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MACHINING GROWTH

For the Indian manufacturing sector to reach \$1 trillion, the machine tools industry needs to fire on all cylinders as it enables the production of other machines, parts and equipment for a wide range of sectors.



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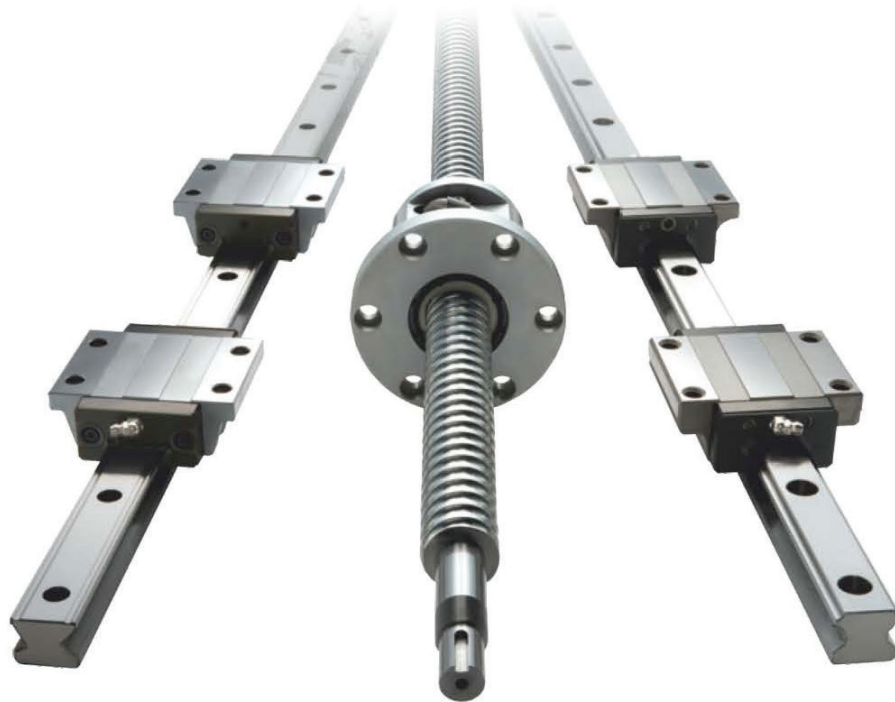
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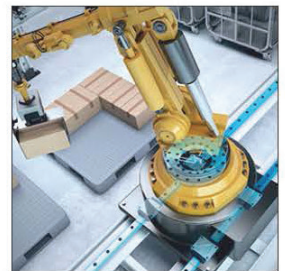
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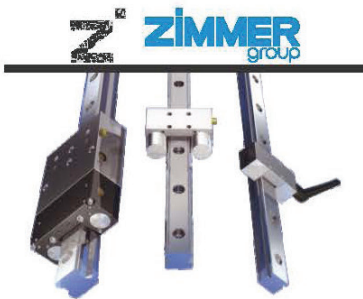
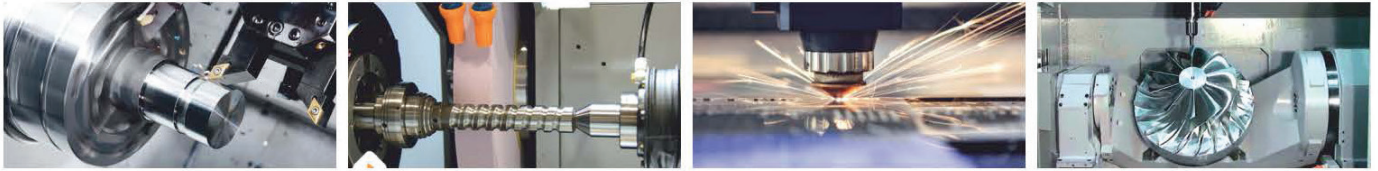
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The liberalisation policy of 1991, introduced during Dr Singh's tenure as FM, marked a transformative shift in India's economic landscape, fostering unprecedented industrial growth.

Architects of India's industrial revolution

Two remarkable leaders—one a bureaucrat-turned-politician and the other a global automotive industry legend—who left an indelible mark on India's industrialization journey, passed away in December 2024.

On December 26, 2024, former Prime Minister Dr Manmohan Singh, the architect of India's economic liberalisation, passed away at the age of 92. The liberalisation policy of 1991, introduced during his tenure as Finance Minister, marked a transformative shift in India's economic landscape, fostering unprecedented industrial growth. Facing a severe economic crisis, Dr Singh spearheaded wide-ranging reforms to open up the economy. The policy dismantled the License Raj, reducing

bureaucratic hurdles and facilitating business operations. These reforms propelled India into becoming one of the world's fastest-growing economies, establishing a robust industrial base and laying the groundwork for sustained economic growth.

Coincidentally, the car Dr Manmohan Singh admired most—the Maruti 800—was the brainchild of Osamu Suzuki, the former Chairman of Suzuki Motor Corporation, who breathe his last on December 25, 2024. Osamu Suzuki, regarded as the architect of India's ₹470 billion car revolution, democratised mobility in the country. Under his leadership, Suzuki Motor Corporation partnered with the Indian government in 1982 to establish Maruti Suzuki India, transforming the automotive landscape. The launch of the iconic Maruti 800 in 1983 made car ownership accessible to millions of Indians, sparking a mobility revolution. A visionary leader focused on efficiency and innovation, Suzuki turned Maruti Suzuki into India's largest carmaker and positioned the country as a global automotive hub. His emphasis on local manufacturing nurtured India's burgeoning auto components industry, creating a robust supply chain and generating employment for millions.

The automotive sector and the machine tool industry share a symbiotic relationship, where growth in one fuels demand in the other. Automobiles require high-quality, precision-engineered components, driving demand for advanced machine tools. This, in turn, fosters innovation and technological advancements in the machine tools sector, enabling it to meet the rigorous standards of global and domestic markets.

The localisation efforts in the auto components industry push machine tool manufacturers to innovate, offering cost-effective and high-performance solutions. Beyond automotive, machine tools are pivotal in the development of other key industries such as railways, defense, electronics, and shipping. A stronger machine tools sector can exponentially enhance India's manufacturing capabilities on the global stage.

In this special edition of *SME*, we explore how the machine tools industry can revolutionise India's manufacturing sector with cutting-edge innovations.

Mark your calendars for our upcoming events:

- 3rd Metro Rail Conference on January 22, 2025 in Mumbai
- AI-Powered Data Centre Conference on February 12, 2025 in Mumbai
- Cement Expo Forum on March 5-6, 2025 in Hyderabad

Additionally, *SME* will feature a special issue for Hannover Messe in April 2025, while our sister publications, *Construction World* and *Equipment India*, will publish a special issue for Bauma Munich, also in April 2025. To participate in these events or special editions, contact us at marketing@asappinfofglobal.com.



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COVER STORY



42 Machining growth with precision

As 2025 begins, India must harness its potential to redefine global industries by focusing on manufacturing high-quality products and components. For this transformation, machine tools industry needs to fire on all cylinders as it enables the production of other machines, parts and equipment for a wide range of sectors.

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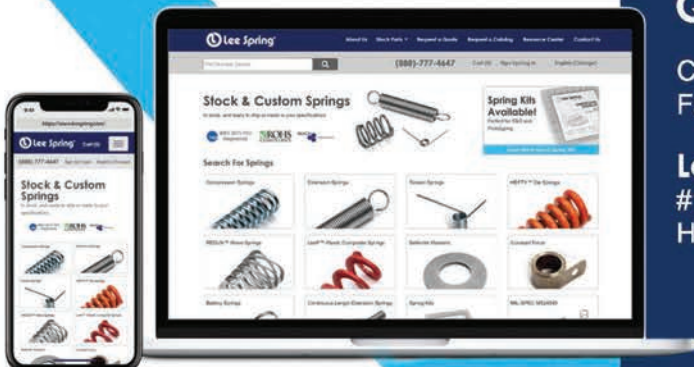
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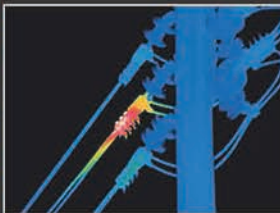
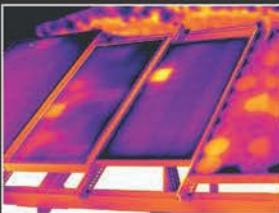
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Auto Components

Pricol to acquire Sundaram Auto Components' injection moulding

Pricol Limited has acquired Sundaram Auto Components Ltd's (SACL) injection moulding business through Pricol Precision Products Private Limited (a wholly owned subsidiary of Pricol Limited). With this acquisition, Pricol will see a consolidated topline addition of approximately ₹7.3 billion combined with SACL's healthy financial parameters that are value accretive to Pricol. The debt-free acquisition is being made through an all cash deal for an amount of ₹2.15 billion.

This acquisition underscores Pricol's commitment towards advancing its growth in allied business verticals thereby cementing its leadership in the automotive sector. SACL, part of the TVS Motor Company, established in 1992, is a well-recognised player in the auto component industry. Renowned for its expertise in innovative polymer solutions and cutting-edge injection moulding capabilities, SACL's six state-of-the-art manufacturing facilities across India embody operational excellence and sustainable practices.



This acquisition presents Pricol with an opportunity to scale the injection moulding business into an independent business vertical and leverage SACL's strength combined with Pricol's capabilities, thereby paving a way for growth in this vertical. It also further fortifies the opportunities to expand the customer base and product offerings through effectively integrating the synergies of Pricol and SACL. Vikram Mohan, Managing Director, Pricol Limited said, "I express immense pride in welcoming the talented team at SACL into the Pricol family. With this acquisition, our focus will remain on harnessing the combined potential of Pricol and SACL, to become an integrated solution player, driving innovation, and delivering sustainable growth. SACL's expertise and value systems perfectly align with our vision and core values which will enable us to meet the demands of our customers. This acquisition is a significant step towards realising our commitment to a sustainable and transformative growth."

Auto Components

Lava Cast exports flywheels and covers to US market

Setco Automotive Limited, one of India's largest manufacturers of MHCV clutches and a premium supplier of truck products successfully exported shipment of flywheels and covers to the US market manufactured by Lava Cast. This achievement underscores the company's commitment to expanding its global footprint and delivering high quality products to a diverse customer base.

The shipment includes flywheels tailored for leading auto and auto ancillary players in the USA and covers designed for aftermarket distributors and remanufacturers. This consignment represents a significant milestone in Setco's export journey, as the company looks to capitalise on the growing demand for



high-quality automotive components in international markets.

Harish Sheth, Chairman & MD, Setco Automotive Ltd, said, "This recent export shipment is a testament to our strategic initiatives and relentless efforts over the past few years. The competitive edge of our Lava Cast products, coupled with the higher margins offered by export markets, positions us strongly for sustained

growth. We firmly believe the worst is behind us, and now is the time to reap the rewards of our hard work. As we expand our presence in both domestic and international markets, we remain committed to delivering superior quality and innovative solutions to our customers worldwide."



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Industrial Automation

Elfonze Technologies expands new office in Bengaluru

Elfonze Technologies, headquartered in Bengaluru, inaugurated its expanded state-of-the-art office space in the bustling Central Business District (CBD) for its Engineering and Digital technology Services. The milestone celebrates the company's remarkable growth and highlights commitment to innovation, collaboration, and employee well-being. The newly unveiled 100-seater office adds to Elfonze's existing capacity. The Chief Guest Sanjeev Kumar Gupta, CEO, Karnataka Digital Economy Mission, KDEM, Government of Karnataka, inaugurated and graced the occasion.

Sanjeev Kumar Gupta remarked, "The new office radiates energy and ambition. It's not just a workspace; it's a hub for innovation and teamwork. Elfonze's growth is a demonstration to its commitment to encouraging talent and embracing innovative technology." He emphasised the role of intent and passion in both



individual and organisational success, inspiring the 300-strong workforce to embrace advanced technologies and act as ambassadors of Elfonze, reaffirming the importance of every individual's, to take an oath to contribute to the company's growth by introducing at least one new idea, client, or business opportunity.

Vinod Kumar, Cofounder and Director of Elfonze Technologies, emphasised the strategic importance of expanding office at Bengaluru's premier corporate hub, Lavelle Road. "This move reflects our commitment to enhancing client engagement and employee experience by situating ourselves at the epicentre of the city's business landscape," he said.

Vijai Velu, CEO at Elfonze, expressed gratitude to the distinguished guests for their motivational messages, saying, "Your words reinforce the value each of our employees brings to the organization. Together, we are building a legacy of innovation, collaboration, and growth."

Auto Components

Kinetic Green and JioThings to launch connected display platforms and analytics

Kinetic Green Energy and Power Solutions Ltd, India's leading electric two- and three-wheeler manufacturer, will collaborate with JioThings, a subsidiary of Jio Platforms Ltd and part of the Reliance Group. This partnership marks a significant milestone in advancing sustainable mobility solutions by enhancing connectivity and user experiences for Kinetic Green's current and upcoming electric vehicle models. As part of this collaboration, Kinetic Green is unveiling an innovative Smart TFT-based digital, connected display platform, aimed at revolutionising the riding experience for its consumers on its popular E2W platforms. This advanced display integrates essential features, including real-time navigation, notifications for incoming calls, and information on nearby charging stations. By incorporating these elements, the platform enables riders to enjoy a more connected and convenient journey, making every ride efficient and enjoyable. Whether navigating city streets or planning longer trips,

this cutting-edge technology empowers users with vital information at their fingertips.

Sulajja Firodia Motwani, Co-Founder and CEO, Kinetic Green, said, "Kinetic Green's collaboration with JioThings demonstrates our commitment to advanced EV technology, innovation, and environmental sustainability. By leveraging this partnership, we aim to deliver advanced software platforms and digital solutions that enhance electric vehicle user experiences. We will continue to build future solutions, including AI-based driver information and ride assistance features, ensuring cutting-edge technology in our robust EV products and platforms."

Ashish Lodha, President, Jio Platforms Ltd, added, "We are pleased to announce our partnership with Kinetic Green to deliver innovative and sustainable electric mobility solutions. This long-term collaboration represents a significant step forward in promoting electric mobility in India. Together, we are committed to fostering a more sustainable future."

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Electricals & Electronics

Hitachi Hi-Rel Power Electronics successfully participates in PLEXPO India 2024

Hitachi Hi-Rel Power Electronics Pvt Ltd, a pioneer in power electronics and a leading manufacturer of industrial UPS systems and low voltage variable frequency drives with other power electronics products, participated in the PLEXPO India 2024 Expo, held from December 6-9 2024 at Gandhinagar, Gujarat. The Hitachi Hi-Rel stall was inaugurated by Darshan N Shah, President - Sales & Marketing and Chief Sales & Marketing Officer. The event was graced by the presence of the company's senior management team and other officials, marking a significant moment in showcasing Hitachi Hi-Rel's latest innovations and commitment to the plastic and packaging sector.

At PLEXPO India 2024, Hitachi Hi-Rel showcased its latest innovations in industrial UPS systems and low voltage variable frequency drives technology, under the theme 'Powering the Future of Plastics and Packaging Industry'. The company's industrial UPS (known for its exceptional safeguard against power disruption) and low



voltage drives (LVDs) known for most energy efficient means of process control were a major attraction at the event.

In the plastic industry, maintaining continuous and precise operations is crucial. UPS systems play a vital role by providing reliable backup power, ensuring that production processes are not

disrupted by power outages. This helps in maintaining the quality and consistency of plastic products. LVDs are equally important as they offer precise control over motor speeds and torque. This precision enhances the efficiency of plastic manufacturing processes, reduces energy consumption, and minimises wear and tear on equipment. Together, UPS systems and LVDs contribute to a more efficient, reliable, and sustainable plastic production environment.

Over the four days of the event, Hitachi Hi-Rel engaged with numerous existing and potential customers, generating numerous leads for various power electronics products.

Electricals & Electronics

IEEMA expands presence: 41 West Bengal companies confirmed for ELECRAMA 2025

The Indian Electrical & Electronics Manufacturers' Association (IEEMA) hosted a power packed roadshow in Kolkata to build excitement for the upcoming ELECRAMA 2025, the world's largest platform for the electrical and allied electronics industry. The event highlighted the active participation of 41 members from West Bengal, reflecting the state's growing prominence in India's electrical sector. Looking forward, IEEMA is preparing to host ELECRAMA 2025, the world largest electrical show, taking place from February 22 to 26, 2025. This upcoming edition promises to break new records with participation from over 1,100 exhibitors, an expected footfall of 400,000 business visitors, and 10+ country pavilions on display. West Bengal, with its rich industrial heritage, is witnessing an increase in IEEMA



membership, which now stands at an impressive 108 members from the state.

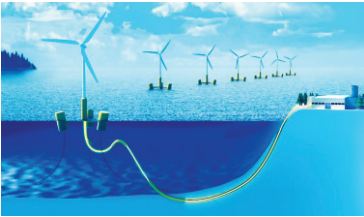
Vikram Gandotra, President-Elect, IEEMA and Chairman, ELECRAMA 2025 said, "The growing membership in West Bengal reflects the state's critical role in driving India's electrical and allied electronics sector. With 41 members already confirmed for ELECRAMA 2025, we anticipate significant contributions

from the state's manufacturers, suppliers, and innovators. This participation underscores the potential of our regional players on a global stage."

Charu Mathur, DG, IEEMA, said, "IEEMA is focused on building stronger regional networks, and West Bengal has been a key focus area. The participation of so many members from the state at ELECRAMA 2025 demonstrates the success of these initiatives."

Industrial Automation

Yokogawa unveils OpreX Subsea



Yokogawa Electric Corporation released OpreX Subsea Power Cable Monitoring, a system for monitoring cables used in the transmission of

electricity generated at offshore wind power facilities. By constantly monitoring temperature increases in the subsea power cables caused by damage, this product enables condition-based maintenance and the reduction of operational costs required for inspection and maintenance.

Subsea power cables at offshore wind power generation facilities are prone to faults and damage from natural disasters and accidents, and damage to these cables can lead to significant financial losses due to disruptions in the supply of power generated by these facilities. This makes regular inspection and maintenance essential. However, the cables are placed on the seabed over long distances, and maintenance requires the use of work vessels and divers, which results in substantial costs.

By utilising Yokogawa's fibre optic temperature sensor, OpreX Subsea Power Cable Monitoring is able to constantly monitor the temperature of subsea power cables and pinpoint abnormalities. This enables condition-based maintenance, in which maintenance is performed with optimum timing, thereby reducing the costs and workload required for regular inspections and maintenances, and maximising operational efficiency. It can be applied to both new and existing offshore wind farms. This product can also be integrated into Yokogawa's OpreX Collaborative Information Server with video monitoring and other solutions, thereby enabling smooth and highly efficient operations through the centralised management of information on the operations management screen.

With its capabilities and established track record in serving the wind power generation industry, Yokogawa is able to provide support for every aspect of this business, from the construction of systems to overall systems maintenance. With its focus on the system of systems concept, whereby a collection of independently operated and managed systems connect to form a larger system,

Yokogawa provides long-term integrated support and contributes to safe and secure operations.



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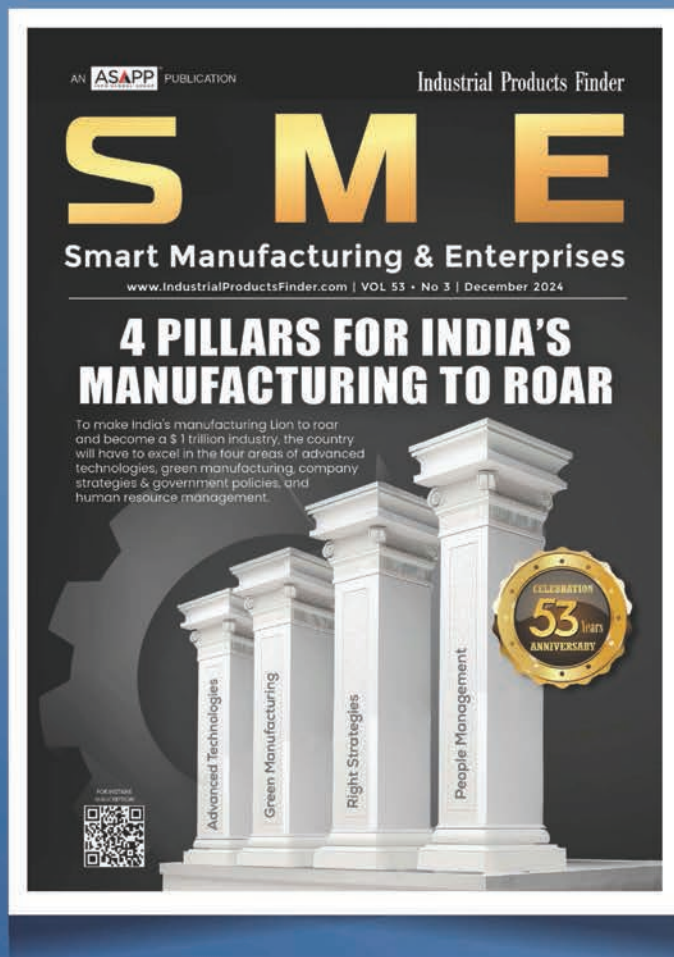
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Auto Components

Samvardhana buys Atsumitec for \$57 mn



Samvardhana Motherson International Limited (SAMIL) has acquired 95 per cent stake in the Japan-based

Atsumitec for \$57 million. Honda Motor will continue to own remaining 5 per cent stake in Atsumitec. The transaction will be executed through SAHN BV, a wholly-owned subsidiary of Samvardhana Motherson Automotive Systems Group BV (SMRP). Atsumitec Co Ltd - which has subsidiaries in Thailand, Hong-Kong, USA, Vietnam, China, Japan, Indonesia and Mexico - is engaged in the production of high precision machined components including gear shifters, chassis and transmission parts for 4-Wheeler (4W) and 2-Wheeler (2W) vehicles.

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Electricals & Electronics

Calcom to make HPL's LED lighting range

Calcom Vision Ltd, one of the leading electronics manufacturing services and original design manufacturers in India, has entered into business association with HPL Electric & Power Ltd to manufacture diverse range of LED lighting products. HPL is a leading multi-product electrical equipment manufacturer offering a diverse range of solutions, including metering systems, switchgears, LED lighting, wires & cables, solar solutions, and modular switches. Abhishek Malik, Executive Director, Calcom Vision, said, "HPL has been a key player in the power and cables industry for over 30 years, and we are proud to associate with them for our shared success. We are committed to building long-term, strategic partnerships and continually innovating our products to stay ahead of market demands. By bolstering our R&D team and expanding our engineering talent, we are strengthening our capabilities and reinforcing our position for future growth."

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Electricals & Electronics

Waaree wins 1 GW solar module order

Waaree Energies Ltd, India's largest solar module manufacturing company, has secured a significant order for the supply of 1 GW of solar modules from a renowned developer. The order, set for delivery in the calendar year 2025, includes the cutting-edge Topcon 580Wp Bifacial Glass modules. These high-efficiency solar modules are designed to maximise energy production, making them an ideal choice for large-scale solar projects. Waaree's Topcon 580Wp Bifacial Glass modules are engineered for durability and performance, allowing for enhanced energy generation and reduced environmental impact. Dr Amit Paithankar, CEO, Waaree Energies Limited, said "This is a very substantial business added to our order book. We will keep ensuring that we serve our customers relentlessly and meet their delivery expectations by supplying highest quality solar modules. This order is another step towards reducing of GHG emissions and promoting sustainable living."

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Chemical Production

Modi Naturals expands ethanol capacity with ₹1 billion investment

Modi Biotech Pvt Ltd (MBPL), a wholly-owned subsidiary of Modi Naturals Limited, is accelerating its growth trajectory with a significant expansion of its production capacity. As part of this expansion, Modi Biotech has already placed orders and commenced construction on a new project, which will add a significant 180 KLD to its existing capacity of 130 KLD. Upon completion, MBPL's total production capacity will increase to 310 KLD, enabling the company to meet the growing demand for biofuels and further solidify its position as a leading player in the industry." This ambitious endeavour comes with a capital expenditure of ₹1 billion and is slated for completion within 8-10 months.

This development is a testament to Modi Biotech's commitment to driving growth and innovation in the biofuel sector. The company's existing 130 KLD grain-based ethanol distillery, accompanied by a 5 MW captive power generation plant, has already established its presence in Raipur, Chhattisgarh. Modi Biotech has received an order of ₹3 billion for 41,600 KL of ethanol from various Oil Manufacturing Companies (OMCs).

Akshay Modi, Managing Director, Modi Naturals Ltd, said, "We are committed to driving growth and innovation in the biofuel sector, and this expansion is a significant step towards achieving our goals. This significant order is a resounding validation of our capabilities and unwavering commitment to delivering high-quality ethanol. We are proud to be contributing to India's ambitious vision of reducing dependence on fossil fuels and promoting sustainable energy solutions. We are confident that our expanded production capacity will enable us to meet the growing demand for biofuels, while also supporting the government's initiatives to reduce carbon emissions and promote energy security."

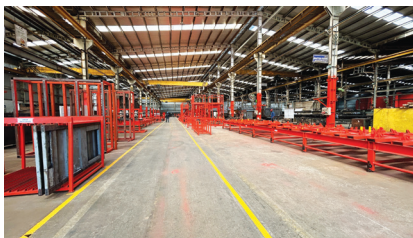
This significant milestone marks a new chapter in the company's growth journey, positively impacting its balance sheet. With the government's decision to extend the ethanol-blended petrol program nationwide, Modi Biotech is well-positioned to capitalise on the growing demand for biofuels. The company's dedication to innovation and sustainable growth aligns with the nation's vision of reducing dependence on fossil fuels and lowering carbon emissions.

Auto Components

JCBL Marrel Tippers expands Chennai plant

JCBL Marrel Tippers Ltd (JML), a leader in the manufacturing of specialised trailers, POL tankers and bowzers, special application export-oriented containers, and components for the US & European market is expanding its manufacturing facility in Oragadam, Chennai. This strategic move by JML, a JCBL Group company, underscores its commitment to meeting the growing demand for its diversified, technically complex, high-quality, and value-added products while reinforcing its dedication to sustainable manufacturing practices.

The facility expansion will boost JML's production capacity by 25 per cent, enabling the company to better serve its growing customer base. Additionally, this expansion marks a significant diversification in JML's portfolio, with a focus on delivering products across sectors including defense, automotive, navy, railways,



construction equipment, petroleum transportation, mining, power transmission, and earth moving heavy fabrication components. Since expansion, JML has been able to increase its customer base significantly. In addition to scaling production, the move will generate 200 new local jobs

and opportunities for around 40 new suppliers in the south zone, especially Tamil Nadu, further strengthening JML's contribution to the local economy.

More than 60,000 square feet of facility space has been built and made operational in the first phase in addition to its existing 100,000 square feet facility. Further another 50,000 square feet facility has been planned for its second phase expansion. Beyond this, JML's strategic vision includes an open land reserved approximately 6 acres for its upcoming projects scheduled in FY 2025-26.



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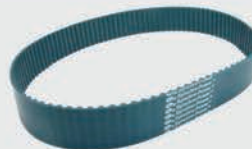
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Auto Components

Scania India and PPS Motors inaugurate training facility in Chandrapur

Scania India has unveiled an advanced training centre in collaboration with its dealer PPS Motors in Chandrapur. This milestone underscores Scania's unwavering commitment to enhancing technical expertise and improving operational efficiency in India through focused investments in skill development via advanced simulated and hands-on training modules.

The all-new facility, located in Chandrapur, is dedicated to providing specialised training for service engineers, technicians, and drivers. Equipped with high-tech driver training simulators, the facility offers a realistic and immersive learning environment, designed to manage advanced control systems, allowing trainees to learn enhanced vehicle operations, optimise fuel efficiency, and ensure safer driving practices.



Additionally, the centre employs innovative technology in Mining and is supported by two technical trainers and one driver trainer, aiming to strengthen Scania India's presence in India.

Munhoz Silvio, MD, Scania India, said, "With this new training centre, we are taking a significant step toward

empowering Indian industry by bridging the gap between advanced technology and operational expertise. By equipping engineers, technicians, and drivers with the skills they need, we aim to help our customers enhance safety, boost productivity, and achieve sustainable growth in their operations."

This new training facility will play a pivotal role in meeting the growing demand for skilled service engineers and trained drivers in mining segment.

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Industrial Supplies

Tata Steel starts all-women shift

Tata Steel has made history by launching India's first-ever all-women shift at its Noamundi Iron Mine. This groundbreaking initiative, part of the company's "Women@Mines" and "Tejaswini" programs, aims to empower women in mining, an industry traditionally dominated by men. The shift will include women in all roles, from operating Heavy Earth Moving Machinery (HEMM) to overseeing shift supervision.

The launch was marked by the presence of Shri Shyam Sundar Prasad, Dy. Director General of Mines Safety, who praised the government's support for an equitable workplace. He highlighted the significance of the 2019 DGMS decision to allow women in all mining shifts and commended Tata Steel for taking a leadership role in this initiative.

D B Sundara Ramam, Vice President of Raw Materials at Tata Steel, called the all-women shift a landmark achievement, not only for the company but also for India's mining industry. He emphasised that the initiative reflects Tata Steel's belief in the importance of diversity and inclusion for innovation and operational excellence.

Tata Steel's journey toward empowering women in mining began in 2019 with the "Women@Mines" program, making it the first Indian company to deploy women in all mining shifts. The launch of the "Tejaswini" initiative further supported this effort by training local women to operate HEMM and integrate them into the mining workforce.

The "Tejaswini 2.0" program, launched in 2021, trained women in technical skills, safety protocols, and physical fitness. This led to the recruitment of several women as HEMM operators. Building on the program's success, the "Tejaswini 2.1" initiative attracted over 2,100 applicants and selected 24 women operators.

Earlier this year, Tata Steel made further strides in diversity by inducting 9 transgender HEMM operators at Noamundi Mine. These efforts underscore Tata Steel's commitment to inclusivity and gender equality in the workplace.

Tata Steel's dedication to diversity and inclusion has earned the company global recognition, including the World Economic Forum's Global Diversity Equity & Inclusion Lighthouse 2023 and the India Workplace Equality Index (IWEI) 2024 Gold Employer recognition for LGBT+ inclusion. The company has also achieved 20 per cent diversity in its India workforce.

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Auto Components

Škoda Auto India begins Škoda Kylaq production

Škoda Auto Volkswagen India Pvt Ltd (SAVWIPL) starts production of Škoda Kylaq at its facility in Chakan, Pune. This milestone marks the Group's commitment to innovation, localisation, and customer-centric offerings.

Reflecting SAVWIPL's focus on the Make in India initiative, Škoda Kylaq is engineered and manufactured locally, adhering to the Group's highest standards. This is the Group's fifth model to be built on the robust MQB-Ao-IN platform with high levels of localisation. Škoda Kylaq is built on four broad pillars of safety, comfort, quality and global design. Additionally, SAVWIPL has expanded its already strong local supplier base by another 10 per cent to improve turnaround time and reduce cost of ownership. SAVWIPL has enhanced its Chakan Plant's production capacity by 30 per cent to 255,000 units annually, with Kylaq's production.



Operational efficiency has also improved significantly, with production lines now running at 40 jobs per hour (JPH). In line with SAVWIPL's commitment to sustainable manufacturing, Škoda Kylaq incorporates eco-friendly materials such as bamboo fiber in the cabin, reflecting

the Group's focus on green innovation. To support the customers, SAVWIPL is rapidly expanding its sales and service network across India. We are planning to expand our network to 350 covering Tier 2 and & Tier 3 cities in 2025. Škoda Kylaq has already received positive reviews during its Covered Drive and World Static Premier. Its compelling combination of design, robust engineering, high safety standards at an attractive price—starting at ₹789,000 (ex-showroom)—will be a game-changer. Deliveries of the Škoda Kylaq are scheduled to begin by January 2025.

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Auto Components

JK Tyre receives €30 million loan from DEG

DEG – Deutsche Investitions- und Entwicklungsgesellschaft will provide JK Tyre & Industries Ltd (JKTIL), a member of the JK Organisation, with a long-term loan of €30 million. The funds will be invested in the sustainable expansion of production capacities at the company's site in the Indian state of Madhya Pradesh. In the past years, the company has already initiated various transformative measures for adopting a resilient and more sustainable position. For example, JKTIL already meets 40 per cent of its energy needs through green electricity that it produces itself and is ranked among the top 3 companies in terms of lowest in energy consumption globally. The new loan will help to continue this transformation, for example by allowing the boiler for the expansion facility to be operated using biomass rather than coal. JKTIL is also currently developing tyres made of recycled material, which is expected to be market-ready in near future.



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Auto Components

Visteon unveils technical centre in Kolkata

Visteon Corporation, leader in automotive cockpit electronics and connected car solutions, inaugurated its new Global Capability Center (GCC) in Kolkata, India. The centre is set to become operational by January 2025 and underscores Visteon's commitment to leveraging India's growing importance in global automotive technology development.

Strategically located, Kolkata's strong talent ecosystem and proximity to top engineering colleges make it an ideal hub for advanced software and technology development. The centre will initially seat 300 engineers by the end of 2026, with plans to scale up to 500+ engineers in the next two to three years. It will specialise in Android-based infotainment, autonomous vehicle solutions, cybersecurity, multimedia & remote projection, and cloud technologies, establishing itself as a Center of Excellence (COE) exclusively focusing on Android-based infotainment and cockpit software development.

"India has been central to our strategy for over 20 years, with over 2,000 of our people driving automotive



innovation. The new Kolkata centre strengthens our focus on Android-based automotive solutions and expands our fastest-growing product portfolio. At Visteon we meet the talent where it's at, and we're glad to strengthen our team with Kolkata's engineering expertise and collaborate with the city's top universities to support the evolving needs of automakers worldwide," said Sachin Lawande, President and CEO, Visteon.

The Kolkata centre is designed as a USGBC LEED Platinum-certified facility, featuring solar panels and water recycling systems to promote energy efficiency and sustainability. India is a significant contributor to Visteon's global operations, with advanced technical centres in Chennai, Goa, Bangalore, Pune, Trivandrum, and Coimbatore, and a robust network of technical and manufacturing teams driving innovations for global automakers. Over the past year, India teams have delivered cutting-edge solutions in connected car technology, solidifying the country's position as a pivotal innovation hub.



Machining Growth with Precision

For the Indian manufacturing sector to reach \$ 1 trillion, the machine tools industry needs to fire on all cylinders as it enables the production of other machines, parts and equipment for a wide range of sectors, says Rakesh Rao.



India is in a transformative phase, with 2024 marking a milestone for its industrial ecosystem. Leading global corporations such as Airbus, Apple, Samsung, and Foxconn have reinforced India's position as a dependable manufacturing hub through substantial investments. Exports have also picked up in the last few months of the calendar year 2024 (CY24). India's total exports for April-November 2024, estimated at \$536.25 billion, recorded a 7.61 per cent growth compared to \$498.33 billion during the same period in 2023. Merchandise exports -- driven by electronic goods, engineering products, and textiles -- during this period reached \$284.31 billion, up 2.17 per cent from \$278.26 billion in April-November 2023. While engineering goods exports increased by 13.75 per cent \$ 8.90 billion in November 2024 (Nov 2023: \$7.82 billion), electronic goods exports were up by whooping by 54.72 per cent in November 2024



“The Indian manufacturing industry is blessed with a huge domestic customer base and a geopolitical

tailwind that supports a widespread global customer footprint.”

Dr Arup Basu, MD, Greaves Cotton Ltd

to \$ 3.47 billion (Nov 2023: \$ 2.24 billion).

Additionally, the government is actively contributing to the development of infrastructure, fostering collaboration and refining regulations—essential measures to enhance competitiveness and drive success in the manufacturing sector. “The manufacturing sector has a pivotal role in driving national

economic growth, and focusing on its development is essential for harnessing its full potential to boost India's overall economic performance. The heady dual themes of Atmanirbhar Bharat and Viksit Bharat constitute the apex purpose driving this sector to accelerate the journey to achieving its full potential,” states **Dr Arup Basu**, Managing Director, Greaves Cotton Ltd (GCL).

With numerous foreign companies setting up operations in India, the nation is poised to emerge as the next global manufacturing hub. “The Indian manufacturing industry is blessed with a huge domestic customer base and a geopolitical tailwind that supports a widespread global customer footprint. The share of global trade is modest, so headroom for growth is significant,” adds Dr Basu.

Manufacturing drives economic growth

India is actively working to expand its manufacturing sector by diversifying into new production areas, enhancing the industrial capabilities of traditional sectors like automobiles, and building a globally competitive domestic supply chain ecosystem. To achieve this, national flagship initiatives such as the Production-Linked Incentives (PLI) scheme, which covers 14 sectors, along with state-specific industrial policies, aim to increase the manufacturing sector's contribution to GDP to 25 per cent by 2025.

Sunil Joshi, President, Sandvik Coromant India, opines, "India has achieved significant milestones in many of the end-user industries during the past decade thanks to the Make in India initiative, which aimed to transform India into an international manufacturing hub. Within the wider engineering industry, the introduction of the PLI scheme in 2020 means that manufacturers are looking to expand on their existing facilities, increase production and boost sales. As a result, we are experiencing demand for products that help to minimise downtime and reduce waste."

India's aspiration to establish itself as a global manufacturing hub under the Make in India initiative depends heavily on the capabilities of its domestic machine tool sector, which is considered to be the "mother industry" as it plays a pivotal role in the production of machinery, components, and equipment for a wide range of industries.



With India predicted to be the world's largest aviation market by 2047, we are increasingly seeing manufacturers looking for tooling options for precision aerospace components.

Sunil Joshi, President, Sandvik Coromant India

Market prospects

The global machine tools market, which experienced moderate growth during the period from 2019 to 2023, is driven primarily by industrial expansion in emerging economies like China and India and increasing automation in manufacturing. According to Fairfield Market Research, global sales of machine

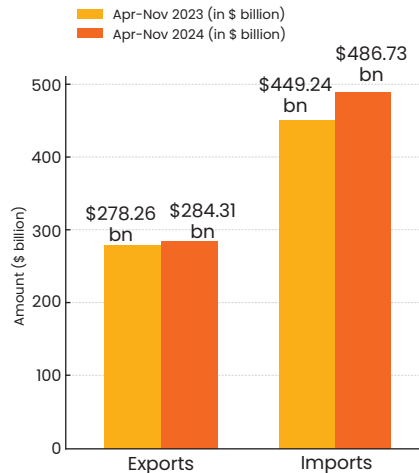


Figure 1: Merchandise trade during April-November 2024

Source: PIB.gov.in

tools are expected to reach \$111.8 billion by 2031 from \$ 86.7 billion in 2024 - registering CAGR of 3.7 per cent.

Sharing her views on the global market, **Melissa Albeck**, Member of the Executive Board of the CERATIZIT Group, says, "2024 has been a challenging year for the cutting tools industry, especially in Europe. The economic situation remains tough, with recent crises impacting market strength, particularly in the automotive sector. The transition to electric vehicles has slowed, leading to reduced machining volumes. However, there are bright spots. The aviation sector shows optimistic potential, and the electronics industry appears promising."

Countries in Asia Pacific, such as China and India, are showing strong demand for machine tools because of the government support for industrialisation and infrastructure development. According to Gardner's World Machine Tools Output Survey, India's machine tool industry holds the 9th position globally in production and ranks 6th in consumption. As an essential segment of the capital goods industry, which accounts for 12 per cent of the manufacturing sector, it encompasses a multidisciplinary

domain with a wide range of end-use applications.

