VOL 9, ISSUE 3 - SEPTEMBER-OCTOBER 2025

MODERN MANUFACTURING INDIA

WWW.MMINDIA.CO.IN

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

INDIA'S MANUFACTURING TAKES CENTER STAGE

IMTMA DESK
India's Aerospace Leap Fuels Machine Tool Growth
14

INDIAN MACHINE TOOL SECTOR @ EMO HANNOVER 2025
India Steps Up at EMO 2025
34

SUBBU VENKATACHALAM
Head of Defence & Aerospace
Carborundum Universal Ltd
40

Increase your efficiency with our customized solutions

LMW®

Machining Solutions..

TURNING | MILLING | TURNMILL

AUTOMATION | TOOLED UP | IOT | PROCESS CONTROL | CAD/CAM | e-Service

EMO HANNOVER 22-26/09/2025 **Hall - 15 Stall - B50**

For Enquiries
info@lmwcnc.com

LMW LIMITED
INDIA

FOLLOW US ON :
LMW CNC

www.lmwcnc.com

Since 1857 HURON
Subsidiary of Jyoti CNC

JYOTI

1,35,000+

Installations across 62 Countries

Visit us @ EMO HANNOVER 22-26/09/2025 Hall : 15 / C 36

Finest Range of CNC Machines

Turning / Turn-Mill Centers | Vertical Machining Centers
Horizontal Machining Centers | 5-Axis Machining Centers | Multi-Tasking Machining Centers

JYOTI CNC AUTOMATION LIMITED
G - 506, G.I.D.C. Lodhika, Village : Metoda, Dist : Rajkot - 360021, Gujarat (INDIA).
T : +91-2827-235100/101 | E : info@jyoti.co.in, sales@jyoti.co.in | jyoti.co.in huron.fr

CONTENTS

VOL 9, ISSUE 3 –SEPTEMBER–OCTOBER 2025

IMPRINT

PUBLISHER
DIRECTOR GENERAL, IMTMA

EDITORIAL

Editor-in-Chief
Soumi Mitra

Chief Copy Editor
Poonam Pednekar

Assistant Editor
Sovan Tudu

Senior Correspondent
Murali Sundaram

Correspondent
Nityasree Kumaraswamy

VIDEOGRAPHY

Video Producer
Merenzungla Longkumer

Videographer
J Jayabharathi
Abinesh Umapathi

Video Editor
Akhilesh Singh
Jyotipriyo Pal

DESIGN
Magic Wand Media

SALES & MARKETING
Indian Machine Tool Manufacturers' Association (IMTMA)
Murali Sundaram, Magic Wand Media Inc
murali.sundaram@magicwandmedia.in

Published and Printed by Indian Machine Tool Manufacturers' Association (IMTMA). Printed at Pentaplus Printer's Pvt Ltd Sy.No.1/2 Situated at Anjanadari Estate, Lingadeeranahalli, Adjacent to D Group Society Yeshwathpur Hobli, Bangalore North - 560091, Karnataka and Published from Indian Machine Tool Manufacturers' Association; Head Office: 10th Mile, Tumkur Road, Madavara Post, Bengaluru - 562123, Karnataka. Editor: Soumi Mitra

Publishing frequency: 6 times per year

STRIVING TOWARDS NEW MANUFACTURING MILESTONES

RAJENDRA S RAJAMANE
PRESIDENT
IMTMA

Dear Readers,

The Indian Machine Tool industry is at a pivotal point, with production and consumer demand showing healthy growth in FY 2024-25. While the Auto sector remains a key focus, the industry is steadily expanding into a broader spectrum of markets. It is making inroads into Defence, Railways, Electronics, and other sectors. This diversification indicates a future where the Machine Tool industry can better withstand global uncertainties and emerge as a key driver of advanced manufacturing across various domains.

Meanwhile, the rising influx of competitively priced, high-technology machines into India continues to present growing challenges. Shorter delivery schedules and large-volume orders are demanding greater capacity, and our Machine Tool industry must quickly adapt to these requirements. It needs to develop sector-specific machines, high-capacity production, customized applications, and integrated solutions that precisely meet the needs of end users.

Encouragingly, policy measures such as the Scheme for Enhancement of Competitiveness in the Capital Goods Sector (Phase II) are supporting the indigenization of machine tools and subsystems while also promoting long-term self-reliance.

The short-term demand outlook remains positive with sectors such as Electronics, Renewable Energy, Consumer Goods, Aerospace, and the Automotive industry expected to drive growth. For FY 2025-26, production and consumption of machine tools are projected to increase by around 10 percent.

> *The future strength of the Indian Machine Tool industry will depend on innovation, customization, and solution-focused value creation. With resilience and foresight, the industry can not only weather external headwinds but also anchor India's manufacturing ambitions in the years ahead.*

The future strength of the Indian Machine Tool industry will depend on innovation, customization, and solution-focused value creation. With resilience and foresight, the industry can not only weather external headwinds but also anchor India's manufacturing ambitions in the years ahead.

As always, MMI remains dedicated to documenting these shifts — delivering insights, viewpoints, and stories that illustrate the industry's evolving journey.

I wish the readers an engaging and insightful read of this issue of MMI.

JIBAK DASGUPTA
DIRECTOR GENERAL & CEO
INDIAN MACHINE TOOL MANUFACTURERS' ASSOCIATION
BANGALORE INTERNATIONAL EXHIBITION CENTRE

Dear Readers,

India's aerospace sector is rapidly evolving, positioning itself as a key global player. This transformation is driven by technological advancements, private sector participation, and supportive policies that foster growth.

The industry is defined by ultra-precision machining, advanced materials, and stringent quality standards. From turbine blades and landing gear to satellite components, the field requires advanced machining capabilities, reliability, and comprehensive quality assurances.

The Indian machine tool industry is well-placed to seize these opportunities, supplying precision, reliable, and innovative machines crucial for the aerospace sector. For the machine tool industry, the focus isn't just on manufacturing machines, but providing complete solutions for flight, space, cyberspace, defence, and other related domains.

The Indian machine tool industry is well-placed to seize these opportunities, supplying precision, reliable, and innovative machines crucial for the aerospace sector. For the machine tool industry, the focus isn't just on manufacturing machines, but providing complete solutions for flight, space, cyberspace, defence, and other related domains.

The industry can achieve further momentum by strengthening its collaborations with leading research institutions, defence establishments, and private aerospace companies. Strategic partnerships, both domestic and international, will help embed best practices and foster innovation, thereby developing advanced products. Such collaborations will build trust, ensure quality, and support India's ambitions in the aerospace sector.

This edition of Modern Manufacturing India (MMI) demonstrates how the industry can prepare itself to meet the changing needs of aerospace manufacturers.

Readers are encouraged to share their views on how to best expand this dialogue and reinforce the role of machine tools in the aerospace manufacturing industry.

Wishing you all an engaging and insightful read.

SOUMI MITRA
Editor-in-Chief
Modern Manufacturing India
soumi.mitra@magicwandmedia.in

EMO HANNOVER CELEBRATES THE SPIRIT OF INNOVATION

My journey in trade journalism began at EMO Hannover almost fifteen years ago. Returning now, as the show celebrates its 50th anniversary, feels both nostalgic and inspiring. This trade fair has always been more than an exhibition. It is a living testament to how production technologies evolve, adapt, and push new frontiers. Over the years, I have seen it grow in scale and diversity, welcoming voices from across the globe, especially from emerging markets.

For India, the timing could not be more fitting. With a real GDP growth of 6.5 percent, the country's economic momentum is undeniable. It fills me with pride to see over 40 Indian companies at EMO Hannover 2025, each carrying forward a story of innovation, resilience, and ambition.

Setting the tone, Indian Machine Tool Manufacturers' Association will mark the opening day with a press conference that highlights the sector's key growth drivers. Equally significant is the India Opportunities Session, hosted in collaboration with German Machine Tool Builders' Association (VDW) and German Engineering Federation (VDMA) on the third day of the show which is an occasion to celebrate India's manufacturing journey on the world stage.

> *"The 50th edition of EMO Hannover is more than a milestone. It is a celebration of global manufacturing excellence, made even more special by India's growing presence on this world stage."*

EMO Hannover has always been a spectacular celebration of innovation, made possible by VDW's masterful organization, the ingenuity of exhibitors, and the enthusiasm of visitors who give the show its heartbeat.

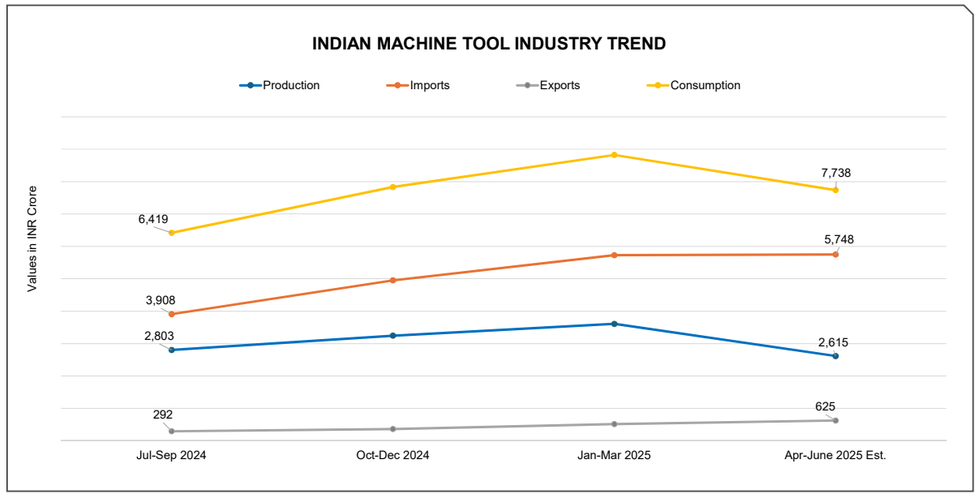
At MMI, we feel privileged to walk this journey as storytellers, sharing the spirit, energy, and excellence that make EMO a defining global stage.

Wishing every participant resounding success, meaningful collaborations, and unforgettable moments at EMO Hannover 2025. See you there!

POWERED BY
Indian Machine Tool Manufacturers' Association

ROBUST ECONOMY, RISING DEMAND

With strong manufacturing and services momentum, low inflation, and heavy government investment, the Indian economy is showing resilience. For the machine tool industry, this leads to double-digit growth, booming exports, and rising domestic demand.



Source: IMTMA

Indian Machine Tool Industry Trend

Source: Data & Policy Team, IMTMA

The economic performance indicators for July 2025 reflect a mixed trend. The manufacturing PMI rose to 59.1, a 16-month high, while the services PMI climbed to 60.5, its highest in 11 months. Additionally, the Index of Industrial Production (IIP) growth moderated to 2.0 percent in Q1 FY26 from 4.0 percent in Q4 FY25.

Consumer Price Index (CPI) inflation moderated for the ninth consecutive month, declining from 2.1 percent in June to 1.6 percent in July, the lowest since June 2017. Wholesale Price Index (WPI) inflation also remained in negative territory for the second month in a row. It contracted by -0.6 percent in July 2025, widening from -0.1 percent in June 2025, largely due to continued declines in food prices supported by favorable base effects.

Fiscal and Policy Developments

GoI's gross tax revenue rose 4.6 percent in Q1 FY26, with direct taxes contracting by -0.8 percent and indirect taxes growing by 11.5 percent. Expenditure surged 26 percent, led by a 52 percent jump in capital outlay and 20 percent growth in revenue spending. The fiscal deficit reached 17.9 percent of the annual BE, while the revenue deficit stood at 6.4 percent.

Financial Sector Updates

In the Financial sector, bank credit growth improved to 10.4 percent in June 2025 (from 9.9% in May). On the external front, net FDI inflows were negligible at US$ 0.04 B, while net FPI inflows were stronger at US$ 1.55 B. The RBI retained the repo rate at 5.5 percent in its monetary policy review held on August 6, 2025.

Trade Dynamics

India's merchandise trade revived in July 2025 with exports up 7.3 percent (driven by non-oil goods) and imports rising 8.6 percent (led by crude oil), after declines in June. Global crude prices touched a four-month high of US$ 69.2/bbl, adding pressure on the import bill.

The IMF (July 2025) projected global growth at 3.0 percent for 2025 and retained India's FY26 growth forecast at 6.4 percent, supported by resilient domestic demand and investments. As per the estimates from the Ministry of Statistics & Programme Implementation, India's Real GDP has been estimated to grow by 7.8 percent in Q1 of FY 2025-26, compared with 6.5 percent in Q1 FY25.

Source: Magic Wand Media

Machine Tool Industry Performance

According to the latest World Machine Tool Survey by Gardner Intelligence, India ranked 4th in consumption and 9th globally in production in 2024. The production of the Indian Machine Tool industry in Q1 FY26 is estimated to have increased by approximately 11 percent year-on-year, reaching around ₹2,615 crore (US$ 306 M). The industry's imports in Q1 FY26 saw a rise of 40 percent year-on-year, amounting to ₹5,748 crore (US$ 672 M). Machine tool exports during Q1 FY26 from India reported a growth of 108 percent, amounting to ₹625 crore (US$ 73 M) and consumption is estimated to have increased by about 26 percent to reach ₹7,738 crore (US$ 904 M).

The IMF (July 2025) projected global growth at 3.0% for 2025 and retained India's FY26 growth forecast at 6.4%, supported by resilient domestic demand and investments.

Source: Magic Wand Media

INDIA'S AEROSPACE LEAP FUELS MACHINE TOOL GROWTH

India's aerospace industry's rapid progress is creating a wide array of opportunities for allied industries—most notably, the machine tool sector, which is set to play a key role in powering India's aerospace and defence growth.

The Indian aerospace sector is on a promising trajectory, marked by ambition and progress. Advances in indigenous fighter jet production, next-generation drone systems, and a historic human spaceflight reflect India's technological strength and growing strategic independence. Backed by the Government and major public as well as private enterprises, the sector's momentum spans both civil and defence domains. This momentum is evident in the MRO (maintenance, repair, and overhaul) segment, which is expected to grow from US$ 800 million in 2018 to over US$ 2.4 billion by 2028, according to the Government of India.

Source: IMTMA

Defence Production at Record Levels

Over the next 15 years, India's domestic aerospace manufacturing market is expected to grow into a US$ 10 billion industry, including structural components, avionics systems, and related products, according to the Ministry of Civil Aviation. India's growing self-reliance and global competitiveness in aerospace were evident earlier this year, highlighting its rising strategic stature. Defence production has also expanded rapidly over the past decade, reaching ₹1.27 lakh crore in FY 2023–24, while defence exports hit an all-time high of ₹23,622 crore in FY 2024–25, as per Ministry of Defence estimates. The country now aims to achieve ₹3 lakh crore in production and ₹50,000 crore in exports by 2029.

As India's aerospace and defence ambitions reach new heights, it is an opportune time for the Indian machine tool industry to make its next moves.

The Machine Tool Sector: Rising to the Challenge

The Indian machine tool industry has maintained its upward trajectory, production in FY 2024-25 has increased by 7 percent to approximately US$ 1.7 billion, while consumption has grown by 17 percent to around US$ 3.7 billion, signalling a positive outlook. Currently ranked 9th in machine tool production and 4th in consumption for 2024, according to Gardner Intelligence's World Machine Tool Survey 2025, the Indian machine tool industry is forecast to expand by about 10-11 percent and increase its domestic market share, gradually reducing its reliance on imports.

Unlocking the Aerospace Opportunity

According to an internal study by the Indian Machine Tool Manufacturers' Association (IMTMA), the Indian machine tool industry caters to only 4 percent of the requirements for the Aerospace and Defence sector, which has a market size of US$ 28.7 billion. The sector is projected to grow at a CAGR of 7.1 percent from 2024 to 2031, compared to the current growth rate of 0.14 percent, reaching a market value of US$ 46 billion. A surge in demand for high-precision components such as turbine blades, engine parts, and airframe structures is expected, leading to increased demand for CNC machining, robotics, and advanced materials processing.

Every breakthrough in the Aerospace sector, from large-scale deployment of fighter jets to human spaceflight programmes, UAV proliferation to rocket launches, fuels significant demand for precision machine tools. The Government has introduced numerous reform measures to support drone manufacturing and operations. As the government, private sector, and startups collaborate in this field, India is well-placed to become the world's drone hub. Domestic machine tool manufacturers have a clear pathway to innovate, expand, and meet strict tolerance standards for airframes, satellite components, engines, and UAV assemblies, thereby enhancing India's strategic autonomy in the sector.

Machines that Power AatmaNirbhar Bharat

As the skies open wider with space missions, aircraft, and rocket launches, the Machine Tool industry is expected to stand as the enabling force powering this ascent. By meeting precise aerospace standards, Indian machine tool manufacturers can secure their position at the center of India's self-reliance journey, ensuring that the dream of AatmaNirbhar Bharat takes flight on machines that are made in India.

MTX Connect Jamshedpur 2025

Indian Machine Tool Manufacturers' Association (IMTMA), in partnership with the Confederation of Indian Industry (CII), is organizing the third edition of MTX Connect, a distinctive two-day business-to-business (B2B) event themed 'Where Technology Meets Opportunity in Eastern India' on November 3–4, 2025 in Jamshedpur, Jharkhand.

Jamshedpur, also known as the 'Steel City of India', is a key manufacturing center in eastern India with a significant presence of steel and related industries. It is strategically situated with plenty of natural resources and a strong infrastructure. Jamshedpur also hosts a healthy number of automobile manufacturers and power-generating companies, along with numerous small and medium-sized enterprises that support larger industries.

"MTX Connect Jamshedpur will have machine tools, digital manufacturing, laser technologies, tooling, and metrology as its focus. Visitors from Aerospace and Defence, Auto and Auto Components, Construction Equipment, Engineering Goods, Textile Machinery, Renewable Energy, Agriculture, and other sectors will attend the expo," shares Jibak Dasgupta, Director General & CEO, IMTMA.

