinary, synchronized engineering platform to provide thousands of features and requirements, allowing for numerous configurations. It ensures constant, multi-disciplinary innovation that empowers a global collaboration to access new market geographies successfully with less cost.

Peek into the ebook

Machine Engineering is very complex and dynamic. Digitalisation processes and increasing software integration in the machines themselves has completely transformed the way industrial machines are designed, developed, manufactured and commissioned.
To help navigate through this journey Siemens has created an E-Book that gives you a quick overview of the most significant tendencies that will drive the change in the machine engineering market and explain how Siemens Advanced Machine Engineering can provide the information and the tools needed to be prepared for the future of machine design.

Siemens Digital Industries Software is driving transformation to enable a digital enterprise where engineering, manufacturing and electronics design meet tomorrow.

The Xcelerator portfolio in Siemens Digital Industries Software suite of products provides a full suite of solutions to empower machine builders and suppliers with the essential tools to thrive in their highly competitive market and transition seamlessly to create tomorrow's machinery today.

Learn more information in the eBook at this link: https://www.plm.automation.siemens.com/global/en/resource/4-trends-advanced-machine-engineering/87638 or visit siemens.com/software

HOW DOES INDUSTRY 4.0 IMPACT TRADITIONAL MANUFACTURING?

A global cutting tool manufacturer has begun to incorporate Industry 4.0 within its production processes and is working one of the world's leading data analysis companies, on several key projects.

Industry 4.0 is a widely discussed topic, with artificial intelligence (AI), big data and machine learning a key element of current developments. But what do these digital activities mean and how will they impact traditional manufacturing?

Dormer Pramet, the global cutting tool manufacturer, has begun to incorporate Industry 4.0 within its production processes and is working with IBM, one of the world's leading data analysis companies, on several key projects. This includes using large amounts of data to map the value chain throughout every department of its production unit in Sumperk, Czech Republic, and incorporating computer software to identify defects in tools during the early stages of manufacture.

Dormer Pramet is working with IBM to evaluate key stages of its production processes to further improve the quality of its cutting tools.

In the first project, Dormer Pramet used advanced algorithms and statistical methods to track every indexable product order from the last two years and how the item moved through the production unit, creating a network model of the entire factory. This model has described how the machines interacted with each other and showed how any process disruptions, such as unscheduled machine downtime, can spread through the entire system. It identified critical points in the process where small issues can cause major inefficiencies later. All were ranked by severity to help focus where improvements were needed to optimize performance and achieve the greatest impact.

In the second phase of the project, Dormer Pramet looked at the definition of the metrics that quantified as an issue, such as quality, maintenance downtime or compliance with the production plan. These metrics were again analysed to identify further areas of operational change and suggest specific improvements.

Meanwhile, Dormer Pramet is using an IBM inspection station, implemented within a pressing machine, to scan inserts using a series of cameras, lights and moving mechanical elements. This is during the first phase of the production process and can help improve the quality of its products at the very beginning of manufacture. An automatic machine image recognition is performed to locate, as well as identify the type and severity of the defect. This detection uses artificial neural networks – a computerised model which improves performance over-time. Therefore, its success depends on the accuracy of the recognition. This accuracy is influenced by the number of defect images and their variability which are inputted into the system. By adding as many examples and information as possible will continuously help to teach the machine what is right and what is wrong on a product. This not only increases the accuracy of recognition, but helps to detect less obvious defects, reduce false alarms and identify problem characteristics.

All these digital elements and projects aim to enhance Dormer Pramet's existing high standards of manufacturing capabilities, built on a century of knowledge and expertise. It will use them to further improve its production processes, increase quality of cutting tools, reduce waste and advance the service provided to customers.

Each of these elements form part of the company's 'Make the Shift 2030' activities which have been established to help create a more sustainable business.

For more information, visit www.dormerpramet.com

64 PER CENT WEIGHT SAVED!

New cost-effective drylin telescopic rail made by injection moulding ensures easy extension

The world's first polymer telescopic rail from igus demonstrates what 100 per cent plastic can do. It is light, quick to assemble and, thanks to injection moulding, cost-effective. With it, amongst other things, drawers, seats and headrests can be easily pulled out and adjusted. For this, igus relies entirely on its durable and wear-resistant high-performance polymers. Available in three colours, the new drylin rail also adapts visually to the respective environment.

