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THE MACHINIST

ULTIMATE GUIDE TO PROFITABLE MANUFACTURING

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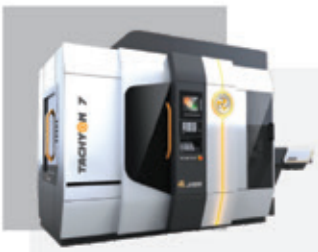

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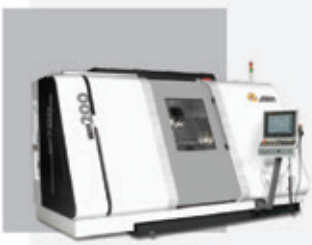

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AUTO SECTOR: BACK ON TRACK

I recently attended the prestigious biennial event in the domestic auto space, Auto Expo 2023, held in Delhi-NCR. It had various players showcasing their existing product offerings as well as capabilities developed in the new energy space like electrification, fuel cells, hydrogen-powered vehicles, CNG, etc.

New model launches by OEMs, however, were limited given the near absence of European players. It had a great mix of existing marquee players as well as new-age players both in the listed as well as unlisted space. We were highly impressed by the technological advancement achieved by OEM players and their readiness to adopt environment-friendly powertrain options along with the readiness of the auto ancillary pack helping OEMs traverse this tectonic technological shift.

Some of the key highlights were Maruti Suzuki (MSIL) unveiling its first concept EV SUV – "eVX". It will be powered by a 60 kWh battery with ~550 km of certified range. Tata Motors unveils a range of concept vehicles powered by various technologies like BEV, fuel cell, CNG, hydrogen cell ICE powered, etc, in the commercial domain (trucks, buses and LCVs). VECV arm at Eicher Motors showcased Intercity electric buses, electric trucks, fuel cell trucks along with premium Volvo buses. Ashok Leyland showcased fuel Cell EV trucks, CNG buses, hydrogen-powered trucks (H2-ICE), EV buses & trucks of various tonnages, LNG trucks and double-decker EV buses by Switch mobility among others. Hyundai launched an electric vehicle Ioniq 5 at Rs 45 lakh. It is powered by 72.6 Kwh with a certified ARAI range of 631 km. It is equipped with Level 2 ADAS, and a head-up display among others.

Expo also had an Ethanol Pavilion wherein existing 2-W OEMs showcased flex fuel prototype vehicles (capable of running on E85 fuel) and also included the Maruti Suzuki Wagon R & Toyota Corolla Altis.

With an underpenetrated PV category domestically, government spending on infrastructure, improved fleet utilisation, strong order book aided by a slew of new launches, I expect PV, CV space, in particular, to witness healthy growth in sales volume, going forward. I remain positive in the auto sector given the expectation of double-digit volume growth coupled with a benign commodity price outlook leading to healthy margin recovery.

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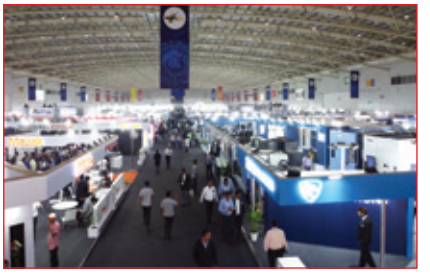

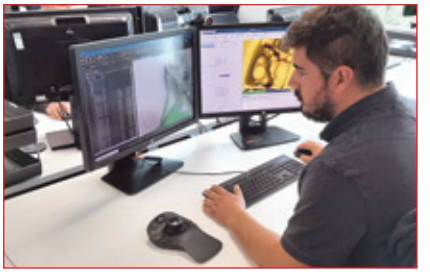

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YOUR GLOBAL CRAFTSMAN STUDIO

Tetra Pak factory becomes the first TPM World Class Manufacturing facility across industries in India

TETRA PAK INDIA'S packaging material factory in Chakan becomes the first in India to be conferred the prestigious 'Award for World Class TPM (Total Productive Maintenance) Achievement' by the JIPM (Japan Institute of Plant Maintenance). Tetra Pak's manufacturing site based in Chakan, Maharashtra, is the first site in India across industries to be conferred this honour. The recognition highlights the outstanding levels of production quality, reliability, efficiency, and sustainability of this state-of-the-art manufacturing facility, and is the most coveted award for the manufacturing industry.

Tetra Pak's site in Chakan has been in operation for over a decade now, bringing alive the aim of 'Making in India, Making for the World'. The Award for World Class TPM Achievement has been awarded to the packaging material converting factory that has the capacity to produce over 16 billion carton packages every year.

Wipro Lighting illuminates Phase 1 of India's longest expressway

WIPRO Lighting, a leading provider of lighting and Internet of Lighting solutions in India, has helped light up Phase 1 of India's longest expressway, The Hindu Hrudaysamrat Balasaheb Thackeray Maharashtra Samruddhi Mahamarg. This 502-kilometre-long Phase has been fitted with heavy-duty lighting fittings by Wipro Lighting. The improved street lighting is another facet of the safety measures that have been undertaken to construct this expressway. Wipro consumer care and lighting has used the Wipro Arcus Façade Lighting Rage to beautify the first-of-its kind expressway.

Phase 1 of the highway that links Nagpur to Mumbai was officially inaugurated by Prime Minister Narendra Modi, and the expressway is now officially open to the public.

Bill Anderson to be the next CEO of Bayer AG

THE SUPERVISORY BOARD OF BAYER AG has appointed Bill Anderson to become CEO of Bayer, effective June 1, 2023. He will join Bayer as a member of the Board of Management on April 1, 2023. Bill Anderson was elected unanimously after a thorough selection process which began mid last year. Werner Baumann (60), current CEO of Bayer, will work closely with him on a smooth transition before retiring from Bayer after 35 years of service at the end of May 2023.

Bill Anderson (56), a chemical engineer by education, has served in various leadership positions in the life science industry over the past 25 years. Most recently, he served as CEO of Roche's Pharmaceuticals Division, where he successfully led a comprehensive transformation program which resulted in many successful new product launches, significant revenue growth, and greater productivity across the organization. Before this role, Anderson was CEO of Genentech, one of the pioneering companies in the biotech field.

Previously, Bill Anderson held several senior leadership positions in general management, product development, and finance at Biogen, another innovation leader in the biotech sphere, and Raychem, an American technology and electronics company. During his time at Biogen, Genentech, and Roche, Anderson was involved in the development and launch of 25 new medicines, including 15 blockbusters. In addition to his native country, the United States, Bill Anderson has lived and worked in several European countries with postings in the United Kingdom, the Netherlands, Belgium, and Switzerland. In his new role, he will be based in Leverkusen, Germany.

"We are very excited to welcome Bill Anderson as new CEO of Bayer. He is the ideal candidate to lead Bayer together with the team into a new, successful chapter at a time of a disruptive innovation cycle in biology, chemistry, and artificial intelligence. Bill has an outstanding track record of building strong product pipelines and turning biotech breakthroughs into products. Beyond that, he is a truly transformational leader who creates a culture that propels innovation, boosts productivity and performance, and allows people to thrive," said Prof. Dr. Norbert Winkeljohann, Chairman of the Supervisory Board of Bayer AG. "Bill Anderson's mission is clear: enable Bayer to realize its full potential and create sustainable value for our shareholders, farmers, patients, consumers, employees, and all stakeholders of the company."

The new CEO-elect, Bill Anderson, said: "Bayer is an innovative company that is already delivering tremendous benefits for the nutrition, health, and environmental protection of the world. Its leading R&D investments in agriculture, medicines and consumer health hold the promise for additional breakthroughs. I look forward to working with the people of Bayer to accelerate innovation, increase performance, advance sustainability, and unleash the full potential of the company."

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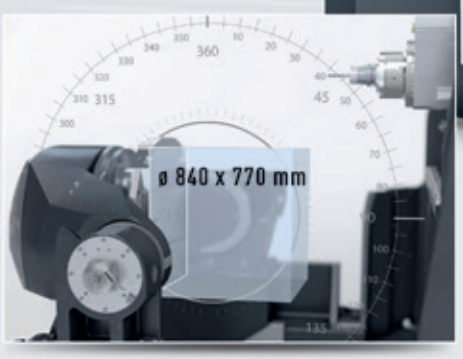

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Elektrobit reveals its role in Sony Honda Mobility's new EV prototype

ELEKTROBIT recently revealed it is a provider of software and services for the Sony Honda Mobility (SHM) AFEELA prototype. The car was unveiled at CES 2023. It's the latest result of Elektrobit's multi-year collaboration with Sony and now SHM to reimagine the software-defined vehicle. The partnership began in 2019 around the development of the first two Sony VISION-S prototype vehicles; the new AFEELA brand vehicles are slated to enter commercial production in 2025.

Elektrobit created the innovative software architecture for the AFEELA prototype, enabling SHM to leverage the entire Sony ecosystem to create a new level of user experience. Elektrobit developed the cockpit system for including software for the Qualcomm high-performance computing (HPC) processors and the software stack up to the UX design powering all cockpit displays. In addition, Elektrobit provided integration services for the cockpit system encompassing all software and hardware components and applications from Sony and its partners.

The AFEELA represents a sea-change in how vehicles are designed, with software playing an increasingly important role, both for core vehicle operation and as a way for carmakers to innovate. Software takes center stage in the AFEELA prototype cockpit, allowing Sony to integrate its latest audio and camera sensor technologies as well as an incredible array of gaming, movie, and music content. SHM also announced a partnership with Epic Games, opening an array of experiential possibilities which can be brought to life within the cockpit system.

"We're extremely proud to be the strategic software partner of Sony Honda Mobility on its groundbreaking AFEELA prototype project," said Maria Anhalt, CEO, Elektrobit. "Together with SHM we are redefining mobility around the vision of creating a new more inspirational and emotional type of user experience. Software is the starting point of this. There is an immense amount of computing power packed into this car which creates all kinds of user experience possibilities, and it challenged us to meet a new level of demands in terms of systems architecture."

Godrej & Boyce collaborates with Tecnimont for Indian Oil Corporation (IOCL) project

GODREJ & BOYCE, the flagship company of the Godrej Group, announced that its business Godrej Process Equipment, a leader in manufacturing custom-built process equipment, has delivered its heaviest equipment - Xylene Column from its state-of-the-art facility in Dahej, Gujarat.

The equipment weighing 1000 MT is made for Tecnimont for Indian Oil Corporation Limited (IOCL)'s integrated paraxylene-purified terephthalic acid (PX-PTA) Project at Paradip refinery in Odisha.

The Xylene Column will help in processing the feedstock thus producing liquids and vapours. This column will be a crucial element in the process and this plant would be a ready source of feedstock for a 300-KTA textile yarn manufacturing project.

The new PX-PTA Project specifically complements IOC's current petrochemical-related initiatives at Paradip, assisting the government of Odisha in its ambition to establish Petroleum, Chemicals, and Petrochemical Investment Region (PCPIR). This would help in attracting sizable investments and create significant economic benefits and employment opportunities in Odisha.

This oversized consignment weighing 1000 MT was manufactured by Godrej Process Equipment with a shell diameter of more than 8 m and 75 m long. The equipment has been successfully developed, built, and tested at its state-of-the-art, coastal manufacturing facility located in Dahej, Gujarat and is being dispatched through its self-owned Sea-going jetty, which is capable in the handling of large, oversized consignments.

Stephen Murugaiah, Vice President – Projects, Tecnimont said, "In collaboration with Godrej Process Equipment, we started this project 20 months ago. As the equipment travelled from Godrej's private jetty circling from the West to the East coast via Sri Lanka, it celebrated a proud moment for every Indian witnessing such a phenomenon. We are grateful to Godrej & Boyce's 125-year-old vision that has enabled one of the biggest revolutions to materialize for the first time in India."

Hussain Shariyarr, Senior Vice President & Business Head, Godrej Process Equipment said, "We are thrilled to hand over the Xylene Column, the heaviest equipment we have made. This delivery is a significant achievement for us since it demonstrates our enhanced ability to manufacture and ship an oversized consignment successfully from our advanced facility in Dahej. Due to several refineries and petrochemical projects in the Eastern and Southwestern parts of India, we have identified enormous business potential in the regions owing to the existing plants as well as the forthcoming expansion projects. We look to grow our business and double our revenue by FY25."

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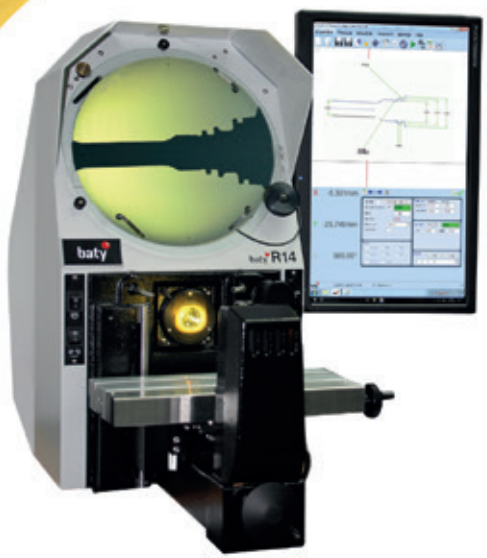

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RIL& Ashok Leyland unveil India's first hydrogen combustion driven heavy-duty truck

RELIANCE INDUSTRIES LIMITED (RIL) & ASHOK LEYLAND recently unveiled India's first Hydrogen Internal Combustion Engine (H2-ICE) powered Heavy Duty truck. The vehicle was flagged off by Prime Minister Narendra Modi in Bangalore at the India Energy Week.

Ashok Leyland, the Indian flagship company of the Hinduja Group and India's leading commercial vehicle manufacturer, along with RIL, has been developing this technology over the past year and has been under test since August 2022. The Ashok Leyland H2-ICE heavy-duty truck range (19-35 Tonne) is powered by Hydrogen, a renewable and clean energy source, maintaining overall architecture like a conventional diesel-based combustion engine thus helping quicker migration to cleaner energy sources at relatively lower cost delta.

Dr. N Saravanan, President and Chief Technology Officer, Ashok Leyland, said, "Ashok Leyland has always been a pioneer in introducing state-of-the-art technologies in the commercial vehicle space. Working with RIL, we have once again demonstrated our technological leadership, and our commitment to the Clean Mobility Mission. Having one of the best R&D teams in the country, we want to continue our path to innovate and leverage new technologies to be a leader in sustainable and environment friendly mobility. Our aim is to make India's alternate fuel segment self-reliant and be one of the flag bearers of the 'Atmanirbhar Bharat' campaign".