Rajendra S Rajamane, President, Indian Machine Tool Manufacturers' Association (IMTMA), elaborates, "Financial year 2023-24 was good for the Indian machine tool industry, with an estimated increase of around 10 per cent year-on-year in production, reaching around \$1.6 billion. It was a good period for exports, with a reported 13 per cent growth, amounting to about \$200 million while consumption was estimated to have increased by around 11 per cent to reach \$3.3 billion."

Over the past five years, while consumption levels have remained stable, India's global production rank has risen from 11th to 9th, showcasing the market's increasing competitiveness and a consistent growth in export figures.

Thriving Indian market

The Government of India (GoI) has set a goal of a \$5 trillion Indian economy by FY2026. To achieve this milestone, the manufacturing sector is expected to contribute \$1 trillion, underscoring the critical role of the machine tool industry in this transformation. To support the manufacturing sector in increasing its GDP contribution, the Indian machine tool industry will have to focus on producing high-precision machines. As a result, India is experiencing a transformative evolution in manufacturing, progressing from solving local challenges to delivering globally competitive solutions.

Gururaj Patil, Managing Director, EMAG India Pvt Ltd, says, "The Indian machine tool industry is currently experiencing significant disruption. Gone are the days when machine tools were designed to address a single machining application. Today, the focus is on combining as many operations as possible in a single machine to

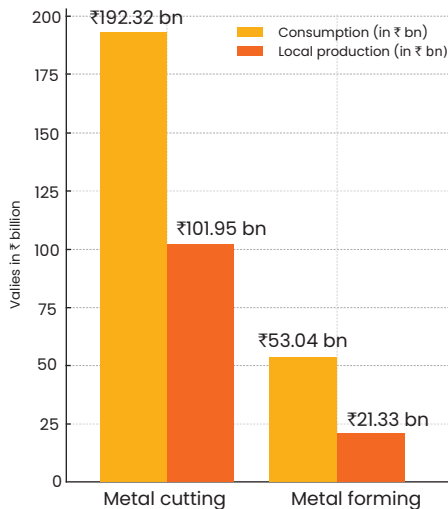


Figure 2: Indian machine tools market in FY23

reduce setup times and costs. While the demand for integrated operations is growing rapidly, there is also a strong desire to keep machines compact, preferably with inbuilt automation.”

In FY23, the Indian metal cutting machine tool segment reported a consumption of ₹192.32 billion, with local production reaching ₹101.95 billion. Lathes accounted for the largest share of metal-cutting machine tool consumption at ₹47.23 billion, representing 25 per cent of the total. Similarly, the metal forming machine tool segment recorded a consumption of ₹53.04 billion, with local production amounting to ₹21.33 billion. Presses dominated metal-forming machine tool consumption, contributing ₹24.94 billion, which is 47 per cent of the total in FY23.

Rajendra Rajamane states, “The machine tool industry needs to create demand initially in the domestic market by building cost-effective standard products, and besides this, it needs to create a good supply chain. Once it aligns itself with global standards compliance, such as CE marking, the industry will gain the necessary confidence to venture into untapped markets and explore new growth opportunities.

India presently exports around 10 per cent of what it produces to global markets, and we have a long way to meet the size of markets in Asia, Europe, and America.”

Global machine tool manufacturers are increasingly focusing on India, leveraging its rise as a key manufacturing hub in Asia. Tokyo-based Tsugami, known for producing automatic lathes for the automotive and electronics sectors, opened its first casting plant in India in April 2024. Furthermore, a processing and assembly plant is scheduled to begin operations by April 2025, with a total investment of Yen 3.6 billion (\$23 million) for both facilities. Similarly, Brother Industries Ltd completed construction of a new machine tool factory, its third machine tool manufacturing facility after those in Japan and China, near Bengaluru in September 2024.

Sanjay Sangam, Head - Sales and Marketing India, Renishaw Metrology Systems Ltd, says, “Like every global business, the machine tool industry is expanding, new investments are flowing in and both the domestic and export markets are seeing significant demand. The rapid industrialisation and modernisation of various sectors have created a need for advanced manufacturing technologies and precision engineering solutions. Additionally, the Indian government’s initiatives to boost local manufacturing and infrastructure development have further fueled this demand. India presents a highly promising market for us, driven by its swift industrial growth, an increasing emphasis on manufacturing quality, and the integration of advanced technologies in vital sectors.”

Automotive: The leading demand driver

India, now the most populous country in the world, is poised for continued population and economic

growth. This progression is expected to drive increased demand for machine tools, particularly in the automotive sector. “India now has the third-largest automotive market globally, with the Faster Adoption and Manufacturing of Electric Vehicles (FAME) schemes encouraging buyers to opt for electric and hybrid vehicles. FAME II’s offer of upfront incentives for customers purchasing electric vehicles (EVs) saw over 1.36 million vehicles sold by December 2023. Consequently, this drives demand in the automotive industry for modern cutting tools that work effectively with lightweight, durable materials such as composites and aluminium,” observes Sunil Joshi.

India presently exports around 10 per cent of what it produces to global markets, and we have a long way to meet the size of markets in Asia, Europe, and America.

Rajendra Rajamane, President, IMTMA

The automotive sector and the machine tool industry share a symbiotic relationship, where growth in one fuels demand in the other. For years, the expansion of the automotive sector has been a key driver for the machine tool industry. Sanjay Sangam opines, “India’s transition towards electric vehicles, the push for sustainability, and the demand for improved fuel efficiency are key growth drivers. The use of electronics, sensors and displays is rising in both EVs and internal combustion engine (ICE) markets. Renishaw products are used throughout EV manufacturing and offer our customers significant benefits in productivity and quality.”

EV transmissions require fine

finishing to achieve high-performance finishes. **Sameer Kelkar**, CEO and R&D Head, Grind Master Machines Pvt Ltd, says, "There is a paradigm shift in the automotive powertrain sector. Conventional internal combustion engines (ICEs) are being replaced with hybrids and battery electric vehicles (BEVs). Rotating shafts are common to all these technologies, and the demand for precision finishing is even greater for hybrids and EVs due to their faster rotational speeds."



2024 has been a challenging year for the cutting tools industry, especially in Europe. The economic situation remains tough, with recent crises impacting market strength, particularly in the automotive sector.

Melissa Albeck, Member of the Executive Board, CERATIZIT Group

The machine tool industry serves as a cornerstone of India's engineering and industrial sector. Its applications span a wide range of industries, including die molding, component manufacturing, aerospace, shipbuilding, electrical and electronics, healthcare, and consumer durables. Rajendra Rajamane states, "Auto industry has been the largest consumer of machine tools in India for several years. While the machine tool industry will continue to engage closely with the auto sector, it is also broadening its scope to do business with many of the rainbow sectors. In recent years, particularly, there has been an increase in demand from strategic sectors, which has resulted in the machine tool industry diversifying its portfolio."

Defence and electronics on the rise

Indian companies are leveraging advanced manufacturing technologies to develop state-of-the-art solutions, including armoured vehicles, aviation systems, and precision weaponry, elevating the country's global standing in defense manufacturing. A robust industrial base and strong government support are enabling private players to innovate in advanced components and systems designed for strategic needs. This thriving ecosystem is propelling India toward becoming a global leader in defense and aerospace manufacturing.

India's vast pool of engineering talent, combined with advancements in materials science, precision tools, and manufacturing processes, is playing a crucial role in tackling global capacity constraints. For instance, the global aerospace sector faces unprecedented order backlogs and production bottlenecks—a challenge where India's precision engineering expertise can make a meaningful difference. Airbus's establishment of a Maintenance, Repair, and Overhaul (MRO) center in India underscores the country's capability to meet rigorous quality standards and efficiently support global supply chains. Sunil Joshi opines, "With India predicted to be the world's largest aviation market by 2047, we are increasingly seeing manufacturers looking for tooling options for precision aerospace components."

Customers from end-user industries are looking for greater fuel efficiency, lighter components and ways to reduce costs. Sanjay Sangam adds, "With initiatives like Make in India and Aatmanirbhar Bharat, there is a growing emphasis on domestic manufacturing in defence and aerospace. The fall in demand during the COVID-19 pandemic has eased, and there are significant order backlogs and strong global demand

for fuel-efficient, narrow-body, single-aisle aircraft. The manufacture and assembly of engines, wings, control systems and landing gear rely on process control and post-process inspection using Renishaw products."



While the demand for integrated operations is growing rapidly, there is also a strong desire to keep machines compact, preferably with inbuilt automation.

Gururaj Patil, MD, EMAG India Pvt Ltd

India is transitioning from a global dependency to a focus on self-reliance, making significant strides in bolstering its defense manufacturing capabilities. With a defense budget of ₹5.94 trillion (approximately \$72 billion) for 2023-24, the nation is fostering indigenous innovation to reduce import dependency. Indigenisation levels have surpassed 65 per cent in critical areas, underscoring India's dedication to establishing a strong and self-sufficient defense ecosystem.

Rising demand from key sectors such as automotive, auto components, general engineering, and consumer durables elevated the domestic production market share to 44 per cent in FY23. Moreover, the growing needs of emerging industries like mobile manufacturing, specialised electronic components, medical devices, and drones significantly bolstered the domestic market for large-scale machine tools during FY23.

Sanjay Sangam says, "With consumers expecting increasingly lightweight and compact products with more features, greater reliability, and longer battery life,

regular updates and upgrades are required faster than ever before. Our consumer electronics customers therefore demand flexible manufacturing systems that can adapt to shorter product life cycles, yet still deliver high-quality, high-volume components. Consumer electronics is one of our largest sectors and includes products such as mobile phones and flat panel displays. The introduction of new generations of electronic devices will be key drivers for future growth.”

Road blocks on the path

While the domestic manufacturing sector has been booming, manufacturers in India are still relying on imports for nearly 50 per cent of their machine tool needs. General-purpose machines are often sourced from China, where product quality is steadily improving, while specialised machines are primarily imported from countries like Germany and Japan. “To compete successfully, the Indian machine tools industry must focus on innovation, quality improvement, and support from both the Indian manufacturing sector and the government. As the backbone of manufacturing, the Indian machine tools industry—built by passionate pioneers—needs nurturing to become a global leader,” opines Sameer Kelkar.

Rajendra Rajamane adds, “Indian machine tool industry is good when it comes to design and manufacturing competence for a wide range of products. However, the product range and home-grown technologies have a substantial gap with ones manufactured overseas. User industries need the highest quality products at competitive prices; thus, making it imperative to develop them indigenously.”

According to Sunil Joshi, despite the growth of the nation’s manufacturing sector in recent years, India is facing a shortfall of 150

million skilled staff in 2024. “The lack of skilled professionals is particularly apparent in technical roles like those found in the manufacturing sector, with a study revealing that only 44 per cent of Indian graduates are employable for technical roles. Addressing this skills shortage is crucial for the continued growth of India’s manufacturing industry,” he adds.

Emerging sectors like aerospace, electronics, and renewable energy present significant opportunities. However, specialised technologies for these industries demand substantial investment in R&D and a conducive environment from the user industry. In India, such supportive conditions are often insufficient, leading to a continued dependence on imported technologies in these sectors.

Rajendra Rajamane explains, “Strategic sectors, such as aerospace, defence, nuclear industries, etc, have complicated profile components that need simultaneous interpolation of 4, 5, or more axes. There are challenges in importing certain machines for key strategic sectors and to overcome that, Indian machine tool industry needs to invest substantially in R&D. This is a long-term plan, and we would reap the benefits of substituting imports over a period of time.”

Adding a “Smart” touch

Building on India’s progress in precision engineering, the next milestone is leveraging the transformative potential of automation to revolutionise productivity, decision-making, and innovation across various industries. “We are seeing a wider adoption of Industry 4.0, including the integration of artificial intelligence (AI), internet of things (IoT) for predictive maintenance and process optimisation, besides smart factories with interconnected devices and real-time monitoring. Automation is gaining wider traction with increased

use of automated solutions and robotics,” observes Rajamane.

The growing adoption of smart manufacturing practices is significantly influencing the machine tools industry. A report by Global Market Estimates predicts that India’s smart manufacturing sector will experience a compound annual growth rate (CAGR) of 8.1 per cent from 2024 to 2029. “As part of this shift, the machine tools sector must embrace technologies such as Internet of Things (IoT) and cloud-based systems, which will allow them to improve tool performance and reduce downtime. Manufacturers also need to ensure that their employees are prepared for smart manufacturing, with recent IBM research predicting that around two-fifths of the workforce will need to reskill due to the implementation of automation technologies,” observes Sunil Joshi.



As the backbone of manufacturing, the Indian machine tools industry—built by passionate pioneers—needs nurturing to become a global leader.

Sameer Kelkar, CEO and R&D Head, Grind Master Machines Pvt Ltd

The machine tools industry is experiencing transformative changes driven by several key technologies. Sanjay Sangam opines, “We are seeing a general trend towards more automation and ‘smart’ factories across all our sectors. Digital technologies are transforming the industrial sector, enabling manufacturers like us to embrace data-driven manufacturing. The shift toward automated manufacturing processes is revolutionising the industry. Technologies like machine

tool probing systems, in-process gauging, and tool monitoring are critical for achieving precision, efficiency, and real-time process control.”

Leveraging ML and AI has become crucial for every machine tool company today. Sunil Joshi opines, “In the metalworking sector specifically, AI can optimise tool paths, improve machining precision and enables predictive maintenance by analysing real-time data from equipment. Sandvik Coromant uses distributed AI to monitor cutting conditions, adapt to material variations and reduce tool wear, ensuring consistent performance, reduced downtime and efficient resource utilisation.”

New technologies like 3D printing (additive manufacturing) are also transforming manufacturing by driving automation, precision and innovation. “Adoption of 3D printing for prototyping, low-volume production, and hybrid machines combining additive and tractive processes is seen in manufacturing space in a big way. Digital twin technologies with virtual simulations to optimise machine performance before production as well as high-precision and speed machine tools are being used,” says Rajendra Rajamane.

Path to sustainability

Sustainable practices, green manufacturing, the use of energy-efficient machines, and waste-reduction techniques are gaining popularity across industrial segments. “Sustainability is a significant transformation along the entire value chain. The supply of raw materials must become more circular in the future. Not only because it is better for the environment, but above all because the tungsten and cobalt reserves are finite, and the supply of fresh ore is far too dependent on China and conflict regions. This dependency represents

a major risk,” says Melissa Albeck.

The machine tools industry is also taking steps to effectively promote circular economy. She adds, “Large, listed international customers are the ones who show the greatest interest in the product carbon footprint (PCF) of our products, as products with a lower PCF reduce their corporate carbon footprint in Scope 3. However, greater sustainability also means that we need to realign the focus in R&D, for example to raise the quality of recovered raw materials to a high level across the board and increase the recyclability of products.”

Sustainability influences processing methods, focusing on optimising energy consumption during product manufacturing and minimising the ecological footprint of finished products, whether machines or components. “From a sustainability perspective, an increased focus on lightweighting is essential for industries like automotive and aerospace. It not only reduces the use of finite resources, but also limits the amount of energy consumed by vehicles. Lightweighting drives significant changes in the cutting tools sector as manufacturers are increasingly tasked with machining lightweight materials such as aluminium and advanced composites, as well as producing weight-efficient components from traditional metals like steel and cast iron. This shift demands cutting tools that enable higher precision, reduce material waste and improve energy efficiency,” says Sunil Joshi.

Gaining cutting edge leadership

Geopolitical tensions and the adoption of the China+1 strategy are driving global companies to diversify supply chains, presenting a big opportunity for India to position itself as a reliable alternative to traditional manufacturing hubs. In

addition, the stability of governance, marked by the current government’s third consecutive term, ensures a predictable and supportive business environment that fosters long-term investment opportunities. India needs to take steps to capitalise on these favourable macroeconomic and geopolitical trends bolstering its position as a global leader in the manufacturing arena.



The rapid industrialisation and modernisation of various sectors have created a need for advanced manufacturing technologies and precision engineering solutions.

Sanjay Sangam, Head - Sales and Marketing India, Renishaw Metrology Systems Ltd

The India machine tools market, which generated a revenue of \$ 2,208.2 million in 2022, is expected to reach \$ 3,873.2 million by 2030, growing at a CAGR of 7.3% from 2023 to 2030. This growth in the coming years presents huge growth opportunities to companies. Gururaj Patil explains, “We see enormous growth potential in India, driven by the need for precise part production at large volumes, powered by automation. We expect a significant shift in manufacturing to India due to the competitive manufacturing environment.”

As 2025 begins, India must harness its potential to redefine global industries by focusing on manufacturing high-quality products and components. Machine tools industry can power this transformation by adopting modern technologies, nurturing engineering talent, and sharpening its expertise to produce innovative for globally markets.

SME



Showstopper for machine tool builders

With more than 1,000 exhibitors from over 20 countries, IMTEX 2025 will bring together global leaders and foster innovation in the machine tool industry.

Over the past decade, India has reached remarkable milestones across various end-user industries, driven by the 'Make in India' initiative, which sought to position the country as a global manufacturing powerhouse. This has had a big positive effect on the machine tool industry, which is considered to be a fundamental pillar of Indian engineering sector as these machines are used across industrial applications such as die moulding, component production, aircraft, shipbuilding, electrical and electronics, healthcare, and consumer durables.

"Globally, India ranks 9th in production and 6th in consumption, according to the World Machine Tool Survey 2023 by Gardner Intelligence. Production during FY 2023-24 is estimated to have increased by approximately 10%, reaching ₹135.71 billion (\$ 1.6 billion). Consumption during the same period is estimated to have risen by 11 per cent, reaching ₹272.65 billion (\$3.3 billion)," stated Rajendra S Rajamane, President of The Indian Machine Tool Manufacturers' Association (IMTMA).

Association (IMTMA).

Against this backdrop, IMTMA will be organising IMTEX 2025, one of the leading machine tool and manufacturing technology shows in the world, January 23-29, 2025, at Bangalore International Exhibition Centre, Bengaluru. With a legacy of more than 5 decades, IMTEX - a showstopper for machine tool builders - has played a stellar role in the growth of manufacturing industries. "IMTEX 2025 will showcase a confident and innovative India, demonstrating how its machine tool industry contributes to the nation's journey toward excellence," added Rajamane.

Over 1,000 exhibitors from over 20 countries will showcase state-of-the-art manufacturing technology solutions, occupying approximately 80,000 sq m of exhibition space. IMTEX 2025 promises to be a landmark occasion for the industry. IMTEX 2025, along with its concurrent shows—Tooltech 2025 and Digital Manufacturing 2025—will present a comprehensive range of advanced solutions in CNC machining, tooling, automation, robotics, additive manufacturing, CAD/CAM, metrology, and smart manufacturing technologies.

Commenting on the scale of the event, Jibak Dasgupta, Director General & CEO of IMTMA, said, "IMTEX 2025 will be the largest machine tool exhibition yet, surpassing all previous editions. Spanning approximately 80,000 square meters, the event will feature over 1,000 exhibitors presenting an exciting range of technologies and solutions, making it the perfect platform for machine tool user industries."

He noted, "The display of 'LIVE' machines at IMTEX 2025 will allow visitors to witness the technologies and solutions first-hand. The event offers exhibitors—both large and small—an excellent opportunity to enhance their brand presence."

In addition to Tooltech 2025 and Digital Manufacturing 2025, IMTEX 2025 will host several parallel events, including i2 Academia Square, the Manufacturing Quiz Contest, Jagruti, and Job Connect. The event will also welcome industry-specific trade delegations and students from engineering institutions.

IMTEX 2025 is set to redefine manufacturing excellence by bringing together global leaders and fostering innovation in the machine tool industry.

SME

Key highlights of IMTEX 2025

According to Neeti Sharma, CEO, TeamLease Digital, the sector in specific suffers from lack of highly skilled talent for multiple reasons such as:

- Exhibition Space: Around 80,000 sqm across five halls
- Exhibitors: Participation from over 1,000 exhibitors representing 25 countries
- Country Pavilions: Nine dedicated country pavilions
- Machines on Display: Over 1,000 "LIVE" machines
- Trade Delegations: Presence of industry-specific delegations
- International Seminar: A focus on manufacturing technologies
- i2 Academia Square: Showcasing R&D projects from leading Indian institutions
- International Buyer-Seller Meet: Facilitating global business connections



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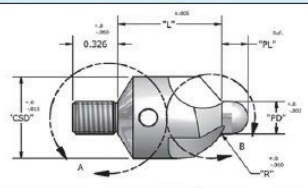
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“IMTEX 2025 is Set to Surpass all its Previous Editions.”

Over 1,100 exhibitors from 23 countries showcasing new products and technologies in the form of live machines are expected to participate. Countries like Germany, Italy, Japan, Korea, Spain, Taiwan, and the United States of America have separate pavilions. IMTMA anticipates participation from several trade delegations representing various user industries, says **Rajendra S Rajamane**, President, Indian Machine Tool Manufacturers' Association (IMTMA), in dialogue with Rakesh Rao.

How is IMTMA supporting the growth of machine tools industry?

The Indian Machine Tool Manufacturers' Association, founded in 1946 by 19 machine tool manufacturers, has been a key driver in the growth of India's machine tool industry. IMTMA has played a vital role in providing user industries with advanced machine tool technologies, fostering competitive manufacturing solutions. Representing nearly 500 members, IMTMA is recognised as the leading authority for the Indian machine tool sector, covering 90 per cent of the organised industry and allied equipment manufacturers.



machine tool industry works more closely with sectors like aerospace, defence, railways, electronics, medical equipment manufacturing, semiconductors, toy manufacturing units, and many others.

Which trends are having a profound impact on the Indian machine tools industry?

We are seeing a wider adoption of Industry 4.0, including the integration of artificial intelligence, internet of things for predictive maintenance and process optimisation, besides smart factories with interconnected devices and real-time monitoring.

Automation is gaining wider traction with increased use of automated solutions and robotics. Sustainable practices, green manufacturing, the use of energy-efficient machines, and waste-reduction techniques are gaining popularity.

Adoption of 3D printing for prototyping, low-volume production, and hybrid machines combining additive and subtractive processes is seen in manufacturing space in a big way. Digital twin technologies with virtual simulations to optimise machine performance before production as well as high-precision and speed machine tools are being used.

Companies are also shifting towards deploying machines that can perform multiple processes like milling, turning, and drilling simultaneously. Last but not least, companies are collaborating with institutions that can impart practical hands-on training to workforce so that they can be easily deployed on shopfloors.

How was FY24 for the Indian machine tools industry?

Financial year 2023-24 was good for the Indian machine tool industry, with an estimated increase of around 10 per cent year-on-year in production, reaching around \$1.6 billion. It was a good period for exports, with a reported 13 per cent growth, amounting to about \$200 million while consumption was estimated to have increased by around 11 per cent to reach \$3.3 billion. India ranked 9th in production and 6th in consumption, globally, as per estimates from Gardner Intelligence's World Machine Tool Survey 2023.

Besides automotive, what growth opportunities do emerging sectors offer to the industry?

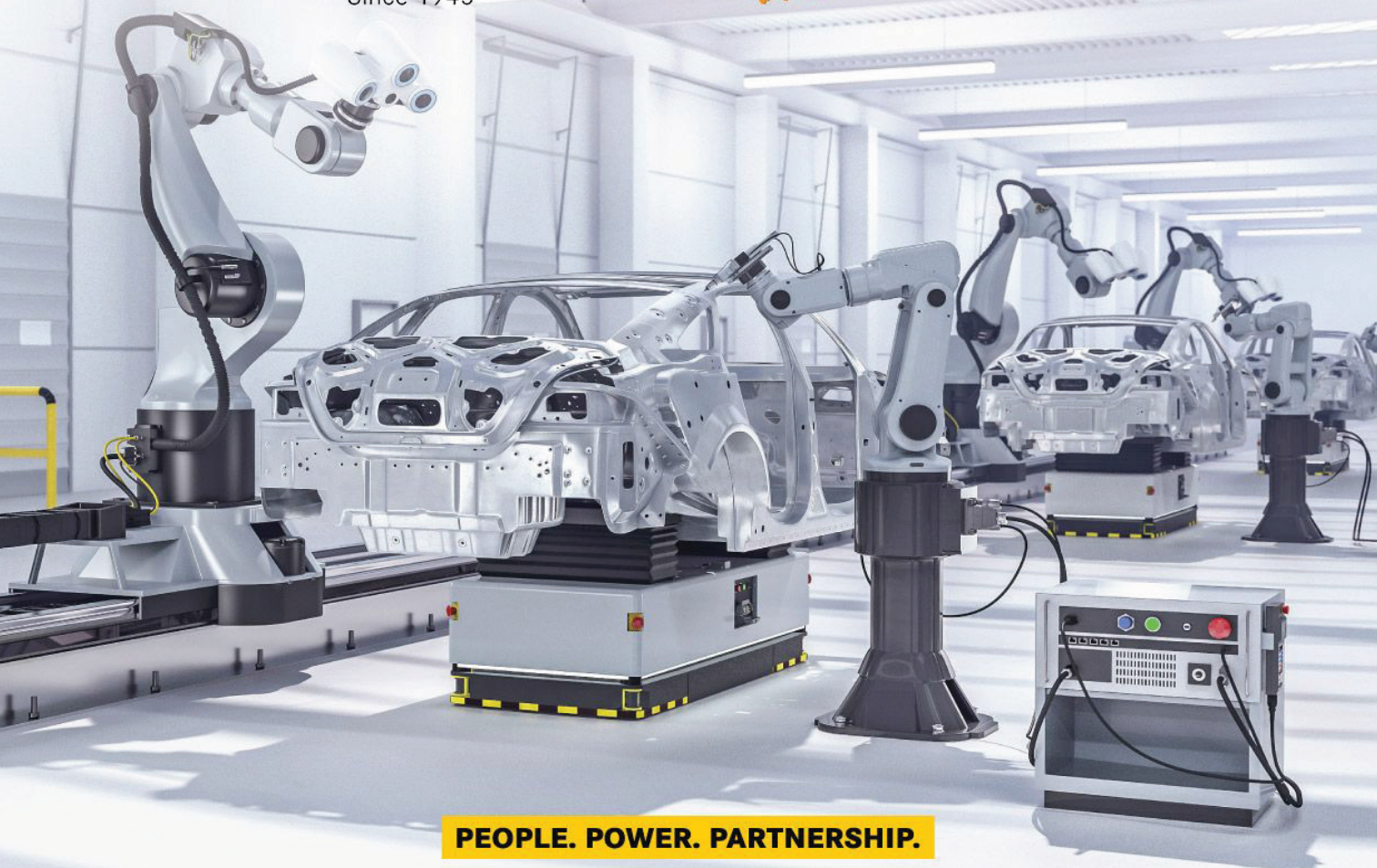
Auto industry has been the largest consumer of machine tools in India for several years. While the machine tool industry will continue to engage closely with the auto sector, it is also broadening its scope to do business with many of the rainbow sectors. In recent years, particularly, there has been an increase in demand from strategic sectors, which has resulted in the machine tool industry diversifying its portfolio. As a result, the

What are the hurdles on the growth path of the Indian machine tools industry?

Indian machine tool industry is good when it comes to design and manufacturing competence for a wide range of products. However, the product range and



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homegrown technologies have a substantial gap with ones manufactured overseas. User industries need the highest quality products at competitive prices thus making it imperative to develop them indigenously.

Strategic sectors, such as aerospace, defence, nuclear industries, etc., have complicated profile components that need simultaneous interpolation of 4, 5, or more axes. There are challenges in importing certain machines for key strategic sectors and to overcome that, Indian machine tool industry needs to invest substantially in R&D. This is a long-term plan, and we would reap the benefits of substituting imports over a period of time.

How has been the export performance of the Indian machine tools industry? What steps does the industry need to take to propel exports?

The machine tool industry needs to create demand initially in the domestic market by building cost-effective standard products, and besides this, it needs to create a good supply chain. Once it aligns itself with global standards compliance, such as CE marking, the industry will gain the necessary confidence to venture into untapped markets and explore new growth opportunities. India presently exports around 10 per cent of what it produces to global markets, and we have a long way to meet the size of markets in Asia, Europe, and America.

A universal approach to evaluating the export potential of homegrown machines is to first test them domestically. When such products have features that will be difficult to replicate overseas then one is highly likely to find success.



Financial year 2023-24 was good for the Indian machine tool industry, with an estimated increase of around 10% year-on-year in production, reaching around \$1.6 billion.

What are the highlights of IMTEX 2025? Would you like to give any message to the industry on the eve of IMTEX 2025?

IMTEX 2025 is very special as it is set to surpass all its previous editions, occupying 90,000 square meters of space in eight halls. Over 1,100 exhibitors from 23

countries showcasing new products and technologies in the form of live machines are expected to participate. Countries like Germany, Italy, Japan, Korea, Spain, Taiwan, and the United States of America have separate pavilions. IMTMA anticipates participation from several trade delegations representing various user industries.



A universal approach to evaluating the export potential of homegrown machines is to first test them domestically.

Tooltech, focusing on tools and dies, and digital manufacturing, showcasing Industry 4.0 and additive manufacturing advancements, will be held as concurrent shows. International Seminar on Machining Technologies held on 24 and 25 January will throw light on the emerging technologies in metal cutting technologies. International experts from various countries will deliberate upon the innovations and global best practices.

The exhibition will have interesting parallel events such as i2 Academia Square comprising Academia Pavilion with institutions presenting innovative projects undertaken by students, helping bridge the gap between academic and industrial circles. Manufacturing Technology Quiz Contest along with TechTalk will be added attractions.

IMTMA will be holding the 'Engagement with Overseas Buyers' on 25 and 26 January 2025 as part of the buyer-seller meet promoting exports of the Indian machine tool industry. Further, the Jagruti-IMTMA Youth Programme, an initiative to raise awareness about the latest advancements in the manufacturing industry would help students stay updated with technological developments.

Two new seminars will be organised in IMTEX 2025 for the first time.

IMTMA, along with ACMA (Automotive Component Manufacturers Association of India), will be holding an Auto Components Industry Transformation Summit on 26 January. The seminar is expected to further buttress machine tool and auto component industry relations.

JMTBA Seminar on Export Controls for Japanese Machine Tools will be held at IMTMA Technology Centre in Bengaluru on January 27, 2025. The seminar is expected to strengthen business relations between India and Japan.



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"India offers huge business opportunities for us."

In the metalworking sector specifically, AI can optimise tool paths improve machining precision and enables predictive maintenance by analysing real-time data from equipment. Sandvik Coromant uses distributed AI to monitor cutting conditions, adapt to material variations and reduce tool wear, ensuring consistent performance and efficient resource utilisation, says **Sunil Joshi**, President, Sandvik Coromant India, during this interview with Rakesh Rao.

How is Sandvik Coromant supporting the growth of the Indian manufacturing sector?

Sandvik Coromant's 'Manufacturing Wellness' outlook, a series of eight habits that help to foster a thriving and sustainable manufacturing industry, places importance on people development.

Despite the growth of the nation's manufacturing sector in recent years, India is facing a shortfall of 150 million skilled staff in 2024.

The lack of skilled professionals is particularly apparent in technical roles like those found in the manufacturing sector, with a study revealing that only 44 per cent of Indian graduates are employable for technical roles.

Addressing this skills shortage is crucial for the continued growth of India's manufacturing industry. To support this, Sandvik Coromant offers a huge selection of learning opportunities for students, as well as for professionals at all stages of their career.

For example, our Green Model Schools initiative in collaboration with Thinksharp Foundation has provided more than 900 disadvantaged students from rural and urban areas in Maharashtra with better access to books and computer equipment. Dropout rates have fallen by over a quarter and test scores have risen by 15 to 20 per cent across all subjects.

In addition, the Sandvik Coromant Academy offers upskilling opportunities both virtually and at our centre in Pune. These include in-person metal cutting technology training, as well as an e-learning platform with over 75 university-level short courses in skills such as threading, milling and turning.

What factors are driving the demand for your company in India? Which end-user



industries in India are offering huge growth opportunities to you?

India has achieved significant milestones in many of the end-user industries during the past decade thanks to the 'Make in India' initiative, which aimed to transform India into an international manufacturing hub.

India now has the third-largest automotive market globally, with the Faster Adoption and Manufacturing of Electric Vehicles (FAME) schemes encouraging buyers to opt for electric and hybrid

vehicles. FAME II's offer of upfront incentives for customers purchasing EVs saw over 1.36 million vehicles sold by December 2023. Consequently, this drives demand in the automotive industry for modern cutting tools that work effectively with lightweight, durable materials such as composites and aluminium.

With India predicted to be the world's largest aviation market by 2047, we're increasingly seeing manufacturers looking for tooling options for precision aerospace components.

Within the wider engineering industry, the introduction of the PLI scheme in 2020 means that manufacturers are looking to expand on their existing facilities, increase production and boost sales. As a result, we are experiencing demand for products that help to minimise downtime and reduce waste.

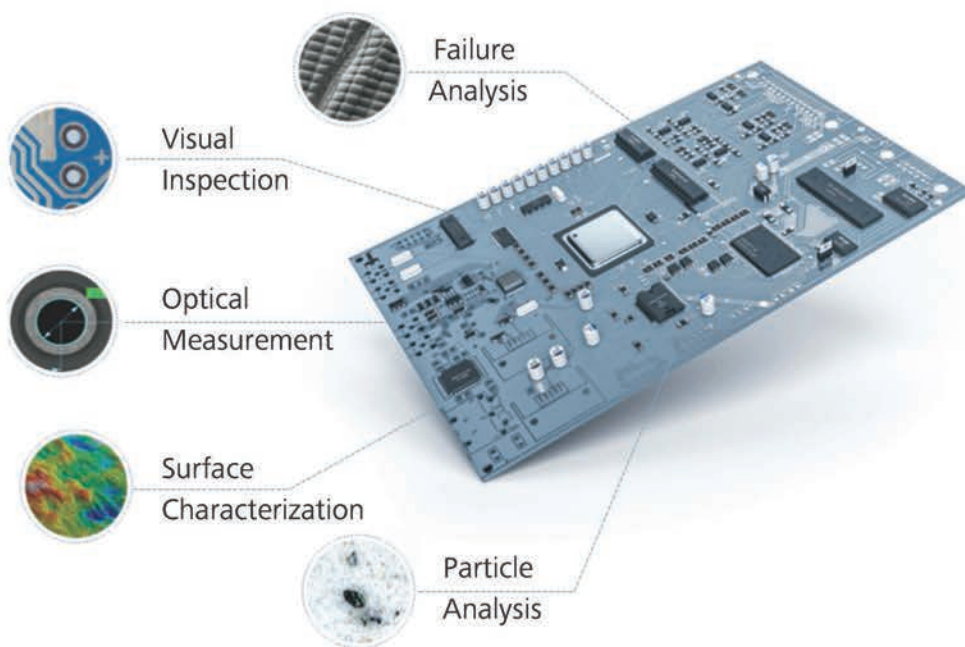
What is Sandvik Coromant's "Manufacturing Wellness" vision? Why is it relevant today?

Sandvik Coromant's "Manufacturing Wellness" vision promotes sustainable growth by encouraging manufacturers to implement eight positive habits that balance economic progress with environmental

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responsibility. This mindset focuses on efficiency, innovation and collaboration across the entire value chain. By making use of advanced technologies, data-driven insights and workforce development, manufacturers can optimise processes, reduce waste and minimise energy use.

This vision is particularly relevant today as India strives to reduce its 2021 carbon dioxide emissions by 22 per cent by 2030 while meeting half of its energy requirements from renewable sources by the same year. Sandvik Coromant has developed new technologies to support manufacturers in this process, such as its Sustainability Analyser which allows manufacturers to measure — and consequently reduce — energy consumption and carbon emissions.

Light-weighting and sustainability needs are growing across end-user industries. What effects this is having on the cutting tools industry?

From a sustainability perspective, an increased focus on lightweighting is essential for industries like automotive and aerospace. It not only reduces the use of finite resources, but also limits the amount of energy consumed by vehicles. Lightweighting drives significant changes in the cutting tools sector as manufacturers are increasingly tasked with machining lightweight materials such as aluminium and advanced composites, as well as producing weight-efficient components from traditional metals like steel and cast iron.

This shift demands cutting tools that enable higher precision, reduce material waste and improve energy efficiency. Sandvik Coromant's CoroMill® MF80 was designed for ISO-K and ISO-P materials and supports smoother cutting actions, reduced forces and longer tool life — crucial for machining thin-walled and near-net shaped components used in lighter, fuel-efficient vehicles.

Additionally, there is a growing need for schemes that effectively promote circularity within the cutting tools industry. For example, the planet only has 100 years of estimated reserves for raw tungsten — which makes up around three quarters of recyclable used carbide inserts.

Sandvik Coromant launched its first tool buyback scheme almost 30 years ago but has recently upgraded the programme to simplify the recycling process. Customers can now use an online portal to receive an instant price for the tools they wish to recycle, secure an order pickup time and receive recycling boxes. They can also view data on the carbon emission reductions as a result of the recycled tools, which helps manufacturers to understand the tangible impact of the scheme.

Which trends are having a profound

impact on the machine tools industry? How is your company gearing up for these trends?

The increasing implementation of smart manufacturing practises is strongly impacting the machine tools industry. According to a report by Global Market Estimates, India's smart manufacturing industry is set to grow by a compound annual growth rate (CAGR) of 8.1 per cent between 2024 and 2029.

As part of this shift, the machine tools sector must embrace technologies such as Internet of Things (IoT) and cloud-based systems, which will allow them to improve tool performance and reduce downtime. Manufacturers also need to ensure that their employees are prepared for smart manufacturing, with recent IBM research predicting that around two-fifths of the workforce will need to reskill due to the implementation of automation technologies.

Sandvik Coromant's 'Manufacturing Wellness' outlook encourages manufacturers to take a holistic perspective that considers all of the interconnected steps of the value chain. This means that when manufacturers implement new technologies, they must take into account the impact this has on other areas, such as staff development and sustainability.

What are your plans for IMTEX 2025?

Located in Hall 4 at booth B127, Sandvik Coromant's stand will move beyond traditional displays of tooling products to an advisory booth concept to encourage valuable conversations around machine investment, process optimisation and our 'Manufacturing Wellness' vision.

Both myself and Masahiro Yamamoto, Managing Director of Sandvik Japan, will be on hand to discuss how 'Manufacturing Wellness' can be implemented across a range of industries that use metal cutting tools, such as automotive, aerospace and rail.

In addition, we will be performing live tooling demonstrations, offering actionable advice on how to seamlessly integrate Sandvik Coromant solutions into existing workflows.

What are your growth plans in India?

At the midpoint of the decade, it is a good time to reflect on our growth so far and plan for the future. As the fastest-growing major economy in the world, India continues to offer excellent business opportunities for Sandvik Coromant. However, it is important to ensure that achieving healthy growth does not supersede the need for environmental sustainability. As we begin a new year, we will use the 'Manufacturing Wellness' outlook to guide our approach and prepare us for a thriving and sustainable future.

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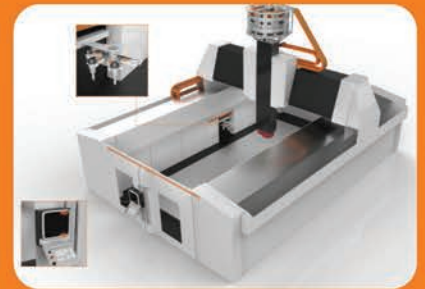
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"CERATIZIT is Planning Capacity Expansion in India."

Luxembourg headquartered CERATIZIT is a high-technology engineering group specialising in cutting tools and hard material solutions. In this interview with Rakesh Rao, **Melissa Albeck**, Member of the Executive Board of the CERATIZIT Group, and **Andreas Fritz**, President of CERATIZIT Asia Pacific, share their insights on the global and Indian markets, as well as the group's plans for IMTEX 2025, where it plans to showcase innovative products and technologies focusing on aerospace, automotive, heavy industry, and electronics.

