

TAGMA TIMES

NEWSLETTER

(Technical Info. on Die, Moulds & Toolroom)

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December 2022



ELECTRIC VEHICLES INDUSTRY: **Charging Ahead**

TECH FOCUS:
How 3D printing makes
prototyping easier?

REWINDING 2022:
A look at the year 2022



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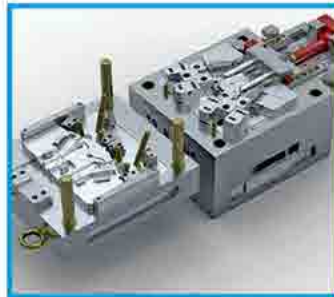
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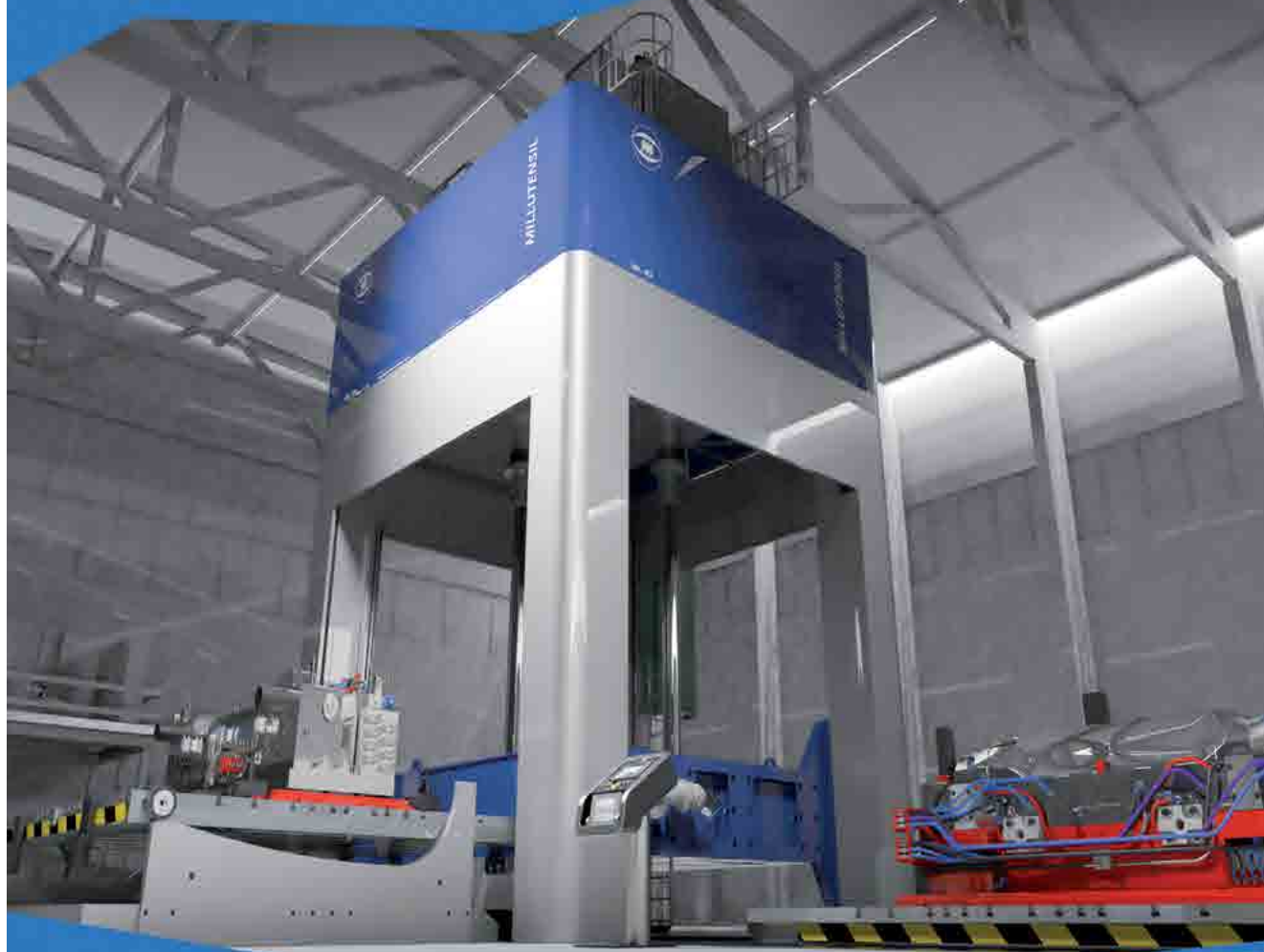
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VICE PRESIDENT'S MESSAGE



D. Shanmugasundaram
Vice President,
TAGMA India

We are ending the year 2022 with optimism and excitement. In 2022, we bounced back from the setbacks caused by the pandemic. As the restrictions related to COVID were eased, we witnessed significant economic activities across sectors which is a great sign for us toolmakers.

2023 will most likely have several opportunities in front of us - the manufacturing PMI index is higher, GST collection is constantly growing, and purchasing power of Indians is improving, this is a sign of the expanding economy. Of course, the world economy is turbulent, but we have ample domestic demand. Our biggest customer, the automotive industry is showing great numbers, commercial vehicle sales have gone up, and heavy vehicle sales are also growing. Apart from this, the scrappage policy in the automotive industry is another welcome move from Government. Further, the healthy monsoon resulted in sales of tractors and farm equipment which is at an all-time high.

Toy manufacturing is another emerging sector in India. The imports of toys have reduced in the last few years, and now Indian toy makers are exporting to various developed countries. The PLI schemes in various sectors will also help the Indian manufacturing industry in a long run.

Backed with domestic demands and industry favourable policies, I believe, we can term 2023 a performance-driven year filled with incredible opportunities.



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Despite supply headwinds, labour shortages, and an uncertain economic environment, the manufacturing industry ended 2022 on a solid footing. In 2022, the business conditions improved at the fastest rate, and growth in new orders and output accelerated. The manufacturing purchasing managers' index compiled by S&P Global, rose to 57.8 in December from November's 55.7. December's reading was the highest since October 2020.

The year 2022, according to me, was the revival year. In 2022, we observed the supply chain getting better, trade shows taking place, and manufacturing output coming back to normal. It was a great year for TAGMA as well. The association organised two of its biggest events - Die Mould India International exhibition and the International Tooling Summit, both turned out to be successful.

We have compiled a list of all the major happenings in this edition, do not forget to check 'Rewinding 2022'.

Now, 2023 looks promising. Many reports suggest that the Indian economy is set to grow more than 7% this year, which will be one of the highest in the world.

As we end this year on a positive note, here's wishing you all a great 2023!



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Aequs, KLE Technological University to set up Aequs Innovation Centre

Diversified contract manufacturer, Aequs and KLE Technological University (KLE Tech.), have come together to establish the Aequs Innovation Centre (AIC), to develop innovative products for the toys and consumer durable goods markets.

"AIC will function as an innovation ecosystem and incubation platform for accelerated product development while leveraging the joint capabilities and infrastructure of Aequs and KLE. The objective is to speed up the idea-to-prototype journey for these emerging industries in India's manufacturing journey," said Aravind Melligeri, Chairman & CEO, Aequs.

"The AIC seeks to ease a long-felt pain of enterprises, particularly in the hinterland, which face challenges in developing products from scratch with limited expertise



and resources," he added.

"This new industry-academia initiative will harness unconstrained minds of young engineers and academia. The Aequs Innovation Centre is in line with KLE Tech's belief that institutions of higher education need to continually innovate to meet the demand of global economies by developing their capacity in research and

development," said Dr. Ashok Shettar, Vice Chancellor, KLE Technological University.

To be housed at the Industry 4.0 Lab being built by KLE Tech University, the AIC will leverage Aequs' expertise for training engineers in cutting-edge technologies and product design & development and benchmarking processes. The AIC will provide direct employment to one-hundred-plus engineers and students in the first five years. ♦

GODI India manufactures India's first ever 5.2 Ah 21700 Cylindrical lithium-ion Cells

GODI India, the first Indian company to get BIS certification to sell lithium-ion cells made with homegrown technology, has achieved another milestone by manufacturing India's first ever 5.2 Ah 21700 cylindrical lithium-ion cells with an energy density of 275 Wh/kg based on silicon anode technology. The electrode composition has been indigenously developed as per the market requirement. With the use of silicon in the anode, an electric vehicle could achieve a greater range, up to 15-20% compared to graphite, on a single charge due to the increased energy density.

Commenting on this achievement, Mahesh Godi, Founder and CEO of GODI India, said, "We are delighted to announce the manufacturing of 5.2 Ah lithium-ion cells at our Hyderabad facility. With the boom in EV sector constituting two, three and four-wheelers in India and across the world, the need of high-energy cells have become very essential. We have already delivered 5.0 Ah cells to the top six OEMs in India and are planning to deliver 5.2 Ah cells in the near future. We believe



Image Courtesy ANI

that these high energy density cells developed with in-house technology will be an important landmark for 'Made in India' for the domestic and international market."

Sharing more details on the future plans, Mahesh said, GODI India is continuously innovating in the anode and cathode areas and planning to achieve >5.6 Ah high-energy and high-power cells for the first time. GODI India has firmly planned for a 100 MWh pilot production facility for 5.0 – 5.2 Ah cells followed by a GWh plant to cater to the requirements of the highly demanding electric two wheeler's needs, which is more than 50GWh by 2030 exclusive for electric two wheelers battery segment.

GODI India has developed an eco-friendly water-based electrode manufacturing process to stabilise the silicon, which has been successfully utilized in the manufacturing of the 5.2 Ah lithium-ion cells. In an attempt towards formulating a sustainable future, GODI India is also practising home-grown, clean, and environment-friendly processes in achieving its high energy density goals and ESG Guidelines. ♦

Courtesy ANI



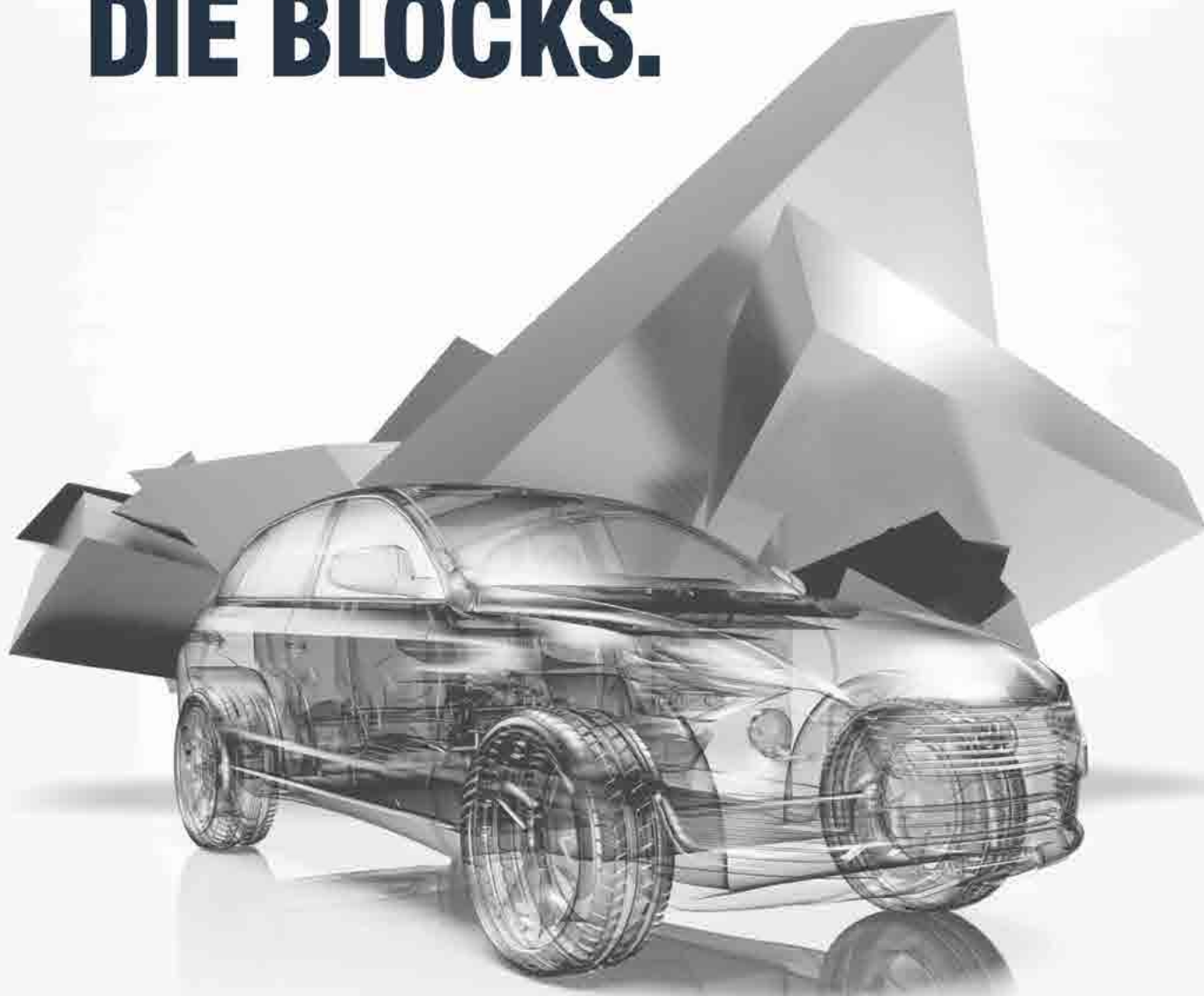
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Collins Aerospace opens new engineering and global operations centers in India

Collins Aerospace, a unit of Raytheon Technologies Corp., has officially inaugurated its new Global Engineering and Technology Center (GETC) and Collins India Operations Center in Bengaluru. The new sites are part of a long-term growth strategy for Raytheon Technologies in India and globally to maximize collaboration and innovation providing cutting-edge solutions for customers and providing additional STEM-based opportunities in the country.

