VOL 8, ISSUE 3 - SEPTEMBER-OCTOBER 2024

# MODERN MANUFACTURING INDIA

WWW.MMINDIA.CO.IN

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

IMTEX 2025
International Machine Tool & Manufacturing Technology Exhibition

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

23 - 29 January 2025 . BIEC, Bengaluru

# In Pursuit of GROWTH

REACHING BEYOND HORIZONS
IMTS 2024 & AMB 2024
52 & 58

CHENNAI METCO PVT LTD
Making a Global Impact
36

PRASANTH SAKHAMURI
Managing Director
Hind High Vacuum (HHV) Group
32

STM
Manufacturing Unit
of S&T Group

# Experience
# Small but Mighty Precision

Aerospace

Die & Mould

Automobile


Tooling

Medical

## VL 510
### 3 Axis VMC

Revolutionize your small parts manufacturing with the STM VL 510 Vertical Machining Center! This compact powerhouse boasts an impressive X/Y/Z travel of 550/410/480 mm and a robust 650 x 410 mm table supporting up to 250 kg. From intricate aerospace components to precise medical devices, the STM VL 510 delivers top-tier performance that will skyrocket your production capabilities.

Proudly MADE IN INDIA

**S&T MACHINERY (P) LTD.**
+91-422-2590810 +91 95974 34111 info@stmcnc.com www.stmcnc.com

25+ YEARS

S&T GROUP SINCE 1996

**Discover the meaning of value**

Since 1857
HURON
Subsidiary of Jyoti CNC

JYOTI

# 1,30,000+

Installations across 62 Countries

Finest Range of CNC Machines

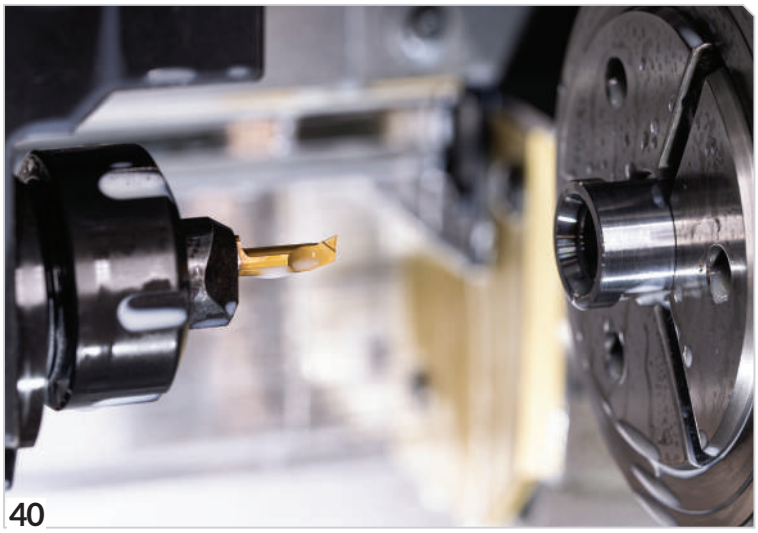
Turning / Turn-Mill Centers | Vertical Machining Centers
Horizontal Machining Centers | 5-Axis Machining Centers | Multi-Tasking Machining Centers


## 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 8, ISSUE 3 – SEPTEMBER–OCTOBER 2024










# IMPRINT


**PUBLISHER**
**DIRECTOR GENERAL, IMTMA**

**EDITORIAL**
**Editor-in-Chief**
Soumi Mitra

**Chief Copy Editor**
Poonam Pednekar

**Senior Sub-Editor**
Sovan Tudu

**Senior Correspondent**
Murali Sundaram

**Staff Writer**
Nityasree Kumaraswamy

**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

**Manuscripts:** No liability is accepted for unsolicited manuscripts. They will be returned only if accompanied by sufficient return postage.

PRECISION
PERFORMANCE
PRODUCTIVITY DELIVERING
PROSPERITY

LMW®

# INDIA'S FINEST RANGE OF CNC MACHINES

TURNING

MILLING

TURNMILL

## SOLUTIONS CRAFTED FOR EVERY INDUSTRY

FOLLOW US ON:

LMW CNC


**LAKSHMI MACHINE WORKS LIMITED**

MACHINE TOOL DIVISION

+91 422 719 1300 | mtd_marketing@lmw.co.in

www.lmwcnc.com

# INDIA, AN EMERGING DESTINATION FOR MANUFACTURING

**RAJENDRA S RAJAMANE**
**PRESIDENT**
**IMTMA**

A country's economic growth and prosperity include manufacturing as a key component, and the story is no different for India, where manufacturing is becoming an integral part of its growth. The performance of key sectors like automotive, engineering, pharmaceuticals, consumer durables, and sunrise sectors is aided by the machine tool industry, the backbone of manufacturing.

As per the Government of India's estimates, manufacturing is expected to contribute around US$ 1 trillion by 2025-26. The Government's thrust on exports and a rising middle class, which is expected to have the second-largest share in global consumption by around 2030, are encouraging signs for companies to step up investments.

Meanwhile, the machine tool industry needs to invest in precision manufacturing, automation, robotics, artificial intelligence, industrial Internet of things, and so on for outcome-oriented results.

To provide a more focused approach and elevate India's manufacturing aspirations, Indian Machine Tool Manufacturers' Association (IMTMA) is organizing the 'India Opportunities' Session during International Manufacturing Technology Show 2024 (IMTS 2024) at McCormick Place in Chicago, IL, USA, from September 9 - 14, 2024, which will be an opportunity to strengthen collaborations between India and the US.

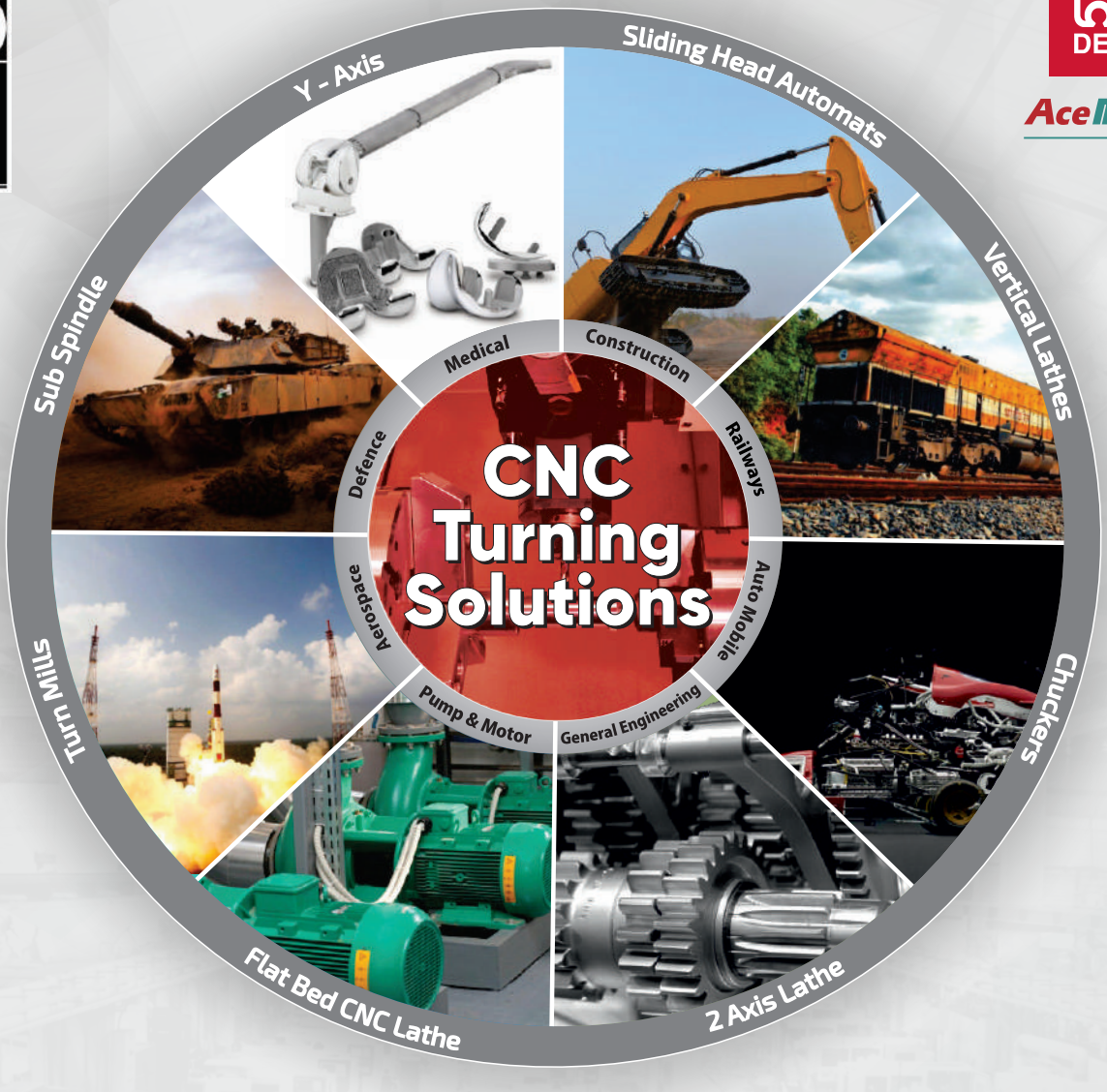
*To provide a more focused approach and elevate India's manufacturing aspirations, Indian Machine Tool Manufacturers' Association (IMTMA) is organizing the 'India Opportunities' Session during International Manufacturing Technology Show 2024 (IMTS 2024) on September 10, 2024, at McCormick Place in Chicago.*

