VOL 8, ISSUE 4 - NOVEMBER-DECEMBER 2024

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The Official Magazine of
Indian Machine Tool Manufacturers' Association
In Association with
Modern Machine Shop

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International Machine Tool & Manufacturing Technology Exhibition

Tooltech 2025
International Exhibition of Cutting Tools, Tooling Systems, Machine Tool Accessories, Metrology & CAD / CAM

23 - 29 January 2025 . BIEC, Bengaluru

Envisioning Automation

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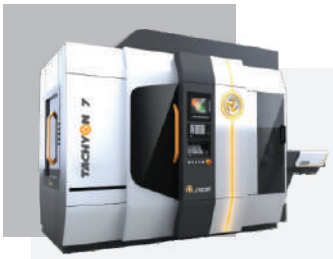

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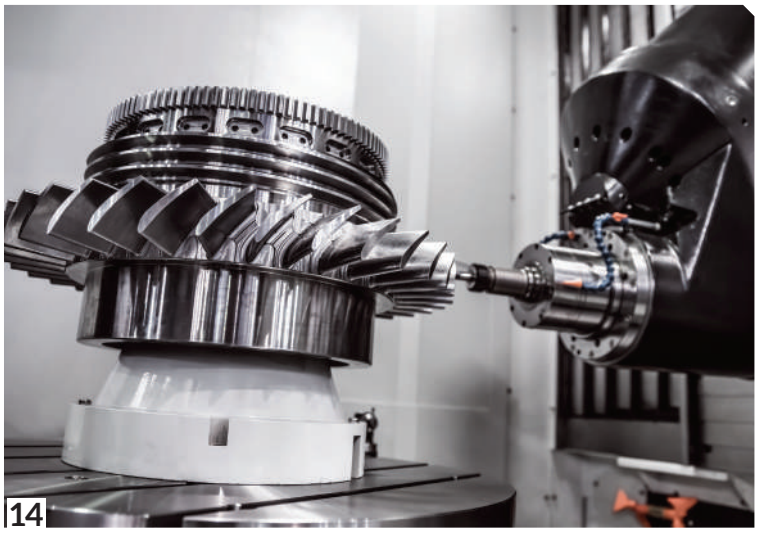

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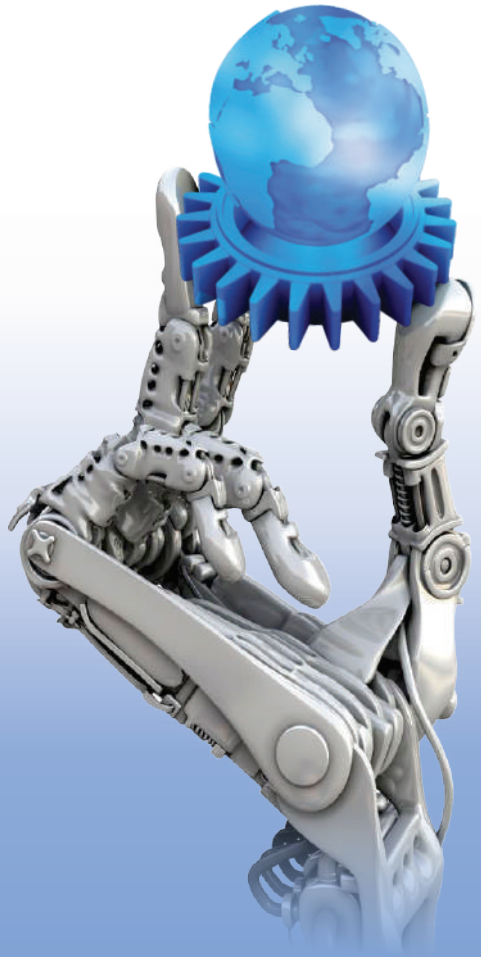

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PROMOTING MANUFACTURING GROWTH WITH EXHIBITIONS

RAJENDRA S RAJAMANE
PRESIDENT
IMTMA

India's economic and manufacturing outlook looks positive for the coming quarters with the International Monetary Fund (IMF) in its latest World Economic Outlook report forecasting growth at 7 percent for FY 25.

Most global agencies have forecasted similar growth, and, importantly, exhibitions have played a crucial role in trade development. Worldwide, leading exhibitions such as IMTS in Chicago, EMO in Hannover, and JIMTOF in Tokyo have helped restore business confidence.

India's manufacturing PMI has remained steady with good domestic demand and robust activities in services. The capital expenditure on infrastructure development is improving the ease of doing business and enhancing growth. India's merchandise exports were estimated to be US$ 178.68 billion from April to August 2024 period, as per the Government of India estimates, indicating good growth.

Big-ticket trade fairs create an economic multiplier effect and this is exactly what IMTEX does. Organized by Indian Machine Tool Manufacturers' Association (IMTMA), IMTEX is a catalyst in promoting domestic demand, factory production, investments, and robust activities in manufacturing.

IMTEX, Tooltech & Digital Manufacturing 2025 at Bangalore International Exhibition Centre (BIEC) from January 23 – 29, 2025 will be the largest of its kind, featuring eight exhibition halls, 90,000 sq mt of space, and over 1,000 exhibitors from 23 countries showcasing the latest cutting-edge technologies.

> *Participation in IMTEX 2025 will be important from the manufacturing perspective as it would chart future industrial development. I call upon the manufacturing industry to attend IMTEX, stay in sync with global practices, and advance manufacturing skills by several notches.*

Tooltech will feature parts, accessories, and systems for machine tools while Digital Manufacturing will have Industry 4.0 and additive manufacturing as prime focus.

Participation in IMTEX 2025 will be important from the manufacturing perspective as it would chart future industrial development. I call upon the manufacturing industry to attend IMTEX, stay in sync with global practices, and advance manufacturing skills by several notches.

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JIBAK DASGUPTA
DIRECTOR GENERAL & CEO
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Dear Readers,

In the rapidly changing environment we live in, things that were once considered sacrosanct are becoming obsolete. Big brands who were market leaders earlier have seen their share dip sharply due to their resistance to change.

Productivity improvements in industries are a necessary step to remain competitive. These changes, when made to happen continually, lead to cost savings and manufacturing excellence. It is always a great practice to constantly learn, see, understand, and inculcate what are considered best practices in day-to-day schedules.

In this context, we must keep an eye on Indian Machine Tool Manufacturers' Association's (IMTMA) National Productivity Summit (NPS), scheduled from December 2 – 3, 2024, in Pune where the best case studies will be presented by leading industries. NPS is an opportunity to gain insight into productivity improvements.

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After the summit, IMTEX 2025, along with Tooltech and Digital Manufacturing 2025, will be underway from January 23 – 29, 2025. IMTEX is a platform for industry professionals to get acquainted with the latest innovations that are even accessible to MSMEs, making it an unmissable event.

In this edition of Modern Manufacturing India (MMI magazine), we bring to our readers some of the top picks from the manufacturing world. The issue also has an opinion piece from IMTMA on advancements in metal cutting.

Finally, I welcome our readers to send their views, suggestions, and concerns which will help us understand your needs better. We would love to hear from you.

Wishing you a joyful reading experience with the November-December 2024 issue of MMI.

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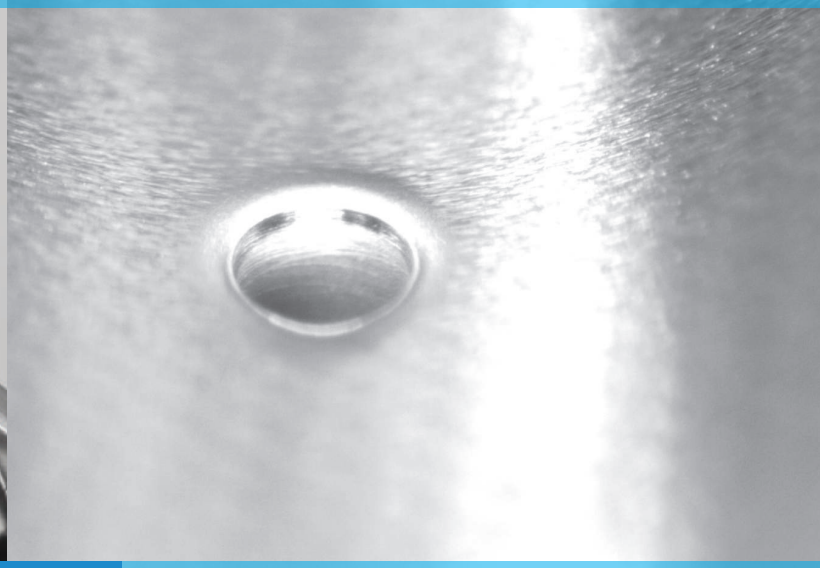

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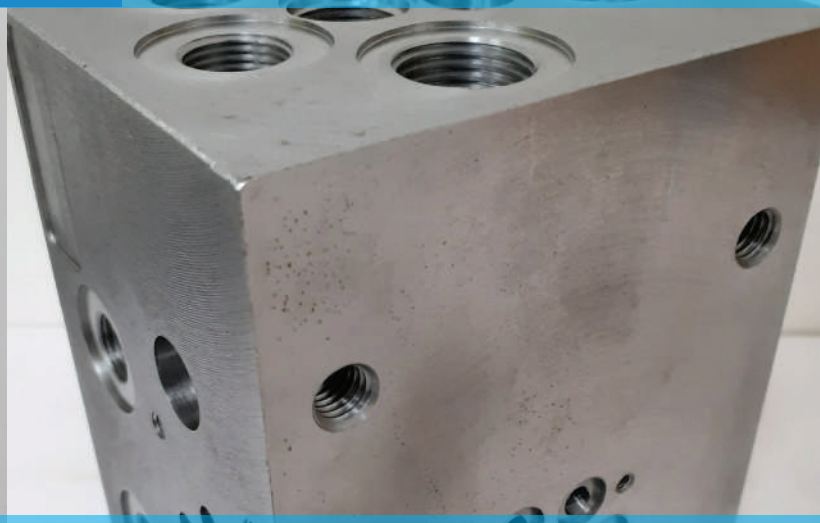

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THE LEGACY CONTINUES...

SOUMI MITRA
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The Indian Manufacturing fraternity deeply mourns the loss of its visionary leader Shri Ratan Tata whose contribution to the industry has helped the nation claim a highly coveted position in the global manufacturing arena. Manufacturing for him was not limited to profit-making, he viewed it as a way to create jobs, empower communities, and build a self-reliant India.

Of all the anecdotes making rounds these days, one that has deeply moved me was his love for his ailing furry friend whose well-being took precedence over an invitation from the British Royals to receive a 'lifetime achievement award'.

When Prince Charles (now King Charles) learned about Tata's reason for declining, he remarked, "That's a man. That's the man Ratan is. That's why the house of Tata is what it is. That's why it's on a stable course."

This rings so true even today. The visionary, philanthropic man is gone but the legacy he created to transform the country continues. A couple of days ago, N Chandrasekaran, Chairman, Tata Sons, announced that Tata Group will create five lakh manufacturing jobs in five years across Semiconductor, Electric Vehicles, Battery, and other allied industry sectors. He emphasized that India cannot achieve the goals of being a developed nation if the country cannot create manufacturing jobs.

> *If you want to walk fast, walk alone. But if you want to walk far, walk together.*
>
> **– Ratan Tata**

The strive to build the nation as a manufacturing hub continues with manufacturing technology exhibitions, symposiums on the latest engineering trends, and seminars on advanced manufacturing innovations. Now a few weeks away, IMTEX 2025 & Tooltech 2025 is IMTMA's endeavor in its pursuit of elevating India's stature and celebrating with the global manufacturing community our pride in transforming what was once deemed impossible into reality.

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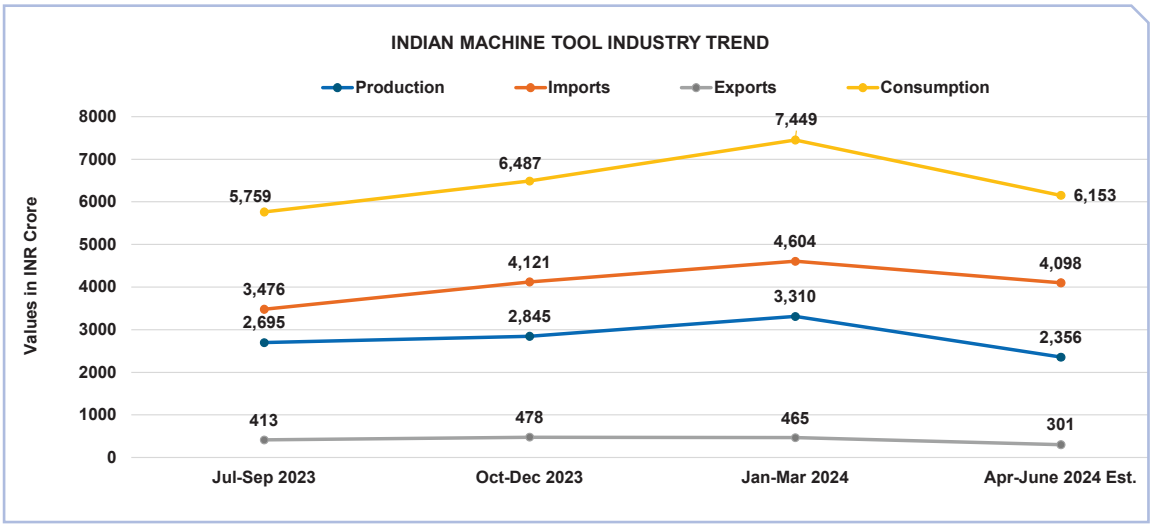
NAVIGATING ECONOMIC WAVES

While the Indian economy faces some headwinds, the machine tool industry remains resilient, supported by strong domestic demand and strategic imports.



Source: IMTMA

Table 1. Indian Machine Tool Industry Trend

In exports, Lathes, VMCs, and Presses were the top three machinery exported, valued at INR 262 crore (US$ 31 M) at about 44 percent of total machine tool exports in H1FY25. The total machine tool exports from April to September 2024 (H1FY25) is INR 593 crore (US$ 71 M).

The Indian economic outlook for October 2024 exhibits mixed trends across most high-frequency indicators compared to the previous month. The manufacturing PMI dropped to 56.5 in September 24, while services PMI fell to a 10-month low of 57.7, pressured by fierce price increases and weaker growth in new international orders, with export growth hitting an 18-month low. Industrial production IIP declined by -3 percent in September 24, driven by contractions in the Mining and Electricity sectors. The Auto sector registered growth across all segments, fueled by a surge in seasonal demand.

Trade deficit narrows as imports decline

On the trade front, the merchandise trade deficit narrowed to a five-month low in September 24, driven by a significant decline in merchandise imports, particularly gold. Forex reserves hit a record high in September 24, boosted by a notable surge in foreign currency assets and gold reserves. FDI also saw a sharp increase in August 24, primarily directed towards the Manufacturing, Financial Services, Communication, and Energy sectors.

In terms of macroeconomic indicators, WPI inflation rose to 1.84 percent in September 24, driven by a surge in primary article prices. CPI inflation rose to a nine-month high of 5.49 percent, fueled by an 8.4 percent YoY spike in food prices. GST collections saw a modest monthly decline, reflecting subdued economic activity. Consumer confidence improved in RBI's September 24 survey, with the CSI index rising to 94.7 and the FEI index to 121.4, indicating higher household confidence. IMF has forecasted global growth at 3.2 percent in 2024 and India's growth at 7.0 percent in 2024.

Positive momentum in machine tool industry

The production of the Indian Machine Tool industry in Q1 FY25 is estimated to have increased by approximately 8 percent year-on-year, reaching around INR 2,356 crore (US$ 282 million). The industry's imports in Q1 FY25 saw a rise of 30 percent year-on-year, amounting to INR 4,098 crore (US$ 491 M). Machine tool exports during Q1 FY25 from India reported a degrowth of 1 percent, amounting to INR 301 crore (US$ 36 M) and consumption is estimated to have increased by about 22 percent to reach INR 6,153 crore (US$ 738 M) in Q1 FY25.

The total machine tool imports in April to September 2024 (H1FY25) is INR 8,006 crore (US$ 956 M). China (26%), Japan (16%), and Germany (13%) emerged as the top countries for imports, contributing 55 percent of the total machine tool imports in April to September 2024 (H1FY25). Presses, Lathes, and Cylindrical Grinding Machines were the top machinery imported valued at INR 3,038 crore (US$ 363 M) at about 38 percent of total machine tool imports in H1FY25.