"We've been committed to the aerospace industry in India for 25 years now, directly advancing key innovations, R&D and STEM opportunities in the local market for the long term," said Steve Timm, President, Collins Aerospace. "At Collins, we are on course for planned investments of over \$200 million in engineering and manufacturing capabilities and hiring an additional 2,000 highly skilled employees in the Indian aerospace and defence sector over the next 5 years. India is strategic to the global growth and investment strategy of all Raytheon Technologies' businesses, and the advanced infrastructure and talent pool will help drive the country's contributions as a global leader in aerospace and defence."

Approximately 3,000 engineers from three other Collins Aerospace locations in Bengaluru, as well as about 600 personnel from other Raytheon Technologies' group of companies will be moving into the 413,000 square-foot GETC at Northgate Tech Park to facilitate collaboration across the company's businesses, with plans to expand its footprint on the 3-acre land next year with new capabilities. Pratt & Whitney's United Technologies Corporation India



Pvt. Ltd. (UTC IPL) contract engineering services is also planned to open in early 2023 in the same location.

"The opening of these new facilities in Bengaluru shows our continued commitment in India, expanding our capabilities and accelerating transformative technologies for a safer, more connected and sustainable world," said Dr. Mauro Atalla, Senior Vice President – Engineering & Technology, Collins Aerospace. "The GETC India organization supports Collins' six strategic business units and is crucial to the continued success of our global businesses."

Kevin Myers, Vice President and Head of Enterprise Operations, Collins Aerospace, said: "The new Collins India Operations Center located at KIADB Aerospace Park spans 26 acres across the Hitech Defence and Aerospace Park and will help Collins bring operational synergy and economies of scale, as well as support future growth opportunities and customer requirements. We will host some 1,700 employees at the new site once it is fully completed in 2026." ♦

Vedanta inks pacts with 30 Japanese firms to develop Indian semiconductor manufacturing ecosystem

Vedanta Group recently said that it had signed pacts with 30 Japanese technology companies to develop an Indian semiconductor and glass display manufacturing ecosystem. The pacts were signed at the Vedanta-Avanstrade Business Partners Summit 2022 held at Tokyo, Japan. The summit was attended by more than



Image used for representation only. Courtesy Envato Elements.

200 delegates from over 100 global companies.

The company is committed to make India a hub for electronics manufacturing. It is focussed on taking the lead in creating the electronics industry ecosystem rather than just technology transfers, Vedanta Global MD, display and semiconductor business, Akarsh K. Hebbar said.

The summit saw interests from a host of companies eager to be part of the ecosystem for India's semiconductor mission.

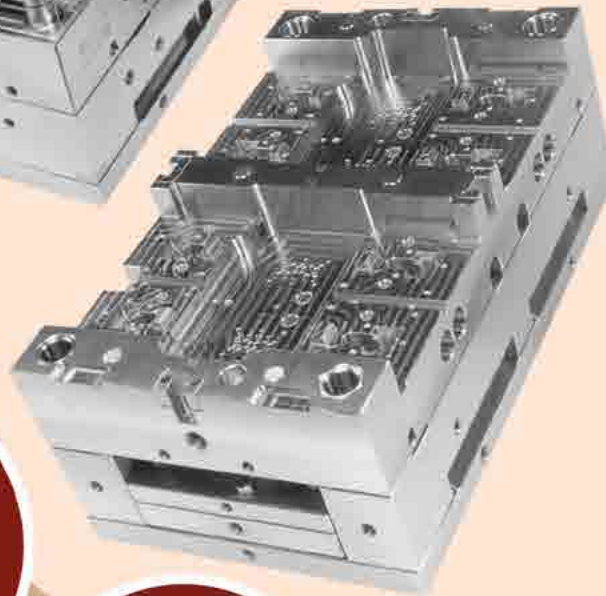
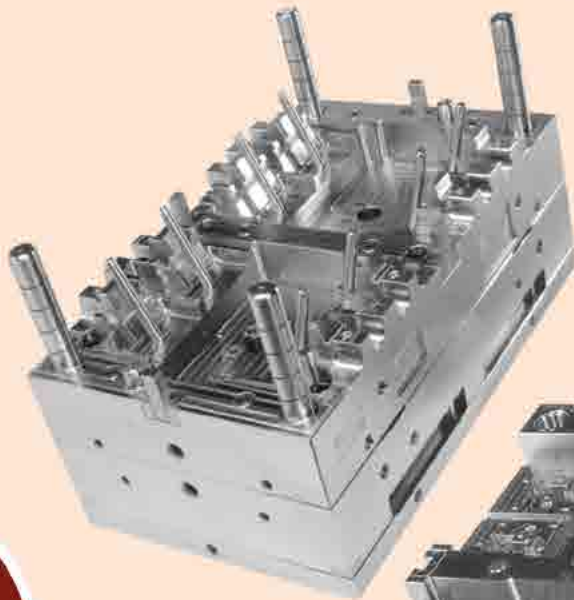
Vedanta Ltd., an arm of Vedanta Resources Ltd., is one of the world's leading oil and gas and metals companies with operations in oil and gas, zinc, lead, silver, copper, iron ore, steel and aluminium, and power across India, South Africa and Namibia. ♦

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Foxconn unit invests \$500 million in India affiliate

Taiwan's Foxconn, the world's largest contract electronics maker, recently said that its Singapore unit has acquired 4.08 million shares in Foxconn Hon Hai Technology India Mega Development Private Limited for \$500 million.

The announcement of a \$500 million injection into its India unit comes after Reuters reported last month that Apple supplier Foxconn plans to quadruple the workforce at its iPhone factory in India over two years, with two government officials with knowledge of the matter pointing to a production adjustment as it faces disruptions in China.

Foxconn plans to boost the workforce at its plant in southern India to 70,000 by adding 53,000 more workers over the next two years, sources had said.

The company shared its plans with Tamil Nadu officials about accelerating its hiring efforts at the Indian plant due to disruptions in China, according to a government source, while a person in Taiwan with knowledge of the matter said Foxconn was expanding its operations in India to increase its capacity for basic



Image Courtesy Reuters

models and to meet Indian demand.

Formally called Hon Hai Precision Industry Co. Ltd., Foxconn opened the India plant in 2019 and has been ramping up production. It began producing the iPhone 14 this year. Foxconn, which grabbed headlines in recent weeks for imposing tough COVID-19 restrictions at its Zhengzhou plant in China, which resulted in worker unrest, has said that the facility has lifted its "closed-loop" management curbs. ♦

Courtesy: Reuters

Renishaw expands its reach with new Technology Centre in India

To support its rapidly growing customer base in India, global engineering technologies company, Renishaw, recently opened a new Technology Centre in Bangalore, India. It officially opened the new facility on December 7, 2022, and the new site now provides customers with access to demonstrations of Renishaw's solutions for metrology, and material analysis.

After experiencing growing demand in the Indian markets, Renishaw made the decision to move to a new 12,000-square-foot facility, which houses its technical, operations and sales and marketing teams, warehouse and Technology Centre. Located on the ground floor of the new facility, the Centre allows companies to work with Renishaw engineers to understand how their processes can become more efficient and productive using Renishaw technologies. Visitors to the Centre will be able to view demonstrations of Renishaw's extensive product portfolio, including its advanced metrology equipment for process control applications, such as the Equator™ flexible gauge and scanning systems for CNC machine tools.

Those attending the inauguration day included William Lee, Renishaw's CEO, Andy Buttrey, President of Renishaw APAC and Paul Gallagher, Vice President and Managing Director of Renishaw APAC. Other guests included Mr. P. Ramadas, Managing Director of Ace



Manufacturing Systems and Past President of the Indian Machine Tool Manufacturers' Association, and over 30 CEOs, managing directors and vice presidents from renowned manufacturing companies operating in India.

"Last year, India rose to number two in the Global Manufacturing Index, showing how the market is growing in the region," explained Paul Weaver, Director of Sales & Marketing – Renishaw Metrology Systems Ltd. "We opened our first training and demonstration centre in Pune in 2008 and we thought now was the right time to increase our investment in India. The new facility is crucial in enabling us to keep up with the country's industrial growth and continue to expand our customer base."

"On the inauguration day, we showcased our advanced systems to fellow manufacturers, partners and potential customers, and highlighted our long-term commitment to India, where we have operated since the 1980s," commented Gallagher. "We demonstrated how Renishaw's dedicated team can support and provide the technical training people need to get the most out of their manufacturing and metrology processes." ♦

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HYM Drive Systems commissions manufacturing facility for electric drive units in Ludhiana

HYM Drive Systems recently announced the commissioning of its manufacturing facility for electric drive units at Hero E-Cycle Valley in Ludhiana, Punjab. HYM Drive Systems is a joint venture between Hero Motors Ltd. and Yamaha Motors Co. of Japan. The two partners announced the joint venture in October last year to create a global electric-cycle drive plant in Ludhiana as the next step in their strategic alliance set up in September 2019 to work together in the e-cycle product segment.

Hero E-Cycle valley is an integrated and high-end plant that manufactures premium push bikes for the global market. "This manufacturing facility is a key component of our joint strategy with Yamaha to design, validate and manufacture electric drive units for global e-cycle markets in India," said Pankaj Munjal, Chairman of Hero Motors Company (HMC).

The EU e-bicycle market has been growing in double digits for more than a decade and is expected to grow at



Image used for representation only.
Courtesy Envato Elements.

a similar rate in near future, he said, adding that "HMC envisions India to be a global manufacturing hub for e-cycles and the drive systems".

The setting of the manufacturing unit at Ludhiana has brought the company a step closer to fulfilling its ambition to be the first fully integrated player in India for the global market, Munjal added. "To take it a step further, Hero Motors is planning to set up a technical centre in 2023 to design the complete

electric drive units, which will include motors from HYM and other components like battery, controller, charger, display, sensors and connect applications from automotive suppliers in India and the EU," Munjal stated.

HYM Drive systems has a facility that includes a hi-tech motor assembly line, along with in-house motor winding and end-of-line testing. HYM said it will start production from the first quarter of the next year with a capacity of 3,00,000 motors per annum in phase 1 (capacity expansion plan to 1 million in phase 2), the company said. ♦

Courtesy: PTI News

Zen Mobility set to launch a range of purpose-built 'Light Electric Vehicles (LEV)'

Zen Mobility, an emerging electric vehicle OEM, conceived with the vision to craft aspirational designs and engineering novelties in electric vehicles, has announced its first range of mobility solutions, which include a multi-purpose 4-wheeler LEV called the 'Zen Maxi Pod' and a purpose-built cargo 3-wheeler LEV called the 'Zen Micro Pod'. The company most recently received the ARAI Certificate of Conformity for the Zen Micro Pod.

Guided by the vision to rethink electric mobility to cater to the demands of modern-day mobility and logistics, the Zen Micro Pod and Maxi Pod have been conceptualised using the best-in-class design and technology, enabled with enhanced comfort, convenience, optimized range, and lower cost of ownership. While the Micro Pod, aimed at addressing long-standing problems of riders and delivery partners in Last Mile Delivery, will be unveiled in early 2023, Zen Mobility has also announced its plans to launch a new-age multi-purpose 'Maxi Pod' in the following years. Designed in Germany and built indigenously, the

Image Courtesy ANI



Zen Micro Pod and Maxi Pod will be manufactured in India using locally sourced components thereby promoting the 'Make in India' initiative.

"I am delighted to introduce Zen Mobility's new range of customer-centric Electric Mobility Solutions," said Namit Jain, Founder and CEO of Zen Mobility. "At Zen Mobility, we have critically analyzed the dynamic and complex nature of scenarios like Last Mile Delivery and intra-city goods mobility, and the challenges that users face during their transit. We have taken a design thinking approach towards conceptualizing and executing solutions in the form of Light Electric Vehicles (LEV), the Zen Micro Pod and Zen Maxi Pod that will provide better efficiency, productivity, safety, durability & cost-effectiveness in a range of use-cases and scenarios." ♦

Courtesy ANI

Variety of inserts in 09,10,14 size available for multiple applications



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ARTPARK-IISc sets up accelerator for advanced manufacturing of robotic systems

Karnataka government-funded ARTPARK-IISc has received approval from the Ministry of Heavy Industries (MHI) to set up an industry accelerator Center for Advanced Manufacturing for Robotics and Autonomous Systems (CAMRAS) for technology development in robotics and autonomous systems.

ARTPARK-IISc aims to reduce the import footprint of robotic & autonomous systems, drones, motors, electronic regulators, and printed circuits while readying the next-generation companies estimated to be worth thousands of crores in these chosen focus areas. The organisation will also spearhead a skilling program to train 2,800 professionals in the field of next-generation advanced manufacturing for robotics and autonomous technologies by 2025.

Dr. C. N. Ashwath Narayan, Minister for IT & BT, Science & Technology, Government of Karnataka, said, "I'm delighted to see ARTPARK lighting the path to developing new-age technology. It is a fine example of how public-private partnerships can truly shape the industry and bring about a massive change in

strengthening India's domestic capabilities in key high-tech sectors."

Five of ARTPARK's pre-ventures in the areas of advanced cargo drones, robotic actuators, legged robots, autonomous systems charging and intelligent controllers will form an MHI Accelerator named CAMRAS.

Set up in 2020, ARTPARK-IISc is an AI & Robotics Technology Park that aims at promoting technological innovations in AI (Artificial Intelligence) & Robotics, leading to societal impact by implementing projects in healthcare, education, mobility, and agriculture focusing on problems unique to India.

Promoted by IISc (Indian Institute of Science) and supported by AI-foundry, it has received seed funding of INR 230 crore from the Department of Science and Technology (GoI) and the Government of Karnataka. ♦

Courtesy: Hindu BusinessLine

Image used for representation only. Courtesy Envato Elements.

Tata Group to soon begin semiconductor chip manufacturing in India: Report

Tata Group is reportedly expected to begin semiconductor chip manufacturing in India very soon. According to a media report, Tata Sons Chairperson Natarajan Chandrasekaran has said that Tata Group has plans to begin chip manufacturing in the home country itself.