Modern Manufacturing India (MMI) will be offering updates on the event and the opportunities seized by Indian manufacturing players during the trade fair in its upcoming editions. Stay tuned for the same and more, and wish you a joyful reading experience.

THE ECONOMIC TIMES
BEST METAL CUTTING BRANDS 2023

ACE DESIGNERS

AceMicromatic® Group




## Ace offers wide range of products & solutions, which caters to different industry segments.


CAT Series


Compact Series


Classic Series


Jobber EVO Series


LT Series

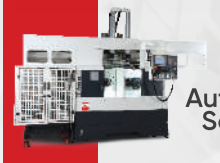

Vantage Series


Simpleturn Series


Sliding Head Automates


Twin Spindle


Premium Series


Automation Solutions


VTL Series

Visit us on
**www.acemicromatic.net**

Mail your queries to
**salesmmt@acemicromatic.com**

Follow us on :

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

Dear Readers,

Espousing technologies and solutions across the entire spectrum of manufacturing with optimized resource utilization is imperative for maintaining excellence in business. It is with this aim that Indian Machine Tool Manufacturers' Association (IMTMA) is participating in International Manufacturing Technology Show (IMTS 2024).

IMTS 2024, organized by AMT - The Association For Manufacturing Technology, from September 9 - 14, 2024, at McCormick Place, Chicago, provides an opportunity for global companies to explore and embrace technologies that are essential for making rapid advancements in digitalization and manufacturing.

India and America have fundamental commonalities, both are thriving democracies with strong value systems and open market economies. The investment climate in India is cordial for American companies willing to set up industrial units. With more than 50 percent of the consumption being met by imports from Asia and Europe, there is ample scope for America to work with India as a natural partner.

While Indian companies are looking for technology upgrades, American companies have an opportunity to provide solutions and set up production processes in India which will be mutually beneficial. To find the synergy between India and America in the manufacturing sector, a session on 'India Opportunities' is to be held at IMTS 2024. It will be an appropriate forum for Indian companies to connect with American companies to collaborate and find larger business opportunities.

The current edition of MMI includes a writeup contributed by IMTMA that provides insights on why American companies should collaborate for making in India and making for the world.

*While Indian companies are looking for technology upgrades, American companies have an opportunity to provide solutions and set up production processes in India which will be mutually beneficial. To find the synergy between India and America in the manufacturing sector, a session on 'India Opportunities' is to be held at IMTS 2024.*

As we share thought-provoking articles and reports on various industries, we also reach out to you for your feedback, comments, and analysis to make this magazine more insightful and interesting. The exercise will also help us understand your requirements and allow us to meet your expectations as we move on.

You can download all previous issues from **https://www.mmindia.co.in/magazine_issues.** I thank you once again for your continued interest in the activities of IMTMA.


# THE **DECISION SUPPORT** YOU NEED FOR **EFFICIENT CONDITION MONITORING** & TO **REDUCE REPAIR COSTS**

Find, report, and fix issues before they become expensive, with FLIR's complete range of Test & Measurement solutions.

**Test & Measurement Tools**

**Thermal & Acoustic Imaging Cameras**

**Analysis Software**

Images for illustrative purposes only.

Secure Storage | Top-tier Service and Support

**Learn more about FLIR**

For more information, please call us at **+91-11-4560 3555** or write to us at **flirindia@flir.com.hk**

# GROWTH IS LIMITLESS, AS IS HUMAN INTELLIGENCE AND IMAGINATION

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

It has been a year since the Indian Space Research Organisation (ISRO) created history by successfully completing its Chandrayaan-3 mission. With this accomplishment, India became the first country to land on the Moon's south pole, and the fourth to land on its surface, solidifying its global stature in space technology.

To commemorate this monumental success, India celebrated the maiden edition of National Space Day this year, centered around the theme 'Touching Lives while Touching the Moon'. Exhibitions, panel discussions, and educative initiatives were featured across the county, all aimed at offering a deeper understanding of the impact space technology has on our everyday lives.

Continuing the momentum, the Indian Space sector achieved another milestone this August with the launch of the first reusable hybrid rocket 'RHUMI-1' from Thiruvidandhai, Chennai. Space Zone India, a home-grown technology startup developed the rocket in collaboration with Martin Group, which carried 50 PICO satellites and three CubeSats of varying sizes, designed to gather data on global warming and climate change. This engineering feat demonstrates the country's advancements in rocket engineering and underscores its commitment to cost-effective and innovative solutions.

> *Do not figure out big plans at first, but, begin slowly, feel your ground and proceed up and up.*
>
> ***– Swami Vivekananda***

The Machine Tool industry, hailed as the backbone of all engineering marvels, is also making strides to meet the increasing demand for high-precision quality components for various industry applications.

The upcoming international exhibitions IMTS 2024 in Chicago and AMB 2024 in Stuttgart will see a strong presence of Indian machine tool builders, proving that 'Made in India' products are gaining unprecedented acceptance. As an entourage, Modern Manufacturing India will be present at both the manufacturing shows to capture the essence and report on the innovations and trends poised to shape the future of manufacturing.

# Unlock
## the Future of Engineering with Eplan

Imagine a world where your engineering projects are not just completed but optimized -where every design is precise, every process efficient,and every deadline met.

**Welcome to Eplan,**
**the global leader in electrical and mechatronics designs and automation.**

Eplan's cutting-edge software revolutionizes your approach to engineering, powering innovation in energy, manufacturing and automation. Streamline workflows, enhance collaboration and ensure accuracy with our state-of-the-art platform. From planning to maintenance, Eplan is your partner at every stage.