How did the cutting tools industry perform in 2024? What are your expectations for 2025?

Melissa Albeck (MA): 2024 has been a challenging year for the cutting tools industry, especially in Europe. The economic situation remains tough, with recent crises impacting market strength, particularly in the automotive sector. The transition to electric vehicles has slowed, leading to reduced machining volumes. However, there are bright spots. The aviation sector shows optimistic potential, and the electronics industry appears promising.

Cost management is a significant issue, with rising expenses necessitating innovative solutions to control costs without compromising quality. This includes optimising supply chains, leveraging economies of scale, and adopting cost-effective manufacturing practices. Efficiency improvements are crucial, with the integration of advanced manufacturing technologies and automation enhancing operational efficiency, reducing waste, and improving productivity and output quality.

Sustainability is also becoming increasingly important and Ceratizit is leading the way in our industry. We are focusing on initiatives such as reducing the Product Carbon Footprint, recovering raw materials from hard metal scrap, and promoting energy-efficient machining processes and more sustainable products.

For 2025, we expect to see a slight growth in the market, but overall, it will remain at a rather low level and the geopolitical situation will remain a challenge.

Which end-user industries do you see as key areas for growth?

MA: At the end of the day, it always comes down to offering customers the best overall package. In the automotive sector, for example, this includes specific tools for aluminium machining on the product side. In



L-R: Melissa Albeck and Andreas Fritz

addition, we use a best-in-class approach for specific applications or components to offer our customers the best solutions available. This includes solutions for components in the automotive sector, such as engine components, axles, electric engines, braking systems and aluminium wheel rims.

In the future, the revenue share will also be increasingly generated by other industries due to the overall decline in machining volumes in the automotive sector. The aerospace, energy and medical technology industries, for example, should be emphasised here. We will focus even more on these industries in the coming years.

What trends are significantly shaping the cutting tools industry?

MA: For the reasons already mentioned, the transition to e-mobility will be one of the major topics. In addition, the processing of difficult-to-machine materials and composite materials will continue to gain in importance and drive R&D and product innovation, as

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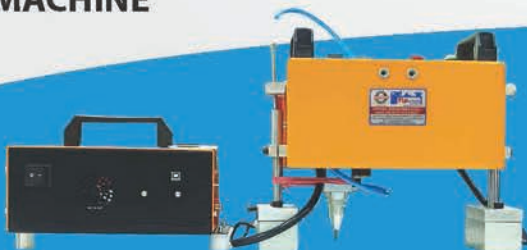
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it has in recent years.

Efficiency has always been important for cost reasons. However, in connection with the growing importance of sustainability considerations in the manufacturing industry, it takes on a new dimension. For example, a process that is faster also requires less electricity and causes lower CO₂ emissions. Users therefore benefit from more efficient processes in two ways.

How is sustainability influencing the future of the metalworking industry?

MA: It is a significant transformation along the entire value chain. The supply of raw materials must become more circular in the future. Not only because it is better for the environment, but above all because the tungsten and cobalt reserves are finite, and the supply of fresh ore is far too dependent on China and conflict regions. This dependency represents a major risk.

We, therefore, need to get to the point where it becomes the norm for worn-out carbide tools to be returned to the industry's raw materials cycle. CERATIZIT has a recycling rate of 95 per cent for tungsten and can cover the entirety of its cobalt needs through recycling. The industry, however, is far away from such values. And as a nice side effect, this will also make products more sustainable, as the footprint of recycled raw materials is significantly lower.

Large, listed international customers in particular are already receptive in this respect. They are the ones who show the greatest interest in the product carbon footprint (PCF) of our products, as products with a lower PCF reduce their corporate carbon footprint in Scope 3. However, greater sustainability also means that we need to realign the focus in R&D, for example to raise the quality of recovered raw materials to a high level across the board and increase the recyclability of products. Our upGRADE powders, made entirely from reclaimed raw materials, clearly demonstrate that with the necessary know-how and diligence, premium products can easily be made from reclaimed raw materials.

In addition, sustainability will naturally also have an impact on topics such as processing methods, the optimisation of energy use in product manufacturing and the service life of products - always with the idea of keeping the ecological footprint as small as possible.

What are the main challenges hindering the growth of the Indian machine tools industry?

Andreas Fritz (AF): The machine tools industry in India is experiencing robust growth, driven by an expanding market and the relocation of businesses seeking reliable and economical partners. This growth is

further supported by a strong GDP forecast and continuous investments in automation, robotics, and digitalisation. However, there are several key hurdles on the growth path. Despite the advancements, many people still prefer high-tech machines from Europe and Japan. Additionally, the development of production infrastructure towards precision is progressing slowly, and a significant portion of components in machine tools are still imported.

More specifically for the cutting tools sector, the industry faces challenges such as the lack of availability of tungsten and cobalt within India, the absence of recycling technology, and a shortage of the right kind of qualified workforce. With regard to CERATIZIT, however, I believe that we have found a good solution for the issues of raw materials and recycling through our international production network. And we can definitely be proud of our team in India. They do excellent work and are important for our growth strategy in the Asia-Pacific region.

How do you intend to maximise your presence at IMTEX 2025?

AF: At IMTEX 2025, we plan to showcase innovative products and technologies focused on aerospace, automotive, heavy industry and electronics. We will feature advanced solutions such as direct cooling technology, additively manufactured tools and information on our sustainability initiatives. This includes our cutting-edge solutions for specific components and applications in key-industries like the automotive, aerospace, and electronics sectors, to address the needs of our customers.

The aim is to engage with industry stakeholders and demonstrate how our cutting tools can improve productivity and sustainability. We invite visitors to explore our offerings and discuss how we can help them achieve their business goals.

What are growth plans for India?

AF: India is not just a potential market for us, we already have a very strong presence – both in terms of production footprint and market share. However, the country continues to present significant opportunities, particularly with its strong growth in the electronics, defense, and aerospace segments. While the automotive market remains substantial, it has recently faced pressure due to cost increases. Nevertheless, we offer robust solutions across all these sectors.

Our growth plans in India include major expansions to increase capacity at our plants here. Additionally, we maintain strong coordination with other countries in the Asia Pacific region to leverage synergies and enhance our market presence.



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"Today, Almost All EV OEMs Use EMAG Technologies."

We developed optimised solutions for the EV sector nearly two decades ago and now offer excellent solutions for chassis, transmission, and safety-related components within the EV ecosystem. In India, the growth of hybrid vehicles and EVs will continue in the near future, says **Gururaj Patil**, MD, EMAG India Pvt Ltd in conversation with Rakesh Rao.

How is your company serving the manufacturing and machine tools sectors?

EMAG is a technology-forward company that provides end-to-end manufacturing solutions to the automotive, non-automotive, engineering, aerospace, textile, and agricultural industries. As a premium machine tool builder, Emag offers exceptional value for the investment customers make in our technology. We make our customers globally competitive and highly agile in adapting to industry disruptions. From being a supplier to OEMs, we cater to Tier 1, Tier 2, and Tier 3 suppliers alike. Our exceptional service, both through remote diagnostics and on-site support, brings us closer to our customers in India—often just a phone call away.

We have two manufacturing facilities: one in Zerbst, Germany, and the other in Jintan, China. The Zerbst facility focuses on highly customised solutions, while the Jintan facility specialises in modular standard machines and technologies critical to the growth and success of customers in Southeast Asia, including India.

We cover almost the entire manufacturing process, from soft machining to gear teeth grinding. With the acquisition of Samputensili, EMAG is now a global leader in gear manufacturing.



How do you analyse the status of the Indian machine tools industry at present? What opportunities are you looking to tap in this industry?

The Indian machine tool industry is currently experiencing significant disruption. Gone are the days when machine tools were designed to address a single machining application. Today, the focus is on combining as many operations as possible in a single machine to reduce setup times and costs. While the demand for integrated operations is growing

rapidly, there is also a strong desire to keep machines compact, preferably with inbuilt automation. This is where many machine tool builders reach their limits, but EMAG excels.

What is driving the demand for your products, solutions, and services?

The demand for EMAG machine tools and technologies is driven by the need to produce precision components in high volumes with tight tolerances, while combining multiple operations in a single setup and eliminating operator intervention.

Some of the unique features of our machine tools, such as the Mineralit bed, glass scales, temperature compensation, plug-and-play components, and easy accessibility for maintenance and troubleshooting, distinguish us from other machine tool manufacturers.

How do you intend to tap into the automotive and auto component industries—the major users of machine tools? Also, what are the growth prospects in these industries with the increasing demand for electric vehicles (EVs)?

Emag was one of the first companies to provide manufacturing solutions for EVs worldwide. Today,



We produce our machine bases and columns from Mineralit, a material that eliminates the need for traditional cast iron. This is a significant step toward sustainability.

Repair, Rewinding & Servicing of All types of Spindle Motors, Servo Motors & Torque Motors

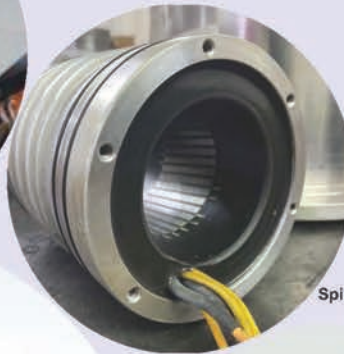
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almost all EV OEMs use Emag technologies to enhance their manufacturing competitiveness. We developed optimised solutions for the EV sector nearly two decades ago and now offer excellent solutions for chassis, transmission, and safety-related components within the EV ecosystem.

In India, the growth of hybrid vehicles and EVs will continue in the near future. While the pure EV segment may not grow as quickly as hybrids, the infrastructure boost for charging stations in non-metro cities will accelerate the adoption of both two-wheelers and four-wheelers.



We expect a significant shift in manufacturing to India due to the competitive manufacturing environment. The demand for high-end solutions like EMAG's will only increase exponentially.

AI, digitalisation/automation, and sustainability are the buzzwords today across industries. How are you planning to tap into these trends? What other trends are visible in the machine tool and accessories industry?

At EMAG, we leverage Industry 4.0 to optimise machine tool data, improving Overall Equipment Efficiency (OEE) and identifying potential breakdowns in advance. All our machines are equipped with remote diagnostics, enabling our service engineers to address issues remotely through high-speed internet, often without the need for on-site visits.

We produce our machine bases and columns from Mineralit, a material that eliminates the need for traditional cast iron. This is a significant step toward sustainability. Mineralit also offers excellent dampening properties, extending tool life and ensuring stability throughout the life cycle of the EMAG machine.

Additionally, all our manufacturing facilities prioritise the optimal use of natural resources, minimising air, water, and energy consumption.

What are your plans for IMTEX 2025?

At IMTEX 2025, we will showcase two machines from EMAG, alongside a range of components and cut sections of parts we have successfully delivered.

The modular concept of the VL 4 allows it to adapt perfectly to various applications, with an extremely compact design and powerful drives. It offers flexible implementation of multiple manufacturing technologies for both soft and hard machining. The machine base made from MINERALIT polymer concrete ensures low-vibration machining and long tool life, as well as high machining quality. The VL 4 features a 12-post tool turret with short indexing times and excellent stability, and an optional measuring station for efficient, time-saving measurements during loading and unloading.

Our new launch, the WPG7, is designed specifically for the Asia-Pacific region, offering the smallest footprint without compromising on accuracy or production volumes. Key features include:

- High-speed grinding wheel drive (up to 50 m/s)
- Grinding wheel diameter up to 500 x 80 mm
- CBN or corundum wheels
- Fanuc control
- Cooling system with water or oil
- Footprint of only 1,800 x 2,400 mm
- Optional in-process measurement control, passive longitudinal positioning, and automatic balancing system



At EMAG, we leverage Industry 4.0 to optimise machine tool data, improving Overall Equipment Efficiency (OEE) and identifying potential breakdowns in advance.

What are your growth plans for the company in the coming years?

We see enormous growth potential in India, driven by the need for precise part production at large volumes, powered by automation. We will continue to support customers in India with the right solutions for success in both domestic and export markets, regardless of the industry.

We expect a significant shift in manufacturing to India due to the competitive manufacturing environment. The demand for high-end solutions like EMAG's will only increase exponentially. At EMAG India, we are preparing for this growth by expanding both our workforce and the resources needed to support this expansion.

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"We will Launch Ball Generation Machine at Expo."

The Bengaluru-based Trishul Machine Tools Pvt Ltd – known for manufacturing polygon turning machines – has presence in many countries across the world. In this interview, **C S Shiva Shankaraiah**, Managing Director, Trishul Machine Tools, highlights the performance of the Indian machine tools industry and the company's future plans.

How is your company serving the machine tools sector?

Trishul Machine Tools is a world renowned manufacturer of polygon turning machines. The company has worldwide presence. Trishul machines are very well accepted and most of our current dispatches are going against repeat orders. The products carry a very high reputation for reliability and productivity. Trishul Machine Tools is popular for the technical support we provide to the customers. We have support team in every major manufacturing hub of the country. Trishul machines are used by various industries like the automotive, auto ancillaries, fastener, aerospace, valves, two wheelers and brass parts.



reasonably well established presence. This sector is anticipated to experience significant growth in the coming years, and we are well-prepared to meet the increasing demand. Yes, electric vehicles (EVs) will have an effect on the growth of our company; but, this will have a limited impact. Necessary course correction activities are underway. We are confident of absorbing this disruption.

How do you analyse the present status of the Indian machine tools industry?

Indian machine tools industry is placed very well to take on the expected growth in the Indian economy. We expect growth in every sector of the country in the years to come. The Indian machine tools industry is expected to grow at a rapid pace in the next few years. Trishul is geared up for the expanding demand.

What are the USPs of your products and services?

Demand for machine tools comes only when there is a flourishing economy. The product will be bought by its past performance. Performance of the machine is the most essential ingredient of the sales strategy. The essential requirement of any machine tool to sell is its performance reliability and the technical support.

How do you intend to tap the automotive industry - the major user of machine tools?

Trishul Machine Tools being the pioneer in our class of machines, the market penetration is well achieved. The automotive being the key target sector, we have a

What strategies do you have to explore opportunities in other end-user industries, such as railways, defense, and electronics, etc?

Presently, we have some presence in these sectors, which will be our focus for future growth. We have constituted a separate team to address the requirements of these sectors aggressively.

How are you planning to maximise your presence at IMTEX 2025?

We are showcasing our work horse Polygon Turning Machine Model TPT-2s. This is a model for machining polygons upto A/F 95 mm and is in great demand from industries such as auto ancillaries, fasteners, valves, brass parts, and aerospace components. At IMTEX 2025, we are launching our ball generation machine, which is aimed at manufacturers of ball valve components in the valves industry. This machine will be capable of generating valve balls from 20 mm to 60 mm to a very high accuracy in sphericity. We are located in Hall No 6 and Stall C106.

What are your growth plans for the company in the coming years?

Trishul Machine Tools expects the market for our machines to grow at 10-15 per cent every year for the next few years. We are taking necessary steps to meet the demand.

ROTOmax 4.2 Twin

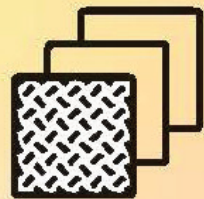
Shortened process times, minimised errors, regular grinding pattern and universal use - the ROTOmax 4.2 TWIN offers all this and much more.



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"Tooling Requirements are Expected to See a Big Rise."

Tool Aids Pvt Ltd, which markets its products under the brand name Minimac, caters to diverse industries such as aerospace, automotive and general machinery. From machining parts in automotives to crafting intricate designs in aerospace, cutting tools are the unsung heroes enabling precision and productivity, says **S Sampath**, Managing Director, Tool Aids Pvt Ltd.

How is your company serving the manufacturing sector?

In every industry, precision and efficiency are paramount, and behind the scenes of many operations lays a crucial component: cutting tools. From machining parts in automotive plants to crafting intricate designs in aerospace engineering, cutting tools are the unsung heroes enabling precision and productivity. Manufacturers are continually developing new materials, coatings, and geometries to enhance performance and durability. We at Tool Aids are Chennai based, possessing over 50 years of experience, specialise in the manufacture of all types of cutting tools. We are renowned for excellence in drilling, hole milling, reaming, milling forms, profiles, and threading applications. As a leader in the industry, we epitomise precision, reliability, and innovation, driving the standards of cutting tool excellence forward.



gearing up technology with machines/ inspection equipment for meeting these challenges.

What are the key demand drivers?

Tool Aids specialises in manufacturing a comprehensive range of cutting tools, including reamers, hole mills, taps, drills, and profile cutters, available in HSS, carbide tipped, and solid carbide variants. The company caters to diverse industries such as aerospace, automotive engine manufacturing, and general machinery.

With high-quality materials like high-speed steel and carbide, it ensures optimal performance for demanding applications. Serving esteemed clients in defence, aerospace, and private sectors, its facility is equipped with advanced CNC and grinding machines, supported by precision inspection equipment. Minimac, a brand of Tool Aids is highly regarded and widely accepted across all defence units.

Tool Aids serves a select group of customers who prioritise quality assurance and import substitution. With top-tier quality control systems and machines comparable to those in Germany, we have earned the trust of our clients to the extent that some do not feel the need to inspect our tools upon receipt. Continuously upgrading our machinery to meet evolving demands, we are poised to invest further in advanced equipment to enhance our indigenous manufacturing capabilities. With an outstanding 50-year history, Tool Aids has kept every client by providing dependable services at no extra cost, such as drawing redesigns, process adjustments, and consistent quality assurance.

How do you analyse the status of the Indian machine tools industry at present?

The country's defence sector is going through a major investment in developing arms/equipment with 'Atmanirbhar' in focus. Collaborations with countries for sophisticated, advanced machines also call for upgrading in cutting tools. An important area, aerospace has tremendous future in the next 25 years. Tool Aids is



Defence will give a major thrust to the machine tool & cutting tool industries for precision and import substitutions.

How do you intend to tap automotive and other end-user industries?

We predominantly cater to internal combustion

engine production, i.e. auto engine manufacturing. But as the electric vehicle segment grows, our role gets reduced due to less of machining. But the segment is more than compensated by our role and challenges in government 'Atmanirbhar' – indigenously developing for aerospace/ aeroengine industries where the growth will double in the next 10 years.

Defence will give a major thrust to the machine tool & cutting tool industries for precision and import substitutions. Railways and electronics will depend more on sophistication and upgrading our automation & robot technology.

How are you gearing up for digitalisation/ automation and sustainability?

Global inspection standards depend on sophisticated equipment, often from Switzerland or Germany. By importing machines with micron-level precision, we maintain high-quality standards. While our inspection capabilities excel, there's room for improvement in manufacturing processes to fully align with these standards. With over 60 years of experience in cutting tools across India, Sweden, and the UK, including studying machining applications in the UK, the firm excels in conducting precise trials, redesigning tools, and providing import substitutions to ensure customer satisfaction. For government customers bound by strict regulations, the company offers alternative materials and conducts exhaustive trials to meet precision requirements.

What are your plans for IMTEX 2025?

IMTEX 2025 will be a great venue for a grand display of the latest machine tool/ cutting tool manufacturers. This is considered as a 'learning curve' to see and gain on technology mutually, eagerly looking forward to once in 2 years.

What are your growth plans for the company in the coming years?

The company anticipates a significant rise in tooling requirements over the next five years, mostly due to possible partnerships in defence production with top industry participants like Tesla, GE, Boeing, Airbus, and others like JLR. This spike calls for a deliberate move to precision-focused tooling, requiring large capital expenditures in equipment to satisfy precise tolerances. Concurrently, Tool Aids also plans its inspection tools to match these higher requirements, even if the company recognises the financial implications. By taking the initiative to address these needs, the firm sets itself up to meet and exceed its affluent clients' high standards, solidifying its position as a leader in the field ready for long-term success. SME

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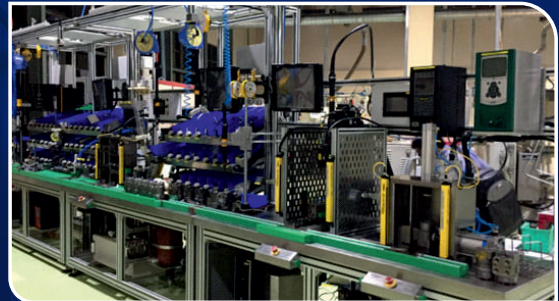
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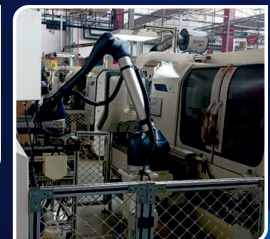


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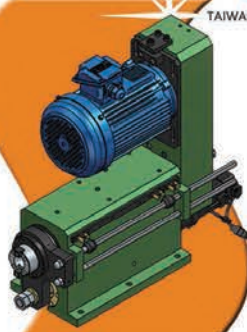
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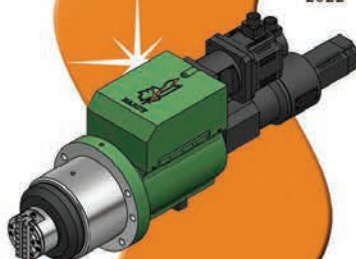
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Built-in Motor Facing Head Unit - Flange Type



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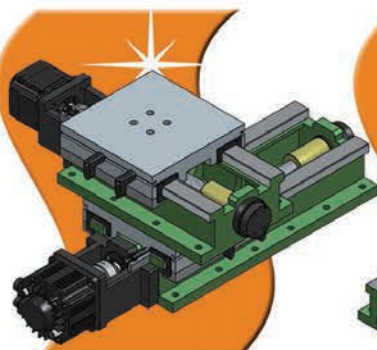
Belt Driven Spindle



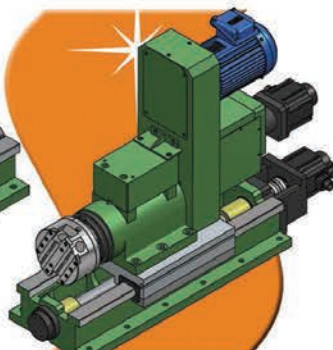
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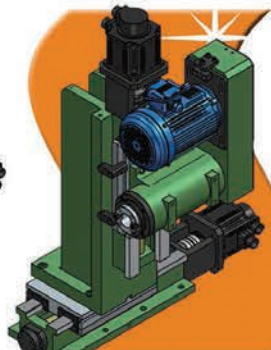
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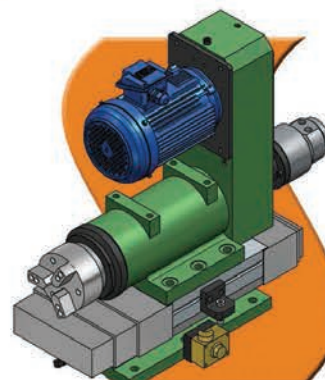
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IEEMA will host the 16th edition of ELEC RAMA, one of the world’s largest trade fairs for the electrical and electronics industry, from **February 22–26, 2025, at India Expo Mart, Greater Noida**. Centered on “Reimagining Energy for a Sustainable Future,” the event promotes collaboration for a greener energy ecosystem. As the media partner, Smart Manufacturing & Enterprises (SME) will release a special supplement on ELEC RAMA 2025, showcasing the potential of India’s electrical and allied electronics (E&E) sector to exhibitors and visitors.

Focus topics include:

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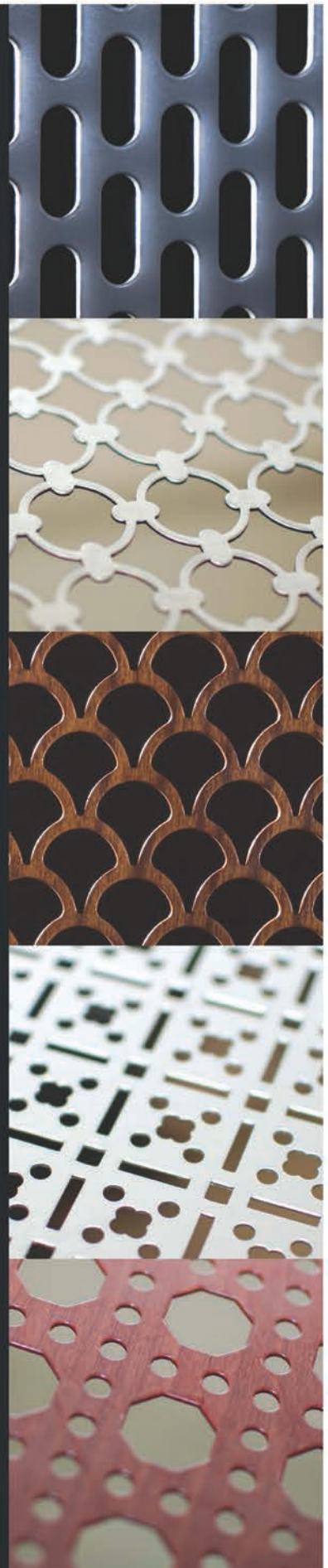
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“Renishaw Actively Supports Precision Manufacturing.”

The shift toward automated manufacturing processes is revolutionising the industry. Technologies like machine tool probing systems, in-process gauging, and tool monitoring are critical for achieving precision, efficiency, and real-time process control. Our solutions are designed to enable manufacturers to reduce human intervention, minimise downtime, and enhance productivity, says, **Sanjay Sangam**, Head- Sales and Marketing India, Renishaw Metrology Systems Ltd, in dialogue with Rakesh Rao.

What factors are driving the demand for your company in India?

Like every global business, the machine tool industry is expanding, new investments are flowing in and both the domestic and export markets are seeing significant demand. Renishaw is at the heart of this growth, actively supporting the precision manufacturing sector.

We are a manufacturing technology powerhouse, developing and expanding into new, close-adjacent markets. Our portfolio includes market-leading sensors, which we are augmenting with a growing range of high-value systems products, enabled by innovative software. Firstly, the rapid industrialisation and modernisation of various sectors have created a need for advanced manufacturing technologies and precision engineering solutions. Additionally, the Indian government’s initiatives to boost local manufacturing and infrastructure development have further fueled this demand.

Which end-user industries in India are offering huge growth opportunities to you?

For 50+ years of Renishaw’s solutions have been spearheading in extensive industries to demonstrate technologies that help increase manufacturing productivity, eliminate user error and improve production processes.

Automotive industry: India’s transition towards electric vehicles (EVs), the push for sustainability, and the demand for improved fuel efficiency are key growth drivers. The use of electronics, sensors and displays is rising in both EVs and internal combustion engine (ICE) markets. Our products are used throughout EV manufacturing and offer our customers significant



benefits in productivity and quality.

Defence and aerospace: With initiatives like Make in India and Aatmanirbhar Bharat, there is a growing emphasis on domestic manufacturing in defence and aerospace. Our heritage lies in the aerospace business and, 50 years later, efficiency and safety remain this industry’s key drivers. Our customers are looking for greater fuel efficiency, lighter components and ways to reduce costs. The fall in demand during the COVID-19 pandemic has eased, and there are significant order backlogs and strong global demand for

fuel-efficient, narrow-body, single-aisle aircraft. The manufacture and assembly of engines, wings, control systems and landing gear rely on process control and post-process inspection using our products. Our systems enable manufacturers to carry out repeatable, traceable and efficient processes to the tightest tolerances.

Electronics: With consumers expecting increasingly lightweight and compact products with more features, greater reliability, and longer battery life, regular updates and upgrades are required faster than ever before. Our consumer electronics customers therefore demand flexible manufacturing systems that can adapt to shorter product life cycles, yet still deliver high-quality, high-volume components. Consumer electronics is one of our largest sectors and includes products such as mobile phones and flat panel displays. The introduction of new generations of electronic devices will be key drivers for future growth.

What are your IMTEX 2025 plans?

Renishaw at IMTEX 2025 is coming with a theme ‘Automation for Everyone’, which aims to make advanced automation technologies accessible to a wide



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range of manufacturers, from small job shops to large production line. We will introduce the Smart Manufacturing Data Platform: Renishaw Central and the world's smallest wireless probe for machine tools: RMP24-micro. And the latest solutions, including the newly launched metrology fixtures, as well as the comprehensive range of Machine Tool, Styli, CMM, Equator, and Encoder solutions.



As our measurement technologies become more advanced, process control becomes more integrated into manufacturing processes, and we provide more holistic solutions, we expect to work even more closely with our customers.

The range of process control solutions are designed to support the growing emphasis on lean manufacturing. The innovative technologies include pre-process machine calibration and both online and offline post-process measurements. Visitors can experience the live demonstrations, get hands-on with the newest technology and speak directly with team experts in hall 4A, booth B101 from to January 23 to 29, 2025.

Which technologies are having a profound impact on the machine tools industry?

The machine tools industry is experiencing transformative changes driven by several key technologies, and Renishaw is at the forefront of helping manufacturers adapt to these trends. Also, we're seeing a general trend towards more automation and 'smart' factories across all our sectors.

Digital technologies are transforming the industrial sector, enabling manufacturers like us to embrace data-driven manufacturing. Our systems collect data to identify where processes can be improved and, ultimately, to maximise profitability. End-to-end process data capture provides insights for analysing and improving manufacturing processes. Predict, identify, and correct process errors before they happen.

The shift toward automated manufacturing processes is revolutionising the industry. Technologies like machine tool probing systems, in-process gauging, and tool monitoring are critical for achieving precision, efficiency, and real-time process control. Our solutions are designed to enable manufacturers to reduce human

intervention, minimise downtime, and enhance productivity.

We make products that support this trend, like our Renishaw Central software platform, which connects measurement machines and computer numerically controlled (CNC) machines to improve the automation of process control.

We believe that our purpose is incredibly relevant in today's environment where the pace of change in technology is faster than ever. The uniqueness in being able to offer a full range of products across metal-cutting production system, enable intelligent decision-making, a crucial part of Industry 4.0. by providing equipment for machine calibration, on-machine measurement, off-machine gauging and verification that can build the required quality into the process.

What are your growth plans in India?

India presents a highly promising market for us, driven by its swift industrial growth, an increasing emphasis on manufacturing quality, and the integration of advanced technologies in vital sectors. Government initiatives are significantly boosting local manufacturing, creating vast opportunities for our solutions in industries like automotive, aerospace, electronics, defence, railways, and medical devices.

In India, Renishaw has made significant investments in the technology centre and offices including major hubs in Pune, Bengaluru, Vadodara, Gurugram and Chennai. These centres are crucial for customer demonstrations, training, and application development, reflecting our commitment to supporting local industries.

Visitors to our centres can 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. The new facilities are crucial to keep up with the country's industrial growth and continue to expand our customer base.

From the point of view of growth, we want to continue expanding our customer relationships to help us prioritise future investment in research and development. These longstanding relationships have been particularly helpful in defining our future product roadmaps. As our measurement technologies become more advanced, process control becomes more integrated into manufacturing processes, and we provide more holistic solutions, we expect to work even more closely with our customers. The integration of our smart manufacturing technologies adds value throughout the product lifecycle of a CNC machine tool. It helps OEMs to differentiate their value proposition to end-user customers.

A blue rectangular graphic with the text "MACHINE TENDING" in white, uppercase, sans-serif font, and the number "101" in a large, white, sans-serif font below it.

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“We Plan to Showcase our Entire Range at IMTEX 2025.”

Sphoorti Machine Tools aligns with the Atmanirbhar Bharat and Make-in-India initiatives, making us a reliable partner for PSUs, DRDO, CSIR labs, OFB units, and space manufacturing units. By offering indigenous products, we aim to reduce dependency on imports, says, **R K Purohit**, Managing Director, Sphoorti Machine Tools Pvt Ltd.

How is your company serving the manufacturing and machine tools sectors?

Sphoorti Machine Tools is a pioneer in manufacturing tool holders for various types of tool turrets on global brands of CNC lathes, CNC turning centers, and CNC turn-mill centers. Our products play a vital role in holding cutting tools to achieve optimum results in machining processes. We are a significant bridge between cutting tools and CNC machine turrets. All industries using CNC machines are our customers. However, as an integral part of the machine, most machine tool builders are our primary customers, and many distributors facilitate the supply of our tool holders directly to end-users. Sphoorti boasts a state-of-the-art manufacturing facility equipped with high-precision machines from Hermle, Mazak, DMG MORI, Hardinge, and others.



configurations in both static and live/driven holders. India holds tremendous potential for adopting the latest global technological advancements in the CNC sector. On the export front, we cater to most countries using CNC machines, with exports contributing over 50% of our annual turnover.

What is driving the demand for your products?

We are experiencing a surge in demand due to our world-class quality and competitive pricing, which have earned us satisfied customers worldwide. To meet this demand, we are planning to offer most of our products off the shelf to prevent delays in customer projects. Sphoorti's major USPs include its wide range of tool holders compatible with any CNC machine, ease of interchangeability, and a customer-centric approach.

How do you analyse the status of the Indian machine tools industry currently?

Since the tool holder business depends on the evolution of turret types in the machine tool industry, we closely follow industry trends. Starting from simple tool holders for generic CNC lathes, we now cover the entire range, including slotted types, VDI, BMT, VTP, and PSC (CAPTO-compatible)



Since the tool holder business depends on the evolution of turret types in the machine tool industry, we closely follow industry trends.

How do you intend to tap the automotive and auto component industries?

The automotive sector is central to the machine tool business and represents a significant share of our market. Our B2B operations are well-established through machine tool builders, while our B2C presence is strong through sales partners, key customers, and global stockists. The increasing demand for electric vehicles is driving growth, but traditional automotive sectors continue to expand due to rising mobility in rural, semi-urban, and urban areas.

How do you plan to tap other end-user industries for future business growth?

End-user industries require tailored strategies, such as tenders, approvals, and localised trader support. Some of our dealers maintain constant contact with these industries for secondary business opportunities. Sphoorti aligns with the Atmanirbhar Bharat and

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Make-in-India initiatives, making us a reliable partner for PSUs, DRDO, CSIR labs, OFB units, and space manufacturing units. By offering indigenous products, we aim to reduce dependency on imports.

How are you going to leverage your presence at IMTEX 2025?

IMTEX 2025 will be a significant event for Spahoorti. We plan to showcase our entire product range, including the launch of new products such as angular heads for machining centers and PSC (CAPTO-compatible) holders in slotted, VDI, and BMT configurations for both static and live/driven tool holder versions. With these additions, Spahoorti aims to offer one of the largest ranges of tool holders, meeting the demands of our customers.

How are you planning to tap into recent trends like AI, digitalisation/automation, and sustainability? What are some other trends that are visible in the industry?

Automation and digitalisation are essential for industrial growth and global competitiveness. All our CNC machines are equipped with HMIs, enabling us to maximise machine outputs and minimise errors and inefficiencies. We are increasingly leveraging digital platforms to enhance visibility and reach the global industrial community.

What are your growth plans for the company in the coming years?

Our performance in FY24 has been highly encouraging, and we are working on a war footing to meet the increasing demands of machine tool builders, end-users, and sales partners. Spahoorti is on a rapid growth trajectory. Beyond expansion, we are focusing on optimising the efficiency of machines, equipment, vendors, infrastructure, and most importantly, our workforce. We believe that business growth is significantly driven by dedicated and committed employees. Together, we are determined to establish Spahoorti as a major global player in the field of tool holders.

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"We are exploring 3D printing to boost offerings."

Dormer Pramet is a global manufacturer and supplier of cutting tools for the engineering industry, including drilling, milling, threading and turning tools. The expanded operation has 30 offices worldwide serving 100 markets and employs around 1,500 people. The Indian unit plays a crucial role in supporting Dormer Pramet's global business by serving as a strategic manufacturing hub, says **Amit Raina**, Country Manager for India, Dormer Pramet, in this conversation with Rakesh Rao.

What were the reasons for Dormer Pramet's refined brand identity?

Our idea of unveiling a fresh identity was to align with the evolving needs of the manufacturing community and reaffirm our purpose and care towards the manufacturing community. This transformation is not just our commitment to support our customers better but even our employees, suppliers and the environment within which we operate. The refined brand identity features updated visual elements and a renewed emphasis on collaboration and harmony within the manufacturing ecosystem. It symbolises our dedication to fostering innovation, sustainability, and operational excellence while strengthening relationships with our stakeholders.



need for high-precision tools for manufacturing components. Additionally, the general engineering sector, railways, aerospace, and renewable energy industries are also contributing to the demand. The focus on infrastructure development and the push for self-reliance in manufacturing are further boosting the need for advanced cutting tools.

How does the Indian unit support the growth of Dormer Pramet's global business?

The Indian unit plays a crucial role in supporting Dormer Pramet's global business by serving as a strategic manufacturing hub. The Ankleshwar plant, for instance, not only produces for the local market but also for global distribution. This plant is fully integrated, manufacturing not only Miranda products but also Dormer Pramet and other brands. Steps to propel exports include increasing production capacity, capability, optimising logistics, and leveraging the low-cost production base of the Ankleshwar Plant. The synergy between Dormer Pramet and Miranda strengthens our position as one of the leading companies in high-speed steel (HSS) products such as drills and taps.

What factors are driving the demand for your company in India?

The demand for Dormer Pramet in India is driven by several factors, including the robust growth in the automotive sector, the government's Make in India initiative, and significant investments in infrastructure. The automotive industry remains a key driver, with the



The company aims to achieve double-digit growth by focusing on key segments such as automotive, aerospace, and renewable energy.

Besides automotive, what kinds of growth opportunities are you exploring?

Emerging sectors such as railways, defence, aerospace, electronics, renewable energy, and electrical vehicles present significant growth opportunities for Dormer Pramet. These sectors are expected to drive demand for advanced cutting tools and machining solutions due to their need for high precision and efficiency. For instance, the aerospace sector requires

tools that can handle complex geometries and high-strength materials, while In the railways sector, the growth opportunities are driven by the modernisation and expansion of railway infrastructure in India. Dormer Pramet is actively involved in supplying cutting tools for the manufacturing and maintenance of railway components. The company's tools are used in the production of various railway parts, including tracks, wheels, and axles, which require high durability and precision.

Which trends are having profound impact on the Indian machine tools industry?

Key technological trends impacting the Indian machine tools industry include the adoption of Industry 4.0, automation, and the integration of AI and machine learning in manufacturing processes. Dormer Pramet is gearing up for these trends by investing in advanced manufacturing technologies, enhancing its R&D capabilities, and focusing on digital transformation to improve efficiency and product quality. The company is also exploring the integration of 3D printing technologies to enhance its product offerings and meet the evolving needs of its customers.

How are you planning to leverage your presence at IMTEX 2025?

For IMTEX 2025, Dormer Pramet plans to showcase its latest product innovations, sustainability initiatives, and strategic partnerships. The booth will highlight new technologies and solutions designed to meet the high precision and efficiency demands of today's manufacturers. The company aims to attract new distributors and end-users, strengthen relationships with existing partners, and generate qualified leads. The focus will be on demonstrating the company's commitment to innovation and sustainability. Additionally, Dormer Pramet will present its new brand identity and highlight its recent growth and innovations in India.

What are your growth plans for the company in the coming years?

Dormer Pramet's growth plans include expanding its market presence in India and other emerging markets, increasing production capacity, and investing in new technologies. The company aims to achieve double-digit growth by focusing on key segments such as automotive, aerospace, and renewable energy. Additionally, strategic partnerships and acquisitions will play a vital role in driving growth and enhancing the company's product portfolio. The company is also committed to sustainability, with initiatives to reduce CO2 emissions and achieve 90 per cent circularity in materials used in products and packaging.

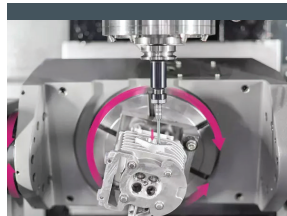
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"Grind Master's Business is Strongly Export-driven."