As per an interview-based report in Nikkei Asia, Chandrasekaran said that Tata Group has some plans to launch new business in emerging fields like electric vehicles. Even in 2020, the group founded an electronic components manufacturer.

Elaborating on this, Chandrasekaran told the publication, "We have created Tata Electronics, under

which we are going to set up semiconductor assembly testing business... We will have discussions with multiple players." Through this, the Chairman also raised a possibility that Tata Group may explore the option of a partnership with some existing semiconductor chip manufacturers.

Through the interview, Chandrasekaran also affirmed that through this step, Tata Group aims to make India an important part of the global chip supply chains. The Chairperson also highlighted in the interview that Tata Group is also looking into the possibility of eventually launching an upstream chip fabrication platform.

Semiconductor chips and their manufacturing have been a hot topic over the last couple of months. With global supply chains getting impacted due to China and the COVID-19 lockdowns, a shortage of chips was reported by several companies that needed them for production of their essentials.

In some cases, as per media reports, a shortage of semiconductor chips also led to a hike in prices of electronic products as production got affected. With Tata's latest move, the problem of importing semiconductor chips may soon start getting a resolution. ♦

Courtesy: Outlook India



Image used for representation only. Courtesy Envato Elements.

Mould Flipper

*Turning the large moulds/dies is more
safer and quicker now.*



90 Deg Mould
Flipper



180 Deg
Mould Flipper



Easy to
Operate



Less time
consuming



Safe Turning of
mould

90 deg mould flipper

- Electrical motor driven
- Economical and free maintenance.
- Occupy dedicated space to keep the table.
- Saves time, manpower and operator's fatigue

180 Deg Mould Flipper

- Hydraulic cylinder driven, very safe to flip the mould by 90deg.
- Saves time, manpower and operator's fatigue.
- The tables can rest at 180deg.
- Does not require any dedicated space to keep the machine as the complete Hydraulic system can be accommodated in pit and the mould maintenance can be done while the mould is kept on the table.



CNC milling machine



Deep Hole Drilling
machine



Electro permanent
magnetic chuck



Hydraulic Quick die
Change system



Mould Flipper



Magnetic Chuck

Hexagon introduces Elements to help engineers design increasingly complex products with system-level modelling

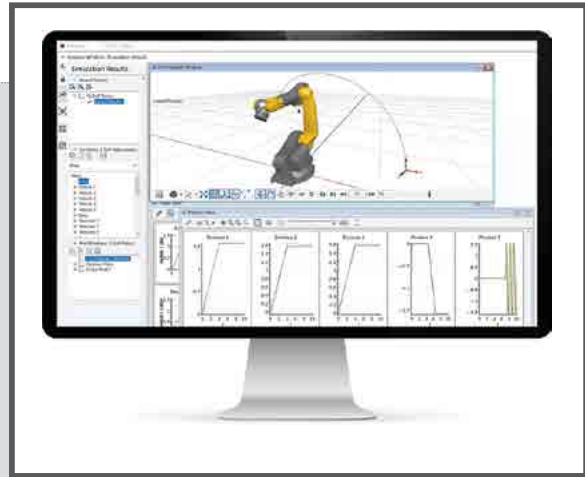
Hexagon's Manufacturing Intelligence division has recently introduced Elements, a new simulation software that helps engineering teams understand the behaviour of systems that are becoming increasingly complex in modern products. Using the software, teams can evaluate the performance and feasibility of new design concepts quickly to inform more efficient product development and reduce risk and cost.

Elements addresses the growing importance of integrated, multi-disciplinary system development and end-to-end workflows. Customers in every industry are demanding technologies that consider many physics domains and tackle mechatronics challenges in a robust way, fuelling a growing trend towards system-level engineering. Achieving this requires the integration of all relevant engineering disciplines, control systems, and third-party supplier systems to understand how the domains interact, and how a design decision in one discipline impacts others.

Systems engineers can easily learn to use the Elements software, using its drag-and-drop environment, to model any physics type or logic and analyse systems by intuitively connecting blocks – regardless of whether they represent electrical, hydraulic, mechanical components – to solve system-level engineering problems. It is based on the Modelica language, which is an open and widely used standard for building fast, flexible, and customisable models.

Systems modelling is indispensable in the early design phases because little information is required – often a CAD model, equation, or lookup table is sufficient and a 3D mesh is not required. Elements further speeds up engineering development because it also ensures that system-level models compute quickly and efficiently by optimising equations and code for fast calculation, but with no loss of fidelity.

As the design develops, and components and subsystems are detailed in specialist simulation software, the components can be routinely integrated into a larger system through full compliance with the FMI standard and Hexagon's proprietary SmartFMU technology. SmartFMU unlocks the Functional Mock-up Unit (FMU) for supported Hexagon products so that changes can be made directly in the Elements system-level model without having to go back to the specialist Computer Aided Engineering (CAE) software and its



expert user. This helps to avoid resource bottlenecks, time-consuming switching between applications, and versioning problems.

Hexagon's roadmap will see its best-in-class CAE technologies readied for easy and productive use with Elements. At launch, the software provides SmartFMU connectivity with Adams multibody dynamics software and Easy5. Future plans are likely to include workflows with Cradle CFD thermal-fluid dynamics and Actran acoustic simulation products, among others.

Elements was developed in close cooperation with Maplesoft, building upon its powerful maths engine to optimise system equations and deliver fast efficient simulation to Hexagon's customers. Chris Hardwar, VP of Strategic Solutions at Maplesoft, commented: "We are excited to begin this long-term collaboration with Hexagon, which has an impressive vision and track record of innovation. By combining the tried-and-tested Maplesoft system-level modelling technology with the extensive Hexagon CAE portfolio, engineers in many industries benefit from new productivity-boosting solutions that significantly reduce simulation effort."

Mahesh Kailasam, General Manager for Design and Engineering Software at Hexagon, commented, "Elements offers engineers an easy way to explore behaviour of systems quickly and find better solutions to problems using simulation, before committing designs to subsequent resource-intensive engineering processes. We look forward to a long-term collaboration with Maplesoft, using its powerful and open technology foundations to realise synergies with our extensive Hexagon CAE ecosystem portfolio and deliver valuable capabilities to our customers." ♦

Gripping Technology: The smart way of handling

Linking mechanical and logical gripping has now been made simple. Automation specialist SCHUNK has developed the 2D Grasping Kit for handling individual objects randomly arranged on one plane. The core of this intelligent system is its in-house developed AI software, which is pre-installed on SCHUNK's own industrial PC (SVC). This fully coordinated package of hardware, software and service stems from one source and can be used for all robots.

With the 2D Grasping Kit, SCHUNK is now offering a complete solution that makes it much easier to get started with automated object handling. Users can easily integrate the plug-and-play, vision-based system and implement automation straight away. Companies that are still in the early stages of automating their manufacturing processes in particular will benefit from this. No prior knowledge of programming or image processing is required. Complete compatibility of all components emphasizes the user benefit - SCHUNK acts as a single point of contact for the entire solution.

The core of this is the SCHUNK KI software

Following on from the MTB application kits for simple partial automation of machine loading and unloading, the 2D Grasping Kit is a further module with which automation expert SCHUNK is offering its customers a concrete solution for greater efficiency and productivity. The kit combines intelligent object recognition and flexible gripping with intuitive usability and can be customized to meet specific customer requirements. This fully coordinated automation solution for gripping and depositing non-position-oriented workpieces consists of a camera system including a lens, an application-specific gripping system, SCHUNK's own industrial PC (SVC) and a plug-in for easy integration into the robot control system. At the heart of the system is the AI software developed by SCHUNK, which reliably ensures detection, even under changing light conditions. All components in the kit are precisely matched to each other and are process reliable.



Automated to optimal grip

The camera system reliably detects workpieces on a defined plane, even in awkward lighting conditions, while calculating possible grips together with collision checks. The workpieces no longer must be sorted or positioned in advance; users can retain their own earlier processes. Workpiece detection uses AI to search for previously defined objects. The software calculates how the workpiece can be gripped without any collisions in the defined workspace using the interference contours of the fingers and the workpiece previously defined in the software. After detection, collision-free grips and approach points are calculated automatically and transferred to the robot in a matter of seconds.

The user can integrate the 2D Grasping Kit into various robots or cobots, regardless of manufacturer, by means of ready-made software modules; SCHUNK supplies the appropriate plug-in for the robot in the kit. During conversations with the customer and while defining their requirements, a combination tailored to the application is assembled and validated. Depending on the gripping situation, suitable grippers can be combined for each cobot type – electric, magnetic, adhesive, or pneumatic. Using the Calculation and Sizing Assistant gripping by SCHUNK and realistic validation in the CoLab Robot Application Center, it is possible to check exactly how well the selected gripper can grip the workpieces prior to its application. ♦

Redesigned -HF Chipbreaker Upgrades Turning Performance of Carburized and Hardened Steel Parts

Tungaloy has redesigned its -HF chipbreaker of CBN inserts to upgrade its turning performance in carburized and hardened steel parts.

Tungaloy's CBN inserts are offered with a variety of chipbreaker styles integrated on the cutting edge: -HP provides precision finishing, -HS allows high feed turning, and -HM and -HF are designed for removing carburized layers of case-hardened steel parts.

Developed for effective removal of carburized surfaces of case-hardened steel through using aggressive depths of cut of up to 1.0 millimeter (.039 inches), the -HF chipbreaker has been a proven performer of stable chip control over a wide range of feeds and depth of cut.

This conventional -HF chipbreaker has been re-designed and upgraded to provide better chip control. A conical wall feature of the new -HF chipbreaker geometry, situated in the center of the rake face, functions to redirect the chip flow back towards the material, forming chips into curls for effective chip evacuation. Furthermore, the renewed chipbreaker incorporates an angled rake face that helps promote smooth chip flow so that the chips make less frictional contact with the rake face, thus reducing crater wear.

The inserts with renewed -HF chipbreaker are



available in BXA20 CBN grade. Successfully integrating a thick TiAlN multilayered coating that adds to wear and chipping resistance and a dedicated CBN substrate with superb hardness and fracture toughness, BXA20 exhibits exceptional performance in turning carburized and hardened steel over a broad range of cutting conditions from continuous to interrupted cuts. The new CBN inserts allows up to 1.0 millimeter (.039 inches) D.O.C., enabling reduction of cutting passes, while providing long, predictable tool life during the machining of case-hardened steel. ♦

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ELECTRIC VEHICLES INDUSTRY: Charging Ahead

The electric vehicle industry's significance and imminent growth are attracting prestigious investments. The EV industry has attracted around \$6 billion (overall) in 2021 and is expected to gain \$20 billion by 2030, according to the Indian Private Equity & Venture Capital Association, EY and IndusLaw report titled 'Electrifying Indian Mobility' released in July 2022. The report also adds that EV sales in India are slated to cross 9 million units by 2027. Evidently, the EV industry has tremendous growth prospects to offer. Toolmakers looking to make the big switch will need to gear up to meet the varying needs of the EV industry.

Kimberley D'Mello

The year 2022 is proving to be a record year for electric vehicles (EVs) with its sales in India witnessing a surge in the last two years, stated a recently published IANS news report quoting Minister of Heavy Industries Mahendra Nath Pandey's written reply in the Lok Sabha. "While 48,179 EVs were sold in 2020-21, the figures increased to 2,37,811 in 2021-22 and 4,42,901 in 2022-23 (till December 9)... As on December 9, 64 original equipment manufacturers (OEMs) of electric vehicles have been registered and 7.47 lakh EVs under FAME India Phase II have been sold," added the news report published in December 2022.

But, why are EVs gaining prominence?

India's EV market is projected to grow from \$3.21 billion in 2022 to \$113.99 billion by 2029, at a CAGR of 66.52% in the forecast period, 2022-2029, according to a report by Fortune Business Insights.

What are the factors contributing to the growth of the EV market in India? Here's a summary of what the research report by Grand View Research stated:

- ▶ The post-lockdown sale of pure and hybrid electric vehicles is a prominent driving factor for the electric vehicle market in India.
- ▶ The increasing prices of conventional fuel are expected to accentuate the development of vehicle electrification.
- ▶ The Greenhouse Gas (GHG) emission norms such as the Bharat Stage (BS) VI emission standards are also expected to play a role in driving the growth of the market.
- ▶ The growing environmental awareness among Indian consumers are also expected to fuel the demand for electric

vehicles.

- ▶ Furthermore, Indian automakers, such as Tata Motors, and Mahindra and Mahindra Ltd., have embarked upon aggressive efforts to add electrified vehicles to their product portfolio, which is expected to encourage Indian consumers to opt for electric vehicles.

Making EVs in India

India's EV industry is growing. Manufacturers believe that the current high fuel prices, introductory schemes, regulations, standards and incentives will promote electric mobility. Apart from manufacturing internal combustion engine (ICE) vehicles, several Indian companies, including those manufacturing two-wheelers, are making notable contributions in the EV space. Let's take a look at a few of these companies...

▶ Mahindra to locate EV manufacturing plant in Pune

In December 2022, Mahindra & Mahindra Ltd. announced in a press release that their

DID YOU KNOW?

The highway between Delhi and Chandigarh is the first in the nation to be made e-vehicle friendly by Bharat Heavy Electricals Limited (BHEL), successful commissioning 20 Solar Based EV Chargers.

Source: Invest India

investment of INR 10,000 crore for EVs has been approved under the Maharashtra government's industrial promotion scheme for electric vehicles. The company, through its subsidiary, will make investments of approximately INR 10,000 crore over a period of 7-8 years for setting up the manufacturing facility, development, and production of Mahindra's upcoming BEVs in Pune, Maharashtra.



Image used for representation only. Courtesy Envato Elements.

► **Kia to launch Made-in-India EV by 2025**

According to an ABP Live news report published in December 2022, the first made-in-India Kia EV will debut by 2025 and will be most likely made in India with a localised E-GMP platform. Currently, the carmaker is ramping up its fast charging network and installing fast chargers.