"At a time when India's economic growth remains steady amidst a volatile global environment, an initiative such as this will help to boost the Indian machine tool industry's ambition to fuel India's manufacturing growth domestically" Dasgupta adds.

Over the next 15 years, India's domestic aerospace manufacturing market is expected to grow into a US$ 10 billion industry, including structural components, avionics systems, and related products, according to the Ministry of Civil Aviation.

RETHINKING ENGINEERING IN THE AGE OF MUSK

Henry Ford revolutionized the automobile industry by implementing conveyor belts and the assembly line, while Toyota implemented operational streamlining to remove inefficiencies. Today in the neural network era, Elon Musk has transformed the factory by redefining manufacturing processes rather than making products.

Source: Magic Wand Media

Elon Musk once famously said, "The factory is the product, the car is the output." What he meant by this was that his core mission is to make his companies the best at creating and managing manufacturing processes and facilities, rather than solely focusing on building electric cars, rockets, etc. This philosophy aligns with Musk's strategy of vertical integration, controlling most aspects of the manufacturing process.

Musk's companies view manufacturing operations as a fundamental strategic capability instead of treating them as a basic cost management function. The factories at Tesla and SpaceX use advanced software systems with real-time monitoring and data optimization to build flexible production systems that continuously improve.

The companies practice vertical integration through their development of proprietary manufacturing technologies which enable fast process development and improvement. The production lines operate with flexible design features which allow process and product changes through performance data analysis and engineering feedback.

The facilities operate as testing sites through which manufacturing processes receive continuous improvement alongside product development.

Vertical Integration

The return of vertical integration at Musk-owned companies appears to be a step backward to supply chain and BOM logic-trained engineers. But in reality, this action represents a revolutionary step toward simplicity. At Tesla's Giga factory in Texas, Tesla produces 4,680 battery cells and vehicle assemblies under one roof. SpaceX is widely reported to be 85 percent vertically integrated, building most rocket hardware in-house.

This is not merely about control. It's about intimacy. The feedback loop between production tools and their components becomes immediate when these tools belong to one's system, allowing endless possibilities for improvement. Through engineering advancements, SpaceX has decreased the cost of satellite launches exponentially.

Tesla delivered 1.79 million vehicles and generated US$ 97.69 billion in revenue in 2024. The term Gigafactory evolved from its original grandiose meaning into a new concept.

Not Just Automation, but Cognition

The late 20th century gave us automation. Intelligent automation appears to be the direction of the 21st century instead of traditional automation. Quality control exists as an integral part of production activities rather than being located at the production endpoint. Machines function autonomously by both receiving instructions and actively listening before they respond to enhance their performance.

One of Tesla's critical pivots was to build, rather than buy, much of its automation technology. The company acquired several specialized automation and tooling firms, including German engineering company Grohmann Engineering GmbH that became its in-house Tesla Automation division. This vertical integration meant the company could rapidly design, prototype, and deploy custom manufacturing equipment tuned specifically for its vehicles and battery systems.

This strategy reduced dependency on external suppliers, shortened development cycles, and ensured that proprietary manufacturing processes remained closely guarded competitive assets.

The engineering field worldwide recognizes system cognition as a basic requirement because it has transitioned from an experimental concept to an essential industrial need. One estimate puts the Industrial Automation market at US$ 233.8 billion (2024), reaching US$ 569 billion by 2034. Intelligence outpaces capital growth as the fundamental resource which drives modern business operations. The intelligence needs to be integrated throughout both machine systems and the manufacturing systems that create them.

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

"If Things Aren't Failing, You Are Not Innovating Enough"

Musk is also known for saying, "If things aren't failing, you're not innovating enough." Fear of failure is part of the problem; it discourages executives from taking risks and being innovative. Business cultures have understandably become first and foremost about being safe and steady. The irony of course is that it is risk that often creates a stronger business through creativity, innovation, and revenue generation in new ways.

SpaceX has transformed the industry's approach to testing and iteration. Rather than following the traditional aerospace model of extensive ground testing before flight, the company embraces a rapid prototyping philosophy where it builds, tests, fails fast, and iterates quickly. This is exemplified in its Starship development program, where it rapidly constructs full-scale prototypes and test them to destruction to gather real-world data.

Its manufacturing facilities are designed for flexibility, allowing the company to implement design changes quickly across its production lines. This approach has enabled SpaceX to achieve manufacturing rates that were previously unthinkable in aerospace, producing Falcon 9 rockets at a pace of roughly one every two weeks while maintaining the reliability standards necessary for human spaceflight.

Musk advocates for technical experts to lead factories and criticises the over-reliance on business graduates who, he believes, focus on financial optimization and taking safe decisions rather than focus on innovation and improving production processes.

Musk's declaration that "The factory is the product, the car is the output", marks the end of engineering traditions that have persisted for centuries. The object is no longer king. The system that creates the object is.

Key Areas of Modern Industrial Development

Designing for Adaptability and Iteration

Instead of aiming for flawless first designs, engineering methods should focus on creating systems that can adapt and evolve. Engineers must create modular systems which adapt to changing needs, but these systems need thorough planning.

Software Integration as Core Infrastructure

The current Manufacturing industry depends on software systems to manage its operations. Digital twins (virtual models of physical systems), Manufacturing Execution Systems (MES) with cloud connectivity, and predictive analytics have become essential components rather than optional add-ons. Software now performs at the same level as mechanical components in determining production capabilities.

Collaborative Partnerships and Specialization

The advanced nature of modern industrial systems goes beyond the capabilities of single companies to develop independently. The successful implementation of projects needs partnerships between experts who specialize in artificial intelligence, robotics, sensor technology, and systems integration. The importance of cross-disciplinary collaboration has increased because manufacturing systems now use a wide variety of technologies.

The Factory is the Product

SpaceX has revolutionized aerospace manufacturing through several groundbreaking approaches that have dramatically reduced costs and production timelines. One of its most significant innovations is vertical integration, where it manufactures approximately 85 percent of its components in-house rather than relying on traditional aerospace suppliers. This allows it to maintain tight quality control, reduce costs, and accelerate development cycles. SpaceX's Hawthorne facility operates more like a high-tech automotive assembly line than a traditional aerospace manufacturer, with components moving efficiently through streamlined production processes.

The company has pioneered advanced manufacturing techniques including extensive use of friction stir welding for creating seamless fuel tanks, 3D printing for complex engine components like injectors and turbopumps, and automated fiber placement for carbon composite structures. Its Raptor engines utilize innovative manufacturing methods such as hot isostatic pressing and single-crystal superalloy casting techniques that were previously reserved for military applications. SpaceX also developed proprietary alloys and manufacturing processes specifically optimized for its engines, allowing itself to achieve higher performance while reducing production complexity.

Musk's declaration that "The factory is the product, the car is the output", marks the end of engineering traditions that have persisted for centuries. The object is no longer king. The system that creates the object is.

Reji Varghese is the President of RV Forms and Gears, one of India's oldest fixture building companies. He is also a guest writer for a number of national newspapers and magazines.

ENGINEERING CHANGE IN A CONNECTED WORLD

For half a century, EMO has mirrored the great transformations in engineering, from the arrival of computer control to the rise of artificial intelligence. Technology journalist and contemporary witness Nikolaus Fecht has followed this journey closely. Here's looking back at five decades of innovation and reflecting on how EMO has shaped—and been shaped by—the changing world of manufacturing.

Source: Deutsche Messe AG

German EMO premiere: In 1977 — two years after Paris — the machine tool industry showcases itself for the first time on a global scale in Hannover.

Compiled by
POONAM PEDNEKAR
Chief Copy Editor
Magic Wand Media Inc
poonam.pednekar@
magicwandmedia.in

In June 1975, almost all of Paris was dreaming of love – à l'électronique. As the new, electronically controlled RER high-speed train began its journey, the Centre Pompidou, with color-coded pipes and electronic building technology, was being built in the middle of the city. At the same time, the international machine tool industry celebrated the premiere of the 'Exposition Mondiale de la Machine-Outil'—EMO for short—at the Parc des Expositions de la Porte de Versailles. The common denominator of the three events was that they heralded the global dawn of a new era in which electronics were gradually taking over.

Farewell, EWA – that was the word in Paris in 1975 and two years later in Hannover. EMO was the successor to the 'European Machine Tool Exhibition', which had been held alternately in Belgium, Italy, France, and Germany since 1951. The con-

Source: Fecht Press Agency

Since EXPO 2000, trade visitors have been entering the Hannover Exhibition Center at Entrance North 1 through the striking wooden roof.

tinental industry show would become an international event, to which the European machine tool association Cecimo invited visitors alternately to Milan, Paris, and Hannover.

Numerical Control: Cam Disk and Camshaft Become Passé

For the first time, the European Machine Tool industry was showcasing itself at a trade fair with international appeal. One innovation from the USA in particular caused a stir in the mid-1970s: numerical control (NC) cam disks, camshafts, and mechanical copying devices were replaced by programmable control systems that allowed motion sequences to be flexibly defined via software for the first time. But this was just the beginning, observed a German trade journal at the time: "The first machine tool world congress concludes with a discussion on the future development of machine tool control in conjunction with the use of computers." But it wasn't that far yet; punched tape still dominated the scene—the classic storage medium for numerically controlled machines.

Fecht learned about the next step towards CNC–'Computerized Numerical Control'–as a working student in the mid-1970s in Thyssen's large training workshop in Kassel. However, the handling of this technology needed to be learned first: "Hands off, this is not for beginners!" a master craftsman told the budding electrical engineer as he curiously inspected his first CNC machine: A CNC machine tool over three meters high – equipped with an early Siemens control system. The student looked at a magnetic tape input system that glowed amber.

Japan's Leap: CNC Adoption Accelerates

No wonder Fecht was fascinated by the newcomer – after all, CNC was still a technical exception in the mid-1970s. According to the National Bureau of Economic Research, Cambridge (USA), less than five percent of machines in the United States were CNC-controlled, and only around two percent in the Federal Republic of Germany. Only Japan was much further ahead: In 1975, one in four lathes exported already had a CNC system — and the trend was rising sharply.

The production experts looked with enthusiasm at computer solutions from the Far East or the USA, but for a long time they were skeptical: Fecht was one of them. During his first visit to EMO in Milan in 1987, as a trade editor Fecht got to know high-tech from the Far East: Mitsubishi presented a CNC system that supposedly worked five times faster than conventional 16-bit systems and even optimized machining automatically thanks to artificial intelligence. For him as an engineer journalist, a new era was beginning, which Fecht referred to in the trade press as 'CIMsalabim' — a tongue-in-cheek allusion to 'Computer Integrated Manufacturing' (CIM), where robots, machine tools, assembly lines, measuring stations, and computers merged to form a computer-integrated factory.

In 2019, VDW celebrated the premiere of umati—the global initiative for open communication interfaces for the mechanical engineering industry.

Source: Fecht Press Agency

Circa 1999: Dry machining with HSC: High-speed machining entirely without cooling lubricant — what started out as an experiment at the beginning of the 21st century has become a symbol of resource-saving manufacturing.

EMO was the successor to EWA, which had been held alternately in Belgium, Italy, France, and Germany since 1951.

The digital trend was soon followed by green issues—initially ridiculed, then promoted, and finally demanded. High-speed machining (HSC) played a key role. The process enabled extremely fast machining with high surface quality—and with very little or no cooling lubricants. At EMO Hanover 2001, Getrag Ford Transmission GmbH demonstrated how HSC and minimum quantity lubrication could be combined to conserve resources. During an on-site report for the EMO press service, Fecht learned: "One glass of Kölsch beer is enough to process 90 gearbox housings"—previously it was 220 liters of emulsion. The VDW (German Machine Tool Builders' Association) also recognized the potential early on. HSC became a promoted key technology, flanked by eco projects and the Blue Competence initiative. At EMO 2011 at the latest, it became clear that energy efficiency is no longer a sideshow.

Industry 4.0: From Label to Evolution

A few years later, a new guiding principle provided further impetus: Industry 4.0 stood for the idea of networking production systems using powerful computers, sensors, and interfaces in such a way that they could be controlled and analyzed in real time, even by cell phone. "A smartphone for production," a developer said in a tongue-in-cheek manner at EMO Hanover in 2017.

However, the first step was to link systems intelligently with one another. Under the guiding theme of 'Connecting systems for intelligent production,' EMO sent out a clear signal for digital networking in production technology. In 2019, umati (universal machine technology interface)—the global initiative for open communication interfaces for the mechanical engineering industry and its customers based on OPC UA information models and initiated by the VDW—celebrated its premiere. Since then, umati has continued to develop: Today, under the umbrella of VDW and VDMA (German Engineering Federation), the international community guarantees standardized information models for numerous applications, offers a platform for exchanging experiences, creates visibility on the market, and enables the practical demonstration of added value. Open interfaces now exist not only for machine tools, but also for components, software solutions, and many other manufacturing technologies—a decisive contribution to the smooth cooperation of a wide variety of systems in networked manufacturing.

The year 2020 became a test: Within a short space of time, virtual communication was established—a replacement for coronavirus-related contact restrictions. Companies switched to remote maintenance, digital customer formats, and flexible logistics. Further adjustments followed in 2022 with the loss of Russian gas supplies ranging from

Source: Heller

Maschinenfabrik Heller has been implementing the EMO 2017 motto "Connecting systems for intelligent production" with its own networked production lines for years.

energy efficiency improvements to the realignment of global supply chains. Industry 4.0 was becoming a living practice. Virtual services such as remote maintenance, remote diagnostics, and online training were replaced onsite deployment in many places. Digital tools supported customer contact, while cloud-based platforms enabled training and support regardless of time and place.

Pandemic Lessons: Digital Service Becomes Standard

Fecht observed during his research that contactless communication worked efficiently: "Digitalization shows its strength especially in combination with online communication." We are talking about troubleshooting, teleservice, and remote diagnostics, the flexibility of which many companies have come to appreciate in times of crisis. The pandemic therefore became a catalyst for digitalization—in service and interaction. This experience still shapes our service structure today. Some people wonder whether physical trade fairs are still necessary after all, virtual communication works surprisingly well these days.

Virtual communication was here to stay—but the next technological leap was already in the pipeline. Shortly after the digitalization push caused by the pandemic, an old acquaintance was back in the spotlight: artificial intelligence. While Asia and America were already investing, Professor Jörg Krüger from the Fraunhofer Institute for Production Systems and Design Technology IPK, Berlin, warned: "Without AI, soon a knockout (KO)"—and advised linking the domain knowledge of workers with neural networks. Data was the 'digital gold dust' of production, from which new business models could emerge. This claim became tangible at EMO 2023: Trumpf presented an AI assistance system for the automatic sorting of sheet metal parts, J.G. Weisser showed predictive maintenance based on learning algorithms. Mapal, Ceratizit, and the Fraunhofer IPT also demonstrated how AI optimizes manufacturing processes, reduces testing times, and makes machines more intelligent. AI was on its way from buzzword to standard—visible at more and more stands at EMO.

And yet EMO 2023 in particular showed that networking does not replace personal exchange but enriches it. Under the claim 'Innovate Manufacturing', the VDW attracted over 90,000 experts from all over the world to Hannover—around half of them from abroad. The trade fair impressively demonstrated that digitalization promoted dialog. In Hannover, Fecht had come full circle, having stood at his first CNC machine 50 years ago as a curious student worker—and now reviewing half a century of EMO experience as a technology reporter. His exciting question: What happens next?

His research shows that EMO 2025 will once again focus on digitalization, automation, and sustainability—complemented by new AI applications. Together with Siemens, DMG MORI will be showcasing an end-to-end digital twin. Sandvik Coromant will launch smart tool holders with real-time monitoring. Supfina will present a new machine concept for surface finishing, and VibroCut will introduce ultrasonic support for machining. At the same time, MAPAL reminds us that classic tool solutions still have their place. Franz-Xaver Bernhard, Chairman, VDW puts it in a nutshell: "The future of production is created where innovation meets experience—and that is precisely the strength of EMO."

Fecht's research shows that EMO 2025 will once again focus on digitalization, automation, and sustainability—complemented by new AI applications.

INDIA'S MANUFACTURING TAKES CENTER STAGE

Source: Magic Wand Media

India's Manufacturing industry is at a defining moment. Backed by strong policy push, booming domestic demand, and rising exports, the country is transitioning from being a cost-driven hub to a value-driven global player. Through the following round-up of industry veterans, a picture emerges depicting a highly positive trajectory—where the Indian manufacturing is not only scaling up its capacity but also earning global recognition for its precision, innovation, and excellence.

POONAM PEDNEKAR
Chief Copy Editor
Magic Wand Media Inc
poonam.pednekar@magicwandmedia.in

NITYASREE KUMARASWAMY
Correspondent
Magic Wand Media
nityasree@magicwandmedia.in

As India moves toward becoming a US$ 5 trillion economy, manufacturing is expected to contribute about US$ 1 trillion—raising its share of GDP from the current 16 percent to nearly 25 percent. This shift is being driven by surging demand in sectors such as Automotive, Aerospace, and MedTech, unlocking vast opportunities for the Machine Tool industry.

Recent economic performance indicators underscore this momentum. In July 2025, the manufacturing PMI rose to 59.1, a 16-month high, while the services PMI climbed to 60.5, its highest in 11 months. Even though industrial output growth moderated slightly (IIP 2.0 percent in Q1 FY26 from 4.0 percent in Q4 FY25), the indicators point to a resilient economy that is fueling both domestic demand and global competitiveness and continuing while creating fresh opportunities for manufacturing expansion.

Expanding Horizons

The backbone of modern manufacturing, the Machine Tool industry, reflects this transformation—recording healthy growth, diversifying beyond Automotive, and increasingly aligning with global supply chains.

"To promote India at EMO Hannover 2025, we are collaborating with VDMA and VDW to host an India Opportunity Session. This will highlight India's growth story, its manufacturing strengths, and the latest technologies, with insights from experts from India, Germany, and beyond."

