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ULTIMATE GUIDE TO PROFITABLE MANUFACTURING

# THE MACHINIST

RNI No 71129/98

Volume 17 Issue 2 • February 2022 • Rs 75

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## BUDGET

AUTOMOTIVE INDUSTRY  
GETS A BIG BOOST

## SUSTAINABILITY

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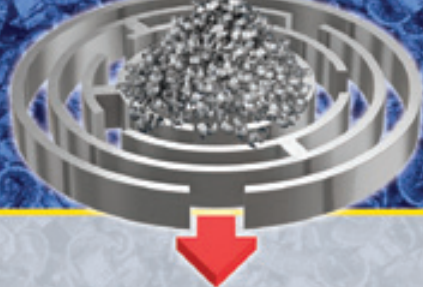


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Alain SPOHR, Managing Director, Alstom India

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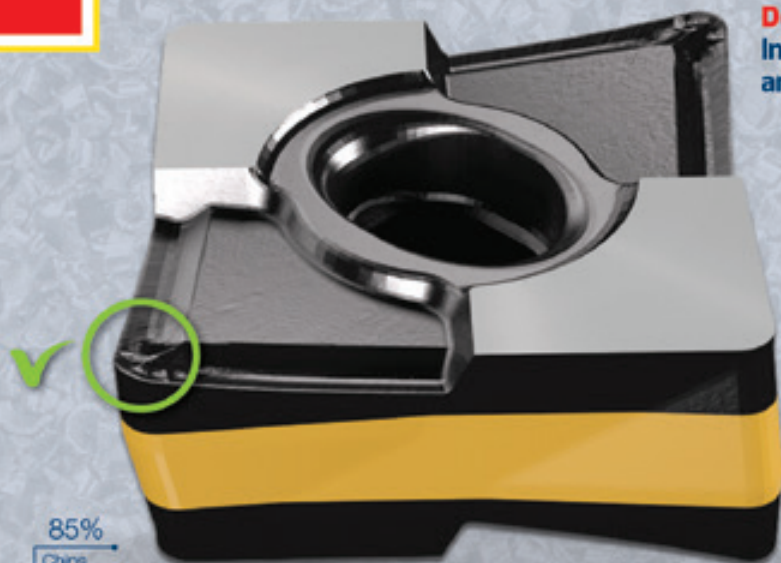
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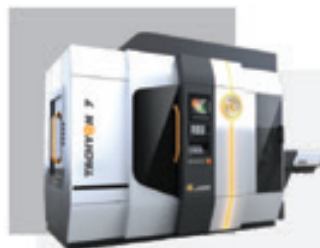


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## BUDGET BOOSTER DOSE: REVIVING THE INDIAN ECONOMY

It is highly encouraging that the Union Budget seeks to lay the foundation and give a blueprint of the economy over 'Amrit Kal' of next 25 years - from India at 75 to India at 100. Effective capital expenditure of the Government is estimated at Rs 10.68 lakh crores in 2022-23, about 4.1% of GDP, revised fiscal deficit estimated at 6.9% of GDP as against 6.8% in Budget estimates and fiscal deficit for FY 2023 is estimated at 6.4%. The Machinist is hopeful that fiscal consolidation will be in line in the coming years.

The Machinist appreciates that the PLI Scheme in 14 sectors has received the excellent response 'Make In India' can create six million new jobs seek to lay the foundation for the next 25 years.

It is encouraging that the Emergency Credit Line Guarantee Scheme has helped 130 lakh MSMEs mitigate the worst impact of the pandemic. In this regard, an extension of the ECLG Scheme up to March 2023 along with an extension of guaranteed cover by another Rs 50,000 crore, bringing the total cover under the scheme to Rs 5 lakh crore now, is highly appreciable.

It is highly appreciable to note that the IT, Defence and R&D will be opened up for industry and startups and 68% of the capital procurement budget in defence will be earmarked for the domestic industry in 2022-23. This will provide a great boost to the industrial development in the country.

To catalyse the overall investments in the economy, an allocation of Rs 1 lakh crore has been made to assist the States for FY 2022-23. These 50-year interest-free loans are over and above normal borrowings allowed to States and will be used for PM Gati Shakti-related and other productive capital investments of States.

That said, in this edition, we have Mr Alain SPOHR, Managing Director, Alstom India from Alstom on the cover. In an exclusive interview, he talks about Alstom's contribution to India's GDP and going forward, how it aspires to positively influence the Indian market with their products and operations. Also covered in the edition is coverage on how the current union budget presented by India's finance minister would boost the manufacturing sector, which includes sunrise sectors like Drones.

To sum up, this edition covers a range of topics from warehouse automation, digital technology, sustainability to refractories. I hope you enjoy this reading this edition as much as we enjoyed putting it together. Do share with us your opinions, comments and thoughts at [Rahul.kamat@wmm.co.in](mailto:Rahul.kamat@wmm.co.in)

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Printed and published by Sunil Wuthoo for and on behalf of owners Worldwide Media Pvt Ltd (CIN:U22120MH2003PTC142239), The Times of India Building, Dr DN Road, Mumbai 400001. Printed at Print Plus Pvt Ltd, 212, Swastik Chambers, ST Road, Chembur, Mumbai- 400 071.

Editor: Rahul Kamat. Published for February 2022.

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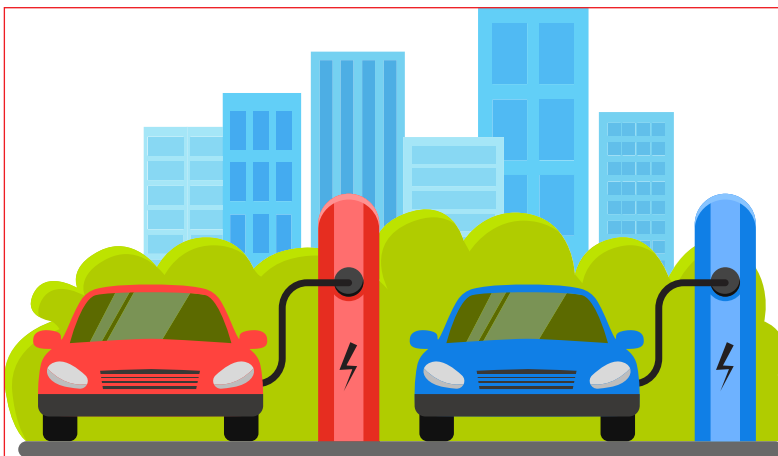
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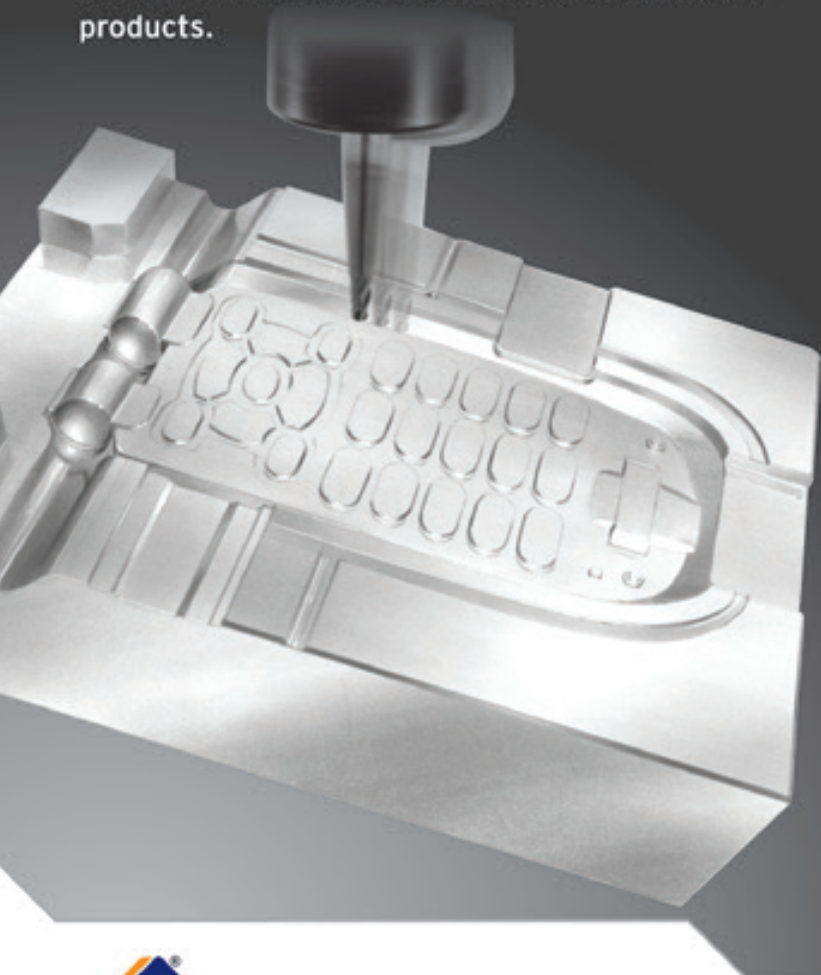
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YOUR GLOBAL CRAFTSMAN STUDIO

## Godrej Process Equipment builds its largest equipment Visakhapatnam Refinery



**GODREJ & BOYCE** announced that its business Godrej Process Equipment delivers a critical LC Max Vacuum Tower to a Refinery Modernization Project in Visakhapatnam, Andhra Pradesh.

The Supersized equipment with a diameter of 9,600 mm is the largest equipment manufactured by Godrej Process Equipment. This Tower weighing

approximately 700 tonnes and 65 metres in length will be deployed at a Residue upgradation Facility in Vishakapatnam, Andhra Pradesh to convert the heaviest Crude oils into high-quality BS-VI fuel while simultaneously increasing feedstock and product flexibility. This refinery up-gradation will process an additional 80,000 barrels of crude oil per day.

The Vacuum Tower has been manufactured and supplied from Godrej & Boyce's state-of-the-art, coastal manufacturing facility located in Dahej, Gujarat through its self-owned Sea-going jetty which enables handling of large oversized consignments.

**Hussain Shariyarr, Senior Vice President & Business Head, Godrej Process Equipment** said, "We are delighted to deliver the LC Max Vacuum Tower along with other fractionator columns & high-pressure vessels for the Hydrocracker unit which is one of the most critical units in a refinery. In line with our philosophy of continual improvement and capacity advancement, we have set another benchmark for us by manufacturing this tower with a 9.6 m diameter that's the maximum by Godrej so far. In addition to supplying this Key equipment for the refinery, the execution of this order is yet another contribution in achieving the goal of "Aatmanirbhar Bharat."

## JSW Group joins the World Business Council for Sustainable Development

**JSW GROUP**, one of India's leading business houses, has joined over 200 forward-thinking companies as the newest member of the World Business Council for Sustainable Development (WBCSD). JSW will be represented in WBCSD by Seshagiri Rao, Joint Managing Director and Group CFO, who also sits on the Board of Directors of JSW Steel. He will also take part in the WBCSD CFO network, which is driving higher ESG performance within companies, and more effective disclosure to capital markets.

The JSW Group is a \$13 billion multinational conglomerate headquartered in India. JSW's innovative and sustainable presence in various sectors including steel, energy, infrastructure, cement, paints, venture capital, and sports is helping the Group play an important role in driving India's economic growth. The Group strives for excellence by leveraging its strengths and capabilities including a successful track record of executing large capital-intensive and technically complex projects, differentiated product mix, state-of-the-art manufacturing facilities, and a greater focus on pursuing sustainable growth.

## Waters Corp tops Human Rights Campaign Foundation's CE Index

**WATERS CORPORATION** announced that it received a score of 100 on the Human Rights Campaign Foundation's 2022 Corporate Equality Index (CEI), the nation's foremost benchmarking survey and report, measuring corporate policies and practices related to LGBTQ+ workplace equality.

"We are incredibly proud of the progress and achievements we've made towards creating an inclusive workplace where diversity in all forms can thrive — but our work is not done," said **Dr Udit Batra, Waters President and CEO**. "We will continue to challenge ourselves as an organization and expand our efforts to support and advocate for inclusivity within and beyond the walls of our labs and offices and out into our communities around the world."

The company recently hired a new head of Diversity, Equity, and Inclusion to continue helping Waters reach its ultimate goal of being representative of the society we live in. In 2022, Waters will continue to build on its internal and external programs and initiatives that have contributed to the recognition of Waters as one of the Best Places to Work for LGBTQ+ Equality. These programs include growing a Supplier Diversity Program that incorporates more diverse suppliers such as minority and veteran-owned businesses in all corporate contracting and procurement initiatives and diversifying employee recruitment initiatives.

The results of the 2022 CEI showcase how 1,271 U.S.-based companies are not only promoting LGBTQ+-friendly workplace policies in the U.S. but also for the 56 per cent of CEI-rated companies with global operations who are helping advance the cause of LGBTQ+ inclusion in workplaces abroad. Waters' efforts in satisfying all of the CEI's criteria earned a 100 per cent ranking and the designation as one of the Best Places to Work for LGBTQ+ Equality.