Ashok Leyland has been a forerunner in introducing cutting-edge technologies, and had recently demonstrated its futuristic vehicle range, powered by electric and hydrogen options at the Auto Expo 2023.

LAPP India inaugurates their first experiential showroom in Bengaluru

LAPP INDIA recently inaugurated their first experiential showroom at Yelahanka, Bengaluru. The exclusive LAPP Shoppe showroom was inaugurated by Gary Bateman, Managing Director, LAPP India and Kodandaram Ramaiah, Director, M. S. Ramaiah Hospital. The event witnessed participation of existing customers, channel partners as well as potential customers of LAPP.

This unique launch in the cable and connection space is aimed at reaching out to LAPP India's existing and potential customers. It is an innovative initiative where customers can walk in and experience LAPP's entire product range under one roof. Their end-to-end solutions serves a range of industries and includes power & control cables, data communication cables, industrial communication products, ÖLFLEX® CONNECT, cable accessories, glands, and conduits. There will also be a support team present at the showroom to guide customers on product specifications and address their queries.

Speaking on the occasion, Gary Bateman, Managing Director, LAPP India said "With this launch, LAPP India aims to provide an immersive and interactive shopping experience for customers, while working closely with them to tackle industry specific challenges and requirements. We will focus our efforts in expanding the brand's retail presence in Tier-2 and Tier-3 cities across the country in the coming years."

Inovance Technology India expands its operations

INOVANCE TECHNOLOGY INDIA has expanded its footprint in the country in recent months as part of a major ramping-up of its operations. The industrial automation company significantly expanded its existing offices in Mumbai and Ahmedabad in October, swiftly followed by a new facility in Chennai in January.

Inovance' s expansion of its office network is in response to rising sales and a need for more regional offices and engineers across India. New teams of engineers have been hired for the Mumbai and Ahmedabad bases, while the 1.2-acre facility in Chennai will provide crucial support for stock management, product assembly and testing, supporting growth and increasing the company's overall productivity.

Anil Kumar, Director of Inovance India, says, "We are delighted with the speed at which Inovance Technology India is expanding and the new offices and teams will enable us to rapidly increase our business activity in the industrial automation market in the western and southern regions of India. We will be able to provide prompt solutions and services for our customers in these areas.

"Our employees are very pleased with the new offices, which are done out to a high spec and contain everything they need to do their jobs to the best of their abilities. It's a great time to be in the industrial automation industry in India. More manufacturing in India means more demand for our drives from Indian end users, distributors, and OEMs. I firmly believe the future is bright for manufacturing and industrial automation in India."

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BharatBenz unveils Construction and Mining trucks at Bauma CONEXPO India 2023

DAIMLER INDIA COMMERCIAL VEHICLES (DICV), a wholly owned subsidiary of Daimler Truck AG, has strengthened its product offering for the Construction and Mining sector with the BharatBenz 3532CM mining tipper, 2832CM mining tipper and 5532 Tip Trailer.

The entire truck model range is on display at Bauma CONEXPO India 2023 in Greater Noida. The new model range comes with a more powerful 320 HP BSVI diesel powertrain, providing high wheel-end torque required to negotiate tough, gradient mining roads. The vehicles come with industry-leading body capacities, benefiting customers in the mining sector. Also, on display at the exhibition was the new BharatBenz 48T rigid tipper and 28T RMC.

BharatBenz offers a wide range of tipper products starting from 6-wheeler 13T medium duty trucks to 22-wheeler 55T trucks (tip trailers). These trucks are used in extensive applications including surface construction, mining, irrigation/ tunneling and intra-city distribution.

Pradeep T, Vice President – Product Engineering, Daimler India Commercial Vehicles said, "We are excited to introduce our new high performance BSVI powertrains, which will revolutionize the industry with their cutting-edge technology and unparalleled performance. BharatBenz vehicles will now feature segment-leading innovations

in our new range such as intel-lift, hill holder, parabolic bogie suspension with bolsters in the rear and more. Safety is a key parameter in our design philosophy and the new products meet the latest HDT cabin crash norms including roll-over protection.

CERATIZIT Group showcases its extensive product-range at IMTEX 2023 & Tooltech 2023

CERATIZIT - a world-renowned high-technology engineering group specializing in cutting tools and hard material solutions showcased their comprehensive range of products and solutions at IMTEX 2023 at the Bengalore International Exhibition Centre, Bengaluru. The CERATIZIT stall was inaugurated by H.E Mrs. Peggy Frantzen, Ambassador of the Grand Duchy of Luxembourg; accompanied by Thierry Wolter, Member of Executive Board of CERATIZIT Group, Dr. Uwe Schleinkofer, Director of R&D at CERATIZIT Group and Anil Kumar, Managing Director, CERATIZIT India.

IMTEX and ToolTech are flagship events of Indian Machine Tool Manufacturers' Association for the metal cutting industry, where all the international brands participate for displaying their new technology trends in machine tools, cutting tools, metrology, CAD/CAM/CAE solutions and tooling systems. CERATIZIT's participation at IMTEX 2023 focussed on broad topics including Sustainability (Tooling a Sustainable Future), Automotive Solutions, Digitalisation, and Industry 4.0 solutions, all of which were presented at the CERATIZIT stall.

With two plants in Bengaluru, one unit in Kolkata, CERATIZIT produces their entire range of cutting tool solutions in India, they are also gearing towards fulfilling the requirements for clients across the globe. "We have an aggressive investment plan for expansion and over the past year have continued to make total investments of over 100Cr in India for upgradation and expansion" said Anil Kumar, Managing Director, CERATIZIT India.

CERATIZIT's focus on Sustainability

CERATIZIT's vision is to be the leader in sustainability for the hard metal and cutting tool industry by 2025 and the company has outlined an ambitious sustainability strategy in this regard.

To drastically reduce its own carbon footprint quickly, CERATIZIT is initially focusing on three major levers. A decisive factor is the increase in the proportion of raw materials remaining in the production chain to over 95%. Compared to primary raw materials from ore, their processing requires 70% less energy and reduces CO_2 emissions by 40%. A positive side effect is the safeguarding of the supply chain for raw materials, so that both the customers and CERATIZIT benefit twice.

Speaking on CERATIZIT's focus on sustainability, Thierry Wolter stated, "Sustainability is an established pillar in CERATIZIT's corporate approach, and we have been putting every effort to point the way through innovation. Apart from an outstandingly high recycling rate and conscientious energy management, we have also won prestigious accolades & awards for our products. 'CT-GS20Y', our so-called 'green carbide', combines the performance of a premium carbide grade with a deliberately sustainable production process. This consists of high-quality secondary raw materials – recycled carbide recovered from decommissioned milling cutters, drills and solid carbide tools."

CERATIZIT's focus on Digitalisation

With the modular monitoring and assistance systems ToolScope, a unique and comprehensive industry 4.0 solution, the CERATIZIT Group is a front runner at digitalisation in the metal cutting industry. Tool monitoring and control systems like ToolScope offer much more transparency for machining processes and can significantly increase process efficiency and process reliability through real-time analysis and adjustment of process parameters.

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By Sumeet Doshi, Country Manager, India, Ultimate Kronos Group

UBERISATION OF WORK: HOW TECHNOLOGY HELPS IN REVIVING THE AUTOMOTIVE INDUSTRY?

With the contract workforce's rapid penetration into specialised industries, especially in the sector such as automotive, the need to have a comprehensive guide on realising its potential has upsurged. The article delves deep on how technology can be vital in unlocking their potential and streamlining this disorganised workforce and company operations.

Historically, India has been known for being a source of cheap labour workforce. It is only fair to acknowledge the part played by the Indian workforce in establishing the modern world. Centuries later, little has changed about the skilled Indian workforce, only that it has evolved in the current times to adapt itself to modern industries. One such industry that has been on the rise is the automotive industry. Despite facing unprecedented challenges, India is expected to be the third-largest automotive market by 2026.

In 2022, nearly 15 million people have been expected to be employed in the automobile sector directly in the industry. According to the Society of Indian Automobile Manufacturers (SIAM), the Indian automobile sector contributes 7.1 per cent to India's overall GDP and 49 per cent to the manufacturing GDP. In addition to this, the sector is predicted to provide employment to 37 million employees, both directly and indirectly. The contract workforce makes up a significant component of the labour force in many nations. When coming to the Indian auto industry, the contract labour workforce is becoming more vital and preferable as a flexible, cost-effective resource that may help their critical business objectives.

ADDRESSING GAPS IN CONTRACT WORKFORCE MANAGEMENT THROUGH TECHNOLOGY

According to the Annual Survey of Industries (ASI), there were 4.2 million contract workers in the industrial sector in 2016-17. This accounted for 36 per cent of all employees for the year. The automobile industry employs 8 per cent of the entire workforce across all industries. According to the government's yearly survey statistics, contract workers make up about half of the auto industry's workforce.

Sumeet Doshi

The contract workforce is the variable workforce of the manufacturing organisation, and it has greatly contributed to the expansion of the auto-industrial sector. However, a contract workforce confronts several issues, including poor working conditions, minimum pay, lack of employee benefits and social security, and not being on the payroll. They're frequently kept throughout the year and hired based on production cycles through outside agencies.

Industries recruit temporary workers through labour contractors rather than directly. For example, auto manufacturing industries favour keeping part of their workers on contract to maintain flexibility in responding to economic cycles and avoid the costs of hiring permanent employees. However, despite the

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contract workforce's rapid penetration into specialised industries, there has been a lack of a comprehensive guide on realising its potential across all sectors of India's economy and technology can be key here in unlocking that potential and streamlining their management.

IS TECHNOLOGY BOOSTING DIVERSITY AND EQUALITY?

Typically, contract workers are not considered at par with the organisation's on-roll workforce; many manufacturers keep manual systems for contract workers and automated processes for direct employees, which adds to the complexity, leading to multiple compliance issues. Moreover, the contract labour is still managed through decentralised systems administered at security gates, with most of the procedures conducted on paper trails. In contrast, permanent employees have the advantage of digital HR tools that provide them with better flexibility with their work schedules and a healthier employee experience.

It is challenging to streamline specific manual procedures using existing technologies due to the changing nature of managing the contract workforce. On the other hand, contractors may be cautious to implement an automated system that includes labour tracking since it eliminates the possibility of data fabrication and manipulating the system for financial advantage.

Even today, contract workers are mistreated, with contractors making inconsistent payments, inaccurate PF contributions, and casually ignoring several of their rights, such as bonus settlement and earned 'Leave'.

> "Despite the contract workforce's rapid penetration into specialised industries, there has been a lack of a comprehensive guide on realising its potential across all sectors and technology can be key here

In addition, most contract employees are unaware of what they are losing since they have no access to their own work data. Technology can help address this issue by capturing accurate data that is passed accurately for vendor billing & payroll processing. Factors available in real-time such as total hours worked, overtime hours, statutory rest days, shift allowances etc should drive a culture of transparency, so employees know that they're being paid basis the work they've done.

ABILITY TO ADAPT AND INNOVATE

Theoretically, digital transformation relies on technology to offer timely access to information, allowing for better, faster, and more informed decision-making, and it's also a way for companies to change the way they do business. New-age technologies such as artificial intelligence (AI), smart automation, and industrial robots allow businesses to connect across their operations in unprecedented ways, resulting in ecosystems driven by real-time data.

To cover the labour gap and grow the workforce

> The auto industry should invest in workforce management tools to address the skilled-worker shortage by upskilling its existing workers, effectively tracking cost parameters, and monitoring KPIs

within the business, employers may want to consider reskilling and upskilling the current workers to take on new or different job positions and contract workforce through cross-training and job-specific training to take on a wider range of duties and to enhance professional development.

If the auto manufacturing sector is to create a better future for its workforce, the digital divide separates those who have access to forecasting and scheduling with the help of workforce technology and those who struggle to keep up with the manual semi-automated tools must be closed. The auto industry must close the digital divide for all workers by enabling access to proper workforce technology to improve and better the employee experience.

SUSTAINABLE DIGITAL TOOLS TO FILL THE GAP

To survive the disruptive trends and thrive in the upcoming year, the auto manufacturing sector must begin to take steps to automate their workplace and their workforce for a future that will be remarkably different and employee-friendly. It will be necessary to acquire more technologically advanced tools and equipment. Additionally, the automotive workforce will have to be trained to ensure they have the right skill set to handle the evolving automobile landscape.

The auto industry should invest in workforce management tools to address the skilled-worker shortage by upskilling its existing workers, effectively tracking cost parameters, and monitoring KPIs (key performance indicators). In addition, the organisation should consider adopting modern work and time schedules to enable automated and predictable scheduling for their gig workforce. Digital adoption will give the flexibility to the contract workforce to plan shifts to pick based on their availability.

- **Allocation of tasks:** In the automobile industry, there are three major areas where technology can play a key role in managing the workforce. The first one is a workload plan where technology, through the help of AI, determines the schedule of employees based on activity, skill, shift preferences, and availability. All this information is then made privy to managers who can efficiently oversee resource management.
- **Averting disruptions with real-time back-ups:** There may arise emergency situations where employees assigned to the production line might be unavailable, in which case, technology intervenes to allocate the task to people from the variable workforce who possess the necessary skills, thus ensuring a smooth continuation of production within the organisation. This availability of a real-time supply of variable workforce is how the uberisation of work is happening in the auto industry.
- **Ensuring Flexibility:** Technology can also allow workers to swap shifts amidst themselves in case of a crisis. This way, technology powered by AI can ensure flexibility for employees working in the manufacturing industry by acting as a bridge between planning and the happening of actual work.

Flexible work approaches, such as inventive time-off tactics and shift schedules, can empower employees by allowing them to work their own schedules. For example, employees manning different workstations for hours on end need to be provided with adequate rest time. Technology can help organisations do that using non-intrusive facial recognition by identifying which workstation is manned by which employee, and then sending in 'relievers' to allow them a break.

A BRAVE NEW WORLD

To optimise its expanding workforce, companies must shift their perceptions of contract workers as being a low-cost alternative, to being a strategic lever to be able to quickly scale up and scale down based on variability in production demand. Instead, contract workers also bring in new perspectives, fresh energy, and innovative problem-solving techniques.

The future seems to be very bright for the automobile industry. However, it is a crucial time for organisations to position themselves properly. The increasing use of tech-driven features in modern automobiles has revolutionised the auto manufacturing industry. Therefore, the automobile industry needs to be diligent and proactive in continuing to invest in the most up-to-date and effective tools, equipment, and technology and ensuring its workforce is adequately trained and has better access to technology; they will then continue to be sustainable and thriving in upcoming years and beyond.