**Don't just follow the industry-lead it. Experience Eplan today.**

SCAN ME


**EPLAN Software Private Limited**
5th Floor, Brigade Triumph, Dasarahalli Main Road,
Sector B Hebbal Kempapura, Bengaluru -560092.
info@eplan.in www.eplan.in
**Ms.Pooja Narain** 97311 57563 pooja.narain@eplan.in

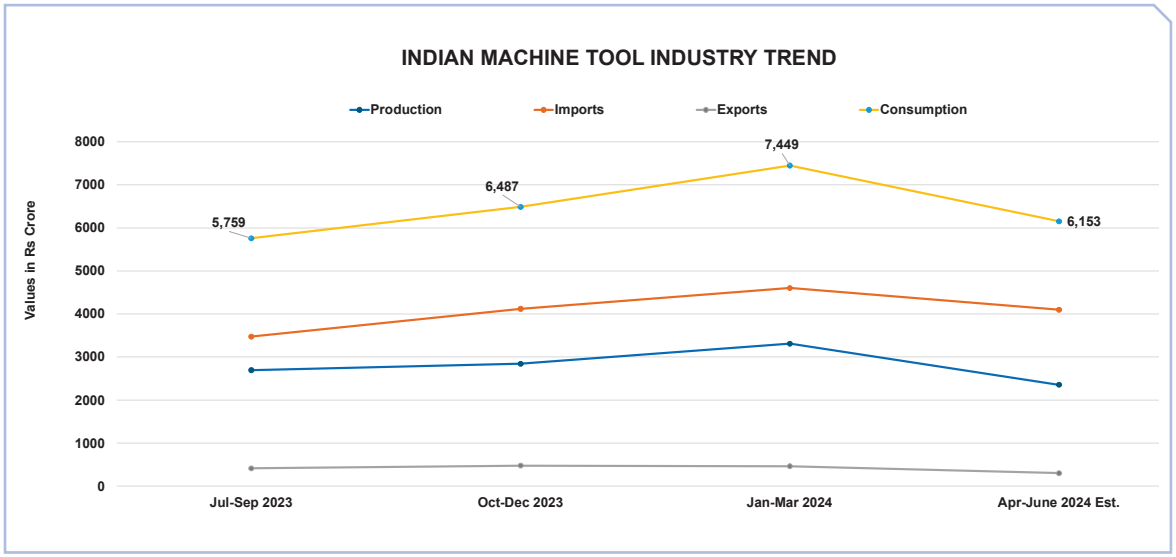

PROCESS CONSULTING | ENGINEERING SOFTWARE | IMPLEMENTATION | GLOBAL SUPPORT

FRIEDHELM LOH GROUP

POWERED BY
Indian Machine Tool Manufacturers' Association

# RESILIENCE AMID ECONOMIC SHIFTS

Despite economic fluctuations, the Indian machine tool industry is experiencing robust growth in FY25. The Government's recent budget outlines significant expenditure with a focus on reducing the revenue deficit. Increase in production in Q1 FY25, rise in imports, and a slight decline in exports. More in the report below.




Source: IMTMA

Table 1. Indian Machine Tool Industry Trend

In July 2024, the Indian Government unveiled its budget for FY25. The budget outlines total expenditure at INR 48.2 lakh crore, split between revenue and capital expenditures in a 77:23 ratio. The budget projected a fiscal deficit to GDP ratio of 4.9 percent. This represents a slight improvement from the 5.1 percent forecasted in the interim budget. A notable highlight is the anticipated enhancement in the quality of the fiscal deficit, with the ratio of revenue deficit to fiscal deficit expected to decrease to 36 percent in FY25, down from 46.3 percent in FY24.

## Economic indicators: PMI and IIP growth

The economic performance indicators for June 2024 reflect a positive trend. The Purchasing Managers' Index (PMI) for both manufacturing and services saw gains, reaching 58.3 and 60.5 respectively, up from 57.5 and 60.2 in May. Additionally, the Index of Industrial Production (IIP) growth accelerated to 5.9 percent in May, driven by increased manufacturing and electricity output, compared to 5 percent in April.

## Inflation trends: CPI and WPI analysis

Inflation metrics present a mixed picture. Consumer Price Index (CPI) inflation rose to 5.1 percent for the first time since January 2024, although core CPI inflation remained stable at a historical low of 3.1 percent. Conversely, the Wholesale Price Index (WPI) inflation, while still low at 3.4 percent, has been increasing for four consecutive months. This inflationary trend is coupled with an interesting shift in Government finances, with gross tax revenues growing significantly by 15.8 percent in the early months of FY25, driven by robust direct tax collections.

## Government spending and fiscal deficit

The fiscal landscape also reveals a contraction in Government expenditure during April-May FY25, with total spending down by 0.4 percent. Revenue expenditure increased by 4.7 percent, but capital expenditure fell sharply by 14.4 percent. Fiscal and revenue deficits for this period were recorded at historically low levels of 3.1 percent and -15.7 percent, respectively. On the banking front, gross bank

Article source: Data & Policy Team, IMTMA

credit growth remained strong at 16.1 percent in May, up from 15.3 percent in April. In its July 2024 report, the IMF projected global growth rates of 3.2 percent for 2024 and 3.3 percent for 2025. For India, the projected growth rates are 7 percent in 2024 and 6.5 percent in 2025.

Trade and investment dynamics show a slowdown. Merchandise exports and imports grew at 2.5 percent and 5.0 percent in June 2024, down from higher rates in May. The trade deficit narrowed to US$ 21 billion, aided by a decrease in oil imports. Foreign Direct Investment (FDI) inflows eased to US$ 3.3 billion, while Foreign Portfolio Investments (FPI) experienced outflows of US$ 1.5 billion. Globally, crude oil prices dropped to a four-month low of US$ 81.2 per barrel. Economic forecasts from the World Bank and IMF project a moderate global growth, with India's growth expected to range between 6.6 percent to 7.0 percent in the upcoming fiscal years.

## Machine tools production and consumption

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

SCAN ME

For detailed insights into the Indian machine tool industry, please scan the QR code to visit IMTMA's Publications Webpage.

In Q1 FY25, China (32%), Japan (20%), and South Korea (10%) emerged as the top countries for imports to India, contributing to 62 percent of the total machine tools imports. Presses (15%), Lathes (9%) Cylindrical Vertical Machining Centres (8%) were the top three machinery types imported, valued at INR 1,158 crore (US$ 139 M), constituting about 32 percent of total machine tool imports during the period. Imports from Asian nations like China, Japan, South Korea, and Taiwan contributed 69 percent of total imports during Q1 FY25.

In exports, Russia (25%), the UAE (7%), and the US (4%) emerged as the major destinations, collectively representing 36 percent of total machine tool exports in Q1 FY25, amounting to a total export value of INR 301 crore (US$ 36 M). Among the machinery types, VMCs (15%), Lathes (12%), and Cylindrical Grinding machines (7%) stood out as the top three machinery types exported, with a combined value of INR 135 crore (US$ 16 M), accounting for about 34 percent of total machine tool exports during Q1 FY25.

**In exports, Russia (25%), the UAE (7%), and the USA (4%) emerged as the major destinations, collectively representing 36% of total machine tool exports in Q1 FY25, amounting to a total export value of INR 301 crore (US$ 16 M).**

POWERED BY
Indian Machine Tool Manufacturers' Association

# INDIA, A RISING ECONOMIC POWERHOUSE IN MANUFACTURING

India demonstrates an assortment of strengths that underpin its potential to be a global economic and manufacturing powerhouse. Attesting to it is the S&P Global Market Intelligence report that estimates it to be the third-largest economy, overtaking Japan and Germany by 2030. The following article discusses the advantages that can help our industries, including the machine tool and other sunrise sectors, evolve and propel the nation to its predicted position.

Investments flow when chances are favorable. The successful enterprises we see today are the ones that have explored markets, expanded their range and footprint, and invested time and resources consistently. Such companies are a testament to the adage that success comes over a while.

The location is also a major factor that drives investment. Many foreign firms including American companies eye India for long-term investment prospects, not only for cost arbitrage advantage but also for the future growth opportunity. Aided by India's friend-shoring policy, American companies are considering investing in India as it is shaping up as a robust alternative destination for manufacturing.

## India beckons

So why India and not any other country, some would ask? Well, for the unversed, India demonstrates an assortment of strengths that underpin its potential to be a global economic and manufacturing powerhouse. India is heading to be the third-largest economy overtaking Japan and Germany by 2030, as per the S&P Global Market Intelligence report.