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# Mobil™

## Hitachi Energy achieves 100% fossil free electricity in own operations

**HITACHI ENERGY** has achieved the first-step target set out in its Sustainability 2030 plan – the use of 100 per cent fossil-free electricity in its operations. The company is driving towards being carbon-neutral in its operations by 2030, in line with its Purpose, ‘Advancing a sustainable energy future for all’.

“By achieving 100 per cent fossil-free electricity in our operations, we have reduced our CO2 equivalent emissions by over 50 per cent compared to 2019,” says **Claudio Facchin, CEO of Hitachi Energy**.

The targeted 50 per cent reduction achieved ahead of the plan will amount to approximately 175 kilotonnes of

CO2e per year, equivalent to removing over 35,000 passenger cars off the road.

To achieve 100 per cent fossil-free electricity in its operations – and in support of the Hitachi Group’s carbon-neutrality goal – the company has pursued several pathways including supporting projects to generate its fossil-free electricity, such as installing solar roof panels combined with e-mesh™ digital solutions for distributed energy resources maximizing energy efficiency and minimizing CO2 emissions.

In its Zhongshan factory in China, the company is generating nearly 20 per cent of its total energy consumption from solar panels. In its first year of operation, the power generated at the

factory is expected to reach 1,510 MW, contributing to the reduction in annual carbon emissions by more than 1,000 tonnes.

Hitachi Energy has also switched to green tariffs, bought Energy Attribute Certificates (EACs), and signed Power Purchase Agreements (PPAs) across its operations and facilities in 90 countries.

Looking ahead, Hitachi Energy is continuing to invest in its journey towards carbon-neutrality by further increasing energy efficiency, as well as electrifying its own operations. In Ludvika, Sweden, the company is now using 100 per cent renewable electricity generated from hydropower and from solar panels to support its operations.

## Log9 Partners with SpareIt to Launch Battery Replacement and Retrofitment Model



**BENGALURU-HEADQUARTERED** advanced EV battery technology startup Log9 Materials has launched a one-of-its-kind battery replacement and retrofitment model in partnership with SpareIt – India’s largest garage network platform. As a part of this long-term collaboration, SpareIt will offer its pan-India extensive garage network for vehicle integration with Log9’s InstaCharging battery packs.

This battery replacement and retrofitment service will be rolled out across various cities/towns wherever SpareIt support is available and will be made available, to both individual owners and fleet aggregator companies.

Any EV 2W or 3W owner having a vehicle with issues due to the battery can reach out to SpareIt or Log 9’s teams and easily get access to Log 9’s next-age battery replaced in their vehicles through SpareIt. On the other hand, since fleets have a larger EV deployment, Log9 and SpareIt simultaneously expects larger volumes from fleet aggregator companies to turn up for retrofitment, and will together continue to support electrification via retrofitment of fleets as well through their newly-formed partnership.

## Drones industry gets a big boost in Union Budget

### AFTER LIBERALISING DRONE RULE IN 2021,

the union government has given a big boost to the drone industry in the current union budget. “Startups will be promoted to facilitate ‘Drone Shakti’ through varied applications and for Drone-As-A-Service (DrAAS),” Union finance



minister Nirmala Sitharaman while presenting her fourth budget. She added, “Use of ‘Kisan Drones’ will be promoted for crop assessment, digitization of land records, spraying of insecticides, and nutrients.”

“Focus on and support for forward-looking technologies such as digital currency, 5G, EVs and use of drone technologies as laid out in the budget will help the country in its progress during the “Amrith Kaal,” said **Yezdi Nagpurewalla, CEO Designate, KPMG**.

According to **Amit Sinha, Co-Founder, Unnati**, “Budget has a strong focus on agriculture with a specific focus on the delivery of high tech services, funding of startups through NABARD, focus on “Drone Shakti” for farmers, and climate action. There is a good balance of the short term and long term measures. It’s very forward-looking with a long-reaching impact on how Agriculture will grow in India. These initiatives will solve the core problem of improvement of farm productivity and help improve farm incomes significantly.”

“GoI’s announcements of promotion of drone-based intervention in pesticide spraying, digitisation of land records and crop assessment are steps towards mechanisation of farms and improvement in productivity,” said **Sabyasachi Majumdar, Senior Vice President & Group Head - Corporate Ratings, ICRA Ltd**.

According to **Shivendra Singh, Founder and CEO, Barton Breeze**, “Use of technologies for farmers like drones indicate ‘forward-looking policy’ thinking of the Government. This will help improve farmers’ income and drive up consumption in the long term. The focus on AgriTech will help in the inclusion of new-age technology in the Agri sector in India.”

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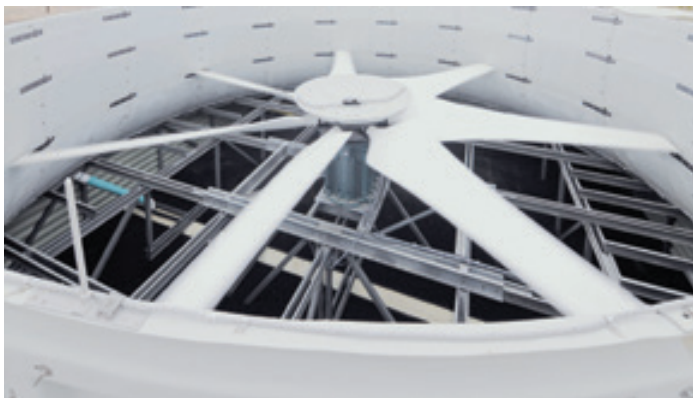
 **WALTER**

## ABB's HVAC solution cuts down JW Marriott's energy losses by 35%

### HEATING, VENTILATION AND AIR CONDITIONING (HVAC)

consume an average of about 50 per cent of the energy in buildings. By installing ABB's Cooling Tower Direct Drive solution in its hotel, JW Marriott Pune has set new benchmarks in energy efficiency, saving about 35 per cent energy annually. Energy saved in a day with ABB's direct-drive solution can charge an electric car to run for approximately 1,500 km.

A cooling tower is a key component of many refrigeration systems and can be used to provide comfort cooling for large commercial buildings like airports, schools, hospitals, and hotels. Energy is consumed in driving the fan, or fans, necessary to achieve proper air movement through a cooling tower. ABB's direct-drive solution offers the benefits of variable speed control and eliminates



the cost and maintenance required for traditional gearboxes or belted solutions.

The fan couples directly to the motor and is controlled by a unique AC drive to provide optimal speed and cooling tower performance that runs quieter with reduced energy consumption. The solution also provides a Quick Start Assistant, making start-up simple.

"When we aim to reduce energy consumption, every possible way to conserve energy must be evaluated,

and the most energy-efficient technologies and practices must be implemented. Buildings offer huge scope in energy optimization and have a great potential in shaping our sustainable future. Investing in energy-efficient technologies can bring both economic and environmental benefits," said **Sanjeev Arora, President, Motion**

### business, ABB India.

World over, buildings consume over 30 per cent of the global energy consumption. For half a century, ABB has been leading the way in optimizing HVAC systems in buildings, using drive control technologies. The group actively contributes to a more sustainable world, leading by example in its operations and partnering with customers and suppliers to enable a low-carbon society, preserve resources, and promote social progress.

## Hikvision announces technology integration with Irida Labs

**HIKVISION, AN IOT SOLUTION** provider with video as its core competency, announced a new technology partnership with Irida Labs, a vision AI solution provider from Europe, to integrate its IP cameras and HikCentral software with Irida Labs' PerCV.ai Industry 4.0 Package. The integration provides intelligent vision AI solutions for manufacturing and logistics sectors to manage warehouses and plants in real-time.

Utilising the Hikvision Intelligent Security API (ISAPI) protocol and Embedded Open Platform Program (HEOP), the integration allows the PerCV.ai algorithm to run inside Hikvision DeepInView camera series for edge processing. Operators can easily monitor manufacturing and logistics processes using PerCV.ai Industry 4.0 Package user interface.

The combination of video, AI, and edge computing empowers real-time pallet and parcel monitoring, product inspection, forklift and truck monitoring, personal protective equipment (PPE) detection, and critical equipment interaction monitoring. The real-time AI-powered analytics also enables actionable business and process insights.

"We are excited to join the Hikvision Technology Partnership Program (TPP). Now, our AI vision software PerCV.ai supports Hikvision DeepInView cameras and HikCentral software through this program," says **Vassilis Tsagaris, CEO at Irida Labs**. "We would like to thank Hikvision for working closely and supporting our team during the last few months, making this integration truly added value for our customers."

"The combination of the AI-enabling camera platform and the intelligent algorithm of PerCV.ai makes a strong and flexible package for the users. With solutions like this, staff safety and warehouse processes are taken to a new level," added **Adler Wu, Global Technology Partner Alliance Manager, Hikvision**.

## Godrej & Boyce wins Rs 550 crore orders

**GODREJ & BOYCE MFG. CO. LTD** has secured orders of over Rs 550 crore in the power transmission business. The orders comprise 400kV New AIS substations, 220kV New GIS substations, 220kV transmission lines and 220kV underground cables in the domestic T&D market.

**Raghavendra Mirji, Senior Vice President & Head – Power Infrastructure & Renewable Energy (PIRE), Godrej Electricals & Electronics** says, "We are enthused to have secured new orders amidst the challenging times. The current orders further strengthen our presence in Domestic T&D Market. With these orders, G&B has expanded its portfolio in EHV substation & transmission line projects across India."

Godrej & Boyce has been delivering a range of equipment, solutions and services aimed at driving efficient energy management across the industry value chain. Godrej Electricals & Electronics, a business of Godrej & Boyce, forayed into the Power Transmission business in 2010 and has successfully commissioned several EHV substation projects up to 400kV across all territories in India, and further aims to consolidate its position in 400kV & above segment.

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## Covestro expands its production capacity at Greater Noida

**COVESTRO** recently inaugurated its new production lines for polycarbonate compounding at their Greater Noida Plant in India. Through its advanced capabilities, the company offers one of the broadest product portfolios and industry-leading solutions to enhance its customer service. To meet the demands and to support the 'Make in India' movement, Covestro planned this expansion in India. This high-tech plant was recently put into operation.

The plant has undergone several de-



bottlenecking exercises in the past and as of 2017, it was able to support about 50 per cent of the domestic requirements,

while the remaining capacity was supported from Map Ta Phut Site in Thailand. To build a resilient business, the capacity expansion project was initiated in the year 2017.

This is the first large-sized project in India after Covestro was carved out from Bayer in the year 2015. With the installation of the two new lines, the capacity more than doubled for polycarbonate compounding at the Indian plant. This is the first project across all Covestro sites globally to implement the Compounding Blue Print concept.

## Ruchira Green Earth expands portfolio of its AKIRA Li-ion EV Batteries

**RUCHIRA GREEN EARTH**, a leading company providing revolutionary lithium battery storage solutions is now enhancing the product portfolio of AKIRA eco-friendly Li-ion EV Batteries to capture a sizeable market share of Lithium-ion batteries in India. It produces high-quality Li-ion EV batteries equipped with all the safety features to protect the battery and the vehicle.

Designed exclusively for Indian weather conditions, AKIRA Li-ion EV batteries are capable of managing increasing volatility. As the electric vehicle segment in India has come a long way, the market has shifted to slow speed to high speed, the demand for more reliable and high-performance Li-ion batteries has increased and in this segment, Ruchira Green Earth has already established itself as the frontrunner. Even during the pandemic induced downturn in the industry, Ruchira Green Earth has registered a considerable net profit.

**Deepan Garg, Director, Ruchira Green Earth** said, "Our manufacturing facility is equipped with state-of-the-art machinery and technology so much so, we have acquired the potential to customise the Li-ion batteries for the bigger OEMs to cater to their specific needs. Committed to making a difference in the industry, we are advancing the technology and producing EV batteries for all the segments of EVs. Our product range has created an edge over others due to their unique energy-storage technology and excellent energy and power capabilities."

'AKIRA' has stirred up even more interest in electric vehicles, a segment of the auto sector that has already been abuzz with activity. Providing sustainable, secure and eco-friendly power AKIRA eco-friendly Li-ion EV batteries range include e-auto batteries, E-Scooter Batteries and e-cycle batteries, among others.

Available in a wide range of models in 2W and 3W power categories 'AKIRA' Li-ion EV batteries are equipped with cutting edge latest technology and easy to install features. Aimed at providing extraordinary performance with longer life, these sturdy EV batteries last long while they get fully charged quickly.

## Six airbags mandatory in all cars sold from October 1: Transport Ministry

**THE GOVERNMENT** has begun the process of making six airbags mandatory for all cars being sold in India from October 1 this year. On Friday, the government issued a draft notification seeking comments from the public and other stakeholders on the proposed rule that will make it mandatory for car manufacturers to provide for six airbags from 1 October. The comments received over the next month will be reviewed by the government and a final notification, with modifications if any, will be issued to implement the rule.

Friday's notification is a follow-up to Union transport minister Nitin Gadkari appeal to car manufacturers on 3 August last year to provide a minimum of 6 airbags across all variants and segments of vehicles.