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IMTEX 2023 - A SHOWSTOPPER FOR MANUFACTURING

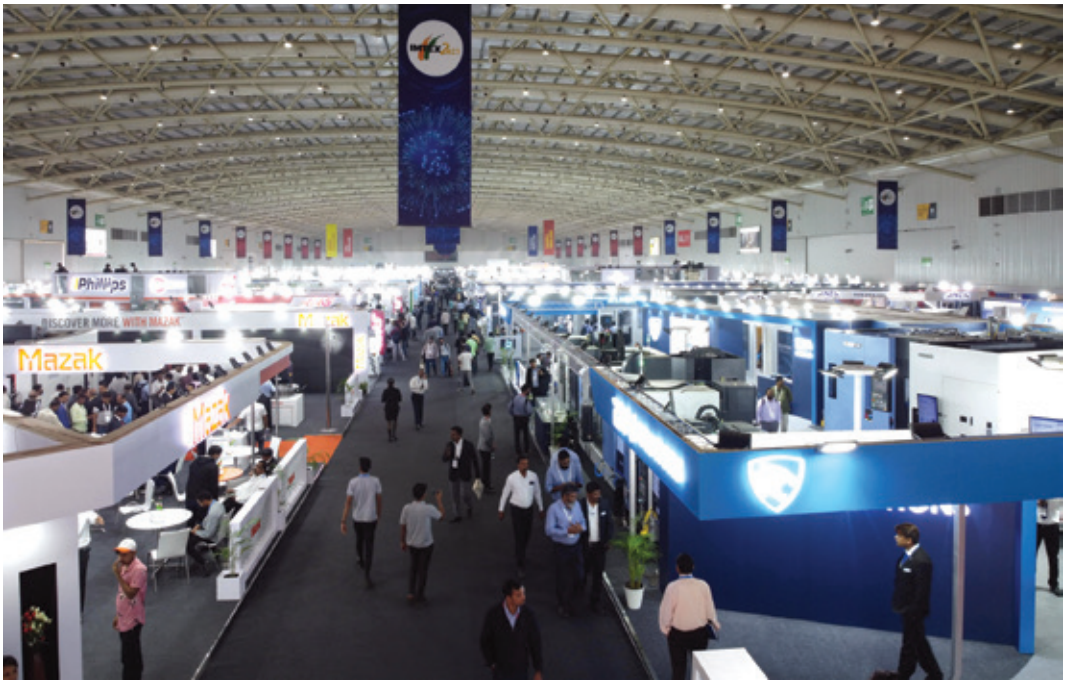
The 20th edition of IMTEX, a showstopper for the manufacturing industry concluded successfully. The show organised by IMTMA was held from 19th to 25th January at Bangalore International Exhibition Centre (BIEC).

IMTEX 2023 focused on metal-cutting machine tools and manufacturing technologies. The exhibition was held in an area of 77,000 square metres in five halls. Concurrent shows Tooltech 2023 and Digital Manufacturing were trendsetters in many ways. IMTEX 2023 was a great platform for the machine tool and manufacturing fraternity to renew relationships, explore collaborations and partnerships, and network with warm handshakes.

Held after four years, exhibitors displayed technologies like smart and intelligent machines, high-precision, high-performance, multi-tasking, hybrid machines and special-purpose machines. Robots, cobots, AGVs, tools, accessories, manufacturing software, 3D Printers, 3D printing solutions, evolving Industry 4.0 hardware, software, customised solutions, 5-axis, digital twin, advancements in tooling and measurement technology, solutions for new products, were also displayed.

"Cutting-edge technologies are vital in addressing the need for quality and precision manufacturing in every industry sector" commented Ravi Raghavan, President, IMTMA. Raghavan added that he was glad to note fresh excitement among exhibitors and visitors to forge relations and enhance business opportunities which will move the manufacturing business forward in the years to come.

"IMTEX 2023 brought together the entire machine tool and manufacturing fraternity on a common platform with the new and innovative products to match today's requirement of the manufacturing industry," said Jibak Dasgupta, Director General &



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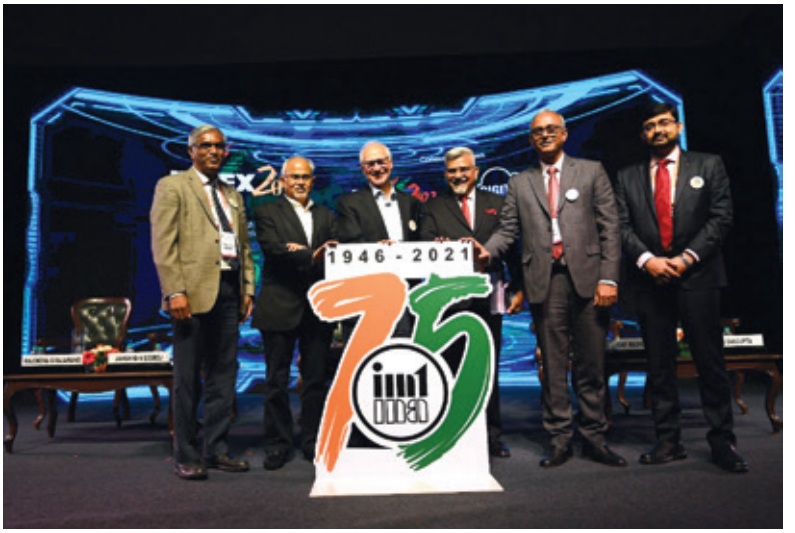
CEO, IMTMA. Dasgupta added that the exhibition not only proved the resiliency of industries but also their yearning to advance manufacturing to new levels with more self-confidence.



IMTEX also coincided with the platinum jubilee of IMTMA. IMTEX 2023 had many other parallel events. IMTMA held the JAGRUTI-IMTMA Youth Programme with the participation of 25 engineering students from 12 various institutions of the country to create awareness about the latest developments and trends in machine tools and manufacturing industries.

Connect, a forum to meet and hire young engineers was held on 22nd January. Around 125 students and 18 companies participated in the event. The event provided the opportunity for students to find placement in companies.

To encourage young engineering talents, IMTEX 2023 organized a competition for young innovators through the i2 Academia Pavilion. The programme enabled twenty-two institutions from across India to connect with exhibitors and showcase the projects that they have undertaken.

The International Buyer Seller Meet held on 23rd and 24th January had 38 representatives from 17 countries and was an apt platform for Indian machine tool manufacturers to interact with international buyers and enhance their export potential.

IMTMA had constituted two awards to recognize and reward companies. The IMTMA Best Design Award for indigenously designed products in metal cutting and the IMTMA Export Performance Award for making significant achievements in the export of machine tools were conferred during the show.

The IMTMA Best Design Award was bagged by Amace Solutions Private Limited, Bharat Fritz Werner Limited and Bestek Engineering Private Limited. Trishul Machine Tools Private Limited and Grind Masters Machines Private Limited were conferred with the IMTMA Export Performance Award.

MAKING WIDE STRIDES

The 20th edition of IMTMA's flagship international machine tool and manufacturing technology exhibition IMTEX had a befitting start to it as the industry veterans physically came together for its ceremonial inauguration. Apart from the show's comeback, they rejoiced at IMTMA's completion of 75 glorious years. The exhibition was inaugurated in the presence of industry veterans including the Guests of Honor Gopal Subramanyam, Chairman, SKF India and Kamal Bali, President & Managing Director, Volvo Group India; Jamshyd N Godrej, Chairman, Exhibitions – IMTMA; Ravi Raghavan, President, IMTMA; Rajendra Rajamane, Vice President, IMTMA and Jibak Dasgupta, Director General & CEO, IMTMA.

In his welcome address, Godrej applauded the Indian Machine Tool industry for achieving global recognition and congratulated IMTMA on the completion of its 75 years journey. Raghavan joined in to acknowledge IMTMA's efforts and the Indian Machine Tool industry for making waves globally. "IMTMA has built up many international associations. Their representatives are visiting this IMTEX. Many machine tool startups are showcasing their innovative products in this edition.

Keeping in mind the expansive nature of the Machine Tool industry and the inclusion of fields like Machine Learning (ML), Industrial Internet of Things (IIoT), Data Science, etc., this time we have included exhibitors from those areas too," he added. Subramanyam, in his address, said that the Machine Tool industry needs to explore new arenas like the Infrastructure sector which may pave the way for future growth. Bali gave a broader perspective of the Manufacturing industry. He said that the next decade belongs to India. He called upon the industry to adopt best practices and build partnerships with global entities. "India witnessed marvellous export growth last year. As the Indian Manufacturing industry is on

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the growth path, the Machine Tool industry will also grow."

ADOPTING NEW PARADIGMS IN MANUFACTURING

The Ceratizit stall was inaugurated by H.E. Peggy Frantzen, Ambassador of the Grand Duchy of Luxembourg, accompanied by Thierry Wolter, Member of Executive Board, Ceratizit Group; Dr Uwe Schleinkofer, Director of R&D, Ceratizit Group; and Anil Kumar, Managing Director, Ceratizit India.

The company manufactures indexable inserts, tool holders, solid carbide, and PCD tools in India at two plants in Bengaluru and one in Kolkata. Ceratizit in India is also addressing the needs of global clients while meeting Indian clients' requirements. Against this backdrop, Kumar says, "We have an aggressive investment plan for expansion and, over the past year, have continued to make total investments of over Rs 100 crore in India for upgradation and expansion."

Wolter remarked that internationalisation is an essential topic and that while Europe has a strong position as a supplier today, Asia and the United States still offer significant growth potential in the next few years. "We are already the world's fourth-largest carbide manufacturer and are closing in on third place. However, to maintain this position in the coming years, we must expand disproportionately in Asia and America. Of course, to some extent, organically. But, if the general conditions are favourable, I can see one or two acquisitions," he adds.

GOING FROM STRENGTH TO STRENGTH

Yamazaki Mazak Corporation is a reputed leader in the manufacture of advanced technology solutions including multi-tasking, 5-axis, milling, turning, and automation. The company has had remarkable growth in India since it commenced its operations in the country in 1998. It has been successfully providing Total Customer Solutions in the Indian market, while relentlessly adding milestones in its growth journey here. From a small team in Chinchwad, Pune that was formed to offer aftersales support, the company has grown exponentially in terms of sales, service, and application network all over India.

In 2011, the company moved its new Technology Center in Sanawadi, Pune sprawled over a luxurious five-acre area, which today has the most advanced machines installed for live demonstration and training purposes. The facility also houses an Online Support System, a state-of-the-art Spindle Repair Facility, and a National Parts Center. Its other five technical centres are in Delhi, Ahmedabad, Bangalore, Chennai, and Coimbatore. The backbone of the Yamazaki Mazak success story in India is a highly trained manpower for providing turnkey solutions and after-sales service. The company has a strong customer base, ranging from OEMs to Job Shops on a pan-India basis. Mazak offers over 200 varieties of products in the Indian market, including Multitasking, Automation, Horizontal Machining Centers, Vertical Machining Centers, and Turning Centers.

The new factory in Pune is yet another proverbial feather in Mazak's hat. It is in the advanced stage of construction and will be operational in March 2023. Takashi Yamazaki, President, Yamazaki Mazak Corporation, shares what prompted the company to start a manufacturing plant in India, especially in Pune, "We started our operations in India 25 years ago in 1998. We chose Pune as our base because of its strong engineering industry presence and our existing customers. In 2011, we opened a big Technology Center to give support to our customers. We have a strong team in Pune and, hence, the city was the natural choice as the base for the manufacturing plant." The company will start with Vertical Machining Centers in the first phase. "The investment in the first phase of the Indian factory is approximately Rs 240 crore. The site area is 23 acres and the total floor area is 23,130 sqm," he adds.

When asked which new (sunshine) industry sectors in India look most promising in terms of generating maximum revenue over the traditional industry sectors, Yamazaki replies, "Currently, in India, a wide range of industries, including automobiles, agricultural machinery, and aircraft, continue to actively invest in equipment as the domestic demand expands. Especially in recent years, as the supply chain of the manufacturing industry has been reviewed worldwide, semiconductor investment in India has been active. Combined with these trends, the demand for machine tools is expected to increase over the medium to long term."

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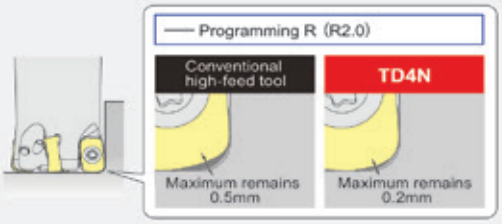
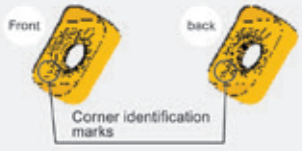
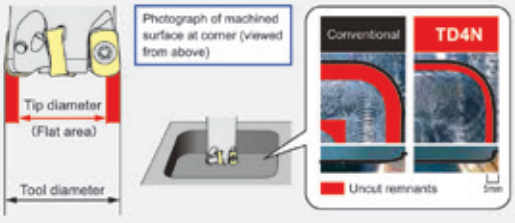
The cutting edge shape was reviewed for TD4N so that uncut remnants are reduced. This enables the load on the next process to be reduced by up to 40 compared to conventional products.



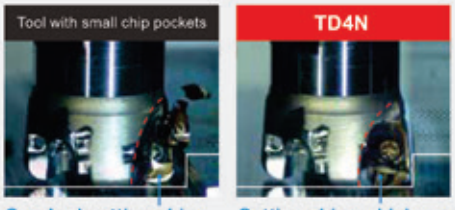
Economical 4-corner inserts with chip breakers for various applications



Large tip diameter for excellent handling



Excellent chip discharge characteristics

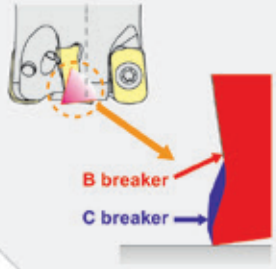


Crushed cutting chips

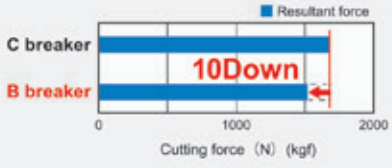
Cutting chips which were discharged well

Magnified view of cutting edge cross section

Positive rake angle



Comparison of cutting force



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"WE ARE AGGRESSIVE ON ACHIEVING NET NEGATIVE BY 2040"

Anil Kumar, Managing Director, Ceratizit India

Tell us about your company's plan to go Net- Zero by 2025.