In recent years, Grind Master has diversified its export profile to developed countries like Japan, Germany, and the USA, where we have successfully installed custom-built solutions for advanced applications in the automotive, aerospace, and heavy engineering industries. Our philosophy, 'Make in India, Make for the World', is focused on building globally recognised competence in innovation and quality, says **Sameer Kelkar**, CEO and R&D Head, Grind Master Machines Pvt Ltd in conversation with Rakesh Rao.

How was FY24 for Grind Master Machines? How has the performance been so far in FY25?

FY24 was a successful year for Grind Master, and FY25 has been stable so far. Grind Master is in the process of transforming its business into a specialised precision finishing enterprise. We have been focusing on developing new products for precision superfinishing, such as bearing finishing. As these products are launched, validated, and gain a strong reputation, we are confident that our business is set to grow in the coming years.

Simultaneously, we have been consciously moving away from certain product lines, such as cookware polishing and robotic finishing. While these were breakthrough technologies, they are no longer part of our future plans. We are licensing or transferring these product lines to capable companies to carry forward their legacy.

How have your company exports been? What steps are you taking to propel them?

Grind Master's business is strongly export-driven, with over 50 per cent of its revenue coming from it. We have been present in China since 2010, with more than 250 machines deployed across the automotive and earthmover industries for specialised finishing. Our microfinishing machines exported to China compete with German and Japanese companies based on technology. The wide acceptance of our solutions is attributed to the company's strong quality culture and process innovation.

In recent years, we have diversified our export profile to developed countries like Japan, Germany, and the USA, where we have successfully installed custom-built



solutions for advanced applications in the automotive, aerospace, and heavy engineering industries. Our philosophy, 'Make in India, Make for the World', is focused on building globally recognised competence in innovation and quality.

What factors and which end-user industries are driving the demand for your company?

There is a paradigm shift in the automotive powertrain sector. Conventional internal combustion engines (ICEs) are being replaced with hybrids and battery electric vehicles (BEVs). Rotating shafts are common to all these technologies, and the demand for precision finishing is even greater for hybrids and EVs due to their faster rotational speeds. However, this industry is undergoing substantial transformation.

Across the manufacturing sector, there is a growing realisation of the value of microfinishing and superfinishing technology in enhancing performance. Improvements in fuel efficiency, noise reduction, and durability all result from finer finishes. Our technology is witnessing growing applications not only in automotive but also in hydraulics, agricultural equipment, aerospace, and motion products. Components in relative motion with other components fall into two categories—those that are superfinished today and those that will be superfinished tomorrow.

Besides automotive, what growth opportunities do emerging sectors like defence, aerospace, electronics, railways, renewable energy, and electric vehicles offer to your company?

Electric vehicles are no longer just an emerging

sector. EV transmissions require fine finishing, and we collaborate with leading automotive companies globally to achieve high-performance finishes.

Emerging fields such as aerospace, electronics, and renewable energy also offer promising opportunities, and our machines are already finding applications in these sectors. However, specialised technologies for strategic industries require investment in R&D and supportive conditions from the user industry. In India, these conditions are often lacking, which contributes to reliance on imported technologies in these sectors.

In terms of technological evolution, which trends are profoundly impacting the Indian machine tools industry? How is your company gearing up for these trends?

Hybrids and EVs are having a tremendous impact on the Indian machine tools industry. Due to our presence in international markets, we have been exposed to the effects of EV adoption for several years and are well-prepared for this transition.

Leveraging machine learning (ML) and artificial intelligence (AI) is crucial for every machine tool company today. Grind Master has developed an ML platform specifically for finishing processes, which we are showcasing at IMTEX.

What are the key hurdles to the growth of the Indian machine tools industry?

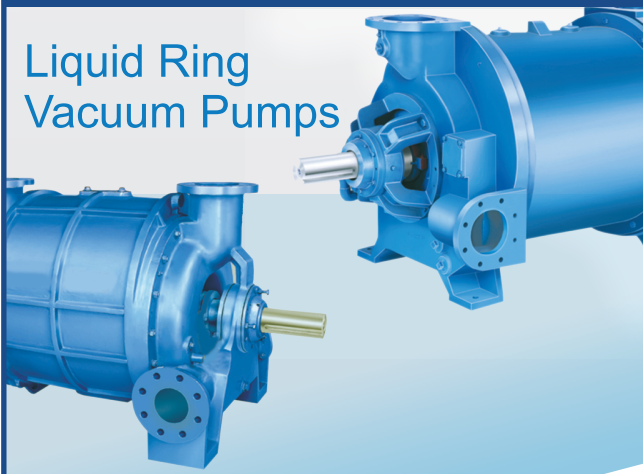
Indian manufacturing continues to import nearly 50 per cent of its machine tool requirements. Some imports, particularly general-purpose machines, come from China, whose products are becoming more refined. Others, especially specialised machines, are imported from countries like Germany and Japan.

To compete successfully, the Indian machine tools industry must focus on innovation, quality improvement, and support from both the Indian manufacturing sector and the government. As the backbone of manufacturing, the Indian machine tools industry—built by passionate pioneers—needs nurturing to become a global leader.

What are your plans for IMTEX 2025?

Grind Master is launching several innovative technologies at IMTEX 2025. One of the highlights is our bearing superfinishing machines, a technology that has traditionally been imported for high-quality bearing production. We have developed a range of machines, including bearing roller superfinishing and raceway superfinishing. The technology for raceway superfinishing for spherical ball bearings has been developed in collaboration with IIT Madras and will

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I first attended IMTEX in 2004 and visited EMO Hanover in 2007. Back then, the difference in outlook between the Indian and European machine tool industries was stark. Today, I can confidently say the gap has narrowed significantly. The Indian machine tools industry is innovating and building successful products that make India proud globally.

To those who view Indian machine tools with skepticism, I say, come to IMTEX. Shed this colonial hangover, open your eyes and hearts, and witness the passionate innovation and excellence of Indian machine tools.

What are your growth plans for the company in the coming years?

We are restructuring Grind Master into a precision finishing solution provider with the ambition of delivering advanced superfinishing solutions to the world. Our vision of becoming a global technology leader will be realised when we establish ourselves as a trusted partner in developed markets. This is the mission we are diligently working toward.

SME



"Smart Factories are Revolutionising Industries."

Bradma, a business division of Forbes & Company Ltd (a part of the Shapoorji Pallonji Group), specialises in coding & marking, traceability, robotics, and automation for the manufacturing sector. In this interview with Rakesh Rao, **Ravi Prem**, Executive Director of Forbes & Company Ltd and President of the Indian Cutting Tool Manufacturers' Association (ICTMA), discusses the impact of the latest technologies on the metalworking industry.

How is Bradma supporting the growth of the Indian manufacturing sector?

Bradma specialises in the Coding and Industrial Automation Business (CIAB) with over six decades of experience, providing traceability and automation solutions across diverse industries. These include automotive, steel & heavy engineering, electrical & electronics, battery pack manufacturing, and renewable energy, all with a strong focus on part traceability and Industry 4.0 integration.

Bradma plays a pivotal role in supporting the Indian manufacturing sector by offering customized solutions, many of which are first-time innovations in India. These solutions enable manufacturers to transition toward smart factories by enhancing operational efficiency, traceability, and digitization.

What factors are driving the demand for your company in India?

Several factors are driving the growing demand for Bradma's products and services in India:

- **Adoption of Industry 4.0:** With the rise of smart factories and digital transformation, industries are increasingly adopting automation solutions to boost efficiency and reduce operational costs. Bradma's solutions align well with this shift, offering real-time data monitoring and seamless integration across manufacturing systems through customized solutions.
- **Regulatory requirements and traceability:** Industries such as automotive, pharmaceuticals, and FMCG face growing pressure to meet stringent regulatory and quality control standards. Bradma's traceability solutions, including marking machines and track-and-trace



software, enable compliance with these requirements.

- **Government initiatives:** Programs like Make in India and Atmanirbhar Bharat have accelerated the need for automation in manufacturing, prompting firms to modernise operations to remain competitive.
- **Adoption of new technologies:** Bradma is continuously innovating and incorporating new technologies into its offerings, particularly in high-growth sectors such as heavy metal industries and renewable energy.

Which end-user industries in India are offering huge growth opportunities?

In India, several key industries such as automotive, steel & heavy engineering, electronics & consumer goods, battery pack & renewable energy, food & FMCG, etc are providing significant growth opportunities for Bradma. Bradma's automation and traceability solutions are experiencing rapid growth in the automotive and auto components sectors. The company is a leader in Vehicle Identification Number (VIN) and chassis marking solutions, leveraging laser and dot peen technologies.

With India's expanding infrastructure and industrial base, there is a growing demand for traceability and automation solutions in steel plants and heavy engineering sectors. Bradma provides innovative solutions like hot ingot weighing and marking to enhance operational efficiency. The surge in electronics manufacturing and consumer goods demand has driven the need for automation and part traceability. Bradma's integrated marking and vision systems address this demand effectively.

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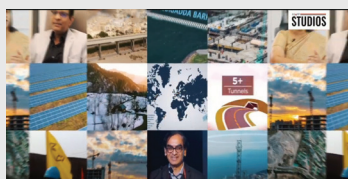


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electric vehicles, Bradma has developed tailored track-and-trace solutions to support these sectors. The rise in packaged food and consumer goods production has created a demand for batch coding and permanent marking solutions. Bradma offers a comprehensive range of laser technologies (CO₂, UV, and fiber) to meet the sector's diverse needs.

What are the key trends in the machine tools industry?

The machine tools industry is undergoing a significant transformation, driven by the following trends:

- **Smart manufacturing and IoT integration:** The shift toward smart factories is revolutionising the industry. IoT integration, real-time data monitoring, and predictive maintenance are key elements. Bradma incorporates IoT capabilities into its automation solutions to enable real-time monitoring and responsive production control.
- **Customisation and precision:** As industries demand greater customization and precision, Bradma develops flexible and adaptive marking and automation solutions tailored to specific needs.
- **Sustainability:** With growing environmental concerns, Bradma's solutions help optimize energy consumption, reduce waste, and ensure compliance with environmental regulations, contributing to greener manufacturing practices.

How are new technologies shaping the future of the manufacturing sector?

New technologies are fundamentally reshaping the manufacturing landscape. Robotics is automating repetitive tasks like material handling, welding, and

assembly, enhancing speed and precision while reducing human error. Bradma offers customised robotic solutions to meet diverse industry needs.

IoT and Digital Twin technologies enable manufacturers to simulate entire production systems in a virtual environment, optimising efficiency, reducing waste, and enabling predictive maintenance. Bradma integrates IoT into its marking and automation solutions to provide real-time data and remote diagnostics, improving operational performance.

What are your growth plans for the company?

Bradma is focused on expanding its presence and driving growth in India through various strategies. We are continuously innovating our product portfolio to include advanced automation solutions, integrating IoT, part traceability solutions, and more customized marking solutions.

To cater to the unique needs of the Indian market, we are expanding our product customisation capabilities, ensuring that our solutions are optimised for cost-effectiveness while maintaining high quality. We are investing in expanding our service and support infrastructure across India to ensure fast and efficient after-sales support for our customers.

We aim to further strengthen our partnerships with industries such as automotive, steel & heavy engineering, electronics, and consumer goods by driving innovation and expanding our product offerings in these sectors.

What are your plans for IMTEX 2025?

We will be visiting the show to connect with key industry players and explore new opportunities. We look forward to engaging with manufacturers and partners to discuss how our cutting-edge automation solutions can support the growth and digital transformation of the Indian manufacturing sector.

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“Demand for High-Precision Machining Tools is Growing.”

Bengaluru-based GUSTI Tool Works LLP specialises in providing advanced cutting tools that enhance productivity, precision, and product quality. In this interview, **Tosher G Hormusjee**, Managing Director, GUSTI Tool Works LLP, highlights the importance of high-precision machining tools for the growth of Indian manufacturing sector shares.

How is GUSTI Tool aiding the growth of the Indian manufacturing sector?

GUSTI Tool Works (GTW) plays a pivotal role in advancing the Indian manufacturing sector by producing special drills, mills, reamers, and custom form tools specifically designed for the high-precision machining industry. This niche segment is crucial for Indian engineering suppliers to meet global quality standards and achieve international competitiveness.

By providing advanced cutting tools that enhance productivity, precision, and product quality, GTW empowers manufacturers across various engineering sectors, from automotive to aerospace. These tools enable faster machining, better surface finishes, and longer tool life, directly improving operational efficiency and cost-effectiveness for manufacturers.

GTW's focus on customization and innovation ensures that customers have access to tailored tool solutions that address unique manufacturing challenges. This not only supports the “Make in India” initiative but also strengthens India's position as a global manufacturing hub for precision engineering.

In essence, GUSTI Tool Works serves as a catalyst for high-precision manufacturing in India, enabling engineering suppliers to achieve world-class standards in performance, reliability, and competitiveness.

What factors are driving the demand for your company in India?

The demand for GUSTI Tool Works' cutting-edge precision tools is being driven by multiple factors that are reshaping India's manufacturing landscape. As India emerges as a global manufacturing hub, there is an increasing need for high-precision machining tools to produce components that meet international quality standards. GTW's special drills, mills, reamers, and



custom form tools are essential for achieving this precision. Industries are shifting towards automation and smart manufacturing, which require advanced tooling solutions capable of supporting CNC and other automated machining systems. GTW's specialized tools facilitate this technological transition.

Indian suppliers are under pressure to meet global quality benchmarks, especially for export-driven sectors like automotive, defence, and aerospace. GTW's focus on precision, durability, and customization helps manufacturers meet these standards.

The “Make in India” initiative aims to boost domestic production, especially in sectors like defense and aerospace. GTW's role as a provider of high-precision tools supports this initiative, allowing Indian companies to localize production and reduce dependence on imports. To remain competitive, manufacturers are looking for tools that offer longer tool life, higher machining speeds, and reduced downtime. GTW's innovative tool designs directly address these needs, enabling better production efficiency.

Many end-user industries offer significant growth opportunities for GTW. India is one of the world's largest automotive manufacturing hubs. With the shift toward EVs (electric vehicles) and the increased need for lightweight & high-precision components, GTW's tools are in high demand for machining critical automotive parts like engine blocks, gearboxes, and electric motor components.

The modernisation of India's railways and the push for faster, more efficient trains require precision components for wheels, axles, and braking systems. GTW's specialised tools enable the production of these parts with high accuracy and durability. As India strives to strengthen its defence manufacturing capabilities under the “Make in India” initiative, the demand for high-precision parts for aircraft, missiles, and defence

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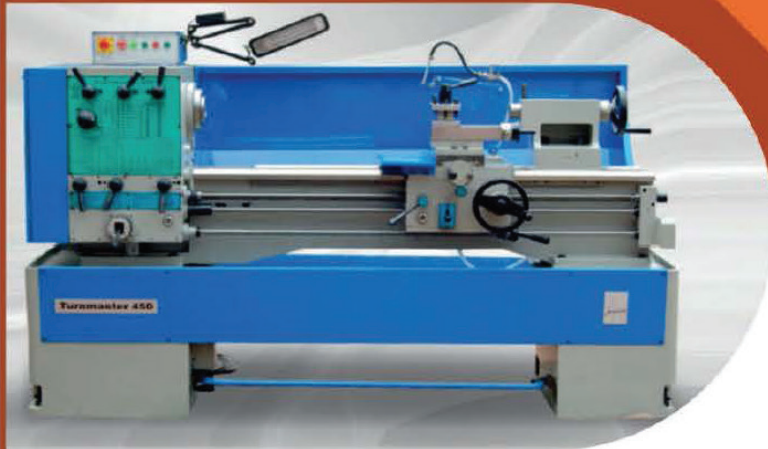
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DEALERS ENQUIRY SOLICITED

equipment is surging. GTW's tools play a vital role in the machining of complex components with stringent quality requirements.

With the boom in electronics manufacturing, especially for mobile phones, semiconductors, and appliances, the need for precision parts has grown. GTW's tools facilitate the production of intricate components used in electronic devices. The mining sector requires heavy-duty, durable tools for machining large and tough components used in equipment like excavators, crushers, and conveyor systems. GTW's robust, wear-resistant tools are crucial for handling these heavy-duty machining tasks.

In summary, GUSTI Tool Works is at the forefront of India's drive toward high-precision manufacturing. With a strong presence in automotive, railways, defence, aerospace, electronics, and mining, GTW is well-positioned to capitalise on the rising demand for superior tooling solutions. As these industries continue to grow and evolve, GTW's customised precision tools will play a key role in supporting India's journey toward global manufacturing excellence.

How are new technologies shaping the future of the manufacturing sector?

Industry 4.0 and beyond is the way to go worldwide. We at GTW have had a digital system which is paperless for all our manufacturing. New technologies like 3D printing, AI, ML, robotics, Industry 4.0, and advanced coatings are shaping the future of manufacturing and the metalworking industry. Automation, data-driven production, and connectivity are now essential for companies looking to stay competitive.

GUSTI Tool Works is responding to these trends by:

- Adopting Hybrid Manufacturing (3D printing + machining) to develop complex custom tools
- Investing in Smart Tools that track tool wear, temperature, and vibration in real time
- Leveraging AI & Machine Learning for predictive maintenance and process optimization
- Robotics-Enabled Production with robotic handling of tool inspection and production
- Focusing on Coatings & Smart Materials to improve tool life and enable dry machining

By embracing these trends, GTW is future-proofing its business while enabling its customers to produce better, faster, and more sustainable products. Let me know if you'd like to expand on any of these points or need a specific emphasis on GTW's role in these technologies.

What are your growth plans in India?

GUSTI Tool Works (GTW) aims to solidify its position as a leading supplier of globally competitive,

precision cutting tools while supporting India's vision of becoming a global manufacturing hub. To achieve this, GTW has outlined strategic growth plans focusing on product expansion, technological advancement, and market leadership.

We plan to diversify the product portfolio by introducing new tools made from advanced materials and customised designs to meet emerging market demands. We are leveraging cutting-edge technologies to deliver high-performance, smart tools that cater to Industry 4.0-enabled manufacturing.

We aim to increase production capacity to meet growing domestic and international demand while supporting India's self-reliance in cutting tools. GTW plans to increase its manufacturing capacity by installing automated production cells and robotic handling systems to enable 24/7 production. GTW aims to adopt fully autonomous production cells where robots handle machining, inspection, and packaging, enabling lights-out production and improving efficiency. GTW plans to modernize its facilities with advanced CNC machines, precision grinding machines, and robotic tool handling systems. GTW is focusing on establishing an advanced R&D centre for testing and developing high-precision tools for aerospace, defence, and other key sectors.

We are also working on building a future-ready workforce with advanced skills in tool design, CNC machining, and Industry 4.0 technologies.

We are also promoting sustainable manufacturing practices to reduce the company's environmental impact and improve energy efficiency. GTW plans to adopt coating processes that reduce environmental impact (like PVD instead of CVD coatings) and consume less energy. By providing regrinding and re-sharpening services, GTW reduces the number of discarded tools, minimizing waste in the tool life cycle.

GUSTI Tool Works (GTW) is committed to being a globally competitive supplier of precision cutting tools. By focusing on product innovation, technological leadership, and a sustainable production approach, GTW aims to become a leading player in the Indian manufacturing ecosystem. The company's growth strategy aligns with the "Make in India" initiative, helping India reduce its dependence on imported cutting tools while supporting the nation's mission to become a global manufacturing hub.

With a strong emphasis on R&D, customisation, and technological innovation, GTW is well-positioned to meet the demands of emerging industries like automotive, aerospace, defence, electronics, and medical devices. By offering tailored tool solutions and embracing digital transformation, GTW is poised to lead India's manufacturing sector into a future of precision, productivity, and sustainability.

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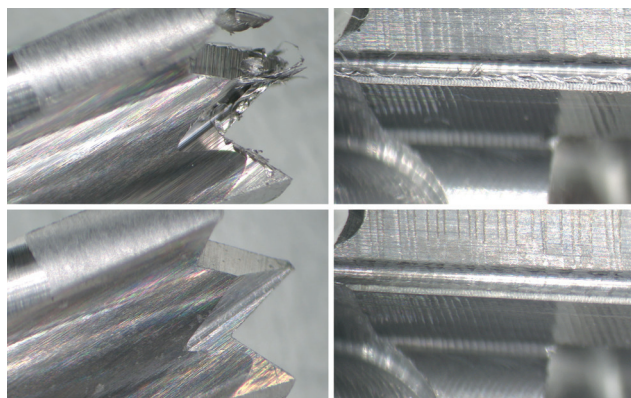


The Future of Deburring

The German technology company, ultraTEC innovation GmbH, uses the power of ultrasonic to deburr components.



The A25 S ultrasonic deburring machine from ultraTEC innovation can be used to remove interfering burrs and fibers from machined components.



Before and after: Selective deburring for optimum results without removing material

Many machining processes produce unwanted burrs and protruding fibres on components and to remove these automatically and in a contact-free manner, ultraTEC innovation GmbH has developed an innovative process. The technology company based in southwestern Germany uses the power of ultrasonic to deburr components. The technology guides components along an ultrasonic horn in a water basin, whose generated vibrations cause the burrs and fibres to break-off in an energy-efficient manner.

It all began five years ago as a start-up in the Swabian town of Laupheim. Dieter Münz, founder and Managing Director of ultraTEC innovation GmbH, is shaking up the deburring market with his new ultrasonic deburring technology. A successful youth research project paired with technical finesse and a lot of will serve as the basis for the young company. Today, ultraTEC has many different ultrasonic deburring machines in its portfolio and can respond flexibly to customer requirements. In addition, ultraTEC has been part of the internationally active Vollmer Group from Biberach an der Riß since July 2022 and will also be able to serve international markets in the future.

Non-contact ultrasonic deburring with the patented ultrasonic horn is the foundation of ultraTEC. Whether drilling, milling, turning or grinding, as soon as machining takes place, unwanted burrs and fibers are created on edges, cross bores or surfaces. In addition to common metals, ultraTEC systems can also be used to deburr components made of various titanium and nickel alloys through to fiber-reinforced plastics.

Ultrasonic deburring with high-frequency sonotrodes

In the process developed by ultraTEC, components are guided to the high-frequency ultrasonic horn in a process water basin. Stimulated by a generator, it oscillates back and forth over 0.1 millimetres 20,000 times a second. These vibrations move burrs and fibers back and forth until they break off with a sharp edge in a reliable process. Users can easily dispose of the process water without further treatment.

New generation in the A-series

It all started at with the A series. Back then, the A15 was the first ultrasonic deburring machine to be launched on the market. This was later replaced by the more flexible A25, which has been continuously optimized in recent years. The new A25 S is already visually very different from the previous A25. This is because ultraTEC is moving away from a machine housing made of aluminum profiles to a solid steel frame with the new "Generation S". This results in significantly greater stability and an even more precise deburring process. But there are also some new features in the machine. In addition to optimised part drying, the process water basin has been completely redesigned. This enables even more flexible processing of a wide variety of components with the ultrasonic horn.

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Raising the Quality Bar in Steel Industry

Quality assurance for companies that produce and process steel are very important. SPC Werkstofflabor GmbH relies on ZEISS microscopy to inspect materials for quality assurance in the steel industry.



Combined ZEISS Microscopy for quality assurance in the steel industry.

Climate requirements, globalisation and geopolitical conflicts pose major challenges for companies that produce and process steel. This makes quality assurance all the more important to ensure that the precious raw material is used as efficiently as possible and rejects are avoided. SPC Werkstofflabor GmbH supports steel producers and processors as a service partner – and relies on a combination of light and scanning electron microscopy from ZEISS.

“The steel industry is in a difficult situation: Whether in the automotive, engineering, construction, or electronics industries – the demands on components made of steel are becoming ever higher. At the same time, supply is falling and prices for crude steel are rising,” reports **Alexander Maier**. As Managing Director of the accredited materials laboratory SPC, he could almost be pleased about this. Because, he continues, “We notice that companies have more need for quality assurance as a result in order to increase the efficiency of their processes. And that’s exactly our business as a service partner for materials testing and failure analysis.”

At the same time, for him and his team, the joy is limited. Because firstly, the main cause of the particularly difficult situation right now, geopolitical

conflicts, is distressing; secondly, it means that it is more difficult to plan orders. This makes the long-standing partnership with ZEISS all the more important for SPC, says Alexander Maier. He adds, “Optimally matched hardware and software solutions, cloud services for sharing results and powerful automation functions mean that we reliably deliver reproducible results, and do so as efficiently as possible – which is exactly what is needed in the current situation.”

Quality of crude steel and recycled content down

Thomas Schaupp is Laboratory Manager at SPC. He, too, knows the pain of the steel industry all too well: “A very high percentage of crude steel came from Russia until two years ago, and it was very high quality. Because of the economic sanctions, Germany now gets its steel from other markets that don’t always deliver comparable quality.” The industry is also increasingly mixing a certain amount of scrap into the crude steel – for economic reasons, but also to meet the growing demand for greater sustainability with more circularity. “But scrap quality is also declining,” says Thomas Schaupp. “And this overall situation – lower quality crude steel and poorer scrap – is causing steel processing companies to experience material quality issues they haven’t seen in many years.”



“The steel industry is in a difficult situation. We notice that companies have more need for quality assurance as a result in order to increase the efficiency of their processes.”

Alexander Maier, MD, SPC

This often has serious consequences for the resulting components, as in the case of a pinion shaft submitted for testing by one of SPC’s customers, a steel processor.



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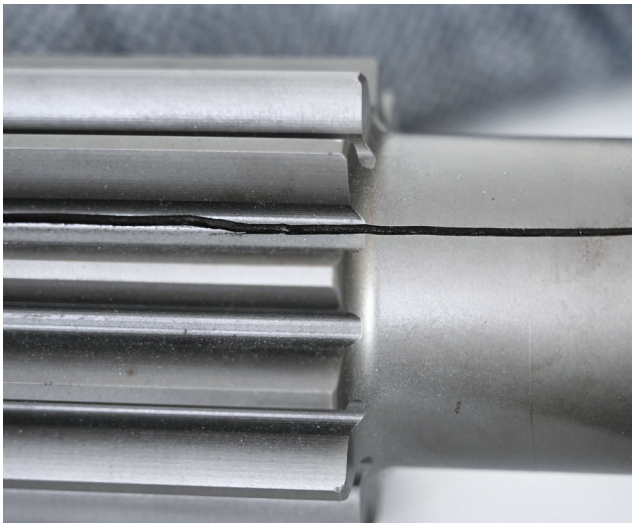
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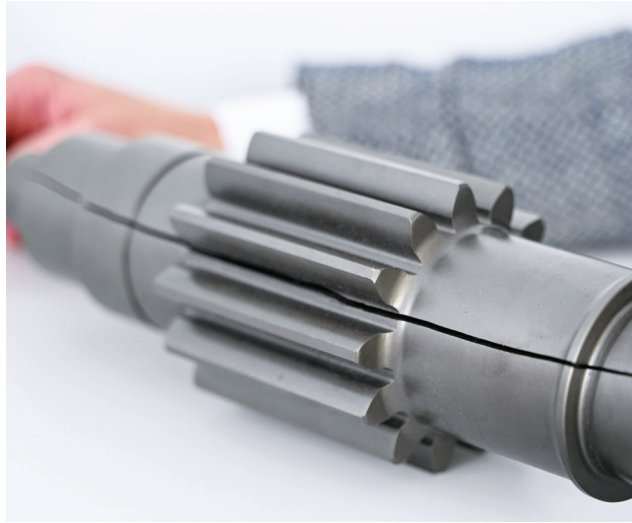
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The manufacturer of the pinion shaft requires a root cause analysis of the failure.



A fast failure analysis is important so that the manufacturer is not late with delivery.

Thomas Schaupp explains: “The manufacturer of the pinion shaft complained to the steel trader after a complete batch of pinion shafts cracked lengthwise in the manufacturing process. The steel trader commissioned us to investigate the cause.”

SPC was happy to comply with this request and was able to clearly determine the cause just a few days later.

Inspection with light and scanning electron microscopy

“At first glance, the fracture looked to us as if it had been caused by damage to the surface of the raw part during hardening process. In other words, a crack from the outside in,” reports Thomas Schaupp. But the high-resolution analysis of a broken piece taken from a destroyed pinion shaft with the ZEISS Smartzoom 5 digital microscope suggests a different conclusion: “Even with the naked eye, we could see from the sample taken that the steel on the center axle is heavily darkened on the inside, which decreases towards the outside,” says Thomas Schaupp. “And the microscopic analysis shows: around the central axis, a so-called ‘scaling’, i.e. oxidation of the steel, is visible. So the fracture originated from the inside.”

To analyse the structure inside even more precisely, SPC staff created another sample, a metallographic section embedded in black epoxy resin, polished smooth and treated on the surface with an acid. “The etching process causes a chemical reaction of the material,” explains Thomas Schaupp. “This allows us to see under the microscope whether and where there is any contamination in the material.”

For this purpose, the SPC staff examined the sample with ZEISS Axio Imager, a high-resolution wide-field



The analysis with the ZEISS Smartzoom 5 digital microscope shows: so-called ‘scaling’, i.e. oxidation of the steel, is visible around the central axis. So the fracture originated from the inside.

microscope for automated materials research. Thomas Schaupp reports, “The analysis confirmed that ‘segregation’ had taken place near the central axis, i.e. contamination; in addition, we saw non-metallic inclusions. This caused the steel to become brittle.”

The final step was to identify what materials the contamination consisted of. To do this, the staff examined a metallographic section from the pinion shaft using the ZEISS EVO scanning electron microscope, whose additional energy dispersive spectroscopy (EDX) capability allows them to perform a chemical material analysis in which an electron beam excites the atoms in the sample and the resulting X-rays are measured. The analysis shows: In the steel of the pinion shaft, there were non-metallic inclusions with high concentrations of manganese and sulfur near the central axle, as well as segregations of sulfur and phosphorus. Thomas Schaupp explains: “Normally, these impurities would still be



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Size: 130 to 200





Magnification of the fracture surface with the digital microscope ZEISS Smartzoom 5.



In order to analyze the microstructure inside even more precisely, a metallographic section is produced.



The sample is examined using the ZEISS Axio Imager, a high-resolution wide-field microscope for automated materials research.



The analysis confirms contamination on the central axis; non-metallic inclusions from foreign material are also detected.

tolerable, but a hole was drilled at precisely this point, which put particular strain on the material, and fracture occurred.” His assessment of the facts: “Yes, the steel supplied by our customer was contaminated, but this was within the norm. The company that made the pinion

shaft from it should have required tighter tolerances for this application, in my opinion.”

ZEISS as a partner: 30% faster to reliable results

Thanks to the correlative workflow between light and scanning electron microscopy from ZEISS, the SPC materials laboratory was able to determine this result within a few days.

“Accurate, reliable results are important, of course, but so is getting them quickly,” says Thomas Schaupp. “Defects in materials such as steel lead to high costs for our customers. It must be possible to find and eliminate the causes quickly, otherwise deliveries are delayed, which can quickly become expensive.” The acquisition of equipment for the laboratory is the responsibility of



“Defects in materials such as steel lead to high costs for our customers. It must be possible to find and eliminate the causes quickly, otherwise deliveries are delayed, which can quickly become expensive.”

Thomas Schaupp, Laboratory Manager, SPC



The final step was to identify which materials the contamination consisted of. To do this the employee examined a metallographic section of the pinion shaft using the ZEISS EVO scanning electron microscope.

Thomas Schaupp as laboratory manager, and for him there is no alternative for ZEISS. “Two things make ZEISS unique: First, the optimally matched hardware and software, something you don’t find with any other manufacturer. Everything works intuitively and simply, as well as quickly and efficiently thanks to the automation functions. With other solutions, we would have to spend 30 percent more time. This is important for SPC, especially in times of a shortage of skilled

workers and high workloads”, he reports, “The influence of the individual user is low, we always get reproducible results with little user input, which makes our work much easier, especially in these times.”

The second major advantage of ZEISS over other providers is the cloud-based database ZEISS ZEN Data Storage, which allows the results of material analyses to be shared transparently and conveniently with customers.

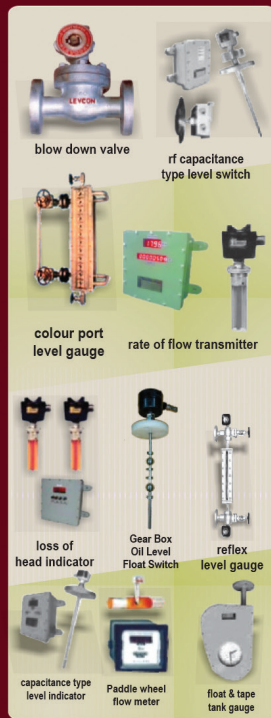
“Sending PDFs via e-mail is simply not in keeping with the times today, and ZEISS offers us a way to avoid exactly that – It’s the kind of thing we and our customers expect, even in the age of digitalization.”

ZEISS and SPC have enjoyed a close partnership for many years – and according to Thomas Schaupp, this will not change: “There are short distances to ZEISS in every respect. If we need service, it’s quick, we know each other, and ZEISS understands our needs. So why should we change anything?”

SME

For details, contact Rohan Tonde, Marketing Manager - ZEISS Industrial Quality Solutions, Carl Zeiss India (Bangalore) Pvt Ltd (ZEISS Group), Bangalore, on Tel: +91 80 4343 8222, Mob: +91 91122 00383, 95452 54345, or Email: rohan.tonde@zeiss.com

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Simple Finger Change During an Ongoing Process

With the new jaw quick-change system BSWS-R, SCHUNK enables automated finger changes during an ongoing process. The cleverly designed system consists of just a few components and is compatible with all grippers with PGN-plus-P screw connection diagram.

In many sectors, production is increasingly moving in the direction of "high-mix/low-volume". This is where being able to produce a wide range of variants without any manual set-up work at all, even with the smallest batch sizes, is becoming a great advantage for companies. The BSWS-R jaw quick-change system now makes this possible with its flexible solution. The latest evolutionary stage of the BSWS series enables robots to change their gripper fingers automatically during a process – in under three seconds!

Until now, automated changes have only been possible when replacing the entire gripper. Meanwhile the BSWS-R, can accomplish this task with a minimum of components. The only part that is needed for each gripper finger is a jaw quick-change system base, two adapter pins and a deposit station. The base is screwed into the workpiece-specific gripper finger and the adapter pins are fastened to the base jaw of the gripper. When the base moves into the deposit station, the locking pin is actuated, and the form fit mechanism is unlocked. The robot moves upwards out of the jaw quick-change system. The fingers and base remain in the deposit station. No additional work is required, as the robot performs the change independently. The new design of the system eliminates the need to drill through the finger. Only threaded holes are required. This gives users even more freedom when designing their fingers.



The automatic jaw quick-change system BSWS-R enables quick and automatic finger changes on the gripper – and it is extremely easy.

Process reliability through presence monitoring

The BSWS-R is available in nine sizes. In smaller versions up to size 100, the support stations are designed with elastomer bearings. This makes them ideal for use with cobots. For even greater process reliability, an optional inductive proximity switch is available to check whether the finger is in the deposit station. The base is also prepared for the installation of an RFID data carrier for finger coding. In addition to the new BSWS-R, the two manual change systems in the series will remain in place. With the tried-and-tested BSWS, the operator changes the finger using an Allen key, with the BSWS-M, this is done at the touch of a button.



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Boehlerit unveils face milling system KAPPAtec 55N

Tool manufacturer Boehlerit is launching a revolutionary face milling system KAPPAtec 55N, into the market. The innovative product is characterised by its stability, efficiency and effective cutting results and is ideal for machining common steel, stainless steel and cast iron materials. The Boehlerit face milling system offers a diameter range from 80 mm for Z04 to 315 mm for Z16 and comprises three different geometries (RK, MP, MM), which guarantee optimum

machining results. The proven Boehlerit cutting material grades, including coarse and fine grain substrates as well as high-performance coatings for cast iron and stainless steel machining, guarantee the highest quality and durability. A significant advantage of the face milling system is the ability to achieve high cutting depths of up to 9.5 mm, depending on the geometry of the indexable insert. Compared to the competition, the Boehlerit KAPPAtec 55N face milling system is characterised by a more stable design and a shim plate to reduce vibration and protect the insert seat in the event of insert breakage. With a total of 10 cutting edges per indexable insert, the KAPPAtec 55N face milling system is extremely economical.

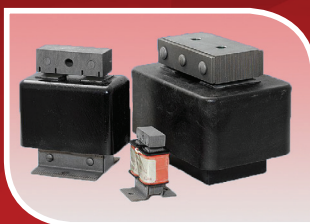
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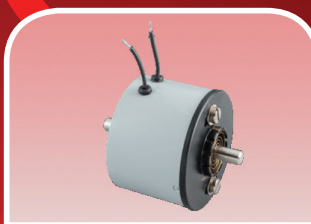


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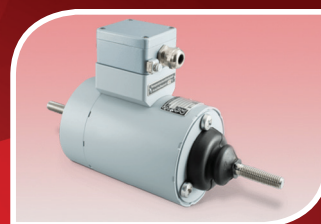
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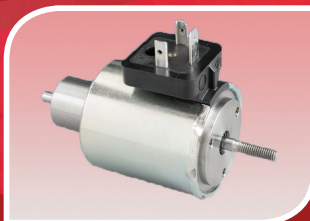
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Rotary Solenoids



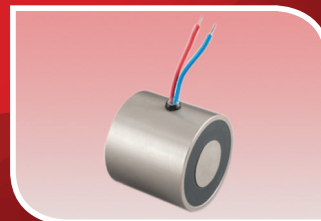
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Purvi Products Transforms Machine Tools

The industry is transitioning from traditional tools to automated, high-precision systems, says **Pathik Patel**, Partner, Purvi Products.

How is your company serving the manufacturing & machine tools sectors?

Purvi Products serves the manufacturing and machine tools sectors with an innovative blend of products, technologies, and services designed to address core industrial challenges.

We offer products such as:

- **POROSIL:** A game-changing fusion welding machine ideal for on-site metal dents and casting repairs. It eliminates the need for annealing or rehardening, significantly reducing downtime. Applications include repairing plastic molding dies, rolls, and casting parts.
- **RICHGOLD:** A portable brush plating machine designed for high-precision selective plating. It allows for on-site plating of metals like nickel, copper, tin, silver, or hard chrome. It is really useful for touch-up or repair of already plated parts, no electroplated tanks but plating by a hand held brush.

Technologies: Our advanced, award-winning designs emphasise portability, precision, and user-friendliness, ensuring operational efficiency and cost savings.

We offer job shop services such as:

- **ENI plating:** Plating without using electrical current so total uniform plating thickness on any shape. It is widely used for superior corrosion protection and wear-resistant coating in heavy machinery and automotive industries and is also suitable for repairing worn-out parts.
- **Magni Zinc flake coatings:** Provides high-performance anti-corrosion coatings for fasteners and sheetmetal components in automotive and machine tools sectors.
- **CED coating:** An eco-friendly coating solution used in automotive parts and machinery components to enhance durability.
- **Hard anodizing:** Used for surface hardening of aluminum components, ensuring wear resistance and longevity, particularly in engineering, aerospace, automotive and electronics industries.

We serve end-user industries such as



manufacturing, automotive, railways, defence, electronics, and heavy machinery. Our solutions cater to the need for cost-effective, efficient, and reliable repair and plating technologies.

How do you analyse the status of the Indian machine tools industry at present? What opportunities are you looking to tap?

The Indian machine tools industry is experiencing significant growth, driven by industrialisation, infrastructure development, and the rise of automation.

The industry is transitioning from traditional tools to automated, high-precision systems. Adoption of portable, on-site repair and maintenance solutions are increasing to reduce downtime. Government initiatives like Make in India are boosting domestic manufacturing capabilities.