As of now, two airbags are mandatory in all vehicles - one for the driver and the other for the co-passenger in the front seat. The rule for airbags for the driver's seat was made mandatory from July 1, 2019, while the one for the co-passenger came into effect from January 1 this year.

## REHAU celebrates 25 years in India

**REHAU**, a global leader in polymer-based solutions, was founded in Germany in the year 1948. The brand started its Indian operations in 1997 and is celebrating its silver jubilee year in India. REHAU has made a significant mark in Indian furniture, construction and industrial markets over the last 25 years. Acknowledged as a spearhead in German-quality uPVC Edge bands, solid surface, pre-laminated boards, laminates, flooring, underfloor heating and cooling solutions, rail solutions, REHAU has become one of the top providers in the market and has a well-expanded product portfolio.

In the last 25 years, REHAU has built three plants and multiple warehouses in the country. The company has two plants in Pune, producing edge bands, gaskets as well as various other profiles for the industrial solutions. The third plant in Vadodara manufactures edge bands exclusively.

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By Lawrence Ng, Vice President of Sales, Asia Pacific and Japan, Aspen Technology

## NO TIME TO WASTE – A SUSTAINABLE PATH FORWARD WITH DIGITALISATION

Combined with the power of analytics and AI machine learning, industrial AI can promulgate sustainability with accelerated ROI. The article elaborates on trends in industrial AI driving value with sustainability in manufacturing plants.



**T**he late UN Secretary-General, Kofi Annan, said, “Our greatest challenge in this new century is to take an idea that seems abstract – sustainable development – and turn it into a reality for all of the world’s people.” One of the keys to meeting this challenge is digitalisation. Digital transformation is a journey of continuum towards the self-optimising plant, which capitalises on data to generate knowledge. Industrial AI provides companies with massive learning ability and can be a strategic business advantage, combining the power of analytics and AI machine learning, with crucial guardrails of domain expertise, to accelerate return on investments (ROI) from industrial data.

**Willie K Chan, CTO, AspenTech,** highlights the

crux of the situation, “Domain expertise is the secret sauce that separates industrial AI from more generic AI approaches. Industrial AI will guide innovation and efficiency improvements in capital-intensive industries for years to come.” Industrial AI enables general engineers to leverage machine learning without being advanced data specialists or specialist engineers. AI algorithms only represent five per cent of the software source code with the remaining 95% derived from domain expertise.

### DRIVING VALUE VIA DIGITAL TWINS

A digital twin is a virtual model of a physical plant. It provides a valuable model of the physical asset, its behaviour and performance so plant knowledge workers can safely explore what-if scenarios without putting people or the asset at risk. It provides a valuable model for assessing asset health, forecasting, and recommending action to avoid degradation and asset failure events. Perhaps most important, it creates a business model representing scenarios for product creation, operations, sustainability, effective asset utilisation, risk, customer satisfaction and profit.

The digital twin is an evolving digital profile of the historical, current and future behaviour of a physical object or process that helps optimise business performance. It is based on models and real-time data across multiple dimensions, including business performance, asset planning, the physical asset, equipment condition and reliability, chemical process performance, safety and risk, energy, and sustainability, operating and project timespans and more.

The digital twin creates an evolving profile of the object or process that provides insights on system performance, guiding actions in the physical world – such as changes in operating strategies, regulations and business objectives, safety and maintenance. The digital twin may be updated in real-time or periodically, taking advantage of asset data to stay up-to-date, and increasingly made intelligent by AI agents.





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### REDUCING ENERGY USAGE BY 2030

The Federation of Indian Petroleum Industry (FIPI) recently named Aspen Technology its 2021 Digital Technology Provider of the Year award. Anchoring this award was a landmark Bharat Petroleum Corporation Limited (BPCL) customer case study that showcased how the Mumbai Refinery adopted a real-time digital twin, based on the use of AspenTech's digital twin and Advanced Process Control (APC) products. The digital twin has been implemented online and integrated with an associated advanced process control (APC) solution, such that the optimisation engineer uses the digital twin on an hourly basis to inform the adjusting of the APC levers for optimum steam use efficiency and amine utilisation effectiveness.

Contributing 15 per cent to India's refining capacity and ranked 44th position in Platts Top 250 Global Energy, BPCL Mumbai Refinery aims to reduce energy usage by 37 per cent in 2030. BPCL has achieved significant energy reductions, with the use of an online digital twin, integrated with APC software in one of the most significant steam usage areas in the refinery, namely, the amine stripping and regeneration process.

Essentially, BPCL had deployed Aspen DMC3™ software with a digital twinning approach – to achieve about \$1 million savings in utilities annually. The company is the first amongst Indian PSU refineries to implement APC in Amine Regeneration Units (ARU) and integrate digital twin output to APC. With an estimated payback of fewer than six months, the company could effectively reduce energy usage in changing sulphur content in crude slate, which had originally resulted in sub-optimal amine regeneration. The Aspen DMC3 software enables the adoption of a scalable and sustainable approach via its patented adaptive process control technology.

In doing so, the intelligent plant can respond automatically, achieve real-time agility and maximise performance in a seamless yet, robust manner. With the ability to accelerate deployments, process manufacturers can achieve benefits faster, improve ROI and enhance overall performance.

### A SUSTAINABLE PATH FORWARD

Companies with the ability to balance profitability and sustainability can address the dual challenge more efficiently in the new industry normal. The dual challenge mandates the need to address increasing resources for a growing population with increasing standards of living while balancing the need to meet sustainability goals.

In a volatile marketplace, supply chain management is critical, as sustainability and resiliency are two sides of the same coin. FPCO, Japan's largest manufacturer of food containers and a logistics supplier, is one




The dual challenge of profitability and sustainability mandates the need to address increasing resources for a growing population with increasing standards of living while balancing the need to meet sustainability goals.

company that can achieve this critical balance. FPCO is committed to environmental advancement, avidly recycling used food containers and PET bottles. With more than a billion containers sold each month, selling recycled products needed to be an economically sustainable activity. The company chose aspenONE Supply Chain Management (SCM) to provide stable and responsive food distribution in an efficient, sustainable, as well as environmentally friendly manner.

Industrial AI can help companies navigate increasingly complex supply chain options and decisions. Momentum from rapidly changing global carbon mitigation necessitates focusing on energy transition across Asia, as cost and carbon footprint reduction come into focus on the agenda.

### DIGITALISATION IN THE NEW NORMAL

Cost and carbon footprint reduction will remain high on the agenda. A shift in refining production mix towards chemical feedstocks is expected, as growth in chemicals is expected to account for about half of the near-term demand growth for oil in Asia. Mega integrated plant projects can address changing market demands efficiently and industry trajectory shifting from oil to gas consumption continues. Natural gas and renewables can address the increasing electricity demand, and the hydrogen economy is an emerging dimension.

As new energy areas gain momentum, rapid and powerful early concept design is crucial for the techno-economic analysis to ensure a profitable asset lifecycle. Hybrid models combining rigorous and AI-driven models are increasingly required to optimise complex operations, more accurately and autonomously. For capital projects, estimation and project progress transparency can unlock value. To manage project risk efficiently, it is necessary to visualise, analyse benchmarks and share data to increase speed and certainty. The result is a more agile, collaborative, and informed asset design – seamless with greater predictability in execution. 

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“WE HAVE AN ORDERBOOK  
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FROM INDIA”

By Rahul Kamat

India has always been a pivotal market for Alstom, and it continues to deepen this partnership by customising mobility solutions for the country. For almost 30 years,

Alstom has partnered with India in the modernisation and development of its transportation revolution, making it safer and more sustainable. And going forward, it aspires to positively influence the Indian market with our products and operations.

In an exclusive interview, **Alain SPOHR, Managing Director, Alstom India** talks about efforts and investments made by the company over the years in India towards building a strong base of sustainable mobility solutions and high localisation, while creating a positive impact on the people and communities.

### What are your views on the recently concluded Union Budget?

We welcome the progressive and growth-oriented Union Budget presented by the Finance Minister for 2022-23. India is poised to regain its title of the fastest-growing large economy with a 9.2 per cent GDP growth estimated for the coming year. With an enhanced capital expenditure outlay of 35 per cent as compared to last year, core infrastructure segments including railways and urban transport stand to benefit and will have a huge multiplier effect on the economy.

The highlight of the budget was the announcement to introduce 400 new Vande Bharat trains over the next three years, the introduction of the state-of-the-art KAVACH TCAS signalling systems over 2,000 km of the railway network, larger investments to provide for sustainable and integrated urban transport systems. The total budget estimates of Rs 23,875 crore for MRTS & Metro railway projects will incentivise faster implementation of projects and the standardisation of

### Outlook for Alstom India

- Alstom will continue strengthening its contribution to socio-economic impact and ESG (Environmental, Social, and Governance) goals.
- By 2025, Alstom aims to reach 85 per cent localisation on all domestic projects and increase digitalisation of processes by 20 per cent.
- The company will accelerate its move to maximum usage of Green/ Renewal Energy in Industrial operations and 100 per cent of newly developed solutions will be eco-designed.
- Through its CSR initiatives, the company plans to reach 100,000 direct beneficiaries.





## Key Rolling Stock Projects

### Domestic

- Lucknow Metro (80 metro cars)
- Kochi Metro (75 metro cars)
- Chennai Metro (172 metro cars)
- Delhi Metro (816 metro cars)

### International

- Sydney Metro Northwest Rail Link (132 metro)
- Queensland Rail New Generation (450 commuter cars)

metro design systems will provide the much-needed stability for manufacturers.

The development of 100 cargo terminals over the next three years will also improve India's competitiveness in faster and cleaner logistics and freight movement by rail. The announcement of new legislation regarding Special Economic Zones is a welcome step as it will help India enhance the competitiveness of its exports and integrate successfully with global supply chains.

From a policy standpoint, the launch of the next phase of Ease of Doing Business (EoDB 2.0), is a step in the right direction. Modernised rules for evaluation of complex tenders especially transparent quality criteria and provisions for payment of 75 per cent of running bills mandatorily within 10 days will encourage faster dispute resolution.

Introducing Production Linked Incentives (PLI) scheme for railway manufacturers and exporters promoting 'Make in India' would have been ideal for fast-tracking the implementation of projects and supporting the manufacturing ecosystem. We were anticipating FM's announcement regarding plans for the private train operations; however, this budget provides the overall push towards economic growth and addresses the key priorities of the Government.

**Alstom has recently inaugurated a new components manufacturing facility in Coimbatore. Tell us more about this facility.**

Alstom's industrial presence in Coimbatore has evolved across three sites since 1978. This new site is spread over a total area of 15 acres and has an installed capacity of 2.1 million hours, which will offer a higher degree of production diversity & complexity – integration & testing of tractions, auxiliary convertors, cubicles, driver disks, and Rolling Stock looms. The site will create 10,000 direct & indirect jobs and currently has



**We are committed to providing our unflinching support as an enabler in India's growth story and help fulfill the government's key ambitions of 'Make in India' and 'Atmanirbhar Bharat.'**

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## The development of 100 cargo terminals over the next three years will also improve India's competitiveness in faster and cleaner logistics and freight movement by rail."

a gender diversity rate of 20 per cent. The Coimbatore site currently delivers not just to Alstom's Indian sites but also to the major sites across five continents – Asia, Australia, Europe, North America and South America. Some of the key countries include – France, Canada, Italy, Belgium, Germany, Netherlands, Saudi Arabia, Vietnam, UAE etc.

The opening of this facility is a testament to our commitment to the government's flagship 'Make in India' & 'Atmanirbhar Bharat' initiative. With our enhanced capabilities and a team of talented and dedicated employees, we are proud to be a catalyst in India's manufacturing-led growth story. We have been the preferred mobility partner on various Indian projects and are keenly looking forward to becoming a leading supplier of components across Alstom's sites globally.

In line with Alstom's Sustainability Goals for 2025, this site has undertaken several sustainability measures like – targeting 80 per cent of regular activities to be run on green energy, utilising 100 per cent of natural light during daytime, rainwater harvesting, reusing 100 per cent of the sewage treated water, etc. The factory also boasts of a stellar record in safety. Cumulatively, the factory has successfully achieved 10+ years of 'accident-free' man-days.

In line with its commitment to contributing

sustainably to communities in need, Alstom is taking up various projects around the factory. To reach out to a total of over 100,000 direct beneficiaries, the company has pledged Rs 3 crore for various CSR projects in the next three years. Some of these activities include - water conservation, sustainable rural living, and youth skilling. With this stronger industrial and commercial base with the purpose to offer a broad range of components, Alstom is much stronger to address the mobility needs of India and the world.

### Over the years, how Alstom has contributed to the Indian economy?

India has always been a pivotal market for Alstom, and we continue to deepen this partnership by customising mobility solutions for the country. We are delighted to share the impact/contribution of our presence in India via this report, especially in the areas of job creation, sustainability, and to the larger community. All this is reflective of the hard work and dedication of our people, and all our stakeholders in this extraordinary journey. We are committed to provide our unflinching support as an enabler in India's growth story and help fulfil the government's key ambitions of 'Make in India' and 'Atmanirbhar Bharat'.