Sustainability and reducing carbon footprint are the core mission of our company. We aim to go carbon neutral by 2025 and net negative by 2040. Our company has already started taking steps from 2020 onwards to achieve them. Globally, the target to achieve Net Zero is 2050; however, we are aggressive on achieving net negative by 2040, which is no less than a challenge.

The company will be going carbon neutral and net negative in stages. By 2025, we will reduce our carbon footprint almost by 35 per cent. With this, we will become carbon neutral. By 2030, we will again reduce the footprint by 65 per cent. Furthermore, by 2040, it will be brought down by 75 to 90 per cent. So this is how we aim to become net negative.

In the first stage, we are working on making our raw materials sustainably. Right now, we are using virgin powder and the elements from the earth and processing them, which consumes a lot of energy. As a result, we have invested in recycling plants in Europe and US. This way, we are already recycling the carbide, and the energy consumption is less as compared to processing the virgin powder, which reduces our carbon footprint to a great extent.

We have introduced green carbide to make rods, and with this, we have utilised almost 78 per cent less carbon. So, it is almost 4.4 against 19 Kg of carbon. Our customers are using these green carbide-made rods to make tools, and in turn, they drastically reduce their carbon footprint.

For recycling the green carbide, we will be using green energy and have tied up with a company in Europe and even purchased it for the future. This way, the energy is produced from green sources.

We have also invested in solar plants. In Kolkata, we have a plant of 100KWP, and in future, we are planning to set up a plant in Bengaluru.

Given that Imtex 2023 is hosted after a gap of four years, what kind of response has your company received so far?

The response has been overwhelming. Since IMTEX came back after a gap of four years, I can see a lot of energy and excitement around it. We are happy to see customers checking our products and visiting our stalls. Also, we are excited to welcome and showcase our offerings to them.

Since Ceratizit is an R&D-driven technology company and, as a pioneer, how are you passing on those benefits to your end consumers?

Yes, we spend a lot on R&D, and this is what brings us new technology and tools. We are already coming up with solutions for e-mobility, and the tools are on display. We are already supplying it some of our customers who are producing e-vehicles. We are also preparing for industry 4.0. We have also come up with tools that work on Bluetooth, electronic displays, and complete integration into the machine. So, these tools help in enhancing productivity and enable remote working, which makes it quite futuristic.

You are one of the major players in the Indian machine tool sector. According to you, which are the sectors that will garner more demand?

Until now, India was automotive driven. The requirement for automotive components and OEMs will remain. Even though the push is for electric vehicles, the machining is reduced on some components, but it is still there. Besides, we have aerospace, electronics division, and defence requirements, which are coming up strongly. So, all these segments are helping for growth.

Do you think the Indian government should consider the Indian machine tools sector for the production-linked incentives scheme? What are the other demands made by your sector to the government?

The government has identified machine tools as a separate sector. We are talking to the government through ICTMA to make cutting tools a new segment. Both segments are quite different but are related to each other. It's crucial to make cutting tools a different sector. Some incentives will help us because the increase in cost makes it challeging to operate. Even profit margins are down, and some support from the government in terms of policies will help.

According to you, which sector other than automotive and auto components would see a demand for your industry?

I think the electronic segment, defence and aerospace would see a demand.

What kind of expansion and investment opportunity is Ceratizit looking forward to in India?

We have started investing in the last two years. We did not stop even in COVID. We have invested in inserts, new electronic presses and grinding machines. For solid carbide, we are investing in micro-tooling, and for PCD, we now have laser machines. So, all our investments are in line with the industry requirements.

What is the kind of manufacturing capacity at which you are operating?

In Kolkata, we have a wide area for expansion. We can make a few more sheds and immediately start machining. Bengaluru plants are already in the process of expansion.

Is Ceratizit a 100 per cent capacity utilisation plant?

Not yet. We have some capacities, but as I said, we are constantly working for the future and ahead of demand. Currently, we are still working at 70-75 per cent in Kolkata and 70 to 80 per cent in Bengaluru. We have already started investing and expanding our capacities for the future.

How much you would like to invest and how much you have already.

We have invested 100 crores in the last two years and will plan to invest 30 to 50 crores.

"SOLID CARBIDE IS A MAJOR ENTRY INTO OUR PRODUCT PORTFOLIO"

M K Raghuram, General Manager, Kyocera CTC Precision Tools

Could you please tell us about your product lineup for the IMTEX 2023 and Indian market?

We started Kyocera CTC in 2015 with mostly indexable product range. In the last three years, we have expanded our product portfolio which includes everything about metal cutting including turning milling, hole making. In solid carbide tools, we now have a whole range of products including a 30 Micron diameter drill. Solid carbide is a major entry into our product portfolio and this is the major highlight.

According to you, what are the trends which are dominating the Indian machine tools industry?

In general, the Indian market on every sphere is growing. We are the bright spot on the manufacturing world. We see a lot of 3C manufacturing coming to India with cell phones and government incentives on the electronic industry side. We are also seeing an upswing on the aerospace side, so the market trends are very positive, and we are very optimistic for this year and next as well.

What are your expectations from the IMTEX 2023?

First and foremost is to showcase our new products. We have an eye catcher in this exhibition, and it is the mobile phone. So, today we all are equipped with the tools which go into manufacturing electronic components. This is something we would like to showcase, apart from the new products in indexable products like turning, milling and hole making, and this is what we would like our customers to know and take away from this event.

How is your company enabling the manufacturers to stay competitive in such a competitive world?

We are offering innovative products which can work at high cutting speeds. By using our products, our customers get the benefit of cycle time reduction.

With this, they can produce more with the same machine and can increase productivity. So, this will be the takeaway from the customer. So, with increased productivity and reduced cycle time, the cost of manufacturing will come down. So, we are putting all our efforts into making our customers understand these benefits.

We believe within Kyocera CTC and CTC Precision that when the pace of change inside the company is greater than the pace of change outside, we'll be able to not only cut costs but we will be able to come up with very innovative products that add value on the customer front, not just on cost but also on quality and productivity as whole.

What do you think about the Indian machine tool markets. Tell us about your plans for India in terms of your investment or expansions?

We are expanding on all fronts. There is an immense number of investments lined up from the beginning of this year, wherein we invested heavily in precision solid carbide tools, quadrupling our capacity on that front. Also, on the standard product lines, the capacity will gradually increase over the year.

I think on the solid cutting tool side, we are quadrupling the capacity, which is a good indication of the volume of increase. And we will come out with numbers as we move along through the years.

What about your current capacity utilisations? Are we utilising at the core, or do you still see there is a chance of meeting a 100 per cent capacity utilisations?

The demand has gone up now, so that's the reason we are enhancing the capacity. The electronic component industry which started two years post COVID and there is a huge demand for it. The media is inundated with the news about manufacturing base now shifting from China to India. This is going to be the next big change in the market. So far, cutting tools have been more dependent on the automotive segment. So, this will change gradually.

So, what used to be 80 per cent automotive and 20 per cent non-automotive, will gradually shift to maybe 60 per cent non automotive and 40 per cent automotive in the next three years. And with the electrification that 60 will further shrink and it will be more non-automotive, maybe not IC engine but automotive with EV. So, this is the trend going further plus the electronic components. So, these will be the two major things- EV and electronic component which is going to be the future in the next 3 to 10 years.

"AFTER AUTOMOTIVE, THE NEXT BIG THING WE CAN SEE IS AEROSPACE"

Prashant Sardeshmukh, Managing Director, MMC Hardmetal India

Tell us about the ESG goals of your company.

The corporate philosophy of Mitsubishi Metals Corporation is for People, Society, and the Earth. Everything that we do evolves around this corporate philosophy. Even in business decisions, the priority is SCQDE (Safety, Compliance, Quality, Delivery and Earnings). We are very thoughtful about the environment, and safety.

How do you see the demand for metal cutting and metal forming tools in India?

We are fortunate that post-COVID, the industry has picked up well for India. We are growing very rapidly and have registered double-digit growth for the last couple of years and we are aiming to continue with that growth for the next couple of years.

Which sectors do you think are going to contribute more to the industry?

After automotive, the next big thing we can see is aerospace. We have demonstrated many new products which we have launched for the aerospace industry. Currently automotive in India is still leading and most of the cutting tool makers are now concentrating on automotive, because it is bread and butter for both cutting tool and machine tools industry.

Could you please tell us about your company's offerings displayed at IMTEX ?

We have launched many new products in gym talk and same products are launched worldwide at the same time. So in IMTEX, we are displaying all those new products which we have launched in gym talk. So, we

have many new products which we have launched for automotive and mainly aerospace.

R&D has been in the MMC's systems for a long time, so how do you pass on your R&D efforts to your end users too?

R&D has been Mitsubishi's core strength and we invest a specific percentage of our earnings every year into R&D. We always keep on saying that "We invent the tool for the future," working hand in hand with various machine makers to know what kind of features they will be launching for their machines. This helps us to get equipped to make the tools, manufacture the tools, or develop the tools for such demands. Besides, we have started working with various world-class universities and their brilliant students work hand in hand together with Mitsubishi Motors Corporation, Japan's R&D team. We try to develop new trends altogether like continuously rotating inserts. So, no need to change the cutting edge etc.

How do you articulate your feelings for IMTEX 2023 after four years?

It is both extra positive and enormous because customers want to come out, they want to see the new technology and get benefited from it because the industry is booming, and everybody wants to manufacture a greater number of components with the same number of machines and that is very much possible with the new developments what we have launched.

Where exactly is MMC hard metal heading in the next couple of years?

We had a lot of expansion plans pre-COVID, but due to COVID some expansion plans got postponed but they are still there. We launched a manufacturing plant in Aurangabad in 2016 and a Technology Center in Pune in 2020. The next plan is to have new manufacturing setups for the remaining tools. So, we would like to get benefitted from the Make in India campaign, AtmaNirbhar Bharat initiative and Digital India program.

Tell us about your company's investment and expansion plans?

It is difficult to comment now because the plants are still fluid, but soon, we will be announcing something.

When do we see these envisaged plants coming to the floor?

The current plan is 2025.

"IMTEX IS A GREAT PLACE TO SHOWCASE OUR PRODUCTS & MAKE CUSTOMERS AWARE OF OUR SERVICES"

Vipin Rana, CEO, ExxonMobil Lubricants Private Limited

Since we are all meeting after almost four years, what are your expectations from IMTEX 2023?

IMTEX is one of the premier machine tool manufacturing shows here in India. There are several manufacturers who have participated. We can see several of our customers and other interested parties who have participated here. So, we can say that we have got right audience here to showcase our products. And we believe that we have got a lot to offer here as part of the manufacturing push in India.

What are your expectations? Do you think this platform will further accelerate your growth as well as of the industry?

IMTEX is the place where several equipment builders, whom we have already worked with are participating. Also, a lot of our customers are also expected to be here. So, this is a great place for us to showcase our products and make them aware of the services that we offer. And we are hopeful to strike new relationships here at this event.

According to you, what are trends that is dominating the Indian machine tools industry?

We are in a very interesting phase at this point. There is a significant push from the Government of India to make India a major manufacturing powerhouse in the world. Owing to this, today, we make things in India and export them to rest of the world and this is closely linked to the aspirations that India has as its GDP is improving. There are very high expectations that the government has from the manufacturing industry here and our fortunes to some parts are also linked with the manufacturing progress in India.

As a player as, what prospects do you see for Atmanirbhar Bharat to push manufacturing sector growth in this country?

AatmaNirbhar Bharat is a very important initiative by the Government of India as well as for people of India. As the GDP expands, I think more and more manufacturing output will be required for the growth and with that growth, there is going to be a lot of equipment that will come in, as well we can expect a lot of investments coming in into India. All this is going to be in new equipment, which we are uniquely positioned to service. We have got the right products and services and the offer that we have in India to service the manufacturing industry, I believe is unique and, in some ways, unparalleled. So, we are going to be in a sweet spot to be able to service this demand and be a participant in India's manufacturing growth.

How your company is enabling the manufacturers to stay updated in competitive and rapidly evolving environment.

We have always been a very strong research and development company. Globally, the foundation of our success has been built around our progress in research and development. Be it coming out with new products, developing new services, and we also have got relationships with a lot of equipment building companies and equipment builders across the world, who really value this relation. We are consultant to them in the design stages and develop products together to meet their requirements in a unique manner and with these relationships in manufacturing, we can service the industry by helping them improve productivity, enhance their energy efficiency, and make them profitable.

What are all the services that ExxonMobil provides to its customers?

We have got several services, that we provide to our customers. So, there are oil testing services that we provide, but specific to the manufacturing industry we have got Mobil soul care services that we are very proud to deploy here in India. It's a very significant effort on our part to be able to reassure our customers that their equipment is operating well. It's going to be performing to their expectations and meet their productivity requirements. We also have on-site filtration services that we provide to the manufacturing industry, and these are services which our customers have really found a lot of benefits from.

Tell us about your investment and expansion plans. How are you going to expand your market share in India?

India is very important market for us. Everybody knows that India is one of the largest growth opportunities in the lubricants business. We expect that in the next 30 years the volumes are going to be doubling here, but "the value is going to be more than tripling here in India", as per some estimates. So, for this market, for any company that wants to be successful in the lubricants business, India is a must do and we believe that we are again very uniquely positioned for the success.

As a company, ExxonMobil is R&D and technology-driven company, so how do you translate these benefits to your customers?

A large part of the success of ExxonMobil in the lubricants business is really founded on our ability to research and develop new products. We have come up with new formulations, provide new service packages to our customers, and got this consultative approach to the business, where we can guide our customers to improve their productivity with the knowledge that we have acquired in the business.

"WE WANT TO CONTINUOUSLY KEEP OUR LEAD IN THE LASER TECHNOLOGY & LASER MARKET"

Deepak Pundlik, Sales Director, Suresh Indu Laser

Could you please tell us about your recent offerings to the sector?

Firstly, we are the first registered laser machine manufacturing company in India. This was way back in 1990, when Founder and Director, Dr. Suresh Shah, started this company. In the Indian market, we are the prime players as far as laser machine manufacturing is concerned. We have a lot of offerings for the industry with applications such as cutting, welding, marking, cladding, micro machining, cleaning. So, these are the standard products that we are offering for various industrial application. Apart from this, we also handle the projects wherein

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laser technologies are involved to do a specific job and that is our forte. It is a niche technology that we are handling, and we take pride in offering such solutions too.

Which are the sectors that you think there is a great demand for your technology?