Article source: Data & Policy Team, IMTMA

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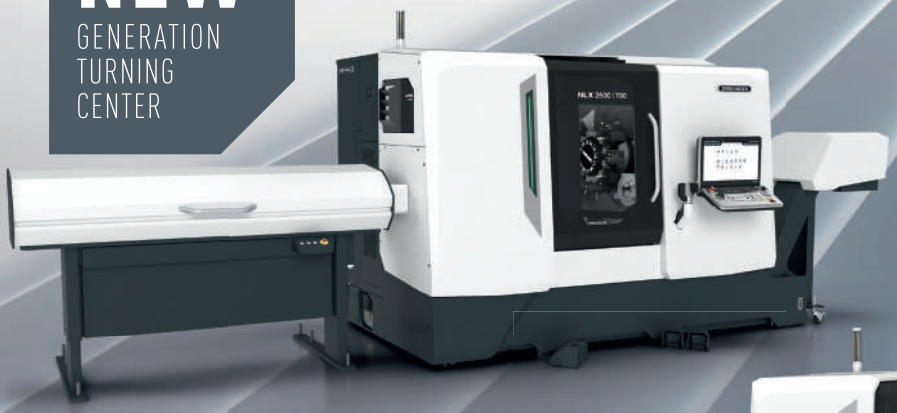

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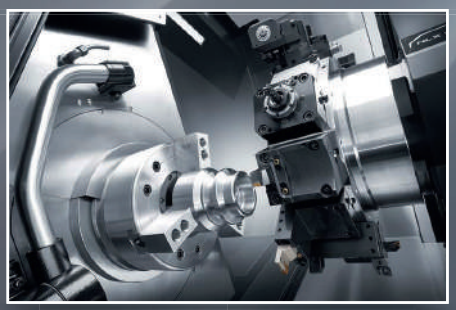

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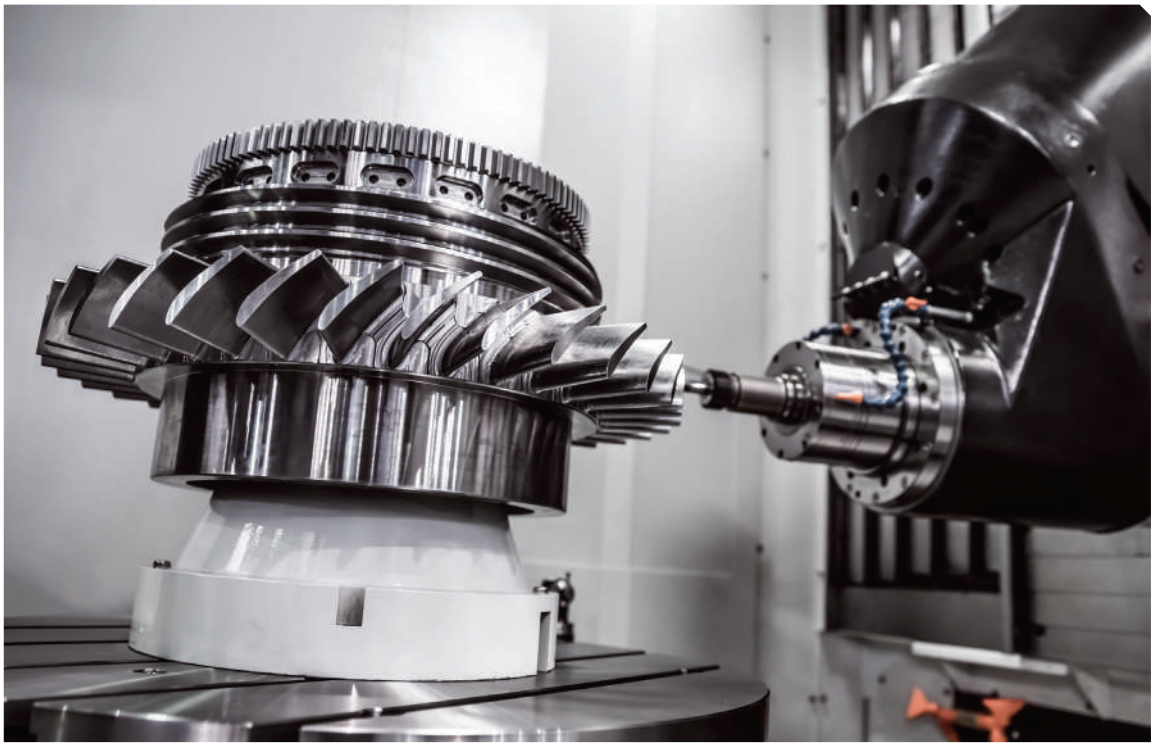
TRANSFORMING THE INDIAN METAL CUTTING LANDSCAPE

Since machine tools are the backbone of manufacturing industries, they are constantly evolving to address the latter's varied demands. In its pursuit to feature the latest and advanced machine tools, Indian Machine Tool Manufacturers' Association (IMTMA) is yet again holding its flagship exhibition IMTEX 2025 & Tooltech 2025, scheduled from January 23-28, 2025, at Bangalore International Exhibition Centre (BIEC). Do mark your calendar.



Source: Magic Wand Media

Machine tools are the backbone of manufacturing industries, with metal cutting accounting for around 75 percent of total demand. India imports nearly 55 percent of its machine tools from various countries. However, as the country moves towards self-reliance, machine tool builders are increasingly investing in technology development and innovation.

Traditionally, the machine tool industry has mainly catered to the Auto sector. However, the Government of India's push to replace fuel-powered vehicles with electric and hybrid ones is prompting the industry to adjust its strategies. The industry now needs to provide solutions to the evolving Automotive industry landscape besides addressing the demands of the rainbow sectors such as Aerospace, Defence, Electronics, Semiconductor, Medical, Railways, Power, Construction, General Engineering, Woodworking, etc. These sectors require very high speed, high precision, and high accuracy machine tools which will help them get quality output. The entire machining process has to be optimized and equipped with tools that can also do predictive maintenance using real-time performance data.

Advancements in machine tools

Machine tools are becoming more advanced, with innovative

Source: IMTMA

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coatings that extend tool life and enhance functionality being developed for products used in various manufacturing units. Materials such as titanium carbon nitride and titanium aluminum nitride are used to coat tools, enabling the processing of tougher materials with closer tolerances.

Global machine tool builders are increasingly adopting automation and robotics. Most machines are Industry 4.0-enabled and equipped with sensors that improve operations through big data analytics, cloud computing, cyber-physical systems, and the Industrial Internet of Things (IIoT). Additionally. predictive maintenance is facilitated by tools with integrated sensors and connections.

Industry 4.0 has also led to the development of smart cutting tools that can communicate with machines, collect data, and make adjustments to optimize performance. They are even able to monitor the cutting process in real time and adjust the speed, feed, and other parameters to optimize the cutting process. All these have resulted in improved accuracy, reduced waste, and increased productivity.

These are some of the critical factors driving demand for precision in components manufactured for key sectors such as Aerospace and Defence.

As we move forward, focusing on customized solutions, forging strategic partnerships, and integrating digital technologies more extensively will be key to ensuring success. Industries require machines tailored to their specific needs, especially those offering the lowest cycle times, highest reliability, and smallest possible footprints. End users expect tailored fixturing solutions and support, whether for tool changes, job changes, loading, unloading, or other tasks.

The Machine Tool industry now needs to provide solutions to the evolving Automotive industry landscape besides addressing the demands of the rainbow sectors such as Aerospace, Defence, Electronics, Semiconductor, Medical, Railways, Power, Construction, General Engineering, Woodworking, etc.

Show Highlights

IMTEX 2025, Tooltech 2025, and Digital Manufacturing 2025 organized by IMTMA from January 23 – 29, 2025, will feature:

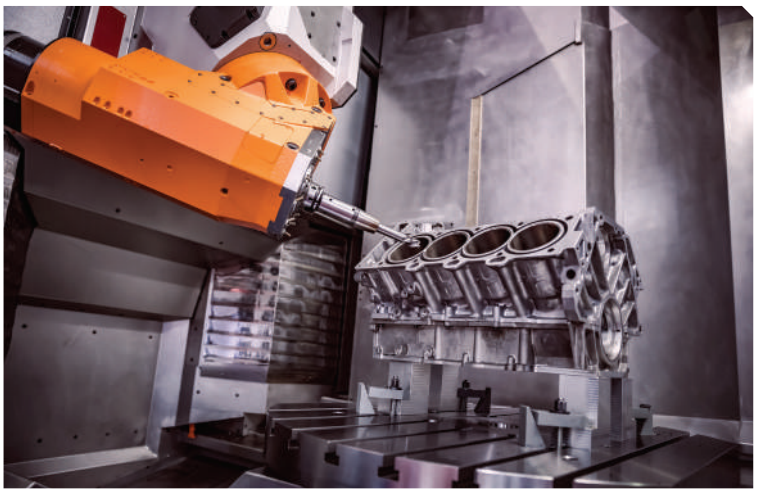
- 90,000 sq mt of exhibition space
- 1,100+ exhibitors
- 23+ countries
- 2,000+ trade delegations
- 1,00,000+ business visitors
- International Buyer Seller Meet
- Industry / Academia Representations
- Global Opportunities / Networking

IMTEX 2025, Tooltech 2025, & Digital Manufacturing 2025

Large-scale exhibitions play a crucial role in helping industries make rapid strides. IMTEX & Tooltech is a much-awaited show for the Indian Machine Tool industry as it's an ideal platform for companies to launch new products and present their technological advancements to various manufacturing industries. "As one of the leading global machine tools shows today, IMTEX attracts visitors from India and numerous other countries. We expect to welcome visitors from more than 50 countries at IMTEX 2025," says Rajendra S Rajamane, President, IMTMA, highlighting the significance of the show.

Exhibitors will showcase high-precision, high-performance, multi-tasking, and special-purpose machines, robots, cobots, tools, accessories, manufacturing software, 3D printing solutions, evolving Industry 4.0 hardware, software, and solutions, etc.

"IMTEX is an ecosystem that complements various activities for the entire manufacturing fraternity. Anyone participating in IMTEX has something to gain. We have seminars, buyer-seller meetings, academia-industry collaborations, national and international trade delegations, and many more. Visitors can plan their visit to the exhibition and attend these activities by doing pre-registration, which is now open at www.imtex.in," shares Jibak Dasgupta, Director General & CEO, IMTMA, supporting Rajamane's views.



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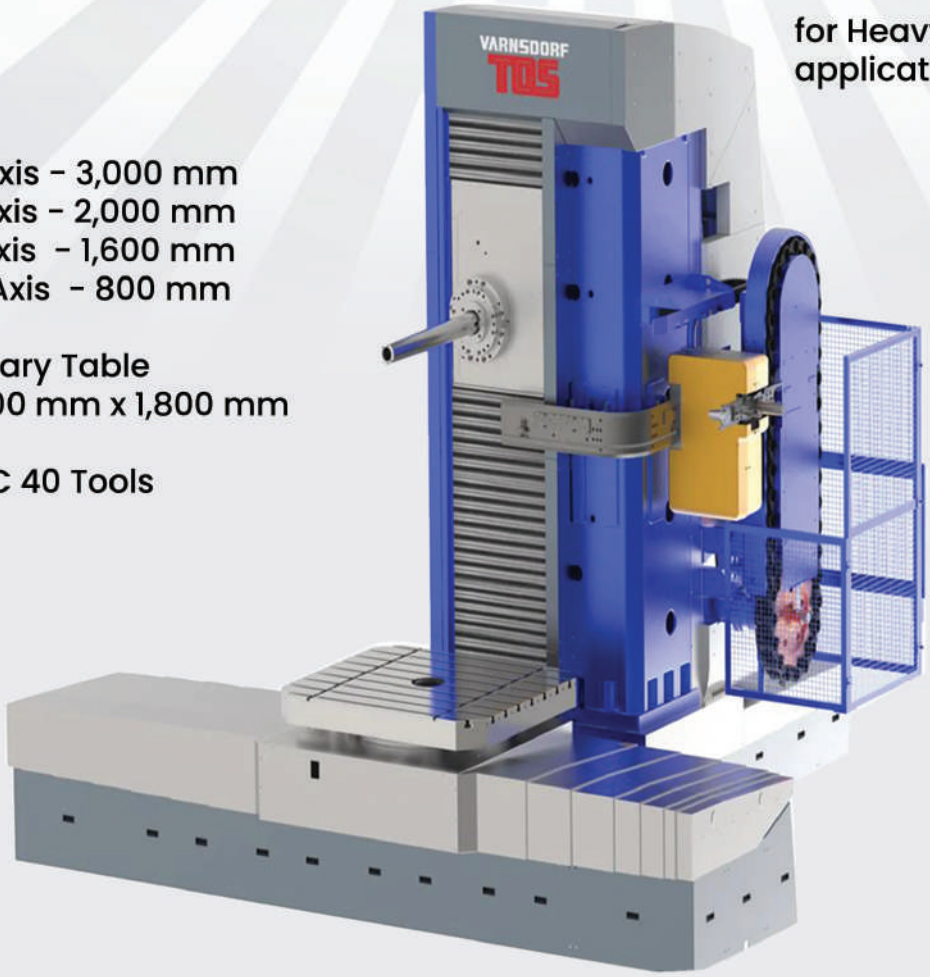

X Axis - 3,000 mm
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PLANNING A NEW ERA OF GROWTH

At the Indian Machine Tool Manufacturers' Association's (IMTMA) 78th AGM, special sessions were held to deliberate on the Indian machine tool industry's juncture on the global map, the challenges it encounters, opportunities waiting to be leveraged, the crucial role of advanced technologies including AI, and many more relevant subjects.

Source: IMTMA

(L to R): Jibak Dasgupta, Director General & CEO, IMTMA; Rajendra S Rajamane, President, IMTMA; Vipin Sondhi, Independent Director & Advisor, Bain Capital – Automotive Sector; Bidisha Ganguly, Chief Economist, Confederation of Indian Industry (CII); Mohini Kelkar, Vice President, IMTMA; and N Ramanathan, Founder Member and Past President, Indian Society for Quality (ISQ) share the dais at IMTMA's 78th AGM.

The Indian Machine Tool industry's exports reported 13% growth amounting to ₹1,659 crore, and machine tool consumption was estimated to be up by 11% to reach ₹27,265 crore.

Source: IMTMA

Indian Machine Tool Manufacturers' Association (IMTMA) held its 78th Annual General Meeting (AGM) on September 27, 2024, at Bangalore International Exhibition Centre (BIEC), Bengaluru. Jibak Dasgupta, Director General & CEO, IMTMA; Rajendra S Rajamane, President, IMTMA; Vipin Sondhi, Independent Director & Advisor, Bain Capital - Automotive Sector; Bidisha Ganguly, Chief Economist, Confederation of Indian Industry (CII); Mohini Kelkar, Vice President, IMTMA; and N Ramanathan, Founder Member and Past President, Indian Society for Quality (ISQ), were among the dignitaries attending the meet.

Way ahead

Sondhi, Ganguly, and Ramanathan were the keynote speakers. Sondhi presented his take on the opportunities and challenges for the Indian Machine Tool industry in making India a global manufacturing hub. He opined that India must become a product nation, strengthen industry-academia partnerships, and focus on research and development to produce innovative products.

Ganguly's presentation focused on the Indian economy and the likely scenario for the future. She believed that consumption and investments in manufacturing are important factors and India was doing well in these parameters.

Ramanathan delivered a special address titled 'Quality: The Journey Ahead' in which he discussed the crucial role of build quality in manufacturing to ensure that products are reliable, comply with industry standards, and meet customer expectations.

During the Business Session of the AGM, Rajamane presented IMTMA's activities during FY 2023-24. He shared that the Indian Machine Tool industry's production during FY 2023-24 was estimated to have increased by around 10 percent year-on-year, reaching ₹13,571 crore.

Selecting visionaries

At the Executive Committee meeting following the AGM, a new Executive Committee of IMTMA for 2024-2025 was formed. Rajamane was elected as the President of IMTMA for the year 2024-2025. Kelkar was elected as the Vice President for the year 2024-2025.

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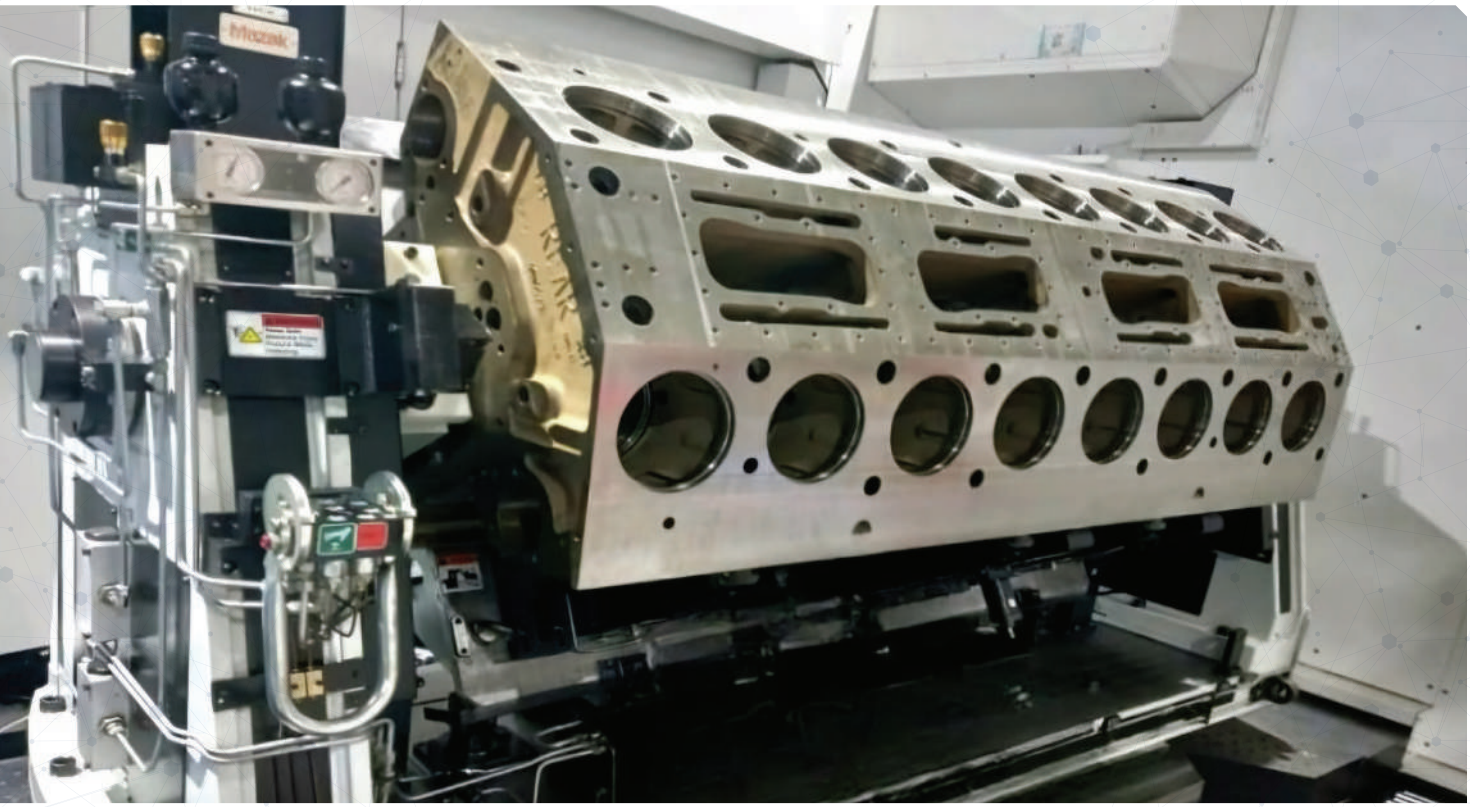
HYDRAULIC FIXTURES - THE UNSEEN HERO OF MANUFACTURING

Reji Varghese explores the evolving landscape of hydraulic machining center fixtures that work tirelessly behind the scenes to ensure precision, efficiency, and reliability. By embracing hydraulic fixtures, manufacturers can unlock new levels of efficiency, precision, and innovation.