We believe in high localisation and building a supply chain ecosystem.

Alstom India buys €331 million worth of goods and services, among which 75 per cent is made with Indian suppliers. Overall, the company has invested €142 million locally in the last five years. In addition, the firm has conducted 21 technology transfers across Alstom locations, to suppliers and other partners. As of March 2021, Alstom had 7,634 direct employees in India. Additionally, the company has supported 71,340 indirect and 27,770 induced jobs across the country. The company is committed to improving its diversity ratio and plans to include 28 per cent of women in management, engineering, and professional roles by 2025 while retaining its position as a Top Employer.

Alstom's eco-design approach focuses on continuously improving the sustainability of its solutions by tracking and minimising their environmental impact throughout their life cycles. For example, the mass of materials and components used in manufacturing rolling stock for Mumbai Metro Line 3 is 96 per cent recyclable and 99 per cent recoverable.

### Signalling, Systems and Infrastructure Projects

#### Signalling

- EDFC New Khurja Bhaupur section of 351 Km & Operations Control Centre (Prayagraj)
- Mumbai L2, L3 & L7 CBTC Signalling & Telecommunication
- Kochi Metro CBTC Signalling & Telecom
- Bengaluru Metro Phase I DTG Signalling
- Delhi Metro L5 & L6 DTG Signalling

#### Systems & Infrastructure

- Bengaluru 3rd rail EP2CC
- Delhi Metro Phase III Track work (Package CT 1B)
- Kochi Metro Receiving Sub station & power supply 3rd rail 750 VDC



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### Key Projects In Progress

- Alstom Indian Railway JV 800 electric locomotives and associated long term maintenance for 13 years
- Delhi Meerut RRTS 210 commuter metro cars and installing India's first ETCS Level 2 system for a mainline project
- Mumbai Metro Line 3 248 metro cars and equipping the latest CBTC signalling technology

### How will the acquisition of Bombardier be a game-changer in the global rolling stock market for Alstom, which includes India too?

The rail market is supported by fundamental growth drivers, such as accelerated urbanisation, public investment strategies, and the worldwide push for green and digital transformation of transport systems. Despite the pandemic, recent stimulus announcements confirm the development of sustainable mobility and more specifically of rail as a long-term priority. The rail manufacturing market is expected to grow at a 2.3 per cent CAGR by 2025. Integrating Bombardier Transportation in Alstom will have an unparalleled commercial reach in all geographies thanks to the complementarities of the two companies. While the

Alstom Group already had a well-established customer base in France, Italy, Spain, India, South East Asia, Northern Africa and Brazil, Bombardier Transportation will bring strong customer proximity in strategic markets such as the United Kingdom, Germany, the Nordics, China, and North America. The Group will have now in particular very strong capabilities in Europe and North America, which represent approximately 75 per cent of the OEM accessible market.

We will offer mobility operators and network providers products and solutions throughout the entire rail value chain. By integrating Bombardier Transportation, Alstom will have the most complete rail portfolio. In Rolling Stock, its portfolio will range from light rail to very high-speed trains, including new strategic products such as people mover and monorail. The Group will be able to serve its clients in the Services space with a wider maintenance facilities network and larger predictive maintenance capabilities. With a fleet of 150,000 vehicles, Alstom will have the largest installed base worldwide, a unique springboard to further expand its leadership in Services. Its Signalling product line gains significant scale, becoming No. 2 worldwide in terms of revenue, acquiring technological capabilities and commercial capacities in strategic markets, complementary to Alstom's.

Alstom is already a pioneer in mobility with leading innovations such as the recent hydrogen train, autonomous train operation, energy efficient rolling stock and infrastructure. Bringing together c.17,500



## By integrating Bombardier Transportation, Alstom will have the most complete rail portfolio.

engineering and R&D talents from both groups, consolidating a rich legacy of 10,000 patents and incorporating significant additional technologies from Bombardier Transportation, for example in predictive maintenance, signalling and digital operations, the Group will be able to develop solutions at a faster pace and on a larger scale to make the mobility of tomorrow a reality. Alstom is accelerating towards its ambition: be the global innovative player for sustainable and smart mobility.

**Today, almost all metro lines in India have a 'bit of Alstom' in them. Take us through your envisaged new projects and how Alstom is contributing to the Make In India campaign through its investments and JVs?**

We have already begun manufacturing the regional commuter and transit trains for the Delhi-Ghaziabad-Meerut semi-high-speed rail corridor for RRTS Phase 1. In May 2020, the company was awarded the contract to design, build, and deliver 210 regional commuter and transit train cars along with comprehensive maintenance services for 15 years.

As per the contract, we will deliver 30 regional commuter trainsets of six cars each and 10 intracity mass transit trainsets of three cars each. In accordance with India's 'Aatmanirbhar Bharat' vision and the Make-in-India guidelines, these RRTS trains are 100 per cent indigenously manufactured, with over 80 per cent localisation and are being manufactured in Alstom's factory in Savli (Gujarat). This facility will produce the bogies, car bodies and undertake train testing. The propulsion systems and electricals are being manufactured at the company's factory in Maneja (Gujarat). This project is a game-changer in India's regional rail segment, benefiting millions of people and contributing towards socio-economic development. We are happy to begin local manufacturing of these technologically advanced trains for the country's first semi high-speed commuter service. At Alstom, we focus on developing sustainable products and solutions that stand the test of time by operating efficiently for decades to come.

Recently, we have handover over the first trainset for the Kanpur metro, to Uttar Pradesh Metro Rail Corporation (UPMRC). As we completed the acquisition of Bombardier Transportation (BT) in

January last year, going forward, we will be responsible for the delivery of Kanpur & Agra metro rolling stocks and signalling, including the scope of all BT technologies. The value of the project is around Rs 2,051 crore, and our scope of the work includes the design, build and delivery of 201 metro cars (67 units of MOVIA metro three-car trainsets) and advanced signalling solution (CITYFLO 650). The customer also has a provision to exercise an option for an additional 51 metro cars.


Last year April, we successfully manufactured and delivered the 100th electric locomotive to Indian Railways. As part of the contract worth €3.5 billion won in 2015, we will be supplying 800 fully electric high-powered double-section locomotives of 12,000 HP (9 MW) for freight service, capable of hauling ~6,000 tonnes at a top speed of 120 km/hr. This is the largest Foreign Direct Investment project in the Indian railway sector.

The Prima T8TM WAG-12Be-Locos are built at one of India's largest integrated greenfield manufacturing facilities at Madhepura (Bihar). Spread across 250 acres, this industrial site is built to international standards of safety and quality. The site has installed a production capacity of 120 locomotives per annum and Alstom has progressively achieved over 85 per cent indigenisation. With these powerful e-Locos being manufactured within the country, India has become the 6th in the world to join the club of countries producing high horsepower locomotives indigenously.

That said, Alstom has been awarded by Mumbai Metropolitan Region Development Authority (MMRDA) the contract to design, manufacture, supply, test, and commission 234 metro cars, including personnel training for Line 4 and the extension corridor (Wadala-Kasarvada-Vali-Gaimukh). The order is valued at €220 million (Rs 1,854 crore).

This first order, following our merger with Bombardier Transportation demonstrates our continued commitment towards partnering in the country's Make-in-India mission. We are glad to have been awarded this prestigious project by MMRDA and look forward to commencing work on this.

The Line is a 35.3-kilometre-long elevated corridor with 32 stations. It will provide interconnectivity among the existing Eastern Express Roadway, Mono Rail, the ongoing Metro Line 2B (D N Nagar - Mandale), and the proposed Metro Line 5 (Thane - Kalyan), Metro Line 6 (Swami Samarth Nagar - Vikhroli). Mumbai Metro Line 4 & 4A is expected to reduce the current travel time by 50 per cent to 75 per cent, depending on road conditions.

With all projects combined our total orderbook is around €4.1 billion. 

By Rahul Kamat

## ONLY DIGITAL SOLUTIONS CAN PROVIDE SUSTAINABILITY

The whole world is going towards virtual analysis. Technologies, such as digital twin, virtual analysis and CAE, play a pivotal role in cutting down the product design engineering cycle and cost says **Basant Sharma, Vice President, Detroit Engineered Products**

### How has DEP established itself over the years in India and across sectors?

DEP was established in 1998 as a software technology-based firm with its headquarters in Michigan, USA. We started our India operations in Chennai in 2000, and since then, we have been growing. We have two major verticals when it comes to our offerings. Firstly, we provide engineering services to work with the customers to do their turnkey projects. We provide services to transform the entire product development, starting from benchmarking studies for design iterations, doing complete CAE evaluation, value engineering, lightweight and prototyping across industries. Secondly, we have our unique proprietary software, MeshWorks – an integrated CAE platform that transforms every aspect of the product development process.

With more than 500 customers, we work with almost all OEMs automotive, major tier-I companies across industries, such as aerospace, consumer goods electronics, Biomed and oil & gas. Although, our main business comes from the automotive sector, which contributes to about 80-85 per cent of the business.

### CAE plays an important role in product design development. What is DEP's role in providing real-world solutions? What solutions are provided to the automotive industry, one of your company's largest domains?

Gone are the days when you waited for the design to be matured, then struggled with CAE not meeting the performance, which would go back to the design, which is further updated and sent back to CAE for validation. This back-and-forth took up valuable time, which was a bottleneck. Recent technologies eradicated this monotonous process, making product development much easier. With software technologies like MeshWorks, users can create concept CAE models using morphing technology and do those changes directly within the CAE model. So, eventually, if the



With software technologies like MeshWorks, users can create concept CAE models using morphing technology.

user is not satisfied with the performance, they can change it by optimising a few parameters. For instance, you can create multiple CAE models and design experimental studies to get your solution faster than conventional methods. Our technologies give you a lot of advantages to cut down the design the engineering process by using morph and para-automation tools.

The whole world is going towards virtual analysis. Technologies, such as digital twin, virtual analysis and CAE, play a pivotal role in cutting down the product design engineering cycle and cost. Proprietary platforms, such as MeshWorks, play a significant role in CAE assessments. With it, the user need not wait for the CAD to be available; instead, users can employ an existing model that can be morphed to create new models. So, you can cut down the product development time.



**How crucial is aerodynamic design through virtual validation in ensuring the safety and precision of aircraft design?**

One of the biggest concerns is aircraft safety when taken into a high altitude, at about 500 miles per hour. This necessitates the analysis of Computational Fluid Dynamics (CFD), which will calculate the track forces based on the aircraft speed, physical profiles, shape and material and then apply those track forces to your aircraft structure. This process aids in the validation of different components, and this is crucial to optimising safety standards. If your CFD is wrong, the entire design could be completely wrong, a major safety issue.

**How does simulation improve efficiency? How does it improve the quality of your overall product, and how important is it in manufacturing?**

Simulation is essential and is one of the critical points in the past for manufacturing industries. For instance, if you take the injection moulded process, you could put your gate location where you're putting the



Simulation is essential and is one of the critical points in the past for manufacturing industries.

material the temperature, then run the simulation. If you see a defect in your actual part, those defects could be optimised early with CAE assessment, which otherwise will cost millions of dollars in building tools. Optimisation can be done with all these parameters checked up in the gate location combined with other structural parameters. This process not only optimises your component for manufacturing but also considers the product's performance and weight simultaneously.

**How does the digital twin technology work and help companies in their process?**

In digital twin, rather than doing a physical prototype and making an actual part, you validate your manufacturing process or performance virtually. A digital twin/virtual twin/simulated twin exists along




with the product's life and optimise the real physical asset. The data is exchanged from the physical to the virtual twin through IoT, which gives real-time data to optimise the analysis process, providing multiple 'what if' scenarios. It is particularly useful when the physical asset is difficult to access locations or undergoing unmanned programs.

**Drone technology is used in defence, entertainment, agriculture and several other sectors. How does DEP fit into this technology?**

DEP does several aftermarket products and services, and the drone is one of them. A drone is like robots in the air; the work they do on the ground today can be done in the air tomorrow. DEP has done an interesting project where we added many control systems to a drone through which we aid in deterring birds assessing the safety during takeoffs and landings. For instance, the drone goes in the air to deter birds and creates high-frequency noise to scatter them. So, the bird will be out of the way of the aircraft. Similarly, drones can be used for many applications, depending on one's vision to create real-world solutions.

**Sustainability has come to the forefront with a pandemic, highlighting the importance of sustainable solutions in personal lives and conducting business.**

**How is sustainability taking on a greater role? Can digital solutions help enable sustainability?**

In my opinion, only digital solutions can provide sustainability. Even before the pandemic, customers were looking for cost-efficient design engineering solutions. Earlier, it took nearly three years to complete a vehicle and launch it. But due to technological advancements, the process has been cut down to about 18 months, which now we are trying to reduce to one year. Morphing and conceptual technologies are evolving as sustainable tools to aid customers looking for sustainable solutions. Customers are trying to address this aspect and incorporate parametric tools to cut down cost and timing on the product within the construction cushion. 