Manufacturing is slated to play an enabling role in this important journey. Sunrise sectors, especially, Renewables, Green Hydrogen, Artificial Intelligence,

Source: IMTMA

Source: Magic Wand Media

Agro-processing, Fintech, Microprocessors, and many others will also be contributing significantly.

Other factors like a large and growing market, a rising middle class with buying power, and capex spending by the Government on infrastructure, logistics, agriculture, skilling, and energy development are encouraging for industries looking to manufacture from India.

## Machine tool industry to thrive

In this period of manufacturing growth, it is a natural possibility that the evolution of the Indian Machine Tool industry will be robust. Although the growth of the Machine Tool industry hitherto had been largely dependent on the Auto sector, which shall continue for some time in the future, the opportunity to contribute to other emerging sectors is also a possibility that will continue to grow and cater to India's growth story.

The Auto sector will remain a major customer for the Machine Tool industry with a market size that is expected to grow from its current INR 5.6 lakh crore (US$ 67 B) to INR 16.7 lakh crore (US$ 201 B) by 2026. Looking beyond this, there are immense prospects from other sectors that are promising. The market size looks encouraging for sectors like Defence (INR 1.73 lakh crore [US$ 21 B] by 2025), Electronics Manufacturing (INR 2.5 lakh crore [US$ 30 B] by 2026), Medical Devices (INR 4 lakh crore [US$ 48 B] by 2026), Toys (INR 0.25 lakh crore [US$ 3 B] by 2028), and Furniture (INR 2.7 lakh crore [US$ 33 B] by 2026). (Source: Invest India/IBEF).

The Capital Goods sector, with its 10 sub-sectors, will grow significantly by 2025. Likewise, Railways, with high-speed trains, infrastructure with the National Master Plan, and productivity-linked incentive (PLI) schemes, will trigger demand.

The domestic market share of machine tools is around 45-50 percent, which opens room for foreign firms to consider investments in India and cater to the untapped market share.

Considering India's potential in manufacturing, it is the best time for foreign investors to continue their investments in sunrise sectors and support the industry including the Machine Tool and Ancillary industries.

## IMTMA holds the flame

Indian Machine Tool Manufacturers' Association (IMTMA) has always been at the forefront when it comes to finding opportunities for manufacturing growth. The Association organizes technology missions for CEOs and senior executives of member organizations to visit reputed machine tool and manufacturing technology exhibitions and understand the latest advancements and best practices. IMTMA also organizes the 'India Opportunities' sessions, jointly with international associations which bring together exhibitors and visitors to connect and discuss business opportunities in the Indian market.

The International Manufacturing Technology Show (IMTS 2024) in Chicago from September 9 - 14, 2024, is an opportunity for the designers, builders, sellers, and drivers of manufacturing technology from India and the US to connect, be inspired, and find solutions.

India looks up to America for cutting-edge technology while America can rely on India for making advanced machines and breakthrough innovations. Jointly the two countries can work to build energy-efficient lightweight green products and processes, using industrial collaboration and possibly leveraging the strength of startups. Breakthrough technologies in the machine tool and manufacturing arena can be explored further.

IMTMA can support American companies to explore possibilities in R&D, innovation, and the overall manufacturing process in India. It can also aid in exploring partnerships and joint ventures with its member companies which can enable collaborative work.

As trade between the two countries deepens further, India could be a reliable partner for America to source machine tools for Asian countries, the Middle East, and Northern America regions. Precision machine tool building and precision component manufacturing can create big opportunities for Indo-American partnerships with a ceaseless supply of trained technical manpower from India. It will be a win-win situation for both Indians and Americans.

**IMTMA can support American companies to explore possibilities in R&D, innovation, and the overall manufacturing process in India. It can also aid in exploring partnerships and joint ventures with its member companies which can enable collaborative work.**

# HOW LASERS ARE REVOLUTIONIZING EV BATTERY RECYCLING

Laser-based battery recycling is poised to radically change the EV industry, offering a sustainable solution for waste vehicle battery management. As this technology continues to evolve, it is essential to address the challenges and limitations, ensuring a scalable and cost-effective approach.

Source: TRUMPF

A TRUMPF employee explains where the battery will be cut open by the laser.

A TRUMPF employee cutting open used/faulty batteries using laser technology.

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

With millions of EVs being sold around the world, one of the critical issues being faced worldwide is the recycling of large lithium-ion batteries. These batteries pose a serious environmental problem due to their complex composition and hazardous materials.

To be recycled, EV batteries must first be dismantled, which is no simple task because batteries are not standardized. The packs from various car models are of different sizes, containing differently shaped battery cells joined together by welds and other connections that must be broken down. This complexity makes the process more expensive and dangerous. However, a cutting-edge technology is emerging as a game-changer in the field of EV battery recycling - Lasers.

Pradeep Patil, Managing Director, TRUMPF India, says, "Carmakers and battery manufacturers can

TEXMO®

Borewell Submersibles
Single Phase Jet Pumps
Single Phase Domestic pumps

AQUA GROUP

**Pumps you can rely on**

AQUATEX®

Agricultural monoblocks
Open-Well Submersibles
Pressure Boosting Systems

# COOLANT PUMPS

## Pumps For Machine Tool Applications

CTS

IE2 / IE3 MOTORS

**PUMPS FOR MILLING MACHINE**

**PUMPS FOR LATHE**

**PUMPS FOR WIRE EDM**

**PUMPS FOR GRINDING**

## AQUASUB ENGINEERING UNIT IV*

Nehru colony, J.N Palayam, K.Vadamadurai Post,
Coimbatore - 641 017. Phone: (+91) - 76675 01572
Email : coolantpump@aquagroup.in , www. aquagroup.in

> "The electrodes for new battery cells are created as foil strips coated with valuable materials such as cobalt and nickel. In a future recycling plant, laser processes can remove the wafer-thin layer from the foil. Manufacturers can collect the precious dust and process it for new coatings."
>
> **Pradeep Patil**
> **Managing Director**
> **TRUMPF India**

**Laser technology enables the extraction of high-quality materials, suitable for reuse in new battery production. Laser- based recycling can recover up to 90 percent of valuable materials like lithium, nickel, and cobalt, while traditional recycling methods can recover only around 50-60 percent of these materials.**

now recycle used or defective batteries from electric cars on an industrial scale using laser technology from TRUMPF. TRUMPF has developed laser systems that cut used batteries safely and remove the valuable raw materials from the battery foil."

Mohammed Hidayath, Director of Sales, TRUMPF India, says, "TRUMPF has extensive expertise in laser welding and cutting for the production of EV batteries. It has been working with most of the leading car and battery manufacturers for a long time, and we have used this vast experience to develop new processes."

TRUMPF presented its new laser EV recycling processes for the first time at the Battery Show Europe 2024, in Stuttgart.

## A large market for recycling EV batteries

All EV batteries contain valuable raw materials such as cobalt, lithium, or nickel. However, the extraction of these raw materials is expensive and not always sustainable. Manufacturers also have to accept long and uncertain supply chains. In addition, the EU requires a recycling rate of up to 90 percent for batteries.

Alexander Sauer, Head, Fraunhofer Institute for Manufacturing Engineering and Automation IPA, said that the industry has to recycle on a large scale and the market for laser processes for recycling batteries, which is currently emerging, is huge. It is estimated that in Europe alone, the industry will have to recycle 5,70,000 tonne of battery material annually from 2030.

The global EV battery recycling market is projected to grow from US$ 1.4 billion in 2020 to US$ 12.8 billion by 2027, with laser-based recycling playing a key role.

## How lasers are used in battery recycling

Lasers are employed in several ways to recycle waste vehicle batteries:

***Disassembly:*** High-precision lasers cut through battery casings and internal components, allowing for safe and controlled disassembly.