Jibak Dasgupta
Director General & CEO
IMTMA & BIEC

"Our strength is our people—a diverse mix of demography and a convergence of ideas—which helps us deliver unique solutions to customers, whether in processes, materials, or special-purpose machines."

Ravi Raghavan
Past President, IMTMA
Managing Director
Bharat Fritz Werner Ltd

According to the latest World Machine Tool Survey by Gardner Intelligence, India ranked 4th globally in consumption and 9th in production in 2024. In Q1 FY26 alone, production rose by 11 percent year-on-year to ₹2,615 crore (US$ 306M), imports surged 40 percent to ₹5,748 crore (US$ 672M), exports reported a growth of 108 percent, to ₹625 crore (US$ 73M), and overall consumption grew 26 percent to ₹7,738 crore (US$ 904M).

Amidst these positive developments, the industry is making inroads into a spectrum of industries, including Defence, Railways, Electronics, and Aerospace. Policy measures such as the Scheme for Enhancement of Competitiveness in the Capital Goods Sector (Phase II) are also driving indigenization and long-term self-reliance. Looking ahead, machine tool production and consumption are projected to rise another 10 percent in FY 2025–26, powered by growth in Electronics, Renewable Energy, Aerospace, and

Source: Magic Wand Media

India Opportunities Session, jointly organized by VDMA, VDW, and IMTMA, will be held on September 24, 2025, at Convention Center, Room 13/14, Hannover Fair Grounds from 10.30 am – 12.30 pm, alongside EMO Hannover 2025 Show.

Automotive space. With innovation, customization, and solution-driven value creation, the Indian Machine Tool industry is poised to anchor our country's manufacturing ambitions in the years ahead.

Presentations by distinguished speakers will touch upon 'India's Manufacturing Growth Story', 'Machine Tool Sector Driving India's Manufacturing Growth', and lastly, 'Government Initiatives to Promote Manufacturing'.

Indian Machine Tools in Spotlight

The growing relevance of Indian machine tools can be gauged by the rising number of companies representing the country at EMO Hannover 2025. More than 40 Indian firms—including several first-time exhibitors—are showcasing innovations across turning, milling, grinding, and automation.

Indian companies are driving innovation, delivering world-class quality, and rapidly expanding into international markets. Their strong presence at EMO Hannover underlines India's emergence as a key force in the global machine tool industry, with a clear vision for long-term success. The event empowers them to stand shoulder-to-shoulder with the world's best.

"At the 50th EMO Hannover exhibition, I am glad to present India's unique strengths on India Opportunity Day. The foremost is the skill and availability of technical manpower, cost-competitive manufacturing, and growing domestic demand, which sets India apart from many other nations.**"**

Mohini Kelkar
Vice-President, IMTMA
Director, Grind Master Machines Pvt Ltd

"For us, EMO is not just an exhibition, it's a legacy. We're showcasing solutions across milling, grinding, and turning—built on fundamentals of reliability, productivity, and cost-effectiveness. The exhibition offers us the opportunity to connect with the right partners and strengthen collaborations globally.**"**

TK Ramesh
Managing Director
Ace Designers Ltd

Advantage India

Highlighting reasons that make India an ideal partner for international companies looking to expand their footprint, Ravi Raghavan, Past President, Indian Machine Tool Manufacturers' Association (IMTMA) and Managing Director, Bharat Fritz Werner (BFW) Ltd, notes that the country's growing Manufacturing sector is increasingly aligned with global supply chains.

"Our strength is our people—a diverse mix of demography and a convergence of ideas—which helps us deliver unique solutions to customers, whether in processes, materials, or special-purpose machines," he adds.

Further dissecting why India makes a compelling case for global firms, Mohini Kelkar, Vice-President, IMTMA, points to India's vast skilled manpower, cost competitiveness rooted in technology investments, and strong domestic demand.

She underscores India's strategic geographic location, making it an ideal export hub for Southeast Asia, the Middle East, and Africa. "India is steadily becoming an integral part of the global supply chain. Aerospace manufacturing, which was once concentrated in the West, is now shifting toward India as the country scales up in Precision Engineering. This shift is also visible in Automotive, Pharmaceuticals, and Electronics industries," she observes.

"What truly sets us apart is our startup culture and spirit of innovation, which ensures that India not only scales in manufacturing but sustains it over the long term," she adds.

Source: Magic Wand Media

A Platform for Collaboration

Recognizing this momentum, IMTMA, the German Engineering Federation (VDMA), the German Machine Tool Builders' Association (VDW), are jointly hosting India Opportunities Day at EMO Hannover on September 24, 2025. The platform will showcase India's strengths, facilitate dialogue between Indian manufacturers and their global counterparts, and underline India's rising role in global manufacturing.

Through keynote addresses and panel discussions, the session will highlight avenues for collaboration and how the development of the Manufacturing industry can present opportunities to international businesses in the Indian context.

"India is already the sixth largest export destination for German machine tools," says Rajesh Nath, Managing Director, VDMA India. "In the first quarter of 2025 alone, exports grew 9.2 percent."

Jibak Dasgupta, Director General & CEO, IMTMA & BIEC, identifies India as an emerging manufacturing hub, attracting global machine tool manufacturers to set up operations in the country, supported by an enabling ecosystem from the central and state governments.

Dasgupta further outlines the growth trajectory of the Indian Machine Tool industry, identifying new growth avenues across industries beyond Automotive, such as Defence, Electronics, Aerospace, Railways, and many more, thus broadening the scope of opportunities in manufacturing.

On the German front, Paul Kössl, Head of Business Development, United Machining Solutions, states, "We have always believed in the long-term potential of the Indian market." Having been active in India for more than two decades, he views the upcoming session as a valuable platform to strengthen ties.

"The perception about Indian machine tool manufacturers have changed. The world is now looking at India with more acceptability, as European and international customers are increasingly confident about Indian-made machines.**"**

Renganathan Chellamraja
CEO & Managing Director
Chennai Metco Pvt Ltd

"I see the India Opportunities Day at EMO Hannover 2025 as a valuable platform to strengthen ties. For us, it is not only an occasion to engage with decision-makers but also an opportunity to share insights on market development and collaboration during the panel discussion.**"**

Paul Kössl
Head of Business Development
United Machining Solutions

IMTMA – IMTEX 2027 Press Conference, organized by IMTMA will be held on September 22, 2025 at Convention Center, Room 12, Hannover Fair Grounds from 3.00 pm – 4.00 pm

Kössl emphasizes that Indian manufacturers are increasingly focused not just on cost, but also on productivity, reliability, and sustainability. "Indo-German cooperation can play a decisive role by accelerating access to advanced technologies in automation, Industry 4.0, and green manufacturing," he adds.

Voices from the Indian Machine Tool Industry

Renganathan Chellamraja, CEO & Managing Director, Chennai Metco Pvt Ltd, notes how global buyers now fathom India's competence to deliver reliable, precision-engineered, and cost-effective products. The company has been participating in EMO Hannover for more than two decades and, has witnessed how the show has evolved over the years. "Today, European companies themselves are using Indian machines in their local plants. With cost advantages added, Indian machines are being taken seriously," he notes.

TK Ramesh, Managing Director, Ace Designers Ltd (ADL), emphasizes that India's presence at global shows like EMO reflects steady progress in specifications, technology, and exports. "With global majors setting up bases in India and manufacturing shifting eastward, the ecosystem is getting stronger—combining local innovation with global integration."

Reflecting on the company's four decades of participation in EMO Hannover, Ramesh shares, "For us, EMO is not just an exhibition, it's a legacy. We're showcasing solutions across milling, grinding, and turning—built on fundamentals of reliability, productivity, and cost-effectiveness. The exhibition offers us the opportunity to connect with the right partners and strengthen collaborations globally."

For ADL, India's manufacturing growth story is inseparable from its own journey of scale and innovation. "Today, manufacturing contributes around 16–17 percent to India's GDP, and is expected to touch 25 percent by 2030. Hence, as an industry, we will need to double or even triple our capabilities," explains Muralidhara Rao, Director, Machining Centre Division, ADL. He further added, "We focus on cost optimization, high reliability, and productivity, which will remain our key drivers in Europe. EMO Hannover is an opportunity for us to showcase our strengths and reaffirm our commitment to serving customers in this market."

Source: Magic Wand Media

"We are seeing tremendous growth and demand in the Automotive, Aerospace, and MedTech sectors, which opens up vast opportunities for collaboration between Indian, European, and German companies."

Rajesh Nath
Managing Director
VDMA India

A Moment of Convergence

India Opportunities Day, set to take place concurrently with EMO Hannover 2025, is designed as a convergence point where Indian and German businesses can evaluate real opportunities for collaboration—whether in technology transfer, market expansion, or joint ventures.

For Indian companies, the session offers a global platform to be acknowledged, strengthening the country's credentials as a competitive, future-ready manufacturing hub. For German and other international firms, it poses as an opportunity to partner with a country that is set to become the world's third-largest economy while contributing to global supply chain resilience.

For Indian companies, the Indian Opportunities Session offers a global platform to be acknowledged, strengthening the country's credentials as a competitive, future-ready manufacturing hub.

Source: Magic Wand Media

India's presence on the global machine tool map is stronger than ever. With over 40 Indian companies joining the global stage of EMO Hannover 2025, it mirrors the country's transformation in the manufacturing and machine tool industry. For many maiden exhibitors, the participation is a validation that Indian engineering has leveled up from being cost-driven to value-driven.

SOVAN TUDU
Assistant Editor
Magic Wand Media
sovan.tudu@
magicwandmedia.in

The machine tool industry of India is no longer just the backbone of domestic manufacturing—it is emerging as a formidable force in global production. The increasing representation of Indian companies at EMO Hannover does not just reflect the sector's significant growth but also the competence required to be on a global platform.

Commenting on this positive developement, Geeta Bisht, CEO, Hannover Milano Fairs India Pvt Ltd, says, "Today, Indian companies focus on innovation, high quality, and expanding their presence in international markets."

This strong presence also shows that Indian manufacturers are confident and ready to compete with the best in the world. "EMO Hannover gives them the chance to learn from global leaders, build new business relationships, and show what they can offer in advanced technologies," she adds. "It is a sign that India is becoming an important player in the global Machine Tool industry and is aiming for long-term success on the global stage."

All eyes turn to EMO Hannover 2025—the world's leading trade fair for production technology, which marks its 50th anniversary this year. With the theme, 'Innovate Manufacturing', EMO will host around 1,400 international exhibitors, spotlighting how digital technologies and AI are transforming production technology and driving Industry 4.0 forward.

Joining the Big League

Explaining the reasons behind the impressive rise in Indian participation at EMO Hannover, Bisht says, "India's Manufacturing sector is undergoing a significant transformation, driven by increased automation, growing global demand, and government initiatives such as 'Make in India'."

As one of the world's leading metalworking shows, the event attracts Indian companies looking to expand internationally. "In addition to the exhibitors, many visitors from India attend the show, and now these visitors are becoming our new exhibitors. Our team began promotional activities early, provided personalized support, and collaborated closely with industry partners," she continues. This helped us to build strong connections with new companies and explain the benefits of participating at EMO."

> *Indian companies focus on innovation, high quality, and expanding their presence in international markets. EMO Hannover gives them the chance to learn, build relationships, and show advanced technologies.*
>
> **Geeta Bisht**
> CEO
> Hannover Milano Fairs India Pvt Ltd (HMFI)

Building India's Stronger Presence

Bisht adds, "We focused on a targeted approach to reach out to potential exhibitors, which included using our industry contacts, having one-on-one discussions, and organizing roadshows and press conferences to explain the importance of EMO." She shares that Indian exhibitors showed great enthusiasm and curiosity. They also had a clear understanding of how to maximize their investment.

LMW Ltd | Hall & Stand: 15/B-50

At LMW, our vision has always been to deliver world-class manufacturing solutions that combine precision, reliability, and innovation. Our decision to participate in EMO 2025 stems from our strong readiness to take our technology and customer-centric approach beyond domestic boundaries.

"EMO Hannover 2025 is the perfect stage for us to highlight our commitment to innovation and customer-centric solutions," says Mr. Soundhar Rajhan, Chief Strategy Officer, LMW Ltd. "We're particularly excited to demonstrate the LR30MYL17, J1, and our flexible automation solution, which exemplify our dedication to precision, productivity, and adaptability. Our customers can always count on us for our broad availability of models and our flexibility in customizing solutions to their unique requirements." Visitors to the LMW booth will experience LMW's value-centric machines designed to boost productivity. Our IoT-ready machines, coupled with a strong application team, ensure tailored solutions that meet the evolving demands of modern manufacturing. LMW's participation at EMO Hannover 2025 reinforces its strong global manufacturing footprint, supported by 8 advanced facilities in India, and additional plants in China and the UAE.

EMO Hannover 2025 is the perfect stage to highlight our commitment to innovation and customer-centric solutions. Our LR30MYL17, J1, and flexible automation solution exemplify our dedication to precision, productivity, and adaptability. Our customers can count on us for the availability of standard and customized solutions to meet their unique requirements.

Soundhar Rajhan K
Chief Strategy Officer
LMW Ltd

The company's steadfast dedication to accuracy, repeatability, reliability, reduced cycle time, and lower cost per component continues to drive its mission of empowering customers with advanced manufacturing capabilities.

LMW fosters a culture of continuous innovation, quality excellence, and customer-centricity. This commitment extends beyond product development to investing in advanced manufacturing facilities, nurturing a highly skilled workforce, and building robust global partnerships. LMW's vision is deeply integrated with the growth of the manufacturing sector. As a group, we believe in contributing to the industry's advancement by providing cutting-edge solutions that enhance productivity and efficiency across various sectors. Our diversified ventures into CNC Machine Tools, Precision Castings (LMW Foundry), and components for the Aerospace Industry (Advanced Technology Centre) are testaments to this holistic approach. By continually evolving and adapting to market needs, LMW not only strengthens its own position but also reinforces the entire manufacturing ecosystem through technological leadership and reliable solutions. This philosophy ensures LMW remains a trusted partner in industrial progress worldwide.

LR30MYL17: A versatile Turn-Mill Center designed for complex parts manufacturing.

J1: A Precision Vertical Machining Center known for its exceptional accuracy.

A Compact Turnmill Center with Flexible Automation.

Ahire Machine Tools Pvt Ltd | Hall & Stand: 5/B-60

We have been manufacturing high-precision workholding products, including machine vises, clamping columns, and customized productivity improvement solutions for machining centers. Though we have been manufacturing and supplying to German companies for the past 20-odd years, we are participating at EMO for the first time.

We are excited since it's the world's biggest stage for manufacturing technology. It's where innovation, automation, and global networking come together. At EMO Hannover 2025, we aim to showcase our engineering excellence, build strong international partnerships, embrace the latest industry trends, and strengthen our position as a trusted supplier for workholding products and solutions—marking the beginning of our global journey.

We are positioning our products by highlighting what global manufacturers value most—precision, reliability, and productivity. Our primary goal is to connect with organizations seeking a reliable, long-term partner for high-precision workholding solutions and other cost-effective manufacturing and sourcing support.

We aim to showcase our engineering excellence, build strong international partnerships, embrace the latest industry trends, and strengthen our position as a trusted supplier—marking the beginning of our global journey.

Chetan Sawant
Director
Ahire Machine Tools Pvt Ltd
(AMT Group)

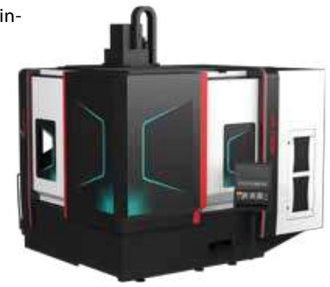
As a first-time exhibitor at EMO Hannover, the biggest learning has been the importance of planning every detail early—right from booth design to product selection and marketing. The scale of the event demands a global mindset, so we have focused on ensuring our products speak to an international audience and preparing our team for high-quality interactions. The main challenge has been balancing day-to-day operations with the intensive preparation required for a show of this magnitude. But the process has pushed us to think bigger, sharpen our presentation, and be ready to showcase AMT at its absolute best.

Participating in EMO Hannover will be a game-changer for our brand. It will put AMT on the global map, giving us visibility among decision-makers and industry leaders from around the world. The event is the perfect platform to start meaningful conversations with potential partners who value precision, reliability, and innovation.

Macpower CNC Machines Ltd | Hall & Stand: 16/F-19

Macpower CNC Machines and its products have gained significant traction in the Indian market. EMO Hannover 2025 is a global platform which enables us to reach out to global customers. While the show gives us a platform to expand our business overseas, it also allows us to reach out to some of the technologically advanced machine tool builders of the world to collaborate by offering cost-effective manufacturing, enhancing our technology, and also jointly developing machine tools that can be offered to the sunrise industry segment in India or elsewhere.

We are displaying some of our top-line products including high-speed VMCs for the Die & Mold sector, 5-axis VMCs for the Die & Mold and General Engineering sectors, and turn mill centers for the Aerospace and General Engineering sectors.



The stage is big, and the audiences are global. We are having an open mind to learn from others and share what we're all giving—a perfect mix to let the world know what we are and what we can do for the industry.

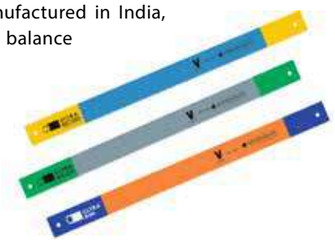
Rupesh Mehta
Managing Director
Macpower CNC Machines Ltd

Ultra Tools India Pvt Ltd | Hall & Stand: 17/D-26

ULTRA has overhauled its range of Bandsaw Blades to cover all applications. We will be launching this updated product range in EMO 2025, which is the perfect platform to introduce our new designs. We hope to be able to find distributors in major European countries and also around the world.

Our company regularly participates in global exhibitions, including in Germany. This is the first time ULTRA India is participating in EMO for the relaunch of ULTRA Bandsaw Blades.