Source: Forms & Gears

Three position Hydraulic Indexing Fixture, common for 12 and 16 Cylinder blocks. 3-tonne weight, 3.5 m length, and assembly tolerances maintained at 10 microns.

REJI VARGHESE
MD
RV Forms & Gears
fngreji@gmail.com

The Manufacturing industry is undergoing a significant transformation, driven by rapid advancements in CNC machines and cutting tool technology. As machines become faster, more precise, and increasingly automated, the Workholding industry is being forced to adapt and innovate to keep pace. There are a number of challenges and opportunities facing the Workholding industry as it strives to meet the demands of modern manufacturing.

The rise of high-speed machining

The development of high-speed machining has revolutionized the Manufacturing industry. CNC machines can now operate at very high speeds, generating immense forces and vibrations that can compromise workholding systems. The development of high-performance cutting tools, such as those with advanced coatings and geometries, has also enabled manufacturers to machine complex parts with increased precision and speed.

Traditional workholding methods, such as fixtures with mechanical clamps and vices, are struggling to keep up with these demands. Hence, to address this challenge, fixture builders are developing new products and technologies that can withstand the rigors of high-speed machining.

E Thayananthan, Head of Design, Forms and Gears, an ASM subsidiary, says, "About 30 years ago, it was only a few OEMs that were using hydraulic fixtures

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"We, at Mazak India, have realized the important role fixtures play in unlocking the full potential of the machine and we are now designing and manufacturing fixtures at our Mazak India facility in Pune. Mazak India is now a fixture hub for Mazak globally and most of our clients in India and abroad have benefited from using our fixtures to reduce cycle time, increase quality and repeatability, and decrease operator dependence."

Gajanan Dongade
AGM
Fixture and Automation Division
Yamazaki Mazak Machine Tools Pvt Ltd

Another important benefit of hydraulic fixtures is improved part quality. Consistent and repeatable clamping force is the primary improvement here, unlike manually operated clamps which rely on the diligence and attentiveness of the worker.

but nowadays hydraulic clamping systems are becoming increasingly popular even amongst smaller companies, as they offer faster clamping and unclamping times, as well as improved holding forces and vibration dampening."

Gajanan Dongade, AGM, Fixture and Automation Division, Mazak India, says, "Quite often companies make the mistake of buying state-of-the-art CNC machining centers and cutting tools and comprising on fixtures. They might think they are saving cost by compromising on fixtures, but they are in fact, paying a heavy price for it because the full capability of their machines and cutting tools cannot be leveraged because of drawbacks in the fixtures."

"We, at Mazak India, have realized the important role fixtures play in unlocking the full potential of the machine and we are now designing and manufacturing fixtures at our Mazak India facility in Pune. Mazak India is now a fixture hub for Mazak globally and most of our clients in India and abroad have benefited from using our fixtures to reduce cycle time, increase quality and repeatability, and decrease operator dependence," he adds.

TV Mohan, Country Head & Managing Director India, Andreas Maier Workholding Technology, a subsidiary of AMF, Germany, says, "Recent developments and progress in workholding and clamping such as Zero-point systems, automated clamping packages in hydraulic and pneumatic versions, lightweight robotic gripper systems, high temperature withstanding clamping, modular tombstone fixture elements, thin workpiece and non-ferrous applications, wireless sensoring systems as well as automatic stackers, loaders, and lifters have dramatically increased the useful machine time and cut costs and idle and downtimes drastically."

Benefits of hydraulic fixtures

Higher cutting parameters, faster machining: Apart from reduced clamping time, hydraulic fixtures allow for much faster machining cycles. Power clamps offer added security as they are not only independent of operator intervention, but also offer consistent and high clamping forces. Holding forces can also be adjusted to suit the specific requirements of the component. Automatically adjusting work supports become rigid supports during machining and prevent deflection and vibration during the machining cycle. Dongade says, "The use of work supports enables higher cutting parameters to be used, translating into lower cycle times. Work supports can be introduced into unsupported and inaccessible areas which greatly improve the rigidity of the fixture during high-speed machining, markedly improving quality parameters too."

Quicker and sequential clamping: Instead of taking several minutes to tighten and loosen clamps on a manual fixture, a machine operator can activate a hydraulic fixture from a single point in a matter of seconds. The increased clamping speed thereby reduces the non-productive time which is especially critical in single pallet machines. In hydraulic fixtures, clamping can be done sequentially to operate the clamps in a specific order. This feature is important in many clamping situations and eliminates the chance of deformed parts due to improper clamping.

Improved component quality: Another important benefit of hydraulic fixtures is improved part quality. Consistent and repeatable clamping force is the primary improvement here, unlike manually operated clamps which rely on the diligence and attentiveness of the worker. Thayananthan says, "Hydraulic fixtures provide controlled and precise clamping forces cycle after cycle, to improve overall quality and minimize rejections. For example, reduced clamping forces can be independently applied on fragile sections of the workpiece, dramatically improving component quality."

Reduced operator dependence: Hydraulic fixtures eliminate the strenuous activity of manually clamping and unclamping by introducing consistent and controllable functioning of hydraulically actuated clamps.

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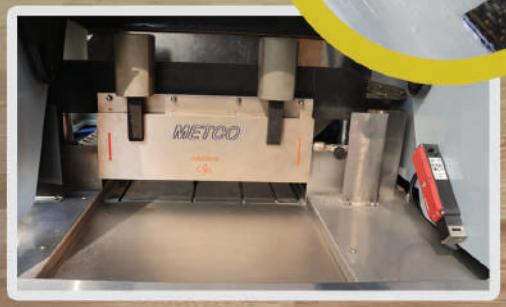

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"At Forms and Gears, we have developed SmartFix 4.0, which is a precision workholding device with the ability to collect, transmit, and analyze data in a useful format. Sensors to monitor vibration, pressure, the sequence of clamping, component presence, etc are mounted on the fixture. While sensors to monitor oil levels, oil contamination, and temperature are mounted on the powerpack."

E Thayananthan
Head of Design
Forms and Gears, an ASM subsidiary

Apart from reduced clamping time, hydraulic fixtures allow for much faster machining cycles. Power clamps offer added security as they are not only independent of operator intervention, but also offer consistent and high clamping forces.

From a single point, multiple clamps can be activated at the push of a button. Hydraulic fixtures also improve the safety and efficiency of machine operations. Setting the component on the fixture and proper clamping is independent of the operator.

Indexing using hydraulics

For fixed indexing applications, hydraulics can be used on fixtures to make the fixtures index to a high degree of accuracy so that multiple setups can be done with just one fixture and one component clamping cycle. In addition to costs saved on multiple fixtures, this can also result in significant cost savings on rotary tables, etc.

Interfacing with robotics/automation

As automation and robotics continue to evolve, the demand for advanced hydraulic fixtures will grow. Artificial Intelligence (AI), Machine Learning (ML), Industry 4.0, and the Internet of Things (IoT) will drive the development of more sophisticated hydraulic fixtures, integrating sensors, actuators, and AI.

By embracing hydraulic fixtures, manufacturers can unlock new levels of efficiency, precision, and innovation, positioning themselves for success in the rapidly changing world of automation and robotics.

The future of workholding

As the Manufacturing industry continues to evolve, the Workholding industry must adapt and innovate to keep pace. This will require the development of new products and technologies that can meet the demands of advanced CNC machines and cutting tool technology.

Mohan says, "In our modern world, a wide range of automation tools such as cobots, robots, AI, and IoT-enabled technologies have become commonplace and are the new normal in the advent of lean and smart factories and shop floors consistent with Industry 4.0 objectives and goals. To achieve this revolution, machine manufacturers are under a constant development mode towards creating value, reducing waste and downtime, and ensuring a sustainable production standard. This is not only the responsibility of the machine builder (as to a large extent they set the pace) but also the task of the workholding, clamping, and the tool manufacturer to bring the efficiencies of the entire eco-system to scale up productivity."

Some potential areas of development include:
Artificial Intelligence and Machine Learning: The world of manufacturing is undergoing a significant transformation, driven by the increasing adoption

"Recent developments and progress in workholding and clamping such as Zero-point systems, automated clamping packages in hydraulic and pneumatic versions, lightweight robotic gripper systems, high temperature withstanding clamping, modular tombstone fixture elements, thin workpiece and non-ferrous applications, wireless sensoring systems as well as automatic stackers, loaders, and lifters have dramatically increased the useful machine time and cut costs and idle and downtimes drastically."

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> "We have developed an advanced Predictive AI system, SensAI, that can be mounted on the fixture or the machine tool. SensAI offers AI-driven waste reduction insights by monitoring tool conditions, maximizing utilization, and minimizing downtime while providing real-time feedback to operators."
>
> **Marcus Taylor**
> **CEO & Founder**
> **SensAI, Singapore**

As automation and robotics continue to evolve, the demand for advanced hydraulic fixtures will grow. Artificial Intelligence (AI), Machine Learning (ML), Industry 4.0, and the Internet of Things (IoT) will drive the development of more sophisticated hydraulic fixtures, integrating sensors, actuators, and AI.

of AI. One area where AI is making a substantial impact is in workholding. Fixture building companies are beginning to leverage the power of AI and ML by incorporating them into innovative workholding solutions. Thayananthan says, "At Forms and Gears, we have developed SmartFix 4.0, which is a precision workholding device with the ability to collect, transmit, and analyze data in a useful format. Sensors to monitor vibration, pressure, the sequence of clamping, component presence, etc are mounted on the fixture. While sensors to monitor oil levels, oil contamination, and temperature are mounted on the powerpack. The high volume of data collected from these sensors is continuously transmitted wirelessly to the cloud where it is parsed and analyzed using Data Analytics and AI tools and sent back to a custom-built dashboard of the end user to provide useful insights into the machining process."

Marcus Taylor, CEO & Founder, SensAI, Singapore, says "We have developed an advanced Predictive AI system, SensAI, that can be mounted on the fixture or the machine tool. SensAI offers AI-driven waste reduction insights by monitoring tool conditions, maximizing utilization, and minimizing downtime while providing real-time feedback to operators. Data security is ensured through an embedded crypto algorithm, maintaining data integrity and privacy. The system supports wireless connectivity via Wi-Fi and 4G/5G/6G networks, enabling seamless integration and uninterrupted data collection. It also tracks power consumption and carbon emissions, addressing legal requirements and creating revenue opportunities through sustainability metrics. Continuous improvement is achieved through machine learning capabilities, as the system adapts to its environment and refines algorithms to enhance waste reduction and sustainability strategies. Operators receive instant feedback through a comprehensive interface, including a display dashboard, a mobile app, and a haptic feedback system on a wrist-worn device, allowing for prompt reactions to changing tool conditions."

AI is transforming the world of workholding, enabling manufacturers to improve productivity, quality, and safety. By embracing AI-powered workholding systems, manufacturers can stay competitive in today's fast-paced industrial landscape.

Advanced materials: Many companies are beginning to use advanced materials such as composites and nanomaterials to create lighter, stronger, and more durable workholding products.

Additive manufacturing: Additive manufacturing techniques such as 3D printing are also being used to create complex workholding products with optimized geometries and structures.

The unseen heroes of manufacturing

Mohan says, "The world of metal cutting is going to be even more exciting with connected machines, the evolution of AI, ML, and Digital and Collaborative automation, leading to unmanned factories and another industrial revolution. Workholding and clamping system manufacturers will have to continue to adapt and innovate to keep pace with this fast-changing landscape."

Hydraulic fixtures are the unseen heroes of manufacturing, working tirelessly behind the scenes to ensure precision, efficiency, and reliability. By embracing hydraulic fixtures, manufacturers can unlock new levels of efficiency, precision, and innovation, positioning themselves for success in the rapidly evolving world of manufacturing.

Tech Talks is a column by industry veteran and journalist Reji Varghese that talks about the latest advancements in Machine Tools, provides snippets from history, interesting facts, etc. about the Machine Tool industry.

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BRIDGING THE SKILL GAP

With the sector advancing at an impressive CAGR of 25-30 percent, projections indicate the creation of 12 million jobs, encompassing 3 million direct and 9 million indirect roles. However, a pressing deficit of 10 million trained professionals underscores the urgent need to bridge this gap to sustain and amplify India's growth in the Electronics sector.

Source: Magic Wand Media

India's Electronics industry is witnessing unprecedented growth, inspired by Prime Minister Narendra Modi's vision of making the country a US$ 500 billion electronics manufacturing hub by 2030. TeamLease Degree Apprenticeship, the largest privately-owned Degree Apprenticeship program from the house of TeamLease Services, has released a crucial report highlighting a significant skills gap in the industry, potentially impacting its growth.

As the industry diversifies into areas such as Communication and Broadcast Electronics, Consumer Electronics, Industrial Electronics, and Aerospace and Defence Electronics, the demand for specialized skills has surged. The growing requirements for components like semiconductors and electromechanical parts further intensify this challenge. Despite the Government's extensive support through programs like the Production Linked Incentive (PLI) Schemes, Scheme for Promotion of Manufacturing of Electronic Components and Semiconductors (SPECS), Modified Electronics Manufacturing Clusters (EMC 2.0) the Electronics Development Fund (EDF), and initiatives under 'Make in India' and 'Digital India,' the talent pool remains underprepared.

Many job seekers lack the technical skills, practical experience, and industry alignment, essential to meet employer expectations, creating a bottleneck in this otherwise promising sector. With a production value reaching US$ 101 billion in FY 2023, including US$ 86 billion in finished goods and US$ 15 billion in components, addressing this skills mismatch is vital to maintain the industry's momentum and enhance global competitiveness.

While India is making strides toward self-sufficiency, especially in electro-mechanical and passive components, challenges remain. The sector's dependence on imported semicon-

Source: TeamLease

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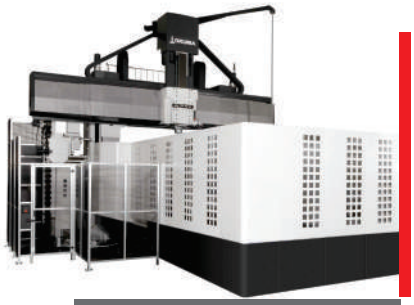

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ductors and PCBs elevates costs and exposes supply chains to global risks. With fierce competition from established players like China, which benefits from lower production costs, and a growing domestic skills deficit in advanced manufacturing, India's ambitions face potential threats. Building a robust domestic ecosystem, reducing import reliance, and investing in workforce development are imperative to solidify India's global electronics production and innovation leader position.

Sharing his insights, AR Ramesh, CEO, TeamLease Degree Apprenticeship, emphasized, "India is on the cusp of becoming a global leader in electronics manufacturing, with domestic production reaching US$ 101 billion in FY23, driven by segments such as Mobile Phones (43%), Consumer Electronics (12%), Industrial Electronics (12%), and Auto Electronics (8%). As demand surges in areas like semiconductors, electronic components, and electronic system design, the industry faces a significant workforce shortfall despite Government initiatives like the Semiconductor Mission and EDF. By FY 2027-28, the industry will require 12 million professionals—3 million in direct roles and 9 million in indirect roles, yet a staggering skills gap of 10 million persists. Bridging this gap demands a robust focus on skill development, blending classroom learning with hands-on training through apprenticeships. Scaling the apprenticeship ecosystem, currently growing at a 55 percent CAGR and projected to reach 1 million apprentices by 2027 to 2 million apprentices, can create a steady talent pipeline to meet industry needs. Additionally, strengthening industry-academia collaboration is crucial to doubling the 2 million graduates entering the workforce annually by FY 2027-28 to 4 million. These efforts will address immediate workforce challenges and accelerate India's transition into advanced domains like AI, IoT, and Industry 4.0, positioning the country as a global leader in electronics production and innovation."

Sumit Kumar, Chief Strategy Officer, TeamLease Degree Apprenticeship, added, "India's Electronics Manufacturing sector stands at a pivotal moment, driven by transformational Government initiatives and growing global demand, yet burdened by a significant 10 million skill gap that threatens to hinder its potential. With the sector projected to create 12 million direct and indirect jobs over the next three years, addressing this gap is critical to realizing its growth. Policies such as the PLI Scheme, which has attracted ₹1.97 lakh crore in investments across 14 key sectors, including electronics, and Employment Linked Incentives (ELI) designed to spur job creation, have set a strong foundation. However, challenges remain, including India's less than 1 percent participation in the global electronics value chain and dependence on imports for critical components, coupled with concerning employability rates—engineering graduates at 60 percent, general graduates at 50 percent, ITI-qualified candidates at 40 percent, and other fields between 38-60 percent, with these trends likely to persist until 2027. Rising demand across high-growth areas such as semiconductors, drones, electric vehicles, solar panels, IT and telecom hardware, consumer electronics, and industrial electronics, fueled by India's emergence as a global R&D hub and the world's third-largest startup ecosystem, highlights the urgent need for a highly skilled workforce."