By Rahul Kamat

## WE CONTINUE TO INVEST IN MODERNISATION AND EXPANSION OF OUR PRESSES AND KILNS

In an interview, **Sameer Nagpal**, CEO, Dalmia-OCL, talks about the refractory market and how Dalmia-OCL is reducing imports of magnesia-based refractories in India.

**In a post-Covid-19 world, there would a greater call for the Indian steel industry to become self-reliant and produce an increasing amount of high-quality steel to reduce import dependence. How does Dalmia-OCL, focusing on high standard refractories, rise to this challenge?**

The Indian Steel sector is doing extremely well despite covid and progressing well towards the 300 million tons (MT) target set by the government. This growth in steel production requires higher quantities of refractories, which when combined with a preference for India-made refractories is resulting in robust demand for our products. We at Dalmia-OCL have been debottlenecking our plants, expanding our capacities for over two years now. We continue to invest

in modernisation and expansion of our presses and kilns, equipment for making better quality products, all of which is helping us grow our order book. Today, we have one of the biggest manufacturing footprints for a refractory company in India. We have contributed significantly to reducing imports of magnesia-based refractories, some special products like snorkels, and critical application monolithics.

**Dalmia-OCL has launched a new refractory line in Odisha to bring down the import dependence on China. How is this brownfield project helping the company to tap some of the growth areas? What is the market share that you are targeting with the launch of this new line?**

We have embarked upon a key initiative of 'Make In India' under the logo 'Bharat ki Factory mein Bharat ki Refractory'. Under this initiative, we put up a new magnesia carbon line which straightaway substitutes 36,000 of the 300,000 tonnes which were being imported ie. roughly 12 per cent of the product. We are targeting to increase this to 25 per cent over the next 12-18 months.

**Do you think India will be able to do away with import dependence from countries such as China? What are the challenges faced by the Indian Refractory industry?**

China produces 65 per cent of world refractories as it sits on a large mineral base used in refractories. So it may not be possible to completely do away with China imports as they enjoy a substantial cost advantage. However, as the capacities in India get ramped up, we expect the gap to narrow, and combined with local supply chain advantages, our customers are likely to prefer locally produced refractory over imports. Dalmia-OCL has also accelerated the development of some of its raw material mines to support refractory making in India.

**What has been the acceptance of products like mon-**



Dalmia-OCL has also accelerated the development of some of its raw material mines to support refractory making in India



**olitics which is manufactured at Katni in JV with Seven Refractories? How do you see the demand coming back from the steel sector for such products?**

We had set up a new line at Katni as we saw an increasing appetite of customers for high-end castable products which were made in India. This is the most modern line in India which has Flexi production capabilities, a unique concept. We make some of the most advanced refractories in this line and the products have been very well received by the steel and cement industry. Due to this bullish demand, we are filling up the capacities rapidly and we think we will need another line soon.

**There is also growing global demand for making cleaner steel. With the acquisition of GSB Group GmbH last year, how Dalmia-OCL has contributed towards achieving that in Europe and India?**

As a key input for manufacturing and construction, steel is one of the world's most used metals, which makes the increasing demand for cleaner steel quite legitimate. Our Dalmia GSB entity in Germany specialises in making lances and snorkels, which are required for clean steel making. While we are leaders in lances in Europe, snorkel demand is now picking up too.

Dalmia GSB also continues to open doors for our made-in-India products for steelmakers in Europe. We have conducted several successful trials at premium steel makers like ArcelorMittal, Voestalpine, ThyssenKrupp etc. A good order book is emerging thanks to all these trials. In that sense, we are beginning

to see green shoots of benefits we hoped would accrue out of our acquisition.

**The refractory industry is dependent on the import of key raw materials like high-grade alumina, bauxite, magnesite, silicon carbide, etc. China is a major supplier of imports and imposed heavy taxes on the export of raw materials for refractories. What steps can be taken to reduce import dependency?**

We have been exploring ways to diversify our raw material supply base away from China. We are expanding our mines and have started sourcing from Africa and the Americas too. We also have a Magnesite mine in Tamil Nadu and are working towards bringing it back into operation.




**Our Dalmia GSB entity in Germany specialises in making lances and snorkels, which are required for clean steel making.**

**With the entry of global players like RHI, Krosaki Harima, and Calderys of Imerys, how do you see the shape of the industry evolving in the coming years?**

Most international players have entered India through the acquisition route. So for us, it has been the only change of ownership of competition. These players have brought better technologies to India and encouraged Indian companies to follow suit. We are sprucing up our facilities at our research institute, DISIR, and have engaged international professionals to bring the latest know-how to India. We are also sourcing technologies from our various partners to remain updated.

**What kind of support do you expect from the government to achieve this mission? Any specific incentives you're looking for government to bring down the cost of production?**

The government has been supporting the local industries through its Make in India initiatives. The recently announced budget will also give a boost to refractory demand. We have no specific asks from the government at this stage. 

By Rahul Kamat

## “WAREHOUSE AUTOMATION IS EVOLVING RAPIDLY IN INDIA”

**Khursheed Alam, Co-Founder, Atmos Systems** is of the view that there is a need to create awareness among businesses that the benefits of automation are aplenty as compared to manual operations. Thankfully, realising the evolved business ecosystem, consumer preferences and prospects of scalability, many businesses are now willing to adopt such solutions.

### How the warehouse automation is evolving?

Warehouse automation as a sector is evolving very rapidly, thanks to the advancements in robotics and the increased adoption of automation systems across different industries. It is essentially a system where machinery, equipment and information technology work together to simplify repetitive, time-consuming and laborious tasks that traditionally require manual intervention. From simple conveyor systems to move goods to advanced automation, robotics and data analytics, warehouse automation has varied scales, depending upon the need of each business, to automate



tasks and working procedures.

While e-commerce, 3PL, FMCG and courier companies have been the early starters in warehouse automation, the need for warehouse automation is now being felt extensively across other industries as well. Also with the e-commerce market becoming more competitive, the sector is making a shift from unorganised to a market-driven organised and well-structured sector, thereby creating the path for new business opportunities and modern industrial growth.

### How Atmos is helping in the development of Smart Warehouses?

A smart warehouse is one wherein there's minimal human intervention and smart usage of technology as well as machinery. The idea here is to boost productivity along with accuracy and both inbound and outbound efficiency. As experts in the domain, we contribute through customised solutions that facilitate the flow of goods, inventory management & tracking and fulfilment of the order, while maintaining flexibility. For instance, we offer Autonomous Case-handling Robotic (ACR), engineered for intelligently picking & handling goods, improving storage density and enhancing operational efficiency. A robotic Palletising System is another of our specialised offerings that can easily pick and place goods onto pallets. Furthermore, Atmos Systems provides Dimensioning Weighing Scanning (DWS) System to capture product dimensions, weight etc, sortation systems enabling 99.99 per cent accuracy in sorting and conveyor solutions for faster and safer transportation.

### How are e-commerce players leveraging warehousing solutions for seamless product delivery?

Warehousing is a very integral component of the supply chain process for the e-commerce industry. To save operational costs and time, several e-commerce



merchants have integrated warehouse automation systems. The need for a Warehouse Management System (WMS) was at first felt by e-commerce players for real-time visibility into product availability, inventory management, streamlining warehouse operations and giving a heads up on the demand to avoid shortage of products. Today, the e-commerce industry is incorporating AMR/AGVs for batch picking and reducing the time taken to pick an order. What the companies do is utilise a combination of dynamic solutions to ensure that orders are delivered as per the schedule to customers while the cost of shipping remains minimal. Therefore, it wouldn't be an exaggeration to say that warehouse automation is a major catalyst in the growth of e-commerce as an industry.



#### **How warehousing automation is contributing to smart city-infra?**

If not directly, at least indirectly warehouse automation can aid in the building of smart city infra. If warehouse automation is widely adopted, the customers would get the products they order within the least possible time. As a ripple effect, a lesser number of people would be encouraged to move out, at least for non-essential or non-perishable items. Also, more number warehouses getting automated would result in increased business opportunities without requiring to set up own shop. One can sell products across the country without any hassles.

#### **What are the current solutions and future trends in warehousing automation?**

As mentioned earlier, warehouse automation is a space that is evolving at a rapid pace, triggered by widespread acceptance across different industries. Among the current trends in the sector are Automated Storage and Retrieval System (AS/RS), Autonomous Case-handling Robots (ACRs), Conveyors, Sortation Systems, Autonomous Mobile Robots (AMRs), Automated Guided Vehicles (AGVs) and Warehouse Management Systems (WMS), among others.

According to reports, the future of warehouse automation might see increased adoption of AMR, AGVs and other robotic technologies to handle different operations. Usage of drones for inspecting stocks, barcode scanning and retrieving goods is also expected to be a reality soon. Further advancements

are likely concerning IoT enabled smart devices and systems to collect, store, and share data.


#### **What are the challenges and opportunities in your segment?**

There is a huge upfront cost and investment that is required for automating a warehouse and thereon maintaining the systems. Several companies often refrain from investing such amounts and prefer to handle the operations with manual intervention. There is a need to create awareness among businesses that the benefits of automation are plenty as compared to manual operations. Thankfully, realising the evolved business ecosystem, consumer preferences and prospects of scalability, many businesses are now willing to adopt such solutions. We are hopeful that the automation costs would soon get reduced with more and more innovation.

#### **What are your plans?**

We already have a plan in place to launch a warehouse automation experience centre this year, wherein gen-next automation systems and solutions would be showcased. Businesses can get a first-hand experience of the automation and material handling services we provide and their benefits.

Furthermore, we intend to acquire new projects in 3PL, E-commerce and FMCG industries while increasing the customer base. The R&D budget has also been enhanced with investment toward new product development and technology.

In the next few months, Atmos Systems is set to come up with new products for warehouse automation and set new benchmarks with the increase in overall market share. 

By Team The Machinist

## ET BEST METAL CUTTING AND FORMING BRANDS 2021

The Economic Times organised Best Brands in Metal Cutting and Metal Forming Awards in Bengaluru. The initiative was appreciated by the audience as it was the first on-ground event after two years.

The who's who of the Indian metal cutting and forming industry had started arriving nearly an hour before the announcement of ET Best Brands in Metal Cutting and Forming ceremony was to go underway. Although a hush descended over the assembly once the ceremony kicked off with the lighting of the ceremonial lamp, the general excitement could barely be suppressed. **Rahul Kamat, Editor – B2B Division, Worldwide Media (The Times of India Group)**, set the tone for the event, saying, "This initiative is designed to bring various innovations and disruptions under the metal cutting and forming umbrella with an eclectic mix of the panel discussion, keynotes and eventually highlighting the success stories from the metal cutting and forming segment in India."

Meanwhile, **Anjum Parwez, Managing Director, Bangalore Metro Rail Corporation Ltd** reminded the audience about the importance of the metal cutting and forming industry in the growth and develop-

THE ECONOMIC TIMES



THE ECONOMIC TIMES



ment of the Indian manufacturing sector. "Today, more than 45-47 per cent of our machines, which are used in metal cutting and forming are imported. So this one industry I realized that there is tremendous scope for growth. A lot of support has been given by the state and central government to enhance the growth of the metal cutting industry," he said during his special address.

During his address, **Kamal Bali, President and Managing Director, Volvo Group, India** said, "We are at the cusp of major socio-economic transformation, especially in the supply chains today. The global manufacturing output is about \$15 trillion, today. Around 30 per cent of the total manufacturing output is taken care of by one particular country and the USA takes about 17 per cent. But India is only three per cent. But the good news is, this is completely getting rebalanced over the next 3-4 years."

### HOW DOES A STRONG BRAND EVOLVE?

They say, measuring any brand's success is always a tricky affair. It is especially so in the contemporary digitised economy where people increasingly believe in interacting with a brand. Meanwhile, the Indian metal cutting and forming industry today has a variety of options when it comes to choosing its metal cutting and forming partners. However, with a gamut of Indian and international players competing in the market, how can the industry know which is the best brand for it?



With this in mind, recently, the Economic Times organised Best Brands in Metal Cutting and Metal Forming Awards in Bengaluru. The initiative was appreciated by the audience as it was the first on-ground event after two years.

During the panel discussion – How Does a Strong Brand Evolves, **Venu Nuguri, Managing Director & CEO, India and South Asia region; Member of Executive Team, Hitachi Energy** cited an example of Hitachi, a 100-year-old company and how this company has built a strong brand over the years. “We had a purpose and actions towards achieving that purpose plays an important role in creating and sustaining a brand, he said.

**Ramesh Ramadurai, Managing Director, 3M India Limited** believed that since the branding is so much less expensive today than what it used to be a decade ago, based on the different platforms that you have now to interact and converse with the stakeholders, cost should not be the barrier to build a brand.”

From machine tools to cutting tools, from saw blades to laser machines, from plasma cutters to water jet cutters, from accessories and metrology equipment to lubricants and everything in between, the industry is a very complex and comprehensive segment. For quite some time now, this segment is dominated by imports. However, lately, we have seen a change of scenario.



Anjum Parwez



Kamal Bali

Domestic players have been consistent in supplying indigenously developed quality solutions.