ULTRA, originally manufactured in France, was a well-known brand in the past, but there has been a discontinuity due to some historic reasons. Through this participation at EMO, we plan to rebuild the brand and get back into the European market. Our technology and designs are all engineered in France, and with the product being manufactured in India, we achieve the best balance between quality and price. We are confident that the show will both enhance our brand and bring us long-term partnerships with reputable customers.



We will be launching ULTRA Bandsaw Blades' updated product range at EMO, the perfect platform to introduce our new designs. We hope to find distributors globally, rebuild the brand in Europe, and establish long-term partnerships with reputable customers.

Ravi N Gupta
President
Ultra Tools India Pvt Ltd

S&T Machinery Pvt Ltd (STM) | Hall & Stand: 15/C-46

EMO Hannover has always been the heartbeat of global manufacturing innovation, and for us, it is more than an exhibition—it is a world stage. Our inspiration comes from the desire to place an Indian-built machine in the league of global excellence, marking a milestone in our journey of world-class manufacturing.

With a portfolio of next-generation machining solutions, we aspire to showcase our strengths in precision, reliability, and smart manufacturing. Our STM machines deliver true value for money—engineered to European standards, offered at an affordable Indian price.

EMO gives us the perfect arena to connect with global decision-makers and innovators while opening doors to the European and international markets. Our debut is not just a participation, but a statement of our readiness, ambition, and commitment to shaping the future of manufacturing on a global scale.

STM is positioning its products and solutions at EMO Hannover with a clear focus on global competitiveness, reliability, and innovation. Our machines are designed to meet the demanding needs of international manufacturers. By integrating advanced automation, smart controls, and energy-efficient designs, we aim to present ourselves as a future-ready partner for modern manufacturing with our STM Technology crafted in Taiwan and the machines being 'Made in India'.

We are not just showcasing machines, but complete solutions that help manufacturers optimize cycle times, reduce costs, and achieve world-class quality. With our diverse product portfolio, spanning VMCs, HMCs, double-column machining centers, surface and cylindrical grinding machines, drill tap centers, VTLs, and more, STM is demonstrating the capability to serve multiple industry verticals under one roof. At EMO, our positioning is built around trust, performance, and value creation.

As a first-time exhibitor at EMO, our biggest learning has been the scale and intensity of preparation required for a truly global platform. From aligning our product portfolio to international expectations to fine-tuning our message for a diverse audience, the process has been both challenging and rewarding. Coordinating global logistics, meeting stringent display standards, and preparing our team to engage with visitors from across continents have pushed us to raise our own benchmarks.

EMO gives us the perfect arena to connect with global decision-makers and innovators while opening doors to international markets. Our debut is a statement of our readiness, ambition, and commitment to shaping the future of manufacturing.

D Shanmugasundaram
Managing Director
S&T Machinery Pvt Ltd (STM)

STRENGTHENING INDIA'S DEFENCE ECOSYSTEM

Subbu Venkatachalam, Head of Defence & Aerospace at Carborundum Universal Ltd (CUMI), shares insights on India's journey in defence production, the impact of policy initiatives, and the opportunities emerging under Mission Sudarshan Chakra. He discusses CUMI's role in indigenizing advanced materials, their applications in aerospace and naval systems, and the challenges of scaling adoption.

SOUMI MITRA
Editor-in-Chief
Modern Manufacturing India
soumi.mitra@magicwandmedia.in

India has crossed the INR 1.5 lakh crore mark in defence production. From your perspective, what key drivers have enabled this momentum, and how do you see the path towards the INR 3 lakh crore target?

The realization that much can be done within India, by India, for India and the world has helped the growth of the 'Make in India' initiative in defence production. Key drivers of this momentum include policy initiatives favoring domestic production and emergency procurement schemes led by the Positive Indigenization Lists and import embargos; indigenization of frontier technologies through Transfer of Technology (ToT); schemes to accelerate MSME growth and participation; startup-friendly initiatives such as iDEX and DRDO's Technology Development Fund; and accelerated R&D in strategic areas through collaborative partnerships between the private sector, government entities, and research institutions.

The journey towards achieving the INR 3 lakh crore target promises to be highly productive in terms of capabilities and resources building across defence and aerospace. As we develop new tech and products at par with global standards, the domestic and export markets will grow.

Source: CUMI

Subbu Venkatachalam, Head of Defence & Aerospace, Carborundum Universal Ltd (CUMI)

How do you see Mission Sudarshan Chakra reshaping India's defence production landscape, particularly in terms of demand for indigenous materials and advanced manufacturing technologies?

Developing India's very own multi-layer national security shield for all-round protection of key attack targets — both military and civilian establishments — broadens the scope of work and offerings from domestic manufacturers. As an example, the focus on developing cutting-edge indigenous aerial protection systems will result in a greater requirement for high-performance products such as heat-, corrosion-, and wear-resistant coatings for next-gen aerospace platforms. Thermal spray powders, which are used to formulate these coatings, exhibit excellent heat resistance. This makes them ideal for components exposed to extreme temperatures, like engine parts and rocket nozzles, significantly improving their performance. Another key material is metallized ceramics for the hermetic sealing of spark gaps, which are critical electronic components of aerial combat systems.

With India aiming to become a global defence manufacturing hub, indigenous technologies backed by Mission Sudarshan Chakra will also encourage a reduction in import dependency, especially for defence-critical materials. This gives organizations such as CUMI a platform to supply to both domestic and export markets, while aligning with our capabilities in indigenously developed, globally benchmarked materials.

> "The journey towards achieving the INR 3 lakh crore target promises to be very productive in terms of capabilities and resources building across defence and aerospace. As we develop new tech and products meeting global standards, the domestic and export markets will grow."
>
> **Subbu Venkatachalam**
> **Head of Defence & Aerospace**
> **CUMI**

CUMI is one of the few Indian companies producing zirconia-based thermal barrier coatings and ceramic armor. How critical are these technologies in reducing foreign dependency, and how is CUMI scaling their adoption in India?

Zirconia-based thermal barrier coatings and ceramic armor are both highly strategic materials for the sector. Traditionally, they have been imported for aerospace, defence, and heavy engineering applications. By being fully backward integrated in our operations, CUMI is helping to produce them indigenously right from the grains and powders stage — the beginning of the value chain. Among the few manufacturers of critical raw materials like thermal spray powders for aerospace, CUMI is directly reducing India's reliance on foreign suppliers.

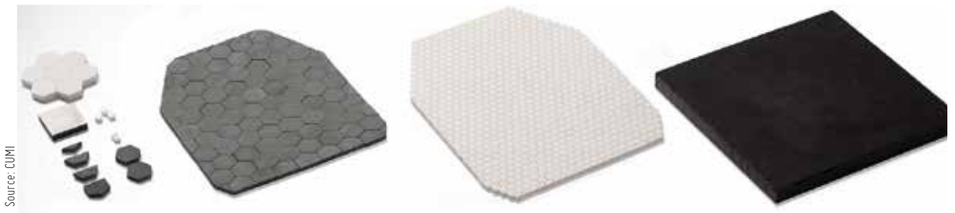
To scale up adoption, we work with DRDO through the ToT route to develop new tech in armor, helping to scale up production. With imports coming down, so does the cost for end-users, with the added advantage of globally benchmarked quality. Being long-term collaborators of government entities like DRDO and ISRO, we have the expertise to develop products suited to the local terrain and environment. We also work with several smaller integrators and MSMEs across the ecosystem, helping them scale up their business and capabilities.

Could you share specific ways in which CUMI's solutions are supporting jet propulsion systems and naval helicopter protection? What challenges do you face in bringing these advanced materials into large-scale defence use?

Our materials science-led solutions span a diverse range of protective applications across land-based, maritime, and aerial platforms and systems. Specific to jet propulsion systems, CUMI supplies thermal barrier and wear-resistant coatings that significantly enhance turbine efficiency and service life of critical engine components.

For naval helicopters, our lightweight ceramic armor panels

The biggest opportunities in the defence materials space will be in lightweight armor, thermal barrier coatings, hypersonic-grade ceramics, and manufacturing of critical parts—all of which will see rising demand as Mission Sudarshan Chakra unfolds.



Source: CUMI

Armour tiles designed using Advanced Ceramics

improve crew protection without compromising on mobility. The main challenges lie in scaling these technologies—high cost of advanced materials, stringent qualification cycles, and the need for long-term volume commitments from defence programs.

Self-reliant supply chains are crucial for defence. What steps are needed to strengthen India's domestic ecosystem for high-performance ceramics and coatings, from raw materials to final applications?

Building a robust domestic supply chain is central to achieving India's ambitions in defence. To strengthen the ecosystem, it is critical to:

Find the right materials and scale up manufacturing: Active R&D to discover new materials that continually align with on-ground priorities – for e.g., making materials stronger and lighter.

Forward integration with the right partners: While we are backward integrated and produce the components, many times, we are required to be involved in forward integration too. In such cases, aligning with the right partners becomes key.

Need for augmented testing and validation: Building more accredited labs and ballistic/thermal testing facilities within India will help pursue faster certification.

Strong ecosystem partnerships: Impactful innovations are the result of effective collaborations. Strengthening materials science research through industry–academia–government entity collaborations can prove to be a game-changer.

> "Impactful innovations are the result of effective collaborations. Strengthening materials science research through industry–academia–government entity collaborations can prove to be a game-changer."
>
> **Subbu Venkatachalam**
> **Head of Defence & Aerospace**
> **CUMI**

How do you assess the current alignment between government bodies, defence PSUs, and private enterprises in areas such as R&D, certification, and procurement for advanced defence materials?

Collaboration has improved significantly in recent years. We now see greater cooperation in R&D through DRDO's Technology Development Fund (TDF) and ToT programs, faster certification processes supported by dedicated testing facilities, and more open procurement policies that encourage private sector participation.

Manufacturing for the Defence and Aerospace industry involves two key considerations—precision and speed. This is possible by leveraging Industry 4.0 tools and other frontier technologies that accompany the use of advanced machine tools.

Source: CUMI

CUMI grains and powders

With India aiming to expand defence exports, what role can companies like CUMI play in positioning the country as a reliable supplier of advanced defence materials globally?

As a leader in materials science with 70 years of expertise, our contribution to positioning India as a reliable supplier of advanced materials globally is manufacturing globally benchmarked materials and products, ensuring no compromise in quality standards related to material procurement and processing at state-of-the-art R&D facilities, certifying products by recognized international testing and certification agencies, and working on pioneering tech that will allow us to break new ground – like lightweighting solutions for several applications.

Furthermore, with our strict export laws that require the highest compliance standards, India can be seen as a trusted global supplier of advanced defence materials.

Advanced materials are highly R&D intensive. How is CUMI investing in research, partnerships, or collaborations to stay ahead of evolving defence needs?

Collaborations are the keystone to developing solutions that not only address current challenges of our defence personnel but also enable next-gen capabilities to be built into defence systems. Our strategic and long-standing partnerships have enabled us to constantly evolve our solutions to offer the best in protection and performance to our soldiers at the frontlines. Some of our partnerships include:

Working with DRDO and academia: Through our long-term association with different DRDO labs, we have jointly developed cutting-edge materials and tech for Indian prototypes.

> "CUMI's defence and aerospace business aims to expand production capacity by five-fold in the coming year. We are currently investing in a world-class defence facility for armor ceramics at our Hosur campus."
>
> **Subbu Venkatachalam**
> **Head of Defence & Aerospace**
> **CUMI**

Our most recent partnership with DRDO-DMRL is a ToT to manufacture lightweight composite armor for all-round ballistic protection of combat vehicles as per STANAG 4569 protection level 2 and 3.

We are in the process of working with academic research partners such as IIT Delhi at the national level and regional partners such as Kumaraguru College of Technology. In fact, we are in advanced discussions with DRDO CoEs and IIT Delhi to develop lighter, more high-performance materials for armoring.

We are also exploring closer tech collaborations with DRDO for future aerospace and defence electronics applications.

Hiring industry-leading experts: We have assembled the best-in-class materials science team for R&D, with pioneering research papers and patents to their credit. Leading names in the field of defence – Dr S Christopher, Former Chairman, DRDO and Dr P Sivakumar, Former Director, Combat Vehicles Research and Development Establishment (CVRDE) – closely guide our decisions as our Defence and R&D advisors.

Testing and refining right from scratch: Since we produce our own raw materials, we have the capacity to test and develop all aspects of our products.

International collaborations: We are working with several global partners to co-develop novel, industry-leading solutions.

Looking ahead, what are the biggest opportunities and challenges you foresee in India's defence materials space over the next decade, particularly as Mission Sudarshan Chakra unfolds?

The biggest opportunities in the defence materials space will be in lightweight armor, thermal barrier coatings, hypersonic-grade ceramics, and manufacturing of critical parts—all of which will see rising demand as Mission Sudarshan Chakra unfolds. The challenges will be in scaling domestic raw material supply, navigating long qualification cycles, and ensuring cost competitiveness versus imports.

The Machine Tool industry in India is rapidly evolving with automation and digitalization. How important is advanced machine tool adoption for CUMI's manufacturing processes, and how does it influence productivity, precision, and scalability in production?

Manufacturing for the Defence and Aerospace industry involves two key considerations—precision and speed. This is possible by leveraging Industry 4.0 tools and other frontier technologies that accompany the use of advanced machine tools. As we look to cement our position as a global defence manufacturing hub, increasing adoption of automation and digitalization will be critical to fulfil demand by targeting speed and efficiency of production while maintaining precision and consistency.

CUMI is exploring tech collaborations with DRDO for future aerospace and defence electronics applications. It is working with academic research partners such as IIT Delhi and Kumaraguru College of Technology.

MODERN AEROSPACE POWERED BY A CENTURY-OLD INNOVATION

Power skiving, a gear machining process once considered too complex for large-scale use, has now become a reliable production method thanks to advances in modern machining centers and process optimization software. Collins Aerospace in Figeac, France, has adopted this technology in partnership with HORN, achieving faster cycle times, improved quality, and greater efficiency in manufacturing critical aerospace components.

Source: HORN/NNCEA

Gear skiving has enabled Collins to make its processes even more reliable while at the same time optimizing the quality of its components.

Over a century ago, Wilhelm von Pittler filed a patent for a gear manufacturing process called power skiving. A revolutionary idea in 1910, it has only gained wide adoption in recent years—thanks to advanced machining centers equipped systems for controlling and synchronizing the spindle speed and with process optimization software. These technologies have transformed skiving from complex into a highly productive solution for modern manufacturing. Collins Aerospace, based in Figeac, France, has been relying on this highly productive technique since 2019. Machine operator Jean-Paul Noyes, team leader Jean-Pierre Destruel, process engineer Joel Bousquet, and process developer Pascal Moulènes (the company's specialist for gear-related matters) worked closely with tooling partner HORN to successfully implement gear skiving for a variety of aerospace components.

"Lots of companies can sell, but it's rare to find one that can develop manufacturing strategies and actively support the implementation process," says Moulènes. "In 2015, we saw the process being used by a machine tool manufacturer to mass-produce machine tool components."

This got the key people at Collins interested in how they could use it themselves and influenced their decisions when selecting new machining processes. After investing in modern machining centers capable of supporting the technology, Moulènes and his team started looking for a supplier of gear skiving tools.

NIKHIL NAYAK
Managing Director
NN Combined Engineering Agencies Pvt Ltd

From Trials to Production

At EMO Hannover, the team witnessed the process live on the HORN stand. Already searching for a reliable supplier of carbide skiving tools, they partnered with HORN and began trials with technical support from engineer Emmanuel Gervais. He is the primary contact at HORN when it comes to machining critical aerospace components and he also supports the development of new tool concepts by providing valuable expertise and experience. Unsurprisingly, Gervais is based in the area of southwest France around Toulouse – the epicenter of the European Aerospace industry.

Prior to the introduction of the gear skiving process, the components were being manufactured with conventional cutting tools. "We were in the process of reorganizing the production of our families of gears," explains Moulènes. With the help of the new technology, he was able to optimize the production processes because fewer setup operations were required and he also managed to eliminate the idle time between work steps. In addition to reducing cycle times, the technology also increased component quality.

A New Process

"The gear skiving process was new to Collins and so we had to start by getting to know it in detail. However, we were not in a position to carry out any lengthy test runs because of the sheer volume of orders," clarifies Moulènes.

Source: HORN/NNCEA

The launch of HORN's system of gear skiving tools demonstrates the company's expertise in the field of gear production.

Gervais, therefore, suggested carrying out the tests at the HORN test center in Tübingen. "The optimum machining parameters for 16NCD13 (1.6657), a material that is relatively difficult to machine, were determined in Tübingen following multiple test series. The results were reproducible across all products and the quality was consistently high," he shares. HORN sent the test parts back to the Collins plant so the quality could be checked. The maximum permissible profile error for the gear teeth is a deviation of 0.03 mm (0.001"). The average deviation for the HORN test series was significantly lower than this. "HORN was able to supply the gear skiving tools with a concentricity correction system. Naturally, our primary aim was to achieve the appropriate level of part quality, but a long tool life was also very important to us," adds Bousquet.

Tangible Benefits

The transition to gear skiving was seamless. "The initial tests proved immediately successful. We could directly apply the cutting data determined in Tübingen with almost no changes," recalls Gervais. As a result: The machining time for the gear teeth alone was cut by more than half. The gear skiving process is subdivided into 14 rough machining, 2 pre-finishing and 2 finishing operations with a grinding allowance of 0.1 mm (0.004").

The hardening distortion associated with the subsequent heat treatment is not factored into the cutting profile of the tool. After hardening, the component then has to be ground. "We are currently using the same tool to manufacture five different components with the same module. So far, we have produced more than 300 parts in total. And the end of the tool life is not yet in sight," shares Moulènes.

The transition to gear skiving resulted in machining time for gear teeth cut by more than 50%, reduced number of setup operations, idle time between steps eliminated, and consistent improvement in component quality.