To bridge this gap, a multi-pronged strategy is essential, focusing on doubling the current 55 percent CAGR in apprenticeships, reskilling and upskilling over 50 percent of the workforce, fostering stronger industry-academia collaboration through initiatives like Apprenticeship Embedded Degree Programs (AEDP) under the National Education Policy (NEP), and addressing the alarmingly low ITI enrolment rate of 48 percent. By aligning academic curricula with industry requirements, scaling workforce development efforts, and building a robust talent pipeline, India can overcome these challenges and unlock the full potential of its Electronics industry, ensuring sustainable growth and positioning itself as a global leader in this dynamic sector.

By aligning academic curricula with industry requirements, scaling workforce development efforts, and building a robust talent pipeline, India can overcome these challenges and unlock the full potential of its electronics industry, ensuring sustainable growth and positioning itself as a global leader in this dynamic sector.

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Envisioning Automation

Source: Magic Wand Media

A study has found that fewer than half of small- to mid-sized manufacturers (SMMs) are willing to invest in automation, citing concerns about the upfront costs. Here's exploring the growing popularity of return on investment (ROI) calculators, which could help SMMs better predict and embrace the future benefits of investing in CNC automation equipment.

HAKAN AYDOGDU
General Manager
Tezmaksan Robot Technologies

In today's rapidly evolving industrial landscape, the integration of CNC automation has shifted from being a 'nice to have' to a strategic necessity for manufacturers. Deloitte's 2024 Manufacturing Industry Outlook report underscores this trend, with 86 percent of surveyed manufacturing executives acknowledging that smart factory solutions will be the primary drivers of competitiveness over the next five years. While larger companies are leveraging automation, SMMs have been more hesitant. According to a survey by the Smart Manufacturing Institute (CESMII) and the Society of Manufacturing Engineers (SME), less than half said they were willing to invest. A major concern is the perceived upfront investment of automation — as Harvard Business Review wrote, "The Robotics industry has traditionally been dominated by large, complex machines that require significant up-front investment and in-house expertise to keep them running."

Fortunately, this is changing as industrial robots and automation systems become smaller, more modular, and affordable. Another change is the growing popularity of return on investment (ROI) calculators to accurately predict the benefits of CNC automation. ROI, in essence, is the time required to break even on an investment, considering both costs and benefits.

Let's look at how ROI is calculated for CNC automation.

Predicting returns

Calculating the ROI for CNC automation involves a systematic approach, starting with the identification of goals and objectives for implementing the automation in the first place. These objectives may include increased production efficiency, reduced labor costs, improved quality, or enhanced production capacity.

Next, manufacturers should apply a comprehensive cost analysis, encompassing the initial investment and ongoing operational costs. The former includes purchase costs, installation, training, and any necessary infrastructure changes on the factory floor. The latter considers maintenance, energy consumption, and additional expenses related to running the CNC equipment.

Estimating labor cost savings is a pivotal step, as the reduced need for manual intervention in the production process is a crucial benefit of automation. Forbes highlights that automation can potentially free up to three work hours a day, or 360

Source: Magic Wand Media

Calculating the ROI for CNC automation requires a meticulous analysis of tangible and intangible factors. Regularly reviewing and adjusting calculations ensures accuracy and relevance to the evolving business environment.

hours of work a year, leading to substantial labor cost savings. Aside from reduced labor hours, there can be fewer production errors caused by human mistakes.

Modular cell

Through such calculations, automation equipment can be used to its optimal capability. Take for instance Tezmaksan's CubeBOX system, a modular cell that can be easily integrated into any production line.

Incepted in 1969, Tezmaksan is a European robotics, machine tools, and industrial equipment company. Tezmaksan manufactures in Europe and distributes its offerings such as CNC machines, machining centers, lathes, milling machines and more. The company headquarters is in Istanbul and has a strong presence in the European market. It delivers cutting-edge solutions, training, and support services for industrial and commercial applications.

The company's CubeBOX is compatible with all CNC machines available on the market, including all types of CNC lathes, machining centers, and grinding machines. It seamlessly integrates with the existing robot operations, eliminating the need for extensive modifications or customizations. This compatibility feature simplifies the implementation process and minimizes downtime during the installation phase.

Offering 24-hour operator-free operation, the core advantage of the CubeBOX system also lies in its ability to work nonstop. By ensuring uninterrupted production even during night shifts, this continuous operation leads to a remarkable 50 percent increase in efficiency in the shift compared to traditional setups that rely heavily on manual labor for CNC machine tending.

Beyond labor cost savings, manufacturers must also consider the impact on production capacity, quality improvements, downtime reduction, time-to-market enhancements, and potential revenue increases. After all, faster and more efficient CNC processes can contribute to increased production capacity, reduced downtime, and faster turnaround times. Companies can use different methodologies to determine this impact.

By embracing automation strategically, manufacturers can not only improve their bottom line but also position themselves competitively in the ever-changing market landscape.

Source: Tezmaksan Robot Technologies

Different approaches

The actual ROI calculation involves subtracting operational costs from the net benefits (savings from labor, reduced downtime, increased capacity, quality improvements, etc.), multiplying this by 100, and then dividing by the total cost (initial investment plus ongoing operational costs).

One methodology is the payback period, or the time taken for the investment to be recovered from net cash inflows. This is a straightforward way to evaluate how quickly a company can recoup its investment, calculated by dividing the amount of the initial investment by the annual net cash flow. A shorter payback period is generally preferred as it indicates a quicker ROI. The payback period is useful for assessing the risk associated with the investment, especially in industries with rapid technological changes.

Another methodology is the net present value (NPV), which accounts for the time value of money by discounting future cash flows to their present value. To calculate NPV, you need to determine the cash flows for

Source: Magic Wand Media

The growing popularity of return on investment (ROI) calculators to accurately predict the benefits of CNC automation. ROI, in essence, is the time required to break even on an investment, considering both costs and benefits.

each period of the investment or project, discount them to present value, and subtract the initial investment from the sum of the project's discounted cash flows. A positive NPV means the investment is expected to generate value, giving a more accurate representation of the investment's profitability.

Our next methodology is the internal rate of return (IRR), which compares the investment's inherent rate of return to the required rate of return. If the internal rate of return (IRR) for Proposal A exceeds the company's cost of capital, which represents the required return on investment, the project is generally deemed acceptable.

In the case of Proposal A, requiring an initial investment of £100 million today and yielding a return of £121 million in precisely two years, the IRR is calculated using the formula: IRR = (end amount / starting amount)^(1/n) - 1. Plugging in the values, with the end amount as £121 million, the starting amount as £100 million, and a time delay (n) of two years, the resulting IRR is 10 percent.

Key variables

Online ROI calculators are becoming more popular throughout the industry. They include Tezmaksan's own online ROI Calculation tool. A range of important variables can be entered into the tool — the investment cost, total expenses, the number of CNC operators, expected working days per year and hours per day, labor expenses, the price of the workpiece, insurance premiums, and more. Based on these variables, users can calculate a definite ROI figure for the year.

To make the analysis more robust, manufacturers should perform sensitivity analysis to understand how changes in key variables, such as production volume, labor costs etc., impact the ROI. Additionally, it's crucial to consider intangible benefits such as improved employee morale, increased competitiveness, and enhanced market reputation.

Calculating the ROI for CNC automation requires a meticulous analysis of tangible and intangible factors. Regularly reviewing and adjusting calculations ensures accuracy and relevance to the evolving business environment. By embracing automation strategically, manufacturers can not only improve their bottom line but also position themselves competitively in the ever-changing market landscape.

SHAPING THE FUTURE OF MANUFACTURING

In this interview with MMI's Soumi Mitra, Anuj Jhunjhunwala, CEO, JJ Aero Group, offers us insight into the factors that make India appealing as a manufacturing base, JJG's contribution to transforming the country's aerospace landscape, the opportunities and challenges facing it, the impact of policies like 'Make in India', and the future of advanced manufacturing technologies.

Source: JJ Aero Group

Anuj Jhunjhunwala, CEO, JJ Aero Group

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As India positions itself to become a global powerhouse in aerospace manufacturing, what key factors are driving this growth? How does JJ Aero Group, a leading figure in India's rapidly expanding Aerospace Manufacturing industry, contribute to this transformation?

The aerospace supply chain in the western world, which still accounts for approximately two-thirds of the global market, has been under strain due to skilled labor shortages and inflationary pressures over the past five years. This has significantly increased the appeal of manufacturing bases like India. Additionally, geopolitical challenges with China have made sourcing from there much more complex for long-term industries like Aerospace. Companies like JJ Aero Group, which spend decades acquiring necessary certifications and approvals, and establishing relationships with marquee clients, play a key role in this transformation by raising manufacturing and service quality standards, thereby helping realign global supply chains.

"Our partnership with Collins Aerospace has been instrumental in our growth. Investments in machining and metal finishing have been closely tied to project wins with these partners. Additionally, these collaborations have enabled us to move up the value chain, allowing us to take on more complex parts in geometries and surface treatments as we continue to serve the Build To Print segment."

Anuj Jhunjhunwala
CEO
JJ Aero Group

Source: JJ Aero Group

Despite India's advancements in Aerospace, we have yet to manufacture our own commercial aircraft. What are the key challenges preventing this, and how can they be addressed?
India's share in the global aircraft supply chain remains under 1 percent. To build our own commercial aircraft, we must first scale our presence in the supply chain by transitioning from manufacturing components and sub-assemblies to major assemblies and, eventually, entire systems. The critical aspect is acquiring sensitive technologies in areas such as aerostructures, avionics, and landing systems. However, the Tata Group's collaboration with Airbus on the C295 and the upcoming Helicopter Final Assembly Line (FAL) will soon help create the ecosystem needed to consider building a commercial aircraft in India.

How has India's Defence Offset Policy influenced the Aerospace Components Manufacturing industry?
While the Defence Offset Policy has encouraged European and American defence manufacturers to source commercial components from India, its influence is relatively small compared to the broader realignments happening in the global supply chain.

JJ Aero Group sources nearly 98 percent of its raw materials locally. How does this impact your production capabilities and cost efficiency?
This figure pertains to our automotive division, where we source approximately 98 percent of our materials locally. In aerospace, the number is currently less than 5 percent, but we expect this to grow significantly in the coming years as Indian steel and aluminum mills work towards securing necessary approvals.

After securing INR 100 crore in funding from private equity firm CX Partners, what are your primary goals for the next phase of growth? How do you plan to leverage this investment to further strengthen your position in the market?
We are focused on expanding our new facility in Bommasandra, Bangalore, and increasing its capacity by introducing new categories of machinery. Additionally, we plan to further enhance our backward integration activities and are working towards setting up a solar park to improve our sustainability efforts.

As someone who has spearheaded the development of more than 1,300 unique parts and driven innovation in aerospace manufacturing, what is your perspective on the startup ecosystem in India? What potential do you see for new ventures in this space?
Most of the startup activity we observe is concentrated in the defence, unmanned aircraft, and space sectors, which currently has little direct impact on our business. However, these areas offer significant potential for new ventures and contribute to boosting India's startup ecosystem.

Which emerging technologies do you foresee having the biggest impact on aerospace manufacturing in the next five years? How is JJG preparing for these changes?
Sustainable Aviation Fuel (SAF) is poised to become a game-changer in the Aerospace Engine sector. While we do not anticipate major disruptions from other technologies in the immediate term, advancements in manufacturing techniques and the adoption of lighter, newer materials could play a role in the future. We are monitoring these developments and preparing accordingly.

The 'Make in India' initiative has played a pivotal role in enhancing India's attractiveness as a manufacturing hub. To compete with global leaders, we need further improvements in the availability and quality of key resources such as energy, land, and skilled labor.

SWISS PRECISION FOR INDIAN INDUSTRIES

The Indian subsidiary of Swiss company REGO-FIX AG has established itself as a pioneer in advanced toolholding solutions, delivering Swiss precision and reliability to meet the high-performance demands of Indian industries.

Founded in 1950 in Switzerland, REGO-FIX AG initially produced food processing machines. However, the Swiss company's direction shifted significantly in 1972 with the invention of the ER collet, a toolholding clamping solution that 20 years later became the global DIN 6499 standard, found on thousands of machines today. "Since then, we have focused on our core business of superior toolholding solutions. This focus and dedication has shaped today's REGO-FIX AG. Every year we extend our product portfolio with new products or accessories to improve our customers' experience with us," shares Makarand Dande, Managing Director, REGO-FIX India Pvt Ltd, the Indian subsidiary of REGO-FIX AG.

Powering up

The parent company has always focused on improving toolholding technology. This journey began with Fritz Weber, Founder, REGO-FIX AG, who came up with the ER collet system to solve issues he experienced with the E-Collet system that existed at the time. It was difficult to use and had several other drawbacks. His solution didn't just improve his own production; it dramatically changed the entire Toolholding industry.

Source: REGO-FIX India Pvt Ltd

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> "REGO-FIX embraces the future of toolholding technology by actively tackling the challenges on the way. We have introduced a new department that works on innovative solutions for developing automated processes and user-friendly solutions for improving production performance."
>
> **Makarand Dande**
> **Managing Director**
> **REGO-FIX India Pvt Ltd**

Building on that spirit, the company introduced the patented powRgrip® system. Unlike traditional methods that require constant heating and cooling of metal, powRgrip® uses an energy-efficient approach to tool clamping. The system can clamp a tool perfectly well within eight seconds and is easy for a robot to operate it as there are only a few steps to perform.

"We introduced the powRgrip® system as we believe that heating and cooling metal repeatedly cannot be the solution – especially considering the waste of energy required for this process," he points out, highlighting how this system improves machining results and also cuts down on energy use.

Swiss craftsmanship, Indian ambitions

In November 2023, REGO-FIX AG established its subsidiary REGO-FIX India Pvt Ltd in Pune, Maharashtra, as a strategic pivot into the Indian market. "We have taken this step to ensure we are close to the Indian customers because we believe in the potential of the Indian market," Dande explains.

Prior to establishing its Pune office, the Swiss company laid a strong foundation across India by building a network of dedicated sales representatives, ensuring broad accessibility to its products and expertise.

He elaborates, "Since REGO-FIX is offering new technology with its powRgrip® system, which is unique in the market, we have received significant response from customers who plan to invest in the future."

Source: REGO-FIX India Pvt Ltd

Focused on 'Swiss quality'

The Swiss company is embracing the future of toolholding technology by actively tackling challenges. It has introduced a new department that works on innovative solutions for developing automated processes and user-friendly solutions for improving production performance.

According to Dande, the company maintains its focus on 'Swiss quality' by investing each year in its production machines to keep up with the latest technology. It has also developed some machines in-house, which helps retain important know-how and expertise within the team.

Additionally, the company emphasizes the importance of its infrastructure, using strict temperature control in production and quality control processes. This careful approach ensures that all products—manufactured exclusively at the company's headquarters in Switzerland—are of the highest quality.

Localized for success

The Indian subsidiary is strategically positioned to meet the unique demands of the Indian market, particularly in sectors

In November 2023, REGO-FIX AG established its subsidiary, REGO-FIX India Pvt Ltd, in Pune, Maharashtra. This branch is strategically positioned to cater to the specific needs of the Indian market, especially in industries such as automotive, aerospace, and precision manufacturing.

such as Automotive, Aerospace, and Precision Manufacturing. With an expectation of increased production in critical sectors like Aerospace, Semiconductors, Die & Mold, Medical, and Dental, the subsidiary is well-equipped to address future challenges.

The strength of the Indian operation lies in its dedicated and well-trained workforce, combined with a strong and established network of sales partners. This local presence allows the company to adapt quickly to the evolving market needs. "By having our own subsidiary with well-trained and dedicated employees as well as a superb sales partner network, we are ready to accept some future challenges," he mentions.

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> **Makarand Dande**
> **Managing Director**
> **REGO-FIX India Pvt Ltd**

One of REGO-FIX AG's standout technological achievements is the powR-grip® system, capable of clamping a tool in just eight seconds. This new system is designed for easy automation and can be operated by robots with just a few simple steps. Through ongoing research and development, the company is not only adapting to industry changes but also shifting the trajectory of toolholding technology.

Relying on the customer's opinion

The Indian subsidiary has embraced localized innovations to meet the preferences and demands of the Indian market. Central to this effort is a proven customer feedback system that ensures constant improvement within the company.

According to Dande, "We do have a customer feedback system in place and can, therefore, react to any feedback we get from customers, partners, and suppliers on a regular basis." This proactive approach enables the company to adapt its solutions in developing special toolholders and combinations of existing products catered to local needs.

By implementing several modifications based on direct input from Indian customers, the subsidiary demonstrates its ability and willingness to understand and address local requirements. This focus is a strategy toward enhancing customer satisfaction and ensuring that the products remain relevant in an evolving market.

Source: REGO-FIX India Pvt Ltd

India support

Customer experience is an important factor that the company takes into serious consideration. With that in mind, the subsidiary plays an important role in making sure its customers get the most out of its toolholding systems by providing comprehensive after-sales support and technical assistance. The local team is dedicated to meeting the high standards set by the company, offering support and personalized training to help customers maximize their experience.