Rising investments in the defence and aerospace industries, coupled with the increasing demand for a wide range of consumer electronics on account of larger disposable incomes are expected to

favour the market growth in the years to come. The rise in the demand for cutting edge technologies coupled with advancements in manufacturing processes is also anticipated to propel market growth in the forthcoming years.


Incidentally, in India, the metal cutting and forming industry has been a crucial part of the machine working and fabrications sector that forms an important industrial segment after the automotive industry.



COMPANY NAME	AWARD CATEGORY
Ace Designers Limited	Metal Cutting
Ace Manufacturing Systems Limited (AMSL)	Metal Cutting
Acemicromatic Manufacturing Intelligence Technologies (AMIT)	Metal Cutting
Blaser Swisslube Solutions Private Limited	Metal Cutting
Ceratizit India Pvt Ltd	Metal Cutting
Chiron Group SE	Metal Cutting
Cosmos Impex (I) Pvt Ltd	Metal Cutting
Exxonmobil Lubricants Pvt Ltd	Metal Cutting & Metal Forming
Fibro India Precision Products Private Limited	Metal Forming
Forbes and company Limited (Totem)	Metal Cutting
Jyoti CNC Automation Ltd	Metal Cutting
Lakshmi Machine Works Limited	Metal Cutting
Makino India Pvt Ltd	Metal Cutting
MMC Hardmetal India Pvt Ltd	Metal Cutting
Motul Tech	Metal Cutting
Proarc Welding and Cutting Systems Pvt Ltd	Metal Forming
Rajamane Industries Pvt Ltd	Metal Cutting
S & T Machinery Pvt Ltd	Metal Cutting
Sphoorti Machine Tools Pvt Ltd	Metal Cutting
Suresh Indu Lasers Private Limited	Metal Forming
Trishul Machine Tools Pvt Ltd	Metal Cutting

## METHODOLOGY

The Economic Times Best Brands in Metal Cutting & Metal Forming 2021 is an ET Edge Initiative and the knowledge partner for this initiative was Breakthrough Management Group India Private Limited, popularly known as BMGI. The Best Brands list is based on the market research conducted by BMGI. The Machinist magazine is driving this project from the editorial point of view. In this category, Best Brands featured the key players from the Indian metal cutting industry, analysing their overall performance, based on their product offer, market presence, and brand awareness. The leading companies were shortlisted and made to go through a further assessment based on publicly available data before making the final list.

As curtains came down, a visibly elated senior executive working with a leading company was seen excitedly telling other guests, ‘Great show! I’m glad that I could make it.’ 

By Rahul Kamat

## AUTOMOTIVE INDUSTRY GETS A BIG BOOST

The budget seeks to lay the foundation to steer the economy over the next 25 years. It lays out four wide-reaching priority areas covering infrastructure, inclusivity, productivity and investment.

**I**n line with expectations, the automobile sector, especially commercial vehicles (CV) would continue to reap the benefits of the Government's continued thrust on infrastructure development and capital expenditure across sectors. The government's Gati Shakti programme, encompassing thrust on seven different engines of growth including roads, railways, and multi-modal logistics infrastructure augurs well for the demand for CVs, especially tipper trucks.

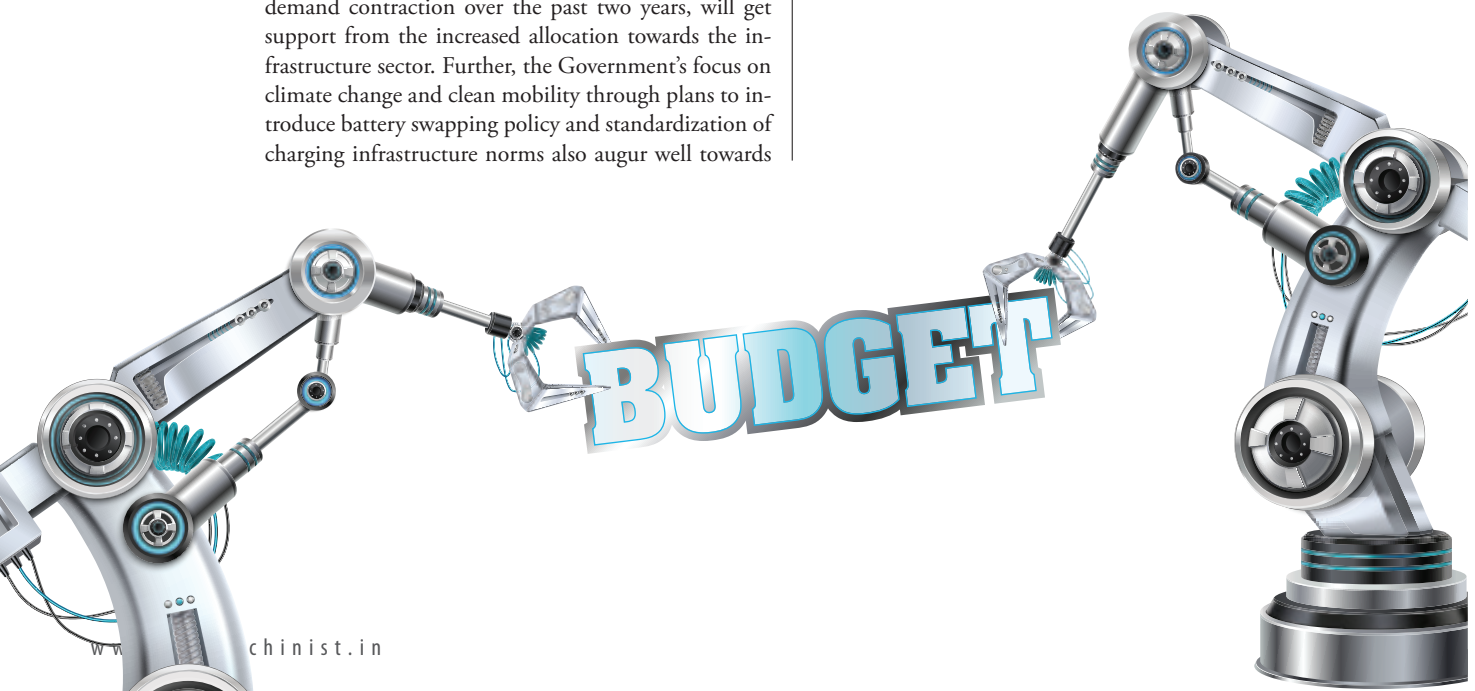
**Shamsher Dewan, Vice President & Group Head - Corporate Ratings, ICRA Ltd** said, "The Government's effort to mobilise funds through multiple avenues, especially Sovereign Green Bonds besides addressing the inherent bottlenecks to ensure faster execution of infrastructure projects by construction companies will be critical for uplifting the sentiments of the construction equipment segment, including tipper trucks."

The medium and heavy commercial vehicle (M&HCV) truck segment, which has witnessed sharp demand contraction over the past two years, will get support from the increased allocation towards the infrastructure sector. Further, the Government's focus on climate change and clean mobility through plans to introduce battery swapping policy and standardization of charging infrastructure norms also augur well towards

enhancing the penetration of electric buses in key cities.

According to **Unsoo Kim, MD, Hyundai Motors India Ltd**, the government's strong approach towards accelerating infrastructure development, sustainability with digitalisation in every sphere of business will give a strong impetus to the overall economy while empowering consumerism in India. The vision for clean mobility creating electric vehicle ecosystem is a positive indicator for the auto industry and its large supply chain. The forward-looking budget will lay modular economic structure for every section of business and society in India.

For **Kamal Bali, President & MD, Volvo Group, India** it was a progressive, thoughtful, imaginative, and growth-oriented budget that touches all socio-economic segments while embracing technology and





modern tools of governance. “The budget has rightly allocated the highest ever Capex of \$100 billion (Rs 7.5 lac crore), up 34 per cent over the last year, aimed at creating and improving our logistics infrastructure through PM Gati Shakti NMP, as well as social sectors of health, education, women, housing and the needs of our 112 aspirational districts.”

### ELECTRIC VEHICLES

The government focus on promoting electric vehicles, as a means of transportation in the country, was reiterated in the budget. In addition to existing financial incentives under the FAME-II scheme to boost demand and the PLI Schemes for ACC and auto segment focused on EVs and other alternative energy technologies, the Finance minister in the budget announced plans to implement a battery swapping policy and formalise interoperability standards. If implemented efficiently, the same is likely to go a long way in reducing range anxiety about EV adoption while also aiding economies of scale in battery production.

“Considering, the battery swapping policy one of the initiatives in the Budget for the auto industry, we feel the policy as being a sincere advocate of EVs as last-mile mobility solutions. A larger battery swapping infrastructure will help enhance



EV infrastructure and should propel the adoption of EVs. We are glad that the government is encouraged to create sustainable and innovative business models for battery and energy as a service, improving the efficiency in the EV ecosystem,” opines **Diego Graffi, Chairman**

### and MD Piaggio Vehicles Pvt. Ltd.

The Finance minister also announced plans to further the push for EV penetration in public transport and create special mobility zones for EVs, which should also spur EV demand. In addition, the inclusion of energy storage in the harmonised list of Infrastructure will facilitate cheaper financing availability to EV battery makers.

Welcoming the battery swapping policy, **Sohinder Gill, Director General, Society of Manufacturers of Electric Vehicles (SMEV)**, feels that it will help to develop EV infrastructure and increase the use of EVs in public transportation. “It would motivate businesses engaged in delivery and ride aggregation businesses to incorporate EVs into their fleet and will create new avenues for companies to venture into the business of battery swapping,” he added. Additionally, creating special clean zones will further accelerate the adoption of EVs and spread awareness amongst the citizens. The move will benefit the whole segment, i.e E2W, E3W, E-cars, and buses.

For **Chetan Maini, Chairman & Co-founder of SUN Mobility**, it would be great to see the government addressing key points around how customers can access subsidies (currently available for EVs), range per charge criteria (as swap batteries, by definition, are smaller and with less range) and GST for swapping services in line with EVs.

### LOGISTICS SECTOR

PM Gati Shakti Masterplan is expected to provide much needed impetus to the logistics sector, by enabling higher integration for all modes of transport, thereby improving India’s cost competitiveness global-


ly. It is a transformative approach towards facilitating faster movement of goods and includes seven engines i.e. roads, railways, ports, airports, mass transport, waterways and logistics infrastructure. The multi-modal connectivity to provide seamless connectivity for movement of goods and services from one mode of transport to another. It is also expected to reduce time and facilitate the last mile connectivity of infrastructure through Rs 20,000 crore financed by the government to speed up this project.

“The PM Gati Shakti project is revolutionary as this focuses on multi-modal logistic parks and Unified Logistics Interface Platforms, we believe that it will help in reconciling supply chain constraints and make them more robust,” adds Diego Graffi.

To strengthen the road logistics and supply chain, expressways are expected to be extended by more than 25000 km and four multi-modal national parks contracts will be awarded in FY2023. Further, eight remote connectivity roadway projects for over 60 km are to be awarded in FY2022 and FY2023 through PPP mode to enable trade facilitation as well as job creation. Under the Gati Shakti Plan, Railway logistics will also get a boost with the development of 100 Cargo Terminals in the next few years, and 400 new generation Vande Bharat trains. It also aims

at developing efficient logistics for small farmers & enterprises and the ‘One station, one product’ concept facilitating the supply chain of local products. Further, the focus is also towards developing a unified logistics interface platform to automate and digitalise logistics paperwork. Unified Logistics Interface Platform will enable efficient movement of goods, assist Just-In-Time inventory management, reduce logistics costs and time, and eliminate tedious documentation.

#### AUTOMOTIVE

The Government’s continued focus on rural development and farmer welfare in the budget augurs well to uplift rural sentiments, and thereby remains positive for the tractor and two-wheeler segment. The allocation of Rs. 20,000 crore for road infrastructure projects, is likely to lead to spillover demand for commercial vehicles and would be a positive for the segment. The plans to implement a battery swapping policy and formalize interoperability standards, if implemented efficiently, are likely to go a long way in reducing range anxiety with regards to EV adoption while also aiding economies of scale in battery production. The Finance minister also announced plans to further the push for EV penetration in public transport and create special mobility zones for EVs, which should also spur EV demand. 

## STRONG ORDERBOOK GROWTH FOR ABB IN CY2021

ABB India posted one of the biggest growth in orders in recent years. The full year order received surged to Rs 7,666 crore while for the quarter it was at a high of Rs 2,243 crore. During the quarter, the process automation business area witnessed good order inflows across all divisions. Traction in the steel and paint industry and downstream units pushed the orders to Rs 770 crore up by 175 per cent compared to Q4 2020. Motion and Electrification business areas both posted healthy double-digit growth year-on-year supported by strong contribution from smart power, channel business, exports, tier 2 and 3 cities penetration and pack-aging. Robotics & Discrete Automation business area continued to record reasonable order inflows, including green shoots of recovery in the automotive market and demand in new market segments.