Opportunities for Purvi Products include:

- **Domestic market:** Tap into the growing demand for cost-effective repair and plating solutions that minimise down time, outsourcing and transportation.
- **Export market:** Expand operations in manufacturing hubs like Germany, Japan, and the USA by showcasing innovative, portable solutions tailored to industrial needs.
- **Emerging sectors:** Collaborate with industries such as electric vehicles (EVs), renewable energy, and aerospace, which require high-precision tools and components.
- **Services contribution:** Job shop services like ENI Plating, Zinc Flake Coatings, Hard Anodizing and CED Coating align with the need for durable and high-performance coatings in precision manufacturing, offering additional avenues for growth.

What is driving the demand for your products/ solutions & services?

Some of the demand drivers are:

- Industrial sectors are focusing on reducing downtime and repair costs, creating a demand for on-site, portable repair solutions.
- The growing complexity of components requires

Tool Discs & Tool Holders

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BMT45, BMT55, BMT65, BMT75 & BMT85 COMMON FOR

DOOSAN, HARDINGE, HWACHEON, HYUNDAI - WIA, SPINNER, EMCO, SMEC, FFG-DMC, TAKISAWA-TAIWAN, TAKAMAZ, LEADWELL, VICTOR, HEADMAN ACCUWAY, GOODWAY, CHIAH CHYUN, TCM, SMART, MYLAS, TONGTAI, HURCO, COLCHESTER, ROMI, GANESH, JYOTI, ACE, LMW, ETC



BMT DISC & TOOL HOLDERS

BMT SHAFT SIZE	SUITABLE FOR
BMT38, BMT45, BMT54	MIYANO
BMT40, BMT55	BIGLIA
BMT40	MURATEC
BMT40, BMT55	EUROTECH
BMT40, BMT60	DMG-MORI
BMT44, BMT55, BMT65	NAKAMURA-TOME
BMT55, BMT65, BMT75	EMAG
BMT60	OKUMA
BMT65	HAAS
BMT65	T-SUGAMI
BMT68, BMT80	MAZAK

PROMINENT MACHINE TOOLS

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high-precision plating and welding technologies.

- Shortage of skilled labour for traditional repair and plating methods drives interest in user-friendly equipment.
- Increasing regulatory standards are pushing industries to adopt sustainable and efficient repair solutions.

Our USPs include:

- Portable solutions: Both POROSIL and RICHGOLD are designed for on-site operations, eliminating transportation delays and costs.
- Precision and reliability: Ensure plating thickness within ± 3 microns and high-quality welds without heat-affected zones.
- Cost-effectiveness: Save up to 30 per cent in repair costs and reduce downtime by 70 per cent with efficient in-house solutions.
- Comprehensive services: Job shop offerings like ENi, CED, Magni Zinc Flake Coatings and Hard Anodizing enhance the durability and performance of critical components, complementing the demand for reliable technologies.

How do you intend to tap the auto industry?

The automotive industry is a significant user of machine tools and new technologies for product improvement.

To tap this, we adopted strategy to:

- Offer POROSIL for repairing wear-and-tear in automotive molds, dies, and tools.
- Use RICHGOLD for selective plating of critical components like gears, shafts, and connectors, ensuring durability and conductivity.
- Promote job shop services like ENi, Magni Zinc Flake Coatings and CED Coating to improve corrosion resistance in automotive parts.

EVs offer big growth prospects for us. EV manufacturing demands lightweight, high-performance components. Our solutions can enable the precise repair and plating of battery connectors, motor parts, and electronic assemblies, aligning with the EV sector's requirements.

How do you plan to tap other end-user industries for future business growth?

Purvi Products' solutions can drive efficiency in various sectors:

- Railways: ENi plating for improving product life and better efficiency, Hard Anodizing for increasing the use of Aluminum, Magni coatings for fasteners and use POROSIL for on-site repair of heavy components.
- Defense: Provide precision plating and welding

solutions for critical equipment and components, meeting stringent quality standards.

- Electronics: Leverage RICHGOLD for repairing and plating delicate, high-value electronic components.
- Other Industries: The job shop services, particularly Hard Anodizing and ENi Plating, are ideal for industries needing durable, corrosion-resistant coatings on critical parts.

How are you planning to tap AI, digitalisation/automation, and sustainability trends?

For AI & digitalisation, we plan to:

- Explore AI-enabled diagnostics for repair solutions, offering real-time analytics to predict maintenance needs.
- Introduce smart tools with IoT capabilities for tracking performance and ensuring consistency.

For automation, we are designing user-friendly tools that can integrate seamlessly into automated production lines.

For sustainability, we are promoting portable solutions to reduce transportation emissions and waste. We are also highlighting the eco-friendliness of job shop services like CED Coating and Magni Zinc Flake Coatings.

Increased demand for lightweight, durable materials also aligns with our ability to deliver precise and efficient plating and welding solutions.

What are your growth plans for the company in the coming years?

We have various plans like:

- Expanding product portfolio: Innovate and introduce new tools to cater to emerging industries like EVs and aerospace.
- Domestic growth: Strengthen partnerships with industries like automotive, railways, and electronics to expand market reach.
- Global expansion: Leverage your expertise to increase exports to Germany, Japan, and the USA.
- R&D investments: Focus on integrating AI, IoT, and sustainable practices into our offerings.
- Enhancing services: Expand job shop capabilities, emphasising high-demand solutions like ENi Plating and Hard Anodizing for industries requiring advanced coatings.

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For details, contact Purvi Products, Ahmedabad, on Email: pateldineshn@gmail.com, pathikoo@gmail.com, or visit www.metalsurfacetreatment.in

(Communication provided by the management of the company)



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"Automation Driving Growth of Machine Tool Sector."

Automation, involving robots for production using digital tools like robots, cobots, artificial intelligence and 3D printing are the need of the modern market. We provide systems that are compatible with most of the automations. We have been approached by top industries for their requirements due to our robust marketing programmes as highlighted earlier, states **Hrishikesh B Sawant**, Director, C. And C. Laser Engineering Pvt Ltd, in this interview.

How is your company serving the manufacturing sector?

C. And C. Laser Engineering Pvt Ltd, founded in 2019, specialises in scientific and industrial laser products. With over 35 years of hands-on experience in laser system installation, maintenance, and services. The company offers advanced systems for laser marking, engraving, cutting, micro-machining, welding, and more. Its scientific laser products support applications such as synchronised laser pumping, interferometry, biological imaging, material processing research, macromolecule studies, fibre diagnostics, LIBS, laser flash photolysis, and LIDAR.



market was valued at \$1.5 billion in 2023, and is expected to reach \$3.2 billion by 2032 with the growth rate expected to grow at a compound annual growth rate (CAGR) of 8.2 per cent from 2024 to 2032. The industry is growing due to the increasing adoption of industrial automation, smart factory concepts, and Industry 4.0 technologies. There is always the demand for advanced technologies like CNC lathes, CNC routers, milling machines, and more which is growing. In addition, lasers are being used along with the mechanical tools to have a combined

system. These new opportunities need to be catered to, by the new laser technology.

How is your company serving the manufacturing & machine tools sectors?

Every tool and other manufacturing product should have a permanent identification. This identity would also include the manufacturing history – in the form of a barcode, or it could be a batch code with a serial number. These identities should be unique and permanent with an aesthetic look. This can only be achieved with laser marking machine that C. And C. Laser Engineering Pvt Ltd masters in. There are many manufacturing industries which require lasers as a part of their production, not only for the identification marks but also for other process during manufacturing. Laser micro-machining, cladding and 3D printing, are few such processes which go hand in hand with the actual manufacturing process in any industry.

How do you analyse the status of the Indian machine tools industry at present?

The Indian machine tool industry is currently growing, with a number of factors contributing to its expansion. The market size for the Indian machine tool

What are the USPs of your technologies?

C. And C. Laser Engineering Pvt Ltd provides lasers as well as laser based marking, engraving, micro-machining systems and the services for such applications. The technology of laser marking is demanding because the processing method is a non-contact procedure, but it is permanent. Lasers can mark on all metals, non-metals, regardless of the part being bare, painted, powder-coated, anodized or hardened. Laser marking machines can mark 2D barcodes for identification where in the user can add the entire history of the production of the part into a code that can as small as possible. The identification marking being non-contact, permanent & personalised is the USP of our systems. There are many processes that require the least amount of heat being imparted to the object to be processed. We can achieve this objective with ultrafast femtosecond and picosecond lasers. We use very high-power fibre lasers for cutting and welding.

How do you intend to tap the automotive

& auto component industries - the major users of machine tools?

We have been a regularly exhibiting in various laser shows enabling us to cater to various industries. We create awareness of our products and services by periodically advertising in subject related magazine like Smart Manufacturing Enterprises. We have marketing team that implements strategies to highlight our product features in various industries. We have been implementing conventional marketing techniques apart from digital marketing. On the digital front, we have optimised our website www.cnclaserengg.com search engines for top keywords. Our YouTube channel features videos that highlight our services and products. We have a strong presence on social media such as LinkedIn, Facebook.

The automotive and auto component industries are expected to grow due to the increasing demand for electric vehicles (EVs) and sustainable mobility solutions, some opportunities for the auto component industry - focus on EVs, develop data-enabled services, form partnerships, expanding portfolio with adjacent industries

How do you plan to tap other end-user for future business growth?

C. And C. Laser Engineering Pvt Ltd has established itself as a one-stop centre for all kinds of laser solutions through our marketing skills and expertise. We have been exploring various industries on regular basis as we have the repertoire to offer innovative and practical solutions be it a prototype of a large production run. With our gamut of experience and an exhaustive range of laser technology, we can provide world class laser-based systems and laser services. Lasers are used all over the world in the railways industry – lasers have many uses in the railway industry, which include cleaning tracks, inspecting tracks, measuring trains and vehicles, measuring contact wires, measuring carriage inclination and movement, measuring track width, measuring rolling surfaces.

Lasers have many uses in the defence industry, which include marking, cutting, micromachining, laser weapons and laser communication. Lasers are used in the electronics industry for many purposes, which include marking, welding, cutting, drilling and surface texturing. Lasers are a good fit for the electronics industry because they are precise, reliable, and can operate non-contact. They are also cost-effective and economical in the long run as laser machines are fault resistant and can be operated for long periods of time.

How are you planning to tap recent trends like AI, automation and sustainability?

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Which other trends are visible in the machine tool & accessories industry?

Automation, involving robots for production using digital tools like robots, cobots, artificial intelligence and 3D printing are the need of the modern market. As mentioned earlier, C. And C. Laser Engineering Pvt Ltd provides systems that are compatible with most of the automations. We have been approached by top industries for their requirements due to our robust marketing programmes as highlighted earlier.

What are your growth plans for the company in the coming years?

C. And C. Laser Engineering Pvt Ltd will be starting a laser manufacturing & repair CO₂ centre in India by mid of 2025. The centre would also be manufacturing lasers, provide extensive service for the lasers manufactured by us and also for most of the lasers manufactured by our principal companies. C. And C. Laser Engineering Pvt Ltd plans to install IR-GR-UV-CO₂ (nanosecond, picosecond, and femtosecond) laser marking, engraving, micro-machining, welding, and cutting systems all under one roof, very shortly.

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“Prominent Machine Tools to Unveil New Variant of Tool Disc at IMTEX 2025.”

The Bangalore-based Prominent Machine Tools manufactures tool disc, tool holders, VDI tool disc, VDI tool holders, BMT tool disc & holders, reduction sleeves, and subsidiary accessories for CNC turning & turnmill centres for all over the world. In this interview, **Gunasekaran G R**, CEO, Prominent Machine Tools, shares more details about the company's growth plans.



VDI tool holder

What kind of opportunities are you looking to tap in the machine tools industry? What are your USPs?

We are expecting the significant growth from key sectors such as automotive, aerospace, and electronics. Government initiatives such as Make in India are fostering significant growth in high-end machine tool manufacturing. The automotive industry, in particular, has been a major consumer of machine tools. With the rise of electric vehicles and increased foreign direct investment, the demand for advanced machine tools is expected to surge.

Computer Numerical Control (CNC) machines is notable, with the CNC segment anticipated to dominate the market due to its precision and efficiency. Some of key factors are understanding our target audience; offering high-quality products; setting competitive prices; creating a sense of urgency; and creating compelling content.

What are the growth prospects in the auto industry?

The growth possibilities for the machine tools industry in the electric vehicle (EV) sector are significant, driven by the rapid expansion of the EV market and the need for precision manufacturing. EVs rely heavily on lightweight materials (such as aluminium and composites) to improve efficiency and range. Advanced machine tools are needed for

precision machining of lightweight materials to meet quality standards. CNC and laser-based machining systems are critical for producing parts for lithium-ion batteries.

How do you plan to tap other end-user industries?

The fastest-growing sectors include railways, defence, and electronics among others. As we are looking to capitalise on future growth, this list of fast-growing industries in India and future growth sectors can help us make the most of India's economic potential in 2025-26.

How are new technologies aiding growth?

Use of IoT and AI in machine tools ensures high precision and efficiency in any part manufacturing. Automation is essential for mass production of EV components, ensuring scalability. Hybrid machines combining 3D printing and CNC machining offer opportunities for advanced manufacturing. Yes, we are also planning to adapt some of the digitalisation/automation to improve our manufacturing.

What are your plans for IMTEX 2025?

IMTEX is one of the largest trade fairs in India focusing on the metalworking and manufacturing sector. We will launch new variant of tool disc and subsidiary accessories. We are expecting to increase our customer range and gain more visibility among OEMs and machine builders.

What are your growth plans for the company?

With the help of IMTEX 2025, we are expecting a big growth by increasing product sales (by supplying precise tool discs all over the world), growing turnover by three times from the present level, and enhancing manufacturing capacity by adding two imported machines.

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(Communication provided by the management of the company)



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Emco Machines Significantly Reduce Production Time

CNC turning machines from Emco, based in Hallein, near Salzburg, are used to manufacture the spare parts required for the die casting tools.



The Hyperturn 65 Powermill G2 from Emco significantly reduces set-up and clamping times.

EMCO, a mechanical engineering company based in Salzburg, ranks among Europe's leading machine tool manufacturers. The international, family-run company owes its success to more than 75 years of expertise and experience in the area of machine tool engineering. Today, EMCO stands for top-of-the-line, customised, automated complete solutions for both turning and milling.

GF Casting Solutions Altenmarkt in Styria specialises in magnesium and aluminium die casting solutions for the international automotive industry. With around 650 employees, the company is an important regional employer in the field of light metal die casting in Austria and beyond. The company was founded in 1972 and has been one of 12 GF Casting Solutions AG production sites around the world since 1999.

Our cooperation works perfectly

The aluminium and magnesium die cast parts produced are mainly developed for the bodies, interiors and drive systems of premium cars sold worldwide. The focus here is on lightweight construction and ready-to-install solutions. The demands on the tools, which weigh up to 70 tons, are constantly increasing. Fast set-up

times are a key factor here.

CNC turning machines from Emco, based in Hallein, near Salzburg, are used to manufacture the spare parts required for the die casting tools. The Hyperturn 65 Powermill G2 is used here, along with the EMCOTURN E65 CNC turning centre, which was added this year. 'From the first technical discussions to the sales process and delivery, our collaboration with Emco went extremely well. Besides, I have been familiar with Emco



The CNC turning centre EMCOTURN E65 primarily produces screw cores for GF Casting Solutions. This makes it possible to produce spare parts at a high level and at high speed.



The EMCO machines are located in Plant 2 in St. Gallen.

machines since my training days, and we know that we are buying machines that deliver what they promise and perform very well in terms of precision,' says Thomas Klade, Team Leader, GF Casting Solutions.

'Both machines are perfectly tailored to our requirements and run excellently. The support from Emco is also really good,' says Klade. The EMCOTURN E65 turning centre is used primarily to produce screw cores. 'With this machine, GF Casting Solutions has been able to significantly reduce its machining times. The parts are collected in a pot and unloaded via the partial conveyor belt, which also eliminates the need to open the door. A bar loader can also be installed, which enables partially autonomous production,' explains Leopold Zerk, Head- Sales, Emco in Austria. He also emphasises how positive the collaboration is with GF Casting Solutions.

High quality in less time

GF Casting Solutions has a high demand for the screw cores to be produced. The company is broadly positioned with the foundry in Altenmarkt and is pleased that the EMCOTURN E65 turning centre has taken its internal spare parts management to the next level. Screw cores are now also produced in-house and stored for employees to remove as needed.

Regarding the special features of the machine, Leopold Zerk reveals, 'It is a universal turning machine with a 65 mm spindle passage, counter spindle, radial turret with twelve driven tools, as well as a Y-axis with 80 mm stroke.'



Georg Fischer Casting Solutions with the Altenmarkt site

One of the biggest advantages of this purchase is definitely the time saved. 'For example, if the system is given the order to produce 15 pieces, these are produced fully automatically within a certain period and engraved according to the requirements of our plant in Altenmarkt. They are then ejected onto a conveyor belt. No further manual intervention is required, and we have been able to reduce production time by two thirds,' says Thomas Klade.

The EMCO Hyperturn 65 Powermill G2, which was purchased in 2022, is also doing its job to complete satisfaction. 'Thanks to this machine, we have been able to minimise and simplify the work steps. The set-up and clamping times have been significantly reduced and we can produce very efficiently,' says Thomas Klade.

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Avians Sectional Overhead Doors for Diverse Applications

Whether one needs robust industrial doors, elegant transparent doors, or versatile garage doors, Avians offers sectional overhead doors that are a perfect blend of innovation and aesthetics.



as fully covered or semi-glazed versions for optimal daylight exposure. These sectional overhead commercial doors are made of high-grade pre-coated galvanized steel, and sandwich panel 40 mm / 80mm thick filled polyurethane foam.

Key features of these doors are:

- **Steel panels:** Constructed with 40mm/80mm thick G.I. panels, double-skinned, Polyurethane Foam (PUF) core for enhanced durability.
- **Heat insulation:** The double-skinned design provides excellent heat insulation, making these doors suitable for heated industrial environments.
- **Air and water tightness:** EPDM seals between panel joints ensure air and water tightness, adding an extra layer of

Regarding advanced door solutions, Avians stands at the forefront with its state-of-the-art sectional overhead doors. These doors are designed to cater to diverse needs and combine security, functionality, and aesthetics. Let's dive into the specifics of the three main types of Avians sectional overhead doors: Industrial, transparent, and garage.

Industrial sectional overhead door

Avians industrial sectional overhead doors are designed to meet the highest security and reliability standards. These doors, made from robust G.I. steel panels, ensure your industrial premises are well-protected. Our industrial sectional overhead doors are specifically designed to suit modern industrial architecture. We offer a complete range of industrial sectional overhead doors, either insulated sandwich panel doors or glazed doors. They provide good air tightness and insulation. They can also be supplied

protection.

- **Environment-friendly:** Insulated panels with zero ozone depletion potential (ODP) and low global warming potential (GWP).
- **Sound insulation:** Capable of achieving significant sound insulation.
- **Safety and control:** Integrated with advanced electronic direct drive and intelligent control, alongside standard safety mechanisms to halt operation upon obstacle detection.

These doors are not just robust and durable but are also aesthetically pleasing with various textures to match modern industrial architecture. Additionally, they can be integrated with touchless solutions, safety sensors and face recognition devices, to minimize contact and reduce accident risks.

Transparent sectional overhead door

Avians transparent sectional overhead doors



are ideal for spaces where visibility and daylight are crucial. The doors maintain transparency, providing a clear outside view and showcasing the interior to outsiders. They are designed for areas where ample daylight is desired and can effectively address lighting issues in warehouse buildings, showrooms, and other applications.

Key features of these doors are:

- **Transparent panels:** Made from extruded cold-profiled, anodized, or painted aluminium sections with synthetic double glazing.
- **Daylight optimisation:** Ideal for showrooms, warehouses, and other applications where natural light is beneficial.
- **Elegant design:** These doors offer a clear view, enhancing the aesthetic appeal of both the interior and exterior spaces.
- **Safety standards:** Equipped with standard safety edge mechanisms and compliant with EN safety standards.

Transparent sectional overhead doors not only solve lighting issues in large spaces but also provide a stylish and modern look, making them an excellent choice for contemporary architecture.

Garage sectional overhead door

Avians garage sectional overhead doors bring a blend of style, safety, and convenience to residential spaces. These doors are an excellent alternative to traditional garage doors, offering numerous benefits. Avians bring you the best design to suit the aesthetics of your home. They are a modern-day alternative to conventional doors that were used for garages. The fantastic insulation value and security properties of a double-skinned, insulated sectional garage door also mean that it is an ideal door to maintain a constant temperature inside. With our garage sectional doors, you can use a complete length of the driveway and

they give you more space both inside and outside of the garage. These doors are manufactured from galvanized steel with almost any color or tough new laminate wood grain finish.

Key features of these doors are:

- **Galvanized steel panels:** Constructed with Polyurethane Foam (PUF) insulation for superior strength and heat insulation.
- **Space efficiency:** Allows full use of driveway length and provides more space inside and outside the garage.
- **Ease of use:** Features a convenient electric drive system with remote control, enabling operation from within your car.
- **Noiseless operation:** Integrated soft-start and soft-stop functions ensure smooth and quiet operation.
- **Security:** Equipped with push-open security devices and electronically monitored systems to guard against burglaries.



Available in various designs and colors, these doors can be customised to complement the aesthetics of any home. With their excellent insulation properties and advanced security features, Avians garage sectional overhead doors are a practical and stylish choice for modern homes.

Conclusion

Avians sectional overhead doors are engineered to provide maximum security, functionality, and aesthetic appeal. Whether you need robust industrial doors, elegant transparent doors, or versatile garage doors, Avians offers a solution that meets your needs. Upgrade your premises with Avians sectional overhead doors and experience the perfect blend of innovation and aesthetics.

SME

For details, contact Avians on Mob: +91 83903 00400,
Email: sales@avians.co.in, or visit www.avians.co.in

(Communication provided by the management of the company)

T90 70R RIDE ON FLOOR SCRUBBER DRYER

Soma Specialities Pvt Ltd offers T90 70R ride on floor scrubber dryer.

Features:

- The T90 70R is a battery operated ride-on scrubber dryer used for cleaning large floor spaces as it is very productive due to its ergonomic and easy to use design. This machine scrubs and cleans the floor and dries the wet floor simultaneously by sucking the dirty water through vacuum action. It can provide productivity of upto 3500 sqm/ hr which is very useful when large areas are to be cleaned in short span of time and it also saves on labour costs as one machine can do the job of 10 people.
- The tanks are made of tough rotomolded plastic and have large capacity of 90 Ltrs & 100 Ltrs for the solution tank and recovery tank respectively so that it can cover a larger area without needing downtime for tank refill & discharge.
- Cleaning solution discharge is controlled electronically to regulate output and save water efficiently when not in use.
- The vacuum motor has a powerful suction that does not leave any water behind but is muted to eliminate noise that can cause disturbance to co-workers. The squeegee can be mounted quickly and the rubber strips can be used on all four sides to reduce consumables cost. Batteries are sealed and maintenance free and can be easily used for upto 4.5 hours on a single charge thereby saving maintenance cost and increasing productivity.
- The machine decelerates automatically when turning or reversing to protect people, objects and the machine also from toppling over. The soft start of the brush reduces the burden on motor and batteries. Traction motor is quite powerful and offers speeds upto 5 km/hr and climbing gradient up to 12%. Brakes are also powerful and stop the machine immediately when applied to avoid any accidents.
- The splash proof rubber of the brush is designed with elastic tension spring which saves tools for assembly and disassembly. The T90 70R is highly useful for all types of large spaces such as in large spaces such as warehouses, factories, shopping malls, airports, railway stations, educational institutions, etc.

About the Company: Soma Specialities Pvt Ltd, the pioneer in introducing cleaning machines in India since 1992 has added yet another innovative floor cleaning machine to its range.

Contact:

Soma Specialities Pvt Ltd, Mumbai
Tel: 022-25786895 Mobile: 09594988533
Email: info@somaspecialities.com



POLYGON TURNING MACHINE

Trishul Machine Tools Pvt Ltd offers a wide range of polygon turning machine.

Features:

- Trishul Machine Tools Pvt Ltd has made an effort to categorize the secondary operations post turning and find an economical solution to machine these parts effectively.
- Polygon Turning is a generation process. The tool and the job rotate simultaneously.
- The locus of the point of contact of the two interposing circles, is an "ellipse" of minor diameter equal to the across flat size of the component and the major diameter equal to twice the tool diameter and across flat size of the polygon.
- The sides of the polygon generated by the polygon Turning process are not flats theoretically.



- They are segments near the minor diameter of the ellipse.
- Unlike in turning where the disturbing forces are generally uniform throughout the process, in the Polygon Turning operation the disturbing forces varies from point to point on the surface being machined owing to the varying dynamic geometry of the tools.
- The varying chip thickness is another important factor contributing significantly to the disturbing force. Under these circumstances the stability of clamping and the natural stiffness of the part being machined have to be essentially rigid enough resist the disturbing forces induced by the cutting action.
- The process of choosing the right diameter of the tool holder is a balance between productivity and flatness.

About the Company: Trishul Machine Tools Pvt Ltd is engaged in the business of Polygon Turning for over 20 years and has mastered the Process including machining of Super alloys like Duplex, Super Duplex, Inconel, Monel and Titanium.

Contact:

Trishul Machine Tools Pvt Ltd, Bangalore
Tel: 080-27836100, 27836166
Mobile: 08792007892
Email: info@trishulmachine.com

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CNC POLYGON TURNING MACHINE – POLYGON 2A

Brisk Tech Engineers offers CNC polygon turning machine – polygon 2A.

Features:

- One of their flagship products is the CNC Polygon Turning Machine, a state-of-the-art solution designed to deliver high precision and versatility in polygonal and complex part machining.
- This machine is ideal for producing multi-sided components with high accuracy, offering superior surface finishes and tight tolerances. The CNC Polygon Turning Machine is engineered to optimize production efficiency, reduce cycle times, and improve overall productivity, making it an essential tool for industries such as automotive, aerospace, etc.

About the Company: Brisk Tech Engineers, based in Bangalore, is a trusted name in the field of precision engineering.

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Contact:

Brisk Tech Engineers, Bangalore
Mobile: 09448479855, 07892743816
Email: info@brisktechengineers.com



UV, FIBER, CO₂ LASER PROCESSING SYSTEMS

C And C Laser Engineering Pvt. Ltd. provides flexible, cost effective and low maintenance CO₂, IR – Fiber/Diode-pumped, GR & UV marking & other processing systems.

Features:

- State-Of-The-Art Laser Marking-Engraving-Processing machines with the Lasers ranging from the Far IR – CO₂, IR – Fiber/Diode-pumped, GR & UV.
- With the UV Laser Series, we offer a flexible, cost effective and low maintenance marking system for non-metals and organic materials. The Marking Software - Marking Mate is easy to operate and allows you to quickly define parameter for single piece, small scale, medium scale and large-scale production.
- UV Laser Marking Machines are available in power ranging from 3W to 20W to achieve top quality marking in industry and craft.

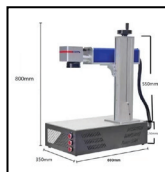
About the Company: C And C Laser Engineering Pvt. Ltd. also offers compact lasers for all applications – lasers of wavelengths from Far IR – CO₂ Lasers, Diode-pumped fiber-coupled IR, Green, UV and DUV lasers. cutting, etc.

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Contact:

C And C Laser Engineering Pvt Ltd,
Mumbai
Tel: 022-35061794 Mobile: 09833105515
Email: info@cnclaserengg.com



FHP ELECTRIC MOTORS

Delco Fans Pvt Ltd offers single phase capacitor run and three phase FHP electric motors, totally enclosed face, foot and flange mounted, as per customer specific requirements.

Features:

- Wide variety and range to meet trouble free application for original equipment manufacturers. Both side shaft rotation available. Sealed Ball Bearing on both sides. 'F' class insulation. Shaft Dia and length available as per requirement. Motors available from 1/35 HP to ¼ HP.
- Its application areas: Scientific & Laboratory Equipment's; Blood Bank Equipment's; Chromatographs; Panel Coolers; Medical equipments.

About the Company: Delco Fans Pvt Ltd established in 1975. Their manufacturing range consists of FHP Electric

Motors, Geared Electric Motors, Centrifugal Blowers and Industrial Fans.

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Contact:

Delco Fans Pvt Ltd, Thane
Mobile: 09769201564,
Email: delcofans@gmail.com



THREE POLE, NON-DIRECTIONAL 3 O/C OR 2 O/C + 1 E/F RELAY JRC 053P/JRC 053

JVS Electronics Pvt Ltd offers a wide range of three pole, non-directional 3 O/C or 2 O/C + 1 E/F relay JRC 053P/JRC 053.

Features:

- The relay measures the line current from each of the phases and if exceeds the set operating current, then relay extends a trip signal after the operating time.
- The relays operating time is determined by selecting one of the four inverse time current characteristics. The relay has facility to active / inhibit the high set protection feature. The relay output contacts are self reset type. Relay operation without any fault current is determined by trip test facility.
- Its features include: Software based design; Programmable time current characteristics; Choice of four IDMT curves; Draw out case; Wide range auxiliary supply; Low burden.

About the Company: JVS Electronics Pvt Ltd is an exporter, manufacturer and supplier of audio indicating

instruments, visual indicating instruments, electrical indicating instruments, etc.

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Contact:

JVS Electronics Pvt Ltd, Bangalore
Mobile: 09448288863
Email: bangalore@jvselectronics.in



METERING CHAMBER

Excel Power Switchgear Pvt Ltd offers a wide range of metering chamber.

Features:

- Metering chamber is equipped on top of the breaker chamber and encased separately from the high voltage section.
- Based on customer's specification, protective relays, meters, control switches, indicating lamps and other pilot devices are flush mounted on the hinged and lockable front door.
- Sufficient space is available inside the chamber to arrange all the secondary control equipment, fuses, MCB's, auxiliary relays, terminal blocks, etc.



About the Company: Excel Power Switchgear, a high tech manufacturing unit established in 1998, is engaged in R&D, production, and manufacturing of low & medium voltage switchgear. Since then, Our company has displayed a rapid growth in the switchgear industry by attaching primary importance to customer oriented approach and by producing quality products.

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Contact:

Excel Power Switchgear Pvt Ltd, Chennai
Tel: 044-22254870
Email: sales@excelpower.co.in

HOSE REELS – AIR / WATER / OIL

Vijay Air Control offers a wide range of hose reels – air/water/oil.



Features:

- An included spring works to retract a hose into the device automatically.
- A contained hose solves the short of air consumption for air tool owing to a large inner diameter.
- A ratchet system applied for the device can keep a tool suspended at any position on the hose travel where your want. Available in both closed body construction as well as open today.
- Its bore sizes: Ø16, 20, 25, 32, 40, 50, 63, 80 and 100; Conforms to ISO 21287 standards.

About the Company: : Vijay Air Control is a one large workplace where work is done and then put on the market in the form of products and services. This work must be benefit if it is to hold its own in the face of competition.

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Contact:

Vijay Air Control, Bengaluru
Tel: 080-23148871, 23141136
Mobile: 08951101436, 09880652082
Email: saivacblr@vacpneumatic.co.in

MEASUREMENT SOFTWARE

Blum-Novotest Measuring & Testing Technology Pvt Ltd offers a wide range of measurement software.

- ### Features:
- User-friendly software for workpiece measurement and temperature compensation with BLUM touch probes.
 - They can be used both for workpiece referencing as well as for measuring during the production process.
 - Optimum exploitation of potential of the BLUM touch probes.
 - NC-based measuring cycles for measurement of the Kinematics of 4 or 5 axes milling machines. Measurement of the accuracy and correction of the kinematics of 1 or 2 rotary axes. Identification of machine problems caused by incorrect machine settings, collisions or wear.



About the Company: Blum Novotest Measuring & Testing Technology Pvt Ltd has made a name for itself in the list of top suppliers of bore gauge, radio receiver in India.

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Contact:

Blum-Novotest Measuring & Testing Technology Pvt Ltd, Bangalore
Tel: 080-23185468 Mobile: 09075004435
Email: info@blumnovotestindia.in

PRECISION TWIN MACHINE VICE

B R Precisions offers a wide range of precision twin machine vice.



Features:

- Twin machine vices are capable of clamping two pieces simultaneously with one single movement of the handle keeping the total length constants.
- This makes it ideal for machining series of work pieces in machining centers. The exterior clamping system towards the center makes the elevated forces in the clamp area to be compensated dynamically thus avoiding deformations.
- Grinding of all surfaces, Possible working positions supported on the base on the side or vertically on the head. Suitable for working in horizontal and vertical machining centers Squareness and parallelism accuracy at 0.02 Microns.

About the Company: B R Precisions is dedicated to the manufacturing of clamping solutions; our main products are high pressure and precision vices.

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Contact:

B R Precisions, Bangalore
Mobile: 09845208854, 09449648171
Email: brvices@rediffmail.com, brprecisions@gmail.com

ALL ELECTRIC BALL SCREW PRESS BRAKE, BB4013

Meiban Engineering Technologies offers all electric ball screw press brake, BB4013.

Features:

- RAM shaft drive enables high speed movement at 100 mm/sec and stable repeat-stop accuracy by adopting a ball screw drive mechanism by AC Servo motor and ball screw drive. This drive mechanism is superior in environmental performance as it is oil less and comprises of a reducer which reduces noise.
- The consistent repeat stop accuracy (repeatability) makes BB Series machines highly accurate.
- The operator support function has been enhanced, including an announcement and an indicator to notify the machine status.

About the Company: Meiban Engineering Technologies Pvt Ltd is a solution provider in the field of automation and turn key projects for manufacturing automobile and sheet metal components..

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Contact:

Meiban Engineering Technologies Pvt Ltd, Bangalore
Tel: 080-26860600
Email: office@meibanengg.com



WIRE HARNESS

Miracle Electronic Devices Pvt Ltd offers a wide range of wire harness.

Features:

- As a leading looms manufacturer in India, we exemplify the commitment to excellence in providing cutting-edge wire harness solutions that meet the highest industry standards. And, as a versatile looms manufacturer in India, we offer a range of wiring solutions, including circular connectors, D sub connectors, Mil-spec. connectors, D-38999 circular connectors, etc.
- These harnesses cater to various applications such as single & discrete EMI cables, EMI-shielded cable harnesses, wiring harness multiwire, flat cable harness assembly, RF cable assembly, airborne looms, etc.

About the Company: Miracle Electronics is a renowned Transformer manufacturer in India, engaged in manufacturing power transformers, toroidal transformers, EI transformers, SMPS transformers, etc.

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Contact:

Miracle Electronic Devices Pvt Ltd, Bangalore
Tel: 080-28362750
Email: sales@miracle.net.in



SURFACE GRINDING MACHINE (MANUAL)

Universal Machine Tools Corporation offers surface grinding machine (manual).

Features:

- The machine is built of heavy cast iron hand scrapped to fine tolerance, easy movement of table slide by providing V – ways & flat ways.
- The grinding wheel spindle is hardened and round and runs in precision contact angular bearing and driven by flange, vertical grinding wheel slide movement down at right side in the body.
- The vertical wheel dial least count in 0.01mm and micro feed least count in 0.001 mm. These machines are available in various sizes: 450 X 225 mm , 600 X 300 mm. And also available in hydraulic version.

About the Company: Universal Machine Tools Corporation, established in 1981, is one of the leading companies in the machine tool industry.

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Contact:

Universal Machine Tools Corporation, Bangalore
Tel: 080-23356231, 23108370, 23206821
Mobile: 09845006959, 09844199559
Email: universalblr@gmail.com



PARALLEL GRIPPER - PGL-PLUS-P

Schunk Intec India Pvt Ltd offers a wide range of parallel gripper - PGL-PLUS-P.

Features:

- These standard parallel grippers include small parts, universal, long-stroke, and sealed grippers for safe and precise handling of work pieces.
- The ability to equip the grippers with inductive sensor systems, magnetic switches or work piece-specific gripper fingers improves their functionality, process reliability, and productivity.
- Integrated sensor system: for precise and process-reliable monitoring of the complete gripper stroke via IO-Link. Large jaw stroke: enables flexible handling of a wide range of parts.

About the Company: Schunk Intec India is engaged in products distribution and supply of industrial automation systems, automation work holding, tool holding, heat shrink tool holder, etc.

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Contact:

Schunk Intec India Pvt Ltd, Bangalore
Tel: 080-40538999
Email: rakhi.singh@in.schunk.com, info@in.schunk.com

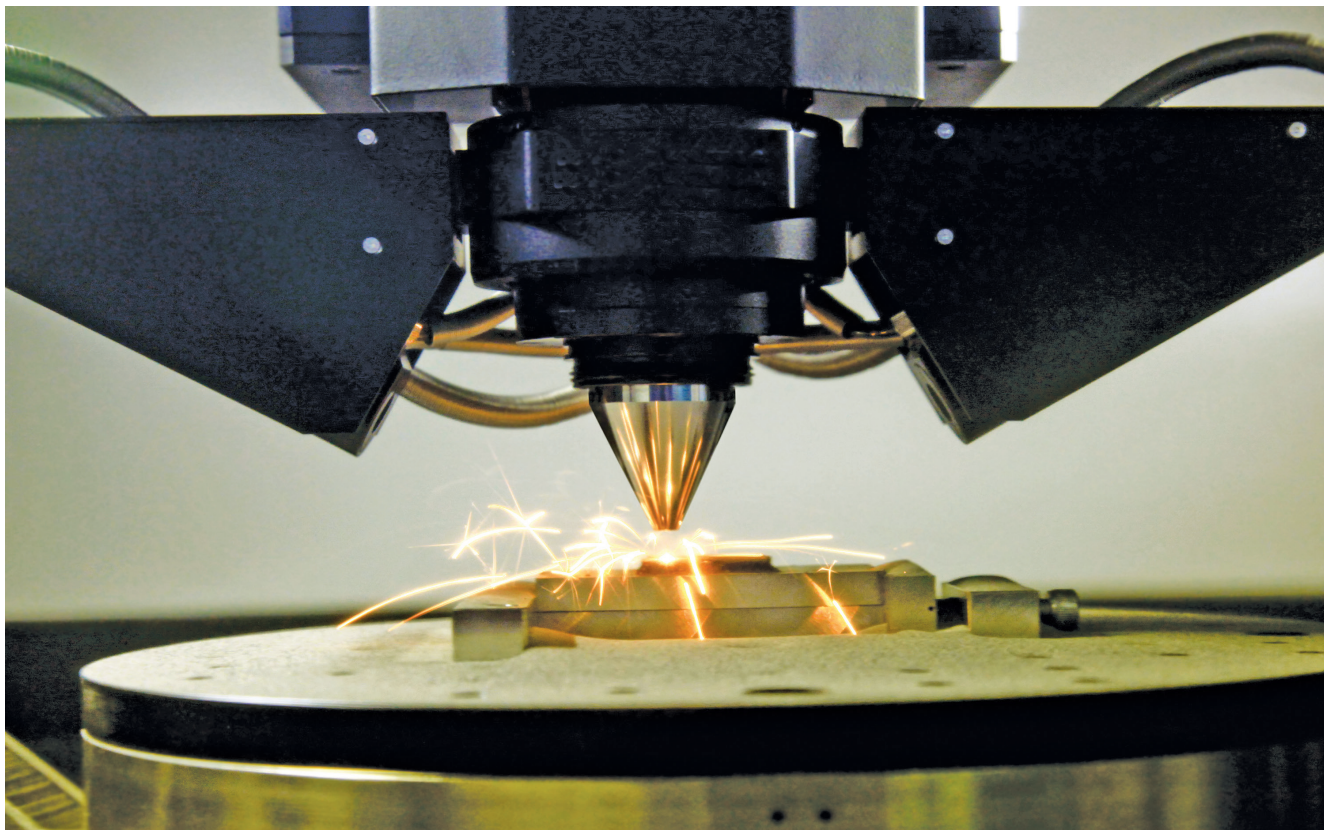




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The 3D Metal Revolution

India is rapidly emerging as a frontrunner in the world of 3D metal printing, a technology that is reshaping the way industries approach manufacturing. From aerospace to automotive, healthcare to defence, this innovative process is transforming production lines, offering exceptional opportunities for efficiency, customisation, and design flexibility, says **Sanskriti Ramachandran**.