A unique aspect of the team is the extensive training provided to them at the Swiss headquarters. This experience gives the team a deep understanding of the products and solutions, allowing them to effectively address customer needs.

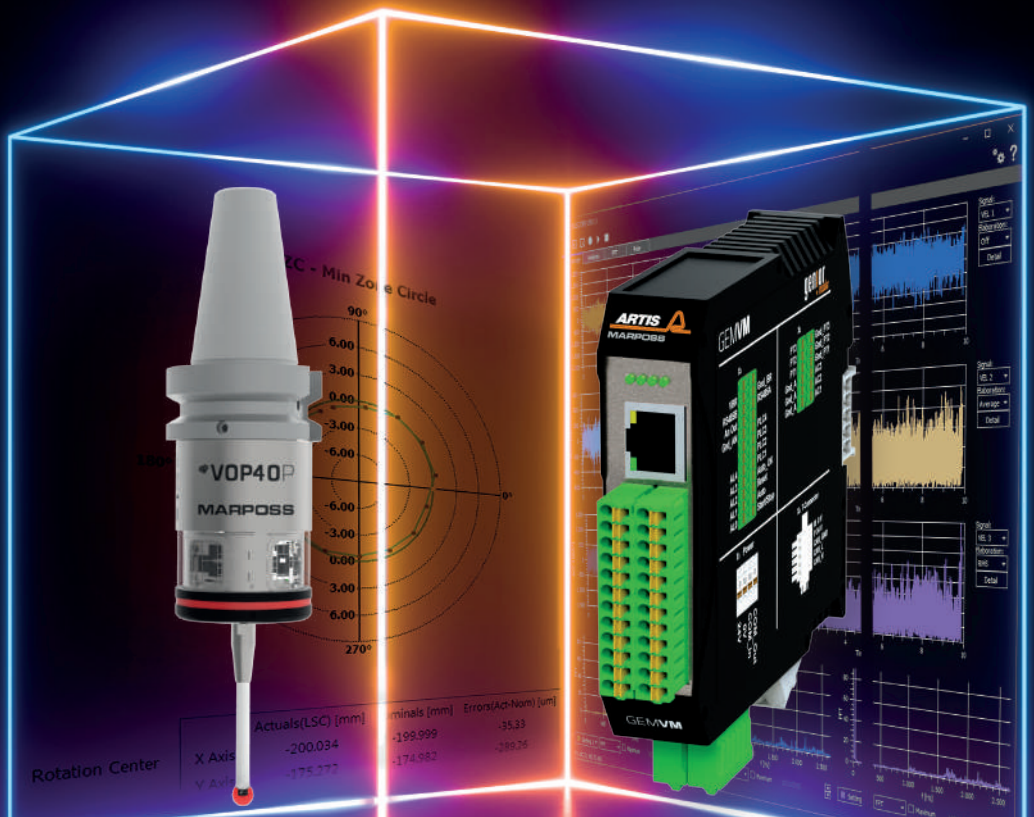
Leveraging opportunities

With regard to the future of the Indian subsidiary, it has identified great opportunities in the Government's 'Make in India' initiative and the growing Manufacturing sector. REGO-FIX aims for steady growth by providing high-quality toolholding systems that meet customer needs. "It is their satisfaction with our products, our services, and our innovations that give us the opportunity to work out our best," states Dande.

Although the parent company does not plan to establish its own production in India, it is still dedicated to supporting local manufacturers. By offering reliable products, it helps Indian businesses improve their operations and create products and solutions that are 'Made in India'.

SYNERGY 3

OPTIMIZE OPERATIONS



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BLENDING TECHNOLOGY WITH CRAFTSMANSHIP

With his company EBG-Instruments, Marc Lochner is breaking new ground, combining the traditional craftsmanship of guitar making with new ideas and technologies. Here's knowing how Paul Horn GmbH supported him in his current project, a Telecaster, in which 3D printed parts made of titanium and CVD diamond cutters are being used.

Source: Horn/NNCEA

Milling of M3 internal threads in a printed titanium component.

NIKHIL NAYAK
Managing Director
NN Combined Engineering Agencies Pvt Ltd

Rock n' roll, blues and heavy metal. No other instrument arouses as many emotions among the public as an electric guitar. The instrument plays a central role in most music genres and has characterized generations of musicians since the 1930s. In addition to mass-produced guitars, there are also small craft businesses that perfect the construction of electric guitars down to the smallest detail. Marc Lochner runs one of them. With his company EBG-Instruments, he is breaking new ground, but also holding on to old traditions. For a current project, a Telecaster, 3D printed parts made of titanium and CVD diamond cutters are being used. Locher received support from Paul Horn GmbH for this project.

Critics claim that anyone can build an electric guitar with a saw, a screwdriver, and a soldering iron. In theory this is true, but nobody wants to hear it. In contrast to an acoustic guitar, most classic electric guitars do not have a hollow resonator to amplify the sound of the strings. There are some electric guitars that have a hollow body, but the tone is generally influenced by the design, the choice of wood, the hardware, the pickups, and the quality of workmanship. Pickups are magnetic coils that convert the vibration of the individual strings into electrical signals. When the guitar is being played, these signals pass through an effects processor and are then boosted in an

amplifier and output as sound via a loudspeaker. The playing technique, the effects processor, and the amplifier produce the desired and familiar electric guitar sound.

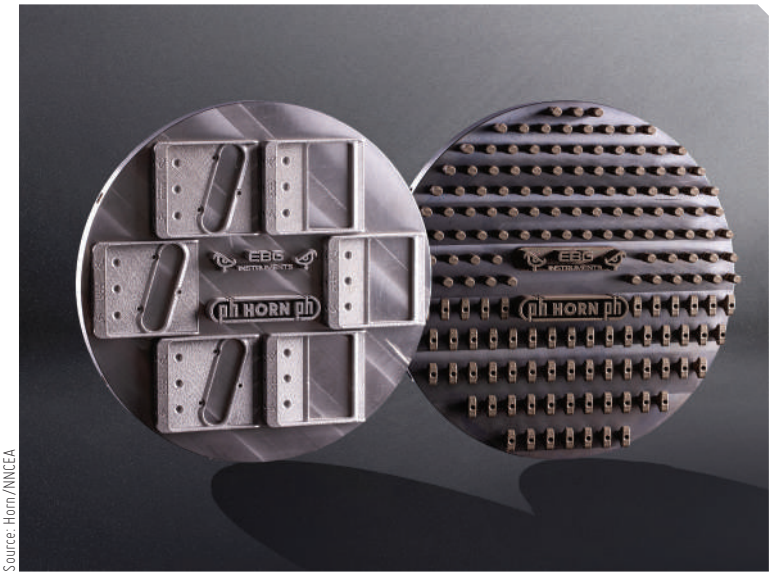
Craftsmanship

With his instruments, Locher impressively demonstrates how to combine the traditional craftsmanship of guitar making with new ideas and technologies. For example, he combines CNC-milled aluminum bodies with fine woods and carbon fiber necks. He builds about six electric treble or bass guitars per year. All instruments are customized according to the customer's wishes and requirements. A vocational school teacher in the field of CNC technology, he can be found in his cellar working on his instruments in his spare time. He has created a guitar-making area in his basement at home. Housed in two rooms, the workshop has a CNC milling machine, numerous woodworking machines, a paint booth and a workstation for final assembly. His cellar also houses a small treasure trove in the form of a tone wood store. Beautiful and rare tone woods such as certified ebony, curly maple, and mahogany are stored here.

Source: Horn/NNCEA

For machining the guitar body, Locher uses a three-axis CNC milling machine with a high-speed spindle and a four-edged, diamond-tipped milling cutter from HORN.

"I'm always on the lookout for old wooden staircases from the 50s and 60s. In those days, staircases were often made from solid mahogany," Locher explains. He uses the old stairs to make the guitar bodies and necks. "The wood is highly suitable for building a guitar, as it is also relatively stress-free due to its age and the dry conditions in the houses," explains Locher. He also uses this valuable wood for his current project, a Telecaster. Its shape is one of the most popular electric guitar designs ever. It was developed by the world-renowned guitar builder Leo Fender. However, Locher's Telecaster is not a simple copy of Fender's guitar. With special materials and components as well as a clean look, and with many hidden screw connections on the front of the guitar, it is a unique piece that requires a lot of time, work, and craftsmanship as well as special manufacturing techniques.



Source: Horn/NNCEA

After 3D printing, the components are still firmly attached to the build platform. A wire EDM machine is used for separating the parts.

3D metal printing

"Building exceptional instruments also requires the use of special materials," says Locher. That's why he decided to use titanium components, including the bridge, which is mounted on the body of the guitar and supports the strings. The bridge is a very important component of the guitar, as it has a major influence on the attack (speed of tone development) and sustain (duration of the tone). Locher approached the 3D printing specialists at HORN with the 3D

Locher approached the 3D printing specialists at HORN with the 3D model he had designed himself to have these parts printed from titanium. Due to the component geometry and the thin walls, milling the parts was out of the question as it would have been too time-consuming and costly.

Source: Horn/NNCEA

Horn uses the selective laser melting process, also known as the powder bed process.

HORN makes the extended possibilities offered by additive manufacturing available to customers and partners such as Locher. Additive manufacturing makes sense if it results in a technological advantage.

model he had designed himself to have these parts printed from titanium. Due to the component geometry and the thin walls, milling the parts was out of the question as it would have been too time-consuming and costly.

Locher was lucky; HORN had already started its additive manufacturing project in spring 2018. Today, it has become a separate production area. HORN uses additive manufacturing in its own tool production, particularly in the manufacture of prototypes, specials and tool holders and in the optimization of coolant attachments. HORN makes the extended possibilities offered by additive manufacturing available to customers and partners such as Locher. Additive manufacturing makes sense if it results in a technological advantage. However, in many cases there is no economic advantage to additively manufacturing a component that was previously produced conventionally. This applies, for example, to turned parts that can be produced quickly on sliding headstock automatic lathes. Additive manufacturing would also be too expensive in terms of rework for finishing.

SLM process

For projects such as Locher's electric guitars, HORN uses selective laser melting, also known as the powder bed process. Metal powder is applied in a layer to a build platform and exposed to a laser in the areas where it is to be melted. The platform is incrementally lowered and the process is repeated until the required component height is achieved. HORN uses aluminum (AlSi10Mg), stainless steel (1.4404), tool steel (1.2709) and titanium for 3D printing. Other materials are currently being trialled. The build volume is 300 mm (11.811") in diameter by 400 mm (15.748") in height. As HORN has all additive manufacturing processes in-house, specialists in the production area can respond directly to customer requirements. Parts are manufactured in various designs according to the intended use. HORN also supports the customer in the design and selection of suitable parameters for melting the powder. Production takes place according to customer requirements; either raw components are supplied or finish-machined components. Further advantages of HORN's in-house production are the wide range of installed machinery and metrology equipment. This saves time and has a direct influence on all production processes.

The printed guitar components are separated from the build platform by wire erosion. However, due to the high stress on the thin-walled components, they require heat treatment before eroding, as otherwise they would warp after separation. The heat treatment takes place at a temperature of 650° C and takes around two hours. Locher opted for glass bead blasting for the optical finish of the components. In addition to the bridge, HORN also printed other components for Locher's Telecaster.

CVD diamond milling cutter

Locher mills the guitar body from solid material. The raw part comes from a mahogany stair tread. Locher cuts it lengthways and glues the two parts together in mirror image. "In addition to providing greater stability, the mirror-image gluing of some woods is also an aesthetic factor in guitar making," says Locher. Special instrument glue is used,

Source: Horn/NNCEA

Marc Locher combines modern technology with craftsmanship.

which sets nearly as hard as glass. This is very important, as soft glue joints would absorb vibrations and affect the sound of the instrument. When machining the body, Locher uses a three-axis CNC milling machine with a high-speed spindle and a four-edged diamond-tipped milling cutter from HORN.

The cutting length of the tool is around 45 mm (1.772"). This is enough to complete most milling operations on the body. Thanks to the sharpness of the cutting edges, Locher saves time during subsequent sanding. "I was extremely impressed by the milled surfaces. The flanks on the cutter are as if they were finely ground and there is no burr on the edges. This saves time when sanding the wood surfaces later," explains Locher. The tool also mills pockets without any problems by ramping into the solid. For example, Locher mills numerous hexagonal pockets as well as the electrical compartment into the body to reduce the weight. Locher later glues a 5 mm (0.197") thick mahogany top over the pockets and milled cable ducts.

Lacquer like glass

Guitar making at this high level combines numerous skills. In addition to mechanical expertise in CNC technology, the abilities of a carpenter, craftsman and lacquerer are required. Once the individual guitar components have been manufactured and the fine sanding work has been completed, the parts are painted. Locher opted for a mother-of-pearl white metallic color for the body of the guitar. The neck made of curly maple and ebony is given only a dark brown stain and a coat of clear lacquer so that the beautiful wood grain remains visible. "Using a primer, colored lacquer and clear lacquer, we apply nine wafer-thin layers," says Locher. Each individual layer is sanded after drying in preparation for the next layer. Painting always produces an orange peel effect. This is characterized by a slightly wavy surface appearance. The final coats of clear lacquer are therefore given a special treatment. After drying, they are sanded with increasingly fine grits and polished to a high gloss using different compounds. "After these time-consuming operations, the clear coat reflects light like a layer of glass," says Locher. The final assembly and tuning of the strings is always a special moment for him. "The first note of the finished instrument also marks the beginning of the farewell. It's difficult for me, as I've spent two to four months building it," Locher explains. He often delivers his guitars personally to their new owners throughout Europe.

Locher rates the collaboration with HORN positively: "From the initial idea of printing the components from titanium to the technical design, goal-oriented advice and implementation, the collaboration was very professional and smooth. I'm already looking forward to the next projects."

HORN in India

Precision Tooling Solutions for the Precision Manufacturing Industries from Paul Horn GmbH are available in India via NN Combined Engineering Agencies Pvt Ltd (NNCEA) in cooperation with select OEM partners. NNCEA provides complete logistics and supply chain management solutions for all major manufacturers in the Indian market.

For projects such as Locher's electric guitars, HORN uses selective laser melting, also known as the powder bed process. Metal powder is applied in a layer to a build platform and exposed to a laser in the areas where it is to be melted. The platform is incrementally lowered and the process is repeated until the required component height is achieved.

LEVERAGING INTELLIGENT AUTOMATION

MR Components, a medium-sized company from Grigno, Italy, specializes in the production of parts for differential and planetary gears. By introducing intelligent automation with EMAG machines, it has significantly enhanced its production capacity and the quality of its offerings.

Source: EMAG GmbH & Co KG

One of the production lines at MR Components with VL 4 machines equipped with TrackMotion automation. This enables unmanned operation in the evening hours.

Alessandro Reguzzo, Founder and Managing Director, MR Components, started out in 1995 with just one CNC lathe in a garage. Since the business grew quickly, Reguzzo invested in additional machines and moved to a larger production hall. In 2006, the company built its first own production hall with 2,500 sq mt. By January 2024, the company moved into its new, modern 6,000 sq mt headquarters, embodying Reguzzo's vision of a modern, highly automated production site.

"Our two main business areas are the manufacture of components for differential gears and planetary gears. The differential gear parts are supplied complete and ready for installation to our customers," he explains. The other product line, which is mainly manufactured on EMAG machines, is planetary gear parts. These are supplied to various Italian customers and abroad, with German customers being the company's important customers.

"We have around 50 employees, ten of whom work in the office in the quality department and in technology. The others work in production. We produce around 80,000 components per month," says Reguzzo while sharing the composition of the team.

Intelligent automation is the key to success

After working with conventional machines, especially horizontal lathes, MR Components began automated production with simple Taiwanese vertical lathes, which were within its financial means at the time. "The use of automated machines was the key to speeding up production," he explains. With automation, the company's machines run unmanned, allowing it to produce in the evening hours without having to introduce a night shift. MR Components is now able to produce batches of 100 to 30,000 components per month. "Our batches vary greatly as we have

> "Today, all our EMAG machines are equipped with measuring probes so that we can check all components 100 percent. In addition to in-process control, we carry out further quality controls with various measuring devices. We also have a measuring room equipped with two Zeiss and other measuring machines."
>
> **Alessandro Reguzzo**
> **Founder and Managing Director**
> **MR Components**

equipped our company to serve different customers with different requirements. We are flexible enough to handle both small and large orders efficiently and on time," he adds further.

EMAG machines guarantee quality and efficiency

MR Components relies on EMAG machines that are equipped with integrated measuring probes. "The stable design and high quality of the machine components are essential in batch production in order to stand out from the competition," explains Reguzzo.

"Today, all our EMAG machines are equipped with measuring probes so that we can check all components 100 percent. In addition to in-process control, we carry out further quality controls with various measuring devices. We also have a measuring room equipped with two Zeiss and other measuring machines, so that we can always supply our customers with an optimum product. As you can see, quality is our top priority! We currently have a reject rate of just 0.2 percent for 80,000 components, which shows that we are well positioned," he adds.

The company uses various manufacturing systems from EMAG to meet the different production requirements of its customers. "In one of our production lines, we work with VL 7 machines, where the operator manually places the workpieces on the automation belt," he shares. This process has proven to be particularly effective for very simple workpieces or more complex workpieces with small quantities.

"In other production lines, we work with VL 4 machines equipped with TrackMotion automation. Here, the automation is very fast and we have greater autonomy, so we can also run the machines in an unmanned mode," he reveals. The company works in two shifts and the machines continue to run autonomously for 2 to 4 hours in the evening, depending on the storage capacity of the raw and finished parts.