► **Ather plans to make its third plant operational by next fiscal end**

A PTI News report published in November 2022 stated that electric two-wheeler maker Ather Energy is set to finalise the location of a third manufacturing plant shortly with plans to make it functional by the end of the next fiscal to cater to the growing demand, according to co-founder Swapnil Jain. The company is in talks with various state governments like Maharashtra and Karnataka to set up the plant, informed the news report.

► **Hero Electric to invest INR**

1,200 crore in greenfield facility in Rajasthan

Two-wheeler maker Hero Electric plans to set up a greenfield manufacturing unit in Rajasthan entailing an expenditure of INR 1,200 crore, its managing director,

Naveen Munjal, told ET. According to Munjal, the company had signed an agreement with the Rajasthan government for the facility in September 2022 and it is likely to go on stream by the middle of 2023.



Image used for representation only. Courtesy Envato Elements.

Electrifying opportunities for toolmakers

The automotive industry has been known to offer several opportunities for the tooling industry to flourish. But manufacturing EVs is going to be different because its parts need to be precise and of high-quality. So, toolmakers looking to venture into the EV space, you need to be ready to meet the new tooling requirements. These include the need for precise machining with tight tolerances to cater to the demand for gearboxes with reduced noise, making components more wear-resistant and brakes sturdier, and also working on new production and machining concepts to manufacture electric drives, among others.

The abovementioned demands highlight the new tooling requirements, which mandate high-precision and accuracy cutting tools. Thus, toolmakers with state-of-the-art setups will be much more preferred. In fact, components, such as battery casings, single-speed gearboxes, charging ports, for EVs could present an opportunity for toolmakers.

The growing demand for EVs translates into a growing demand for cutting tools. Indian

manufacturers should take advantage of this opportunity. For starters, they can initially focus on developing new cutting tools that can be used in manufacturing electric vehicles. They can also focus on process automation and technology upgrades, which will help them enhance their performance and decrease their manufacturing costs.

As Naveen Munjal, President, Society of Manufacturers of Electric Vehicles, aptly summarizes it at the recently held National Conference and Awards for the EV industry: "The growing EV industry opens opportunities for battery assembly, battery metal manufacturing, BMS, IoT and spark technologies, telematics, charging infrastructure, swapping infrastructure, financing, etc. The technology is evolving rapidly and, we already have various chemistries of lithium, followed by sodium ion or sodium-sulfur or solid-state along with talks on hydrogen fuel cell technologies to power the EV sector. While the future is definitely bright, green, and clean, additional research and collaborations are required to build a robust EV ecosystem in the country."

► **Tata Motors to have 10 new EVs in portfolio by 2025: Chandrasekaran**

According to a PTI News report published in June 2022, Tata Motors announced its plans to have 10 new battery electric vehicles (BEVs) in its domestic product portfolio by 2025, as per Tata Motors Chairman N. Chandrasekaran. "Tata Group is actively exploring partnerships in cell and battery manufacturing in India and Europe to secure our supplies of batteries," he added.

► **Suzuki to invest INR 10,445 crore for manufacturing EVs, batteries in Gujarat**

A PTI News report published in March 2022 revealed Japanese automaker Suzuki Motor Corporation's plans to invest around INR 10,445 crore by 2026, for local manufacturing of battery electric vehicles (BEV) and BEV batteries in Gujarat. The company has signed a memorandum of understanding to this effect with the Gujarat government, it added.

Battery makers are charged

As automakers gear up for the 'EV revolution', the battery makers are not far behind. Eager to avail of the opportunities that EV manufacturing is set to offer, some battery-manufacturing companies are setting up base to strengthen the Indian EV industry. Here are their developments:

► **Ola Electric set to launch its own lithium-ion cells by 2023**



Image used for representation only. Courtesy Envato Elements.

Ola Electric will roll out its own lithium-ion cells in 2023, said various news reports in December 2022. The cells will be manufactured at Ola Electric's manufacturing facility in Krishnagiri, Tamil Nadu. They will be first utilised in the company's electric motorcycles, which are scheduled to be launched in 2023. It has been speculated that the company may monetise its own batteries and make them available for the market.

► **Amara Raja to invest INR 9,500 crore in battery-making unit in Telangana**

A PTI News report published in December 2022 stated that industrial and automotive battery making company Amara Raja Batteries signed a memorandum of understanding (MoU) with the government of Telangana, to set up state-of-the-art research

and manufacturing facilities for lithium-ion battery-making in Mahbubnagar district. The company plans to invest around INR 9,500 crore in the unit over the next 10 years.

► **GODI India manufactures India's first-ever 5.2 Ah 21700 cylindrical lithium-ion cells**

An ANI news report stated in December 2022 that GODI India, the first Indian company to get BIS certification to sell lithium-ion cells made with homegrown technology, has achieved another milestone by manufacturing India's first ever 5.2 Ah 21700 cylindrical lithium-ion cells with an energy density of 275 Wh/kg based on silicon anode technology.

► **Exide to invest INR 6,000 crore in setting up lithium-ion unit in Karnataka**

According to various news reports published in September 2022, automotive and industrial battery maker Exide Industries plans to invest INR 6,000 crore in the next 8-10 years to set up a 12 gigawatt-hour lithium-ion cell manufacturing unit in Karnataka. The first phase with a capacity of 6 gigawatt-hour is expected to be completed in 27-30 months. ♦

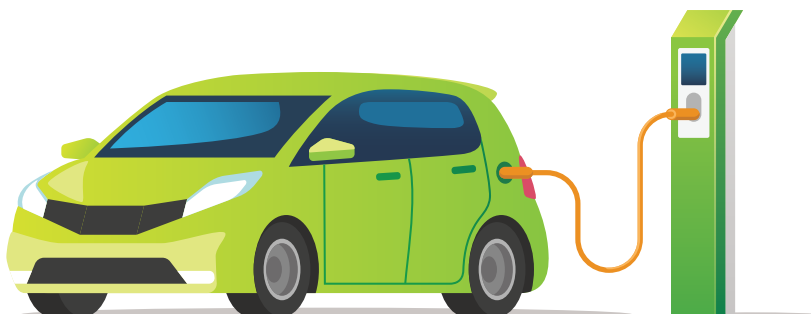
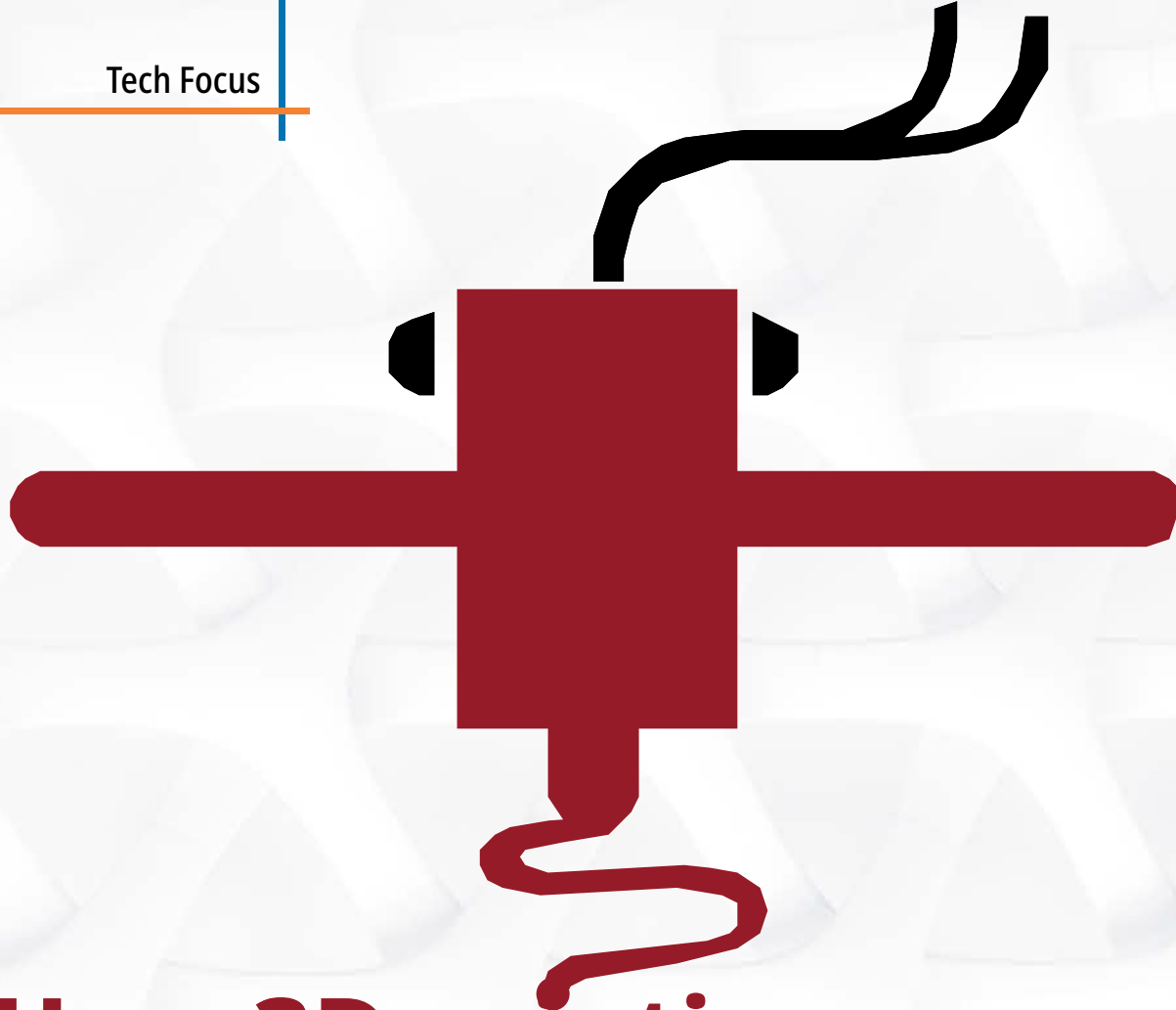


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How 3D printing makes prototyping easier?

3D printing is “the thing” now. It has not just taken the manufacturing industry by storm but is also going to make an impact on the future that we envision. The most impact that it has had is on the amazing prototyping industry. With the consistently growing demands of the prototyping industry coming to a whirlwind, 3D printing has made the process a lot more streamlined, and for that matter, easier as well. Irrespective of what and which industry the prototype might be for, the impacts are absolutely quite marvelous if you do think about it yourself. Make sure that you are familiarising yourself with it for a better understanding of the same.

What is a prototype?

A prototype is, in simple words, the first model of the design that is going to be further manufactured into bigger and more similar products and designs. This is quite beneficial in handling a number of manufacturing prospects because of the fact that it gives a fair and clear idea of what the prospects will look like on a larger scale.

If you have been in a similar limbo trying to figure out the importance of 3D printing in the prototyping industry, the possibilities are actually quite extensive and endless, for that matter. Irrespective of what and which industry you belong to, having a practical demo of the ideas is always better.

How does 3D printing benefit prototyping?

Given the fact that a lot of it is at stake with the prototype you are presenting to the investors, it goes without saying that you want to invest in something that would most definitely contribute a lot to your overall success of the business, prototypes; especially 3D prototypes are the way to go about it.

If you are still stuck in a dilemma as to why it is standing out day after day, we do have a well-informed list of benefits that can come in handy for you to look into.

Design and ready to feed into the machine

The very first and the most

Image used for representation only. Courtesy Envato Elements



important factor of 3D-printed prototypes that do stand out is the fact that the design is completely ready to be fed into the machine. With 3D printing, it becomes a lot easier to do better designs of the same which brings out lesser chances of inaccuracies in them. Prototypes are often still used as a way to test out the designs and while the process was quite effective back in the day, it was not completely foolproof as such. The same has completely changed with 3D printing. More accurate and well-designed models are now available to be fed into the machine directly without any form of limitations and that is all thanks to 3D printing.

Better if you own a 3D printer, it makes the process of manufacturing and development a lot easier for you and a lot more feasible as well. This also provides better control over the overall digital fabrication process and then adjusts and even later modifies the design if required.

Complex geometries are easy to design

With everything aside, you'd be surprised to know that bringing an idea to life with prototypes is not a cakewalk. Not only does it require a lot of work, but it also does require a lot of effort and precision. Complex geometries are part of it and with 3D printing; it has become a lot easier

to cut down on the inaccuracies that did come with the same. 3D printing does make topology optimization a lot easier and a lot more manageable, which brings forth better results in the end.

Multiple iterations in the same build platform

The next thing in line is the fact that 3D printing paves the way for the list of multiple iterations. Having multiple iterations at one go is actually quite easy given the fact that it does reduce waste generation altogether. Most companies are now extremely worried about their carbon footprint and with the inclusion of 3D printing in prototyping, it does become a lot easier to reduce waste and bring it to the bare minimum. Statistics suggest that 3D printing does bring down the overall waste by 10%, which is amazing for the company as well as the environment. 3D printing is now being used just for prototypes, but the same has the possibility of being extended to comprehensive manufacturing too for better reduction of industrial waste altogether.

Product deliverable time reduced

Yet another benefit of having 3D

KEY BENEFITS OF PROTOTYPING

1 Understand the flaws

Much like every other big and long-term business, every possible idea has its fair share of risks. With prototyping, it does become a lot easier to get a hold of the flaws at an earlier stage so they can be rectified before they do get to the stage of manufacturing. Once you get a hold of the problems in the prototype itself, it becomes a lot easier to handle the problems in the bigger picture too.