Productive Tool System

The HORN tool range includes highly productive gear skiving tools for manufacturing internal gears, splines and other internal profiles, as well as external gears with interfering edges. In these applications, the key advantages offered by gear skiving are: significantly shorter process times compared to broaching, the ability to use the technique on optimized turn-mill centers, turning and

gear cutting in one clamping, and the absence of reliefs at the tooth end. Gear skiving tools are designed for gear cutting in medium to large batches. Each tool is individually adapted to the application and to the material being machined, with the various tool interfaces based on the number of teeth and the module.

HORN's gear cutting portfolio comprises a wide range of tools for the production of various gear geometries with module 0.25 to module 30. Whether this involves teeth for spur gears, shaft/hub connections, worm shafts, bevel gears, pinions or customized profiles, all these tooth profiles can be manufactured cost-effectively with HORN tool solutions. Gear skiving technology only came into use when machining centers started supporting the use of this complex technology by offering systems for controlling and synchronizing the spindle speed, as well as process optimization software.

Source: HORN/NNCEA

Gear skiving can be easily programmed on modern CNC production centers.

HORN's gear cutting portfolio comprises a wide range of tools for the production of various gear geometries with module 0.25 to module 30, involving teeth for spur gears, shaft/hub connections, worm shafts, bevel gears, pinions and customized profiles.

A Global Company

With more than 70,000 employees based at 300 locations across the globe, Collins Aerospace is one of the biggest suppliers to the Aerospace industry. Its customer base includes all of the major international corporations in this sector. The Collins plant in Figeac is one of the world's leading manufacturers of propeller systems for civil and military aircraft, cockpit and cabin equipment, and horizontal tail actuators. At its plant in the south of France, it also manufactures the propellers for the Airbus A400M.

Collins Aerospace and HORN have been partners for 30 years. "It all began when we started using the Mini and Supermini systems to machine Inconel," recalls Pascal Janot, who is in charge of tool procurement. Today, the team at Collins also uses HORN solutions for milling in addition to the Mini and Supermini systems. "Our company relies on HORN for the majority of parts where we need to cut grooves. But HORN does not just offer excellent tools. Thanks to its high-quality support and services, the company is our preferred partner," says Moulènes.

Source: HORN/NNCEA

A partnership spanning 30 years: Pascal Moulènes with Jean Paul Noyes (both from Collins) and Emmanuel Gervais from HORN France.

HORN in India

Precision Tooling Solutions for the Aerospace and Precision Machining Industries from Paul Horn GmbH are available in India via NN Combined Engineering Agencies Pvt Ltd (NNCEA). NNCEA provides complete manufacturing solutions including logistics and supply chain management solutions for a wide variety manufacturing industries in the Indian market.

Source: Magic Wand Media

Marc Troïa, Director General, Huron Graffenstaden at the company's Strasbourg factory.

DRIVING INNOVATION IN PRECISION MACHINING

Innovation in precision machining has always been about balancing uncompromising accuracy and high productivity. During MMI's recent visit to Huron Graffenstaden's facility in Strasbourg, France, we saw how the company has mastered this balance through machines like the MX 12MT Mill-Turn center, while also preparing for the future with forward-looking concepts such as Industry 5.0.

MURALI SUNDARAM
Senior Correspondent
Magic Wand Media Inc
murali.sundaram@magicwandmedia.in

Founded in 1857, Huron carries a legacy of excellence in 5-axis and high-end milling technologies. Today, as part of the Jyoti CNC Automation Ltd, Huron continues to build on its reputation by blending European engineering tradition with Indian agility and scale. This synergy has enabled the company to serve industries as demanding as aerospace, defence, energy, and high-tech manufacturing.

The Power of the MX 12MT

The centerpiece of our visit was the MX 12MT, a gigantic 5-axis Mill-Turn machining center designed to perform both milling and turning in one setup. It features a swiveling torque-motor head, a Ø1400 mm rotary table, and a machining volume of Ø1600 × 1120 mm, capable of handling loads up to 4000 kg. Its clamping torque reaches 12,000 Nm, while a maximum working torque of 8570 Nm ensures robust performance even for the heaviest parts.

With a twin-pallet system and a high-capacity automatic tool changer, the MX 12MT is designed for uninterrupted productivity, enabling roughing, finishing, and complex geometries to be handled seamlessly in one cycle. As Marc Troïa, Director General, Huron Graffenstaden, explained, "Our customers are in highly demanding sectors— aerospace, space, defence, high-tech—where every process is governed by strict norms and long lifecycles. One of our biggest strengths is machine longevity. A Huron machine can last 20–25 years, which means customers don't have to restart costly certification processes again and again."

Synergy with Jyoti CNC

Huron's growth and global reach today cannot be separated from its partnership with Jyoti CNC Automation Ltd, which acquired the French company in 2007. This partnership brought together Huron's heritage of high-end milling expertise with Jyoti's vision, innovation, and capacity.

"We are working with a company that not only produces machines but understands our needs and delivers them economically in a very competitive global market," Troïa said.

The collaboration allows the group to cater to a broad spectrum of industries— from entry-level machining for small parts in watches and electronics, to massive multifunctional machines like the MX 12MT for aerospace and energy applications.

Competing Through Accuracy

Huron's strategy at EMO, the world's premier machine tool show, is not simply about showcasing products, but demonstrating a higher standard of accuracy.

"We speak of extra accuracy," Troïa emphasized. "It's not just good accuracy—it's accuracy below 0.01 mm even on a 10 cubic metre workpiece. This is possible only because of the stability of our machines and advanced software compensation systems."

The combination of rigid mechanical design and digital enhancements gives Huron an edge in industries where there is no tolerance for error.

Customer-Centric Approach

Beyond machine performance, Huron has invested heavily in services that add value to customers' operations. This includes predictive maintenance powered by AI, programming support, application consulting, and operator training. Troïa highlighted that the company's goal is to ensure customers maximize returns throughout the machine's lifecycle.

> "One of our biggest strengths is machine longevity. A Huron machine can last 20–25 years, which means customers don't have to restart costly certification processes again and again."
>
> **Marc Troïa**
> **Director General**
> **Huron Graffenstaden**

"It's not just about selling machines. It's about helping customers get the most out of them for 20 years and more," he added.

Preparing for Industry 5.0

While many manufacturers are still adapting to Industry 4.0, which standardized machine connectivity and real-time monitoring, Huron is already preparing for Industry 5.0.

"The next stage is human–machine collaboration," Troïa explained. "It's not only about informing operators, but enabling clever decisions where production choices are shared between people and machines. Customers are already asking us for this."

This vision highlights a future where automation and human expertise complement each other to achieve efficiency, adaptability, and resilience.

The Lifecycle of a Huron Machine

Watching the MX 12MT on the shop floor, Troïa described the rigorous journey each machine takes before it reaches the customer.

"Once assembly is complete, the customer inspects the machine for geometry, cutting capacity, performance, and noise. After approval, the machine is dismantled, boxed, shipped, and reassembled on-site. Geometry is rechecked, operators are trained, and the warranty begins. From there, the machine serves its customer for the next two decades."

This meticulous process reflects Huron's reputation for quality and reliability. The MX line, in particular, has been built for versatility—capable of handling horizontal, vertical, and intermediate positions with ease. This makes it ideal for cylindrical aerospace engine parts and other complex, high-value components.

The Future of Precision Machining

Huron's journey demonstrates how tradition and innovation can coexist. Its machines, engineered for longevity and reliability, remain highly relevant in industries where failure is not an option. At the same time, its embrace of digital technologies, predictive maintenance, and Industry 5.0 concepts ensure that the company is not only keeping pace with change but shaping it.

For Huron and Jyoti CNC, innovation is not about isolated breakthroughs. It is about creating a sustainable ecosystem where machines, software, and human expertise work together to deliver precision, productivity, and resilience for the industries of tomorrow.

For Huron and Jyoti CNC, innovation is about creating a sustainable ecosystem where machines, software, and human expertise work together to deliver precision, productivity, and resilience for the industries of tomorrow.

Source: Magic Wand Media

PRECISION BEYOND THE SKIES

The aerospace sector is one of the most complex and demanding industries in the world. To meet the demands, CNC (Computer Numerical Control) machining and Metal Additive Manufacturing (3D printing) have become indispensable. Together, these technologies enable engineers to translate digital designs into physical components with a level of accuracy, repeatability, and performance unmatched by traditional processes.

C R RAGURAMACHANDRAN
Chief Executive Officer
AceMicromatic International

The Aerospace sector encompasses not just aviation (aircraft within Earth's atmosphere) but also space systems — satellites, launch vehicles, spacecraft, and exploration systems operating beyond Earth. What unites these fields is an uncompromising demand for precision, reliability, and performance under extreme conditions — whether it's the high vibration of a jet engine, the vacuum of space, or the re-entry heating of a spacecraft.

These demands are shaping the Indian Aerospace and Defence sector which is entering a phase of accelerated growth. According to Custom Market Insights, the market is set to rise from US$ 27.1 billion in 2024 to US$ 54.4 billion by 2033, achieving a 6.99 percent CAGR. Similarly, GlobalRisk Community projects the aircraft parts market to increase from US$ 16.22 billion in FY2025 to US$ 26.66 billion by 2033, at a 6.41 percent CAGR.

Hence, to keep pace with the momentum, the adoption of advanced technologies has become non-negotiable. CNC (Computer Numerical Control) machining and Metal Additive Manufacturing (3D printing) equip engineers to translate digital designs into physical components that match the industry's highly rigid quality benchmarks.

Why CNC Machining Matters in Aerospace

Precision at Scale: Aerospace parts often require tolerances measured in microns. CNC systems ensure these specifications are consistently met across multiple production runs.

Complex Geometries: Aircraft and spacecraft designs increasingly feature lightweight structures with intricate contours. 5-axis CNC machining allows such geometries to be produced efficiently and accurately.

Capability with Advanced Materials: Materials such as titanium alloys, Inconel, and composites are standard in Aerospace. CNC machines equipped with rigid structures and high-torque spindles handle these effectively.

Repeatability and Traceability: Aerospace programs often run for decades. CNC machining ensures parts produced years apart remain identical, with digital traceability supporting quality assurance.

CNC Applications in Aerospace Manufacturing

Aircraft Components: CNC machines find applications across critical aircraft components — from turbine blades, discs, and housings in engines; large aluminum and titanium structures such as wing spars and fuselage ribs in airframes; high-strength steel and titanium shafts, pistons, and cylinders in landing gears; to lightweight housings, mounts, and structural elements in avionics.

Spacecraft & Satellite Components: Additionally, CNC machines are also used to manufacture lightweight but rigid panels and brackets for structural frames; cryogenic pump housings, thrusters, and rocket nozzles in propulsion systems; radiators and panels for thermal control; precision-machined mechanisms for safe operation while docking and deployment; and launch vehicles such as turbopumps, fuel tanks, and engine components.

Role of Metal 3D Printing in Aerospace

Metal Additive Manufacturing (AM), often called metal 3D printing, is increasingly used in Aerospace for its ability to create lightweight, complex parts that would be difficult or impossible with traditional methods.

Engineers can design parts with internal cooling channels (e.g., in rocket nozzles) or lattice structures that reduce weight while maintaining strength.

Metal 3D printing minimizes waste by building parts layer by layer, which is valuable when working with costly alloys like titanium.

AM enables fast production of prototypes for testing before scaling to CNC machining and is Ideal for producing specialized components for spacecraft, satellites, or experimental aerospace systems.

CNC + Metal 3D Printing: A Hybrid Approach

Most metal 3D printed parts still require CNC finishing for surfaces, tolerances, and fits. This hybrid workflow combines additive manufacturing to build the near-net shape and subtractive (CNC) to finish critical surfaces with precision. This synergy makes aerospace one of the biggest adopters of hybrid manufacturing.

CNC Across the Aerospace Lifecycle

CNC machining and 3D printing play a vital role in the aerospace lifecycle—from design and prototyping to production and finally maintenance and operation. In design and prototyping, they shorten development cycles through rapid iteration. Automated CNC systems and additive manufacturing (AM) technologies deliver high precision for both serial and custom parts during production. For maintenance and operation, CNC machining ensures spare parts perfectly match original specifications, while 3D printing enables the on-demand replacement of complex components.

Future Directions

Looking ahead, several trends such as Hybrid Manufacturing, Automation, Industry 4.0, Space-Based Manufacturing are to redefine aerospace manufacturing. Hybrid manufacturing, which combines additive manufacturing with CNC finishing, is expected to become standard for many aerospace parts. Automation will be crucial for robotic handling and lights-out machining for continuous production.

Industry 4.0 will see CNC and additive manufacturing systems integrated with digital twins, sensors, and predictive analytics, creating smarter, data-driven production environments. Additionally, space-based manufacturing is an emerging concept, where 3D printing combined with CNC finishing could be deployed in orbit for repairs or new builds.

Summing Up

CNC machining and metal 3D printing together form the backbone of modern aerospace and space manufacturing. While CNC ensures precision, repeatability, and long-term reliability, additive manufacturing enables design freedom, weight reduction, and material efficiency. By complementing design, production, and maintenance, these technologies ensure aerospace systems remain safe, efficient, and future-ready —whether in the skies above or on missions beyond Earth.

CNC machining and 3D printing play a vital role in the aerospace lifecycle—from design and prototyping to production and finally maintenance and operation.

CURRENT TRENDS IN THE AEROSPACE INDUSTRY

Source: Fritz Studer AG

The aerospace industry is a 'driver of innovation'; many key aircraft components are constantly being developed further.

The civil aviation industry is currently experiencing an upswing with full order books, as is the international supplier industry. At the same time, competition remains fierce with growing demands for efficiency and sustainability. Machine manufacturers such as Fritz Studer AG play a crucial role here.

It was a turning point in the history of mankind when the 'Wright Flyer' became the first motorized aircraft to take off on a successfully controlled flight in 1903. Today, more than 120 years after the Wright brothers' maiden flight, over 2,00,000 flights take place every day to transport passengers and freight around the globe. The Aviation industry has become indispensable for the modern global economy, providing millions of jobs, and it is of immense importance for logistics, tourism, and trade. This trend is set to continue, with the industry association IATA forecasting an average annual increase of 3.8 percent in global passenger numbers alone over the next two decades. .

This positive trend leads to increasing orders worldwide, for both major aircraft manufacturers and suppliers. This is because things are no longer as they were in the days of the Wright brothers when they were able to manufacture most of the components for their 'Wright Flyer' in their workshop. Modern aircraft cannot be built without the cooperation of highly specialized suppliers who manufacture engines, landing gears, fuselage components, avionics, or cabin interiors for example.

Efficiency and Sustainability are Becoming Increasingly Important

"Every manufacturer today has to become more efficient – both in terms of the product and in production," says Martin Hofmann, Sales Director North America and aerospace specialist at STUDER. Machine companies such as the Swiss manufacturer of high-precision CNC cylindrical grinding machines play a decisive role for suppliers and original equipment manufacturers (OEMs) because their production systems manufacture crucial components for the Aerospace industry. For example, pinion shafts for helicopter transmissions are manufactured on the S31 CNC universal cylindrical grinding machine.

Customers benefit from the ability to perform complete machining in a single clamping operation, which enables the tightest form and position tolerances. This also eliminates the need for re-clamping and unproductive idle times. The machining time is reduced with the use of grinding wheels that match the appropriate surface finish. Modern sensor technology, an individually adjustable cutting speed, or the programmable coolant pressure for roughing and fine finishing open up further optimization options for the entire grinding process on specific workpieces.

Another example is control pistons for aircraft, which are among the most demanding components in terms of geometrical tolerances. In the past, these were manufactured on conventional machines by experienced and specially trained personnel. Today this is done automatically by a modern CNC universal cylindrical grinding machine such as the S41. Like all STUDER cylindrical grinding machines, they can be configured and optimized for the customer's specific application. Thanks to a special unit with a length positioning probe on the longitudinal table, which automatically determines the amount to be removed from the control edge, the S41 can grind both symmetrical and asymmetrical control pistons in a single clamping – and this to an accuracy of one or two microns (40 - 80 mill").

Source: Fritz Studer AG

WireDress® unit

How STUDER Supports Aerospace Customers

Hofmann explains that the entire industry is currently experiencing an increasing trend towards better materials, optimized aerodynamics, sensor technology, and data analysis, or more efficient engines. "We are therefore supporting our customers with innovative production technologies so that they can be even more successful," he says.

For example, STUDER has developed SmartJet®, an automatic and more efficient technology for cooling in the grinding process that uses up to 40 percent less coolant and up to 50 percent less energy than conventional methods. And WireDress®, an innovative dressing process for metal-bonded CBN and diamond grinding wheels, opens up new possibilities for difficult-to-machine materials that are frequently used in the Aerospace industry.

The non-contact LaserControl™ measuring system, which measures workpiece dimensions directly in the machine down to the micron range, is also of benefit in the Aerospace industry where component geometry must be precise.

Hofmann also sees the future-proof C.O.R.E. hardware and software architecture and intelligent STUDER software with comprehensive digital capabilities as a major advantage of the new generation of STUDER cylindrical grinding machines. This includes intuitive operation, process and data vi-

The Aviation industry has become indispensable for the modern global economy. It is of immense importance for employment, logistics, tourism, and trade. This trend is set to continue, with the industry association IATA forecasting an average annual increase of 3.8% in global passenger numbers alone over the next two decades.

Source: Fritz Studer AG

CNC Universal cylindrical grinding machine STUDER favorit

CNC Universal cylindrical grinding machine STUDER S31

Source: Fritz Studer AG

CNC Universal cylindrical grinding machine STUDER S33 CNC Universal cylindrical grinding machine STUDER S41

Source: Fritz Studer AG

STUDER machines can be operated efficiently even by less specialized personnel after a short training phase and deliver first-class results. This is particularly important in times of an increasing shortage of skilled workers, which is also affecting the Aviation industry.