***Material separation:*** Lasers selectively vaporize and remove specific materials, enabling the separation of valuable components from hazardous ones.

***Purification:*** Laser-induced breakdown spectroscopy (LIBS) analyzes the chemical composition of materials, ensuring the quality and purity of recovered substances.

## Benefits of laser-based battery recycling

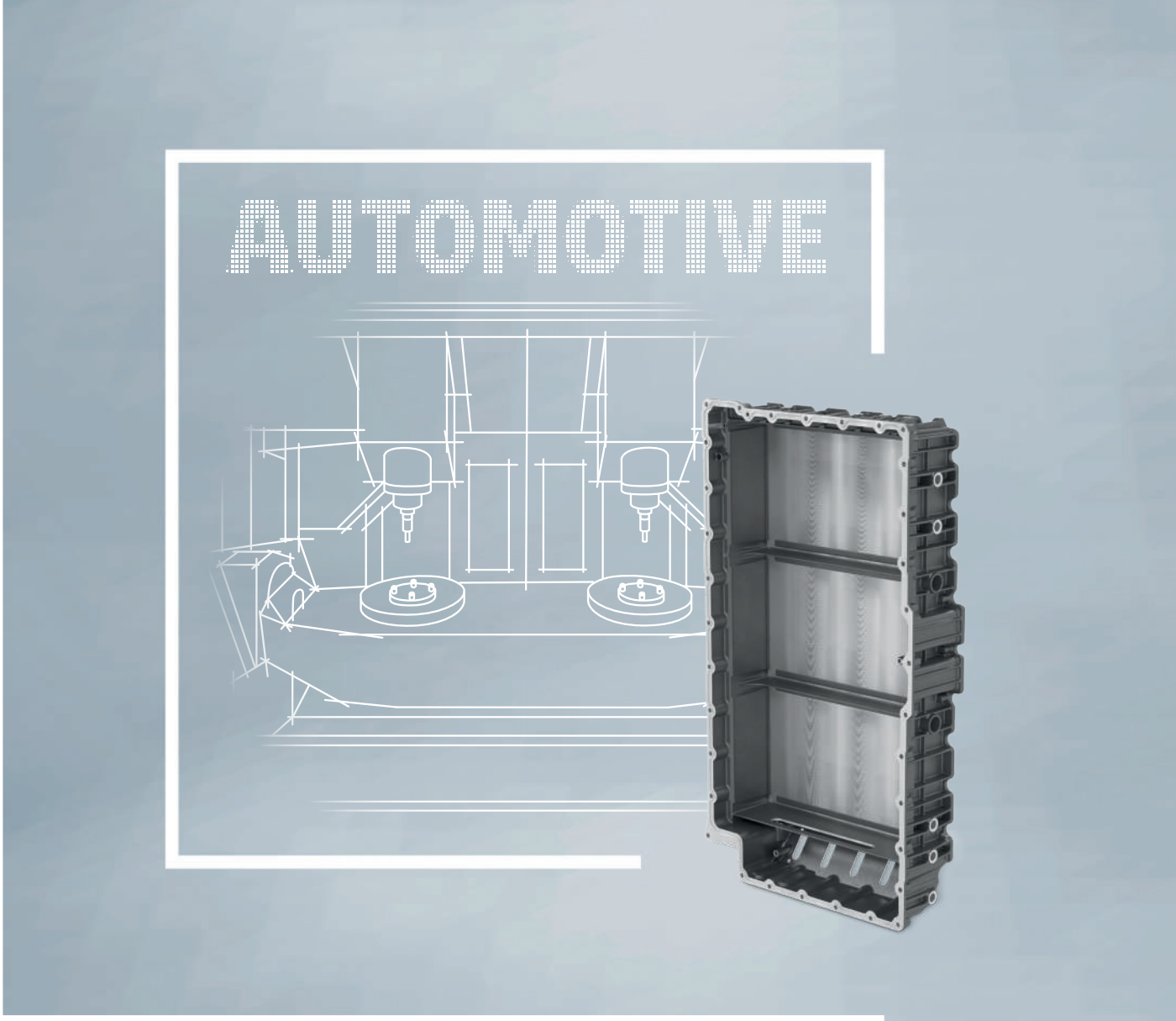
***Enhanced safety:*** Lasers minimize the risk of explosions and toxic emissions associated with traditional mechanical disassembly methods.

***Increased efficiency:*** Laser processing speeds up the recycling process, reducing costs, and environmental impact. Laser-based recycling can reduce processing time by up to 70 percent compared to traditional methods. It can also reduce costs by up to 50 percent due to increased efficiency and reduced labor needs.

***Improved material recovery and reusability:*** Laser technology enables the extraction of high-quality materials, suitable for reuse in new battery production. Laser-based recycling can recover up to 90 percent of valuable materials like lithium, nickel, and cobalt, while traditional recycling methods can recover only around 50-60 percent of these materials.

***Scalability:*** Laser-based recycling can be easily scaled up to accommodate growing demand, supporting the transition to a circular economy.

Patil says, "The electrodes for new battery cells are created as foil strips coated with valuable materials such as cobalt and nickel. In a future recycling plant, laser processes can remove the wafer-thin layer from the foil. Manufacturers can collect the precious dust and process it for




# Two spindles for maximum productivity

600, 800, 1,200 mm: With their graduated spindle clearance, the three Series 22, 25 and 28 are precisely designed for the various workpiece dimensions and cover the whole range of sizes and complex components for automotive applications.

CHIRON Group

**CHIRON India Machine Tools Pvt. Ltd.,**
#33, Naseer Affinity, 1st Floor,
Miller Tank Bund Road, Kaveriappa Layout
Vasanth Nagar, Bangalore – 560 052 / India
P +91 80 4905 6490
info.india@chiron-group.com

**www.chiron-group.com**

> "In the future, laser technology could also be used to recycle battery packs. Laser technology is the only way to ensure efficient and automated dismantling, for example, to remove the covers from batteries or to cut off cables. The raw materials can then be sorted and the battery cells that are still usable can be separated and reused directly."
>
> **Mohammed Hidayath**
> **Director of Sales**
> **TRUMPF India**

new coatings. Until now, it was not uncommon for kilometers of coated foils to end up as waste in the garbage."

Hidayath adds, "In the future, laser technology could also be used to recycle battery packs. Laser technology is the only way to ensure efficient and automated dismantling, for example, to remove the covers from batteries or to cut off cables. The raw materials can then be sorted and the battery cells that are still usable can be separated and reused directly. Until now, dismantling electric car batteries has been a manual process. It is laborious, slow, and sometimes dangerous for workers."

***Reducing environmental pollution:*** Traditional recycling methods can generate hazardous waste and emissions, contributing to environmental pollution. Laser-based recycling produces minimal waste and emissions, reducing the environmental footprint of EV battery recycling.

## Challenges for the future

While laser-based battery recycling holds great promise, several challenges need to be addressed.

***Cost reduction:*** High initial investment costs must be decreased to make laser technology more accessible.

***Standardization:*** Industry-wide standards for laser-based recycling processes are essential for ensuring consistency and quality.

***Research and development:*** Continued innovation is necessary to optimize laser technology and expand its applications.

Laser-based battery recycling is poised to revolutionize the industry, offering a sustainable solution for waste vehicle battery management. As this technology continues to evolve, it is essential to address the challenges and limitations, ensuring a scalable and cost-effective approach. By embracing laser-based recycling, we can unlock a more circular and environmentally conscious future for the Battery industry.

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

# Wide range of machines for your growing needs

**Sprint – Turning Center**
Batliboi


**Chetak – Vertical Machining Center,** Batliboi


**VTL – Vertical Turning Lathe**
Batliboi


**Annihilator – Gantry Machining Center**
Quickmill, Canada


**CNC Horizontal Milling & Boring Machine**
SMT, Czech Republic


**Plate Bending Machine**
DAVI-Promau, Italy

**Cold Isostatic Press**
EPSI, Belgium

13 years in Service to the nation

We manufacture as well as source leading brands of Machine Tools from around the world.