In aeroplanes, cars, trains or furniture construction, it is not only the durability of the components that is important, but above all their lightweight property and quickly assembly. This is why igus has now developed a telescopic guide completely made of high-performance polymers. With the drylin NT series, igus already successfully carries telescopic guides made of aluminium and polymer, which glide smoothly and evenly due to the use of tribologically optimised high-performance polymers, in its range. However, every gram counts in seat adjustments or drawers in aircraft and cars. "That's why we have now developed the first telescopic guide completely made of high-performance polymer. Compared to the drylin NT-35 telescopic rail, it is 64 per cent lighter with the same extension length," explains Stefan Niermann, drylin Drive Technology Division Manager. "If we replaced metal rails in six drawers each of ten kitchen containers with our new polymer telescopic rails on board an aircraft, the weight of the containers would be reduced by eleven kilograms, saving over 33 tons of fuel in an Airbus A340-400 in 20 years of operation." Another advantage of the new polymer guide: no rolling balls are used. External lubricants are not necessary. The corrosion-resistant guides are therefore also suitable for use in hygienic areas such as packaging or medical technology.

"EVERY GRAM COUNTS IN SEAT ADJUSTMENTS OR DRAWERS IN AIRCRAFT AND CARS. THAT'S WHY WE HAVE NOW DEVELOPED THE FIRST TELESCOPIC GUIDE COMPLETELY MADE OF HIGH-PERFORMANCE POLYMER. COMPARED TO THE DRYLIN NT-35 TELESCOPIC RAIL, IT IS 64 PER CENT LIGHTER WITH THE SAME EXTENSION LENGTH."

STEFAN NIERMANN, drylin Drive Technology Division Manager.

With the new cost-effective polymer telescopic rails from igus, up to 64 per cent weight can be saved.

The right solution for every application

The new polymer telescopic rail has a length of 150 millimetres and can be extended by a further 150 millimetres. Thanks to a snap-on hook system, the guide is quickly and intuitively mounted and ready for installation. The drylin polymer telescopic rail is available in white, light grey and dark grey, allowing it to be adapted to the respective environment. Other colours and extension lengths are available on request. In addition to the new polymer telescopic rail, igus offers its drylin NT telescopic rails with a width of 35 and 60 millimetres for higher loads. They allow a continuous extension of up to 1200 or 2000 millimetres. For the drylin NT telescopic guides, igus relies on guide rails made of hard anodised aluminium, which have a high rigidity.

For more information, contact: Vinayak Shetty, Product Manager - drylin®, igus (India) Private Limited, Email: vinayak@igus.net, or visit www.igus.in

UPDATE

ZF ENHANCES ITS PORTFOLIO WITH WABCO ACQUISITION

Building on its recent acquisition of WABCO, ZF is accelerating the development of its product and systems portfolio to enable intelligent commercial vehicles. This includes an industry-first autonomous trailer coupling function and energy-saving truck-trailer combination. EU requirements for manufacturers to reduce new commercial vehicle CO2 fleet emissions by 15 percent before 2025, increasing to 30 percent by 2030, makes ZF an invaluable partner to the commercial vehicle industry as demand for electric drive trains in buses and trucks grows exponentially. In addition, the EU requires new driver assistance systems approvals from 2022 and, from 2024, for new registrations to include advanced blind spot warning systems. With this integration of WABCO's leading advanced driver assistance and fuel-efficiency systems into its existing technology range, ZF is demonstrating the advantages of a complete and unique product portfolio for trucks, buses and trailer OEMS as well as fleets.

NEW LOW-COST LASER CUTTING MACHINE

The Machine cuts a variety of materials and thicknesses with the flexibility of fiber laser, has low operating and maintenance costs, and provides a quick return on investment.