There are also other manufacturing systems, including VL 4 and VL 6, which are automated with robots. The decision was made to use a system with robots, as many components have to undergo other operations in addition to turning, such as marking, which can be carried out easily and flexibly with the robot.

Future investments and growth plans

Looking ahead, MR Components is poised for growth and innovation. The company plans to install two new VL 8 machines with robotic support to handle larger components with diameters up to 450 mm. "This will enable us to produce fully finished parts for our customers and continue expanding our technological expertise in gear cutting and assembly," Reguzzo shares.

The company uses various manufacturing systems from EMAG to meet the different production requirements of its customers. In one of its production lines, it works with VL 7 machines, where the operator manually places the workpieces on the automation belt.

Source: EMAG GmbH & Co KG

A robot at work on a production system from MR Components. Automation allows additional operations, such as marking, to be carried out flexibly and easily.

MR Components' modern and highly automated machinery. The company continuously invests in the latest technologies in order to offer customers the best possible quality.

DRIVING DOWN RISING ENERGY BILLS

Businesses are struggling to cope with compounding costs and rising energy bills—that much is clear. In the face of surging costs and in the absence of certainty, businesses across the globe are looking to reduce consumption and cut costs wherever possible.

Source: FLIR

FLIR Si2-LD industrial acoustic imaging camera for pressurized leak detection and mechanical fault detection.

In this new (increasingly costly) reality, acoustic imaging is offering manufacturers a crucial lifeline; it is helping energy-intensive industries to keep the lights on by driving down operating costs and slashing maintenance expenses.

You've heard of 'lossless sound'. Well, acoustic imaging takes that quite literally.

Detecting previously undiscovered air leaks can plug a costly problem

For the UK and much of the EU, the cost of energy has almost doubled from this time in 2021, with prices now at 34.0p/kWh (versus just 18.9p/kWh in 2021). That's 179 percent higher. In fact, gas prices have increased in 23 of the 24 EU Member States for which data are available, with the biggest jumps after the UK being seen in Estonia (+154%), Lithuania (+110%) and Bulgaria (+108%).

This begs the question, "How can energy-intensive industries survive in this climate?" Large-scale industrial processes are driven largely by compressors and vacuum pumps to operate machines and transport assets, and that's a critical question.

The answer is of course to look at one's outgoings and real, tangible ways to cut expenditure on the factory floor. One way that is rapidly picking up traction among manufacturers across the breadth of the EU is acoustic imaging.

No piece of equipment is immune to the issue of machine failures and wear, however

FEDERICO DE LUCIA
Team Lead of Condition Monitoring
FLIR

high-tech they are. Machines that aren't operating optimally are costing one money in very real terms. This is where acoustic imaging comes in; on the frontline of condition monitoring, it promises to yield savings by picking up air leaks in real time.

While isolated incidents may seem minimal, the costs of wasted energy can quickly snowball from a minor inconvenience to an acute concern. Consider that with the average compressor system, approximately 80 percent of energy is lost through heat dissipation, meaning only 20 percent makes the transition into a usable output on the factory floor. From this, up to a third of this usable energy is lost to leaks. Energy that you're paying more and more to use.

Why are air leaks so expensive?

Let's put a measurable scale on a problem that can vary substantially by application. To do this, operators must first explore exactly how much a leak can impact production costs.

Source: FLIR

FLIR Si2-LD's easy-to-view color LCD screen.

Take, for example, a compressed air leak from a small hole of just 1.5 mm on a network of compressed air at seven bars of pressure. Two years ago, with a price of €0.07 per kilowatt hour, that alone would have cost a company roughly €1500 (£1300) if one assumes an operating time of 6,000 hours per year.

Of course, now the energy situation is worsening, which means that costs may be three, four, even five times higher in some

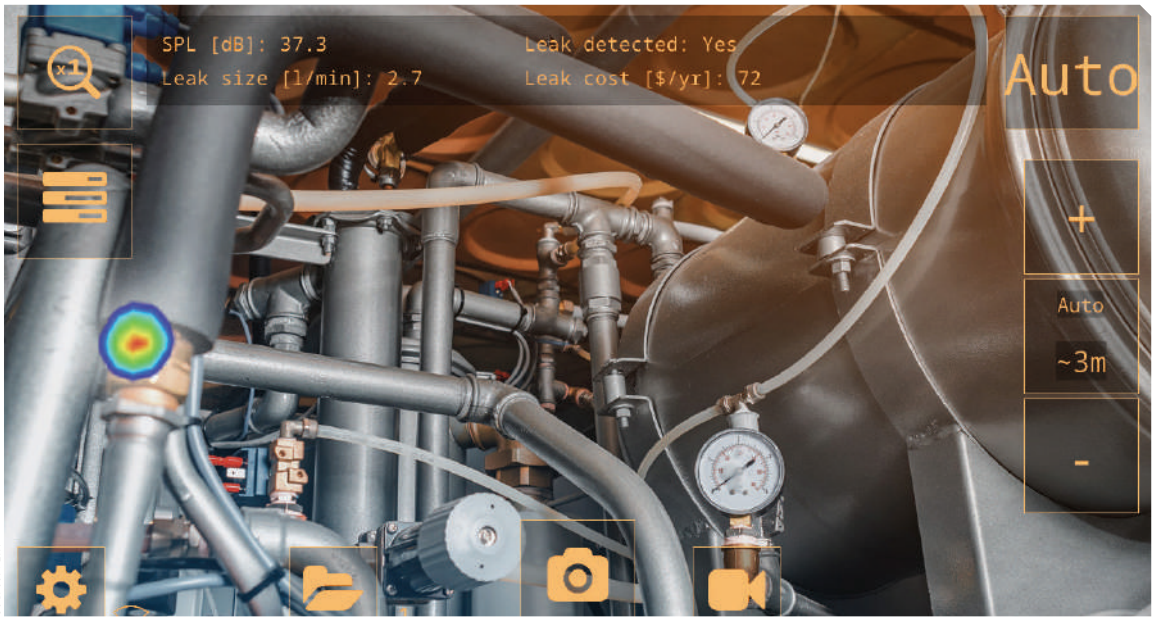
Value of Acoustic Imaging for Leak Detection

It's a proactive stance against leaks: Compressed air may be cheap, but the power needed to run faulty systems is not. By catching leaks through detection systems and sensors early, facilities crews have the opportunity to prevent further energy waste and can schedule repairs.

It pays for itself: Leak detection with an acoustic imager leads to improved energy efficiency and reduced costs, not only from repairs to compressed air and vacuum systems but also related to any expensive specialty gases that could be leaking during your production process.

It finds leaks more accurately than traditional methods: Acoustic imagers actually see the leak and display it on a screen, allowing technicians to pinpoint leak locations almost instantly.

Newer acoustic imaging camera models such as the FLIR Si2-LD use a number of high-spec audible and ultrasound microphones to detect air leaks as they appear and boast an optimal bandwidth range of 2–130 kHz.



Source: FLIR

Industrial compressed air leak, as seen by the FLIR Si2-LD.

Why Choose a FLIR Acoustic Imager?

Effortless one-hand operation: improves operator safety and reduces potential neck strain.

Superior sound detection with 124 microphones: optimized dynamic range helps balance frequency capabilities with how far sound travels (you want your detectors to use the lowest frequencies possible to get the farthest distance).

Enterprise scalability: fleet management, cloud data integration, and OTA software updates ensures optimal use in large-scale industrial settings.

Machine learning capabilities: allows Si-Series cameras to distinguish sound patterns created by leaks from background noise.

Source: FLIR

The FLIR Si2-LD detects two sources of potential compressed air leaks, distinguished from background noise.

In the case of FLIR Si-Series acoustic imagers, projective algorithms even estimate how much the leak will cost by evaluating the air lost in real time, calculating the spend per kWh, and displaying an expected saving per year or on a specified timeframe.

cases—which could be a cost of up to £7,500 a year for failing to identify a single small hole in a vital production component.

When you consider the scale of industrial manufacturing and the scope for leaks to crop up unnoticed, it is staggering that such a comparatively small hole can compound into such a large problem.

Driving down energy bills with the FLIR Si-Series

Newer acoustic imaging camera models such as the FLIR Si2-LD use a number of high-spec audible and ultrasound microphones to detect air leaks as they appear and boast an optimal bandwidth range of 2–130 kHz. This range yields unmatched detection accuracy and identification down to even the smallest breach.

Source: FLIR

FLIR Si-Series acoustic imaging cameras include features such as dual-mode LED worklights and a 12 MP camera with 8x digital zoom.

The technology also gives handlers the ability to identify, photograph or video the location of an air leak up to ten times faster, meaning minimal downtime for the facility and a prompt repair or replacement of the defective component. In addition to this, it also detects partial discharge, floating discharge, and corona, helping to curb potentially life-threatening events, as well as general maintenance issues.

Operators benefit from the much quicker identification of problem parts and even have the capability to see the detected leak(s) as they appear. This is because the sound is superimposed by functional AIs to render a visual depiction of where the leak is as well as gauging its severity, including recommended actions to resolve.

In the case of FLIR Si-Series acoustic imagers, projective algorithms even estimate how much the leak will cost by evaluating the air lost in real time, calculating the spend per kWh, and displaying an expected saving per year (or on a specified timeframe), ensuring that inspectors have clear evidence needed to solve problems and justify any incurred repair costs across the production line.

IMTEX 2025

International Machine Tool &
Manufacturing Technology Exhibition

Concurrent Shows

Tooltech 2025
International Exhibition of Cutting Tools, Tooling Systems, Machine Tool Accessories, Metrology & CAD / CAM

DIGITAL MANUFACTURING
International Exhibition on Digital Manufacturing Technology

23 - 29 January 2025 : BIEC, Bengaluru

Largest Machine Tool and Manufacturing Technology Show in South and South-East Asia

Scaling new heights in manufacturing

KEY HIGHLIGHTS

- 1000+ Exhibitors
- 23+ Countries
- 90,000 sqm. Exhibition Area
- 100,000+ Business Visitors
- Group Country Pavilions
- Product Launches & Live Demonstrations
- International Buyer-Seller Meet
- Industry Trade Delegation
- i2- Academia Square
- Industry Awards
- International Seminar on Machining Technologies

Organiser

Indian Machine Tool Manufacturers' Association

Venue

BIEC Bangalore International Exhibition Centre

ufi Approved International Event

www.imtex.in

Children below 14 years of age are not allowed

IMTS 2024: REINFORCING THE 'CAN-DO ATTITUDE'

Positivity loomed large at McCormick Place, Chicago, where International Manufacturing Technology Show (IMTS) was held from September 9-14, 2024. Tech giants demonstrated software, AI, machine learning, and cloud-based applications, while manufacturing leaders and budding innovators showcased cutting-edge solutions to improve workforce productivity and lower costs.

Source: IMTS

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Organized by the Association for Manufacturing Technology (AMT), IMTS served as a comprehensive platform for staying informed about the latest in manufacturing technology. The 2024 edition of the manufacturing trade fair stayed true to its reputation, kicking off with a spirited start that set the tone perfectly. Douglas K Woods, President, AMT, welcomed visitors to IMTS 2024, saying, "You're the backbone of the economy in the United States, and IMTS is the place where the very best manufacturers connect with the very best technology."

An Out-and-Out Success

Emphasizing the transformative potential of the show, Peter R Eelman, Chief Experience Officer, AMT, said, "IMTS 2024 will accelerate the adoption of advanced technology in ways visitors could not have imagined before the show. A sense of new possibilities generated an enthusiasm throughout the show."

The event featured 1,737 exhibitors, a record of more than 40 million pounds of machinery, 1,226,523 sq ft of show space, and 89,020 registrants, including 14,713 at the Smartforce Student Summit. The IMTS 2024 Conference attracted 53 percent more registrants. There were 1,70,000 organic impressions on posts from the IMTS official channels (#WEAREIMTS) and hundreds of thousands more impressions for all IMTS posts.

Douglas K Woods, President, AMT, shared, "Exhibitors fine-tuned their demonstrations, packaging their solutions in the way people

Source: IMTS

want to consume them. Rather than featuring a product, exhibitors showed how they solved problems with systems. That's the genius that excited visitors."

A Hub of Innovation

Kathleen Mitford, Corporate Vice President, Global Industry Marketing, Microsoft, opened the show with a keynote speech focusing on how 'AI solutions are accelerating manufacturing outcomes across the sector from factory floors to boardrooms'.

BlueForge Alliance exhibited in AMT's Emerging Technology Center, which also featured a convergent manufacturing platform from the U.S. Department of Energy's Manufacturing Demonstration Facility at Oak Ridge National Laboratory (ORNL).

The ETC featured Apollo, a humanoid robot from Apptronik. The company uses AI to teach the robot how to perform tasks autonomously by leveraging a technique called imitation learning, almost like teaching a young child how to do something for the first time.

At IMTS 2024, AWS announced additional edge partners for its AWS IoT SiteWise Edge service, from Belden and Litmus, which makes it easy to collect, organize, process, and monitor equipment data on-premises.

In a first for IMTS, contract manu facturers learned how they could partner with the U.S. Navy and its submarine industrial base.

Automation Beckons

The show witnessed the launch of the new Automation Sector, accelerated by SPS – smart production solutions.

"Creating the Automation Sector at IMTS and SPS – smart production solutions in Atlanta reflects our commitment to helping manufacturers enhance and accelerate their productivity and support the expanding U.S. manufacturing market," said AMT's Woods.

Every major machining exhibitor in the Metal Removal Sector demonstrated integrated systems featuring large pallet changers, bar feeders, load/unload robots, chip removal systems, and more.

First-time exhibitor Lights Out Mfg collaborated with Universal Robots to demonstrate the first robot system that can load a different part every time and clamp it in the company's RoboWrench X5 pneumatic CNC vise.

Additionally, Fanuc exhibited the industry's first explosion-proof cobot.

The technology in the Additive Manufacturing Sector, accelerated by Formnext and educational opportunities on the Formnext Stage made IMTS an additive manufacturing (AM) destination.

Jupiter Machine Tool, a strategic integration partner in Meltio's booth, unveiled its high-precision five-axis vertical mill integrated with Meltio's 3D metal wire head.

Student Summit

A total of 14,731 students and educators visited the Smartforce Student Summit to experience hands-on technologies and gain valuable insights into the future of manufacturing.

India Shines at IMTS

One of the special highlights during IMTS 2024 was the 'India Opportunities' session, jointly organized by Indian Machine

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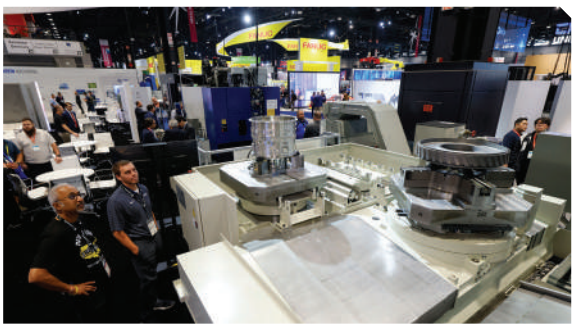


Source: IMTS

Source: IMTMA

The IMTS community will be able to further explore automation in a manufacturing environment at SPS – smart production solutions Atlanta, to be held from Sept 16-18, 2025, at Georgia World Congress Center.

Tool Manufacturers' Association (IMTMA) and AMT.

An interesting panel discussion titled, 'Synergy for Indo-US Partnership in Manufacturing', provided an outlook on the Indian Manufacturing and Machine Tool industry. Moderated by TK Ramesh, Managing Director, Ace Designers Ltd, the session featured panelists including Rajendra S Rajamane, President, IMTMA and Managing Director, Rajamane Industries Pvt Ltd; Ravi Raghavan, Past President, IMTMA and Managing Director, Bharat Fritz Werner Ltd; David Moskey, Territory Manager - India, South-East Asia and Middle East, Mastercam; and Arun Mahajan, Director, India - AMT.

India Advantage

The session deliberated on the advantages that India has to offer:

A Global Force – As the world's most populous country, India boasts a strong consumer-driven market, making it a hub of opportunity for businesses worldwide.

Economic Powerhouse – India is the 5th largest and fastest-growing economy, with a GDP of US$ 3.94 trillion in 2024, and is projected to reach US$ 10 trillion by 2035.

Trade Momentum – India's trade strength is evident, with exports amounting to US$ 437 billion and imports reaching US$ 675 billion in FY 2023-24.

Startup Leader – Ranking as the 3rd largest startup ecosystem globally, India is a breeding ground for innovation and entrepreneurship.

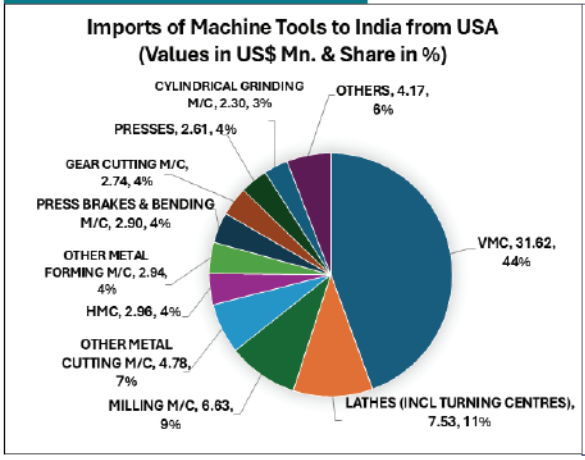
Indian Machine Tool Industry Overview

According to the Gardner Intelligence World Machine Tool Survey - 2023, the global machine tool industry recorded a production value of US$ 85.26 billion, imports at US$ 38.64 billion, exports totaling US$ 44.87 billion, and consumption reaching US$ 79.04 billion. Within this global framework, India's machine tool industry showcased a production value of US$ 1.52 billion, imports of US$ 1.73 billion, exports amounting to US$ 0.18 billion, and consumption at US$ 3.06 billion. Additionally, India ranked 9th in global machine tool production and stood 6th in consumption in 2023

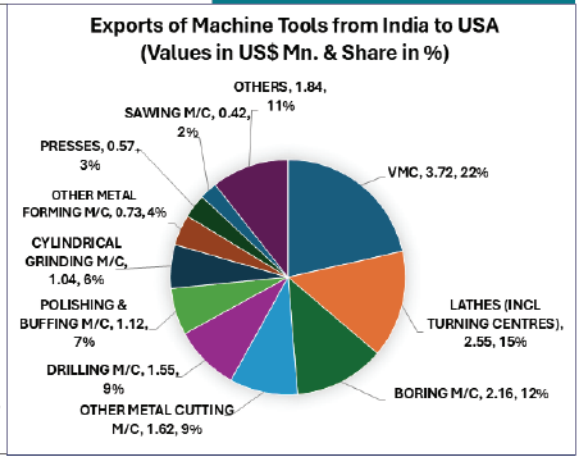
See You in 24 Months!