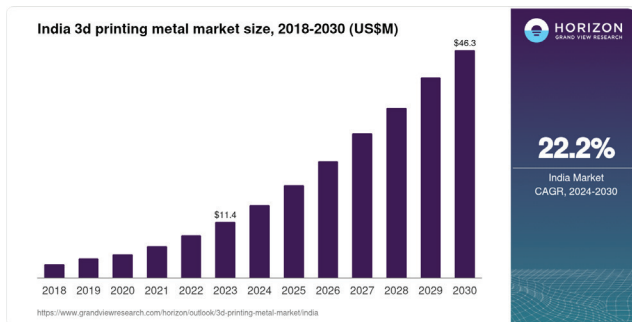
The world of manufacturing is undergoing a radical shift, and at the heart of it lies 3D metal printing. This cutting-edge technology builds metal parts with astonishing precision, layer by layer, unlocking designs that were once impossible to achieve. Beyond its technical marvels, it's a tool of transformation—streamlining production, reducing waste, and accelerating innovation across industries.

In India, 3D metal printing is leading a quiet revolution. From etching the national emblem onto a lunar rover to redefining automotive manufacturing timelines, this technology is reshaping what was once impossible. With each breakthrough, India is etching a new path in advanced manufacturing, proving that the future is being built one row at a time.

Metal 3D printing, also known as additive

manufacturing, creates objects by fusing layers of metal or metal powder using lasers or electron beams. This process occurs in a closed, inert environment to prevent oxygen contamination, ensuring precision and quality. Common materials used include aluminum, stainless steel, titanium, cobalt chrome, and Inconel. Industries like aerospace, automotive, energy, and healthcare are leveraging this technology for its ability to produce complex geometries and consolidate multiple components into single, efficient designs.

Various techniques, such as Direct Metal Laser Sintering (DMLS), Selective Laser Sintering (SLS), and Laser Powder Bed Fusion (LPBF), cater to different production needs. Research firm Horizon predicts that the Indian 3D printing metal market is projected to reach \$46.3 million by 2030 and a compound annual growth



Source: Horizon Grand View Research

rate of 21 per cent from 2025 to 2030, the sector's growth is undeniable.

Real-world impact

During the COVID-19 pandemic, when supply chains were disrupted globally, Amace Solutions demonstrated the power of 3D metal printing. In just 20 hours, they designed, printed, and delivered critical ventilator parts. **Dr Vishwas R Puttige**, CEO, Amace Solutions, shares his experience, "A customer urgently required ventilator parts. Within 20 hours, we managed to generate a quotation, receive a purchase order, print the required parts, and ship them. This demonstrated the speed and efficiency of 3D printing."

This rapid response isn't limited to medical emergencies. Amace also played a pivotal role in India's Chandrayaan-3 mission. The Pragyan rover, which marked India's lunar success, featured wheels etched with the ISRO logo and the national emblem, crafted with unmatched precision using 3D printing.

The automotive industry, too, has embraced this innovation. Companies like Bajaj Auto and Hero MotoCorp use 3D metal printing for rapid prototyping and design validation. Dr Puttige highlighted a standout project, "We collaborated with an electric motorcycle startup to produce 3D-printed components for three motorcycles in just 15 days. The assembly process took another 15 days, and within 30 days, the entire project was completed. One of these motorcycles set a Guinness World Record by covering over 14,000 kilometers across India without any issues."

Addressing challenges

Despite its advantages, 3D metal printing faces challenges. **Yathiraj Kasal**, General Manager and Business Head, Wipro 3D, elaborated on these hurdles:

- **Complex geometries:** The enhanced design possibilities of 3D printing often result in geometrically complex features. Machining supports for these intricate designs and ensuring no unfused powder remains trapped in internal channels is a significant challenge.

- **Material limitations:** The range of materials suitable for 3D printing is still limited compared to traditional manufacturing. Designers must account for material availability during the design phase to avoid delays or surprises during production.
- **Dimensional accuracy:** Achieving the necessary dimensions and tolerances for functional requirements remains a critical focus area.

Recent trends

The field of 3D metal printing is constantly evolving. Kasal highlights several recent trends shaping the industry, "Multi-material printing is enabling the integration of diverse materials in a single component, enhancing functionality and performance for industries like aerospace and healthcare. Multi-laser systems are reducing print times, making large-scale production more practical and efficient."

Engineers are also adopting lightweight designs, inspired by nature, to minimise material use while maintaining strength, benefiting sectors like automotive and aerospace. Additionally, component consolidation allows multiple parts to be combined into a single unit, simplifying assembly and cutting costs.

These trends showcase the growing impact of 3D metal printing on innovation and manufacturing efficiency across industries.



Multi-material printing is enabling the integration of diverse materials in a single component, enhancing functionality and performance for industries like aerospace and healthcare. Multi-laser systems are reducing print times, making large-scale production more practical and efficient.

Yathiraj Kasal,
General Manager and Business Head, Wipro 3D

The future

Additive manufacturing is revolutionising the metalworking industry by offering unprecedented design freedom and efficiency. **Amit Raina**, Country Manager-India, Dormer Pramet, comments, "Traditional manufacturing methods often result in significant material wastage, especially during machining, where excess material is removed to achieve the final shape. In contrast, 3D printing minimises waste by constructing parts layer by layer, using only the exact amount of



Looking to the future, breakthrough technologies in 3D metal printing are expected to revolutionise the industry even further.

material required. This precision not only cuts down on waste but also reduces costs and improves sustainability.”

Additionally, 3D printing enhances production speed by enabling rapid prototyping and quick design iterations. This acceleration of the product development cycle allows manufacturers to bring products to market much faster than with conventional methods, making it an invaluable tool for industries that prioritise speed and innovation.

Customisation and technological advancements

The ability to produce customised parts on demand is another transformative aspect of 3D metal printing. This capability is especially valuable in industries such as healthcare and aerospace, where specialised, tailored components are often needed. 3D printing makes it easier and more cost-effective to meet these niche demands, opening the door for highly personalised manufacturing solutions.

Looking to the future, breakthrough technologies in 3D metal printing are expected to revolutionise the industry even further. Industry leaders, like Fronius, are excited about two key advancements that promise to reshape manufacturing processes.

One is the closed-loop feedback system, which allows

for real-time process control and material characterisation. This system will improve both precision and quality assurance, ensuring manufacturers can achieve greater reliability and efficiency in their production.

Another promising technology is Cold Metal Transfer (CMT), exemplified by the Fronius CMT Additive Pro process. This system delivers high deposition rates and precise molten pool control, making it ideal for producing high-quality, complex parts, especially when working with difficult-to-weld alloys. The CMT process is particularly suited for high-volume production and applications that demand tight tolerances, further expanding the capabilities of 3D metal printing.



3D printing enhances production speed by enabling rapid prototyping and quick design iterations. This acceleration of the product development cycle allows manufacturers to bring products to market much faster than with conventional methods, making it an invaluable tool for industries that prioritise speed and innovation.

Amit Raina,
Country Manager-India, Dormer Pramet

Expanding applications

As the technology matures, its applications continue to grow. Sectors such as healthcare are leveraging 3D printing for custom implants and prosthetics. Aerospace manufacturers are producing lightweight, high-strength components, while the defence industry is exploring its potential for rapid prototyping and low-volume production.

India's 3D printing ecosystem is steadily expanding, with companies like Amace Solutions, Wipro 3D, and others leading the charge. The country's focus on Aatmanirbhar Bharat and Make in India are further driving the adoption of advanced manufacturing technologies. Investments in research, infrastructure, and skill development will be crucial in realising the full potential of 3D metal printing.

3D metal printing is India's ticket to the future of manufacturing. Its ability to defy traditional constraints, reduce time-to-market, and enable customisation makes it a game-changer. As industries continue to innovate and adopt new technologies, India stands on the brink of becoming a global powerhouse in additive manufacturing. The journey has only just begun, and the possibilities are limitless.

SME



We collaborated with an electric motorcycle startup to produce 3D-printed components for three motorcycles in just 15 days. The assembly process took another 15 days, and within 30 days, the entire project was completed. One of these motorcycles set a Guinness World Record by covering over 14,000 kilometers across India without any issues.



Dr Vishwas R Puttige,
CEO, Amace Solutions



"Amace Printed India's Emblem on Pragyan Rover."

Amace Solutions is one of the frontrunners in the 3D printing space in India. Our machines have been adopted by a variety of industries and organisations, including; ISRO, DRDO, private sector industries like automotive and mold-making companies, as well as educational institutions, says **Dr Vishwas R Puttige**, CEO, Amace Solutions Pvt Ltd, to Sanskriti Ramachandran while discussing the intricacies of 3D metal printing and its challenges.

Kindly brief us about Amace Solutions.

Amace Solutions Pvt Ltd, also known as Amace, is part of the Ace Micromatic Group, which is a subsidiary of IS Designers Limited. The group has been a leader in metal cutting for nearly 50 years, specialising in CNC turning machines, CNC milling machines, and other metal-cutting technologies. We have catered to both domestic and international markets, with over 100,000 machines installed worldwide. This makes us the largest provider of CNC technology in India. Amace Solutions started as an R&D project approximately eight years ago and was spun off as an independent company in early 2018.

We focus on two primary areas. First, we manufacture and sell metal 3D printers, and we are one of the frontrunners in this space in India. Our machines have been adopted by a variety of industries and organisations, including ISRO, DRDO, private sector industries like automotive and mold-making companies, as well as educational institutions. Second, we offer 3D printing services for customers who wish to explore the benefits of 3D metal printing or additive manufacturing before investing in the technology themselves. These services include printing parts, consultancy, training, and helping customers build awareness about 3D printing. We assist in digitising their inventory and converting conventional components into 3D-printable designs.

What key sectors are you focusing your services on?

The key sectors we cater to include space technology, medical technology, defence, aerospace, automotive, general engineering, and education. These are evolving industries where 3D printing is rapidly gaining traction, and we are committed to serving their needs effectively.



What kinds of metals and alloys do you specialise in for 3D metal printing?

We work with a wide range of materials to meet the needs of various applications. Our expertise includes stainless steel, aluminum alloys, titanium alloys, Inconel (a nickel-based, high-temperature-resistant alloy), and maraging steel (a high-strength steel). We also handle niche materials like cobalt-chrome and copper-based alloys. In addition to the established materials, we are actively developing new alloys and materials tailored to specific customer

requirements.

What are the challenges in the process?

There are several challenges in 3D metal printing. The first is identifying which components are suitable for 3D printing. Many customers are not aware of which parts are worth converting, making screening a critical step. Another challenge is the limited availability of materials. While conventional manufacturing processes use over 5,000 types of metals, 3D metal printing currently works with only about 25–30 materials, though this number is increasing steadily. Post-processing is another significant challenge. After printing, components often require secondary machining or finishing processes to achieve high accuracy and surface quality, particularly for mating surfaces or critical tolerances.

How do you incorporate new materials into your process?

Incorporating new materials is a critical part of our R&D efforts. We prioritise material development based on demand. When there is growing interest in a specific material for an application, we take up its development

and validation. Once finalised, we offer it to our customers, ensuring it meets their specific needs and expands the potential of 3D printing applications.

Can you share a success story where your 3D metal printing helped a client?

We have numerous success stories. One notable example is from the COVID-19 pandemic when a customer urgently required ventilator parts. Within 20 hours, we managed to generate a quotation, receive a purchase order, print the required parts, and ship them. This demonstrated the speed and efficiency of 3D printing. Another proud moment was our contribution to ISRO's Chandrayaan-3 mission. The Pragyan rover, which left India's footprint on the moon, had wheels bearing an ISRO logo and the Indian national emblem. Amace printed the national emblem, a significant milestone for us.

In the automotive sector, we have helped companies like Bajaj Auto and Hero MotoCorp rapidly validate their designs using metal 3D printing. For instance, we collaborated with an electric motorcycle startup to produce 3D-printed components for three motorcycles in just 15 days. The assembly process took another 15 days, and within 30 days, the entire project was completed. One of these motorcycles set a Guinness World Record by covering over 14,000 kilometers across India without any issues. These examples highlight how 3D printing can accelerate design validation and reduce time-to-market for various industries.

What are some recent trends in 3D metal printing?

The 3D metal printing industry is witnessing several exciting trends. Machines are becoming larger and more productive while simultaneously becoming more affordable. New materials are being developed at a rapid pace, further enhancing adoption. The technology is also making significant inroads into niche markets such as electronics, semiconductor manufacturing, and space technology. For example, rocket engines with complex geometries are now being successfully 3D printed. These advancements are bringing 3D metal printing closer to becoming a mainstream manufacturing process.

What are your company's goals for expanding or enhancing 3D metal printing capabilities?

Our primary goal is to continuously enhance the productivity and usability of our machines. We are working on incorporating smart features and sensors to improve the user interface and make the machines more customer-friendly. Additionally, we are focused on expanding into the education sector domestically, where



BS:5315. | SAE-J1508



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MSWD



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• Tel.: 022-28684221 / 28682257

• Fax: 022-28688348

• E-mail: klipco@mtnl.net.in

• www.klipcoclips.com

3D metal printing is gaining significant traction. Internationally, we see increasing opportunities in North America and Europe as more customers recognise India's potential as a reliable equipment supplier. We are optimistic about the growing demand for our machines in these regions.

What do you believe will be the next big breakthrough in 3D metal printing?

The next big breakthrough will likely involve integrating advanced software features, AI-driven manufacturing processes, and digital manufacturing techniques. Machines will become more productive and affordable, bridging the gap between 3D printing and conventional methods like investment casting. This will help dispel the perception of 3D metal printing as an expensive, niche technology. As manufacturing trends shift towards smaller production volumes with higher variety, the flexibility and efficiency of 3D metal printing will make it an indispensable tool. With these advancements, the adoption of Agile manufacturing and digital processes will revolutionise the industry both in India and globally.

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"We are Eyeing New Markets for Metal 3D Printing."

Wipro 3D specialises in variety of metals and alloys such as titanium, stainless steel, aluminum, Inconel, copper and cobalt-chrome alloys. There are many custom alloys which Wipro 3D has developed to meet their specific functional requirements from the customers. In conversation with Sanskriti Ramachandran, **Yathiraj Kasal**, General Manager & Business Head, Wipro 3D delves into the unknown 3D metal printing process and its technicalities.

What sectors are you focusing on for metal 3D printing services?

Wipro 3D primarily focus on the aerospace, automotive, energy, medical, and industrial manufacturing sectors. We cater to prototyping, tooling and production needs of our customers. Our customers benefit greatly from faster turnaround time, tool less production, cost efficiency, and supply chain efficiency, that metal 3D printing offers. Apart from metal 3D printing Wipro 3D also provides polymer 3D printing services.



AM PS4 engine for ISRO's LPSC unit. This engine powers the upper stage of the PSLV. LPSC redesigned it with the Design for Additive Manufacturing (DfAM) approach, achieving significant advantages. Using the Laser Powder Bed Fusion technique, the number of parts was reduced from 14 to a single piece, eliminating 19 weld joints. This streamlined process drastically cut raw material usage, requiring just 13.7 kg of metal powder compared to 565 kg of forgings and sheets in the conventional method. It also reduced overall production time by 60 per cent. The engine underwent

What types of metals and alloys do you specialise in for metal 3D printing?

Wipro 3D specialises in variety of metals and alloys such as titanium, stainless steel, aluminum, Inconel, copper and cobalt-chrome alloys. There are many custom alloys which Wipro 3D has developed to meet their specific functional requirements from the customers.

How do you incorporate new materials or technology into your manufacturing processes?

We stay at the forefront of the materials by continuously researching and integrating new materials and cutting-edge technologies into our manufacturing processes. This includes collaborating with material scientists, engaging with customers to understand new requirements, and leveraging advanced software for design optimisation. We have consistently introduced many difficult to print materials successfully with our strong material and manufacturing expertise.

Share a success story where 3D metal printing significantly benefited a client.

We take pride in collaborating on numerous success stories with our valued customers, one of which is the

successful hot testing at ISRO Propulsion Complex, Mahendragiri, in May 2024, marking a milestone in efficient and innovative manufacturing.

What are your plans for expanding Wipro 3D's capabilities?

Our goals include expanding our production capacity, investing in new machinery bring out new machines, and enhancing our R&D capabilities. We aim to explore new markets and applications for 3D metal printing, as well as improve our service offerings to provide even greater value to our clients.

What do you believe will be the next big breakthrough in 3D metal printing that could reshape manufacturing?

We believe that the next big breakthrough will be the development of fully automated, end-to-end 3D metal printing systems. These systems will integrate design, printing, and post-processing in a seamless workflow, significantly reducing production times and costs while maintaining high-quality standards. This advancement has the potential to revolutionise the manufacturing landscape.



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3D Printing Summit: Innovations in Healthcare

The workshop offered a diverse lineup of sessions focusing on 3D printing applications in surgical education, neurosurgery, orthopaedics, and biomedical engineering.

The 3D Printing Summit for Medical Devices, Simulation, and Innovation successfully concluded at the India International Centre, Lodhi Road, New Delhi. Organised by All India Institute of Medical Sciences - AIIMS, New Delhi, with support from the Indian Council of Medical Research (ICMR) Centre of Excellence—a collaborative initiative between AIIMS and IIT Delhi in Neuro-Engineering—and in partnership with Stratasys and Altem Technologies, leaders in the global 3D printing industry, the two-day event brought together renowned medical professionals, engineers, and industry experts to explore the transformative potential of 3D printing in healthcare.

The workshop offered a diverse lineup of sessions focusing on 3D printing applications in surgical education, neurosurgery, orthopaedics, and biomedical engineering. Attendees participated in interactive panel discussions, hands-on demonstrations, and a 3D printing design competition, fostering collaboration and knowledge exchange.

Ashish Suri, Professor-Neurosurgery, AIIMS, highlighted the critical role of 3D printing in advancing neurosurgical simulation and device development, “3D printing has transformed how we approach complex brain and spine surgeries. By enabling the creation of precise anatomical models and neurosurgical devices, we can simulate procedures, enhance training, and improve patient outcomes. Integrating such technologies is vital for the future of neurosurgical education.”

Rajiv Bajaj, Managing Director- India & Southeast Asia, Stratasys, underscored the transformative power of 3D printing in healthcare, “3D printing is no longer a vision of the future, it is a tool revolutionising healthcare today. India is among the leading global adopters of this technology with its healthcare ecosystem, from surgeons, to researchers and device manufacturers using digital anatomy printers to save precious human lives and



provide better surgical outcomes. Collaboration between clinicians and technologists is essential to fully harness the potential of 3D Printing and increase its adoption, and such events play an important role in enhancing it.”

Ramandeep Singh, Scientist D, Neuro-engineering Lab, AIIMS, New Delhi, and organising secretary of the workshop, highlighted the pivotal role of biomedical engineering in transforming patient care through 3D printing, “By merging engineering principles with clinical requirements,

3D printing is enabling patient-specific solutions that were previously unimaginable. From the creation of tailored implants to surgical simulation platforms, this technology bridges the gap between innovation and clinical applicability, fostering a paradigm shift in how we approach complex medical challenges.”

Exploring the future of 3D printing in healthcare

The workshop highlighted how 3D printing is reshaping healthcare by facilitating the development of surgical guides, anatomical models, and neurosurgical devices that enhance planning, education, and patient care. Discussions spanned innovative areas like bioprinting, customised implants, and 3D cadaver printing, emphasising the profound impact of these technologies on the future of medicine.

A notable feature of the event was the 3D printing design competition, where participants showcased creative and practical healthcare applications. This platform inspired inventive thinking and demonstrated how emerging talent can drive the next wave of medical innovation.

The workshop’s success marks a significant step toward integrating advanced manufacturing technologies in medicine, paving the way for personalised and precision-driven healthcare solutions.

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Charged up for Accelerated Electric Mobility

EV charging guns are not merely tools; they represent the backbone of the clean energy revolution. As India leads the way in scaling EV adoption, the continued evolution of charging connectors will play a crucial role in ensuring that the transition is safe, efficient, and sustainable, writes **Ishaan Parwanda**, Director, Trinity Touch.



Image Source: ShareAlike

The electric vehicle (EV) revolution is accelerating worldwide, including in India, transforming transportation and spurring the development of cutting-edge charging infrastructure. At the heart of this transformation lies a critical yet often overlooked component: EV charging guns or connectors. As India and the world move towards sustainable mobility, the evolution of EV charging guns plays a pivotal role in enabling the safe, efficient, and widespread adoption of electric vehicles.

Early days of EV charging infrastructure

The transition to EVs began with basic charging setups designed for low power requirements. Early

systems primarily supported two-wheelers (2W) and three-wheelers (3W), which required little more than a standard 16A outlet for inline charging. However, with the rise of electric cars and commercial vehicles demanding higher power now, the need for sophisticated charging solutions has emerged.

Modern EV charging infrastructure integrates advanced safety protocols and communication mechanisms. Data communication has become a crucial fourth pillar alongside Live, Neutral, and Earth connections. Chargers now interact dynamically with vehicles, ensuring safe power cut-offs during anomalies, reflecting how the technology has matured to meet safety and efficiency requirements.

Looking ahead, concepts like vehicle-to-grid (V2G) technology could redefine EVs' role in energy systems, enabling batteries to stabilise grids or power homes during peak demand. Charging connectors, the essential interface between vehicle and infrastructure, remain central to these innovations.

India's rapidly growing EV charging ecosystem

India's EV market has witnessed exponential growth, with EV sales surging from 160,000 in 2019 to 1.5 million in 2023. However, this growth has been unevenly distributed, with 2W and 3W dominating the segment. These vehicles largely rely on portable chargers, reducing the pressure on public charging infrastructure. Despite this, the number of charging stations in India has grown from just 451 in 2021 to over 16,300 by mid-2024, signaling the beginning of a robust charging network.



Globally, the journey toward EV adoption has often been marred by fragmented charging standards, leading to consumer confusion and slower uptake.

The Indian government has played a proactive role in standardizing EV connectors to ensure seamless adoption. The Bureau of Indian Standards (BIS) mandates the use of formats like CCS2 (DC), Type 2 (AC), and LEV DC, offering compatibility across vehicle categories and preventing the fragmentation seen in early global markets.

Unlike other countries that faced challenges with multiple, often incompatible charging standards, India's foresight has created a unified ecosystem from the outset. This approach has enabled EV users to access public charging networks without worrying about compatibility, fostering consumer confidence and accelerating adoption.

Advancements in EV charging gun technology

EV charging guns have evolved significantly to meet the demands of modern electric mobility. Innovations focus on three key aspects: durability, performance, and user experience.

Durability: Ingress Protection (IP) ratings, such as IP67, have become the gold standard for ensuring that

connectors are dustproof and waterproof. These standards are essential in countries like India, which face diverse weather conditions.

Performance: Connector pins, often silver-plated for enhanced conductivity, are designed to withstand high temperatures generated during fast charging. Indian standards account for higher temperature thresholds than international norms, reflecting the unique demands of the local climate.

User Experience: Design improvements, such as ergonomic grips and textured finishes, make connectors easier to handle. These features are particularly critical for ensuring user satisfaction in high-traffic charging environments.

Technological advancements in connector designs also prioritise safety, preventing short circuits, overheating, and other risks, while maintaining compatibility with various vehicle segments.

Standardization as a game changer

Globally, the journey toward EV adoption has often been marred by fragmented charging standards, leading to consumer confusion and slower uptake. For instance, early EV markets were divided by proprietary standards from American, Japanese, European, and Chinese automakers, resulting in limited interoperability.

India has avoided this pitfall by mandating a set of standardized connectors from the outset. The BIS-compliant formats ensure that every EV sold in the country is compatible with public charging infrastructure. This cohesive approach has set India apart, enabling a seamless transition to electric mobility.

Road Ahead

EV charging guns are not merely tools; they represent the backbone of the clean energy revolution. As India leads the way in scaling EV adoption, the continued evolution of charging connectors will play a crucial role in ensuring that the transition is safe, efficient, and sustainable.

From meeting India's unique environmental challenges to supporting global innovations like V2G technology, the humble charging gun holds the key to unlocking the future of electric mobility. As advancements continue, these connectors will remain at the forefront of enabling a greener, cleaner tomorrow.

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About the author:

Ishaan Parwanda is a Director at Trinity Touch, a leading product manufacturer and solutions provider for industrial electrical applications

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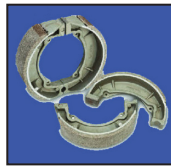


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“Greaves Engineering Is Steadily Increasing Exports.”



Greaves Cotton Ltd (GCL), with a rich engineering legacy of over 165 years, offers end-to-end energy solutions redefining the sustainable and green mobility ecosystem through transformative technology. Looking after the development and execution of the company's long term strategies is **Dr Arup Basu**, GCL's Managing Director, who has more than 30 years of experience in executive leadership roles in manufacturing intensive industries such as automotive, chemicals, packaging, etc. In this interview with Rakesh Rao, Dr Arup Basu highlights emerging trends in the Indian manufacturing sector and the company's plans for robust growth with minimum carbon footprint.

How has Greaves Cotton Ltd, which has a rich engineering legacy of over 165 years, transitioned in the last five years? And where it is heading in the next five?

165 years is evidence that the ability to roll-with-the-punches is deeply embedded in Greaves' DNA. Through the last few years, Greaves has successfully identified and used relevant intrinsic assumptions to pivot into the next phase of sustainable profitable growth. This meant, moving us from products to solutions, in keeping with the tailwinds present today. Building on an eco-system playbook, the springboards for growth comprise fuel-agnostic mobility, greener energy solutions, an expanded geographic footprint within India and beyond, supported on a foundation of by customer-centricity and a digital operating ecosystem. This transformative process has already been set in motion.

Given your experience, how do you view the changes in the Indian manufacturing sector in the last 5 years?

The manufacturing sector has a pivotal role in driving national economic growth, and focusing on its development is essential for harnessing its full potential to boost India's overall economic performance. This conviction is driven by an interesting shift across three factors: confidence, competence, and comprehension. A study of M&A activity of Indian companies in recent years is a useful lead indicator of the future. Industries across sectors are investing heavily in human capital and all other types of capital to build an arsenal of differentiators and unique value propositions. Partnerships and collaborations between civil society, government and the business community are enabling and accelerating capability and competency building.

Finally, entrepreneurs and entrepreneurship are receiving genuine and long overdue mainstream societal respectability for their role in value and job creation. Simultaneously, the Indian consumer is becoming as discerning and demanding. Government too is helping build the national soft and hard infrastructure, supporting collaboration and interdependence and

reframing the rules of the game, all steps that are crucial to make manufacturing competitive and therefore successful. The heady dual themes of ‘Atmanirbhar Bharat’ and ‘Viksit Bharat’ constitutes the apex ‘purpose’ driving this sector to accelerate the journey to achieving its full potential.

What are the opportunities in front of the Indian manufacturing industry today?

The Indian manufacturing industry is blessed with a huge domestic customer base and a geopolitical tailwind that supports a widespread global customer footprint. The share of global trade is modest, so headroom for growth is significant. The Indian factor cost structure is favourable and on the soft side, Indian talent has acquired a reputation globally for technical acumen and exceptional work habits. In addition, notwithstanding infrastructural gaps, federal and state governments are supportive of industry, willing to listen to their points-of-view and want industry to thrive.

How is Greaves Engineering (the engineering division of Greaves Cotton) gearing up for robust growth with minimum carbon footprint?

The ability to listen is a trait we actively nurture at Greaves. Combined with this our business-to-business (B2B) and business-to-consumer (B2C) businesses help us build a wider view of the demand landscape. Accordingly, Greaves Engineering is expanding its product and solutions portfolio so that we maintain our dedication to environmental stewardship by focusing on innovation and sustainable energy solutions. For example, our CPCB IV+ compliant gensets lower NOx and particulate matter emissions, thus significantly cutting GHG emissions. Our gensets incorporate features such as electronic fuel injection systems and remote monitoring capabilities, enhancing efficiency and reliability.

To support cost-effective sustainability, we have introduced Retrofitted Emission Control Devices (RECD) kits, allowing older gensets comply with the latest emission standards. We are also developing hybrid gensets that integrate renewable energy sources like solar and biofuels, further reducing fuel consumption and emissions. By building capabilities in fuel-agnostic technologies, our engines can operate on fuels such as CNG, Biodiesel and Ethanol blends, enabling customers meet ever tightening environmental and emission norms and respond with agility.

Our commitment extends to sustainable manufacturing practices, including zero-liquid discharge systems, rainwater harvesting, and on-site solar power installations. Furthermore, use of eco-friendly materials in production minimises waste and supports a circular

economy. By advancing hybrid technologies and renewable energy integration, Greaves Engineering is playing a pivotal role in achieving India’s net-zero vision.

How is the acquisition of Excel Control linkage driving Greaves Engineering’s growth?

The acquisition of Excel Control linkage has helped Greaves Engineering expand its solutions portfolio to include a wider range of complementary products, long-standing customers, and geographies. Apart from these the bundle comprising industry leading profitability, diversified internal competencies, cross-selling, sourcing synergies, customer-centricity, and agile product innovation will act as differentiators and force multipliers in our growth trajectory.

How do you intend to expand exports?

Greaves Engineering is steadily and systematically increasing export share of total revenues. Key elements of value proposition for our export customers include a culture of enduring relationships, reliable and robust products from our ever-widening portfolio, adherence to committed timelines, competitive techno-commercials, local partnerships offering after-sales service support and agile responsiveness. Indian emission and environmental regulations are increasingly identical and sometimes even stricter than those prevailing in developed economies. Hence our products are at once suitable for India and the world beyond. We tailor our offerings to local geographies – auto engines to Europe, small engines, engine components and motion control solutions to the USA, gensets to Africa and large engines to the Middle East are some examples of this approach.

What are your growth plans?

The continued focus on capital expenditure for infrastructure projects presents opportunities for market expansion and revenue growth for Greaves Engineering. GCL’s active participation in various government and private initiatives including projects in the power sector, inland waterways and shipbuilding OEMs positions us to capitalise on this momentum. Demand for gensets in infrastructure development continues to grow steadily, while applications requiring small engines have demonstrated consistent growth over the past few years.

On last mile mobility, we are expanding our customer base and portfolio across fuel options (diesel, CNG, biofuels, electric) and engine/motor sizes. Our relentless focus on product enhancements, new product development and innovation is built on a bedrock of a deep understanding of unit economics, manufacturing excellence and continuous improvement.

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Robots Gaining Strong Traction in India

The Indian manufacturing industry continues to experience strong growth in 2024, spurred on by government investments in infrastructure. Industrial robots are rapidly gaining traction in India, says **Samantha Mou**, Research Analyst, Interact Analysis.



The industrial robot market is facing a mixed picture over the coming years, with 2024 set to end on a challenging note. Global robot shipments are projected to decline by 0.2 per cent, following a flat performance in 2023. Compared with our May 2024 forecast, we have revised our 2024 projections for overall shipments downward by 5.8 per cent; from over 553,000 units to 521,328 units. Additionally, the expected growth for 2025 has been reduced by 0.7 percentage points. These revisions reflect weaker-than-anticipated sales to the automotive industry in the second half of 2024 within the US and Europe, along with continued sluggish demand in China.

Despite these challenges, we expect a gradual recovery in 2025. This is driven by anticipated increases in machinery investments – as key economies lower interest rates – alongside a broader recovery in the global manufacturing sector. However, factors such as high inventory levels and weak order intake are likely to persist in many industry sectors. This could potentially dampen robot demand during the first half of 2025. We forecast that industrial robot shipments will return to growth rates of over 7 per cent by 2026.

Market by robot type

Collaborative robots (cobots) stand out as a key growth area. We expect to see a 15.9 per cent increase in shipments in 2024, despite the global economic

slowdown. However, as competition increases, the price decline for cobots has been the most pronounced, resulting in a slower projected revenue growth rate of 11 per cent during 2024.

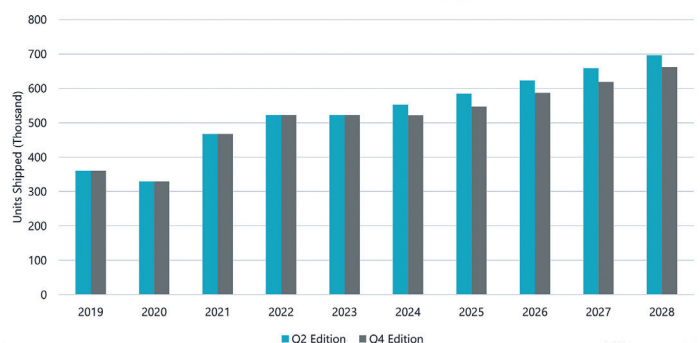
SCARA robots are expected to see modest growth of 1.8 per cent in 2024, fuelled by demand recovering in Asia's semiconductor and electronics sectors. In contrast, other robot types will experience declines in shipments of 1-3 per cent over the year, primarily due to challenges within the automotive and broader industrial sectors.

Regional market dynamics

Robot shipments in the Americas are projected to contract by 6.6 per cent in 2024, primarily due to sluggish demand from the automotive industry. Shipments in the electronics and metal sectors are also experiencing declines. While demand for robots in consumer-related sectors is growing, it is not enough to offset the downturn in other industries. However, the life sciences sector has been a bright spot, with strong growth in demand for robots used in pharmaceutical production and medical device assembly in the US.

From 2024 to 2028, industrial robot shipments in the Americas are expected to grow at a CAGR of 6.1 per cent.

Global Industrial Robot Shipments

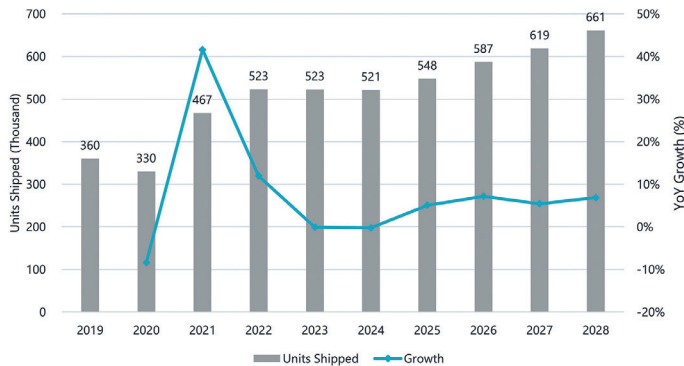


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Interact Analysis' forecast for robot shipments in 2024 and beyond has been revised downward.

Industrial Robot Shipments and Forecasts



Source: Interact Analysis

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Interact Analysis expects global robot shipments to reach 548,000 units in 2025.

After the double-digit growth seen in 2021 and 2022, it is expected that the market will stabilize and expand at a more moderate pace in the coming years. We anticipate the continued trend towards greater automation and US reshoring initiatives will support the growth of manufacturing and demand for robots in the region.

In 2024, robot shipments in Asia Pacific are expected to increase by 2.3 per cent, driven by a 3.3 per cent increase in China and a 4.9 per cent rise in the rest of APAC (excluding Japan and South Korea).

- The Indian manufacturing industry continues to experience strong growth in 2024, spurred on by government investments in infrastructure. Industrial robots are rapidly gaining traction in India.
- The robot market in Taiwan and Southeast Asia is also seeing steady growth, fuelled by recovery of the semiconductor industry.
- China's manufacturing sector is facing another challenging year in 2024. Due to overcapacity in the EV battery and solar panel industries, robot shipments in these sectors are expected to decrease by nearly 10 per cent. Additionally, robot demand in the automotive and electronics sectors is expected to show only modest growth.

From 2024 to 2028, robot shipments in Asia Pacific are projected to grow at a compound annual growth rate (CAGR) of 6.2 per cent. Excluding China, South Korea and Japan, the region is expected to record a CAGR of 7.4 per cent. Southeast Asian countries are emerging as key hubs for the electronics, semiconductor, and automotive industries, with international companies increasingly establishing factories there. This is expected to help drive robot demand.

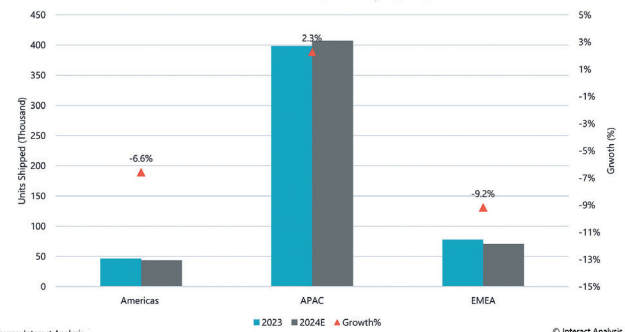
In 2024, robot shipments in EMEA are expected to decline by 9.2 per cent. In Europe, orders sharply deteriorated in the second quarter, particularly in the

automotive sector. Like North America, robot shipments in the European life sciences and food & beverage industries are expected to see smaller declines (2-3 per cent), in contrast to the larger contractions anticipated in industries such as automotive, metal, and rubber & plastics. Although the new energy segment in Europe is comparatively small, it is also expected to experience a significant drop in robot shipments.

From 2024 to 2028, we expect robot shipments in the EMEA region to grow at a CAGR of 5.6 per cent. Demand growth in Eastern Europe is expected to accelerate with the expansion of the automotive supply chain in the region. Specialist countries in the life sciences sector, such as Denmark and Switzerland, are also expected to see above-average growth.

However, larger manufacturing hubs, like Germany, are anticipated to experience slower growth, due to the ongoing recession in the manufacturing sector and structural challenges that could hinder economic recovery.

Industrial Robot Shipments by Region



Source: Interact Analysis

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Americas and EMEA are expected to see declines in robot shipments during 2024.

Final thoughts

In conclusion, the industrial robot market is navigating through a period of instability, with regional and sector-specific challenges influencing overall growth. While 2024 is a year of contraction, the medium-term outlook is more positive, especially as economic recovery gains momentum and new opportunities arise for automation.

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About the author:

As a research analyst at Interact Analysis based in China, Samantha Mou provides support in the industrial automation sector. She brings with her a master's degree in Economics, and has experience, while working in Germany, conducting market research in industrial equipment and automobile components.



Solar Panel Defect Detection Made Easy

By detecting and addressing defects early in production, the technology extends the lifespan of solar panels and ensures they meet stringent performance standards. Its robust quality control capabilities ensure products meet standards, accelerating the adoption of renewable energy, says **Gautam Mohanka**, CEO, Gautam Solar, in conversation with Sanskriti Ramachandran.

Gautam Solar, a manufacturer of Technically Advanced Modules™, has filed a patent for its latest AI-based system to detect defects in solar panels. This innovation integrates advanced imaging and AI technologies to enhance the efficiency and precision of defect detection in photovoltaic cells, setting a new benchmark for the solar industry. The system incorporates 100 per cent electroluminescence (EL) testing, covering both pre- and post-production stages with AI-assisted analysis.

The patent, titled 'AI-Based System for Detecting Defects in Solar Panels', leverages EL and visual imaging for comprehensive real-time defect analysis. High-resolution EL images are captured using an infrared camera and processed through advanced machine-learning algorithms. The system provides defect labels and actionable insights, allowing immediate identification and corrective measures.