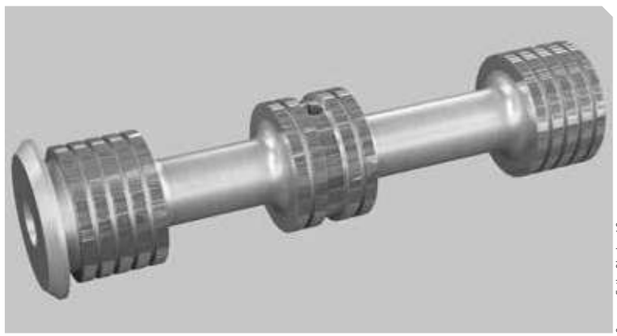
sualization as well as standardized or customized automation systems. "Our focus is always on people, technology should support them," he explains. This means that STUDER machines can be operated efficiently even by less specialized personnel after a short training phase and deliver first-class results. This is particularly important in times of an increasing shortage of skilled workers, which is also affecting the Aviation industry.

Process Reliability and Precision are Important for Aerospace

Responding to the needs of the industry with innovation and technical progress: STUDER can look back on a history that is almost as old as modern aviation itself. Less than ten years after the Wright brothers' flight, the Swiss Fritz Studer made grinding history in 1912 with the founding of his company. "One timeless quality that our aerospace customers, in particular, appreciate is the very high accuracy and repeatable process reliability of STUDER cylindrical grinding machines," Hofmann emphasizes. These properties are particularly important here as the components must not exhibit any deviations, must withstand high forces, and are often made of materials that are difficult to machine.

The flexible and process-reliable application possibilities of cylindrical grinding technology are a great advantage here and STUDER offers a broad portfolio of high-precision CNC machines for external and internal cylindrical grinding, on which a large number of aerospace components of different sizes, geometries, and weights can be manufactured. STUDER cylindrical grinding machines are used in many places as production systems for modern civil aircraft. For example, the S31, S33, and favorit can grind landing gear components coated by high-velocity oxy-fuel (HVOF) to an accuracy of just a few microns. The same applies to the test specimens that are so important in the Aerospace industry for material testing for certain processes (dog bone specimens).

"Competition in the Aviation industry remains fierce and, as a machine manufacturer, we can make a decisive contribution to our customers' success," summarizes Hofmann. For him, the open, and regular exchange about optimization potential in production is just as much a part of the corporate culture as STUDER's renowned customer care in numerous national languages and the competent advice and installation when purchasing a new system.



Source: Fritz Studer AG

Example image of a control piston – Possible machining task: Face grinding of the control edges on a STUDER S11

REVOLUTIONIZING AUTOMOTIVE MANUFACTURING

As the automotive industry embraces electric mobility and lightweight construction, servo press technology is gaining widespread adoption for its precision, flexibility, and energy efficiency. Companies like Isgec are at the forefront of this transition, offering advanced solutions tailored to the evolving needs of global manufacturers.

Source: Isgec Heavy Engineering Ltd

YOGESH SAXENA
Chief Executive
Machine Building Division
Isgec Heavy
Engineering Ltd

The Automotive industry is in the midst of a profound transformation. Driven by a global push for sustainability, stricter emissions regulations, and the rapid shift toward electric vehicles (EVs), manufacturers are under pressure to innovate. This has led to an increased demand for lightweight components, requiring the use of advanced materials such as high-strength steels (AHSS), aluminum alloys, and composites. Traditional mechanical and hydraulic presses, with their fixed stroke profiles and limited control, are often ill-suited to the complexities of forming these modern materials.

Servo presses represent a significant technological leap and are emerging as the ideal solution for modern automotive needs. Their programmable slide motion, superior energy efficiency, and ability to handle intricate shapes make them indispensable for producing critical components like Body-in-White (BIW) parts and the specialized parts required for electric vehicles.

Industry Growth Drivers: Precision, Efficiency, and Sustainability

The adoption of servo presses is being fueled by a clear value proposition. Unlike their conventional counterparts, servo presses replace the flywheel, clutch, and brake with a high-torque servo motor that directly controls the slide motion. This fundamental change unlocks a host of benefits:

Programmable Motion Profiles: The ability to precisely control the slide's speed and position throughout the entire stroke allows a single press to perform multiple forming tasks—from drawing and blanking to coining and secondary forming. This flexibility is crucial for working with advanced materials that have narrow forming windows.

Enhanced Precision and Repeatability: Closed-loop precision control ensures exceptional dimension-

al accuracy and consistency, which is vital for complex parts. It also extends the life of expensive dies, significantly reducing tooling costs.

Significant Energy Savings:
By consuming energy only during the working stroke and recapturing energy during deceleration, servo presses can achieve energy savings of up to 30–33 percent compared to conventional presses. This aligns perfectly with the industry's green manufacturing and sustainability goals.

Global Market Insights and Isgec's Strategic Position

While the domestic market in India is still in its nascent stages, the global servo press market is experiencing steady growth, particularly in technologically advanced regions like Europe and North America. Automotive OEMs in these regions are early adopters, recognizing the long-term benefits of accuracy, sustainability, and production flexibility.

Isgec, through its Canadian subsidiary Eagle Press and Equipment Co. Ltd, has already established a strong international footprint. The company has successfully supplied servo presses up to 800 tonne to international clients, primarily for highly automated, high-volume automotive production lines.

Aligned with the 'Make in India' initiative, Isgec is committed to strengthening its manufacturing capabilities within the country while leveraging its global expertise. With the capability to produce and supply servo presses up to 3,500 tonne, the company is well-positioned to handle future projects involving large panels and structural automotive parts, a segment with growing demand.

A Competitive Edge: Isgec's Technological and Manufacturing Prowess

The global market for servo presses is highly competitive, dominated by well-established European and Japanese manufacturers. However, Isgec–Eagle is carving out a unique and compelling position. The company combines its robust in-house mechanical design expertise with state-of-the-art electronic control systems from leading global brands such as Siemens, Mitsubishi, and Allen-Bradley.

This strategic blend of global components and local manufacturing—supported by world-class facilities in both India and Canada—gives Isgec a strong competitive advantage. The company is known for delivering customized, cost-effective, large-tonnage solutions tailored to the specific needs of selective global buyers. This flexible, customer-focused engineering approach, combined with a reputation for reliability, positions Isgec as a compelling alternative to traditional supplier networks.

Challenges and Opportunities: A Look Ahead

Despite the clear advantages, the adoption of servo presses faces a few challenges. The primary barrier is the high initial investment, which can be a hurdle for companies in cost-sensitive markets. Additionally, in many emerging economies, a lack of skilled personnel for operation, integration, and maintenance can slow the adoption rate.

However, the opportunities far outweigh the challenges:

The EV Revolution:
The need for precise forming of lightweight materials for EV battery enclosures, structural parts, and suspension components presents a massive and growing market for servo presses.

Export Potential:
Strong and sustained demand from export markets in Europe and North America provides a reliable growth path.

Brownfield Applications:
Servo presses offer a way for existing factories to achieve significant performance gains without expanding their footprint—making them ideal for retrofitting or brownfield scenarios.

Green Manufacturing:
Reduced energy consumption, lower noise levels, and minimized scrap align with global mandates for sustainable production, making servo presses a future-proof investment.

Paving the Way for a Smarter Future

The servo press is no longer a niche technology; it is becoming the global standard for precision stamping. As the Automotive industry continues its evolution toward lighter, more efficient, and more complex designs, the demand for presses with programmable stroke control and superior energy efficiency will only escalate.

Isgec, with its 100 percent subsidiary Eagle Press, is exceptionally well-prepared to meet this demand. The company's proven track record of international deliveries, coupled with its capability to produce presses up to 3,500 tonne, demonstrates both scale and expertise. By focusing on in-house design and manufacturing, backed by reliable, globally sourced controls, Isgec is a promising force in the future of metal forming. While the Indian market matures, the company's strategic emphasis on exports, the EV segment, and advanced forming applications positions its servo press line as a key driver of innovation for years to come.

Isgec, through its Canadian subsidiary Eagle Press, has already established a strong international footprint. The company has successfully supplied servo presses up to 800 tonne to international clients, primarily for highly automated, high-volume automotive production lines.

WHY NOW IS THE TIME TO JOIN THE AIMS ECOSYSTEM

The article introduces AIMS—the ANCA Integrated Manufacturing System—an open and interoperable smart factory platform for the tool and cutter grinding industry. AIMS connects machines, software, and automation into a seamless ecosystem, addressing challenges like labor shortages, productivity pressures, and traceability demands.

Source: ANCA CNC Machines

AIMS is a modular and flexible ecosystem that can be tailored to meet individual needs.

SAMUEL KIRKPATRICK
ANCA Senior Product Manager
AIMS

The Manufacturing industry is undergoing its most transformative shift in over a century. As smart automation, AI-driven production systems, and advanced robotics redefine what's possible, manufacturers are seeking ways to scale efficiently, adapt rapidly, and remain competitive in a world that rewards agility and intelligence.

In the tool and cutter grinding (TCG) sector, ANCA has been at the forefront of that transformation for over 50 years. But the industry challenges ahead—labor shortages, productivity pressures, rising costs, and demand for traceability—require more than smart machines. They demand integrated, open, and collaborative systems that elevate the entire production ecosystem.

This is where AIMS—the ANCA Integrated Manufacturing System—enters the spotlight. Designed to Connect, Automate, and Create, AIMS is an open, interoperable smart factory solution that is reshaping what's possible in tool manufacturing. And now, ANCA is inviting visionary technology equipment manufacturers or TCG industry players to become partners in this growing global ecosystem.

Why Forward-Thinking Vendors are Aligning with Open Ecosystems like AIMS

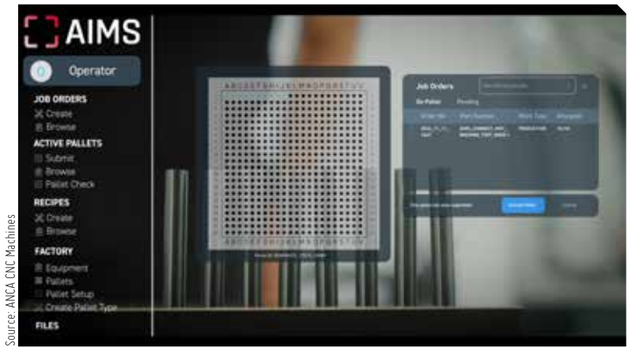
As tool manufacturers navigate mounting cost pressures, evolving customer expectations, and widening skills gaps, there's growing recognition that it's partnerships that will meet the complex needs of a modern smart factory. The era of closed systems and proprietary silos is giving way to collaborative, open ecosystems that bring together complementary technologies to deliver holistic value.

That's why technology vendors across hardware, software, and automation are increasingly seeking partnerships that allow them to embed their innovation into broader platforms—like ANCA's AIMS. Becoming part of the AIMS-ready ecosystem offers a powerful position in an industry-leading platform.

Here's why:

- **Open ecosystems are shaping purchasing decisions**

Manufacturers are no longer sourcing machines or software in isolation. They're looking for integrated, in-



Source: ANCA CNC Machines

AIMS Connect in action

teroperable systems that reduce complexity and risk. By being part of a trusted ecosystem like AIMS, vendors position themselves to be part of these full-stack solutions—rather than competing in fragmented Request for Proposals.

- **Value is shifting from products to solutions**

It's not just what a product does—it's how it fits into a manufacturer's process. AIMS partners gain the advantage of being embedded in a solution-oriented sales approach, where customer conversations focus on end-to-end value, not line-item pricing.

- **Reach and visibility multiply through shared infrastructure**

The traditional sales model—one company, one channel—is being replaced by co-marketing, co-selling, and shared customer journeys. AIMS opens doors to ANCA's global customer base, sales team, and service network—creating scale many vendors can't access alone.

- **Integration is the new differentiator**

The ability to seamlessly connect to a customer's digital factory infrastructure is fast becoming a purchasing prerequisite. AIMS provides both the technical infrastructure and engineering collaboration to make third-party integration straightforward, turning 'partnership potential' into real-world deployments.

- **Collaborative innovation unlocks new customer value**

In a modular factory environment, the best innovation doesn't always come from one place. Smart vendors know that collaborating—whether on data sharing, software features, or joint R&D—can unlock use cases neither party could deliver alone. AIMS provides the platform for that collaboration to thrive.

Source: ANCA CNC Machines

AIMS Pallet transfer from AutoFetch to the grinder

The AIMS ecosystem is leading the industry and at the forefront of smart manufacturing as the benchmark for integrated, end-to-end tool production with world leading closed loop geometry compensation.

Beyond access to ANCA's large and loyal global customer base, AIMS partners benefit from two-way opportunity sharing, preferred inclusion in end-to-end customer solutions, and potential access to ANCA's international sales and service networks.

With detailed integration support and co-marketing opportunities, partners can scale faster, extend their reach, and deliver greater value by being part of a collaborative, future-ready ecosystem built on openness, interoperability, and shared innovation.

Who Could—and Should—Partner?

The AIMS ecosystem welcomes any organization that can add value to the smart factory experience for tool manufacturers. This includes:

- **Tool measurement and metrology equipment providers**
(e.g. ZOLLER, a current AIMS partner)

- **Machine accessory and fixture manufacturers**
(e.g. Arobotech-style component manufacturers)

- **Tool and cutter industry machinery providers**
(edge prep, laser marking, packaging, cut & chamfering, etc.)

- **Smart manufacturing software companies**
(MES, ERP, simulation, production monitoring)

- **Worker tracking, localization, and wearable tech providers**

Tool manufacturers are under increasing pressure to do more with less. AIMS addresses that challenge by connecting every process and piece of equipment into a single, intelligent, modular system.

- **AR and operator augmentation companies**
- **Barcode scanning and digital interface hardware suppliers.**

But most importantly: if your solution improves automation, integration, traceability, or productivity in a factory—there's a place for you in AIMS.

Why AIMS, Why Now?

Tool manufacturers are under increasing pressure to do more with less. AIMS addresses that challenge by connecting every process and piece of equipment into a single, intelligent, modular system. Whether it's integrating a third-party machine without a native data interface, or scaling up to fully autonomous, lights-out manufacturing—AIMS makes it possible.

For customers, the benefits are clear:

- Up to 30 percent higher machine utilization
- Up to 20 percent reduction in production costs
- Enhanced traceability, quality assurance, and error reduction
- Real-time data at operator and plant manager level
- Compatibility with both legacy and next-gen equipment.

Source: ANCA CNC Machines

AIMS Ecosystem

At the core of AIMS is the AIMS Server which orchestrates workflows, connectivity, and compliance across grinding, measurement, laser marking, and IT systems (including ERP/MES) through scalable features like worker guidance with AIMS Connect to fully autonomous workflows with AIMS Automate. Key components such as AutoFetch (an autonomous mobile robot) and AutoComp (the world-leading closed-loop tool geometry measurement and compensation system) provide seamless tool handling and tolerance control, drastically reducing scrap and manual intervention.

This flexible architecture allows manufacturers to start with worker guidance and job management and then scale up to fully autonomous, end-to-end production cells—all while gaining real-time data insights for better decision-making and higher machine utilisation.

Source: ANCA CNC Machines

ZOLLER is AIMS Ready

As ANCA cements its transition from capital equipment manufacturer to a true Industry 4.0 solutions provider and technology partner, AIMS is the spearhead of that transformation.

AIMS represents an evolution—one that started in 1974 with CNC automation, progressed to robotic tending in the 1990s, and now culminates in a flexible, smart, autonomous factory standard.

Building the Future Together

Becoming an AIMS-ready partner means more than integrating technology—it's about shaping the future of manufacturing. For partners, it's an opportunity to embed innovation into a globally trusted ecosystem, accelerate market access, and collaborate on smarter, more complete solutions. For AIMS customers, it unlocks greater flexibility, faster innovation, and a seamlessly connected production environment—powered by best-in-class technologies working in harmony.

As manufacturing moves toward modular, autonomous, and data-driven operations, the value of open, integrated ecosystems is undeniable. Together, we can raise industry standards, accelerate digital transformation, and deliver the intelligent, adaptive factories of tomorrow.

Becoming an AIMS-ready partner means more than integrating technology—it's about shaping the future of manufacturing.

Source: Magic Wand Media

REDEFINING CNC WITH 'PERFORMANCE SERIES'

Innovation and precision took center stage at Lemon Tree Premier, Pune, on September 1, 2025, as Precision Engineering Technologies (PETECH), a Phillips group company, raised the curtain on its new 'Performance Series' CNC machines. The exclusive media preview blended cutting-edge technology with the spirit of Indian manufacturing excellence, spotlighting a strategic partnership-powered breakthrough portfolio that has already clocked over 500 global installations.

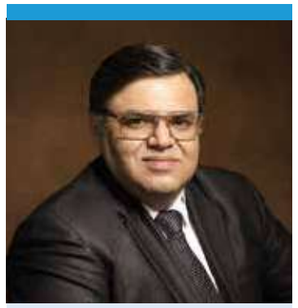
The landmark evening opened with an address from Nitin Mehra, President, PETECH, who set the tone for the event. Welcoming the attendees, Mehra said, "It's not just about unveiling a new line of CNC machines; it's about celebrating the vision to make precision manufacturing more powerful, more intelligent, and more accessible across industries and geographies." Highlighting the rapid adoption of the series, he noted, "In just two years, our 'Performance Series' has already achieved over 500 global installations—spanning India, the Middle East, and Malaysia. This remarkable adoption reflects the trust and confidence our customers have placed in us."

The keynote speaker of the event, Partho Kar, Joint Managing Director, Jaykay Enterprises Ltd, reinforced this spirit of progress, stating, "The CNC business in India is projected to grow at a CAGR of nearly 17 percent over the next decade, so that's quite high, and there is a lot of room for innovation and excitement." Further he pointed out, "Manufacturing excellence demands cutting-edge innovation, and that requires both industry and institutions to prioritize R&D as a national mission." He noted, "What Indian industry needs today are not just equipment suppliers, but solution providers. That is where PETECH stands apart—because it brings reliability, innovation, and above all, trust. Built to deliver precision, productivity, and reliability at scale, the 'Performance Series' represents the future of manufacturing with Industry 4.0-ready technologies, IoT connectivity, predictive maintenance capabilities, and automation-driven designs."