This year's edition garnered an overwhelming response from the industry stakeholders, setting the stage for the next the preparations of which have already begun with great gusto. Mark your calendar for IMTS 2026 scheduled for September 14-19, 2026, at McCormick Place in Chicago.

Total Imports values in FY2023-24: US$ 71 Mn



Total Exports Value in FY2023-24: US$ 17 Mn



Source: DGCIS, IMTMA

INTERNATIONAL SEMINAR ON MACHINING TECHNOLOGIES

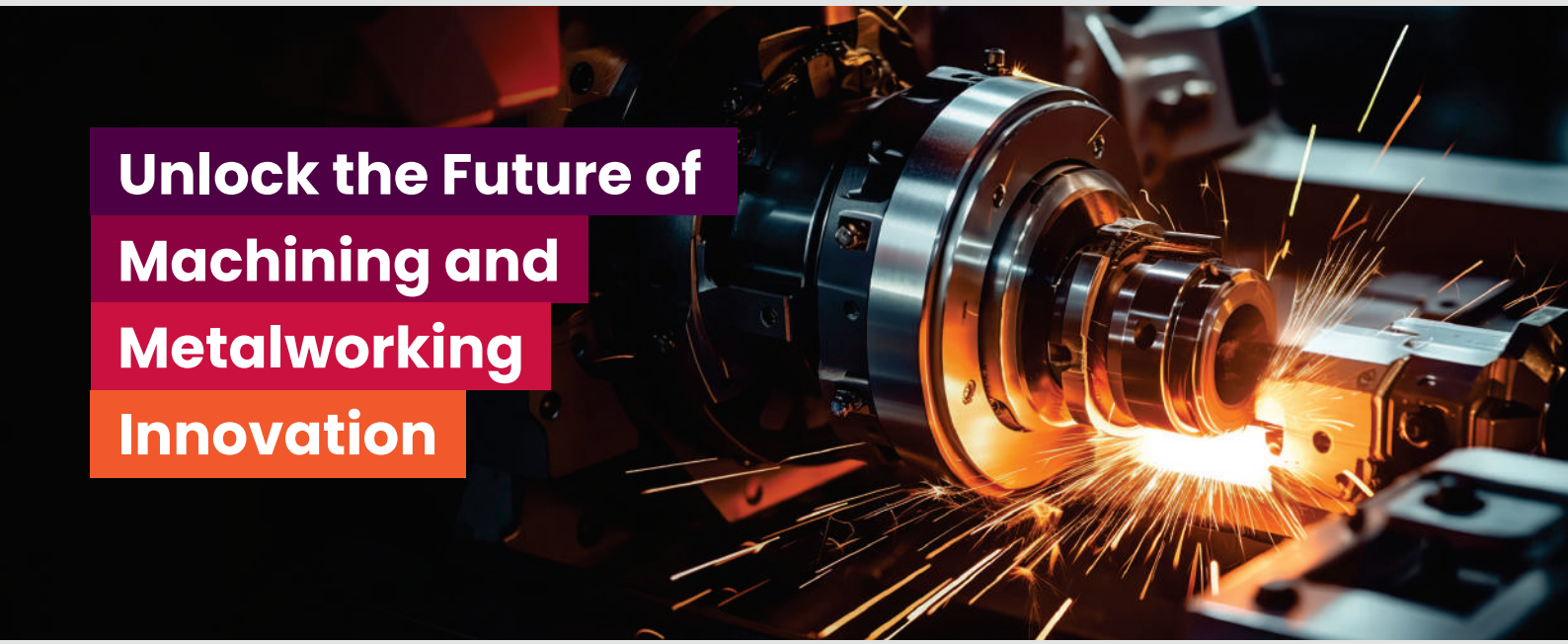
24 - 25 January 2025, BIEC, Bengaluru

During

IMTEX 2025

International Machine Tool & Manufacturing Technology Exhibition

23 - 29 January 2025



Unlock the Future of Machining and Metalworking Innovation

Explore transformative trends at the International Seminar on Machining Technologies. Discover innovations in machine tools, digital solutions, and sustainable manufacturing that will power the future of manufacturing.

Reasons to attend

- Access insights into cutting-edge Industry 4.0 solutions and digital transformations
- Learn about the latest in machine tools and hybrid manufacturing
- Discover new approaches to micromachining, robotics, and super finishing
- Engage with 20+ global experts and 200+ industry delegates

Event Highlights

- Exclusive sessions on sustainable manufacturing for an eco-friendly future
- Valuable networking opportunities with industry leaders
- In-depth discussions on high-performance machining and quality solutions

Registration Fees

2 days: 24th and 25th January 2025 is INR 3000 + GST

1 day: 24th or 25th January 2025 is INR 1500 + GST

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FUTURE-PROOFING INDIA'S INDUSTRIES

Source: IMTMA

Organized by Indian Machine Tool Manufacturers' Association (IMTMA), at Hotel TipTop International in Pune from September 25-26, 2024, the 7th edition of 'Symposium on Automation & Robotics' centered on transformative industry mega-trends, painting a clear picture of a future where the sector advances into an era of unprecedented technological growth in line with the country's progress.

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Symposium on Automation & Robotics 2024 offered a glimpse into tomorrow with innovations and technologies. The conference featured more than 300 delegates representing about 100 companies in addition to a concurrently held exhibition that displayed ground-breaking advancements. Visitors engaged with state-of-the-art equipment, exchanged insights, and immersed themselves in technical demonstrations, which were both informative and inspirational. Sessions focused on vital topics such as artificial intelligence (AI), automation, laser welding, sensors for Industry 4.0, robotics, machine learning for manufacturing, digital manufacturing, cobots, and the use of digital imaging, and many more. Apart from presentations, the discussion deliberated on self-reliance and start-up innovations, underlining the entrepreneurial spirit needed to push automation forward.

Pioneers shaping automation's future

Visionaries at the helm inaugurated the Symposium, setting the tone for the event. Subrata Kar-

makar, Head - Robotics Business, ABB India, delivered a keynote address on 'Embracing Automation - Global and Indian Perspective and India's Way Forward' highlighting India's potential to make waves in the global automation arena. While Rahul Yadav, Vice President - Manufacturing Excellence, Lean, IoT, Automation, Anand Automotive, in his keynote address on 'Automation approach to master process and quality for Indian manufacturers and machine designers', underscored IoT and lean processes' importance in crafting future-ready manufacturing systems.

Other influential figures at the ceremony include Vikram Salunkhe, Managing Director, Accurate Gauging & Instruments Pvt Ltd and Ingrid Rasquinha, Jt Managing Director, Electropneumatics & Hydraulics (I) Pvt Ltd. Sharing the dais were Rajendra S Rajamane, President, IMTMA; Jibak Dasgupta, Director General & CEO, IMTMA; and Guru Prasath, Executive Director, IMTMA.

Source: IMTMA

Symposium on Automation & Robotics 2024 featured panel discussions and presentations by industry leaders from various sectors on automation and robotics. Attracting over 300 delegates from 100 companies, it was held alongside an exhibition, where visitors gained first-hand experience with displayed products and technologies in addition to the conference's technical deliberations.

Insights, case studies, perspectives, and more

Touching upon a wide set of aptly chosen topics, industry experts' presentations deeply resonated with the sector's core needs. It included case studies like 'Start-up Opportunity – Case Study on Innovation and Self-reliance, ARTPARK @ IISc' and 'A Case Study on Lights-Out Factory'.

Presentations were made on topics, including 'Robotics and Automation for Enhancing Efficiency and Productivity', 'Industrial Automation and Robotics – Global Application Perspective', 'Smart Automation: For the Factory of the Future', and 'Easy Way of Robotics – Industry Connect'.

'Make Your Sensor Application Easier, Efficient, and Precise through Innovative Approaches' and 'AI-Based Image Analytics for Process Monitoring in Galvanizing', 'Digitalization Solutions: Improving Productivity and Delivering Bottom-Line Performance', and 'Ease of Digitalization for Enhancing Efficiency'.

The issues of sustainability and resource optimization were deliberated in 'Automation @ Sustainability' and 'Optimizing Energy Along with Resource Consumption and Achieving Remote Monitoring'.

Source: IMTMA

Turning aspirations into action

Power-packed panelists from leading names like Ashok Leyland, Bajaj Auto, C4i4 Lab, FANUC India, Festo India, Leuze Electronic, Maxbyte Technologies, Rittal India, SCHUNK Intec India, Tata Motors, and Titan Engineering and Automation Ltd, made the panel discussions impactful.

Addressing challenges and opportunities, the panel discussions recognized that skilling and upskilling the workforce are necessary for a seamless transition into advanced automation. It further drilled down on having a talent pool versed not only in new technologies but also being adaptable to evolving trends—a vision that would transform the industry to be both future-ready and inclusive.

CELEBRATING RUDRAPUR'S INDUSTRIAL DAWN

Indian Machine Tool Manufacturers' Association (IMTMA) delivered a rip-roaringly successful 2nd edition of MTX Connect to the industrial heartbeat of Rudrapur, Uttarakhand. Over two days, from October 3-4, 2024, Ark Hotel & Resorts transformed into an innovation hub with 46 exhibitors and 550 visitors under one roof. The air charged with anticipation as the expo became a melting pot of ideas, technologies, and opportunities.

Source: IMTMA

The B2B short expo kicked off in a grand style, with esteemed dignitaries gracing the occasion. The inauguration was marked by the presence of industry stalwarts like Biswajit Mazumdar, Plant Head, Ashok Leyland Ltd; Ashok Bansal, President, Kumaun Garwal Chamber of Commerce & Industry (KGCCI), Kashipur; Shreekar Sinha, President, SIDCUL Entrepreneur Welfare Society, Pantnagar; and Pandurang Chavan, Plant Head, Mahindra & Mahindra Ltd. Also present were Nisha Lobo, EC Member, IMTMA; Jibak Dasgupta, Director General & CEO, IMTMA; and Guru Prasath KR, Executive Director, IMTMA. Together they deliberated over the marvelous transformation of Rudrapur into a manufacturing powerhouse.

Rudrapur, located in Uttarakhand, is a prominent industrial hub with the presence of various industries like Automotive, Electronics, Food Processing, Pharmaceuticals, etc. The area is also supported by a well-established infrastructure, including industrial estates and special economic zones, offering modern facilities and business incentives.

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Source: IMTMA

Technology meets opportunity

The expo had its spotlight on cutting-edge innovations in Machine Tools, Digital Manufacturing, Laser Technologies, Tooling, and Metrology. Exhibitors showcased solutions tailored for MSMEs and Tier I/II markets, demonstrating how the latest advancements can power local industries. Workshops and tech talks enriched those in attendance, facilitating a fruitful exchange of ideas and fostering collaboration. The event also offered factory visits, allowing exhibitors a first-hand view of Rudrapur's industrial potential.

A game-changer for the region

As the unique two-day tabletop expo brought down the curtain on the premier gathering for the Manufacturing industry, one thing was certain: it wasn't just an exhibition—it was a catalyst for growth. In line with IMTMA's effort to bring technologies and solutions to the doorsteps of industries located in various key geographic regions, the expo surely strikes the right chord. And with Rudrapur waiting with bated breath for the future of manufacturing to unfold, MTX Connect proved that indeed small towns can have big dreams.

MTX Connect Rudrapur 2024, held from October 3-4 at Ark Hotel & Resorts, Rudrapur, witnessed participation from 46 exhibitors with 550 registered visitors. Machine tools, digital manufacturing, laser technologies, tooling, and metrology were the focus areas.

Source: IMTMA

FULL THROTTLE ON PRODUCTIVITY

Indian Machine Tool Manufacturers' Association (IMTMA) is set to bring down the curtain on the much-anticipated National Productivity Summit 2024, scheduled for December 3-4 at Sheraton Grand, Pune. For its 18th edition, the Summit expects over 200 productivity leaders, industry champions, and aspiring professionals from across the country for an immersive two-day event that celebrates productivity advancements and manufacturing excellence.

Source: IMTMA

With the theme 'Showcasing Excellence in Manufacturing', the summit provides a common platform to share experiences and ideas for networking among decision-makers, experts, peers, researchers, academia, customers, and suppliers of productivity equipment. It aims to address and demonstrate a wide range of productivity improvements in manufacturing through inspiring keynotes, live case study presentations, plant visits, and success stories by leading manufacturing companies.

Witnessing best practices

The planned 'Insightful Pre-Summit Plant Visits' will be a prelude to the main event, offering an exclusive, firsthand look into operations at leading manufacturing facilities. Delegates can choose from three tours: 'Tour A: Bajaj Auto Ltd and Gabriel India Ltd'; 'Tour B: Forbes Marshall and Aakar Foundry'; and 'Tour C: Tata AutoComp Systems and Mahle Anand Thermal Systems'. Each visit provides a behind-the-scenes look at production processes and productivity techniques in action, making it a must-attend for those keen to understand real-world implementations of best practices.

Efficiency champions in spotlight

'Live Case Study Presentations', a highlight of the summit, where leading companies will present live case studies, showcasing their best productivity practices. The participating companies will compete for the prestigious IMTMA-ACE Micromatic Productivity Championship Awards 2024. The contenders include industry

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Source: IMTMA

heavyweights like Ashok Leyland (Hosur and Pantnagar), Kirloskar Toyota Textile Machinery, Lucas TVS Ltd, SEG Automotive India, Tractors and Farm Equipment Ltd, Tata Electronics, Hero Moto Corp, Synergy Engineers & Powder Coaters, and Inder Enterprises.

Enriching keynotes by distinguished industry leaders will not only allow the attendees to hear from the most influential voices regarding current trends and future directions but also the role of productivity in shaping India's manufacturing horizon. Such sessions will provide optimum food for thought and inspiration to make leaders fully equipped to navigate an evolving industry.

Unrivaled networking and learning

One of the unique aspects of the National Productivity Summit is the networking opportunities it presents. This event serves as a bridge between key stakeholders to foster collaboration and ignite new ideas. As the dynamic landscape of manufacturing is ever-changing, the summit offers a perfect stage for all those who wish to stay at the forefront of the industry. Powered with insightful presentations to collaborative exchanges, it promises a comprehensive journey into the heart of productivity.

The Summit addresses and demonstrates a wide variety of productivity improvements in manufacturing through inspiring keynotes, live case study presentations, plant visits, success stories by manufacturing companies, and so on.

Source: IMTMA

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CONNECTING THE MANUFACTURING WORLD

Organized by Indian Machine Tool Manufacturers' Association, the highly anticipated IMTEX 2025 & Tooltech 2025 is just around the corner, ready to showcase global excellence in manufacturing. In its endeavor to shape the future of manufacturing, the premier event will bring together game changers from across the industry to demonstrate cutting-edge innovations, advanced machining technologies, and smart manufacturing solutions.

Source: Magic Wand Media

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Indian Machine Tool Manufacturers' Association's flagship international machine tool and manufacturing technology show in the world, IMTEX will be back at Bangalore International Exhibition Centre (BIEC), Bengaluru, from January 23 – 29, 2025. Highly awaited by machine tool builders worldwide, the show offers an unparalleled platform to connect with industry professionals and gain insight into the latest trends and technologies. The new metro connectivity to BIEC is a highlight which is expected to significantly simplify transit for IMTEX 2025 & Tooltech 2025 attendees.

With a legacy of more than five decades, IMTEX has played a stellar role in the growth of manufacturing industries, attracting large numbers of visitors and trade delegations and supporting the business growth of exhibitors.

The mega event, which is to take place in a sprawling total

"As one of the leading global machine tools shows today, IMTEX attracts visitors from India and numerous other countries. We anticipate welcoming visitors from more than 50 countries at IMTEX 2025."

Rajendra S Rajamane
President
Indian Machine Tool Manufacturers' Association

area of 90,000 sq mt, will house over 1,100 exhibitors from 19 countries and welcome over 100,000 business visitors and 2,000 trade delegations from a wide spectrum of manufacturing and ancillary industries.

IMTEX 2025 is set to host seven country pavilions, bringing together a global showcase of cutting-edge technology and innovation. Hall 1B will feature pioneering exhibits from the USA, Taiwan, Spain, and Japan, while Hall 2B will spotlight advanced solutions from South Korea, Germany, and Italy.

From state-of-the-art machinery to groundbreaking manufacturing techniques, these pavilions promise an immersive experience of global excellence.

Offering a range of innovations

The exhibition will showcase a wide range of advanced solutions in CNC machining, tooling, automation, robotics, additive manufacturing, CAD/CAM, metrology, and smart manufacturing technologies with the potential to transform the Indian Manufacturing industry.