LVD now offers YSD LaserONE, a new cost-effective laser cutting machine designed to put the advantages of fiber laser technology within easy reach of sheet metal fabricators by eliminating the extras that increase machine cost and complexity. LaserONE is offered with a 2- or 4-kW laser power source in a 3000 x 1500mm table size and with optional Load-Assist automation.

Ultra practical

Developed to address the market need for a truly low-cost, ultra-practical fiber laser cutting machine, LaserONE is designed, manufactured, sold and serviced by LVD. Engineered and tested by LVD Company in Belgium to function as a reliable and efficient machine LaserONE cuts a variety of materials and thicknesses with the flexibility of fiber laser, has low operating and maintenance costs, and provides a quick return on investment.

The machine features a Precitec cutting head with NC-focus, automatic focal adjustment and crash protection, Raycus laser source, Siemens control, servo motors and drives. The YSD LaserONE is equipped with an automatic pallet changer for fast interchanging of the shuttle tables in a cycle time of approximately 30 seconds. An optional Load-Assist automation system offers easy loading/unloading.

The YSD brand

YSD is an established brand owned and used by one of LVD's joint venture companies. The YSD brand was founded in 1958 and is recognized for providing good value by balancing machine functionality and price point. The YSD LaserONE will make its debut at LVD's INSIGHTS 2020 in Virtual Tech Sessions.

For more information, contact: Kurt Van Collie, Laser Product Manager, LVD Company nv, E-mail: kurt.vancollie@lvdgroup.com, or visit www.lvdgroup.com

UPDATE

DP TECHNOLOGY TO BE ACQUIRED BY HEXAGON AB

DP Technology Corp. has signed an agreement to join Hexagon AB's smart manufacturing portfolio in a strategic acquisition that will bring the best of smart manufacturing to a wider customer base.

Headquartered in Stockholm, Hexagon serves a multitude of ecosystems with its sensor, software, and autonomous solutions—from manufacturing and industrial facilities to mining, agriculture, autonomous mobility, public safety, construction, and more. The ESPRIT CAM system will be included in Hexagon's Manufacturing Intelligence division. "This is a natural fit, because manufacturing intelligence is exactly what ESPRIT is all about," says Paul Ricard, Co-Founder and President of DP Technology "Ultimately, their acquisition of ESPRIT allows us to better serve our customers."

"The global reach of Hexagon will allow us to expand our brand and to accelerate the evolution of our products based on the needs of manufacturers around the world," says Dan Frayssinet, Co-Founder and CEO of DP Technology.

The ESPRIT mission—to deliver powerful solutions to the world to drive automation in manufacturing—is synchronous with Hexagon's mission of putting data to work to enable autonomous, connected ecosystems that boost efficiency, productivity, and quality for their customers. "As we are integrated into Hexagon, we will see a magnification of the qualities that make ESPRIT an industry leader, especially those most valued by our customers. Leveraging the strengths of a multinational company, we will achieve greater velocity in the expansion of our products and services on the global CAM marketplace." says Chuck Mathews, Executive Vice President of DP Technology.

"ESPRIT partners, resellers, and end users can expect a smooth transition and significant synergies that will produce faster growth and greater opportunities," says Philippe Albert, Vice President of International Sales and Director of European Operations for DP Technology.

"We recognize that our industry relationships, as well as the quality of our products and services, have been foundational to our success," says Don Davies, Vice President of the Americas for DP Technology. "ESPRIT will continue to offer the best product, the best post processors, and the best support and service in CAM. ESPRIT has always had a strong future, and the acquisition by Hexagon will only strengthen our offerings for our resellers, partners, and customers."

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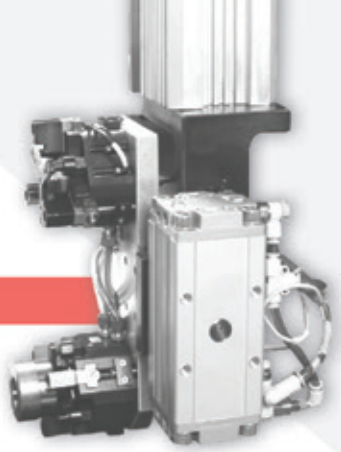

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