2 Gather more intel

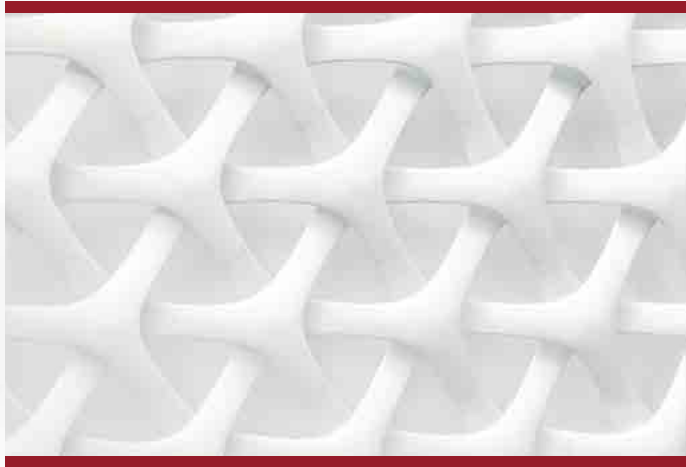
Having an overall idea of the requirements does have an impact on the cost and budget. The last thing you want is to end up indulging more in the redoing of the inadequate requirements. These are what end up affecting the overall budget and can badly make you go overboard with it. Having a prototype can change that issue.

3 Better chances at funding

Explaining one idea is one thing but when you end up having a live example of what your idea is going to take shape of, it is more convincing to the investors, without a speck of doubt. It thus increases your chances of better funding from the investors. It also reduces the risks of investment for the people investing in your projects.

printing with the prototype is that it cuts down the time of product delivery. Owing to the fact that it does speed up the process of how fast the product is made and manufactured for the prototype, it is not surprising that it cuts down the time by a lot. Keeping the fact that 3D printers have the capability of printing out around 20 products at a time, it is not surprising that it does make the overall process of product delivery a lot easier. Manufacturing prototypes with the traditional

Image Courtesy Objectify Technologies



model do take around a long stretch of time, which is not the case with 3D printing at all. This ensures that the overall product delivery deadlines are cut out by

a lot.

Given the fact that the usage of 3D printing in prototype development is still in its initial stage, it is not surprising that more and more companies are just getting the hang of it. Overall, more and more prospects are making their way around with this process and it is also making it quite simpler in the final result as well. The combination of 3D printing with prototype

development is expected to see more progress in the coming years, but for now, the growth is definitely defined. ♦

Article courtesy: Objectify Technologies

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Email Id: info@bhavyamachinetools.com;
inquiry@bhavyamachinetools.com

Website: www.bhavyamachinetools.com

Activities: Lathe Machine, Milling Machine, Drilling Machine, Grinding Machine, Workshop Tool Room Machines, Re-sharpening Machines.

FLOTECK HOT RUNNER TECHNOLOGIES

Survey No. 77/5A2, Meccana Industrial Estate,
Velappanchavadi, Chennai – 600077, Tamil Nadu

Contact Person: V. VIJAYABASKAR - PARTNER

Tel: 044-26790338 / +91-9962468786

Email Id: vijay@floleck.in; sales@floleck.in

Website: www.floleck.in

Activities: HOT RUNNER SYSTEMS, HOT RUNNER TEMPERATURE CONTROLLER, HOT RUNNER SERVICE

RAJ TOOLS AND STAMPING PVT. LTD.

Gat No. 1559, Dehu Alndi Road,
Shelarwasti, Chikhali, Pimpri, Chinchwad
Pune – 411062, Maharashtra

Contact Person: SIDDARAM HUGAR & DIRECTOR /
RAJASHEKHAR HUGAR & DIRECTOR

Tel: +91 8408000812

Email Id: marketing@rajtools.co.in

Website: WWW.RAJTOOLS.CO.IN

Activities: DESIGN AND MANUFACTURING OF PRESS TOOLS AND MOULDS, STAMPING OF AUTOMOTIVE AND NON AUTOMOTIVE PARTS.

Associate member

MR. R SAMINATHAN

18A-1/3, Saratha devi Street-3,
Ramakrishnapuram, Ganapathy,
Coimbatore – 641006, Tamil Nadu
Tel: +91 8220014960

Email Id: diecastingsolutions@gmail.com

Website: https://www.diecastingsolutions.com

Activities: Consulting, Training, Business Development and HPDC Related Services - In HPDC Domain

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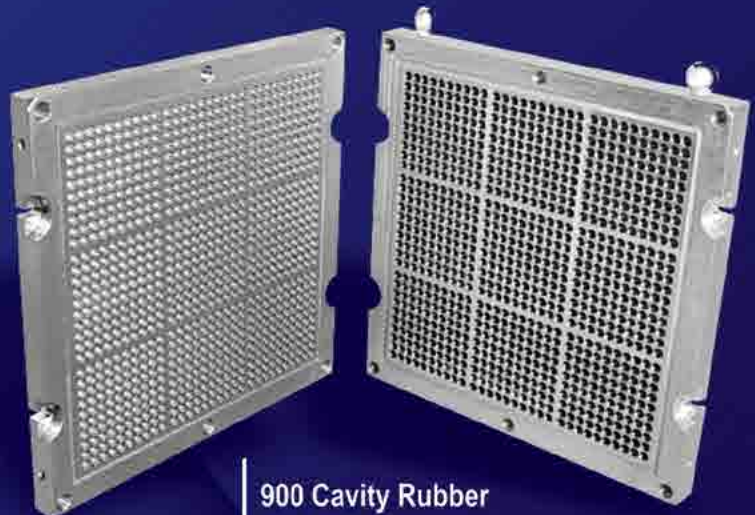
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Warehouse & Machining Division:

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Fax : +91 161 2510072
Email : ludwh@pck-buderus.com

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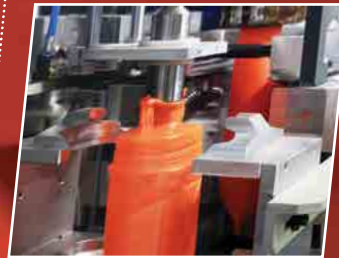
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FOR DETAILS:





A LOOK AT THE YEAR 2022

After a couple of tough years, 2022 felt like a step back from the brink. The year 2022 had lots of positive moments such as PV sales getting back to the pre-covid era, FDIs increasing in the country, the purchasing power of Indians getting better and many investment plans made by large entities. This time of the year is always a good chance to make an assessment of the running year and think of all the good moments and lessons learned. During 2022, the Indian manufacturing industry witnessed lots of positive developments that will have a direct impact on the growth of the Indian tooling industry. We look at some of those major developments.

TAGMA successfully organises biggest ever Die Mould India

The 12th edition of Die & Mould India International Exhibition organised by Tool & Gauge Manufacturers Association of India (TAGMA) concluded on April 30, 2022. The four-day mega event, which began on April 27, 2022, not only had the latest technologies and innovations on display, it also became the launch pad for some companies to introduce their new products.

The much-awaited exhibition was inaugurated on April 27, 2022, at the Bombay Exhibition Centre, Goregaon, Mumbai. It was inaugurated by Mr. Prabhakar Kadapa, Partner & Director at Mudita Strat-Aegis Consultants Pvt. Ltd. in the presence of Guests of Honour Mr. Vidyadhar Limaye, Senior Director at IAC Group; Mr. Raghava Badhya T. V., President & Director, Makino India Pvt. Ltd.; Mr. D. M. Sheregar, President, TAGMA India; and Mr. D. Shanmugasundaram, Vice President, TAGMA India.



The 12th Die & Mould India International Exhibition had more than 300 exhibitors covering an area of 19,200 sq m and 10+ countries. Each exhibitor presented the latest developments in the tooling industry and many companies used the platform to launch new products.

In this edition, TAGMA introduced 'B2B PAVILLION'. Here, 10 companies from the user industry met around 25-30 toolmakers collectively and shared their expectations with toolmakers. The absolute objective of the 'B2B PAVILLION' was to help the Indian manufacturing industry grow at

the much-needed rate by offering a platform for toolmakers and companies to meet and network.

With significant growth forecasted and the emergence of many sectors in India, the Indian tooling industry is expected to see double-digit growth in the coming years.

Overall, over 38,000 visitors marked their presence at the 12th edition of Die & Mould India from over 15 different sectors. With the grand success of Die & Mould India 2022, TAGMA is gearing up for the 2024 edition of Die Mould India which is scheduled to take place during February 14-17, 2023 at the Bombay Exhibition Centre, Mumbai. ♦

TAGMA India successfully organises multicity chapter meetings for members

The Tool and Gauge Manufacturers Association (TAGMA) India organized a series of chapter meetings in Delhi, Chennai, Mumbai, Coimbatore, Bangalore and Pune between February 26 and April 6, 2022. The chapter meetings were aimed at giving all the industry stakeholders a common platform to discuss their growth opportunities and the challenges that impact them. In these six meetings, TAGMA connected with over 500 members and 50+ delegates from the user industry.

"A lot of restrictions were imposed during the pandemic. The market opened after two years. So, we thought of organising some events for our members and providing them a networking platform, where they can meet fellow toolmakers, and user industry professionals, to understand the market sentiment. We are pleased that all the events were successful and attended by a huge number of participants in all the cities," said D. M. Sheregar, President, TAGMA India.

All the chapter meetings were sponsored by Multiple Special Steel, Yudo Hot Runner India Pvt. Ltd., and S&T Machinery India Pvt. Ltd. The sponsors made presentations during the event and highlighted the importance of the latest technologies in the tooling industry. They also shared their views about

the latest developments in their respective products such as tool steel, hot runner systems and CNC machining.

D. Shanmugasundaram, Vice President, TAGMA India, said, "During the lockdown period, when we were all working from home, we launched many digital events such as the first-ever virtual ITS and Tool Talk. We were determined to organise some physical events once the situation got better. The chapter meetings are the start of such events."

The chapter meetings were attended by executives from companies such as Volkswagen, TATA Motors, IAC Group, USHA Industries, Motherson Sumi, Varroc, Torq Motors, Matter, SMR Automotive, Toyoda Gosei, and Force Motors, among others. ♦

International Tooling Summit was organised in Delhi

The 6th edition of the International Tooling Summit (ITS) was recently held at Hotel The Leela Residency, Gurugram, during September 21-22, 2022. Organised every year by the Tool and Gauge Manufacturers Association (TAGMA), it is India's largest die and mould conference. With more than 400 visitors, the 6th ITS edition witnessed 38 speakers discussing various topics that impact the Indian tooling industry.

The program started with the singing of the National Anthem, followed by the lighting of the traditional lamp and the inauguration by the dignitaries. Chief Guest Mr. Sunil Kakkar, Sr. Executive Officer - Supply Chain, Maruti Suzuki India Limited; Guest of Honour Mr. Hari Om Rai, Chairman & Managing Director, Lava International Limited; Guest of Honour Mr. Prashant Jain, Managing Director, GE Power India Ltd.; Mr. T. S. Gopalakrishnan, Director - Marketing, Multiple Special Steel Pvt. Ltd.; Mr. Vishal Agarwal, President, Yudo Hot Runner India Pvt. Ltd.; Mr. D. M. Sheregar, President, TAGMA India, and Mr. D Shanmugasundaram, Vice President, TAGMA India, conducted the lamp lighting ceremony in



the presence of the attendees, speakers, panelists and sponsors.

During the event, TAGMA facilitated some of the industry stalwarts such as Mr. S. C. Kalyanpur, Founder and Managing Director of Sridevi Tool Engineers Pvt. Ltd.; Mr. A. K. Kaul, Horizon Industrial Products Pvt. Ltd., and Mr. Krishnamoorthy, Chairman, Fine Components and Tools Pvt. Ltd., for their immense contributions to the Indian tooling industry.

Highlights of the ITS 2022

- **15 technical sessions**
- **4 panel discussions**
- **Over 400 attendees**
- **38 speakers**
- **14 sector presence**

All the attendees were filled with gratitude and optimism. As highlighted by the panel discussions, the future looks certainly bright for Indian toolmakers. Some of the common outcomes of the two-day summit were: Indian tooling industry is poised for growth, toolmakers need to look beyond automotive and explore emerging sectors, skill development is key, we need to fast-track technology adoption, cluster development is a must and we must focus on exports as well.

The two-day event helped the attendees gain a thorough understanding of the latest technology trends, customer expectations, opportunities and the challenges in front of the Indian tooling industry and growth drivers. ♦

TAGMA launches Tooling Academy to help the industry with skill development

Experts believe that if India wants to become a hub for mould making, reduce mould imports and serve global customers, the Indian toolmakers must work on skill development. Keeping the same in mind, the Tool & Gauge Manufacturers

Association, India has launched Tooling Academy to help Indian toolmakers with skill development.

"The world is moving fast and the expectation from the user industry regarding, efficiency and quality and is constantly becoming more stringent. In such a scenario, having the right infrastructure is not the only solution, we must have the right skill set on the shop floor, design, and quality department as well. Tooling Academy is an initiative towards that," said D Shanmugasundaram,

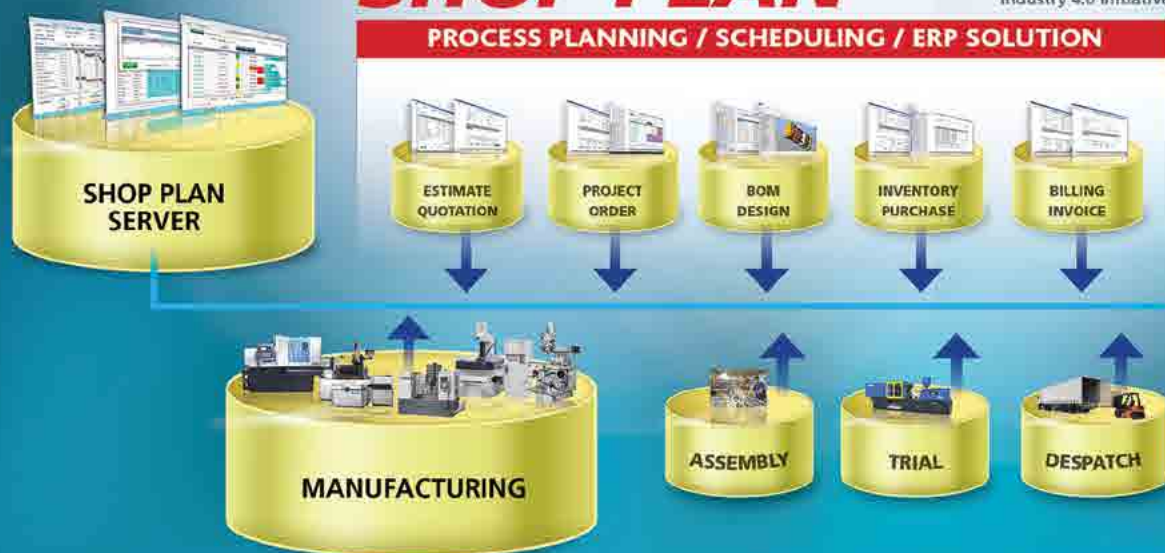
Vice President, TAGMA India.