Laser is now being used in almost every sector. But in today's scenario, automotive is one of the largest consuming laser technologies and with the emergence of EV especially, this is becoming a prime focus as far as laser technology and application of laser technology in the market or industry is concerned. In that sense, Automotive is one of the major sectors. Apart from that, we are offering various solutions to the defence sector, which is also an important sector for us. There are lot of other sectors wherein the solutions are available for laser applications.

What are the strategies of Suresh Indu Laser to keep themselves ahead of their competitors, considering you also focus on the niche segment?

Since, we were the first to offer any laser-based solutions in the industry in 1990, our motto has been to be the first amongst others, who can offer the solutions which the market is looking for as far as the laser application or laser technology is concerned. We have capabilities, technology and the manpower, which is very important to cater to such requirements. We understand what the laser is and how it can be applied to cater to various requirements of the market. How it can be used as a tool so that it will facilitate industry or the users in general, so that the problems can be catered to, or solutions can be sought in that aspect.

IMTEX 2023 is back after four years, so how do you look at this kind of opportunity?

This is one event that we look forward to capitalise on our presence. We can present it to the market and industry what all offerings we can showcase and what all the solutions we can offer the industry and market. We want to continuously keep our lead as far as the laser technology, laser market, laser solution provider is concerned. So, we always look forward to IMTEX as a platform. This is a very important platform for us, and we are looking forward to making our presence felt all the time.

"WE ARE KNOWN FOR OUR ENGINEERING PROBLEM SOLVING MINDSET"

Vijaykrishnan Venkatesan, Managing Director, Kennametal India

Several companies have plans to go Net-Zero and carbon neutral. What is Kennametal doing on this front?

Kennametal is an ESG-oriented organization globally. We have already published a second ESG report in terms of a global framework. Now when we look at ESG, we have three pieces. The first one which is E stands for the environment. So, what we do as a company is look at carbon footprint reduction and energy efficiency across all our manufacturing plants. So, it also applies to our Bengaluru facility's water efficiency and effluent management. So, everything related to emission to reduce carbon footprint, including our supply chain is something we are looking at very seriously and educating our partners how they can get to a global standard to make sure that we are contributing to the climate change actions committed by the Government of India. So that's just on the E piece.

On social front, we are undertaking a couple of initiatives. We have a lot of focus on diversity of inclusion. We are starting with gender now, but we are also broadening the scope. Global diversity inclusion is a big key area for Kennametal. You can take race, ethnicity in terms of differently able, so we're looking at across categories of diversity and community around us. When you talk about social as responsible corporate, we are also looking at how we can strengthen the community around us. For example, we did a very large water related project in a park very close to Kennametal in Bangalore, which improves the water table by at least four feet in and around the facility. So, these are areas what we are doing. And that's a big impact and governance again. We are a very strong on code of conduct and ethics and

we bring that practice to all our partners and suppliers both- the back end, which is all our suppliers, and front end which is our channel partners. So, I think at a very high level this is what we are doing and as you know Kennametal in India is a listed entity. And we are also responsible for the BRS reporting. We are part of the top 1000 listed entities. Hence the ESG easily flows into forests from the BSR perspective. So, we are looking at not just practicing, but living and breathing the ESG principles.

One of the main factors about Kennametal is that it is R&D driven. So, how is this entire R&D factor, you are passing it out to your end consumers.

Kennametal is a customer oriented and process oriented engineering problem solving company. If you look at all our people, they are engineers who are very analytical and mathematical. So, they focus on problem solving, so that is an approach which we bring to a customer, when a customer has a new project, a new solution, a new problem to solve. One of the companies they look for is Kennametal in terms of solutions because we bring in years of expertise, engineering problem solving mindset. So that's where we bring value to our customers, and we partner with our customers. We do not sell them. We help them achieve, solve their problems or achieve their productivity. Thereby we have become a preferred supplier. So that is the approach we take and that's why the R&D and application piece becomes very crucial part for us.

As far as IMTEX is concerned, we are all meeting after almost four years. So how do you see the vibe around IMTEX and the kind of crowd which has come?

IMTEX is happening after four years. And first thing, what I see is phenomenal energy levels. What you see is just not in the participants. Everybody walking in is highly energized one. It also reflects where India is today? A lot of things are going for us. We took the Presidency of G20 and the result in B20. We see a lot of optimism. We are bucking the global recession trend today. We are above 6 per cent of GDP growth and it's driven by domestic consumption. Now that confidence you can see when you look at the face of people walking in the face of exhibitors. There is a lot of positiveness and happiness. So that is what I would define, which only comes when you're so confident of your future.

What are the evolving technologies that Kennametal is going to bring on table in the next couple of years for various sectors?

See more than sectors, if you look at the evolution of industry in India now, aerospace is a sector which is becoming very large. Thanks to all the policies and how government is helping investments into the country. Kennametal has a lot of technology products which help manufacturing of components for aerospace. Now because we are very well established in both Western Europe and US, obviously, two large bases for aerospace component manufacturing. So, we are bringing those technology into the country, which today we are probably in no need for, so we are bringing a lot of new technologies into the country, and we are also stepping up because when you talk about ESG, you're also talking about increase in productivity, lower wastage, better energy efficiency. What we see, is we have helped the industry to grow in a manner which is very responsible, and that's what we are bringing technology into the country. And I think we are in a very good place as a country because we are no longer looking at let's say a lower cost manufacturer looking at productivity, higher technology innovation. So, I think that's where Kennametal is very keen to play a role in the growth of the country.

What is your growth path? What is your strategy to achieve growth you must have?

We are looking at - one grow with the industry, obviously, plus our target is can we grow in multiples of the industry because India is going to be a fast-growing market. Let us say the market is growing to grow at 10 to 12 per cent. 10 to 12 per cent is not good enough? You need to be 1.5 X to 2X of the market. That is the right way to grow in a growing economy, so that's something which you're looking at and very specifically, because we play very well when it comes to the sectors we spoke about - aerospace, energy, oil, and gas infrastructure are all very good positions for Kennametal globally and the solutions what we can offer to the customers in the country. So that is the way we are looking at, the other area is equally bridging the capabilities in the country in terms of manufacturing and supply chain.

Recently we made an announcement in November of opening of our very large insert capacity plant in our existing facility, but it's new building which doubles our capacity. We have invested ahead of time knowing that we will need that level of capacity to support the growth in the country. So, what we are looking at is how do you bring in not just volume capacity increase but also technology, upgradation, and modernization so that to match up to the current needs of the market. So, if you look at the machines, all the exhibitors are showing, it is all current age machines? They are all industry Ford Auto. They are all connected devices so your tools must also be at the same level. So, we're also broadening our old plant sequentially so that we meet the requirements of the customers.

UDYOG UTSAV: THE BIGGEST CELEBRATION OF INDIAN MANUFACTURING

India is one of the largest manufacturing hubs in the world, but very seldom a common man or even a professional knows the inside stories of manufacturing. As manufacturing is the core of any country's economy, the Festival of Manufacturing is a step towards giving this industry the recognition and credit it deserves. The objective of the Festival of Manufacturing is to make Indian manufacturing a people-oriented industry.

By Rahul Kamat

India, for the past 10 years, has been setting historical benchmarks throughout the world – the latest being taking over the presidency for the G20 summit. Thanks to India's recognition by the World Bank as one of the top improvers in Ease of Doing Business (EoDB) assures the world about India's relentless efforts for redefining the ways businesses operate in new times.

What's more? An unprecedented opportunity for convergence with the 19 highly significant countries in terms of trade—Argentina, Australia, Brazil, Canada, China, France, Germany, India, Indonesia, Italy, Japan, the Republic of Korea, Mexico, Russia, Saudi Arabia, South Africa, Turkey, UK, United States—as well as the European Union—is provided by India's G20 Presidency, which is being held at this momentous crossroads in world history (EU).

Since the G20 collectively accounts for 85 per cent of the world's GDP, 75 per cent of international commerce, and two-thirds of the world's population, it is the foremost venue for global economic cooperation. Aligning G20 cooperation in the economic sphere will be the game changer. While the G20 summit is taking its stride towards building a better India and cohesively the world development, there is no better time than now for the manufacturing sector (which contributes nearly 16-17 per cent of the country's GDP) and its technological prowess to be highlighted.

In tandem with the global agenda and sync with the theme of Vasudhaiva Kutumbakam" or "One Earth · One Family · One Future" ET Edge is launching the Festival of Manufacturing (FOM) – an initiative that unites and highlights one of the most important fragments of this family – the manufacturing sector. The festival will recognise, celebrate and monumentalise the manufacturing sector across India.

The Festival of Manufacturing's presenting partner is Exxon Mobil, in association partner is RR Kabel, its gold partner is Ace Micromatic Group, its Banking Partner is State Bank of India and its Associate partner is igus.

"I would like to congratulate the ET Edge, part of the Times of India group taking up Festival of Manufacturing in 2023, a nationwide initiative in India. I am sure, this initiative will bring together the best and brightest minds from the manufacturing fraternity. As India is bestowed with G20 Presidency, it's a tremendous chance to engage with the business leaders. It's a chance to play a significant time in the global supply chain," said ***Dr Mahendra Nath Pandey, Union Minister, Minister of Heavy Industries, Government of India.***

"I would like to congratulate and extend my support to The Festival of Manufacturing, a nationwide initiative undertaken by ET Edge from the Times of India Group. The state of Maharashtra is already marching towards a trillion dollar economy, with all the economic indicators point to it—the GDP of Maharashtra is already 15 per cent of the national GDP, FDI is 30 per cent, industrial production is 15 per cent of the national production, GST collection is 15 per cent, export is 21 per cent, Maharashtra's employment generation capacity is 68 per cent, the trillion dollar economy is not a distant reality now," said ***Uday Samant, Industry Minister, Government of Maharashtra***

"At Mobil, we are proud to be the presenting partner for the Festival of Manufacturing being hosted by ET Edge. We need to

Dr Mahendra Nath Pandey

Uday Samant


Vipin Rana


T K Ramesh


H K Agarwal


Dr PKC Bose

Celebration at GKN Fokker Elmo India Pvt Ltd, Pune

recognise the success we have obtained in the manufacturing sector and I think the bigger part of the celebration is also going to plan for our future, given the importance of manufacturing to the country's GDP growth," said ***Vipin Rana, Chief Executive Officer, ExxonMobil Lubricants Private Ltd.***

That said, for ***T K Ramesh, Managing Director, Micromatic Machine Tools,*** Festival of Manufacturing is a synergic turbo bringing together India's manufacturing in a joyous celebration of infinite possibilities.

"Indian manufacturing is moving in a solution-oriented direction. While we are learning & understanding sustainability, a collective consortium will catalyse performance and results. We are happy and energised to be a part of and contribute to all you need in machining," he mentioned.

The celebration is set to take the floor in Delhi, India, on 24th March 2023. The event will congregate conglomerates, MSMEs, start-ups, associations, R&D centres, education institutions, and government officials under one roof.

WHY A FESTIVAL?

Festivals and celebrations are a key part of what makes India, India – a nation prime example of unity in diversity. Conforming to India's ideas of celebration, FOM posits as a national platform that will bridge the gap between common people and India's manufacturing sector, pulling the industry out of the shadows.

"Festivals and celebrations are a core part of what brings India together as a nation of diversity, making a positive impact throughout communities. Keeping the prominence of festivals and celebrations in mind, Times of India group has conceptualised, developed and launched 'The Festival of Manufacturing', a national platform that will bridge the gap between common people and the country's manufacturing industry," said ***H K Agarwal, Managing Director – Grasim Industries Limited, Business Director- Pulp and Fibre Business, Aditya Birla Group.***

"In India, we are flooded with festivals on all seasons but 'The Festival of Manufacturing' is one of its kind and totally unique in all respects. India is one of the largest manufacturing hubs in the world, but very seldom a common man or even a professional is aware of the inside stories of manufacturing," said ***Dr PKC Bose, Vice Chairman and Managing, Director, Enercon Windenergy Pvt Ltd.***

Our brand ambassador, ***Satyakam Arya, Managing Director & CEO, Daimler India*** feels that The Festival of Manufacturing is a recognition of hard work and dedication demonstrated by millions of professionals working in the field of manufacturing across the length and breadth of our country.

He further said, "The high standard of Quality, Engineering, Sustainability and Innovation that India brings to the table is making us an attractive destination for manufacturing for the entire world. This means we should not only celebrate what we, together have achieved as a country but also look at how we can leverage our strengths to harness the opportunities in front of us."

The event will create a five-way collaboration network while encouraging


Satyakam Arya


N Venu


Sanjay Koul


Amol Nagar

start-ups, entrepreneurs as well as women & the youth to consider the manufacturing industry as an active, vital option.

The program also endeavours to attract more domestic and foreign investments. The one and half day event is poised to be a grand gathering of the best and brightest minds of India that will celebrate India's vibrant manufacturing sector while enabling meaningful discussions and deliberations which will step up India's game on a global level.

500+ Indian plants will celebrate the FOM between February-March 2023 in their respective manufacturing plants with engagements such as inviting families of employees for celebrations, fun competitions for employees, facility tours for colleges and educational institutions based locally, job fairs, and more.

"Government-approved PLI schemes for new-age products and the climate tech industry such as drones, batteries, and renewables, demonstrate their will to drive manufacturing. Catalysed by the pandemic, digitalization is taking centre stage as manufacturers explore automation to minimize uncertainties and maximize productivity. From making in India to making for the world, a focus on quality and productivity will be key in propelling manufacturing over the 25 per cent mark of GDP contribution," said ***N Venu, MD & CEO – India & South Asia, Hitachi Energy.***

RECOGNIZING THE CHANGE-MAKERS

The 'X' factor that makes or breaks any organization is the people it employs. Everyone makes a difference in a plant in their unique way. While FOM is all about bringing a change in the manufacturing industry, what helps it get to this goal is recognizing the changemakers of the industry.

According to ***Sanjay Koul, Managing Director & Director of Manufacturing – India, Timken India Ltd,*** manufacturing is the core of any country's economy and the Festival of Manufacturing is a step towards giving this industry the recognition and credit it deserves. "I hope the event brings manufacturing back into the limelight and pulls more talented youth towards it. Manufacturing deserves to be celebrated," he said.