“2021 was a year that demonstrated our resilience. Our performance across all key parameters was excellent across the majority of business divisions. Customer support, the team’s dedication and ABB’s agile business model helped overcome pandemic and global supply chain challenges in the first half. Business fundamentals further improved over the second half of the year. ABB Team in India has developed a robust

order & cash position aided by strategic product mix aligned with growth market segments helped improve margins and bottom-line significantly,” said **Sanjeev Sharma, Managing Director, ABB India.**

#### REVENUE AND OPERATIONS

The Company recorded a revenue of Rs 6,934 crore for the full year, an increase of 19 per cent as compared to CY20. The growth was driven by capacity expansion and strong backlog execution despite supply chain challenges. The company reported Rs 2,101 crore revenue for the quarter, which is higher by 24 per cent as compared to Q4 last year. In Q4, strong backlog execution, solid customer-connect, an uptick in exports and service business led to the positive movement in the quarter. Revenue in the electrification business grew by 31 per cent Y-o-Y supported by higher revenues from smart building and smart power business. Motion business saw growth of 17 per cent Y-o-Y across all divisions except some delays in traction motors. Process Automation grew by 22 per cent supported by strong backlog realization with service revenues contributing to 30 per cent. Robotics and Discrete Automation segment posted revenue growth of 26 per cent Y-o-Y.

By N Venu, MD & CEO, India & South Asia, Hitachi Energy

## STRIDING TO 2022 CRADLING THE ENERGY TRANSITION

With India aiming to hit 500 GW in renewable energy by 2030, the pace of development in sunrise sectors will also pick up.

2021 had been a year on tenterhooks, ricocheting from hope to gloom to a flat wait-and-see state. India, in a Whack-a-Mole mode, was setting records administering vaccines to its vast population and just as fast new Covid variants – Kappa, Delta, Omicron – were appearing to strain existing relief measures.

Normalcy only emerged in pockets and a significant population continued to operate remotely, hopeful the vital power infrastructure would support in the new normal. Fact is, nothing can function without power. Not even national aspirations and targets.

### THE YEAR TO COME

2022 beckons opportunities in the right direction. The two years of Covid-19-led unprecedented disruption has ushered in faster adoption of and adaptation to digital power technologies in traditional sectors such as transmission works and rail. It has also brought in fresh fervour toward sunrise sectors such as electric vehicles (EVs), data centres and renewables -- from the government through productivity-linked incentive schemes and from corporates via investment in green businesses.

Hitachi Energy has had a strong play in metro and rail, power transmission and renewables this year -- we advanced Indian Railways' mission to achieve net-zero emissions via rail electrification solutions, India's Power-for-All drive by commissioning one of India's longest UHVDC transmission links from Raigarh to Pugalur, as well as provided our technology for a multitude of solar and hydro projects alongside to datacenter players propelling India's Energy Transition.

### OPPORTUNITIES AHEAD

We are seeing green shoots of recovery in core sectors – mainly government-owned metals and oil and gas industries. With India aiming to hit 500 GW in renew-




N Venu

able energy by 2030, the pace of development in sunrise sectors will also pick up. Renewable capacity addition is also likely to be ramped up in 2022, meaning a higher requirement for substations, transmission corridors as well as battery energy storage. Rail electrification, urban metro and regional transport system will also drive growth, bringing in fresh opportunities for us.

Since the focus is high on sunrise industries, there is tremendous potential in technology localization in areas such as remote power monitoring, predictive maintenance, EV charging, green hydrogen and energy storage. We are already seeing interest in models such as Energy-as-a-Service (EaaS), augmented reality power applications and a shift in customer preference from proof-of-concept (PoC) to proof-of-value (PoV). Building the required know-how and skills will underpin all efforts in our pivot to cleaner, greener and smarter energy, depending heavily on partnerships with academia.

Likewise, as ESG gains spotlight, industry-wide collaboration in greening the power infrastructure and investment in sustainable, eco-efficient and industry-agnostic power solutions will help India make steady progress toward its energy goals. It is also a vastly untapped market to establish power quality solutions that globally support the renewable segment, for improving the availability and reliability of hybrid grids.

### CHALLENGES TO OVERCOME

Yet challenges ranging from new variants of the Covid-19 virus such as Omicron, high commodity prices, material shortages especially about semiconductors will likely weigh on market recovery. Businesses may be finding ways to remain competitive in their pricing. This could also strain for some time the market quest for fresh investments in sunrise sectors. We expect industrial CAPEX to pick up only by the second half of 2022. 

By Rahul Kamat

## CLEANLINESS IN THE SUBMICROMETER AND ATOMIC PER CENT RANGE

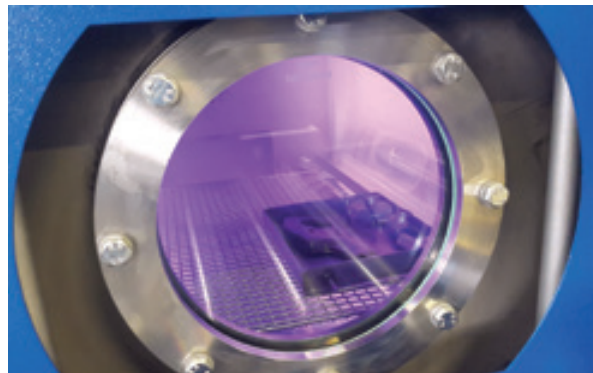
In many industry areas new and enhanced products lead to very high cleanliness specifications. Due to changed manufacturing, joining and coating technologies and more stringent regulatory specifications, there are stricter requirements for particulate and film-type part cleanliness. To reach these values in series production in a process-reliable and efficient way, not only cleaning and drying processes meeting demands and suited system technology but also software implementation and cleaning environment must be adapted accordingly.



Whether production equipment for the semi-inductor industry, biotechnology, laser and sensor technology, devices for measuring and analysis technology, components for accumulators and fuel cells, optical systems or metal cutting tools, the requirements for performance and reliability are extremely high. This not only leads to high demands in terms of production precision of the parts but also their cleanliness. For medical technology products such as implants, instruments, cannulae and endoscopes, particulate and film-type contamination from manufacturing processes is an essential criterion due to regulatory specifications. Moreover, there is a trend for miniaturisation and functional integration with ever smaller and more complex components. These

developments entail that particulate cleanliness specifications in the micrometre and even nanometer ranges, as well as very stringent requirements regarding residual thin-film contamination, must be met by more and more industry sectors. Depending on components and/or applications, outgassing rates for organic substances and residual moisture may also have to be met, as well as limit values down to the atomic per cent range when it comes to surface analyses for residues of prohibited substances. For the production of these miniaturized components, there is also an evolution towards ever-larger integrated manufacturing modules. This also creates new challenges for the cleaning processes and the mechanical systems required to implement them.

The result is a series of very demanding parts cleaning tasks across the complete manufacturing chain. As a supplier of future-oriented complete solutions, SBS Ecoclean Group of companies covers the whole range of precision and ultrafine cleaning. This enables them to adapt cleaning processes, their control software as well as the machinery and ambient conditions to the requirements and applications on hand.







### THE RIGHT SYSTEM CONCEPT

For the selection of a suitable cleaning system for a specific task, the first thing looked at is whether the system is to be used for pre-cleaning, intermediate cleaning or final cleaning. Depending on the use and cleanliness specifications to be achieved, the solution may be a chamber or multi-tank immersion machine, a flexible ultrasonic multi tank machine based on standardized modules, or a customized ultrasonics-based ultrafine cleaning system. The cleaning chemicals as well as the optimal process technologies such for example spraying, high-pressure fluid application, immersion, ultrasonic or megasonic treatment, plasma cleaning, injection flood wash, pulsated pressure cleaning (PPC) as well as passivation/preservation as required, are also specifically chosen for the application and the contaminants to be eliminated.

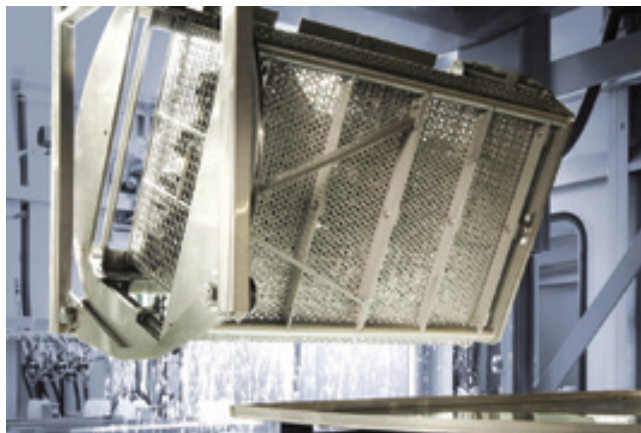
### CLEANING PROCESSES

The design of customised ultrasonic multichamber systems and processes for ultrafine cleaning applications is the core competence of Switzerland-based UCM AG. Key factors to be considered are the material and geometry of the parts to be cleaned, the type and quantity of contaminants, the particulate or film-type cleanliness specifications and, where applicable, permitted outgassing rates and maximum acceptable residues of prohibited substances in the atomic percentage rate. Another important aspect is the selection of suitable cleaning chemicals and washes fluid, for example, reverse osmosis water or deionized water. The materials and manufacturing methods used to build the cleaning system and automatic transport system are also selected with


the prevention of dirt build-up, re-contamination and cross-contamination already in mind. Outfitting with clean room-grade components and interfacing with clean rooms are also possible.

Standard equipment installed in precision and ultrafine cleaning systems is multifrequency ultrasonic systems that offer flexible adjustment of ultrasonic frequency and intensity to the requirements of different parts to be cleaned. With parts that present complex geometries, capillary structures or porous surfaces, such as sintered metal components or additive manufactured components, the PPC method comes into play. Features such as multi-side overflow in all wash and rinse tanks, as well as the immersion/spray rinse technology specially developed for ultrafine cleaning systems, contribute to the reliable meeting of very severe cleanliness specifications.

The decision which parts are taken to which wash and rinse tanks as well the part-specific process parameters such as temperatures, ultrasonic output and frequency, the intensity of PPC, dwell time in the various wash and rinse tanks, are defined during the process development phase. Depending on the complexity and



heat absorption capacity of the parts, drying is mostly done using infrared or vacuum technology. The resulting part-specific cleaning programs are stored in the machine controller. The software-controlled implementation of the cleaning sequence plays a decisive role in this context. It ensures among other things that the specified dwell times in wash and rinse tanks are precisely observed, and that prioritized sequences - e.g. for very fragile parts - can be programmed.

The best system and process solution from a cleanliness and economic efficiency point of view can be determined through cleaning trials with original parts in Ecoclean's and UCM's Precision Cleaning Technology Centres. 

By Naveen Mehta, President – Operations, Jindal Aluminium Limited

## DEBUNKING TOP MYTHS RELATED TO USING ALUMINIUM WINDOWS

Aluminium windows in buildings have been around since the 1930s, and many landmark buildings in western countries prominently featured them in their designs during that era. With World War II, its application saw a new dawn in aviation, manufacturing tanks, automotive engines and others. From then on, the usage of Aluminium products and the market around it changed forever. Countries leading the war increased their aluminium production capabilities, and new aluminium alloys were seen almost everywhere.

After the end of the war, Aluminium gained more widespread use in the construction industry and soon surpassed steel and wood window sales in commercial and institutional construction. It might be surprising to know that aluminium windows first appeared in railroad cars, streetcars and buses, as early as 1912.

Today, virtually all commercial properties and a significant number of adobes use Aluminium framed windows to increase durability, provide an aesthetic charm to the overall building design, create a sense of wonderment and provide safety and security. Additionally, as it can be easily cast, machined, and formed,



Naveen Mehta

architects prefer using Aluminium to tackle wind pressure in high-rise buildings when used in facades, glazing, cladding, curtain walls, etc.

However, despite holding a significant position in the fenestration industry, certain myths float around the usage of Aluminium in windows. Experts believe that the reason behind this could be its popularity as it is firmly holding the market globally. Below are some of

the myths one should steer away from while considering an aluminium window for their property.

### DO ALUMINIUM WINDOWS CAUSE CONDENSATION?

The fact of the matter is that this is no longer the case today. As a metal, Aluminium has the same thermal insulation level as wood and uPVC. Today, it is all about quality, design and glass specifications. The modern-day high-performance aluminium windows do not cause any extra condensation, and they are designed with the latest thermal break technology that has excellent thermal resistance properties to improve the energy efficiency of the building. The hollow chambers in the glass filled with insulation provide aluminium windows



with outstanding transfer coefficients that ensure the indoor temperature is always perfect.

#### ARE ALUMINIUM WINDOWS DIFFICULT TO MAINTAIN?

It is one of the most unsubstantiated myths about aluminium windows. The answer to this is a straight no! Aluminium has an added advantage that requires almost zero maintenance and is less reactive than most other metals. It is weather-proof, termite-resistant, and detrimental to pests and insects. Furthermore, it does not rust, flake, or peel off easily and it is very appropriate for places constantly exposed to the outside environment. A quick clean of the glasses and frames every three to four months will help remove sedimentary dirt and keep the windows looking elegant.