For Tooling Academy, TAGMA partners with subject experts in a specific field related to the tooling industry and conduct virtual training. The first session on the topic "Press Tools-Basics, Types, Design Considerations" was highly successful. The objective of this session was to understand various types of Sheet metal processes, types of Press tools, and understand the various elements of a press tool. The session was attended by 32 participants. ♦

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(Feb 2022)

Bosch to invest INR2,000 cr. in India in next five years

TECHNOLOGY and services supplier Bosch said it would invest a total of INR2,000 crore in India, in the next five years, in addition to the INR8,000 crore it had already pumped into the country over the past decade. The company would invest INR1,000 crore towards the localisation of advanced automotive technologies while an equal amount of investment would be made in building digital platforms like Mobility Marketplace and Mobility Cloud Platform, it recently said. ♦

(Apr 22)



Exide Industries announces investment of INR 6,000 crore in Karnataka

EXIDE Industries has announced an investment of INR 6,000 crore in Karnataka. This is for setting up one of the largest giga factories for advanced cell chemistry technology. "Exide Industries MD & CEO, Subir Chakraborty, met with Chief Minister (Basavaraj Bommai) for INR 6,000 crore investment in a Lithium-Ion cell manufacturing giga factory," Department for Industries and Commerce recently said in a statement. Stating that this will be one of the country's largest giga factories for advanced cell chemistry technology, it said Exide has requested 80 acres of land in the Haralur Industrial Area near Bengaluru airport. The project is expected to generate 1,200-1,400 employment opportunities, it added. ♦



(Apr 22)

Suzuki to invest INR 10,445 crore for manufacturing EVs, batteries in Gujarat

JAPANESE automaker Suzuki Motor Corporation has said it will invest around 150 billion yen (about INR 10,445 crore) by 2026, for local manufacturing of Battery Electric Vehicles (BEV) and BEV batteries in Gujarat. The company has signed a Memorandum of Understanding (MoU) to this effect with the Gujarat government. It was signed "on March 19, 2022 at IndiaJapan Economic Forum held in New Delhi, India, in the presence of Japanese Prime Minister Fumio Kishida and Indian Prime Minister Narendra Modi," Suzuki Motor Corporation said in a statement. ♦

(May 22)



Continental inaugurates INR 200-crore greenfield surface solutions plant in Pune

Technology company Continental recently inaugurated its greenfield plant in Pune, India, manufacturing surface solutions materials mainly for the Indian automotive and two-wheeler market. With investments totaling about INR 2 billion covering facilities and machinery, Continental will produce premium surface materials for car interiors, including electric vehicles as well as two-wheeler seats, catering primarily to the domestic market and exports. "Growing our business in the Asia-Pacific region is one of our main strategic pillars. Amongst others, India will play a major role to strive for our goal. That's why we continue to invest in our Indian locations. Thus, we will remain close to our customers maximizing value creation," said Philip Nelles, Member of the Continental Executive Board and Head of Group Sector ContiTech at the inauguration ceremony in Pune. ♦



(June 22)

Toyota Group signs MoU with Government of Karnataka for big investments

IN its effort to contribute to the country's vision of 'Make in India' and to enable a faster reduction in carbon emissions, out of total investment of INR 4,800 crores, the Toyota Group of Companies that constitutes of Toyota Kirloskar Motor and Toyota Kirloskar Auto Parts recently announced their Memorandum of Understanding (MoU) with the Government of Karnataka to invest INR 4,100 crores. In addition to boosting the local manufacturing ecosystem, the new development will provide an impetus to employment generation and local community development. This investment will also spur the growth of the local supplier base and hence, result in higher investments and further job creation. ♦

(June 22)



Chip consortium ISMC to set up \$3 billion plant in India's Karnataka

INTERNATIONAL Semiconductor Consortium ISMC will invest \$3 billion in India's southern Karnataka state to set up a chip-making plant, the state government recently said. ISMC is a joint venture between Abu Dhabi-based Next Orbit Ventures and Israel's Tower Semiconductor. U.S. chip giant Intel Corp has announced plans to acquire Tower. ISMC and Indian conglomerate Vedanta Ltd. have applied for Prime Minister Narendra Modi's \$10-billion incentive plan to push companies to set up semiconductor and display operations in India, the government's next big bet on electronics manufacturing. ♦



(June 22)

M&M to invest INR 15,300 crore to fortify position in auto, farm equipment and EVs

MAHINDRA and Mahindra (M&M) will incur a capital expenditure of INR 15,300 crore in the auto, farm equipment, and electric vehicle (EV) businesses over 2022-24, the firm said. Of this, it has already pumped in INR 3,200 crore in FY22, while the remaining INR 12,100 crore will be done during FY23 and FY24. This is significantly higher than the capex done by the company in the recent past. Prior to FY21, it was pumping in INR 3,000-4,000 crore annually. The pandemic, coupled with chip shortage, made the company defer the expenditure. M&M's capex plans are in line with the trend at its peers Tata Motors and Maruti Suzuki India. Both companies are incurring higher capex in the current fiscal year compared to pre-pandemic years, to capitalise on the demand momentum. ♦

(July 22)



Okinawa Autotech to invest INR 500 crore for manufacturing plant in Rajasthan

ELECTRIC two-wheeler maker Okinawa Autotech recently said it will invest INR 500 crore to set up a new manufacturing plant at Karoli in Rajasthan. Spread across 30 acres of land, the factory will have an annual production capacity of 10 lakh units and will be fully operational from October 2023, Okinawa Autotech said in a statement. The plant will employ more than 5,000 people. This will be the third plant of the company apart from the two manufacturing facilities at Alwar in Rajasthan, it added. ♦



(Aug 22)

HAL and Safran to develop new helicopter engines in joint venture

HINDUSTAN Aeronautics Limited (HAL) and Safran Helicopter Engines have signed an agreement to create a new joint venture intended to develop helicopter engines. Through a Memorandum of Understanding (MoU), signed by Mr. R. Madhavan, CMD, HAL, and Mr. Franck Saudo, CEO, Safran Helicopter Engines, in the presence of Mr. Olivier Andriès, Safran CEO, both the partners will extend their long-lasting partnership by establishing a new aero-engine company in India. It will be dedicated to the development, production, sales and support of helicopter engines and one of its main objectives will be to meet the requirements of HAL and Ministry of Defence's future helicopters, including the 13-ton IMRH (Indian Multi-Role Helicopter). ♦

(Aug 22)

Polymatech to invest \$1 bn in chip manufacturing in India

DOMESTIC chip manufacturer Polymatech Electronics recently said it will invest \$1 billion in the country towards semiconductor manufacturing by 2025. Polymatech has signed a memorandum of understanding with the Tamil Nadu Government with an initial investment of \$130 million. Established in 2007, the company said it has imported all equipment for semiconductor manufacturing from Japan. ♦



(Sept 22)

Hero Electric to invest INR 1,200 crore in greenfield facility in Rajasthan

Hero Electric will set up a greenfield manufacturing unit in Rajasthan entailing an expenditure of INR 1,200 crore, its managing director, Naveen Munjal, told Economic Times. The facility, to be set up in the Salarpur industrial region, will be spread over 170 acres and have an annual capacity of 2 million units, he said, adding that it will also accommodate a vendor company that will invest an additional INR 400 crore in the facility. ♦

(Oct 22)

Triton EV issues INR 8,060 crore LoI to BEL for purchase of battery packs

Electric vehicle maker Triton Electric India has issued a letter of intent (LoI) to defence public sector unit Bharat Electronics Ltd. (BEL) for the procurement of battery packs for its semi-truck project in India at an estimated value of INR 8,060 crore, according to a regulatory filing. The 300-kilowatt lithium-ion battery packs are to be delivered by BEL to Triton Electric in 24 months commencing from January 2023, the filing stated. ♦



(Nov 22)

Ather invested INR 320 crore on the second manufacturing unit

EV maker Ather Energy has inaugurated its second manufacturing facility spread across 300,000 sq. ft. in Hosur (Tamil Nadu), to help increase the company's production capacity to 420,000 units per annum and bring down delivery timelines from months to a couple of days. At the time of commissioning its second plant in 2021, Ather had committed to invest INR 650 crore over five years. Of this, it has so far invested INR 320 crore. Ather also plans to build a third manufacturing plant by the end of the next financial year. However, it is yet to decide on the location of the plant. ♦

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The printing industry expanded its capabilities in the mid-1800s, thanks to the invention of die casting equipment. Starting its journey in the printing industry to serving arguably every industry today, die casting has come a long way with several upgrades and applications. Read on to know more about the history of die casting, technical updates, and the latest market overviews...

Die casting forms an integral part of several applications and it would be difficult to imagine manufacturing without it. Long ago, die casting was primarily used to cast print type. These individual letters were used in the early printing presses. The first die casting equipment was a small, hand-operated machine invented in 1838. A combination of tin and lead was melted and then poured into a steel mould, this mould was referred to as the die. As the metal alloy cooled, it would take the shape of the mould and solidify. This final element taken from the mould is

the casting.

Commercialisation started when Herman Doehler invented modern high-pressure die casting when he patented the first actual die-casting machine in 1907.

Technological Advancements and Innovation

Technological advancements in die casting revolve around the high-tech requirements of the automotive and machine industries. Significant innovations have been also witnessed in sectors like power, transmission, body, steering, architecture, and instrumentation over the last decade. There have been advancements concerning safety measures as well. The usage of non-ferrous metals in near-net shape cast parts is one such heavily adopted application, wherein the focus is given on fine details, involving surface conditions, complex shapes, and economy.

Today, die casting has become a



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preferred option for the machinery industries, as it can be utilised when there is a requirement in large quantities. Optimum casting techniques, along with the best feature of design, helps the industry save production costs. Through innovation in product and technology, the usability of die casting industry is increasing, which is further limiting the metal wastage and rejection rate. As a result, non-ferrous die casting applications continue to attract designers.

Market Overview

According to Mordor Intelligence, "The Die Casting Market was valued at USD 61.12 billion in 2021 and is expected to reach USD 86.3 billion in 2027, registering a CAGR of 5.92% during the forecast period (2022 - 2027). The COVID-19 pandemic had a profound impact on manufacturing operations, and the market witnessed a slowdown due to supply chain disruptions and trade restrictions worldwide. However, the resumption of economic activities across the world is likely to provide steady growth during the forecast period."

The die casting market has attracted the automotive industry, which is looking for highly durable die cast parts. In the last few years, industrial machinery and piping manufacturers are increasingly using die casting. The aerospace and defense industry are also using die cast parts, increasingly. Increased automation in the die casting industry has spiked productivity and is attracting the attention of automotive and other industrial manufacturers toward highly durable die casting parts. Demand for stronger aluminum components in agriculture and medical devices has also witnessed an increase.

"The Asia-Pacific region is anticipated to hold the largest market share in the die casting

market during the forecast period. The growing automobile industry, demand from the industrial sector, and increased scope of application in windmills and telecommunications are expected to drive the die casting market at a faster pace in the Asia-Pacific region," according to the report by Mordor Intelligence.

Asia Pacific is the largest market for die casting and accounted for over 58% share globally in 2017. Further growth is imminent in the region's magnesium alloy



die casting market as several new companies have cropped up looking at the increasing preference for lower production costs. Additionally, facing tough competition from established players these companies are opting for mergers and acquisitions.

Aluminium Die Casting for Automotive Industry

Automotive manufacturers have been forced to continually find new ways to increase fuel economy. It has been the primary strategy that producing lighter vehicles will improve gas mileage, and the use of aluminum parts that replace steel parts has been the most popular method to reduce vehicle weight. Over time, aluminum has been progressively incorporated into automotive doors, trunks, hoods, and engines. However, in today's time, aluminum has become the main component used to manufacture engines and wheels.

Heavy usage of aluminum in automobiles first began with Audi's 1994 A8 model. Since then, standard consumer automobile manufacturers have been amplifying the aluminum used in their vehicles and are beginning to transition to primarily aluminum-based vehicle bodies. Today, Ford has become one of the pioneers in aluminum usage for the automobile body. Changing the body from steel to aluminum is expected to cut the weight of the car by about 700 pounds, or 15 percent of current vehicle weight, which would increase fuel economy by as much as 25 percent.

Die casting is an efficient, economical process offering a broader range of shapes and components for the automotive

Die casting process can be divided into two parts: Hot-chamber Die Casting:

Here the injection mechanism is immersed in the molten metal bath of a metal holding furnace. It allows better control of the casting temperature and higher productivity, as the molten metal is taken directly from the tank. The pressure needed for hot-chamber die casting does not usually exceed 130/140 bars. Hot-chamber die casting is usually employed for zinc alloys (zamak) and allows high-quality surface finish.

Cold-chamber Die Casting:

Here the control of the casting temperature and productivity is lower than in the hot-chamber die casting system, as the injection of the molten metal in the mould takes longer. Cold-chamber die casting allows more flexibility in the choice of the casting alloy. The pressure needed for cold-chamber die casting can reach up to 1500 bars. Cold-chamber die casting is usually used for aluminium alloys. It is also used for zinc alloys, when high mechanical properties are required.

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industry as well as other applications than any other manufacturing technique. Parts have a long service life and may be designed to complement the visual appeal of the surrounding part. Automotive parts designers can gain several advantages and benefits by specifying aluminum die casting parts.