Driving innovation

"Gautam Solar's AI-based defect detection system establishes a new standard for quality assurance in solar panel manufacturing," said **Gautam Mohanka**, CEO, Gautam Solar. "Unlike conventional methods prone to human error, this system utilises advanced imaging and AI technology to perform 100 per cent EL testing during both pre- and post-production phases. By ensuring unparalleled accuracy in detecting issues like micro-cracks, dead cells, and latent defects, we can produce Technically Advanced Modules™ with superior reliability and performance."

"At Gautam Solar, innovation drives our mission," Mohanka stated. "We consistently push boundaries to enhance system capabilities and explore new applications in solar technology. Our R&D efforts focus on meeting the evolving needs of the solar industry, further solidifying our leadership in renewable energy solutions."

The system enhances the durability and efficiency of solar panels, directly addressing consumer concerns



about long-term reliability. By detecting and addressing defects early in production, the technology extends the lifespan of solar panels and ensures they meet stringent performance standards.

Gautam Solar's AI-powered solution addresses the shortcomings of traditional quality control methods, which often lack automation and are susceptible to human error. The system's features include:

- **Comprehensive testing:** EL imaging detects defects such as micro-cracks, broken cells, dry soldering, latent flaws, black borders, scratches, and non-functioning cells.
- **Machine-learning algorithms:** Trained on a vast database of images, the system analyses data with remarkable accuracy.
- **Enhanced efficiency:** Automation reduces manual intervention, improves throughput, and increases production efficiency.

"Our AI-powered defect detection system transforms the quality control process in solar manufacturing, delivering greater reliability and optimising production," commented Mohanka. "This innovation supports our goal of building a smarter, more sustainable future for the solar industry." This advanced system represents a significant leap in solar technology. By incorporating real-time monitoring and AI-driven repair suggestions, it ensures early defect detection, improving the overall quality and reliability of solar panels.



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How Data-Driven Optimisation Works

Optimisation is about achieving the desired output with minimal resources, ensuring no compromise in performance or uptime. For compressed air systems, understanding key data such as pressure needs, compressor operation, flow patterns, and energy consumption is critical, **Panchu Saha**, Energy Manager-Compressor Technique Service, Atlas Copco (India) Private Limited.



Optimisation refers to the process of utilising minimal resources to achieve the same or required level of output without affecting performance or uptime. For instance, if the application requires compressed air at 5 bar, but the supply is 6.5 bar, reducing the pressure by 1 bar without compromising the application's performance can lead to significant energy savings. This is called optimisation.

Compressed air system data

Understanding compressed air system data is crucial for effective optimisation. Some of the key factors include:

- **Pressure need:** Manufacturers define their pressure requirements. The challenge arises when varying pressure ranges are needed within a plant. Utility teams often maintain the highest required pressure plus a safety margin. For example, if a plant's maximum requirement is 5 bar, a safety margin of 1 bar might result in maintaining 6 bar across the plant.

- **Compressor operation:** Multiple compressors are typically operated based on flow requirements, with individual pressure setpoints programmed into their controllers. Variations in pressure sensors or location can cause operational differences, even with small discrepancies (e.g., 0.05 bar), impacting machine behaviour.
- **Flow patterns:** Flow consumption can vary due to production schedules, shift changes, or maintenance. Understanding flow patterns helps optimise compressor usage. Leakage, a significant contributor to non-productive usage, must be addressed to ensure the success of optimisation efforts.
- **Energy consumption:** Existing energy consumption data is essential to evaluate optimisation potential and ensure a viable return on investment (ROI). Without this data, it is difficult to measure the benefits of implemented optimisation strategies.

Optimisation can be of two types:

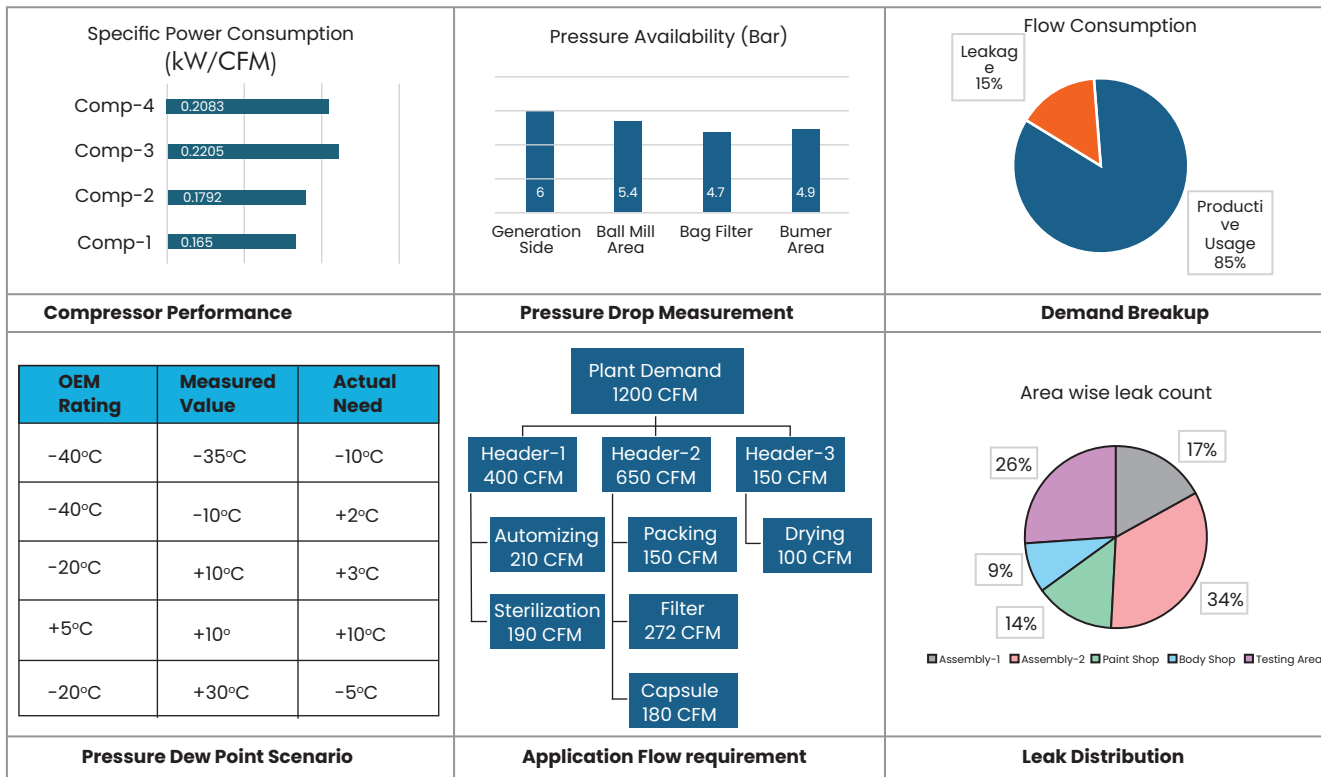


Figure 1: Overview of the AIRScan audit

- Within the existing system (minor adjustments):
 - Minimal or no capital investment required.
 - Medium to low returns with an ROI of 6 months to 1 year.
- System upgrades (new technology/equipment):
 - Involves capital investments and equipment changes.
 - ROI expectancy of 1 to 2 years.

Data-driven optimisation approach

At Atlas Copco, we recognise that every installation is unique. Our approach ensures tailored solutions through

a detailed site understanding, irrespective of the compressor manufacturer.

Step 1: AIRScan Audit

AIRScan is a comprehensive service that evaluates compressed air systems to identify optimisation opportunities. Key parameters assessed include:

- Flow:** Consumption vs. requirement, leakage levels, and artificial demand.
- Pressure:** Availability vs. requirement, reasons for pressure drops, and solutions to reduce them.
- Power:** Compressor performance vs. design expectations, identifying ways to reduce energy

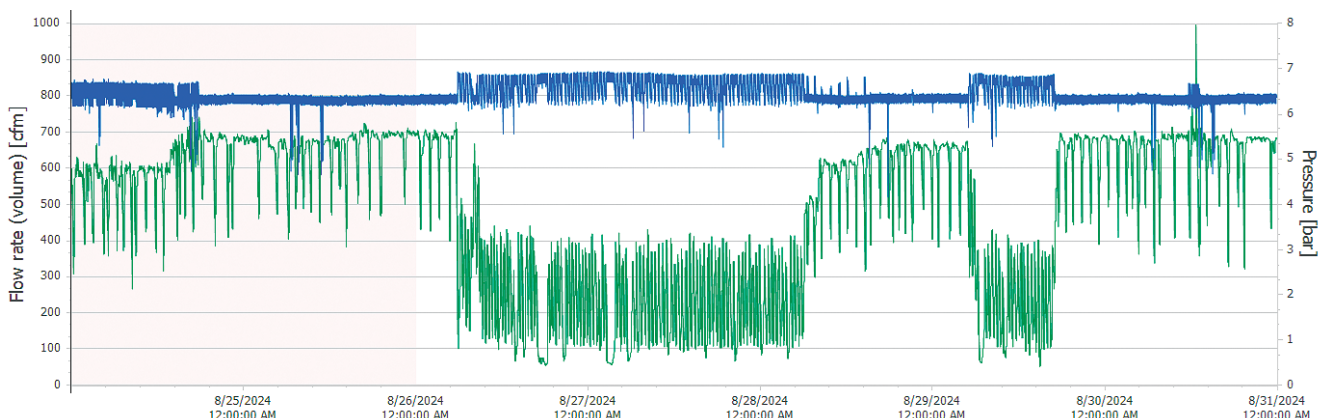


Figure 2: Flow profile generation

Load/No load/stopped hours per compressor

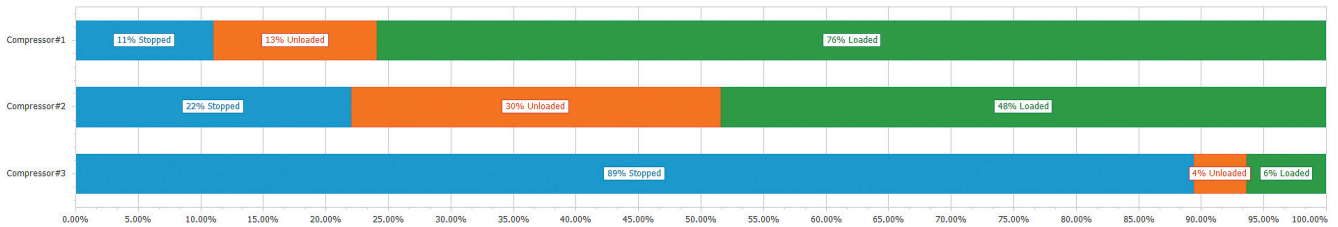


Figure 3: Running pattern

Total consumed energy load/No load

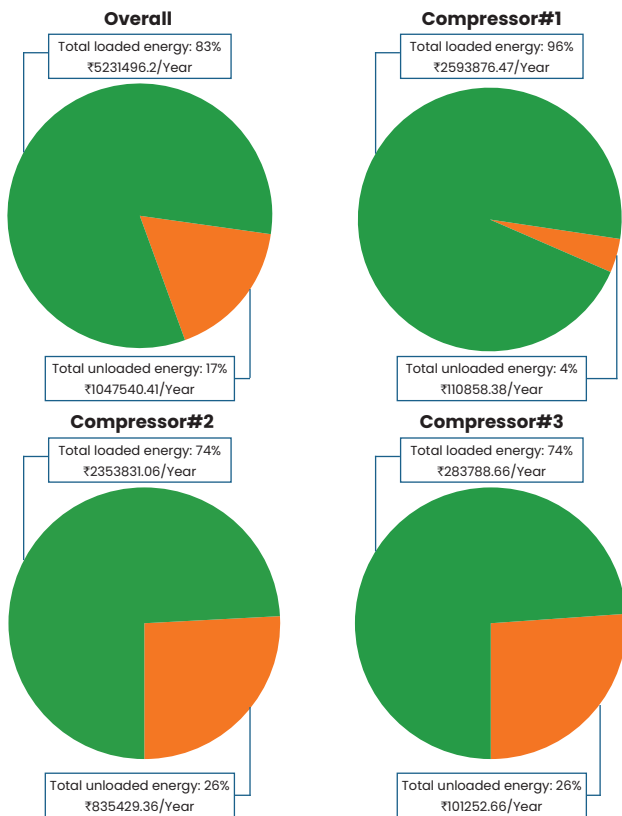


Figure 4: Energy consumption

consumption.

- **Energy:** Analysis of specific energy consumption levels.
- **Air Quality:** Ensuring proper dew point levels to meet production needs without excessive drying energy.

Step 2: Simulation software

We start the assessment with a site walkthrough, where we gather all the information relating to installation, application need. Then the dedicated Energy Consultancy team evaluates the site for the next step in the optimization journey.

The team gathers machine running information (by

installing data logger at each individual compressor or by virtual mode though SmartLink) for one week & the same is fetched to our state of art simulation software called AIRchitect.

In the simulation platform, we have the compressor installation data (flow, pressure, setpoint), operation pattern (which one is running at what time, what is their combined running) for almost every second. So, in cumulative scenario, it tells how many compressors are running and how much they are producing, as shown in the Figure 2, 3 and 4.

Understanding evolving demands is crucial for effective system optimisation. Identifying the limitations of your current compressed air system is the first step toward achieving energy efficiency for your business.

Once the existing system is analysed, we determine the total flow and energy requirements. Our expert team then evaluates the system using multiple options, such as:

- Optimising pressure settings
- Assessing receiver requirements for the current system
- Exploring the feasibility of a central controller
- Upgrading compressors
- Implementing combinations of these or additional measures

The advantage of this approach is that it eliminates the need for field-based trial and error. By simulating scenarios on a virtual platform, we ensure accurate and realistic results. After identifying the most suitable solution, we provide a comprehensive report tailored to your needs. If an audit is required alongside or prior to the optimisation process, it will be communicated in advance to address system losses before initiating improvements.

SME



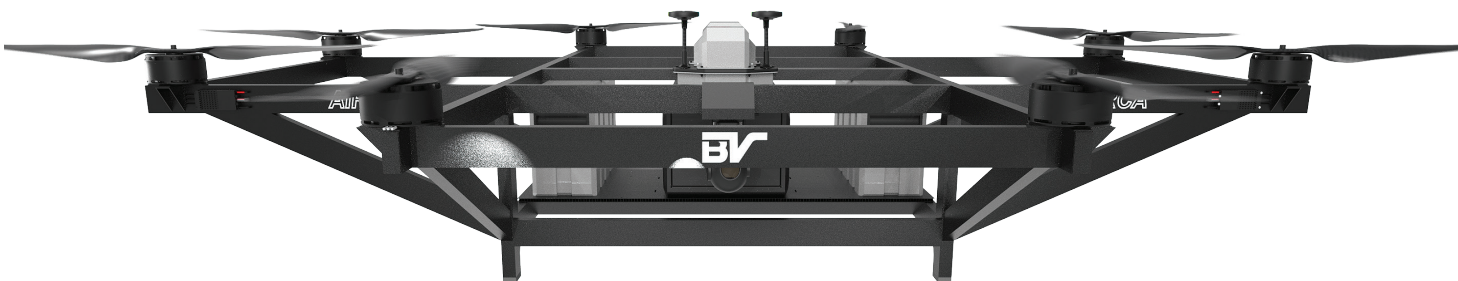
About the author:

Panchu Saha is the Energy Manager for Compressor Technique Service at Atlas Copco (India) Private Limited.



BonV Aero Reshapes High-Altitude Logistics

India's high-altitude regions often face prolonged isolation due to road blockages caused by snow and landslides. Traditional solutions, such as mules, are time-consuming, labour-intensive and pose challenges to animal welfare in extreme conditions. Helicopters, an effective alternative, are expensive and come with significant risks for pilots operating in such environments. BonV Aero's unmanned transport-class aerial platforms offer a practical and efficient solution to address these logistical challenges, narrates **Satyabrata Satapathy**, CEO, BonV Aero in an interview with Sanskriti Ramachandran.



India's challenging terrains and extreme weather conditions, particularly in hilly regions and high-altitude zones, have long posed significant logistical hurdles. Recognising this critical need, Odisha-based deeptech startup BonV Aero has embarked on a mission to revolutionise logistics with its pioneering unmanned aerial transport platforms. Founded with a focus on addressing logistical challenges in sectors like defence, where timely and reliable supply chains are vital, the firm identified the pressing need for innovative aerial solutions to support troops operating in harsh and inaccessible terrains like Ladakh and Kashmir.

The company's flagship innovation, the Air Orca drones, embodies the vision by offering a faster, safer, and more efficient alternative to traditional transport. These drones reduce dependency on ground vehicles, ensuring the uninterrupted delivery of essential supplies, even in adverse weather or difficult landscapes. Earlier this year, BonV Aero secured \$1.6 million in funding from renowned investor Tim Draper, known for backing global giants like Baidu, Tesla, SpaceX, and Skype.

Addressing challenges

India's high-altitude regions, such as the Eastern Himalayas, frequently experience road blockages due to

snow and landslides, leaving critical areas isolated for months. Traditional methods, such as using mules and porters, are not only slow and labour-intensive but also compromise the welfare of animals in harsh conditions. Helicopter operations, while effective, are costly and risky, especially for pilots navigating these environments.

BonV Aero's unmanned transport-class aerial platforms aim to bridge this gap. These vehicles, approximately 2 meters by 2 meters in size, can carry up to 50 kilograms of cargo to altitudes as high as 16,000 feet. By autonomously navigating and delivering essential supplies to remote and inaccessible regions, these platforms promise to enhance efficiency, reduce costs, and minimise risks.

Breakthrough

"BonV Aero's aerial platforms are not just drones—a term we consciously avoid due to its commoditised connotation. These transport-class vehicles are built for reliability and rugged performance. Constructed from aerospace-grade aluminum alloys, they offer durability, low thermal and electromagnetic signatures, and the ability to operate autonomously in extreme weather conditions. The platforms are designed to take off, navigate, and land autonomously, even in unprepared

terrains or atop bunkers”, says **Gaurav Accha**, Co-founder, BonV Aero.

One of the company’s groundbreaking achievements is setting a world record by flying at Umlingla, one of the highest motorable passes in the Himalayas, with a payload of 30 kilograms. This capability is equivalent to what transport helicopters currently achieve at such altitudes but with far greater efficiency and cost-effectiveness.

Indigenous development

BonV Aero is committed to the ‘Make in India’ initiative, with over 80 per cent of its product components being domestically developed. While the battery cells are sourced from countries like South Korea and Taiwan, all assembly and integration are conducted in India. Additionally, the company is building a robust ecosystem to support its platforms, including maintenance services, charging infrastructure, and component supply chains.

Dual applications: Defence and civilian

While BonV Aero’s initial focus is on defence, particularly serving the Indian Army’s high-altitude logistics needs, the company envisions broader applications. Potential civilian uses include:

- **Disaster relief:** Delivering emergency supplies to areas affected by natural calamities where traditional infrastructure is compromised.
- **E-commerce:** Facilitating quick commerce and last-mile deliveries in challenging terrains.
- **Infrastructure support:** Assisting in stringing transmission lines, transporting tools, and supporting construction activities in remote regions.

“Our platforms can also play a crucial role in maritime logistics, replenishing supplies to islands and offshore installations. Furthermore, BonV Aero is exploring opportunities in urban aerial mobility, tapping into a market that consulting firm Morgan Stanley estimates will reach \$1.4 trillion”, explains **Satyabrata Satapathy**, CEO, BonV Aero.

Regulatory landscape and government support

India’s regulatory environment has evolved to support the growth of aerial mobility. On the defence front, certifications are governed by entities like DGQA (Directorate General of Quality Assurance) and DGAQA (Directorate General of Aeronautical Quality Assurance). For civilian applications, the Directorate General of Civil Aviation (DGCA) oversees regulations, categorising drones by size and weight. BonV Aero’s transport-class platforms fall into the medium and large categories,

meeting stringent performance-based evaluations for both defence and civilian use.

The Indian government’s proactive stance on drone technology further bolsters the industry. Prime Minister Narendra Modi’s vision to make India the drone capital of the world by 2030 stresses the national commitment to fostering innovation and adoption in this field.

Market potential

The aerial mobility market presents immense opportunities. The global market for urban aerial mobility as previously mentioned is projected at \$1.4 trillion, while India’s defence drone market alone is expected to reach \$3–4 billion by 2030. Civilian applications are forecasted to contribute an additional \$20 billion domestically.

BonV Aero’s platforms, with their indigenous development and proven reliability, are well-positioned to capture a significant share of this burgeoning market. The company is already exploring export opportunities to friendly nations such as Armenia, Mongolia, and the Gulf countries, as well as potential collaborations with the United States Department of Defence.

Leveraging advanced technologies

BonV Aero integrates next-generation technologies like artificial intelligence (AI) and machine learning (ML) to enhance the functionality and user-friendliness of its platforms. Key innovations include:

- **Predictive maintenance:** Algorithms monitor noise profiles, vibrations, and other parameters to identify potential issues and recommend maintenance.
- **Autonomous pre-flight checks:** The system ensures all components are operational before take-off, reducing manual intervention.
- **Lifetime prediction:** Continuous monitoring helps estimate the remaining lifecycle of vehicles, aiding in warranty and service management.

Future advancements include computer vision for obstacle detection and precision navigation, enabling the platforms to avoid collisions and execute precise landings, even on moving targets like ships.

Currently, BonV Aero operates a manufacturing facility in Bhubaneswar and has partnerships within India’s defence corridors to scale production. As demand grows, the company plans to establish additional facilities and expand its production capacity to meet both domestic and international needs. The company’s current investment round seeks to raise \$20 million. As the aerial mobility sector evolves, BonV Aero’s pioneering efforts underscore India’s potential to lead this dynamic industry on a global stage.



Igus unveils SHT linear module in hygienic design

At BrauBeviale 2024, igus presented lubrication-free drylin linear and drive technology – designed according to the EHEDG guidelines – for beverage producers.

The pressure on beverage manufacturers to produce hygienically is increasing: consumer demands for product safety are growing and global standards from authorities such as the FDA are becoming stricter. As a result, the demands on machine and system components are also increasing. To enable machine builders and operators to achieve hygienic, low-maintenance and fail-safe production, igus presented lubrication-free drylin linear and drive technology in hygienic design at BrauBeviale 2024 (which was held from November 26-28, 2024) in Nuremberg, Germany, including a design study for a ready-to-install SHT linear axis. This not only fulfils FDA and EU requirements, but also meets the EHEDG guidelines with regard to cleanability.

In times of stricter regulations, companies in the beverage industry must ensure that their equipment for filling, labelling, packaging and inspecting bottles and tins can be cleaned easily and thoroughly. This also applies to machine components such as linear technology, which is used for the adjustment and movement of filling heads, label dispensers and camera systems, among other things.

“The demand for linear technology in hygienic design is currently increasing rapidly. Machine manufacturers are looking for ways to further reduce the risk of contamination in their systems while lowering cleaning effort and thus operating costs,” confirmed Michael Hornung, Product Manager drylin Linear and Drive Technology at igus. For this balancing act, igus presented a growing product portfolio at BrauBeviale 2024, which is being developed in accordance with the guidelines of the European Hygienic Engineering & Design Group (EHEDG). These require that components must either have a gap-free design or be encapsulated accordingly. “This way, we can support the safe and efficient operation of production facilities in the beverage industry,” said Hornung.



To enable machine builders and operators to achieve hygienic, low-maintenance and fail-safe production, igus develops lubrication-free linear and drive technology such as the ready-to-install SHT linear axis in hygienic design.

SHT linear module for hygienic positioning tasks

Among the new products that visitors to BrauBeviale were able to see was the design study of a ready-to-install SHT linear axis in hygienic design, which has been optimised for better rinsing. It is suitable for filling stations, for example, allowing for precise and hygienic movements to position bottles and tins. The axis uses stainless-steel round shafts as guidance and relies on dryspin lead screw technology from igus made of corrosion-free stainless steel for the drive.

The truss assembly consists of two housing halves that are sealed with an FDA-compliant silicone flat gasket and hygienic screws. Specially developed wiper seals protect the shafts and prevent dirt and moisture from entering the shaft end support. In addition, igus has designed the lead screw nut on the lead screw in such a way that there are generous gaps. This prevents deposits and makes it possible to clean them efficiently. Hornung said, “We are working on developing more and more products consistently in accordance with the hygienic

design guidelines and have now also joined the EHEDG so as to facilitate new types of certification for open moving parts."

Growing portfolio proves its worth in numerous applications

In 2023, igus presented the world's first sliding carriage for linear guides in hygienic design, which is made of 100% food-grade plastic with FDA and EU 10/2011 approval. Here, too, the design is completely open and free of dead space, making the system fully flushable - even with aggressive cleaning agents. The carriage is suitable for format adjustment in beverage-bottling plants, for example, to handle different bottle sizes without interchangeable parts.

Thanks to solid lubricants integrated into the high-performance plastic, the carriage works hygienically with low-maintenance dry operation and doesn't require external lubrication. Furthermore, individual bearings have been added to the drylin hygienic design product range. They are placed separately on the guide rail and assembled into linear carriages using stainless-steel plates in various sizes, which enables a more flexible design. This also includes the drylin ZLW toothed belt axis made of stainless steel with bearings, toothed belts and ball bearings made of plastic compliant with FDA and EU 10/2011.

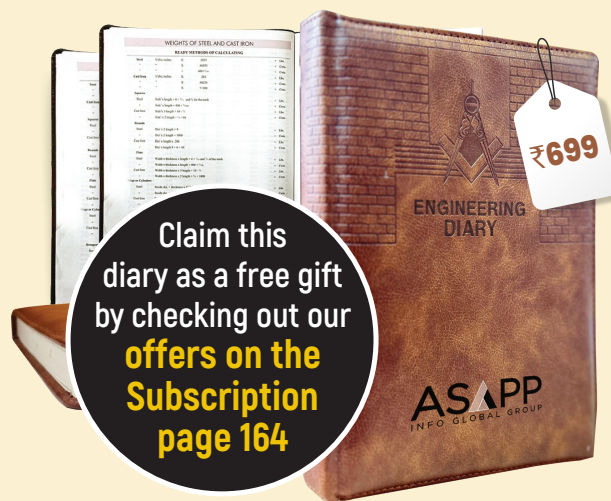
The igus components have already proven themselves in a variety of applications in the food, beverage and packaging industries: from the inspection technology of Kronen AG to the robotic kitchen of the start-up Cook-e to the fully automated pizza oven from BistroBox. Hornung: "Thanks to their hygienic design and the fact that they are easy to clean, our linear and drive technology fulfils the strict requirements of the food and beverage industry and thus contributes to safety and efficiency in the production process."

The Cologne (Germany) based igus GmbH develops and produces motion plastics. These lubrication-free, high-performance polymers improve technology and reduce costs wherever things move. In energy supplies, highly flexible cables, plain and linear bearings as well as lead screw technology made of tribo-polymers, igus is the worldwide market leader. The family-run company is represented in 31 countries and employs around 5,000 people across the globe. In 2023, igus generated a turnover of €1,136 billion. In recent years, the company has expanded by creating internal startups, e.g. for ball bearings, robot drives, 3D printing, the RBTX platform for Lean Robotics and intelligent "smart plastics" for Industry 4.0. Among the most important environmental investments are the "chainge" programme - recycling of used e-chains - and the participation in an enterprise that produces oil from plastic waste.

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Gandhi Automations' Sectional Overhead Doors Provide Unrivalled Safety

Their robustness and energy-efficient features make them a smart investment, ensuring both operational effectiveness and financial benefits over time.



Sectional overhead doors offer numerous benefits for commercial buildings, making them an excellent choice for both retail and industrial settings. These doors consist of multiple panels connected by hinges, allowing the door to bend/slide and open vertically. When fully opened, the door rests parallel to the ceiling, maximising space both inside and outside the building.

Sectional overhead doors by Gandhi Automations are renowned for their reliability and durability. We engineer them to withstand rigorous use while providing excellent thermal insulation and soundproofing. Customisable to fit a range of opening sizes and designed to meet high aesthetic standards, our doors enhance the appearance of your facility while contributing to long-term cost savings. Their robustness and energy-efficient features make them a smart investment, ensuring both operational effectiveness and financial benefits over time.

Our range of sectional overhead doors, including the Porto and Max Vista models, are designed for industrial and commercial buildings. They are available in multiple operational versions: manual push-pull, electrically operated, and chain-hoist operated by pulling an endless chain. This flexibility ensures our doors meet the diverse needs of various applications.

Additionally, both models are offered with different lifting systems tailored to the available overhead space. The sliding system options include normal lift, high lift, vertical lift, low headroom lift, and inclined lift, providing optimal solutions for every setting.

Porto sectional overhead doors seamlessly blend with any architectural style. They are easy to use, quiet, and reliable. Built with pre-painted, galvanized steel and 40 mm thick sandwich panels, they ensure robust protection and energy efficiency.

Max vista sectional overhead doors combine aluminium panels with special glazed panels enhancing natural light, gridded, or meshed windows for a distinctive look. These doors provide ample natural light, creating a bright and pleasant work environment. They are durable and visually appealing, suitable for various commercial and industrial applications.

Key features include:

- Reliable and low-noise operation
- Extreme robustness for long-lasting use
- Includes safety features in accordance with EN 13241-1 CE, including finger trap protection between the door panels to avoid the risk of fingers being pinched, and side trap guards where the side frames are completely closed to prevent injuries.
- Easy and practical to open and operate
- Energy savings and enhanced comfort
- Constructed from pre-painted, galvanized steel with a 40 mm thick sandwich panel
- Equipped with special non-aging rubber gaskets that seal the perimeter, preventing water, air, and dust infiltration
- For easy access for people and small transport vehicles, a side door or pedestrian door can be provided to reduce the number of times the door is operated, making it energy efficient.
- Opening-closing speed: 0.2–0.4 m/s
- Available sizes: Width up to 15,000 mm, Height up to 10,000 mm

Gandhi Automations' sectional overhead doors are the ideal solution for all industrial and logistic needs. **SME**

For details, contact Gandhi Automations, Mumbai, on
Tel: +91 22 6672 0200, 6672 0300, or
Email: sales@geapl.com, or visit www.geapl.com

(Communication provided by the management of the company)

SPIRAL WOUND GASKETS

G P Gaskets offers a wide range of spiral wound gaskets.

Features:

- The spiral wound gaskets are composed of a metallic continuous stripe with a special shaped profile, coupled with a continuous filling stripe (Asbestos, PTFE, Grafoil, Ceramic etc) evenly wound in concentric spiral under constant stress.
- The spiral wound gaskets are reinforced on the inner and outer diameter by winding of several electrically welded spiral metal only.

About the Company: G P Gaskets, began in the 1999 to cater all types of engineering industry requirements. Over the last almost a decade, the company has developed a strong team consisting of qualified & experienced people to satisfy the ever increasing and complex needs of clients. G P Gaskets consistent quality and timely

execution of work orders makes it one of the well known organization in the country for manufacture & supply of.

Contact:

G P Gaskets, Mumbai

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Email: sales@gpgaskets.com



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REINFORCED WATER ACTIVATED PAPER TAPE

Mexim Adhesive Tapes Pvt Ltd offers a wide range of reinforced water activated paper tape.

Features:

- Water-activated paper tape (WAT) or gummed paper tape is made from natural starch based adhesive. To use the tape apply water to activate the adhesive. Once applied, the tape bonds with the surface permanently making them tamper-evident. The tape does not get affected by dirt, dust, oil or extreme temperature environments.
- Its features include: Tamper evident: once applied, the tape bonds with the surface permanently, making them tamper-evident; cross weave reinforced fiber glass for increased strength; Kraft Paper: high durability and tear resistance; eco-friendly, 100% recyclable.

About the Company: Mexim was incorporated in 1987, as a trading firm authorized to distribute Tapes for Sanghi Polyester in the West-Zone markets of India.

Contact:

Mexim Adhesive Tapes Pvt Ltd, Mumbai

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BOPP SELF ADHESIVE TAPES

Sonal Adhesives Limited offers a wide range of Bopp self adhesive tapes.

Features:

- Biaxially oriented polypropylene (BOPP) carton sealing tape with a water-based acrylic adhesive. It has excellent adhesion, superior impact resistance, and excellent shelf life and UV resistance.
- Suitable for Automatic carton sealing and manual Dispenser machines. Made with water based acrylic adhesive. Available Thickness -40 micron to 75 micron, colors - transparent clear, tan, brown, white, etc.
- In all sizes and required lengths. Being one of the leading manufacturers of BOPP Tapes in India, we offer complete range of products. We have latest coating & slitting equipments to ensure excellent quality of the Tapes.

About the Company: Incorporated in the year 1991, Sonal Adhesives Limited is one of the largest manufacturers and exporters of BOPP Self Adhesive Tapes and Various types of Speciality Adhesives & Emulsions in India.

Contact:

Sonal Adhesives Limited, Dist-Raigad

Tel: 022-49633128

Email: info@sonal.co.in



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CUSTOMIZED CYLINDRICAL WIREMESH FILTER

Raj Filters & Wiremesh Pvt Ltd offers a wide range of customized cylindrical wiremesh filter.

Features:

- These are cylindrical wire mesh filters, which have one closed end and one open end. The close end is produced by folding and spot welding wire mesh. At the open end, there are two cut outs on the cylindrical periphery.
- The filter is made using various precision fixtures and is produced completely by our skilled technician.

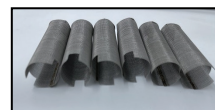
About the Company: Raj Filters is spread into multiple units, well equipped with the latest innovative machinery, ready to accept any specific filtration challenges. Our strength is our outstanding range of manufacturing knowledge and a team of well-groomed professionals where there is a zero compromise on the quality. We offer a wide array of product ranges supplied across the globe.

Contact:

Raj Filters & Wiremesh Pvt Ltd, Vadodara

Mobile: 09724190931

Email: support2@rajfilters.com



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PERFORATED CABLE TRAYS

Rama Enterprises offers a wide range of perforated cable trays.

Features:

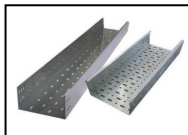
- Offered perforated cable trays in different widths, heights and lengths. These are easy to install and cost effective. Owing to our in house facilities we offer tested and proven in the harsh environment of the offshore oil and gas industry to meet the customer's requirement.
- These are designed and developed by using sophisticated machinery available with durable finish standards available at cost effective prices.

About the Company: Rama Enterprises an ISO 9001-2000 certified company. Take this opportunity to introduce as a manufacturing organization, that the production based in Ghaziabad, Uttar Pradesh in Year

2000 having manufacturing facilities for cable tray, slotted angle, raceways & earthing material.

Contact:

Rama Enterprises, Ghaziabad
Tel: 0120-6531212 Mobile: 08800566900
Email: info@ramaenterprises.co.in



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SEMI METALLIC AND METALLIC GASKETS

PGE Industries Pvt Ltd offers semi metallic and metallic gaskets.

Features:

- The PGE® SealPro™ is a reusable gasket consisting of a solid metal core with serrations with a specialized flexible face consisting of various options for high temperature, chemical resistance, and exhaust gases etc.
- Once the gasket is installed, the soft non-metallic material is forced into the metal core serrated grooves. As a result, the compressive stress increases, and multiple concentric high-pressure seals are created along the gasket face surface.
- Unlike traditional spiral-wound gasket, all of the compressive force is exerted on the PGE® SealPro™ facing, thus resulting in a very tight seal. Since the PGE® SealPro™ is basically a solid metal, as opposed to alternating plies of metal and filler applied at spiral-wound gaskets; to handle even in large diameters (2000mm).

About the Company: Established in 1981, PGE India (PILOT Gaskets) is the prominent manufacturer of sealing and insulating products. They are dedicated to being customer-oriented and proactively providing solutions to their needs. **Contact:**

PGE Industries Pvt Ltd, Mumbai
Mobile: 08080890022
Email: info@pilotgaskets.com



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PTFE RODS

Dhwani Polymer India Private Limited offers a wide range of PTFE rods.

Features:

- This PTFE rod is available in various diameters and lengths. On coil or reel with production lengths, straight lengths of 1000/2000mm or on customer-specific cut lengths. For applications requiring an exact diameter and roundness, we recommend grounded rod. This rod is processed after extrusion so desired diameter and roundness are guaranteed.
- These molded rods: available in diameter of 25mm to 300mm and Length of 300mm to 1000mm; Extruded Rods: available in diameter of 6mm to 200mm and length of 1000mm to 2000mm.

About the Company: We are certified for the processing and application of PTFE and fluoropolymers. Some of our process capabilities include CNC machined components, precision seals and fluoropolymers coatings. We recognize quality as an essential part of our products we offer to our customers and believe that getting it right the first time is what differentiates us from our competition.

Contact:

Dhwani Polymer India Private Limited,
Ahmedabad
Mobile: 09033012056
Email: info@dhwanipolymer.com



Scan the QR Code for instant product enquiry



GASKET GRAPHITE POWDER

Arihant Packing & Gasket Company offers a wide range of gasket graphite powder.

Features:

- The graphite powder is basically used for casting and polishing purposes, molding & carbon addition in steel industries.
- The graphite powder is well-treated and offers high conductivity. Their graphite powder is easily available at industry leading prices.

About the Company: Established in 1956 our parent firm A.K Jain and Brothers www.akjain.co.in is a highly acclaimed name for Asbestos, Non-Asbestos Gland Packing, Ceramic Products, PTFE products, pure graphite products, Asbestos/Non-Asbestos Jointing Sheets, cut Gasket, Spiral wound metallic gaskets, Rubber Products, Brake liner & Friction Material and other industrial products in India for over 55 years.

Contact:

Arihant Packing & Gasket Company,
Kolkata
Tel: 033-22624511, 33164018
Email: sales@arihantgasket.com



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FEATURED PRODUCT

REPAIRING OF TIME MAKES DIGITAL PORTABLE METAL HARDNESS TESTER

Heat Treatment Sales & Services, Ahmedabad offers complete repairing, servicing and calibration of all kinds of digital portable metal hardness testers. The company has factory trained engineers who can handle repairing, servicing and calibration of all portable metal hardness testers. The company offers the services of refurbished and reconditioned metal hardness tester with 6 months warranty, which includes parts and labour charges also. However, the dispatching/transportation cost and related expenses such as packing charges



are not included in the warranty. One can dispatch their fault hardness tester properly packed/crated and they will provide a free written estimate upon thorough examination of their portable hardness tester. The company also maintains a complete stock of spares and accessories like impact devices, impact bodies, standard test blocks, support rings, batteries, etc. According to them, when a complete service with spares is conveniently available why do users think of buying a new LEEB hardness tester? It is much more economical to get the existing hardness tester repaired, reconditioned, and refurbished or rebuilt at a fraction of the cost.

Contact:

Heat Treatment Sales & Services
Contact Person: Mr. Bharat Shah
L/119 GIDC Industrial Estate, Odhav
Ahmedabad 382 415
Tel: 079-22870144/Mobile: 08980718181
Email: info@enmatest.com
URL: www.enmatest.com, www.enmatest.co.in

LINEAR MOTION SOLUTIONS

Delta Electronics India Private Limited offers a wide range of linear motion solutions.