#### ARE THE ALUMINIUM WINDOWS NEITHER SUSTAINABLE NOR ECO-FRIENDLY?

Aluminium is 100 per cent recyclable and non-toxic, leaving a minimal ecological footprint. It can be recycled multiple times without losing its properties, making it an inexpensive source of material for production runs. The recycling process requires just five per cent of the initial energy consumed to generate the primary metal. Hence, this unique metal feature makes it one of the most sustainable options for windows.

#### AREN'T ALUMINIUM WINDOWS STRONG ENOUGH?


Having the most robust structural integrity of all other metals in the world, the impact-resistant properties of Aluminium make it carry heavy loads and maintain

the dimensions and tightness of window frames effortlessly. As they are designed to withstand extreme climatic conditions, high-performance Aluminium does not rust, warp or split over time and thus are perfect for windows.

#### ARE ALUMINIUM WINDOWS NOT STYLISH AND SUITABLE FOR VINTAGE BUILDINGS?

It is important to debunk the myth that aluminium windows are not stylish. To cater to your needs, high-quality Aluminium is widely available in various styles, shapes and shades. Earlier, it was available in silver, white, or hardwood sub-finish only, but, now with powder coating, it can be coloured in almost any hue and shade. Depending on personal preferences and décor style, glossy and matte framed aluminium windows can also be installed. As Aluminium is highly malleable, for traditional buildings, aluminium windows are an incredible choice to elevate the aesthetics of the overall building design.

#### IN CONCLUSION

From the early eighteenth century till now, Aluminium has always been one of the most trusted metals in the world. It has seen transformations like no other metal. Moreover, it comes at the fore for future projects with its high demand in commercial and residential properties. There are almost no criteria for aluminium windows in which they do not perform as well as other equivalents. It is already leading the global race for sustainable buildings, and one cannot imagine a dream house or office premises without Aluminium - as that is the only way forward to a prosperous and sustainable world. 

## ICRA ESTIMATES RENEWABLE GENERATION CAPACITY ADDITION AT 16.0 GW IN FY23

The outlook for the capacity addition in the renewable energy (RE) sector remains strong with a large project pipeline of over 55 GW and the highly competitive tariffs offered by these projects. The commitment to climate change goals announced by the Prime Minister at the recent COP26 summit, including increasing the non-fossil power capacity to 500 GW and meeting 50 per cent of energy requirement from renewable sources by 2030, further strengthen the investment prospects in the renewable energy sector. The capacity addition witnessed a strong recovery in the first eight months of FY2022 with 8.2 GW added against 3.4 GW added in eight months FY2021.

Commenting further, **Girishkumar Kadam, Senior Vice President & Co-Group Head - Corporate ratings, ICRA**, said, "The backlog of the projects awarded by the Central nodal agencies and state distribution

utilities remains large with under-development solar, wind and hybrid capacities of more than 55 GW. Basis this pipeline, ICRA expects the RE capacity addition to increase from 7.4 GW reported in FY2021 to 12.5 GW in FY2022 and further to 16.0 GW in FY2023."

The downside risks for renewable energy sector in the near term emanate from the execution headwinds and supply chain challenges for procuring modules and wind turbine generators (WTGs). Moreover, the average price of imported solar PV modules (Mono PERC) have increased by over 35 per cent over the past 12 months, putting upward pressure on capital costs for solar power projects. Notwithstanding the same and the recent hike in GST rate for solar power equipment, the solar bid tariffs continue to remain highly competitive as seen from the quoted bid tariff of Rs. 2.17 per unit in December 2021.

## WIDMA VU-1150 - A VALVE MAKER'S DREAM MACHINE

The pump and valve industry in India has been growing steadily, thanks to its broad-based application in almost every segment. Indian manufacturers are leveraging this enormous potential not just for meeting domestic demands, but also spreading their footprint in the global arena through exports. Apart from the simple and standard models, there is an increasing demand for high quality and future-ready valves with electro-mechanical actuators for automation and monitoring, under the Industry 4.0 standards.

The complexity involved in manufacturing such valves is further heightened by the need for manufacturers to meet the stringent criteria of global certifying agencies like API (American Petroleum Institute).

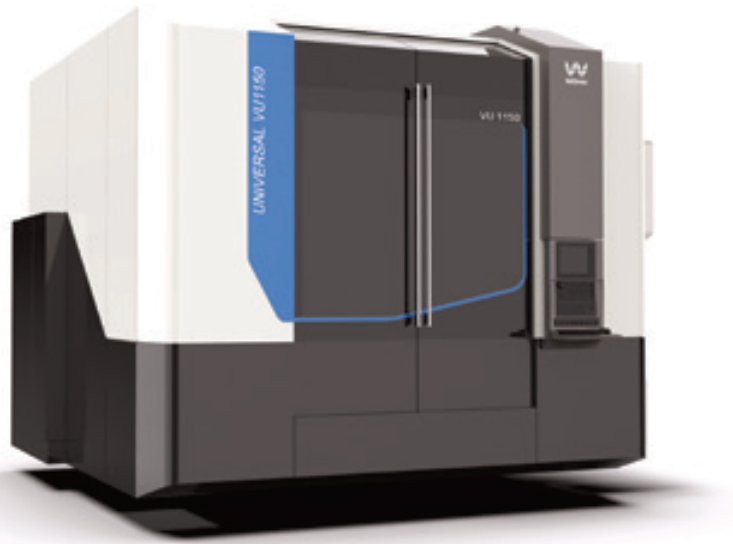
Let us take the example of a triple offset butterfly valve that involves complex machining owing to its intricate design and geometries. Two offsets are at the centre while the third is on the seating surface which creates a cone type shape out of the disc and the seat. These valves are used mostly in applications where a tight shut-off is required, a high temperature is expected, or hard sealing surfaces are required with zero leakage (soft seat) or rated leakage (metal seat).

### WIDMA IS CONTINUOUSLY ENHANCING ITS PRODUCTS AND SERVICES TO HELP CUSTOMERS PRODUCE HIGH-QUALITY PRODUCTS.

The success of machining such a valve that delivers desired performance is hugely dependent on the machining process. To enable customers to address the said complexities associated with valve manufacturing, WIDMA, the Machining Solutions Group of Kennametal India Limited has developed multi-tasking machines to perform operations such as turning, milling, drilling, boring and tapping, all in a single set-up.

The VU 1150, five-axis CNC Multi-tasking Turn-Mill lathe machine is a recent development from WIDMA that can perform a series of operations in one setup. This machine is ideal for components that have multiple operations to be covered and have close relative tolerance between sections of the component. The machine can cover 5 faces of the component in a single setup. Hence, it improves the relative accuracy of the machined parts of the components.

The machine is powered by a 30/37 kW work spindle operating with a speed ranging from 5 - 350 RPM, which enables a very high material removal rate, while the tool spindle is powered by a 25kW motor. The spindle head can swivel from +90° to -90°. This



rotation of the spindle facilitates the movement of the tool and generates complex angles and shapes on the component. The rigid base and column make the machine ideal for a valve manufacturer, given the huge size and weight of components to be mounted.

Let us now compare WIDMA's VU1150 with a conventional machining setup. In a traditional manufacturing facility for the butterfly valve, it requires one Horizontal machining Center, a Vertical Turning Lathe and 1 Vertical Machining Center to perform a similar operation. A total of five setups are required to cover the entire process for a double offset valve and 6 setups for a triple offset. One of our customers informs us that they take up to four hours to change a setup. Now, if there are 6 setups to be done, it takes 24 hours only for a setup change. Since there are three machines, the work-in-progress inventory is usually high to feed all three machines.

The triple offset seat that is to be machined is usually made such that the fixture has a predefined angle upon which the component is placed at an inclined position and then turned

to achieve the required slope. This creates an intermittent cut for the component, reducing the life of the insert. All these issues are addressed in the VU1150 machine.

The VU1150 requires just two setups to complete the entire machining operations, right from the cast to the finished component, reducing the overall setup time of the process. Also, the relative accuracy is achieved as the component is not disturbed between operations, eliminating the cumulative misalignment that is gathered due to multiple load-reload during setup change. We have achieved relative accuracies superior to the industry requirement of 0.05mm or 50µm.

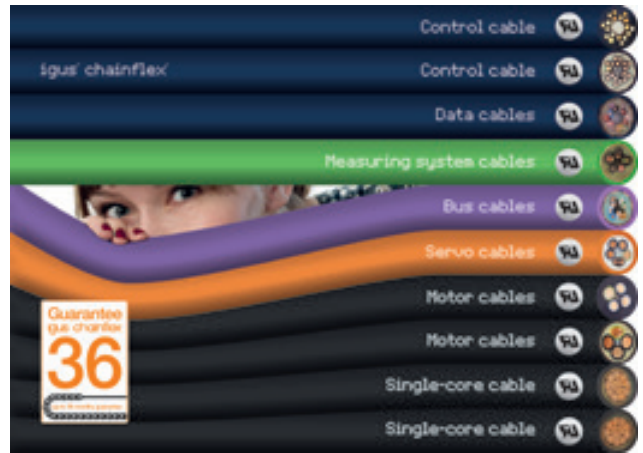
To cite a success story, DelVal Flow Controls Private Limited, a leading manufacturer of valves replaced their existing setup with WIDMA's VU1150 and achieved the following results:

WIDMA is continuously enhancing its products and services to help customers produce high-quality products with optimum efficiency. WIDMA's customers find these machines an excellent substitute for imported machines.

## IGUS RECEIVES UL APPROVAL FOR HALOGEN-FREE TPE CABLES

The independent organisation Underwriters Laboratories (UL) is one of the most important authorities in the USA in terms of product safety. It has been testing components of machines and systems since 1894 to see whether they are suitable for industrial use. Their seal is one of the prerequisites for a successful market entry in North America. Fire protection is a key decisive criteria. This is because, according to the US National Fire Protection Association (NFPA), machine fires are the fourth leading cause of fires in industrial environments in the USA, closely followed by fires caused by electrical factors. "That is why we are particularly pleased that igus has now become the world's first manufacturer to receive a UL seal for halogen-free TPE cables," says **Rainer Rössel, Vice President and Head of the Chainflex cables business unit** at igus. "The approval demonstrates to our customers that they have the safety aspect with chainflex high-end TPE cables."

For this certification, the igus engineers had to do a lot of persuading. Up to now, the flame retardancy of cables has been the key factor in obtaining UL certification for fire protection. Approval is therefore only granted to products containing flame retardants such as chlorine, fluorine or bromine. These additives increase flame retardancy. However, so far it has not been taken into account that the flame retardants generally change the chemical structure of the jacket and reduce the mechanical load-bearing capacity. Therefore, igus starts much earlier in the process: The cable specialist focuses less on preventing a fire from spreading, but rather on how the cable itself caused the fire. The TPE jacket compounds from igus are extremely resistant to mechanical loads as well as external influences. They can therefore be used in a wide range of applications: in small installation spaces of up to 4xd, on highly dynamic, short travels with accelerations of 100m/s<sup>2</sup> or on long travels in a temperature range from -35°C to +100°C. At the same time, they



are extremely media resistant, even with special organic oils. In all of these energy chain applications, the halogen-free TPE jacket compounds from igus minimize premature ageing of the outer jacket by a factor of up to 10; when compared to the same materials containing flame retardants. A decisive cause of the fire is reduced. This is because if the jacket does not break the cable cannot cause a fire because a reduction in the cross-section of the cores is impossible due to the non-existent jacket break. An argument that finally convinced the UL.

With these measures, igus makes a significant contribution to increasing machine safety. The

long-term flexural strength and service life of chainflex cables in the e-chain have been proven by numerous practical tests in the in-house igus test laboratory - and not just for TPE cables. "So far, customers have already had the opportunity to choose from 1,044 chainflex cables with UL approval," Rainer Rössel points out. "With the new certification, there are now more than 200 TPE cables, so we can offer an almost complete UL certified product range." Customers in Europe benefit from this by being halogen-free, as do those who build machines for the North American market, where UL certification of the individual components is the required rule.

## CHIRON GROUP AND GREIDENWEIS COMBINE AUTOMATION EXPERTISE

One of the CHIRON Group's core competencies is turnkey solutions for machining processes based on machining and milling/turning centres of the brands CHIRON, STAMA and FACTORY5. The CHIRON Group's product range meets the diverse automation tasks with integrated automation solutions, autonomous stand-alone solutions, the linking of machining centres and their process and system integration in assembly and production lines.

Greidenweis is a system supplier for the automotive industry. In addition to its development and assembly of machines and systems for laminating, joining and glueing, Greidenweis has positioned itself competently in process and system integration. One example of this is the fully automated complete assembly of components for vehicle interiors using several processing stations. The

company has years of experience in integrating various technical solutions into automated assembly systems and production lines and has also successfully installed these in other industries. Greidenweis has developed its expertise in mechanical engineering and holistic automation solutions to a high level through consistently implemented overall process support - design with CAD/CAM and 3D technology, robot simulations, project control, manufacturing, assembly, commissioning and service.

The CHIRON Group and Greidenweis will each concentrate on the further development of their traditional core businesses. With the strategic and operational cooperation, both companies also want to offer their customers attractive, future-oriented solutions through optimised and new combinations of products, competencies and know-how.

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