Our manufacturing facility at Surat turns out an impressive range of products – from conventional to sophisticated CNC machines.

Quickmill Inc., our Canadian subsidiary company, manufactures large area CNC Gantry and Bridge Milling and Drilling Machines at its manufacturing facility at Peterborough, Canada.

Agency Division of Batliboi represents state-of-the-art Metal Cutting, Metal Forming Machine Tools and Industrial Equipment manufactured by leading manufacturers from around the world. **We provide end-to-end solutions.**

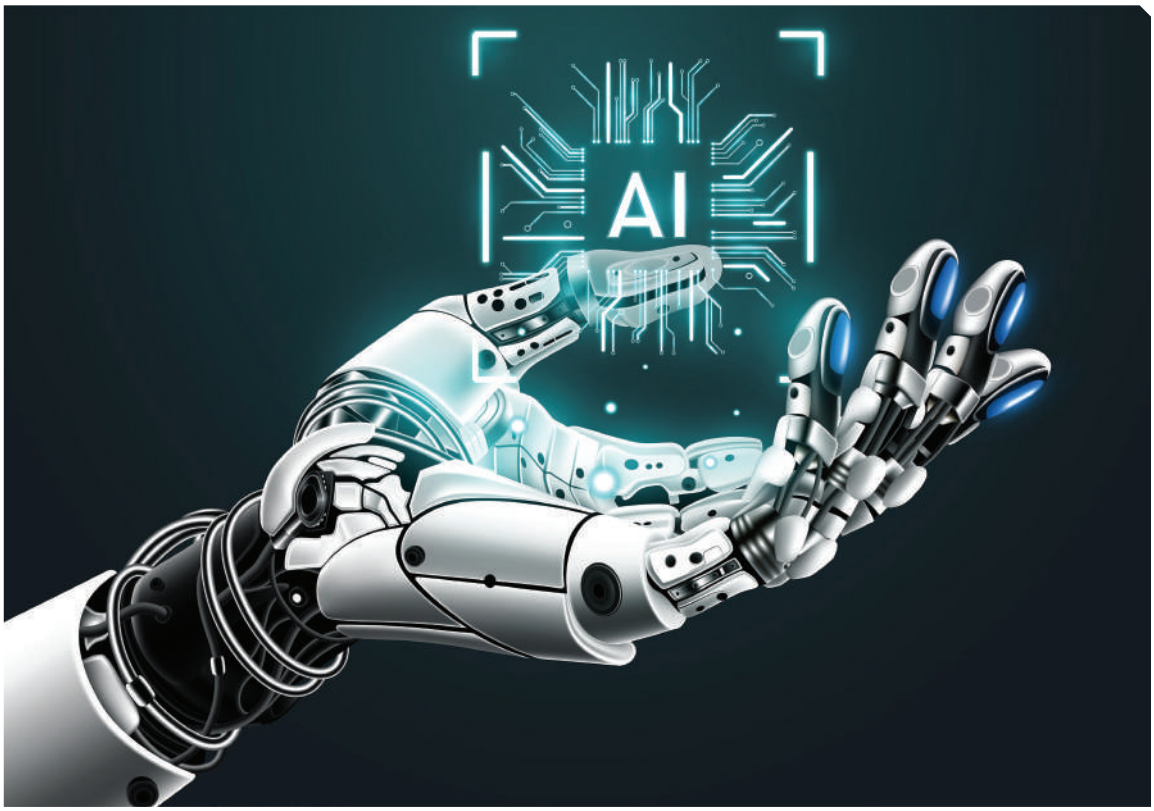
Our quality consciousness assures dependable products, and our unrivalled pre-sales & post-sales services ensure total customer satisfaction.

BATLIBOI

**Batliboi Ltd.**
**Machine Tool Group**
Bharat House, 5th Floor, 104 Bombay Samachar Marg, Fort, Mumbai – 400 001.
Phone: +91.22.6637 8200 I Email: info@batliboi.com
Web: **www.batliboi.com**

# OPTIMIZING OPERATIONS AND CUSTOMER EXPERIENCE

The New Relic State of Observability for Industrials, Materials, and Manufacturing report shows that 44 percent of respondents say the adoption of AI technologies is driving the need for observability, with 65 percent able to resolve incidents faster after adoption.




Source: Magic Wand Media

New Relic, the intelligent observability platform, published its State of Observability for Industrials, Materials, and Manufacturing report, which offers insights and analysis on the adoption and business value of observability. The report is based on insights from 285 technology professionals and was developed in association with the 2023 Observability Forecast. It shows that manufacturers are investing in observability to optimize uptime and improve productivity, cross-team collaboration, and strategic decision-making.

The report highlights the importance of implementing full-stack observability, with respondents reporting a higher return on investment (ROI) after adoption. Additionally, 65 percent of industrials, materials, and manufacturing respondents said their mean time to resolution (MTTR) has improved since adopting observability. The report found that the primary strategies and trends driving observability include security (50%), AI technologies (44%), and IoT technologies (43%).

As manufacturers across India accelerate their digital transformations, they are recognizing the critical role of observability in optimizing operations and customer experience. Forward-thinking manufacturers are gaining a competitive edge by leveraging full-stack observability to en-

PETER MARELAS
Field CTO
APJ, New Relic

CHMER

# Automation Intelligence Green Machines



**UA432L**
Green and Compact
Linear Motor Drive Wire Cut EDM


**AD5L**
AMS Premium Drilling EDM


**DX432L**
Linear Motor Drive High Speed
Die Sinker EDM


**RV853L**
Intelligent Linear Motor Drive Wire Cut EDM


**HM6050L**
Linear Motor Drive High Speed
Milling Machine


**PL6880**
High Precision Linear Motor Drive
Laser Cutting Machine

**CHING HUNG MACHINERY & ELECTRIC INDUSTRIAL CO.,LTD.**
Wire Cut, Die Sinker, Small Hole Drilling & High-Speed Milling

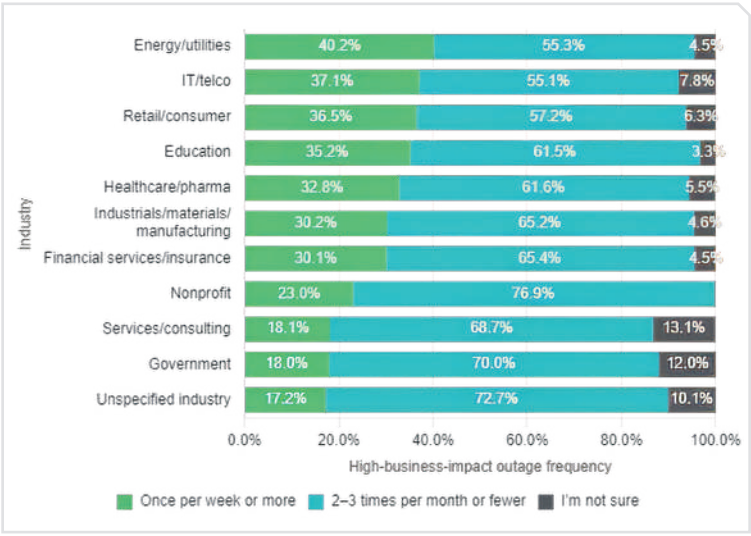
TEL:+886 4 2350 9188 | E-Mail:overseas@mail.chmer.com | http://www.chmer.com

hance operational efficiency, mitigate risks, and deliver superior customer experiences.