Highlighting the significance of the show, Rajendra S Rajamane, President, IMTMA, says, "IMTEX is a much-awaited show for the Indian Machine tool industry as it's an ideal platform for the companies to launch new products and present their technological advancements for various manufacturing industries. As one of the leading global machine tools shows today, IMTEX attracts visitors from India and numerous other countries. We anticipate welcoming visitors from more than 50 countries at IMTEX 2025."

Echoing his sentiment, Jibak Dasgupta, Director General & CEO, IMTMA, underscores the event's impact on the global manufacturing landscape, "IMTEX is an ecosystem that complements various activities for the entire manufacturing fraternity. Anyone participating in IMTEX has something to gain. We have seminars, buyer-seller meets, academia-industry collaborations, national and international trade delegations, and many more. Visitors can plan their visit to the exhibition and attend these activities by doing pre-registration, which is now open at www.imtex.in."

Complementing shows and parallel events

Tooltech 2025 and Digital Manufacturing 2025 will be concurrent shows at IMTEX 2025 with products covering tools and accessories as well as futuristic technologies.

While Tooltech will feature parts, accessories, and systems for machine tools, Digital Manufacturing will have special pavilions on Industry 4.0 and additive manufacturing.

International Buyer-Seller Meet: Overseas dealers, distributors, and potential buyers from target countries will visit the show. It is a significant opportunity for IMTEX exhibitors to connect and explore new opportunities and penetrate overseas markets.

International Seminar on Manufacturing Technologies: The seminar will address the latest trends, developments and research in machine tool and manufacturing technologies. Exhibitors can explore the opportunity to connect with more than 300 delegates attending the seminar from user industries.

Connect: It is a platform for young engineers and technocrats to explore opportunities to work with machine tool companies. Exhibitors can participate in the program and employ the bright minds for their organizations.

This edition of IMTEX 2025 & Tooltech 2025 is slated to break its own records of receiving show attendees at Bangalore International Exhibition Centre from January 23-29, 2025.

Source: Magic Wand Media

New Metro Station connecting BIEC with the city

The recent 3.7 km extension of the Namma Metro Green Line from Nagasandra to Madavara, with key stops like Chikkabidarakallu and Madavara, provides a direct and convenient route to the exhibition center, making IMTEX 2025 & Tooltech 2025 even more accessible for its global audience.

i2 Academia Pavilion: An initiative to connect academic institutions with machine tool and Manufacturing industry. Leading engineering and technical institution will present their R&D and innovation work. Exhibitors will be able to get information on the ongoing research work on manufacturing technologies and forge collaborations to move to next level of developing new products.

Extensive exhibitor and visitor profile

The exhibitor profile at IMTEX 2025 spans a wide array of manufacturing and machining technologies, including turning machines, CNC multi-function machines, drilling machines, boring machines, milling machines, machining centers, flexible manufacturing systems, special production machines and unit heads, grinding machines, special purpose grinding machines, tool grinding machines, planning, shaping, slotting and broaching machines, sawing and cutting-off machines, screwing and tapping machines, honing, lapping, polishing and deburring machines, electro erosion machines, robotics & manufacturing automation, machines for unconventional and other operation, machines for marking, machine tools for educational purposes, heating and hardening machines, organizations, lubrication and coolant, welding material and accessories, cutting tools, forming tools, abrasive and polishing tools, hand-held tools, tooling systems, work holding, automation for storage & transport, components for robotics & automation, attachment, accessories & sub-systems, mechanical elements and components, hydraulic and pneumatic systems and elements, electrical & electronic equipment, and feeding systems.

The visitor profile at IMTEX 2025 includes professionals from a diverse range of industries, such as aerospace, automotive and auto components, capital goods, defence, earth-moving equipment, electrical and electronics, food processing and dairy equipment, infrastructure, job shops, material handling, plastics processing, process plant and machinery, railways, research and development, space and nuclear, telecom equipment, textile machinery, tractors and farm equipment, white and brown goods, wind, power, and thermal sectors, office equipment and automation, oil and gas equipment, and pharmaceutical equipment.

Seamless travel to BIEC

Leaders from India's machine tool industry expressed enthusiasm about the new metro connectivity from the city to Bangalore International Exhibition Centre (BIEC), where IMTEX 2025 will be held from January 23-29, 2025.

The new 3.7 km extension of Namma Metro Green Line from Nagasandra to Madavara, with

"IMTEX is an ecosystem that complements various activities for the entire manufacturing fraternity. Anyone participating in IMTEX has something to gain. We have seminars, buyer-seller meet, academia-industry collaborations, national and international trade delegations, and many more."

Jibak Dasgupta
Director General & CEO
Indian Machine Tool Manufacturers' Association
Bangalore International Exhibition Centre

stations such as Chikkabidarakallu and Madavara, offers seamless access to Bangalore International Exhibition Centre. This development marks a significant improvement in Bengaluru's transit options for IMTEX visitors.

Jibak Dasgupta, Director General and CEO, Indian Machine Tool Manufacturers' Association IMTMA and BIEC mentioned, "One of the important aspects for this IMTEX is the new metro connectivity connecting directly the city with BIEC, greatly improving accessibility. Earlier reaching the venue was challenging, but with the metro, this issue is resolved, offering significant benefits to the show attendees."

Taking this forward, Guru Prasath, Executive Director - Trade Fairs, Indian Machine Tool Manufacturers' Association, announced, "The Metro has finally started, and this will provide a big relief to a lot of visitors as well as encourage even more attendance."

Joining in, Parakramsinh Jadeja, Chairman & Managing Director, Jyoti CNC Automation Ltd., highlighted how convenient this new metro development would be making the visitor experience seamless and bringing in more footfall in IMTEX 2025.

In alignment, Raghava Badhya TV, President & Director, Makino India Pvt Ltd, emphasized the metro's direct access, saying, "The metro connection brings you right to the doorstep of BIEC, making this edition of IMTEX "bigger, better, with a lot more engineering, automation, and technologies to see."

Similarly, Soundhar Rajhan K, Chief Strategy Officer at LMW Limited - LMW Machine Tool division, added that the metro connection is an added advantage for IMTEX 2025 goers as commuting to BIEC will be much better as there will be no traffic congestion.

International Seminar on Manufacturing Technologies will address the latest trends, developments and research in machine tool and manufacturing technologies. Exhibitors can explore the opportunity to connect with more than 300 delegates attending the seminar from user industries.

CNC PRECISION LINEAR CHUCKER LATHE

ACE'S LJ 100LM FOR SMALL-SIZED PRECISION COMPONENTS

The LJ 100LM (Linear Jobber) is a small-sized CNC precision linear chucker lathe suitable for machining small-sized precision components. The machine features a rigid cast bed with linear motion guides for both axes. A cartridge-type spindle with spindle speeds up to 6,000 rpm as option, 30 m/min rapid rates for both axes, and Gang tooling flexibility provide high productivity.

Source: Ace Designers Ltd

Both the X and Z axes guides are well protected with the help of telescopic covers. The spindle A2-5 nose with both high-speed and low-speed versions. The use of Fanuc Oi-TF plus system aptly fits into the requirements of the machine functioning and makes the machine highly competitive in this segment. The machine is also designed with equivalent Siemens, Delta, and Syntec control systems.

It is fitted with all other CNC lathe standard accessories like hydraulic power pack, coolant system, centralized lubrication system, lighting system, etc.

At IMTEX 2025 & Tooltech 2025, the company is showcasing the LJ 100 mostly used in the Bearing segment. The machine is a high-performance product specifically designed to meet the demanding requirements of bearing applications. Whether it's used in the Automotive, Aerospace, Industrial, or Heavy Machinery sectors, the LJ 100 offers excellent performance in critical bearing functions where reliability, durability, and efficiency are paramount.

Ace Designers Ltd
www.acemicromatic.net
Hall & Stall: 5/B-109

LINEAR GUIDE CUTTING MACHINES

ABRASIVE CUTTING SOLUTIONS FROM CHENNAI METCO

The Automation industry extensively uses ball screws and linear guides, which come in various sizes and need to be cut to specific lengths based on end-customer requirements. Manufacturers, distributors, dealers, and high-volume end-users often require precise cutting of ball screws and guide rails.

Chennai Metco, a global provider of abrasive cutting solutions, offers a range of manual, semi-automatic, and fully automatic machines for cutting ball screws and guide rails to length. Key aspects of these machines include length accuracy and sectional integrity, ensuring finish quality and hardness stability. Chennai Metco's machines are specially designed to meet these standards and are equipped with essential stands, workholding devices, feeders, and more. The fully automatic sectioning machine also features pin location-based length control, ideal for mass production.

Prominent distributors such as THK, Schaeffler, Rollon, MISUMI, Festo, and FAG extensively use Chennai Metco's models. Beyond serving Indian customers, Chennai Metco exports its machines globally.

Chennai Metco Pvt Ltd
www.chennaimetco.com
Hall & Stall: 1/A-101

Source: Chennai Metco Pvt Ltd

VERTICAL MACHINING CENTERS

THE ERGONOMICALLY DESIGNED VMC 1580

The VMC 1580 features a unique T-Base construction, which ensures optimal surface quality during demanding cutting conditions and prevents overhang issues for heavy workpieces on the table. Its triangular saddle and stepped bed, with widely spaced guideways, enhance structural stability for the entire Y-axis movement. The broad column construction—extending up to 50 percent of the column height—offers better stability during extreme Z-axis strokes. A one-sided slope allows for efficient and easy free fall of chips into the conveyor.

An optional BT-50 spindle with high torque capacity supports the heavy machining of injection molds, forging dies, and large plates. The VMC 1580's wide working area and ergonomic design are notable features, with a 90° tilting operating panel that enables operators to view the machine area easily while working.

In addition, TPM-friendly units that require regular checking like pneumatics, electrical panel, and lubrication are conveniently located for easy maintenance at the rear side of the machine well within the reach of the operator.

Source: Jyoti CNC Automation Ltd

High-speed, high-torque motorized spindles with 12,000/15,000/18,000 rpm options are available. These spindles are manufactured in-house for high-speed machining. The peak speed for such spindles reaches in just 2.5 seconds, with a deceleration time of only 2 seconds.

For maximum flexibility, an optional 4th and 5th-axis table with a high-resolution feedback system can be used to avoid multiple set-ups and do multiple side machining in a single set-up to reduce the overall cycle time. Additionally, a wide selection of tool and surface-sensing probes as tool and job probes with infrared/radio/laser transmission technologies are available to increase productivity and reduce non-cutting time. The Gear Box option with auto shifting mechanism is also available for special applications requiring high cutting torque at lower rpm for harder materials.

Jyoti CNC Automation Ltd
www.jyoti.co.in
Hall & Stall: 5/A-122

VERTICAL MACHINING CENTERS

JG50 SERIES FOR HIGH PRODUCTIVITY AND COMPACT DESIGN

Source: LMW

The JG50 series comprises compact yet highly productive high-speed moving column VMCs, purpose-built to meet the rigorous demands of modern industries. Tested extensively for components with stringent quality parameters and high-volume production, the JG50 has proven its capabilities.

Featuring a remarkable acceleration exceeding 1G and spindle speeds of up to 16,000 rpm, the JG50 ensures rapid machining processes without compromising accuracy. Its rapid tool change, taking only 1 second, significantly reduces non-cutting time, resulting in increased productivity. The machine's enhanced speeds and accelerations minimize idle movements, further optimizing efficiency. It has a rapid traverse rate (X/Y/Z) of 48 m/min (60 m/min), which is optional. It also features a rotary pallet changer in selected models.

In addition to its high performance, the JG50 boasts an ultra-compact design that saves valuable shop floor space, making it an ideal choice for manufacturers seeking to maximize their operational footprint.

LMW Ltd - Machine Tool Division
www.lmwcnc.com
Hall & Stall: 5/A-108

VERTICAL MACHINING CENTERS

CUTTING-EDGE TECHNOLOGY FOR TINY AND LARGE PARTS

The demand for future-oriented machining solutions continues to grow, driving manufacturers to strive for top performance. At IMTEX 2025, the Germany-based Chiron Group will showcase its ability to deliver such solutions through a comprehensive product portfolio and a deep understanding of customer needs. The spotlight will be on the new Micro5 and the established Mill 2000.

Micro5 with Feed5 automation — high autonomy, ultra-precise, sustainable

Aerospace part on Mill series — 5-axis complete machining with high precision and process safety.

Source: Chiron Group

"From the Chiron Group, customers can expect tailored solutions for small and large parts, with standard automation or as a turnkey solution. The expertise in process automation and mastering technologies as double spindle and multitasking machining with milling and turning positions us to deliver the solution that best meets our customers' requirements," states Rajesh T Ghashi, Managing Director, Chiron India Machine Tools.

Precise and productive - 5-axis machining for large parts

The Mill 2000 vertical machining center, designed for 5-axis machining, showcases Chiron's expertise in delivering an all-rounder that combines precision, productivity, and versatility. The swivel spindle achieves speeds of up to 30,000 rpm with a torque of 180 Nm. Within the working space dimensions of X/Y/Z = 2000 x 975 x 715 mm, multiple clampings or large workpieces can be dynamically machined with feed rates of up to 75 m/min and a chip-to-chip time of just 3.3 seconds.

The must-have in micro-machining

With more than 150 units sold in 2024, the new Micro5 is showcasing how the future of micro-maching is taking shape. "Why would you machine small tiny parts on machines which are overdimensioned for this task?" With that question in mind and after a succesful developing period, Chiron Group now sets a benchmark in micro-machining with the new Micro5.

A footprint of only 1 sq mt and an energy consumption of only 0.5 kW are sufficient to machine ultra-precisely complex and high-quality parts for medical devices, watchmaking, jewelry and highly specialized tiny components. Automated with Feed5 automation system, the modular design of Micro5 is able to grow step by step from prototyping to large scale production, delivering high autonomy.

For Ghashi, the Micro5 and the Mill 2000 are two outstanding examples to demonstrate to customers the strength of Chiron's product range, engineering excellence, and the ability to deliver machines and solutions enabling innovations and competitiveness.

Chiron Group
Chiron India Machine Tools Pvt Ltd
www.chiron-group.com
Hall & Stall: 4/A-138

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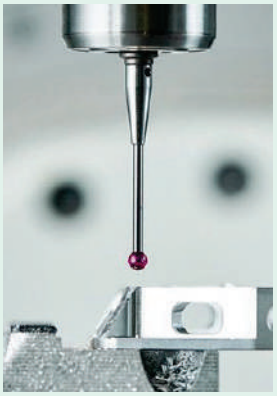

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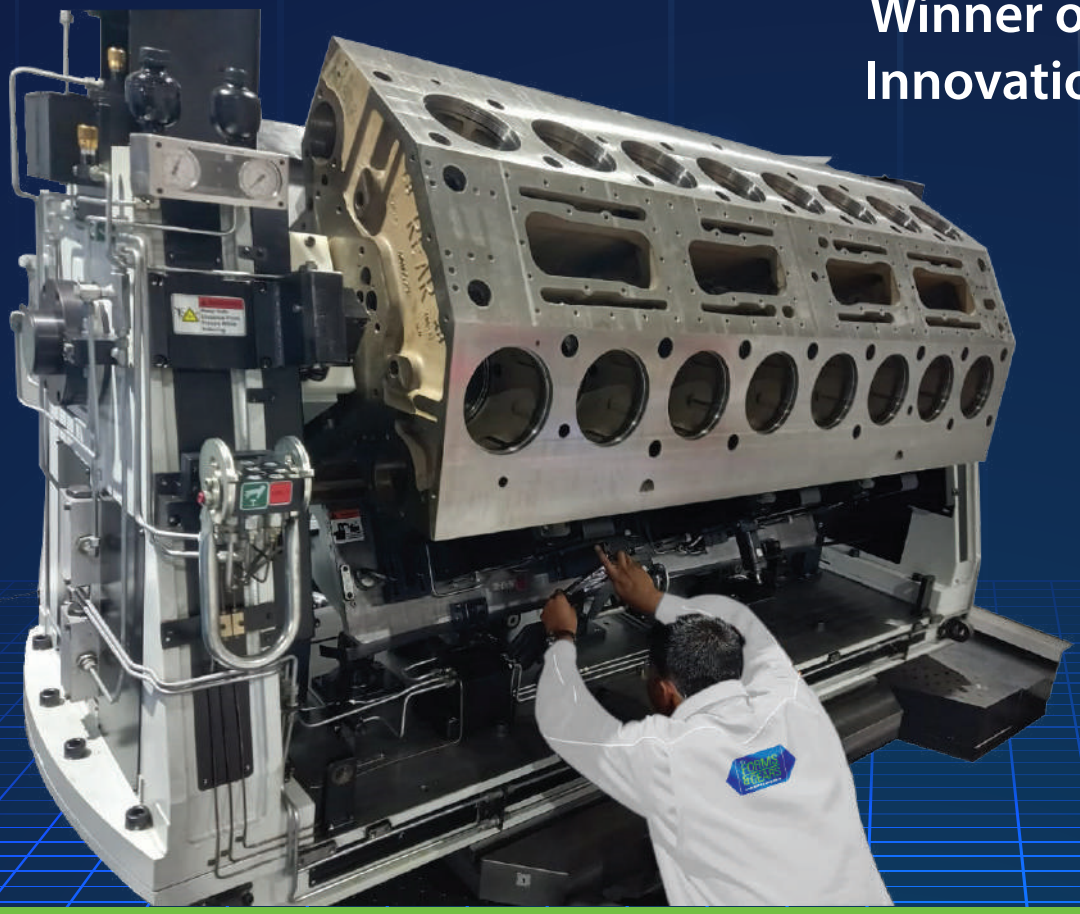

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