Charting a New Benchmark

Unfolding the 'Performance Series' portfolio before the audience, Sumeet Bengeri, Vice President, PETECH, shared, "When we started building the 'Performance Series', our vision was clear: we wanted to create a machine line that could redefine precision manufacturing."

SOVAN TUDU
Assistant Editor
Magic Wand Media
sovan.tudu@
magicwandmedia.in



"It's not just about unveiling a new line of CNC machines; it's about celebrating the vision to make precision manufacturing more powerful, more intelligent, and more accessible across industries and geographies."

Nitin Mehra
President
Precision Engineering Technologies

"Performance is not just a word. It's a mindset that says: don't settle, push limits. A mindset that challenges industries to perform beyond expectations."

Sumeet Bengeri
Vice President
Precision Engineering Technologies

Stating that the vision has come to life, Bengeri said, "The 'Performance Series' includes high-performance vertical machining centers (VMCs), horizontal machining centers (HMCs), CNC turning centers with Y-axis, 5-axis machining centers, drill tap centers, vertical turning lathes—and now, even collaborative robots, or cobots. He continued to elaborate on the guiding philosophy of the 'Performance Series'—creating smarter, versatile platforms that can handle complexity with ease and deliver precision at scale.

Highlighting the worldwide machine installations, he added, "For us, this is not only a business achievement—it is a movement. A movement towards smarter, stronger, performance-driven manufacturing, catering to precision-demanding industries that are shaping tomorrow, such as Aerospace, Defence, Automotive, Semiconductors, Energy, Medical, Die & Mold, and General Engineering."

Bengeri offered a powerful call to action and said, "Performance is a mindset that says: don't settle, push limits. A mindset that challenges industries to perform beyond expectations. A mindset that makes PETECH not just a machine builder, but a partner in shaping the future of manufacturing."

The 'Performance' Take for a Global Future

The launch evening was a mix of inspiration, innovation, and ambition. The event showcased PETECH's growing stature in the machine tool ecosystem. With strategic alliances with industry leaders like Mastercam, Renishaw, MMC Hardmetal, Zoller, and Nikken, the 'Performance Series' has been positioned not merely as machines but as part of a connected and comprehensive manufacturing ecosystem.

The senior leadership from PETECH underscored the 'Make in India' vision driving growth and aptly put it, "Our goal is making precision manufacturing accessible globally. Aligned with India's 'Make in India' initiative, we're expanding domestic manufacturing to produce our 'Performance Series' portfolio within the country."

Source: Magic Wand Media

PETECH's leading industry partners during an insightful discussion at the Launch event.

The 'Performance Series' includes high-performance VMCs, HMCs, CNC Turning Centers with Y-Axis, 5-Axis Machining Centers, Drill Tap Centers, Vertical Turning Lathes, and Collaborative Robots, or Cobots.

INDIAN INNOVATION ON THE GLOBAL STAGE

Ace Designers Ltd, amace solutions Pvt Ltd, and Micromatic Grinding Technologies (MGT) Pvt Ltd from the AceMicromatic Group will present a range of advanced machining, additive manufacturing, and grinding solutions at EMO Hannover. Their showcase reflects India's engineering expertise and commitment to delivering precision, productivity, and innovation to a global audience. Here's a preview of the innovations that will take the spotlight, promising to capture the attention they truly deserve. Together these companies aim to further fortify India's position in the global manufacturing ecosystem, offering customized solutions to empower their customers stay relevant in the rapidly shifting, highly-competitive industrial landscape.

CNC TURNING MACHINES

J SERIES FROM ACE DESIGNERS

The J Series machines are precision, cost-effective CNC turning machines, ideal for job shops and ancillary units. Unlike retrofit CNC machines, the J Series is a fully-fledged CNC solution, designed and built to leverage advanced CNC features such as high rapid rates, optimized cutting parameters, and constant surface speed.

Key machine elements—including ball screws, bearings, CNC systems, and drives—are sourced from the best available globally. Assembly is carried out by a dedicated team of skilled craftsmen, working under expert technical guidance.

These precision CNC turning centers come with C-axis capability to handle a wide variety of machining needs—milling, drilling, and tapping—in a single setup, significantly enhancing productivity and versatility.

Features

- Rigid cast iron bed with step-up design for superior rigidity and extended service life
- Thermally stabilized high-speed spindle (4,500 rpm)
- 8 in. high-speed chuck with Ø63 mm bar capacity
- BMT-45 servo turret with milling capability; index time: 0.15 sec
- Machining capacity: Max turning diameter 350 mm; max turning length 460 mm
- Suitable for automation lines

Applications

The machine is suitable for a wide range of applications, including:

- Tool room components
- Automobile components
- General engineering parts

Ace Designers Ltd
AceMicromatic Group
Hall & Stand: 16/D-11

MACHINING CENTERS

540G-30 – GRAPHITE SERIES MACHINING CENTER

The 540G-30 is one of the highest-selling machines in the Graphite Series (G-Series). It features a BBT-30 spindle with a high speed of 20,000 rpm, making it ideal for machining graphite materials. The machine is designed with the utmost care, using special ball screws, LM guideways, and telescopic covers to ensure that the dust generated during graphite machining does not affect the accessories or compromise machine performance.

The G-Series can be configured for both wet and dry graphite cutting applications. These machines are widely used in the production of electrodes, rotors, battery cells, furnace parts, valves, and components for nuclear reactors, among other applications.

Key Features

The 540G-30 comes equipped with a toughened glass front door for operator safety and visibility. It uses a BBT spindle taper, capable of running at 10,000 rpm for specific applications, and incorporates a spindle air curtain to prevent dust entry. For wet machining, a curtain-type coolant system is provided, along with a two-stage filtration system to ensure clean coolant flow.

A twin-arm automatic tool changer (ATC) with a magazine isolation door allows fast tool changes while protecting tools from contamination. All G-Series machines use a direct drive spindle for maximum precision. The machine is coated with a special high-gloss finish paint for durability and easy maintenance.

To further protect internal components, the machine incorporates a special double-protection telescopic cover and specially designed LM guideways and ball screws to withstand graphite powder exposure. For graphite applications, it is equipped with a dedicated coolant tank featuring a multistage filtration system. Lubrication for ball screws and LM guideways is provided through an oil lubrication system, which can be customized based on the component application.

Applications

Depending on the application, users can choose between a grease or oil lubrication system. By integrating special rotary and tilting tables, the 540G-30 can also perform 4th and 5th axis operations. It is suitable for machining graphite, ceramic, silicon carbide, carbon fiber, glass fiber, aluminum ceramic, and composite materials.

Ace Designers Ltd
AceMicromatic Group
Hall & Stand: 16/D-11

CNC TURNING CENTERS

LT-2 SERIES FROM ACE DESIGNERS

The LT-2 Series machines are engineered for a perfect balance of power, rigidity, and productivity. These precision CNC turning centers feature a sub-spindle along with C- and Y-axes capabilities, enabling a wide range of machining operations—milling, drilling, tapping, and front/back-end turning—in a single setup. This significantly boosts machine capability and operational efficiency.

A Power-Up series motor is offered for increased torque at lower spindle RPMs. The C-axis provides bi-directional motion that can be interpolated with X and/or Z motion. Rotating cutters are mounted on the tool turret and operate in the same two axes as the turning tools.

The Y-axis serves as a third axis, allowing rotary cutters to machine across the spindle centerline. This is achieved through an additional set of ways, which move the live tool across the spindle face. This design enables production shops to quickly realize the benefits of integrating milling, drilling, and turning operations in one setup.

The machine supports full contouring movements of the workpiece, allowing profiling cuts to be made using simultaneous X-Y-Z axes motion along with the C-axis.

Applications

The LT-2 Series can handle a wide range of machining tasks, including: milling, drilling, tapping, boring, reaming, and contour milling. It is ideal for manufacturing tool room components, aerospace components, and automobile components. Once set up at the start of production, the machine runs according to the programmed instructions until the process is complete.

Ace Designers Ltd
AceMicromatic Group
Hall & Stand: 16/D-11

Ace Designers Ltd
AceMicromatic Group
Hall & Stand: 16/D-11

MACHINING CENTERS

1060V MACHINING CENTER FROM ACE DESIGNERS

The 1060V is a rigid and efficient machining center, designed with an ergonomically optimized structure that offers an excellent rigidity-to-weight ratio. This machine is ideally suited for machining die and mold components. Equipped with high-precision LM guideways and ball screws, it ensures outstanding accuracy and productivity.

It offers high cutting capability, a rigid structure, increased feed rates, and efficient chip removal for smooth operations.

The 1060V features a spindle speed of up to 15,000 rpm and a fast automatic tool changer (ATC) with 24 or 30 tool capacity. The spindle taper is available in BT-40 or BT-50 configurations. Rapid traverse rates are 32 m/min on the X and Y axes and 24 m/min on the Z axis. Depending on the configuration, spindle power is rated at either 11/7.5 kW or 18.5/11 kW.

Additional features include front chip disposal for easy maintenance, coolant through the spindle for improved machining efficiency, compatibility with 4th and 5th axis rotary tables, and a DM kit for extended functionality.

This machine is suitable for a variety of applications, including die and mold manufacturing, aerospace components, pattern machining, and general engineering components.

METAL 3D PRINTERS

COMPACT METAL 3D PRINTER STLR 120 FROM AMACE SOLUTIONS

The STLR 120 is a compact and efficient metal 3D printer designed for R&D, academic use, and small parts production. It features Laser Powder Bed Fusion (LPBF) technology and operates on a single-phase power supply, ensuring low power consumption and a minimal footprint.

Equipped with a powerful 400 W laser and a fine laser spot for exceptional resolution, the STLR 120 is ideal for producing high-quality parts such as medical implants, electronic components, and prototypes. Its capability to process a wide range of materials makes it a versatile and cost-effective solution for exploring additive manufacturing.

The printer is particularly well-suited for skill development and material research in educational and research institutions.

amace solutions Pvt Ltd
Ace Designers Ltd
AceMicromatic Group
Hall & Stand: 16/D-11

Micromatic Grinding Technologies Pvt Ltd
AceMicromatic Group
Hall & Stand: 16/D-15

GRINDING MACHINES

ECO 200 – COMPACT UNIVERSAL CYLINDRICAL GRINDING MACHINE

The ECO 200 from Micromatic Grinding Technologies Pvt Ltd is a compact, conventional cylindrical grinding machine designed for high-precision grinding of small components. Capable of performing both internal and external grinding in its universal model, it is ideally suited for producing small-sized, high-precision components for tool rooms and small-batch production.

This machine features a universal configuration for internal and external grinding operations. It delivers high accuracy, achieving less than 1 µm roundness on diameter as standard, with an option to achieve less than 0.5 µm roundness.

The heavy-duty cast iron bed provides exceptional rigidity and stability, while hand-scraped guideways with Turcite ensure smooth and consistent performance. The wheel head is equipped with hydrodynamic spindle bearings for enhanced reliability. The table can swivel up to 30° to facilitate taper grinding.

An automatic grinding cycle is controlled through an integrated PLC. The wheel head spindle motor, rated at 3.7 kW, provides high stock removal capability. The MK 3 tailstock offers ±0.03 mm micro taper adjustment for precision alignment.

The ECO 200 is also available in a CE-marked version. This machine is a smart choice for high-precision, multi-purpose grinding in a compact footprint.

HORN AT EMO HANNOVER 2025

Paul Horn GmbH
Hall & Stand: 5/A-32

HORN will be showcasing pure machining across 580 sq mt of exhibition space in Hannover, featuring four machines, four exciting components, and a wide variety of tool solutions—live in action, cutting chips throughout the event.

On display will be the DMU 65 mB from DMG, the Index G220, the Citizen L12, and the GROB G150.

The company will showcase a wide range of exhibits and tooling solutions, unveiling its latest innovations for 2025. Across four machines, Horn will demonstrate key focus areas such as finishing, machining lead-free materials, aluminum machining with rotating PCD tools, and advanced turning operations.

Alongside live machining, the company will present several new developments, including the Mini system with sintered chip breaker geometry. This I-geometry is specifically designed for machining materials with poor chip formation, making it ideal for copy turning, longitudinal turning, back turning, and facing.

The system shows its greatest strengths when working with shallow depths of cut in steel and stainless steels, where it ensures superior chip control, higher process stability, and extended tool life. Importantly, Horn has also engineered the I-geometry with the challenges of machining lead-free materials in mind—materials expected to become increasingly significant in the future. To address this, Horn now offers inserts with extremely small corner radii, starting from 0.05 mm for delicate lateral infeeds. Corner radii ranging from 0.05 mm to 0.2 mm are available directly from stock.

CARBIDE ROD CUTTERS

CHENNAI METCO BRINGS INNOVATIONS

Carbide material has now become the most common material for cutting tools. In cutting tool production, the first step is sectioning the carbide rod to the desired length, from which the tool is further processed.

Carbide rod cutting is a sophisticated operation that requires specialized machines, blade and processes. The need may range from simple carbide rod cutting for small-volume manufacturing to high-volume cutting tool producers who require rapid, high-speed production. There is also demand for larger cutters for cutting bigger raw materials.

Chennai Metco offers a comprehensive range of carbide cutters from simple low volume cutting solutions to high-volume automated systems. The simple cutters can be manual or automatic. They employ appropriate blades and coolants for effective sectioning of carbide materials. Such machines come equipped with coolant deliveries, work holding devices, and coolant filtering systems.

High-volume mass-producing carbide rod cutting requires sophisticated automated systems. They employ sensors, auto feeders and auto cutters with modern PLC-based automation. It is a total system ensuring interruption-free operation and operator safety. Since carbide rod cutting requires specialized sub systems, the machines incorporate spark suppression, safety modules, fume extractors, and coolant filters.

Chennai Metco Pvt Ltd
Hall & Stand: 11/H-35

JYOTI CNC AND HURON UNVEIL NEXT-GEN MACHINING

Jyoti CNC Automation Ltd, India's largest CNC machine tool manufacturer, together with its French subsidiary Huron Graffenstaden, will present a powerful line-up of advanced machining solutions at EMO Hannover. From ultra-fast drill-tap centers to multi-axis turn-mill platforms and large-format 5-axis machining centers, the companies will highlight innovations that blend speed, precision, and automation to meet the most demanding manufacturing challenges across a spectrum of industries.

TURN-MILL CENTERS

JYOTI CNC'S ATM 200 FOR COMPLEX PARTS

The ATM 200, part of the Vertical Line Series, is a high-performance turn-mill center designed for mass production with a fully integrated automated job feeding system. Its unique architecture features an inverted vertical electro spindle head that moves in all axes, while the front of the machine base remains open for flexible tooling layouts and automation modules. This design ensures excellent chip evacuation, easy integration of gantry or robotic loading, and versatile process customization. Equipped with a high-speed electro spindle and a live tool turret, the machine performs turning, milling, drilling, and tapping operations in a single setup, significantly reducing cycle times and manual handling.

Automation is at the core of the ATM 200, with features such as auto job feeding, multi-function stations for customized machining, and pick-up stations that enable continuous, unattended operation. These capabilities minimize operator fatigue, ensure consistent part quality, and allow lights-out production. The Y-axis on the headstock provides high rigidity and accuracy during off-center operations, making the ATM 200 particularly suited for complex parts like differential cases and other automotive or precision components that demand multiple machining processes and specialized tooling such as goose-neck cutters.

Jyoti CNC Automation Ltd
Hall & Stand: 15/C-36

Jyoti CNC Automation Ltd
Hall & Stand: 15/C-36

TURN-MILL CENTERS

JYOTI CNC'S MTX 300 FOR UNMANNED MACHINING

Introducing the incredible MTX Series from Jyoti that seamlessly integrates advanced 5-axis milling and 4-axis turn-mill capabilities, perfect for the intricate world of single-piece component manufacturing. With its outstanding precision, remarkable versatility, and top-notch efficiency, the MTX Series is a go-to solution for industries that demand peak performance and unwavering reliability.

It boasts a main electro-spindle featuring a C-axis and a secondary electro-spindle equipped with a Z3-axis for turning. It also includes a milling spindle with X1/Y/Z1 along with a B-axis, complemented by a live tool turret (X2/Z2-axis). Additionally, it is outfitted with a high-capacity Automatic Tool Changer (ATC) to keep one's production running smoothly. Engineered for high-precision, unmanned machining, the MTX Series is a game-changer in industries such as Aerospace, Automotive, Mechanical, Power, and Oil & Gas. It delivers exceptional tolerance and reliability even in the most challenging applications.

TURN-MILL CENTERS

AX-200 MY FOR HIGH-PRECISION INDUSTRIES

The AX-200MY from Jyoti CNC Automation Ltd is a next-generation multi-axis turn-mill center with a unique Y-axis design that enables complete machining of complex components in a single setup. Equipped with roller-type linear guideways and high-resolution glass scales, it delivers excellent rigidity, vibration damping, and positioning accuracy. A 12-station servo-driven live tool turret integrates turning, milling, drilling, and tapping operations in both radial and axial orientations, while the high-speed electro spindle ensures stable cutting performance on challenging materials.

Each turret movement is powered by high-torque servo motors, making the machine capable of PCD drilling, eccentric milling, and intricate OD/ID profiling without additional setups. The digital tailstock provides stable support for long components, and the combination of X, Z, C, and Y axes allows complex contouring and multi-tasking. These features make the AX-200MY particularly suited for high-precision industries such as Aerospace, Medical, and Surgical Manufacturing, where accuracy, reduced cycle time, and flexible machining are critical.