## Observability and AI drive industry advantages

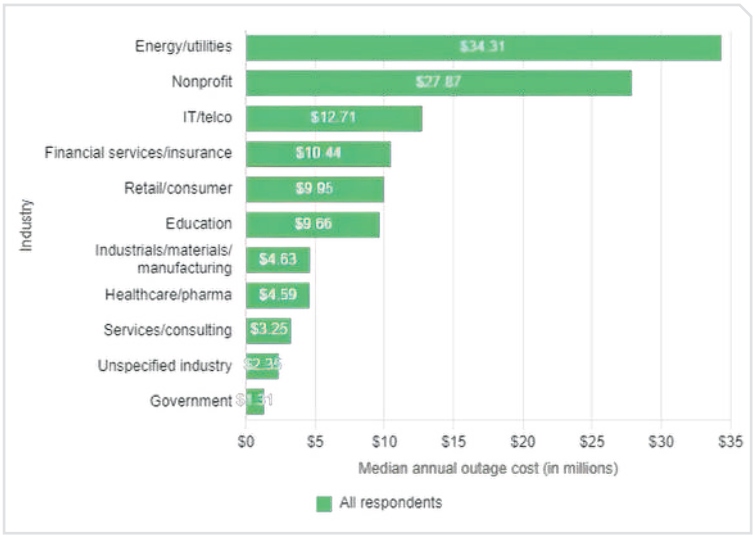
As the Manufacturing industry enters the Fifth Industrial Revolution, there is a strong focus on adopting new technologies to create a competitive advantage. Close to half (44%) of manufacturing organizations said AI technologies were driving observability needs. The powerful combination of technologies like observability and AI are creating greater insights into telemetry data and are crucial to addressing the surmounting complexities of growing data sets. Observability is critical to the success of AI, since it helps teams understand their telemetry data, offers ways to improve MTTR, and enables developers to easily apply fixes to code-level errors in their integrated development environment (IDE). It also increases automation for rapid alerts while improving incident detection and resolution.

**The report is based on insights from 285 technology professionals and was developed in association with the 2023 Observability Forecast. It shows that manufacturers are investing in observability to optimize uptime and improve productivity, cross-team collaboration, and strategic decision-making.**



High-business-impact outage frequency by industry

Manufacturing organizations that had achieved full-stack observability saw a substantial rate of improvement in MTTR, with 34 percent reporting an improvement of 25 percent or more since adopting observability. These organizations also experienced less frequent high-business-impact outages, with 30 percent reporting outages at least once a week, compared to the average of 32 percent. Additionally, just 12 percent of responses estimated outages cost their organizations more than US$ 1 million per hour compared to 21 percent overall.



Median annual outage cost by industry

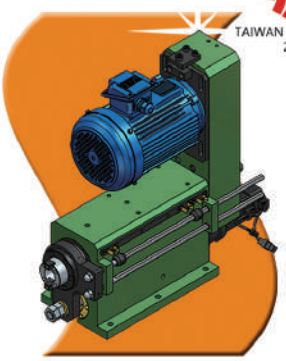
## Investments in observability drive productivity

More than half (51%) of manufacturing organizations said that observability improves cross-team collaboration and strategic decision-making. When it came to what improved their life the most, nearly half (47%) of practitioners said observability increases productivity and that they can find and resolve issues faster.

"New Relic is a critical component in our DevSecOps cycle. New Relic will allow us to normalize the process of driving continuous application and service improvement through observing the user experience, which is key for any project and moves beyond setting and forgetting after deployment," said Mitsuhiro Mabuchi, Ph.D, Group Manager, Cloud CoE Grp., DS System Development Dept., Advanced Data Science Management Div., Advanced R&D and Engineering Co., (Concurrently Lead of the CCoE Virtual Team at the Direct Reporting Digital Transformation Promotion Dept.), Toyota Motor Corporation.

# HANN KUEN
# MACHINERY & HARDWARE

HARDY



TAIWAN EXCELLENCE 2017

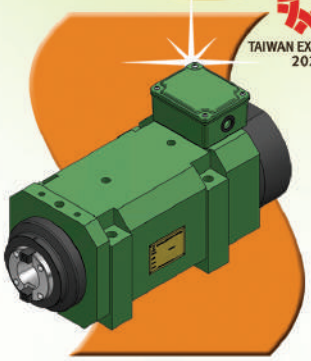
Servo Type Drilling / Tapping Spindle Head Unit

TAIWAN EXCELLENCE 2022

Built-in Motor Facing Head Unit - Flange Type

TAIWAN EXCELLENCE 2022

Boring/Milling Head Unit with ATC



TAIWAN EXCELLENCE 2020

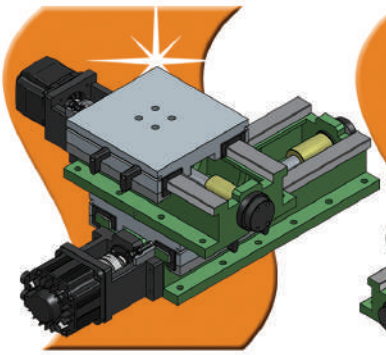
Built-in Motor Spindle Unit

Built-in Spindle

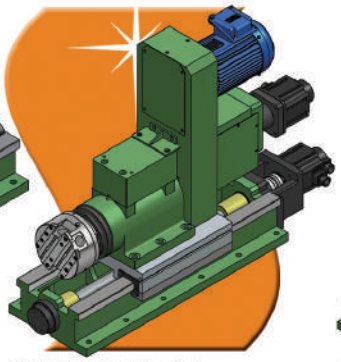
Belt Driven Spindle

Belt Driven Spindle Coolant

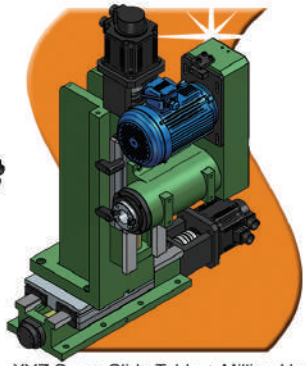
Direct Drive Spindle



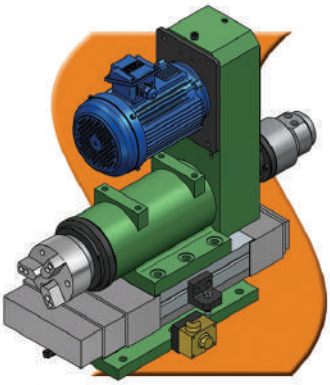
XY Servo Hardness Slide Unit



Servo Facing Head + Servo Ball Screw Slide Unit



XYZ Servo Slide Table + Milling Head



3-Jaw Chuck Spindle + Slide Unit


HARDY

**HANN KUEN MACHINERY & HARDWARE CO., LTD.**
NO. 22, Liou Shun Rd., East District, Taichung City 401, Taiwan
TEL:+886-4-2486-0602 FAX:+886-4-2486-0605
E-mail: hann.kuen@hardy.com.tw
https://www.hardy-tw.com Skype: hann.kuen


GCL INTERNATIONAL ISO 9001 UKAS MANAGEMENT SYSTEMS 5965

WhatsApp

# In Pursuit of GROWTH

India's ambitious defence modernization programs are a key driver of growth in the Ammunition industry. The modernization efforts are backed by financial commitments, including a significant allocation of the defence budget to capital expenditures. The Government's initiatives to promote defence production and export play a pivotal role in this context, aiming to increase domestic production and reduce reliance on imports.

Source: Magic Wand Media

Source: KPMG India and FICCI

"Today, India is proactively leading the narrative of finding smart and cost-efficient military solutions with the help of cutting-edge technologies and indigenously developed capabilities, and ammunition is no exception."

**Vinod Sahay**
**Chair**
**FICCI Defence and Homeland Security Committee**

The Indian Ammunition industry is on a fast track to grow. In the current defence budget, 27.67 percent of the total was allocated for capital acquisition. Self-reliance is a significant growth driver, propelling the industry towards greater independence and enhanced capabilities. The Indian Government's 'Atmanirbhar Bharat' initiative underscores this focus by prioritizing domestic production and reducing dependency on imports.