Features:

- Precision and Reliability for Advanced Automation Needs: Delta's Linear Pocket Actuator and broader Linear Motion Product Line are designed to meet the rigorous demands of modern industrial automation. With high precision and stability, these solutions ensure accuracy and consistency, supporting smooth, linear movement for applications where exact positioning is critical.
- Compact and Space-Saving Design: The Linear Pocket Actuator offers a compact design that is easy to integrate into limited spaces, making it ideal for industries with stringent spatial constraints, such as electronics, medical devices, and semiconductor manufacturing.
- Enhanced Productivity and Energy Efficiency: Delta's linear motion products are optimized to boost operational efficiency by minimizing energy consumption and reducing maintenance requirements.
- Broad Range of Applications Across Industries: From assembly lines to packaging, Delta's linear motion solutions cater to various sectors, including electronics, pharmaceuticals, food and beverage, and automotive.
- Easy Integration and Customization Options: Delta's Linear Motion solutions, including the Linear Pocket Actuator, are built to seamlessly integrate with existing automation systems.
- Built for Durability and Consistent Performance: Constructed with robust materials and engineered for high durability, Delta's Linear Motion solutions are designed to withstand intensive use and challenging industrial environments.
- Support for Industry 4.0 and Smart Manufacturing: Delta's advanced linear motion technology aligns with Industry 4.0 principles, supporting smart manufacturing and high-speed automation.

About the Company: Delta Electronics India has been at the EPI Center of shift that is needed for today's complex industrial ecosystem of interconnected equipment and smart industrial assets for over two decades. Actively implemented a number of trends in the creation of sustainable and energy-efficient solutions for the upcoming generation of energy since it is a responsible company.

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Contact:

Delta Electronics India Private Limited,
Bangalore
Tel: 080-68141800
Mobile: 09953882197
Email: sanjay.gupta@deltaww.com

TOTAL DISPLAY SOLUTION

Roto Leaner Technology Pvt Ltd offers a wide range of total display solution.

Features:

- Roto leaner Technology Pvt Ltd manufactures and supplies a wide range of document display products like Wall units, magnetic folders, information stands etc as applicable for work instruction, SOP, MSDS and display of other certification, notices, pictures, information in offices, factories, hospitals, shops, etc.
- Folders available in various sizes of A4/A3 and colors of blue, yellow, red, black and grey.

About the Company: With over 25 year's experience, Roto Leaner Technology Pvt Ltd has been dealing in the manufacturing of Document Display Systems which are used in showing critical and helpful information used in engineering, automotive, food and pharmaceutical factories and offices.

Contact:

Roto Leaner Technology Pvt Ltd, Mumbai
Mobile: 09225314026/28
Email: huzaiifa@infomate.co.in

Scan the QR Code for instant product enquiry



SPRING WASHER

Khanwalkar Industries offers a wide range of Carbon' brand spring washer.

Features:

- These are manufactured on automatic machines within close tolerances and under strict quality control that are applicable to production process.
- The company supplies its product 'Carbon' spring washers conforming to various standards like ISS, BSS, DIN, ASA, JIS and also in stainless steel all over India.
- These washers conforming to special sizes and combi sizes are also available. Washers are manufactured in ID size 2.5mm to 50mm in natural black and in electroplated coating with blue, golden green finish and with trivalent coating.

About the company: Khanwalkar industries, an ISO 9001:2015 certified company manufacturing 'Carbon' brand spring washer in carbon steel (EN-42B), domestic market of India.

Contact:

Khanwalkar Industries, Indore
Mobile: 09993555087
Email: Khanwalkaro8@gmail.com

Scan the QR Code for instant product enquiry



"KUSAM-MECO" ULTRASONIC THICKNESS GAUGE - MODEL - KM 131D

KUSAM-MECO" has introduced a new Ultrasonic Thickness Gauge Model KM -131D.

Features:

- The special feature of this instrument is that it controlled by a microprocessor which can measure thickness and sound speeds of various materials quickly and accurately.
- The instrument is capable of accurate measurement of different materials or parts in Industrial production, as well as monitoring pipelines and pressure vessels of production equipment, and corrosion degree of various parts in use.
- The thickness of any good conductor for ultrasonic waves with top & bottom surfaces parallel to each other, like metal, plastic, ceramic & glass, can be measured with the instrument.

About the Company: Established in 1983, Kusam-Meco, an ISO 9001:2008 certified company, introduced and pioneered the use of digital multimeters and clamp meters in Indian industry.

Contact:

Kusam Electrical Industries Ltd, Navi Mumbai
Mobile: 09594058456, 09594057456
Email: sales@kusam-meco.co.in

Scan the QR Code for instant product enquiry



NANO HYBRID AHU

Vaayu Home Appliances (India) Pvt Ltd offers nano hybrid AHU.

Features:

- Vaayu is world first patented Nano Hybrid AHU which is an innovative solution for air cooling. Vaayu is a green and sustainable air cooling solution that can replace air conditioners and traditional evaporative air coolers by providing 20 degree temperature difference from ambient at 80% less power consumption as compared to same tonnage air conditioner.
- This benefits of using Vaayu: reduces power consumption up to 80% as compared to similar tonnage AC; delivers green temperature of 20-24degree Celsius; does not emit heat in the environment; 100% fresh air based; reduces high maintenance cost of AC; generates carbon credits.
- These products could be installed for commercial as well as domestic purposes while on erection as well as in erected premises like: factories, hotels, banquet, etc.

About the company: Vaayu is a Multinational Company which is working for innovative cooling solutions and is a certified ISO , CE, ROHS Company.

Contact:

Vaayu Home Appliance (India) Pvt Ltd, Indore
Mobile: 09685090174, 09981184811
Email: info@vaayuindia.com

Scan the QR Code for instant product enquiry



VIBRATORY FURNACE CHARGER

Elektromag-Joest Vibration Pvt Ltd offers a wide range of vibratory furnace charger.

Features:

- This vibratory furnace chargers are a cost effective method of increasing productivity and quality of melt.
- With constant improvement in technology, furnaces require rapid and uniform charging to keep pace with the melting power of the system for which the Furnace chargers are the optimum solution.
- The entangled pieces of scrap metal form a layer above and if unrecognized by furnace operator, bridging can lead to super heating of bath and failure of furnace lining and run out.
- Due to controlled feed, the hot metal splashing is avoided and the charger can be operated from a framed plate by the operator without actually being near to the furnace.

About the Company: Elektromag-Joest Vibration Pvt. Ltd., is a leading manufacture of Vibrating equipments for foundry, steel, mining, quarrying, chemical, food, recycling, air separation and thermal processing.

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Contact:

*Elektromag-Joest Vibration Pvt Ltd,
Mumbai
Tel: 022-66624444
Email: vibration@elektromag.com*



SUPERIOR ROLLING MOMENT WITH COVER STRIP LINEAR GUIDEWAY

IBK Engineers Pvt Ltd offers a wide range of Hiwin CG Series superior rolling moment with cover strip linear guideway.

Features:

- CG series guideways can be classified into non-interchangeable and interchangeable types. The sizes are identical. The only difference between the two types is that the interchangeable type of blocks and rails can be freely exchanged, and their accuracy can reach up to P class. The model number of CG series contains the size, type, accuracy class, preload class, etc.
- Its features include: O-type Configuration; higher rolling moment capacity; new lubrication path design; fully lubricated; rail with cover strip; stainless steel material; quick installation; protects wiper seal from fastener damage; protects block from particles that could collect in mounting hole.

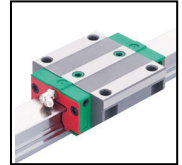
About the Company: Established in 2014, IBK Engineers Pvt Ltd, is engaged in the wholesaling, supplying, distributing and trading of deep groove ball bearing, mechanical bearing, roller chain, steel rear sprocket, safety equipment, automotive components, electric equipment, etc.

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Contact:

*IBK Engineers Pvt Ltd, Bengaluru
Tel: 080-26321112 Mobile: 09880566644
Email: rajukn@ibizkart.com*



NON-DIRECTIONAL, INVERSE TIME, 2 POLE O/C RELAY WITH INSTANTANEOUS HIGHEST ELEMENTS - JRC 064

JVS Electronics Pvt Ltd offers a wide range of non-directional, inverse time, 2 pole O/C relay with instantaneous highest elements - JRC 064.

Features:

- The relay measures the line current from each of the phases and if it exceeds the set threshold, then relay extends a trip signal after an operating time.
- The relay has facility to active / inhibit the high set protection feature. The relay output contacts are self reset / Hand reset type. Relay operation without any fault current is determined by trip test facility.

About the Company: JVS Electronics Pvt Ltd is an exporter, manufacturer and supplier of audio indicating instruments, visual indicating instruments, electrical indicating instruments, etc.

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Contact:

*JVS Electronics Pvt Ltd, Bangalore
Mobile: 09448288863
Email: bangalore@jvselectronics.in*

SIGNAL TOWER LIGHT

Werner Electric Private Limited offers a wide range of signal tower light.

Features:

- Signal tower lights provide a visual indication of machine status, enhancing operational efficiency and safety by alerting operators to changes or issues in industrial environments.
- These products boasts clean and crispy design, bulletproof product consistency and intuitive builds.

About the Company: Werner Products are created by top industry leaders in mechanical design and with extensive feedback of user experience. They are obsessed with their customer's success and take pride in their achievements.

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Contact:

*Werner Electric Private Limited, Mysore
Mobile: 7353947299
Email: info@wernerelektrik.com*



POLIFLEX GRINDING POINTS

PFERD offers a wide range of poliflex grinding points.

Features:

- Poliflex® fine grinding tools are manufactured with high shape accuracy, outstandingly consistent quality and tight dimensional tolerances. They are ideally suited to fine grinding, structuring and preparations for polishing work, and are very frequently used for tool and mould-making applications.
- Poliflex® finishing points with the rubber bond are manufactured with pink aluminium oxide. The rubber (GR) bond is an elastomer-based soft bond. Ideal for use on surfaces.
- Finishing point in conical shape for fine grinding inner radii, contours and transitions..

About the Company: PFERD engages in development, production and support and distribution of tool solutions on jobs for surfaces and material cutting.

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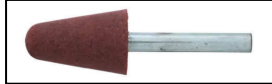
Contact:

PFERD, Bengaluru

Tel: 080-42187117

Mobile: 09880665415, 09741481117

Email: sales@swit.in



CABLE DRAG CHAINS

Elektromag offers a wide range of metallic/plastic cable drag chains.

Features:

- This Elektromag drag chains enable the conveyance of flexible cables/hoses, etc to movable units with maximum reliability.
- Its advantages of Elektromag cable drag chains is avoidance of mechanical strain on the cables/hoses.
- No tensile stress or compression, no frictional wear as there is no relative movement between the cables/hoses and the cable drag chain, no bending below an established radius, no crushing, buckling or forming of loops or torsion strain.

About the Company: Established in the year 1958, Elektromag is engaged in manufacturing of metallic/plastic cable drag chains and supplying to various steel plant, machine tools, cement, foundries, etc.

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Contact:

Elektromag Methods, Mumbai

Mobile: 09820192772

Email: cablereels@elektromag.com



SERVO TYPE DRILLING/TAPPING SPINDLE HEAD UNIT

Secon Technological Solutions Inc offers servo type drilling/tapping spindle head unit.

Features:

- Every hardy precision spindle is built with high rigidity and quality housing material which is process by boring and honing. All spindles are made of alloy steel with the process of heat-treatment and assembled with NSK or SKF bearings for high performance and long life usage.
- The accuracy of the spindle is strictly under 0.003mm, this unit allows it to perform all types of machining applications such as drilling, peck drilling, threading, tapping, chamfering, reaming and countersinking.
- Feed rate is programmable and driven by a preferable servo motor.

About the Company: Secon Technological Solutions Inc. is engaged as a manufacturer, trader, service provider, distributor of CNC machines tools, preventive maintenance and consultancy services.

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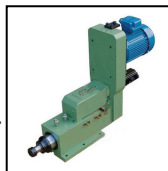


Contact:

Secon Technological Solutions Inc, Bangalore

Telefax: 080-23575752

Email: secontech2000@gmail.com, secontech@hotmail.com



HIGH PRESSURE DIRECTIONAL CONTROL VALVES

HTM Hydraulics Pvt Ltd offers high pressure directional control valves.

Features:

- Dynex directional control valves offer high pressures of upto 700 bar, with a high flow capability of flows 151 lpm are possible.
- Actuator options include: Manual lever, direct solenoid, hydraulic piloted and Air piloted.
- Multiple flow patterns are available. For additional information contact sales team. Fluid viscosity: 7-323 cSt.
- Its applications used on wide variety of industrial, mobile, oil & gas hydraulic press and portable tools.

About the Company: HTM Group has been in the field of hydraulics since 1995. Their expertise in the industry makes us one of the leading competitive companies in the field of trading, marketing & servicing and training for customers in India and abroad. HTM group has headquarters in Bangalore, India.

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Contact:

HTM Hydraulics Pvt Ltd, Bangalore

Tel: 080-41572101 Mobile: 09741165877

Email: info@htmhydraulics.co.in, sales@htmhydraulics.co.in



FLUORESCENT PIGMENTS FOR TRAFFIC CONE

Aron Universal Limited offers fluorescent pigments for traffic cone.

Features:

- This Rubber Paint is extensively used for colouring steel structural and concrete surfaces of chemical & fertilizer industries.
- These products are available in various colours and shades to suit varied client's requirement.
- Its features include: safe to use; non-toxic nature; long shelf life.

About the Company: Aron Universal Limited was established in the year 1974 and is headquartered at Bengaluru, India. It is India's leading manufacturer and exporter of vivid daylight Fluorescent pigments, etc.

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Contact:

Aron Universal Limited, Bangalore
Tel: 080-27825331 Mobile: 09791427847
Email: enquiry@aronuniversal.in



EXTRACTOR ARM

Powertech Pollution Controls Pvt Ltd offers a wide range of extractor arm.

Features:

- The Extractor Arm is device which allows the user to position a suction hood to capture fumes or dust close the generation spot with complete ease and flexibility.
- This highly useful accessory may be used with the Fumekiller(R) and DustBag(R) units maintenance and running costs are low as all components are built for continuous, reliable, safe and efficient use.
- The Extractor Arm consists of 2 ducts made of aluminium or stainless steel, connected by PVC flexible hoses and mounted on interconnected support rods with friction-loaded pivots.
- The arm can also be fitted to overhead ducting to provide suction points close to the flow level for the capture of fumes or dust from pollution generation spots.

About the Company: Powertech Pollution Controls Pvt Ltd was established in the year 1996, for the design and manufacture of a wide range of air pollution control equipment.

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Contact:

Powertech Pollution Controls Pvt Ltd, Bangalore
Tel: 080-23452156, 23452256
Email: powertech@airtelmail.in, philipthomas@powertechindia.com



FLEXNUTS

Nord-Lock India Pvt Ltd offers a wide range of flexnuts.

Features:

- Flexnuts have been specially developed for through-hole applications. Their reactive design distributes the bolt load along many threads, adds elasticity and prevents stress concentrations in the first few threads.
- This helps relieve stress concentrations and increases the fatigue life of the bolt. Since Flexnuts are reactive nuts to be used opposite our tensioners, they are never torqued directly to achieve preload.

About the Company: The Nord-Lock Group has been providing customers with high-quality, safe and innovative bolting solutions since 1982. The Nord-Lock Group is wholly owned by Investment AB Latour, a company listed on the Stockholm Stock Exchange.

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Contact:

Nord-Lock India Pvt Ltd, Mumabi
Tel: 022-49743518
Email: info@nord-lock.in



IMPACT CRUSHER

Crush Power offers a wide range of impact crusher.

Features:

- This vertical shaft impact crusher is widely used in all kinds of minerals. It provides the high quality sand and crushed stone aggregate to the high-speed railroad, high-rise construction, municipal administration construction, water and electricity dam construction, concretes agitation station.
- It is effective machines at present. It is also applicable to crush various stones with different hardness in medium and fine crushing area. It is more advanced in intermediate hard, extra, extra hard and abrasive material crushing.

About the Company: Crush Power are the manufacturer and supplier of heavy machinery like jaw crusher, horizontal shaft impact crushers, cone crusher, grizzly feeders, vertical shaft impactor and their allied equipments, and also conveyor system, hoppers etc mainly used in stone quarry and mining field.

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Contact:

Crush Power, Nashik
Mobile: 09657064878, 09922293339
Email: shashi@crushpower.net sales@crushpower.net



VOLTAGE TRANSFORMERS

Guru Nanak Electric Works offers a wide range of high voltage transformers. These voltage transformers are available in a wide range as per requirements and specifications. Manufactured from fine quality raw materials.



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Contact:

*Guru Nanak Electric Works, Ludhiana
Tel: 0161-5027517, 3241427
Mobile: 09814090227, 09814090935
Email: gnew_avtar@sify.com*

SHOT BLASTING MACHINE

Guru Nanak Mfg Company offers a wide range of shot blasting machine, hanger type. These machines are used in finishing of industrial components and products. Manufactured by experts using finest grade materials.



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Contact:

*Guru Nanak Mfg Company, Jalandhar
Tel: 0181-5091321
Mobile: 09815496000, 09517511368
Email: metalfinishing@yahoo.co.in*

HYDRO EXTRACTOR

Guruson International offers a wide range of cone hydro extractors. This machine comes with three-leg suspension to check vibrations created by unbalanced rotating fabric/material.



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Contact:

*Guruson International, Ludhiana
Tel: 0161-5056246
Fax: 0161-5015297
Email: guruson@rediffmail.com, info@guruson.com*

HOT WATER SYSTEM

Haadi Enterprises offers a wide range of solar hot water systems. This solar hot water system has applications in both domestic and commercial areas. Manufactured using latest technology.



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Contact:

*Haadi Enterprises, Bengaluru
Mobile: 09845158011, 09620638110
Email: haadienterprises1109@gmail.com, ismailshiraguppi@gmail.com*

BARREL PUMP

Hacop Pumps offers electric barrel pumps. This electric barrel pump is used for removing the liquid contents from a standard barrel without spillage. The drive is particularly suitable for intermittent operation and equipped.



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Contact:

*Hacop Pumps Pvt Ltd, Pune
Tel: 020-25431638, 25431639
Mobile: 08408033553 Fax: 020-25431639
Email: hacoppumps@gmail.com*

INDUSTRIAL HDPE PIPES

Haffer Electro Plast offers a wide range of industrial HDPE pipes. These HDPE pipes in a high quality range for wide ranging applications. These tested high quality range of HDPE pipes are manufactured on modern machines.



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Contact:

*Haffer Electro Plast Pvt Ltd, Chennai
Tel: 044-65487686, 65460404
Mobile: 09282168187, 09282168186
Email: hafferelectroplast@rediffmail.com*

AIR COMPRESSORS

Hallmark Compressor offers single stage air compressors. These single stage air compressors are a reliable source of low pressure air for numerous applications. They are designed to meet the needs of a variety of users who demand a constant and reliable source of low pressure air.



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Contact:

*Hallmark Compressor Pvt Ltd, Ahmedabad
Mobile: 09687643303 Fax: 079-25832627
Email: info@airhallmark.com*

TEMPERATURE CONTROL WITH SOLDER BATH

Hallmark Electronics offers solder bath with temperature control. This is engineered for various operations like tinning-cum-deep soldering. The device has a pot meter for variable setting, and is available in an extensive range of solder and wax bath.



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Contact:

*Hallmark Electronics, Pune
Tel: 020-24223188, 30423188
Mobile: 09822353694, 08888827810
Email: response@hallmarkelect.com*

HEAVY INDUSTRIAL OVENS

Hansa Enterprises offers a wide range of heavy industrial ovens. The industrial ovens are manufactured in a wide range of sizes and specifications, using the best quality raw materials available and priced very



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Contact:

*Hansa Enterprises, Bengaluru
Tel: 080-28511454, 41158874
Mobile: 09845030900
Email: hansauv@yahoo.com*

HARDENED & GROUND

Hans Machineries offers a wide range of pins, hardened and ground. These pins are small but vital parts in industrial machinery and manufacturing activity. It is available in a wide range and materials of construction.



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Contact:

*Hans Machineries Pvt Ltd, Howrah
Tel: 033-26792105
Mobile: 09432357682, 09432357681
Email: machineries@hanspl.com*

INDUSTRIAL PLASTIC MOULDING DIES

Adith Plastic offers a wide range of industrial plastic moulding dies. Available in different specifications, these plastic moulding dies are manufactured with modern machinery and technology to leave no scope for defects.



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Contact:

*Adith Plastic, Mumbai
Mobile: 09821230980, 09664093729
Email: adithplastics@gmail.com*

COMPONENT MOULDS

Innovative Moulds & Dies offers a wide range of plastic component moulds. These plastics component moulds manufactured for a wide variety of plastic products. Manufactured using best in class machinery and technology.



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Contact:

*Innovative Moulds & Dies, Chennai
Tel: 044-42852146
Mobile: 09840914445
Email: info@innovamoulds.in*

INJECTION MOULDINGS

Vikas Industries offers a wide range of plastic injection mouldings. These are in wide in demand, highly acclaimed for supreme strength, exceptional performance, compact design, and durability.



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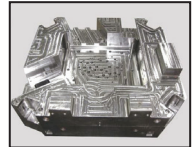


Contact:

*Vikas Industries, Mumbai
Mobile: 09821036215, 09821666215
Email: response@vikasindus.com*

INDUSTRIAL CUSTOM BUILT MOULD BASES

Eltec Engineering offers a wide range of industrial mould bases, custom built. These mould bases are custom built for various products, in an excellent range. Manufactured using quality tested raw materials and progressive technology in adherence with



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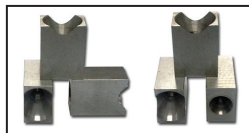


Contact:

*Eltec Engineering, Coimbatore
Mobile: 09500200069, 09500650999
Email: eltecengineering@gmail.com*

SPINNER DIES

Regal Carbide Dies offers a wide range of spinner dies. These high quality spinner dies are made in tungsten carbide and used in wire cutting and straightening industries. Manufactured using genuine raw materials procured from well known vendors.



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Contact:

*Regal Carbide Dies Pvt Ltd, New Delhi
Tel: 011-22143278
Mobile: 09811312738, 09311312739
Email: ankur@regaldies.com*

MOULDING DIES

Microcam Technoworld offers a wide range of rubber moulding dies. These dies are manufactured in an exclusive range to fulfil various application needs. Manufactured by experts using high grade raw materials and latest



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methodology as per the set industry standards and norms.

Contact:

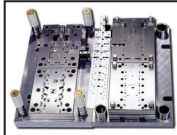
*Microcam Technoworld, Faridabad
Mobile: 09873700136, 09810847725
Email: micro_cam@ymail.com*

INDUSTRIAL COMPOUND DIES

Star Die Works offers a wide range of industrial compound dies. Manufactured from quality raw materials sourced from trusted vendors. The products, available in various sizes and specifications, meet the exact requirements of user industries, and can be customised as per needs.

Contact:

Star Die Works, Thane
Mobile: 09321587008, 09594040362
Email: stardieworks@rediffmail.com



Scan the QR Code for instant product enquiry



GRINDING SOLUTIONS

Farohar Engineering offers a wide range of surface grinding solutions. Grinding surface with assured accuracy in microns and degrees; also grinding facility to provide bend removal using variable magnetic power setting.

Contact:

Farohar Engineering, Navi Mumbai
Tel: 022-27600040
Mobile: 09819898970, 09819074557
Email: percykarani@hotmail.com



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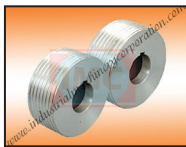


THREAD ROLLING DIES

Industrial Machinery Corporation offers a wide range of circular thread rolling dies. The circular thread rolling dies are manufactured as per customers' specifications and requirements.

Contact:

Industrial Machinery Corporation, Ludhiana
Mobile: 09803987006, 09803987004
Email: industrialmachinerycorporation@yahoo.com



Scan the QR Code for instant product enquiry



STANDARD MOULD BASES

HM Tools & Dies offers a wide range of standard mould bases. These standard mould bases are manufactured from quality raw materials for a variety of industries. Robust in construction, these mould bases are resistant to corrosion and dimensionally accurate.

Contact:

HM Tools & Dies, Surat
Tel: 0261-2274116
Mobile: 09904299116, 09924399116
Email: hmttools_himanshu@yahoo.co.in



Scan the QR Code for instant product enquiry



GATE VALVE

Manek Investment Cast offers gate valve investment castings. These gate valve investment castings are available in a wide range for valve manufacturers. Castings are available in various grades,

dimensions and sizes in order to meet the diverse requirements of users.

Contact:

Manek Investment Cast Pvt Ltd, Rajkot
Mobile: 07567047001, 09586326808
Email: manekcasting2011@gmail.com



Scan the QR Code for instant product enquiry



DIE CASTINGS

Supercast Industries offers a wide range of pressure die castings. These pressure die castings are manufactured for various industrial applications. They are appreciated for rust resistance, durability and perfect dimensions, and are checked thoroughly before shipping.

Contact:

Supercast Industries, Mumbai
Mobile: 09665094970, 09326474970
Email: response@supercastind.com



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CASTINGS

Gravity Cast offers a wide range of castings for pumps. Castings for pumps manufactured in standard and customised options. Available for OEMs with various options and can be provided in support with internal or external threading as well as with different surface finishes.

Contact:

Gravity Cast Pvt Ltd, Rajkot
Tel: 02827-253037
Mobile: 09375324868, 09909028121
Email: info@gravitycastindia.com



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CAST IRON COUPLINGS

B K Tech Enterprise offers a wide range of cast iron couplings. Cast iron couplings manufactured in a wide range to meet a wide variety of end user applications. Highly versatile, of high quality, and available at very reasonable rates.

Contact:

B K Tech Enterprise Inc, Rajkot
Mobile: 09662861959
Email: sales@bktechenterprise.com, bktechenterprise@rediffmail.com



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INDUSTRIAL FORGING HAMMERS

Shree Somnath Forge And Fitting offers a wide range of industrial forging hammers. Manufactured by skilled technocrats using premium quality components and state-of-the-art technology.



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Contact:

Shree Somnath Forge And Fitting,
Ahmedabad
Mobile: 09898458215
Email: somnathforgefitting@gmail.com

INDUSTRIAL PLAIN WASHERS

Micro Metals offers a wide range of industrial plain washers. These washers come in different size options, dimensions, and finishes to suit different industrial applications. The product is preferred for dimensional accuracy, high tensile strength, abrasion resistance.



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Contact:

Micro Metals, Mumbai
Mobile: 09930772998, 09773102209
Email: info@micrometals.co.in

ULTRASONIC BRASS INSERTS

Kalyani Sales Corporation is offering a range of ultrasonic brass inserts. These ultrasonic brass inserts for plastic components are available in sizes ranging from M2 to M10 for all types of plastics, especially thermoplastics, etc and threaded brass inserts.



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Contact:

Kalyani Sales Corporation, Kolhapur
Mobile: 09960550053
Email: kalyanisalescorp@bsnl.in

SEAMLESS PIPES

Katariya Steel Distributors is offering a range of stainless steel seamless pipes. These pipes are manufactured with heavy machinery and skilled work force. A flawless product ranges that fulfills the expectations of clients.



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Contact:

Katariya Steel Distributors, Mumbai
Tel: 022-22423168, 66363168
Mobile: 09833405433, 09823458877
Email: katariyasteel@yahoo.com

HIGH QUALITY NICKEL FLANGES

Horizon Mercantile Associates Pvt Ltd offers a wide range of high quality nickel flanges. These flanges are known for stability, manufactured using best quality



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Contact:

Horizon Mercantile Associates Pvt Ltd,
Mumbai
Mobile: 09819679707, 09167250453
Email: info@horizontrade.in

EXPANSION BOLTS

Pee Vee Enterprises is offering a range of expansion bolts. These expansion bolts offer an apt choice for a variety of fastening applications. Made in precise dimensions, with best raw materials.



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Contact:

Pee Vee Enterprises, Delhi
Tel: 011-23242039
Mobile: 09811150326, 09873250326
Email: pvent11@rediffmail.com, pvent11@gmail.com

DOWEL PINS

Bhagya Shri Sales Corp is offering a range of cylindrical dowel pins. The product is widely used in industry owing to strong structure. It is



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manufactured using the quality materials obtained from trustworthy vendors.

Contact:

Bhagya Shri Sales Corp, Delhi
Mobile: 09311696016, 09873897016
Email: bs_sc@ymail.com

PREMIUM QUALITY REDUCED HEAD

Advance Hydrau Components Pvt Ltd offers an array of rivet nut, reduced head. These products are manufactured using premium quality basic parts and sophisticated technology as per the set industry norms.



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Contact:

Advance Hydrau Components Pvt Ltd,
New Delhi
Tel: 011-28353714/18 Mobile: 09313861011
Email: info@advancehydrau.com

HIGH GRADE GI PIPES

Industrial Piping Products is manufacturers wide range of high grade GI pipes. These pipes are designed and developed from high-grade materials used in sanitary fittings in commercial and residential places.



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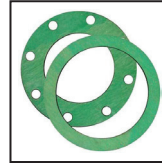


Contact:

Industrial Piping Products, Delhi
Tel: 011-23267475
Mobile: 09811377008, 09350290172
Email: industrialpiping2007@gmail.com

NON METALLIC CUT GASKETS

Citizen Metals Pvt Ltd offers a broad range of non metallic cut gaskets. These products use high-grade raw materials such as CAF sheets, insulation sheets, graphite, thermo plastics, non-asbestos sheet material, non-asbestos millboard and glass fibre.



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Contact:

Citizen Metals Pvt Ltd, Mumbai
Mobile: 09819448843
Email: exports@citizenmetals.com

SOCKET SCREWS

Canco Fasteners offers a wide gamut of socket screws, countersunk. This countersunk socket screws are manufactured in a comprehensive assortment. It is available in various sizes, shapes, grades and materials.



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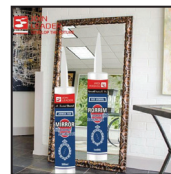


Contact:

Canco Fasteners, New Delhi
Tel: 011-42525500
Mobile: 09811063537, 09811315315.
Email: canco@vsnl.com

SILICONE SEALANT

Join Leader Chemtech Pvt Ltd offers join leader 550 mirror silicone sealant. It is a high modulus, neutral-curing, nor corrosive, weatherproof and anti-mildew sealant. Known for its adhesion, provides a permanent flexible bond for mirrors to plaster, metal, or wood.



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Contact:

Join Leader Chemtech Pvt Ltd, Delhi
Mobile: 09311145624, 09311145622
Email: sales@joinleader.in

TWO-PART SYSTEM

Universal Adhesives is offers a wide range of epoxy two-part system. The product is used for patching and sealing applications on various substrates like concrete, wood, metal, fibre glass, etc.



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Contact:

Universal Adhesives, Ahmedabad
Tel: 079-26562948, 26562949
Mobile: 09898598145, 09375811520
Fax: 079-26562951
Email: uniadhesive@satyam.net.in

CYANOACRYLATES ADHESIVES

Priya Components offers a wide range of cyanoacrylates adhesives. Cyanoacrylates adhesives are one-part acrylate adhesives. They cure instantly on contact with mated surface through a reaction with surface moisture.



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Contact:

Priya Components, Vadodara
Mobile: 09925023362
Email: priyacomponents@yahoo.co.in

THREAD SEALANT

Glue Farm (India) Pvt Ltd manufacturers a range of piping thread sealant. This piping thread sealant is an effective solution for leaking pipes. It is widely used for sealing metal pipes and fittings.



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Contact:

Glue Farm (India) Pvt Ltd, Bengaluru
Tel: 080-25504889. Mobile: 09611871123
Fax: 080-25521385.
Email: info@gluefarm.in

SAFETY FIRE RETARDANT COATING

Marco Trading Company is offering a range of safety fire retardant coating. Fire retardant coating, a safety product that prevents rapid spread of fire allowing time for extinguishing the same before spreading rapidly.



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Contact:

Marco Trading Company, Surat
Mobile: 09638886161, 09726522888.
Email: info@marcouae.com

Event	Date & Venue	Contact
IMTEX – 2025	January 23-29, 2025 BIEC - Bangalore International Exhibition Center Bangalore	Indian Machine Tool Manufacturers Association Bangalore Tel: 080-66246600 Email: imtma@imtma.in
PAINTINDIA - NEW DELHI	January 30-31, 2025 IICC India international Convention and Expo Center New Delhi	ExpoNova Exhibitions & Conferences (India) Pvt Ltd Mumbai Tel: 022-62165323 Email: hpci.india@nm-india.com
POWER2DRIVE INDIA - GANDHINAGAR	February 12-14, 2025 Helipad Exhibition Centre Gandhinagar, Gujarat	Messe Muenchen India Pvt. Ltd. Mumbai Tel: 022-425547-05 Email: harshal.gadda@mm-india.in
MECTECH EXPO - NEW DELHI	February 13-15, 2025 Pragati Maidan Exhibition Center New Delhi	Confederation of Indian Industry Gurugram Email: amit.sharma@cii.in
INDIA FASTENER SHOW SOUTH CHENNAI	April 24-26, 2025 Chennai Trade Center, Chennai	FME (Future Market Events) Media Pvt Ltd Noida Email: eisha@futuremarketevents.com
INDIA MACHINE TOOLS SHOW - NEW DELHI	May 15-18, 2025 Yashobhoomi Convention Centre New Delhi	K AND D Communication Ltd. (KDCL) Ahmedabad Mobile: 099090-41613 Email: info@kdclglobal.com
INDOMACH - HYDERABAD	May 23-25, 2025 Hitex Exhibition Center Hyderabad	Indomach Business Solutions Nagpur Email: info.indomach@gmail.com
AUTOROBOT - COIMBATORE	August 01-03, 2025 Codissia Trade Fair Complex Coimbatore	Midaas Touch Events & Trade Fairs LLP Chennai Mobile: 09600047460 Email: vivek@midaastouch.in
7TH IMS 2025 INDIA MANUFACTURING SHOW	November 06-08, 2025 BIEC, Bangalore	India Exposition Mart Ltd Mobile: 09743784166 Email: exhibition21@indiaexpocentre.com
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DPES SIGN EXPO - CHINA GUANGZHOU	February 15-17, 2025 PWTC Poly World Trade Center Guangdong, China	Guangzhou Baoxuan Exhibition Co Ltd 510335 Guangzhou, China Tel: +86 (0)20 89089736 Email: sales@dpes.com.cn
IMEX - TIANJIN	March 06-09, 2025 Tianjin Meijiang Convention and Exhibition Center Tianjin, Tianjin, China	Zhenwei International Exhibition Group Guangzhou, China Email: hjn@zhenweiexpo.com
LASER WORLD OF PHOTONICS - CHINA	March 11-13, 2025 Shanghai New International Expo Center - SNIEC, Shanghai, China	Messe München GmbH 81823 Munich, Germany Tel: +49 (0)89 94920720 Email: info@messe-muenchen.de
AUTO MAINTENANCE AND REPAIR EXPO (AMR) - BEIJING	March 31- 02 April, 2025 Beijing Exhibition Center Beijing, China	Messe Frankfurt (HK) Ltd. Hong Kong, China Email: info@hongkong.messefrankfurt.com

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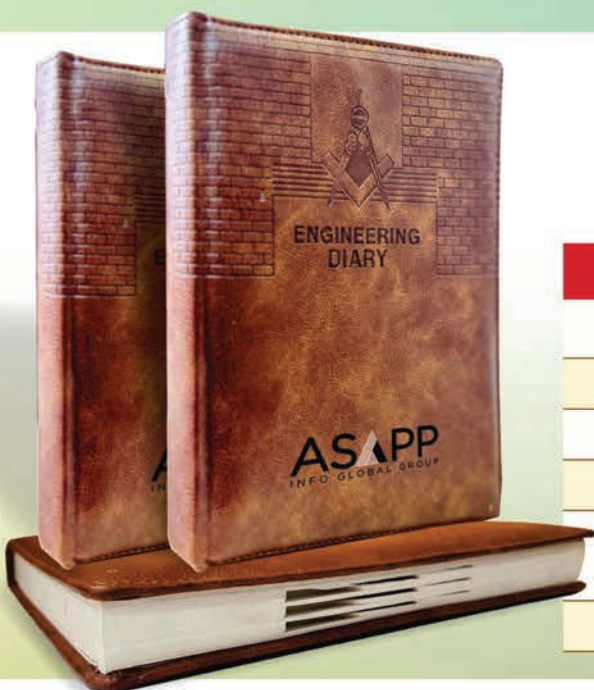
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DRDO India



Secretary DDR&D and Chairman DRDO presided over the steel cutting ceremony of Air independent propulsion (AIP) at L&T Hazira facility on 28 Dec 2024. It is an important milestone in AIP programme and marks beginning of the AIP manufacturing process.



Indian Navy



Keel laying ceremony of the 3rd Cadet Training Ship held at M/s L&T Shipyard, Kattupalli on 30 Dec 24. RAdm Ravi Kumar Dhinra, Flag Officer Tamil Nadu & Puducherry Area presided over the ceremony. These ships will be utilised for training officer cadets at sea after their basic training ashore & will also extend training facility to cadets from friendly foreign countries. Another significant milestone in Indian Navy's pursuit towards indigenous shipbuilding in consonance with GoI's vision of Aatmanirbhar Bharat & Make in India initiatives.



ISRO



SpaDeX's historic mission onboard PSLV-C60 delivers breathtaking visuals, showcasing India's strides in space exploration.



Prithvi Potta,

Director, Piot Solutions



The global manufacturing sector reveals striking contrasts. While China leads the pack, the 31.99% attributed to "Others" underscores the diverse and distributed nature of global manufacturing. India's 2.80% share represents a massive opportunity for growth, driven by innovation, policy reforms, and investment. The global manufacturing race is dynamic, and the future holds immense potential for change.



Prashant Kumar,

Co-Founder, ArthX



ArthX successfully demonstrated some intense drone operations at the Gandhinagar Military Station, earning resounding appreciation from our nation's finest. Our major drones: Vritra X86, Tapyra Thermal, and AMI-A3, which consistently outperformed expectations with their precision and endurance, but our Nano drones and VR Training Simulators did steal the show! We are setting new standards for versatility and innovation in modern warfare. Each system showcased is a proud result of relentless dedication, indigenization, and our unwavering mission to empower India's defense forces with world-class, made-in-India technology.



Power Grid



Power Grid has acquired 'Rajasthan IV 4A Power Transmission Limited' for evacuation of power from Rajasthan REZ Ph-IV (Part-4: 3.5 GW): Part A with cost ₹5,846 cr (NCT estimations). Project includes establishment of 765/400 kV sub-station in UP, 765 kV & 400 kV lines traversing.



Ministry of Coal



Driving the spirit of 'Make in India' as envisioned by the Hon'ble PM Narendra Modi, ECL, a subsidiary of CIL under Ministry of Coal, has achieved a remarkable milestone by launching India's first Standard Height Continuous Miner & Feeder Breaker at Jhanjra. These home-grown, state-of-the-art mining equipment marks a significant step towards Aatmanirbhar in advanced coal mining technology & reinforces the Nation's commitment to innovation & sustainability in coal mining.



Mayuresh Dash,

Founder, Metalogy

Honored to participate at IIT Bhubaneswar Research & Entrepreneurship Park, an inspiring hub for India's innovation journey. Shared the vision of d2F Industries with Hon'ble Minister Dharmendra Pradhan ji.

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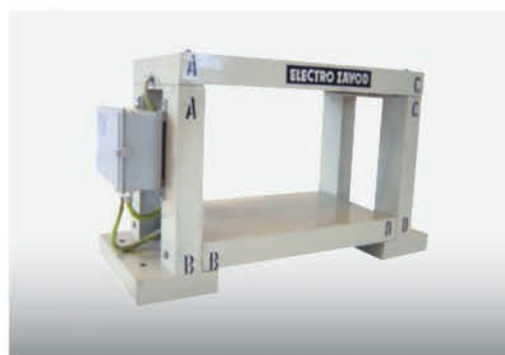
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