"As India marches towards becoming the third largest economy in the world, our manufacturing sector will play a significant role in this growth. It is time for manufacturing organisations to come forward and showcase the innovative work we are doing in India. We must attract and nurture talent to be a part of this nation-building exercise. Let us celebrate the 'Festival of Manufacturing' at all manufacturing houses in the country - from MSMEs to large corporations," said ***Amol Nagar, Managing Director & Head of Operations, GE Aviation.***

The reliance on technology has resulted in a boom in the manufacturing and engineering sector across the world. "As per the recent data, 14 lakh new jobs have been created in manufacturing and IT in the last one year, which is really applaudable. Manufacturing is the strength of a developing economy, and it also addresses a key component of economic

Celebration at LM Wind Power, Vadodara


Bipul Chandra


Rama Shankar Pandey


Prashanth Doreswamy

growth, which is job creation. Hence, FOM will help boost the core manufacturing sector will further create employment potential and increase opportunities for the youth in the coming years," said ***Bipul Chandra, Managing Director, Ducati India.***

FOM, through its initiative 'Champions of Manufacturing', is inviting nominations from manufacturing plants by nominating one person from each organisation who has made an altruistic difference in their organization – age, designation and gender no bar. These champions will be formally recognized in person, on the day of the event. In a country where no achievements go uncelebrated and no community unnoticed, the manufacturing sector has been making salient contributions in silhouettes.

"If India needs to come up as a credible global choice to be the Factory of the World, the Indian Manufacturing sector must attract the best global talent. Festival of Manufacturing brings Collective Celebration to build the narrative of a cool and happy workplace for young talents to join the Industry," said ***Rama Shankar Pandey, Chief Executive Officer, Tata Green Batteries.***

Despite being a thriving sector, manufacturing remains disorganized with no initiative that unites them as an industry. An initiative like the Festival of Manufacturing is a need of time and will not only celebrate its potential but also bring together fragments of the industry under one roof.

Festival of Manufacturing (Udyog Utsav) roadshow at The Economic Times Industry 4.0 Conference and Summit, Pune.


Celebration at Kranti Industries Limited, Pune

FOM CELEBRATION

As the name goes, manufacturing companies have already started celebrating the Festival of Manufacturing at their plants. Pune-based Kranti Industries invited 186 students from 9th and 10th grade to their plants and explained to them in detail about plant activities. GKN Fokker's, all women's unit celebrated by cutting the cake and spreading the most important message of women's empowerment.

"To make India a manufacturing superpower, we need to expand our innovation practices, set new benchmarks in skill development, incentivise R&D, and industries coming up with new technologies. From India to the world, let's celebrate the Festival of Manufacturing, together!," said ***Prashanth Doreswamy, President and CEO, Continental India.***

That said, Bajaj Auto, a pioneer in the automotive sector decided to celebrate the family day, where the auto major invited family members of shop floor workers at their plant. Meanwhile, GE Aviation, despite being occupied in the Aero India show, celebrated in a big way with their 5,000 employees.

Only a few countries like India can boast of a robust Global manufacturing hub, in such a short span post-independence. We have not only brought self-reliance to our country, but we have also turned the heads of the world towards us as an attractive manufacturing destination.

"We hold the promise as a cost-effective yet quality powerhouse. We are seen as a nation which can fulfil the needs of the Global middle-income population, who seek to improve their quality of life and access to goods and services at a reasonable price. With all these achievements, let us celebrate India's contribution as the world's Manufacturing partner," concluded ***Prakash Guha, MD and CEO, Zuventus Healthcare.***

MEET OUR **BRAND AMBASSADORS**

DR MAHENDRA NATH PANDEY
Union Minister, Minister of Heavy Industries, Government of India

DR BHAGWAT KISHANRAO KARAD
Hon'ble MoS, Ministry of Finance, Govt of India

SHRI UDAY SAMANT
Minister for Industries, Government of Maharashtra

VIPIN RANA
CEO, ExxonMobil Lubricants Private Limited

SHREEGOPAL KABRA
Managing Director and Group President, RR Global

T K Ramesh
Managing Director, Micromatic Machine Tools

AMOL NAGAR
Managing Director & Head of Operations, GE Aviation

ANAND SUNDARESAN
MD India & Executive Vice President, Ammann Group

BIPUL CHANDRA
Managing Director, Ducati India

DILIP PIRAMAL
Chairman, VIP Industries

DIEGO GRAFFI
Chairman and Managing Director, Piaggio Vehicles Pvt. Ltd.

DR PKC BOSE
VC & MD at Enercon Windenergy Pvt. Ltd. and Senator, German Economic Council

FARROKH NARIMAN COOPER
Chairman & Managing Director, Cooper Corporation Pvt.Ltd.

GIRISH WAGH
Executive Director, Tata Motors Ltd

HARISH K KOHLI
President and Managing Director, Acer India

H K AGARWAL
MD – Grasim Industries Limited ,Business Director- Pulp and Fibre Business, Aditya Birla Group

KAMAL BALI
President and MD, Volvo Group, India

MAHESH BABU
Group CEO, Switch Mobility

NARENDRA SHAH
Director, Bayer Vapi and part of Bayer's South Asia Leadership Team

NAVID TALIB
President & COO, Hero E-Cycles

PRASHANTH DORESWAMY
President and CEO, Continental India

PREETI BAJAJ
CEO & MD, Luminous Power Technologies

PUNEET KAURA
Managing Director & CEO, Samtel Avionics Ltd.

RAMA SHANKAR PANDEY
Chief Executive Officer, Tata Green Batteries

SANJAY KOUL
MD & Director of Manufacturing – India, Timken India Ltd

SATYAKAM ARYA
MD & CEO, Daimler India Commercial Vehicles

SHAILENDRA SHUKLA
MD Vehicle Group, Eaton India

VENU NUGURI
MD & CEO of Hitachi Energy in India and South Asia

By Suresh Mamunuru, Vice President, Supply Chain & Logistics, Cybage Software

SHARED DARK STORES: MEETING THE CUSTOMER EXPECTATIONS IN FMCG

The article highlights the growing importance of shared dark stores and how they are revolutionising delivery services, inventory control and customer experiences.

Today's shoppers expect prompt order fulfilment and on-demand customer satisfaction. Smart inventory management, diligent last-mile logistics planning, and secure execution are crucial to delivering on this seemingly impossible demand.

The e-commerce industry has been largely successful in addressing this. But to grab the market share from the street corner stores, the time between order and delivery had to be decreased significantly. The advent of Quick Commerce (or Q-Commerce) was targeted toward this need.

Suresh Mamunuru

> A shared dark store forms a layer below the existing Q-Commerce platforms and serves them simultaneously

However, to ensure the demand is fulfilled and the end customer is delighted, Q-Commerce had to cater as a one-stop shop for everyone's needs. Customers want the convenience of quickly having products in hand, the same as shopping at the corner store, but delivered to their doorsteps. A reliable source in fulfilling this demand will make a business successful. Are dark stores able to provide this function? And is it appropriate for Q-Commerce to be backed by them? Let's find out!

Before Q-Commerce, the most significant barrier to reducing order-to-delivery timespan was the physical distance between warehouses with product availability and delivery locations, causing more cost and time to be expended on the last mile.

Q-Commerce platforms fulfil orders through dark stores to address such a scenario. These stores are strategically placed in high-density customer areas to minimize delivery times. However, they bring in additional costs in urban areas where commercial spaces are at a premium cost. As a result, the stores maintain a reduced product range to optimise space utilisation. These platforms often leave a gap for a range of products that require delivery within a relatively short period. Also, each e-commerce platform works with a different store leading to space, inventory, and workforce redundancies.

Big box retailers and e-commerce platforms still offer a more comprehensive range of products. In fact, one of the largest e-commerce platforms offering over 12 million products. This has led Q-Commerce stores to fall short in breaking the legacy connections and limiting their ability to capture market share. However,

this translates to shrinkage of average order size and inflates delivery costs.

Additionally, local mom-and-pop stores are never to be underestimated, given the short time between the need for a product and its acquisition. So, that is where the shared dark store comes in!

A shared dark store forms a layer below the existing Q-Commerce platforms and serves them simultaneously. These highly specialised and automated warehouses would be relatively larger than regular dark stores, with a broader range of products.

The inventory here can be owned by manufacturers, distributors, shared warehouses, or the Q-Commerce platform. And its credit lines can be extended to multiple platforms for order pick-up and delivery. This collaboration will result in the following:

- Reduced inventory maintenance redundancy for Q-Commerce platforms
- Elimination of setting-up and management costs for dark stores
- Product line scalability to compete successfully with local stores, e-commerce platforms, and hyper markets
- The ability to launch and market products across platforms locally
- Streamlined entry for platforms that want gradual scale-ups or big-bang launches

These stores can also be backed by data analytics, constantly sensing the target customers' pulse in conjunction with external events and platform preferences. This will further facilitate the availability of the right product collection in suitable locations.

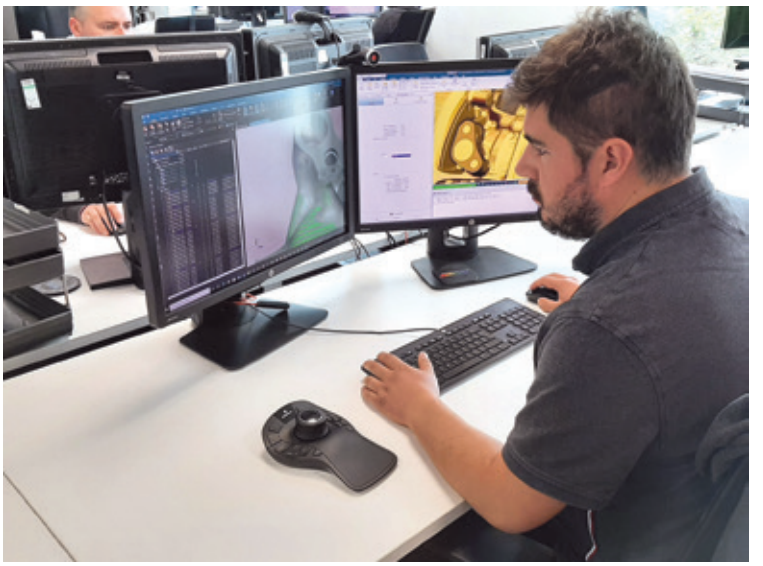
> **"**
>
> **Shared dark stores can potentially be the future of delivery for all fast-moving goods, especially FMCG. They will benefit all stakeholders involved**

Shared dark stores can potentially be the future of delivery for all fast-moving goods, especially FMCG. They will benefit all stakeholders involved. Q-Commerce platforms will be released from inventory maintenance and order fulfillment tasks, bringing a greater focus on building intuitive and seamless user interfaces, driving efficiencies into delivery models, customer relationships, customer service, introducing unique products, and marketing. These stores can offer a range of products without platforms worrying about initial CAPEX investments and subsequent OPEX.

No matter the platform the end customer uses, these dark stores will cater fully to any given region. And the customer will get what they want, i.e., a wide range of products and quick order fulfilment!

A CLASS APART

Vericut provides safe and optimized machining operations for the Mercedes-AMG PETRONAS Formula One Team



The machine shop of the Mercedes-AMG PETRONAS Formula One Team relies on VERICUT verification, simulation, and optimization software from CGTech to guarantee the successful machining of its many high-complexity, high-value components. A VERICUT user for over two decades, the team has engrained VERICUT into its Standard Operating Procedures (SOPs), aware of the benefits it provides in reducing machine collisions and component scrap, while simultaneously optimizing lead time.

Today, the Machine Shop at the Team headquarters in Brackley, Northamptonshire, not only manufactures parts for the race cars, but also for several customer programs, including other Formula One Teams and the INEOS Britannia Americas Cup sailing Team.

"We are pretty diverse with our component supply, but in all cases reaction time is key: for our race car we sometimes only have 24 hours from design release to delivery," reveals Machine Shop Manager Robert Brown. "VERICUT really helps as it gives us the confidence to start the machine running safely, enabling us to switch our focus onto another activity, such as writing programs or setting up tools for the next part. This is far preferable to requiring the presence of an operator at the machine, monitoring the cutting process to mitigate the risk of a collision."

Formula One Teams have been operating within a cost cap for the past couple of years, imposed by the FIA, the sport's governing body, so the Mercedes-AMG PETRONAS Formula One Team cannot afford to be non-productive.

"Today, more than ever, championships could be won or lost in the factory," states Mr Brown. "Obviously without the right drivers we're not going to win, but there's a reason the sport currently has three dominant teams: because those teams can develop and engineer cars on a scale that no one else can match."

According to Production Engineer James Peddle, the cost cap has not changed this capability: "Some thought the cost cap would change the order of the grid, but the well-resourced teams with good structures and processes in place have continued to do well. At Mercedes, we've got leaner and doubled down on how much value we can extract from our time. As an organization we are more efficient now than we were two years ago, before the introduction of the cost cap."

ADVANCED MACHINE TOOLS

The Mercedes-AMG PETRONAS Formula One Team has 25 machine tools on site at Brackley, including: five-axis machining centres; five-axis turn-mill centres; four and three-axis milling machines; and four and two-axis CNC lathes.

"The enemy of Formula One cars is weight, so approximately 60% of our parts are made from various

types of aluminium alloy," says Mr Brown. A further 30% are made from titanium, with the remaining 10% comprising steels, other alloys and plastics. Batch sizes of 8-12 are typical for our five-axis machines. Five-axis machining is our speciality and where the team gets its value from this department. We can get high-complexity parts up and running quickly, working closely with the design team to manage any iterations."

One of the principal challenges is minimising cycle times for these highly complex components without compromising quality. A recent case in point was a titanium front axle.

"The cycle time for this part was in the region of 70 hours over five operations," says Mr Peddle. "Due to the nature of the material, we were limited by the speed of machining. However, by using the latest machining methodology from one of our suppliers, we managed to reduce the lead time by 50%."

"We always get really good solid-model transfer from tooling suppliers into VERICUT for our simulations," he adds. "Whenever we need a bespoke cutting tool, we can do the modifications virtually and seamlessly, and complete the simulation before we place our order for the tool, so we know for certain that it will work."

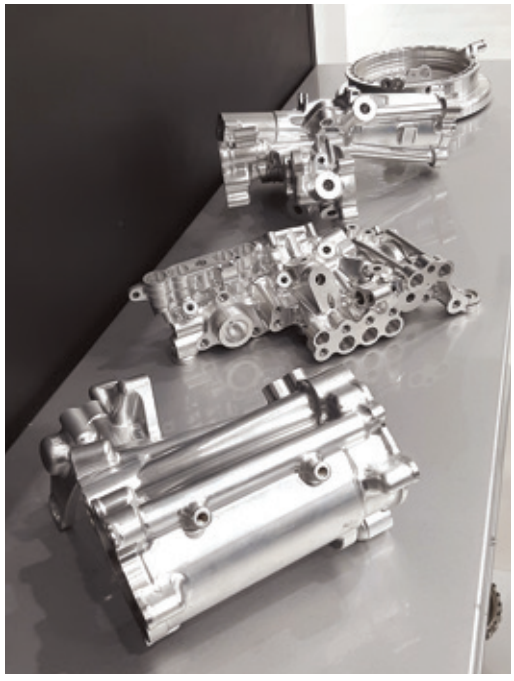
ADDED VALUE

There is little doubting the value that VERICUT adds to operations at the Machine Shop of the Mercedes-AMG PETRONAS Formula One team. Mr Brown was with the company when the software first arrived over 20 years ago.