Jyoti CNC Automation Ltd
Hall & Stand: 15/C-36

VERTICAL MACHINING CENTERS

HIGH-PRECISION VX 8 MP-PRO FROM HURON

The VX 8 MP-Pro from Huron Graffenstaden is a high-precision vertical machining center designed for complex and high-volume machining applications. Built on a rigid, thermally stable structure with high-precision linear guideways, it ensures exceptional accuracy, excellent surface finish, and dynamic performance even under demanding cutting conditions. A high-speed electro spindle with advanced cooling and vibration control enables efficient machining of diverse materials, while direct-drive rotary axes support simultaneous 5-axis contouring and complex geometry machining in a single setup.

The hallmark of the MP-Pro configuration is its integrated multi-pallet system, which enables continuous machining by allowing one pallet to be loaded or unloaded while another is in operation. This capability drastically reduces idle time, enhances productivity, and facilitates seamless batch production without frequent interruptions. Combined with a fast automatic tool changer and intelligent CNC control, the VX 8 MP-Pro delivers superior throughput and flexibility, making it particularly suited for Aerospace, Die & Mold, Automotive, and Precision Engineering applications where multi-sided machining and reduced cycle time are critical.

Huron Graffenstaden
Hall & Stand: 15/D-35

DRILL-TAP MACHINING CENTERS

TACHYON 5 FT FROM HURON FOR ULTRA-FAST OPERATIONS

The Tachyon 5 FT is a high-speed drill-tap machining center from Jyoti's Tachyon series, designed specifically for ultra-fast and precise operations. This FT variant features a fixed-table design, ensuring exceptional rigidity and stability while the moving column architecture delivers dynamic, high-acceleration movements. Equipped with a high-speed electro spindle, rapid axis acceleration, and a fast automatic tool changer, the machine achieves minimal non-cutting time and superior productivity. Its design focuses on reducing cycle time through near-instantaneous tool changes and optimized ergonomics, making it ideal for high-volume drilling, tapping, and light milling applications.

With five-axis machining capability integrated into a fixed-table platform, the Tachyon 5 FT can complete complex components in a single setup with high accuracy and repeatability. Precision linear guideways, thermally stable construction, and an advanced CNC control system ensure consistent machining performance over long runs. This model is particularly suited for industries such as Electronics, Automotive, Aerospace, and Precision Engineering, where high spindle uptime, speed, and tight tolerances are critical.

Huron Graffenstaden
Hall & Stand: 15/D-35

Huron Graffenstaden
Hall & Stand: 15/D-35

DRILL-TAP MACHINING CENTERS

HIGH-SPEED TACHYON 4FT FROM HURON

Inspired by the theoretical particle that travels faster than light, Tachyon 4FT is Jyoti's latest high-speed drill-tap center designed to meet the relentless pace of modern manufacturing. With cutting-edge engineering and a compact footprint, it delivers exceptional cycle times with near-zero loading and unloading delays—ideal for the Electronics, Telecommunications, and Automotive sectors. Built on a rigid moving column architecture, the machine achieves rapid traverses of up to 70 m/min and acceleration up to 15 m/s², supporting continuous, high-precision production environments. Its fixed table configuration offers a generous working envelope, while minimizing floor space—an advantage where space is a premium in mass manufacturing setups.

The advanced rotary tilting table features absolute encoders on both A and C axes, paired with a torque motor-driven C-axis. This ensures vibration-free, dynamic 5-axis performance with angular accuracy of 0.001°, empowering complex part machining with unmatched stability. Equipped with a servo-driven automatic tool changer, the Tachyon achieves chip-to-chip tool change times of just 1.6 seconds, thanks to its short arm design and motorized de-clamping mechanism. The in-house manufactured spindle, with an HSK 40A taper, offers speeds up to 24,000 RPM and a rapid 0.8-second ramp-up/down, making it ideal for fast tapping and drilling cycles.

Operational efficiency is further enhanced by a rear chip evacuation system and a positively sloped machining area, which ensure consistent chip flow and reduced operator intervention. For uncompromising accuracy, the machine is equipped with Volumetric Compensation Technology. This system corrects 18 geometric deviations and 3 squareness errors, ensuring sub-micron precision—a must for Aerospace, EMS, Medical, and other critical component industries.

At its core, SINUMERIK ONE, Siemens' digital-native CNC controller, powers the Tachyon 4FT, enabling high-end multi-axis machining. Performance is validated through ISO 10791-7 standard tests, reinforcing its capability in precision-critical applications. In every sense, the Tachyon 4FT is built not just for speed, but for speed with precision—exactly what the future of manufacturing demands.

VERTICAL MACHINING CENTERS

HURON'S VX 12 NVU FOR LARGE, COMPLEX COMPONENTS

The VX 12 NVU is a next-generation Vertical Machining Center engineered to meet the demanding requirements of modern machining with superior rigidity, precision, and productivity. Built on a robust cast iron structure, it offers exceptional vibration damping and thermal stability, ensuring consistent accuracy even during high-speed or heavy-duty operations.

Huron Graffenstaden
Hall & Stand: 15/D-35

With a generous X-axis travel of up to 1,200 mm, Y-axis travel up to 600 mm and Z-axis travel up to 610 mm, combined with rapid traverse rates of 24 m/min in all axis and a high-performance spindle, makes VX 12 NVU ideal for machining large, complex components in Aerospace, Defence, Energy, and Precision Engineering sectors. Its tool changer supports fast and reliable automatic tool swaps, significantly reducing cycle times.

With high-speed spindle options and dynamic axis movement, it delivers optimal cutting performance across a wide range of materials. The spacious work envelope makes the machine ideal for medium to large part machining in Automotive, Aerospace, and General Engineering applications. Equipped with the latest CNC controls, it ensures user-friendly operation and real-time diagnostics. Intelligent chip management and coolant systems enhance uptime and maintain process efficiency. Built for reliability, the VX 12 NVU reflects Huron's legacy of innovation in high-precision machining. From roughing to fine finishing, the VX 12 NVU stands as a powerhouse VMC that empowers manufacturers with unmatched speed, precision, and reliability.

HORIZONTAL MACHINING CENTERS

HP 4000 FROM HURON

Huron Graffenstaden
Hall & Stand: 15/D-35

Huron has introduced the high-performance HP Series, the cutting-edge evolution of horizontal machining centers, crafted with the foundational elements of rigidity, accuracy, and high dynamics. This extraordinary series is designed for peak performance, with the potential to boost productivity and deliver exceptional reliability, guaranteeing top-notch machining outcomes. Equipped with state-of-the-art technology and precision engineering, the HP Series sets an innovative standard for efficiency, paving the way for the future of precision manufacturing.

Built on a robust, heavy-duty bed made from high-quality graded cast iron and other resilient materials, the series features a unique Step Up Structure that enhances load distribution. Its wide T-base structure ensures outstanding stability, enabling vibration-free cutting for larger job envelopes along the X-axis, even in extreme positions without any overhanging effects—ensuring superior cutting capabilities.

Packed with intelligent features, the HP Series includes a servo-driven digital door for the ATC that synchronizes with tool length, significantly reducing chip-to-chip change time while preventing unwanted coolant or chip entry. With Jyoti electro spindles featuring HSK 100 and BBT 50 tapers, the series delivers impressive power, torque, and RPM, offering increased productivity and remarkable versatility to tackle a wide variety of machining tasks with exceptional precision.

5-AXIS MACHINING CENTERS

HURON'S GU 5 FOR INTRICATE MACHINING OPERATIONS

The GU Series machines represent the forefront of moving gantry 5-axis technology. In today's competitive environment, machinists require 5-axis machining centers that deliver enhanced dynamics, along with exceptional accuracy and reliability. Huron Graffenstaden's solutions are ideally positioned to meet these critical industry demands. Offering an optimal balance of cutting-edge technology and strong return on investment, the GU Series is designed to perform intricate machining operations with precision, efficiency, and adaptability, making it a valuable asset in modern manufacturing.

With a moving gantry architecture, swivelling rotary table, and thermal stability ensured by cooling circuits surrounding the linear motion bodies and ball screw nut bracket, the series is engineered for peak performance. Its electro spindle, developed for high-efficiency machining, delivers a high chip removal rate and features an integrated cooling system that ensures smooth operation and extends service life.

The GU Series offers exceptional stability and high dynamics, enabling reliable performance and superior machining capabilities across a wide range of applications. These advanced machines serve diverse industries, including Aerospace, Automotive, Healthcare, and other sectors where precision machining is essential.

Huron Graffenstaden
Hall & Stand: 15/D-35

5-AXIS MACHINING CENTERS

HURON'S KX 100 FOR HIGH-VALUE, COMPLEX COMPONENTS

Direct measurement on linear and rotary axes ensures exceptional volumetric precision, while the modular design allows customization through different variants and equipment configurations. These features combine to deliver superior surface finish, reduced set-up times, and long mechanical life for manufacturers handling high-value, complex components.

The KX 100 from Huron's KX Large Series is a high-precision, large-capacity five-axis/five-side machining center engineered for the continuous production of complex parts. Its fixed-portal architecture ensures maximum structural rigidity and thermal stability, delivering high accuracy and repeatability even when machining tough materials. With an expansive work envelope capable of accommodating volumes up to 4,080 × 2,180 × 1,550 mm and a load capacity of 20 tonne, the KX 100 is ideally suited for large-scale components in general mechanical engineering, precision 3D shapes, and parts for the Aeronautical and Energy sectors.

Designed to maximize productivity, the KX 100 features a palletizing function for uninterrupted machining, wide column clearance for full utilization of the work volume, and high-performance spindles capable of both heavy-duty roughing and high-speed finishing. Direct measurement on linear and rotary axes ensures exceptional volumetric precision, while the modular design allows customisation through multiple variants and equipment configurations. These capabilities combine to deliver superior surface finishes, reduced setup times, and long mechanical life—making the KX 100 a powerful solution for manufacturers handling high-value, complex components.

Huron Graffenstaden
Hall & Stand: 15/D-35

REVOLUTIONIZING MEASUREMENT AND INDUSTRIAL CONTROL

At EMO 2025, Marposs will present a selection of new solutions for quality control, tool diagnostics, and machine tool integration. These developments cover a broad range of manufacturing processes, including grinding, turning, and electric powertrain applications, with a focus on improved measurement precision, and process reliability.

VISUAL TOOL SETTERS

VTS WITH SURFACE INTEGRITY CHECK SOFTWARE

The VTS (Visual Tool Setter) is a non-contact optical system designed to inspect and measure cutting tools using CCD sensors and shadow projection. At EMO 2025, Marposs will introduce a significant enhancement to the system: the new Surface Integrity Check software. This feature enables automatic detection of tool wear without requiring reference images, making it suitable even for tools that have not been previously inspected.
To support this function, VTS is now equipped with a six-LED light ring that eliminates reflections and unwanted shadows, ensuring consistent image quality and more reliable analysis across a wide range of tool types.
Integrated with the CNC, it enables automatic inspections during the machining cycle, transmitting tool wear status directly to the machine. The operator can view high-quality images directly from the machine control, avoiding machine stoppages and manual microscope inspections. This marks a significant step toward in-process metrology and smart automation.

Marposs
Hall & Stand: 5/D-13

NON-CONTACT TOOL MEASUREMENT SYSTEMS

ML3G: PRECISION AND RELIABILITY IN LASER TOOL MEASUREMENT

Among the highlights at EMO 2025 is ML3G, a new non-contact tool measurement system based on laser technology. Developed for use with small, delicate, or coated tools, ML3G enables rapid and precise measurements directly at real operating speeds, helping to eliminate errors caused by runout and dynamic variations.
Building on Marposs' experience in laser-based tool measurement, the ML3G introduces several key enhancements: a high-performance processor for faster data processing, redesigned shutters for improved sealing, an integrated air blower for tool cleaning, and a reinforced mechanical structure to ensure stability even in challenging industrial conditions. With four available lengths and three mounting configurations, the system offers flexibility to suit a wide range of machine tools.

Marposs
Hall & Stand: 5/D-13

PROCESS MONITORING, CONTROL, AND DATA MANAGEMENT

GRINDING: NEW DEVELOPMENTS IN PROCESS MONITORING

For the grinding sector, Marposs will present three new technologies aimed at improving process monitoring, control, and data management.

- The OTX system is a compact solution for grinding wheel balancing and vibration control. It operates at high spindle speeds and uses ultrasonic sensors to detect and process vibration signals directly at the source, helping to maintain stability and surface quality during machining.
- The BLÚ system is a centralized digital platform for managing sensor data on machine tools. At EMO 2025, it will feature the new RECORDING function, which enables continuous tracking and storage of process data. Information collected by the sensors is stored in the BLÚ MASTER unit and can be exported for external analysis—supporting advanced diagnostics and potential integration with AI-based optimization tools.

Marposs
Hall & Stand: 5/D-13

Marposs
Hall & Stand: 5/D-13

GEAR NOISE AND VIBRATION TESTING SYSTEMS

NVH G-EAR: GUARANTEED QUIETNESS IN ELECTRIC DRIVETRAINS

With the rise of electric and hybrid vehicles (EV/HEV), transmission noise has become a critical factor for comfort and perceived quality. The new version of the NVH G-EAR machine is Marposs's answer to this challenge—a system capable of testing each individual gear before final assembly under real operating conditions (2,000 rpm, 25 Nm), using single flank rolling with a master gear.
The competitive advantage is clear: identifying potentially noisy gears before they enter production drastically reduces rework, scrap, and costs. During EMO, visitors will be able to explore the system's full capabilities thanks to a large interactive display and the support of Marposs specialists on-site.

UCAM
Engineering Excellence. Exactly.

INNOVATION IN MOTION

UCAM, India's leading manufacturer of high-precision CNC rotary tables, is all set to unveil a powerful portfolio of next-generation rotary tables and automation solutions at EMO Hannover 2025, demonstrating how its innovations are driving higher accuracy, efficiency, and competitiveness in global manufacturing. The advanced solutions are set to meet the evolving needs of diverse industries.

CNC ROTARY TABLES

URQ-180 RH FOR HIGH-SPEED PRODUCTION

The versatile URQ HS Series High-Speed CNC Rotary Table is expertly engineered for mass production. Designed for high-speed indexing and continuous cutting of small workpieces, it ensures seamless machine integration and superior performance in demanding industrial environments. With its precision engineering, the URQ-180 RH is ideally suited for high-accuracy tool manufacturing across the Aerospace, Automotive, and Agriculture sectors.

URQ-200 FOR PRECISION AND PERFORMANCE

Engineered with advanced precision, the URQ-200 is ideally suited for manufacturing high-accuracy tools across the Aerospace, Automotive, and Agriculture sectors. The URQ HS Series High-Speed CNC Rotary Table is built for mass production, excelling in rapid indexing and continuous cutting of small workpieces. Designed for seamless integration, it delivers reliable performance even in the most demanding industrial environments.

URQ-250: PRECISION ROTARY TABLE FOR DEMANDING INDUSTRIAL ENVIRONMENTS

With precision engineering at its core, the URQ-250 is an ideal choice for high-accuracy tool manufacturing in Aerospace, Automotive, and Agriculture. The URQ HS Series High-Speed CNC Rotary Table, built for mass production, excels in high-speed indexing and continuous cutting of small workpieces. Seamlessly integrating into machining setups, it delivers consistent performance even in the most challenging industrial environments.

TILTING TABLES

USSR200Q-TILT FOR 5-AXIS PRECISION

The UCAM Q Series USSR200Q-Tilt Tilting Rotary Table is a highly versatile solution engineered to upgrade any 3-axis vertical machining center into a full 5-axis machine.

HIGHLY VERSATILE ULSR200Q-TILT

Engineered to transform any 3-axis vertical machining center into a complete 5-axis machine, the UCAM Q Series ULSR200Q-Tilt Tilting Rotary Table offers a dynamic solution.

ROTARY PRODUCTION SYSTEMS

URPQ-200 HIGH-SPEED, MODULAR ROTARY PRODUCTION SYSTEM

The URPQ HS Series Rotary Production System is a highly versatile, modular solution designed to maximize efficiency. With the ability to accommodate multiple components simultaneously and support multiple setups on the same fixture, it significantly enhances productivity while ensuring precision and reliability in demanding manufacturing environments.

ROTARY TABLES

URX 320 X SERIES ROTARY TABLE FOR MEDIUM-SIZE PRECISION MACHINING

The UCAM X Series URX 320 Rotary Table carries a proven legacy of compatibility with all major VMC brands in the market. Built with a robust design and high rigidity, it is ideally suited for machining medium-size components across the Automotive, Aerospace, and General Engineering industries.

ROTARY TABLES

UTTR SERIES: TABLE-IN-TABLE ROTARY SOLUTIONS FOR SEAMLESS INTEGRATION

The UTTR Series Rotary Tables are designed to be integrated directly into the machine bed, offering a compact and efficient machining solution. Available in both worm wheel drive and direct drive configurations, the series provides flexibility, precision, and reliability for diverse manufacturing applications.

UNXT 250: NEXT-GEN ROTARY TABLE WITH ROLLER CAM TECHNOLOGY

The UNXT 250 Series Rotary Table introduces advanced Roller CAM technology, leveraging high-precision cam profiles and advanced motion dynamics to deliver superior accuracy, minimal backlash, and robust performance. Designed for modern machining systems, it ensures precision, reliability, and efficiency, making it an ideal solution for today's high-demand manufacturing environments.

CANTILEVER ROTARY TABLES

UDD600CT FOR ADVANCED 5-AXIS MACHINING

The UDD600CT Cantilever Rotary Table is an integral part in 5-axis machining centers, enabling complex and precise machining operations. Offering both tilt and rotary motion, it allows parts to be positioned and machined at multiple angles, greatly enhancing a machine's ability to produce intricate shapes, contours, and features. By facilitating access to multiple faces of a workpiece, it ensures efficient 5-axis simultaneous machining. The UDD600CT is ideal for manufacturing turbine blades, impellers, medical implants, and a wide range of other complex components.

UCAM Pvt Ltd
Hall & Stand: 12/E-51

Company Index

Advertiser Index