High-speed production – Die casting can produce automotive parts with complex shapes with closer tolerances than many other mass production processes. Little or no machining is required, and thousands of identical automotive die castings can be produced before repairing the molds.

Dimensional accuracy and stability – Die casting produces automotive parts that are durable and dimensionally stable while maintaining close tolerances. They are also heat resistant.

Strength and weight – Thin wall castings of die cast automotive parts are stronger and lighter than those possible with other casting methods. As die castings do not consist of separate parts welded or fastened together, the strength of automotive components after die casting is that of the alloy rather than the joining process.

Multiple finishing techniques – Die cast automotive parts can be produced with smooth or textured surfaces, and they are easily plated or finished with a minimum of surface preparation.

As per Mordor Intelligence Report, "The Indian automotive parts aluminum die casting market was valued at USD 1.09 Billion in 2020 and is expected to reach USD 1.81 Billion by the year 2026. The India Automotive Parts Aluminum Die Casting Market is anticipated to register a CAGR of over 8.8 % during the forecast period (2021 - 2026)."

The Way Ahead

Metal casting plays a critical role in the overall manufacturing

Die Casting and India

According to a report released by ALUCAST titled, 'Evolution of the Aluminium High Pressure Die Casting in India', the first pressure die casting machine was installed in India way back in 1954 in Jalandhar. Exactly 20 years later in 1974, the first indigenous PDC machine was built in Delhi. In India, HMT, a government of India undertaking started manufacturing PDC machines with a license from Buhler-Switzerland.

Since then the die casting industry has seen several developments, global giants have also entered the Indian market to tap the growing opportunities. As mentioned earlier, like other manufacturing technologies and processes, die casting industry is also directly linked with the automotive industry with about 70% of global demand coming from the sector.

India's automotive component manufacturing sector is on a growth trajectory. Driven by increased urbanisation, evolving automotive industry demand (as it is readying for the Electric Vehicles revolution), and changing fuel economy standards, the sector is growing at a fast pace. Foreign

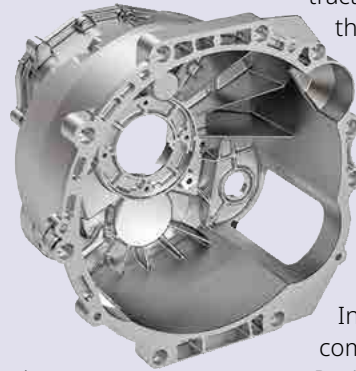
process around the world. As an important segment of the larger metal casting industry, the die casting industry produces over one-third of all metal castings. Today, there are over 250 die casting companies in India serving the growing automobile and manufacturing industry. Unlike other manufacturing techniques, the biggest strength

investments from countries like China and the US are also flowing in, and there is a fair amount of optimism in the country's economic environment that is created by initiatives taken by the government like Make in India, 100 Smart Cities, etc. As a result, automotive aluminum die-casting part manufacturing holds vast growth opportunities.

Vinnie Mehta, Director General, ACMA said, "Despite the supply-side issues, as vehicle sales and exports gradually gained traction, month-on-month,

the auto component industry demonstrated a remarkable performance in FY2021-22. Significant growth was witnessed across all segments including supply to OEMs, Exports as also the Aftermarket.

In this backdrop the component industry sized-up to Rs.4.20 lakh crore (USD 56.5 billion) registering 23% growth, thus outpacing its highest-ever turnover of Rs.3.95 lakh crore in FY18-19. Exports grew by 43% to Rs.1.41 lakh crore (USD 19.0 billion) while imports grew by 33% to Rs.1.36 lakh crore (USD 18.3 billion) leading to a trade surplus of USD 700 million. The Aftermarket, estimated at Rs. 74,203 crore also witnessed a steady growth of 15%. Component sales to OEMs in the domestic market grew by 22% to Rs.3.41 lakh crore."



of die casting is that it is not subject to limitations in materials. The process is ideal for any alloys and materials with different characteristics, which indicates that the technology will continue to enjoy further acceptance in the manufacturing processes. ♦

*With inputs from
Mordor Intelligence Report.*



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'India's electric vehicles industry revenue pool expected to hit \$100 billion by 2030'

EV penetration to reach 35%–40%, in 2030 up from 2% in 2022 with two- and three-wheel leading the pack, stated a recently released report by Bain & Company.



Image used for representation only. Courtesy Envato Elements.

India's electric vehicles (EV) value chain revenue pool is expected to reach between \$76 billion and \$100 billion by 2030, potentially translating to a \$8 billion–\$11 billion profit pool, according to a report released by Bain & Company.

The Indian automotive market is poised for rapid EV growth, due to the convergence of factors including government incentives, improving cost competitiveness and original equipment manufacturer (OEM) investment in the industry along with increased customer readiness and awareness.

"Contributors to the auto revenue and profit pools in 2030 will be significantly different from those in today's automotive industry," said Deepak Jain, a

partner at Bain & Company and co-author of the report.

"While 40%–50% of revenue pool will come from auto OEMs, it will be significantly altered in the nature and composition. New business opportunities such as battery (13%), charging (8%), mobility (6%) will emerge and scale. Unified platforms will become the next big play as many EV ecosystem players are looking for forwards or backwards integration to create a broader e-mobility ecosystem."

Indian EV sector has already seen \$3.7 billion private equity and venture capital (PE/VC) investments in this space over the past three years, and this number looks set to increase significantly as the industry transforms.

Findings from the report indicated that 35%–40% of all

vehicles sold in India by 2030 will be EVs, up from 2% in 2022. This equates to approximately 14 million to 16 million new EVs sold each year.

The two-wheel (2W) and three-wheel (3W) EV segments will be vanguards for EV adoption, achieving 40%–45% of penetration by 2030. This is driven by several factors, including highly competitive total cost of ownership (TCO), limited need for public charging infrastructure given the adequacy of home charging for daily use, investments in building compelling product offerings with comparable performance to internal combustion engine (ICE) vehicles, and early adoption by delivery and logistics fleets.

The 4W electric passenger vehicles (PV) segment, which

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includes passenger cars, utility vehicles, and multipurpose vans, is expected to fall behind the adoption curve. Higher requirements for product performance and buildout of public charging infrastructure, plus higher capital cost and TCO gaps, serve as barriers to adoption. This segment is still expected to account for 15%–20% of total 4W PV sales by the end of this decade.

Interestingly, 4W electric PVs will constitute the largest segment of the revenue pool of about 41% by value despite seeing relatively lower penetration and volumes, followed closely by 2W vehicles at 33%.

Electric buses will also see a penetration curve similar to that of PVs by 2030, driven in large part by State Transport Undertakings focused on fleet electrification for intracity transport.

“While we believe that deep EV penetration in India by 2030 is a realistic scenario, five key areas need to align to make it a reality,” said Mihir Sampat, partner at Bain & Company and co-author of the report.

“First, global battery prices need to fall 20%-30% over the long term to drive competitiveness; second, OEMs need to build a sustainable EV-specific business model for the Indian market; third, a sustained focus on safety particularly for batteries; fourth, continued regulatory and incentive support from government; and lastly, India's charging infrastructure will need to significantly expand to support the projected volume of EVs on the road.”

This electrification-led disruption of the automotive value chain in India will create several opportunities for investors and new participants. The report outlined six emerging business models:

Battery cell manufacturing, packaging, and BMS - India's EV industry today largely relies on imported battery packs for

their vehicles. However, there is a push to localise large parts of the battery value chain and increase domestic value add. This is partly driven by government localisation targets and incentives, opening opportunities for new players to participate.

EV components - Substantial demand for localised EV-specific components has created opportunities for component suppliers. Players choosing to make an EV component play will have opportunities to extend global markets and non-automotive consumer segments, making this an attractive long-term opportunity.

Software and telematics - Asia-Pacific already has the fastest-growing automotive telematics market in the world, with a CAGR of approximately 31%. As the third-largest provider after China and Japan, India's telematics market was approximately \$4.5 billion in 2021 and is poised to grow at a CAGR of 30% over the next five years. There is significant room to grow, with multiple emerging applications across predictive and preventive maintenance, driver monitoring, and other vehicle-tracking use cases.

New-age OEMs - The emergence of new, EV-first OEMs has been playing out within the 2W and 3W space in India where multiple new players, such as Ampere, Ather, Okinawa, and Ola have been early movers and are looking to challenge ICE incumbents, for share in this space. These

new players have attracted and developed talent and capabilities in EV-critical areas that traditional OEMs are relatively weaker in, such as software and telematics.

EV charging infrastructure - Still at its infancy, fragmentation and incentives for participation in India's EV charging infrastructure market have created attractive opportunities for both disruptors and conglomerates. While a viable economic model for charging point operation or battery swapping is yet to emerge, it is likely that a sustainable model will develop, allowing a portion of value accrued through the significant operating cost savings for consumers to go to charging infrastructure players over time to build a sustainable and scalable business.

Mobility-as-a-service (MaaS) - The TCO benefits of EVs combined with customers' emerging preference for green and sustainable solutions will lead to the rise of electric mobility offerings in the Indian market. This will encompass B2C electric ride-hailing offerings, rental mobility offerings, and business to B2B MaaS platforms seeking to provide an integrated solution for fleet operators to electrify their fleets. A sustainable and replicable city-level operating model could allow rapid growth and scale given the rise in underlying demand across these segments and the professed push for electrification.

India's automotive market is on the cusp of full-scale transformation. Stakeholders with the vision and agility to navigate and differentiate in a rapidly evolving landscape have multiple opportunities, but there is no single roadmap for stakeholders to follow. Each will have to calibrate which parts of this profit pool they want to participate in, control, or influence based on their starting points and end objectives. ♦

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India's charging infrastructure will need to significantly expand to support the projected volume of EVs on the road.

**Mihir Sampat, Partner,
Bain & Company**

Ashok Leyland and IIT-Madras researchers join forces to develop hybrid EVs



The collaboration aims to develop a series of hybrid electric vehicles using turbine technology, which will replace the large batteries in the main power train to generate onboard power.

Ashok Leyland, the flagship company of the Hinduja Group and India's leading commercial vehicle manufacturer, and the Indian Institute of Technology-Madras (IIT-Madras) Researchers at the National Centre for Combustion Research and Development (NCCRD) have collaborated for the development and commercialization of 'Swirl Mesh Lean Direct Injection (LDI) System' technology for developing a series of hybrid electrical vehicles (EVs) using turbine technology.

The IIT-Madras Researchers at NCCRD are developing an indigenously designed micro gas turbine. The core of the micro turbine is a patented combustion technology called 'Swirl Mesh Lean

Direct Injection (LDI) system'. The main power train will be the electric motors, but the onboard power would be generated by the micro gas turbine, developed jointly by NCCRD and Aerostrovilos Energy, an IITM-incubated start-up. This micro gas turbine will replace the large battery.

After the technology was demonstrated on a lab scale, Ashok Leyland signed a letter of support to develop this technology for the heavy vehicles segment with NCCRD, IIT-Madras. As part of the collaboration, Ashok Leyland, handed over to NCCRD a 9-metre passenger electric bus in October 2022. Prof. V. Kamakoti, Director, IIT-Madras, received the bus on behalf of NCCRD, IIT-Madras, from Dr. N. Saravanan, Chief Technology

Officer, Ashok Leyland, and Mr. Kanakasabapathi Subramanian, Senior Vice President – Product Development, Ashok Leyland. This bus would be converted as part of the series of vehicles having the hybrid power train with the micro gas turbine developed by NCCRD and Aerostrovilos.

Speaking about this collaboration, Dr. N. Saravanan, CTO, Ashok Leyland, said, "Micro gas turbines hold significant promise as a technology that will extend fuel combustion beyond traditional IC engines and provide for more efficient performance and multi-fuel capability. Ashok Leyland is proud to be associated with IIT-Madras and Aerostrovilos in this development effort."

Highlighting the key outcomes

The key advantages of this series hybrid configuration with this new micro turbine technology include:

- An overall lighter power train (high weight-to-power ratio)
- Ultra-low emissions
- Multiple fuel capabilities (eg. Biogas, CNG, LNG, diesel, hydrogen, etc.)
- An overall low cost of ownership.

from this collaboration, Prof. Sathya Chakravarthy, Coordinator

– NCCRD, IIT-Madras, said, "This marks our conviction of not only working with the industry on innovative technological solutions of societal impact but also pushing the in-house developments on innovation to see the light of day with the industry."

This collaboration will enable the development and demonstration of a series of vehicles with hybrid concept equipped with this micro gas turbine called the 'Turbine Electric Vehicle' (TEV). The aim of this project is to establish a power train that has ultra-low emissions, low cost of ownership, is fuel flexible and has a reliable system for long-range heavy vehicles. ♦

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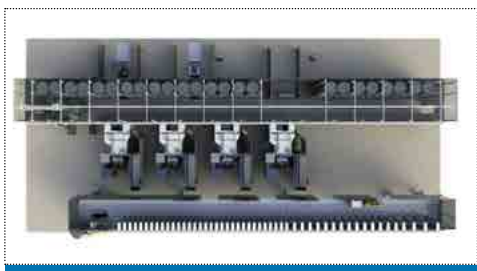
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Ingersoll Rand's new factory extension is all about intelligent and flexible automation



Fastems is deeply involved in planning and delivering CNC automation for Ingersoll Rand's factory extension in Tampere, Finland, with the aim to start manufacturing in early 2024. With the help of Fastems, Ingersoll Rand can manufacture its growing part families even more efficiently.

As a part of the automation investment, the companies have also agreed to co-develop Fastems' MMS control software to match the needs of a modern machine shop even better.

Ingersoll Rand is a leading provider of mission-critical flow control and compression equipment. Its broad and complete range of compressor, vacuum and blower products and services, along with its application expertise and over 160 years of engineering heritage, allows Ingersoll Rand to provide differentiated product and service offering for its customers' specific needs.