"Previously we would export CNC code from our CAM system, alongside creating some CNC code conversationally and editing this together into a single CNC program, with all the risks that go with that strategy," he explains. "We had too many collisions on the machines and too much scrap as a result of human error. But once we had VERICUT, we could export all of our CNC code from CAM and validate it (using VERICUT). The initial investment was all about reducing risk and over the years that thought process has continued. We know that better use of CAM and more use of VERICUT simulations will reduce errors and the risk of machine collisions. If code goes through VERICUT, we know it's safe."

Today, tool transfer from the CAM session, through VERICUT and on to a tool sheet is virtually seamless at the Mercedes-AMG PETRONAS Formula One Team. The opportunity for human error, perhaps adding incorrect details or picking the wrong geometry, is significantly reduced.

It's always been about reducing scrap and protecting machine tools, which are obviously very



expensive assets," says Mr Brown. "A new spindle is around £20,000 these days. We've damaged spindles in years gone by and, when we scrutinized the root cause, it was predominantly human error; someone manually editing a few lines of code incorrectly. Utilizing VERICUT to simulate the CAM session has removed human error. Today, every CNC machined component is validated via VERICUT."

THE PROCESS

When the Design department at the Mercedes-AMG PETRONAS Formula One team releases a CAD model, the Production Engineering team imports it into a CAM session where various templates exist for the different machine tool types.

"We program within the context of the machine regarding travel limits, access and other parameters," says Mr Peddle. "Once we're happy with the program we post-process it and use our CAM-to-VERICUT interface to replicate the set-up we created in the CAM software before running the simulation. We also use VERICUT's AUTO-DIFF module to check for any excess material or gouging. This is important as we don't want to reach the end of the program and identify that we've missed a section of machining or gouged the part. It would be difficult and increase risk to manufacture some of our parts without AUTO-DIFF, by solely relying on the CAM package."

He continues: "Another advantage of VERICUT is its simulation speed, which in our experience is far

greater than the core CAM product. This ensures a much more efficient and flexible work stream, where we can be programming certain component features while simulating others."

Around 30 employees at the Mercedes-AMG PETRONAS Formula One Team are trained to use VERICUT, at various levels. Production Engineers might need to create, edit or interrogate sessions, whereas machine operators might only replay the simulation to identify what type of machining operation is coming next in the sequence.

"We operate multiple shift systems around the clock here at Brackley," says Mr Peddle. "One of the key benefits of VERICUT is its ease of use, especially for staff who work unsupported, outside of regular hours. For example, the night shift might not have the same level of support available as those working shifts that cross our core hours. However, they can just open the software and easily see the entire simulation. They don't need to be a software expert."

REGULAR INVESTMENT

The machine shop at Brackley replaces most of its machine tools on a 10-year cycle, but investing in a new machine is no problem for VERICUT.

"CGTech has a good library of machine tool templates, so they can usually provide a template 'off-the-shelf' or create a bespoke version if required, based upon their extensive library," explains Mr Peddle. "The support is always excellent, quickly resolving any issues we might have."

Adds Mr Brown: "CGTech regularly spend time on site with us, periodically though the year, integrating with our CAM team. They understand what we do here and what we need from VERICUT. We have a very strong relationship with them."

CGTech also has long-standing relationships with all of the major machine tool vendors, a factor that has proved beneficial to the Mercedes-AMG PETRONAS Formula One Team on more than one occasion.

"We've recently done a lot of work reducing our five-axis milling cycle times," says Mr Peddle. "CGTech has a really good relationship with our machine tool suppliers, which meant they were able to gain access to certain machine parameters and build that information into our VERICUT projects, helping us to simulate the digital cycle time compared with the actual cycle time."

Mr Brown picks up on this important point: "Understanding how much a component has cost to make and what value it has as an asset to the Team has been a complex thing to learn over the past two years since the cost cap was introduced. We've had to create a new process where we now rely on VERICUT cycle times to help cost a component. Having really accurate cycle times exported from VERICUT has proved so important."

Adds Mr Peddle: "As VERICUT has evolved we've evolved alongside it, not just in terms of how we prevent collisions, but in reducing lead times and improving quality."

Another benefit of VERICUT is its independence of the CAM session. The programming stations in the office and on the shop floor at Mercedes-AMG PETRONAS Formula One Team have multiple screens, so users can work on CAM and VERICUT sessions in parallel.

"Due to our compressed manufacturing lead times, we'll routinely start machining a part before the program is complete, so we can be simulating while we are creating the next sequence of CNC code in the CAM session." explains Mr Peddle. "We always have a finite amount of time, so we'll begin roughing as soon as a part is released and get as far as possible before waiting for more code. It's the only way we can achieve on-time delivery, which translates directly into the machine shop adding performance to the race car."

Concludes Mr Brown: "Tools such as our CAM system and VERICUT verification, simulation and optimization software ensure we get the best result possible in the finite amount of time we have."

By Nisha Shukla

ENSURING A SENSE OF SECURITY

The advent of Industry 4.0 technologies and the gradual digitisation of manufacturing processes has explicitly exposed the industry to cybersecurity challenges. In an interview, **Mahesh Wagle, Co-Founder & CEO of Cybernetik,** talks about why automated manufacturing facilities should prioritise cybersecurity and how they can avert the threats caused by it. He also spoke about the consequence of digital twin and lights-out factories on the Indian manufacturing sector, new technologies and innovations launched by his company and other plans.

Tell us about the new trends shaping the food, agro, pharmaceutical, chemical, and other manufacturing industries.

Manufacturing will be more data-driven than ever before. It will shift from automation to autonomy as Industry 4.0 technologies such as artificial intelligence (AI), machine learning (ML), virtual reality (VR), industrial internet of things (IIoT), predictive data analytics, augmented reality (AR), and others will become more sophisticated. The data-driven model will not improve production operations but also the supply chain, enhancing resource usage and associated efficiencies.

What, according to you, are the cybersecurity challenges faced by the manufacturing industry? How can these be tackled?

Prior to the advancement of technology, manufacturing businesses were only connected within the network of a single organisation, with restricted internet access, making it difficult to communicate with other organisations or individuals in general. However, technology has evolved, and the archaic ways of communicating within the manufacturing industry are obsolete. Threat actors can access a system undetected, move laterally, mine information, and exit before anyone notices they were there.

Phishing attacks are highly widespread in the manufacturing industry, and it is one of the areas that receive the most phishing attacks each year. IBM released a report detailing how ransomware and other vulnerabilities disrupted supply chains, with manufacturing being the top targeted industry. Another challenge is Supply chain attacks. There are three types of supply chain attacks: Software, Firmware, and Hardware attacks.

The failure to change default passwords, disable security measures, and lack of firewalls give access

Mahesh Wagle

opportunities for threat actors. Simply removing passwords and user controls that encourage the use of poor security settings can help keep manufacturing organisations safe and prevent the deployment of vulnerabilities.

New products and services are integrated into the manufacturing process as a part of automation, thereby exposing it to vulnerabilities. How can they be safeguarded?

Automation, for the sake of it, is counterproductive. What's required, is customised automation that addresses the issues specific to a set-up. This should be the guiding principle when opting for automation. Implementing this principle requires establishing the process and operational sequence for Greenfield projects. For introducing automation in existing systems, the process needs to be stabilised.

A detailed feasibility study is essential to evaluate

whether full automation is possible or if semi-automation is more appropriate. Often, it is the nature of the process and the product that heavily influence the level of automation.

Handshake is the number one concern when introducing equipment in an existing set up for automating it. It is not only the capacities of the newly introduced equipment must match those of its upstream and downstream machines, but also important technical specifications must match for a seamless transition.

The Human-Machine Interface (HMI) of automated systems are normally user-friendly. Besides, the automation providers will usually train the plant personnel and may even be involved with handholding. Nevertheless, operating these sophisticated systems requires trained and skilled operators.

Automation systems need specialist personnel to conduct repairs in case of unscheduled downtimes. Plant owners will do well to negotiate the appropriate service package with the automation provider so that the response to breakdown visits is rapid. This will also ensure that specialised spares and consumables are immediately available to resume production at the earliest.

Can a lights-out factory be a reality for the Indian manufacturing sector?

In a method like "lights out manufacturing," fully automated technology is employed to manage a production plant with little-to-no human involvement. To enable this, a variety of technologies including machine learning and high-frequency data collecting are required. Consequently, workplace accidents, maintenance costs, and labour expenditures would be reduced significantly. While having a system where machines could be turned on and left about is the essence of manufacturers' dreams, it also has its share of drawbacks. Initially implementing completely automated processes can be a massive technological challenge that may involve considerable financial investment. Second, it may be more difficult to adopt automation or perceive a sufficient benefit for more complex jobs as well as smaller production runs and operations. Furthermore, no matter how much a process may be automated, human intervention will still be essential if something goes wrong in a manufacturing setting and damages raw materials, physical property, machinery, or equipment. However, these problems can be avoided with remote monitoring and automatic machine failure detection. Lights-out factories must perform scheduled preventive maintenance.

How is the digital twin transforming the manufacturing industry? Elaborate with a case study.

The digital twin is now attainable due to the digitisation of production processes. It aids the discovery of physical flaws earlier, anticipates outcomes more precisely, and creates better products by offering a full digital twin of systems. An oxygen tank on board the Apollo-13 spacecraft exploded, seriously injuring three astronauts on 13th April 1970. NASA mission controllers tinkered with the 15 training simulators and, despite the zero margins for error, quickly came up with fool-proof procedures that brought back all three astronauts safely to earth. Moving forward, Deloitte used digital twins to reduce changeover time for their industrial clients by 20 per cent. Using digital twins, Boeing increased first-time part quality by 40 per cent. GE's digital wind farm claims to increase power output by up to 20 per cent, allowing a single wind turbine to generate an additional $100 million throughout its lifespan.

Digital twins first caught the mainstream in 2017 when technology consulting research firm Gartner, Inc. named it among the top ten trends for strategic technology. The firm repeated a similar rating in 2018. This explains why the global market for digital twins is predicted to jump from $3.1 billion in 2020 to $48.2 billion by 2026. Today, Power Generation Device operators can better schedule maintenance operations for locomotive engines, jet engines, and turbines. Manufacturing Operations churn out improved products because all stages from design to manufacturing are streamlined. Town Planning makes use of real-time, 3- or even 4- D spatial information as well as augmented reality. Health Services employ digital twins to virtually model patients to track health parameter data and analyse the same. This transformation is possible because of the digital twin.

How do you ensure a smooth and error-free assembling of EV battery packs? Kindly elaborate on the entire process of automated assembling.

Customisation, traceability, virtual commissioning, precision systems, pre-set operational sequence, testing, and error code system are the tools for smooth and error-free assembling of EV battery packs.

By customising the assembly line for the specific EV battery pack, we ensure overall compatibility and establish the correct operational sequence. Virtual commissioning and digital twins allow design validation before manufacturing begins. Any possible design errors are nipped in the bud. SCADA and Automated Bar Code Scanners are important for traceability via which similar cells are batched into modules. Traceability helps point the source of an issue during the manufacturing process and is important for safety as well.

Precision Systems include sensors, vision systems, transducers, fixtures, XYX gantry, and servo actuators. The vision system checks for cell orientation when forming cell stacks. Another vision system locates the precise weld coordinates. The XYZ gantry positions the weld head at the correct location. The robotic dosing system dispenses the correct amount of structural adhesive, insulation foam, and thermal paste at the correct location. Laser sensors check these adhesive beads. Servo Actuators accurately position the battery pack for insertion in the housing and employ the correct magnitude of force during insertion. Fixtures hold the parts in the proper position during testing or the respective operation.

Testing is carried out at various stages. Individual cells are checked for internal resistance – OCIR, ACIR, and DCIR – at the very beginning. Weld joints are subjected to rigorous resistance tests given their critical role in the safety and performance of battery packs. End-of-Line Testing further examines the battery pack after full assembly by subjecting it to customised charging and discharging cycles.

Error Code Systems pinpoint the exact location and nature of errors, thereby simplifying and accelerating the detection and fixing of errors. For e.g. conveyor alarm, gripper alarm, and process alarm.

Given that start-ups are apprehensive about embracing automated technologies. What steps and actions are you taking to tap into this aspirational segment?

Startups are concerned about how much of the promised benefits the automation solution will deliver. Experts are more accessible to larger, wealthier companies than MSMEs. Automation is an ecosystem and functions best when all facets of the system operate cohesively.

Startups are often forced to adopt piecemeal automation solutions that increase cost and complexity over the long run. However, these days Indian businesses have realised that innovation in manufacturing is as important as innovation in the final product. Through a phased manner, wherein organisations must plan their cash flows and invest according to their capabilities, automation can be effectively implemented in MSMEs as well. Startups that are integrated with automation will make sure that the company's time and resources are employed for relationship-building, networking, and the development of fresh ideas.

What are the new innovations and technologies to be launched by your company?

We have forayed into a new area of automated solutions including the extraction of organic materials for cosmetics and bio-products through the company. This goes in line with our vision to expand our business into numerous markets as a growing company. With the recent focus on EVs, we have been actively collaborating with automakers to develop battery packs that could address safety concerns and are tailored to Indian conditions. Recently, we have also ventured into wind energy automation solutions. Our robotic machining system performs multiple operations to hike accuracy, reduce cycle time, and eliminate rework for root end machining of windmill blades.

What are the new segments you are planning to tap into?

Considering our presence in a broad range of industries from wind to pharmaceutical packaging, we can cross-pollinate a wide range of ideas and concepts to deliver out-of-the-box solutions for tech problems that aren't addressed by standard machines.

In the future, we intend to make greater use of augmented reality (AR) to hasten the virtual commissioning process. This is only one part of a wider plan to simplify the entire process from design through commissioning. Among the most crucial aspects of this endeavour is the quicker and more accurate integration of data from process simulation into design.

Going ahead, what's in the pipeline for Cybernetik for the long and short-term future in India?

Cybernetik is looking to expand steadily in the international markets. We are actively onboarding sales partners in South America, while also looking to open offices in other locations globally. We are also researching and pre-emptively developing solutions for future technologies that will dominate the manufacturing industry. Our goal is to establish Cybernetik as a global leader in the manufacturing automation space.

By Mahalakshmi. G, Sr. Manager, Product Management, ELGi Equipments Limited

DECODING THE DUTY CYCLE OF PISTON COMPRESSORS

A detailed look at how piston compressor functions and are completely different from others in context to air compressor duty cycle and its efficiency. It also touches upon the need for an optimum duty cycle, and ideal operating duty cycle for piston compressor.

Choosing the right compressor for an application is crucial. Apart from air quality, pressure and flow are vital factors in selecting the compressor technology (Piston, rotary, centrifugal, etc.) for any given application. Each compressor technology has an optimal flow output for a set pressure.

Unlike rotary compressors that are designed to run continuously without wear or damage due to overheating, piston compressors cannot run continuously for extended periods as their cooling and lubrication system is basic, and their design has a lot of moving parts. Piston compressors thus have a fixed running time without causing any damage to the compressor.

UNDERSTANDING THE AIR COMPRESSOR DUTY CYCLE

To understand the air compressor duty cycle, it is important first to know what cycle time means. When it comes to piston compressors – they run on a start/ stop cycle, which means that when the desired maximum pressure is reached, the compressor stops and starts back only when it reaches a set minimum level. The total cycle time is the time between one stop and one start.

Usually, the duty cycle is represented as a percentage. It is the time duration a compressor's top block runs to provide pressurized air at a defined flow rate relative to the compressor's cycle time.

DISCERNING THE IMPORTANCE OF DUTY CYCLE

The duty cycle is important as it helps to understand how efficiently a piston compressor functions by stopping and starting during use. Additionally, it aids in determining if a specific compressor model will fulfil the air requirements of the application when sizing the compressor system.

> A piston compressor that specifies a 100 per cent duty cycle can produce air at a specified pressure and flow during the time it operates

It is also essential for ensuring the optimum life of the compressor, as exceeding the recommended duty cycle can prematurely wear out or damage the internal components.

DECODING DUTY CYCLE

If a piston compressor has a cycle time of 10 minutes and runs for only 7 minutes during that period, then it runs on a 70 per cent duty cycle, which means 3 out of 10 minutes, the compressor will be resting/cooling down during a cycle.

A piston compressor that specifies a 100 per cent duty cycle can produce air at a specified pressure and flow during the time it operates (in the example above, this is 7 minutes) using a storage tank and not continuously.

Mahalakshmi. G

NEED FOR AN OPTIMUM DUTY CYCLE

Heat is primarily generated due

to friction while the compressor is operating. The primary source, the friction between millions of air molecules while getting compressed, makes compressed air very hot. The secondary source of friction is the moving parts inside the compressing unit, which raises the cylinder temperature to as high as 150 to 200 degrees C.

99 per cent of industrial piston compressors have a simple splash lubrication system, and the oil property plays an important role in guaranteeing adequate lubrication. Excess heat generation degrades the oil characteristics, thereby impacting lubrication.

The cooling system is less advanced than what is available in other types of compressors. In a piston compressor, the cooling is majorly forced air cooled with fabricated or casted fan pulleys mounted on the compressor shaft and Copper or Aluminium pipes acting as coolers. These need non-operational time to ensure sufficient cooling time and steer away from additional heat build-ups between cycles.

CONSEQUENCES OF RUNNING AT 100 PER CENT DUTY CYCLE

Running a piston compressor at 100 per cent duty cycle may cause:

- Piston seizure in the piston housing due to excessive heat in the cylinder
- Valves expand and jam with continuous exposure to a higher temperature, causing catastrophic failure of the compressor.

> In a piston compressor, the cooling is majorly forced air cooled with fabricated or casted fan pulleys mounted on the compressor shaft and Copper or Aluminium pipes acting as coolers

- Changes in oil properties lead to higher oil carryover.
- Continuous exposure to higher temperatures results in higher condensate formation in the receiver tank, which leads to moisture carryover to the downstream and end equipment.
- Higher maintenance cost due to quicker wear and tear of internal parts

IDEAL DUTY CYCLE RECOMMENDATIONS

It is crucial to understand that a 100 per cent duty cycle of a piston compressor does not imply that it can run nonstop. This can harm the compressor, causing premature wear and higher maintenance costs.

While different brands recommend different duty cycles based on their design standards, we suggest a duty cycle of 70:30. Lastly, keep in mind to always select a compressor that best meets the requirements of your application.

IGUS COMES UP WITH TWO NEW HYBRID CABLES SUITABLE FOR BOSCH REXROTH AND SIEMENS

igus is expanding its chainflex cable portfolio with two new hybrid cables: one is the CF280.UL.H401 with PUR jacket suitable for the modular drive system ctrlX DRIVE from Bosch Rexroth for synchronous servo motors of the MS2N series. The other is the proven hybrid cable for Siemens SINAMICS S210 drives, now with PVC outer jacket.

With over 30 different types, igus has the largest portfolio of highly flexible hybrid cables, which consists of two series: CF280.UL with PUR outer jacket and CF220.UL with PVC outer jacket. igus relies on two different jacket materials so that the right one can be selected individually for different applications and external conditions. For example, the jacket made of oil-resistant PVC is the ideal partner for use in the energy chain due to its high abrasion resistance when it comes to high cycle numbers in dry areas - for example in woodworking machines. PVC is designed for ambient temperatures of +5°C to +70°C. PUR, on the other hand, has an exceptionally high notch and oil resistance. This makes the halogen-free PUR cables suitable for use in the energy chain, especially with very high oil loads, e.g. in a machine tool. In addition, it works reliably in an extended temperature range from -25°C to +80°C. The chainflex cables are available from stock, sold by the metre and as harnessed products, and are designed to match the well-known manufacturer standards. "To be able to offer our customers more and more solutions for the drive systems of a wide range of manufacturers, we are continuously expanding our cable range. That is why we are now offering two new hybrid cables suitable for Bosch Rexroth and Siemens," explains Rainer Rössel, Head of Business Unit chainflex Cables at igus.

More solutions for different areas of application

With the PUR hybrid cable CF280.UL.H401 for synchronous servo motors of the MS2N series, igus is adding a product for the modular drive system ctrlX DRIVE from Bosch Rexroth to its portfolio. The new cable is suitable for applications with a bend factor of up to 15 x d and can therefore be used in a wide range of industries - from machine tools and material handling to the automotive industry. In addition, igus is now offering its hybrid cable as CF220.UL.H304 with PVC outer jacket to match Siemens SINAMICS S210 drives. "Our customers can now also use the proven hybrid cable with a 15.3% more cost-effective PVC jacket for applications in dry environments. This additionally reduces costs in the hybrid cable segment, giving customers the choice between two technically identical cables with different jacket qualities, depending on the area of application," says Rainer Rössel. "This allows us to implement even more diversity and offer our customers additional individual solutions for their applications." By using chainflex cables, users also save around 40% installation space in the energy chain and 43% material weight compared to opting for separate servo and measuring system cables.

Tested with millions of cycles for guaranteed fail-safe performance

The highly flexible cables are specifically designed for use in moving applications and guarantee a long service life even with high dynamics. Each cable is specially adapted to the respective motor type. Like all igus chainflex cables, the new hybrid cables have also been tested under real conditions with millions of cycles. Based on the test results collected in the 3,800-square-metre in-house laboratory, the cable specialist can make a service life statement for its cables. This data also flows into an online tool, with the help of which customers can calculate the service life of their cable very easily and in the shortest possible time. As the only manufacturer on the market, igus therefore also offers a guarantee of up to 36 months on its entire cable range. This gives customers additional security for planning their application.

ATI MOTORS LAUNCHES SHERPA: AI IN MOTION

In a world which demands non-stop movement of goods for fulfilment of needs of the populi, continuous and reliable movement of materials is a necessity, first on the shop floor. As the current modus operandi in most industries is manual tugging of materials, their reliability is highly dependent on availability of manpower. Also, the correct material being delivered at the correct time also lies at the discretion of a human. The available alternative currently being utilised is an Automated Guided Vehicle or AGV.

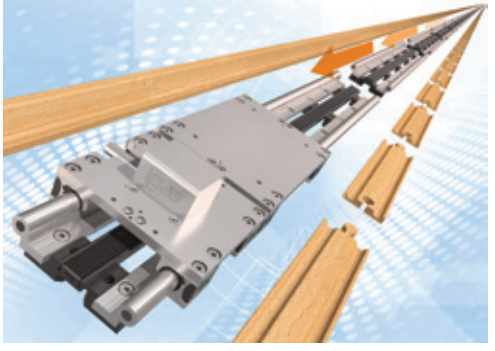
In a fast-paced and dynamically changing scenario, any manufacturing plant goes through numerous changes, including complete layout changes. This puts AGVs at a disadvantage as they are guided with the help of magnetic strips or colour-coded strips laid out on the floor, and thus require a redo every time any change of routing is required. Integrating them with the Material Requirement Planning systems is a whole different story. Enter AMRs.

AMRs or Autonomous Mobile Robots are the self-driving cars of the shop floor. Equipped with a LiDAR, they are able to "see" their environment in real-time. This makes navigation more natural and eliminates any infrastructural requirements which handicap AGVs. Among AMRs as well there are many differentiating factors. Most AMRs available use a 2-D LiDAR, which sees a very limited "worldview" making them prone to errors in understanding where they are, called "localisation" and where they want to go, typically called "mapping". Many other pressing complex problems such as multi-bot fleet operations and integration with various Material Requirement Planning (MRP) or Enterprise Resource Planning (ERP) systems and the effective use of data to make material movement on the floor a lean process are yet to be solved by most products available in the market.

Ati Motors have recently come up with Sherpa, aptly named after the dependable and intelligent porters and guides, offers material movement solutions in two form factors. A tug, which can tow up to 1 tonne and a roller-top which can be integrated with conveyors to form an end-to-end smart solution. What sets it apart from others is the state-of-the-art sensor stack equipped with an advanced autonomy stack which can exploit the huge amount of high-quality data generated by the sensors to expertly guide the Sherpa through complex routes in challenging environments. This has nearly eliminated the errors that other AMRs are prone to getting into. Apart from this it has been able to integrate with MRP/ERP systems to reliably move materials with the least human errors. This makes Sherpa the intelligent choice among AMRs.

IGUS TO LAUNCH THE DRYLIN ENDLESS GEAR LINEAR MODULE (EGW)

Igus is launching the drylin Endless Gear linear module (EGW), a modular, lubrication-free linear guide with rack and pinion drive. The modular system can be extended to any travel length, costs little and is almost as light as the guide for a toy train. Several carriages can travel on it in different directions and at different speeds. Users can also extend the linear guide after installation and add more carriages.



Linear axes with toothed belt drive are suitable for many handling and positioning tasks. The problem is that if they are longer than ten metres, they start to sag, and lengthening the belt makes it difficult to engage the teeth. A second problem is the lack of flexibility. Multiple carriages cannot travel at different speeds on the rail, nor can they travel in different directions. "To offer more options to everyone who requires long travels, we developed drylin EGW - a modular linear guide with rack and pinion drive," says Stefan Niermann, Head of the igus drylin Linear and Drive Technology Business Unit. "Users are no longer limited in the lengths of their travels. They can assemble additional rails at any time - it's almost as simple as putting together rails for a toy train. Thanks to the system's modularity, the kit consists of just two pieces, each two meters long, which also significantly simplifies handling and transport." Unlike a toothed belt drive, the system can also be used with several carriages, each with its own electric motor, travelling in different directions and at different speeds. The drylin EGW modular kit gives users everything from a single source, from linear guidance and carriages to chains and cables for energy supply - ready to install upon request, including motor and control system.

Precisely repeatable process even over long travels

The drylin EGW consists of several components: the basis is the WS-20 from the drylin W series, a guide rail made of hard-anodised aluminium with a round profile, on which the carriages slide. In the middle between the two, there's a profile to receive the polymer rack modules. The second component is the drive carriage. It is supported on the rail by four plain bearing bushings made of iglidur J200 high-performance plastic. An electric motor in the carriage drives a gear that engages in the gear rack. The motor cable moves in an energy chain running parallel to the rail. The third component is directly attached to the drive carriage: a towing carriage, on which such elements as a camera, picking robots, or sensors can be mounted. Due to the modularly expandable linear guide, it is possible to carry out testing or monitoring tasks, for example, with precise repeatability even over very long travels. This ensures greater quality and safety in train roof inspection or automotive part production, for example. "In such applications, drylin EGW operates more quietly and with much less vibration than linear guides with classical ball recirculating systems," says Niermann. "Thanks to the principle of plastic instead of metal, the linear guide's weight and thus the required drive energy are reduced as well. And corrosion is also no longer an issue."

igus laboratory approves its durability

The drylin EGW linear guide is durable, as tests in the in-house igus laboratory prove. Engineers loaded a carriage to 200N and moved it at a speed of 1m/s along a stroke length of 15,000mm. The result was that even after 45,000 cycles, there was no significant wear on the rails or plain bearing bushings. If the linear guide does reach its wear limit at some point, users can simply replace the liners directly on the rail in just a few minutes, without disassembling the bearing mounts. Another advantage is that it requires no external lubrication because the high-performance plastic contains solid lubricants that are released over time, allowing for low-friction dry operation. Maintenance costs are correspondingly low.

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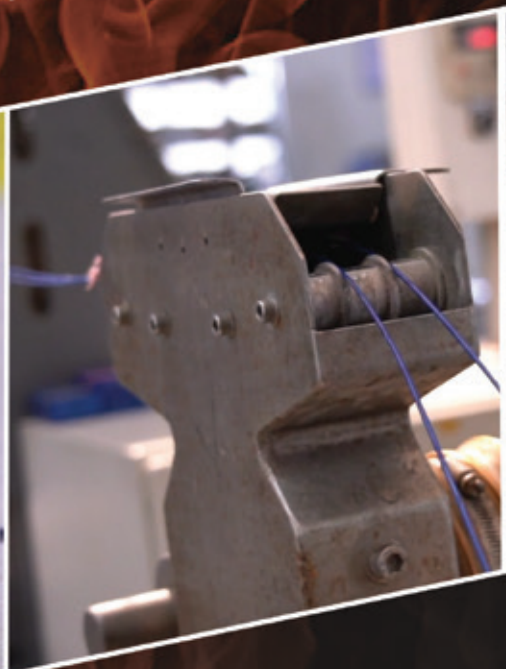

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*- The values mentioned are optional features.