Ingersoll Rand's current production facilities in Tampere, including two flexible manufacturing systems by Fastems, are running out of capacity. The growing business simply needs more production capacity and also newer technology. The new investment will increase unmanned production capacity as well as flexibility for small batch manufacturing. Intelligent control software ensures that production equipment can proactively work together with operators and production management.

The internationally advanced factory is a step towards the future of manufacturing

For Ingersoll Rand, the extended factory is an intelligent and futuristic production facility that will substantially increase their efficiency. "Our goal is to raise OEE (overall equipment efficiency) to 85% when the industry average is about 60%," tells Jani Mannila, Production and Development Manager of Ingersoll Rand in Tampere.

In addition to the production volume needs, the factory also takes environmental matters

into account. The ultimate goal is a completely carbon free factory. In addition, safety and engagement of the employees is a high priority. "We want to reduce uncomfortable work such as night shifts or repeating, physically straining operations," Mannila explains.

Long history culminates on co-development of Fastems' MMS

Ingersoll Rand got their first automation system from Fastems in 1995. Fastems has developed into a unique production development partner to Ingersoll Rand, thanks to its control software features, very extensive and brand-independent integration skills, excellent services and good user support. Fastems automation can integrate with almost any machine tool or other device brand, including the brands Ingersoll Rand utilizes: DN Solutions (former Doosan), Niigata, Okuma and DMG Mori.

Thanks to the short distance, the companies have been able to spar and support each other in finding the best solutions to whatever challenges at hand. This cooperation culminates in Ingersoll Rand's participation to the development of new features to Fastems MMS control software: "We can provide Fastems with valuable first-hand experience. By combining the knowhow of both companies, we'll get even further on developing and using flexible automation systems," concludes Mannila. ♦

Article and images courtesy: Fastems

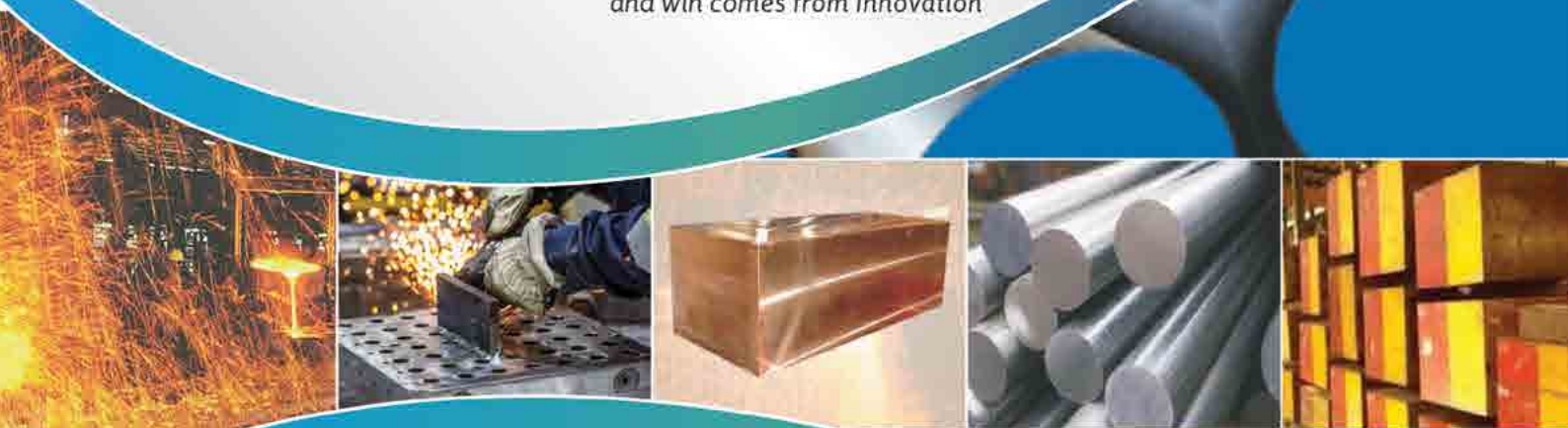


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TRUMPF enables additive manufacturing with new metals

TRUMPF has expanded its selection of powder alloys for its 3D-printing systems.

At a trade fair for additive manufacturing in Frankfurt, the high-tech company has demonstrated the potential of new titanium, aluminium, stainless steel and tool steel alloys for additive manufacturing. "Powder is an important component of additive manufacturing. Our goal is to offer our customers the broadest material portfolio on the market. To achieve this, we work closely with powder manufacturers. Users of our equipment can thus always implement new applications using additive manufacturing or improve existing applications with new powders. A broad selection of materials is important in order to be on a par with conventional manufacturing processes," says Jan Christian Schauer, materials expert for additive manufacturing at TRUMPF.

New titanium alloy is suitable for aerospace applications

TRUMPF equipment can now process titanium 6242. The aerospace, motorsports and energy industries, in particular, are asking for this material. "It should not displace the top dog, titanium 64. At room temperature, titanium 64 and titanium 6242 behave very similarly. But at higher operating temperatures of 300 degrees Celsius and above, titanium 6242 has higher strengths compared to titanium 64," Schauer says. However, this titanium alloy is harder to process. "This is where



our 500 degree Celsius preheating of the TruPrint 5000 comes into play. This allows users to easily print components with titanium 6242 as well," says the TRUMPF materials expert.

Automotive industry benefits from special aluminium alloy

For the automotive industry, the CustAlloy aluminium alloy from ECKA Granules is particularly beneficial. "With standard aluminium, automotive manufacturers have reached their limits, especially when it comes to the combination of strength and elongation. This is where CustAlloy helps," says Schauer. This aluminium alloy has very good mechanical properties; it does not break or crack as quickly. This makes crash-relevant applications possible. At the same time, CustAlloy is far less expensive to purchase than comparable high-end aluminium alloys, which use expensive alloying elements to achieve their properties.

Stainless steel alloy for medical technology

Just recently, TRUMPF qualified the Printdur HSA alloy for the TruPrint 2000, which is made from recycled scrap. This makes it particularly sustainable. The advantages of this alloy: It is particularly strong without thermal post-treatment. In addition, it does not rust as quickly. The Medidur alloy has the same properties as Printdur HSA. However, the powder manufacturer has developed this material especially for the medical industry. This sector has

higher requirements for the purity of materials. Medidur therefore consists only of pure elements. Users from the medical industry can design thin-walled and small components with this stainless steel alloy. "In addition, both Printdur HSA and Medidur do not contain nickel or cobalt. Since both substances are considered potentially carcinogenic, this has a positive effect on the hazard load for employees who process these powders," says Schauer.

New tool steel with good corrosion resistance

The M789 AMPO tool steel is used primarily in tool and mould making. Without preheating the powder, users can use it to print components. Because it is easy to process and at the same time very corrosion-resistant, users use the steel, for example, to manufacture tools that are used in combination with more aggressive materials, such as in plastic injection molding. ♦

Article and Image Courtesy:

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The Auto Expo, over the years has grown tremendously in size and transformed itself into a global event. Owing to the tremendous growth of Auto Expo - Asia's largest Automotive expo is now seen at two different venues with clear focus on Automobiles (Auto Expo - Vehicles) and Components (Auto Expo - Components)

Date: Jan, 12-15

Venue: Pragati Maidan, New Delhi

Organiser: ACMA, CII, SIAM

Contact: +91 0124 4060

neelam.bhagat@cii.in

IMTEX 2023

IMTEX is a flagship event for the Indian metal cutting industry. It is South Asia's apex exhibition showcasing the latest trends as well as technological refinements from India and other global players. The mega event attracts visitors from a wide spectrum of manufacturing and ancillary industries including key decision and policy makers as well as industry captains who are keen to source latest technologies and manufacturing solutions for their product lines.

Date: Jan, 19-25

Venue: BIEC, Bengaluru

Organiser: IMTMA

Contact: +91 80 6624 6600

info@imttx.in

PLASTINDIA 2023

10 exhibitions old, today, Plastindia has grown into a global experience, covering the entire gamut of plastics producers, processors and users of plastics, and it witnesses intense participation by both Indian and International Plastics Fraternity.

Date: Feb, 01-05

Venue: Pragati Maidan, New Delhi

Organiser: PLASTINDIA FOUNDATION

Contact: +91 22 26832911/14

contact@plastindia.org

International

Intermold Korea 2023

INTERMOLD KOREA is the only mold exhibition in Korea and is held every two years. It promote the development of dies, molds and related equipment and facilitate the exchange of cutting-edge technology and Know-how.

Date: Mar, 14-18

Venue: KINTEX Exhibition Center, Seoul

Organiser: Korea Die & Mold Industry Cooperative (KODMIC)

Contact: +82 (2) 783-1711

koreamold@koreamold.com

Intermold Japan

Largest exhibition for tooling industry in Japan with global participation. The exhibition showcases latest in the die mould industry and provide ideal opportunities for technology providers to showcase their capabilities.

Date: Apr, 12-15

Venue: Tokyo Big Sight, Tokyo

Organiser: Japan Die & Mold Industry Association

Contact: +81-6-6944-9911 / iminfo2023@tvcoe.co.jp

Hannover Messe 2023

HANNOVER MESSE is the most important international platform and hot spot for industrial transformation - with excellent innovations or unusual products.

Date: April 17 - 21

Organiser: Deutsche Messe AG

Contact: +91 022 41562727 / yash.panchal@hmf-india.com

Moulding expo 2023

Moulding Expo is one of the most important European events for tool, pattern and mould making.

Date: Jun, 13-16

Venue: Messe Stuttgart

Organiser: Landesmesse Stuttgart GmbH

Contact: +49 711 18560 0 / info(at)messe-stuttgart.de

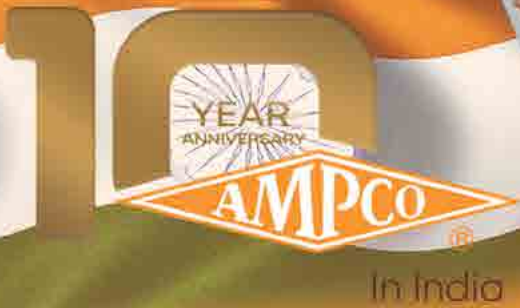
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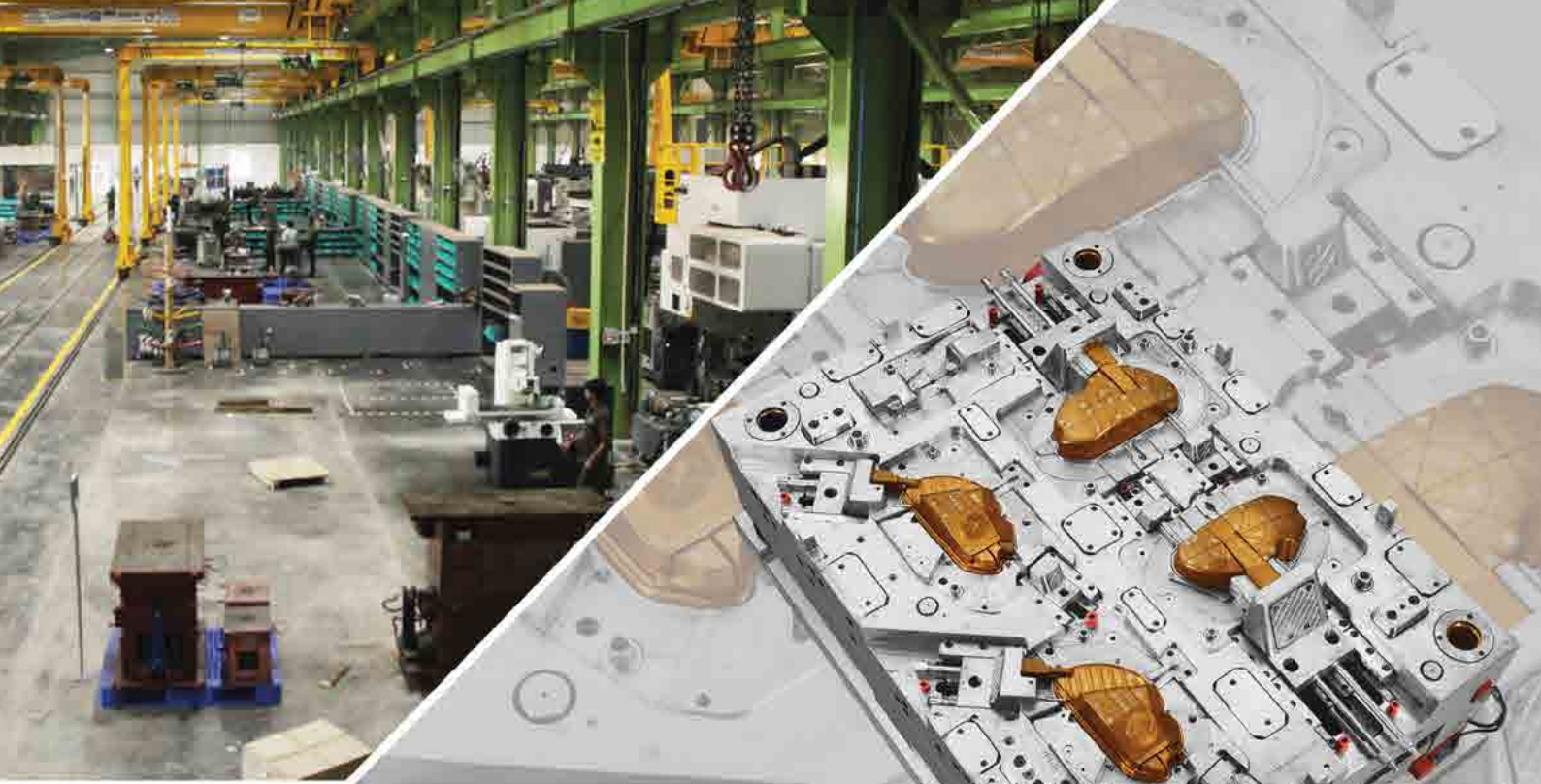
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