In the positive indigenization list released till date, there are approximately 85 items that have been identified by Ministry of Defence (MoD) to be indigenized by 2034.

## Market size

Given that the Indian ammunition market is witnessing substantial growth, the current market is estimated to be worth INR 7,057 crore (US$ 844.0 M) in 2023, which is about 5.5 percent of the global Ammunition industry. A majority of this market comprises medium calibre closely followed by grenades, mines, and mortars.

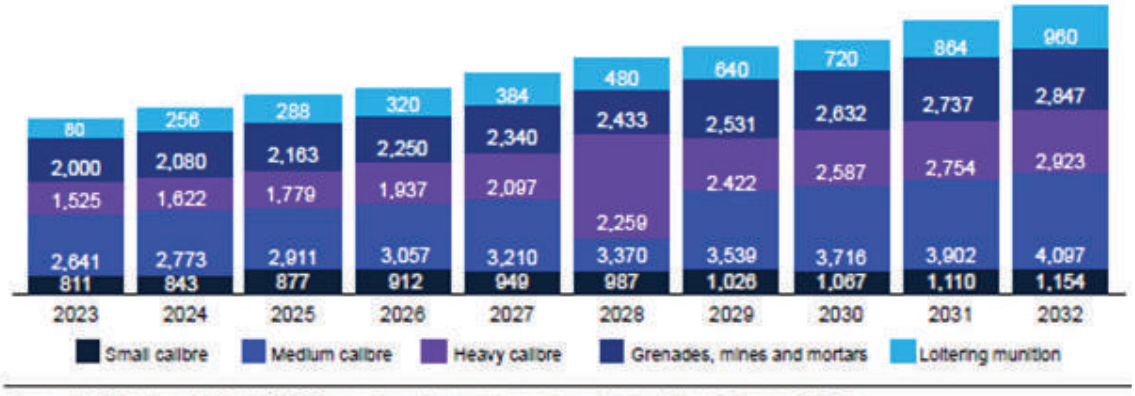
Over the period 2023-32, the market is anticipated to increase at a CAGR of 4.93 percent to INR 11,981 crore (US$ 1.4 B) – a number that is 6.5 percent of the global Ammunition industry over the same period. This indicates that the Indian ammunition market is going to grow faster in comparison to the global demand.

The chart provides a detailed breakdown of the Indian ammunition market's growth components based on the calibre-wise segmentation. In 2023, the small calibre ammunition market in India was around INR 811 crore (US$ 97.1 M) and it is expected to rise to INR 1,154 crore (US$ 138.1 M) by 2032, showing a rise of 42 percent. This number is expected to increase to 225 million units by 2032 with Armed Forces accounting for 85 percent of the consumption. The demand for medium calibre ammunition in India was estimated at INR 2,641 crore (US$ 316.1 M) in 2023 and is expected to grow to INR 4,097 crore (US$ 490.4 M) by 2032, showing a rise of 55 per-

**With the policy underscoring the importance of reducing dependency on foreign suppliers, and boosting in-house capabilities, India is emerging as a notable exporter of defence equipment, with key markets in Southeast Asia, Middle East, and Africa.**

## Indian ammunition market – current and forecast

**Indian ammunition market (INR Cr)**




Source: IISS Database (2023), KPMG Research and Analysis, Inputs from Subject Matter Experts (SMEs).

Source: KPMG India

## Defence innovations in design in India (non-exhaustive list)

| Product | Type | Features | Advantages |
|---|---|---|---|
| **Precision Guided Munition (PGMs)** A type of explosive guided by a seeker control system using laser guidance, GPS, and/or integrated inertial navigation for precise military target acquisition | Precision guided kit by an Indian DPSU | A mid-body guidance section that transforms a standard unguided rocket into a precision laser-guided rocket | • Precise target acquisition<br>• Reduced collateral damage and costs<br>• Affordability and compact design<br>• Extended range and effectiveness |
| | ATAGS (Advanced Towed Artillery Gun System) | Capable of firing precision-guided munition designed to target and destroy armoured vehicles and other high-value targets with high accuracy. | |
| | Hypervelocity Projectile (HVP) by an Indian DPSU | Capable of executing multiple missions, provides lethality and performance enhancements to land and naval gun systems | |
| **Frangible bullets** These bullets disintegrate into tiny particles upon target impact. | • RIP bullets<br>• Multiple Impact Bullet (MIP) | Penetrate less than non-frangible bullets and less risk of ricochet | Non-toxic ammunition |

Source: KPMG India

**India has made good strides in technological advancements, particularly in design innovations which are bringing greater sustainability and improved performance in ammunition production.**

cent. The demand for medium calibre ammunition is spread across all the wings of the Indian military.

### Overview of ammunition imports and exports

India's Defence sector, characterized by an influx of foreign investments and rapid technological advancements, has seen shifts in its imports and exports strategy. Historically, the country has been reliant on importing military equipment, including various types of ammunition from countries such as Russia, the United States, France, etc. However, recent years have witnessed a concerted push towards self-reliance, underlined by the 'Make in India' initiative. With the policy underscoring the importance of reducing dependency on foreign suppliers, and boosting in-house capabilities, the country is emerging as a notable exporter of defence equipment, with key markets in Southeast Asia, Middle East, and Africa.

#### *Import*

In 2023-24, India imported ammunition of INR 837 crore (US$ 100.1 M) in terms of value and 4.7 million rounds in volume. In terms of small calibre, the Defence Public Sector Undertakings (DPSUs) are capable to meet the domestic demand, but in the case of medium and heavy calibre, there is a prominent dependence on European and Russian countries for Import. With respect to advanced technology ammunition i.e., the precision guided ammunition, there is almost 100 percent dependence. However, owing to the indigenization push, we have seen a decline in imports in the last couple of years, and the Indian defence establishment is striving to become self-reliant as well as a net exporter of ammunition in the next 1-2 years.

#### *Export*

In 2023-24, India exported ammunition of INR 1,230 crore (US$ 147.2 M) in terms of value and 4.7 million in volume. Increased focus on indigenization in the Defence sector under the 'Make in India' policy is enabling the increased participation from private players in terms of ammunition manufacturing. The major portion of export involves small calibre ammunition and associated components (machined) of the various calibre.

The Indian ammunition industry has traditionally been dominated by government-owned entities namely DPSUs. Despite their significant contribution, these organizations have faced legacy issues such as outdated technology, inefficiencies, and supply chain constraints, limiting their ability to meet demands. This has catalyzed the need for a more dynamic and responsive production ecosystem.

In response to the increasing demand and supply-demand gap, the sector has seen a surge in investments from both domestic and international players. Liberalization of defence

"In India, the push towards self-reliance and focus on modernization of the armed forces have long pointed towards having the state-of-the-art weapon systems. This argument forms the basis for indigenization and steady progress in the last few years, especially in the realm of ammunition."

**Cdr Gautam Nanda**
**Associate Partner Aerospace, Defence and Space Management Advisory**
**KPMG India**

production policies and initiatives like 'Make in India' have played a crucial role in attracting private sector participation. Until October 2022, the MoD has issued close to 600 industrial licences for defence manufacturing to private companies – 1/5th of which have been for the manufacture of guns and cartridges – and cumulative Foreign Direct Investment (FDI) in the Defence sector has reached INR 5,077 crore (US$ 607.7 M) until 2024. These investments have facilitated the entry of global entities and enabled numerous joint ventures aimed at enhancing domestic production capabilities.

## Challenges and opportunities

The Indian Ammunition industry, despite its growth, faces several significant challenges that hinder its full potential. Regulatory complexities, technological deficiencies, and reliance on imports for essential components are among the primary obstacles. These issues not only impede progress towards self-reliance, but also affect the competitiveness of the sector. However, addressing these challenges head-on can pave way for substantial improvements and innovations.

## Technological hurdles

India has made good strides in technological advancements, particularly in design innovations which are bringing greater sustainability and improved performance in ammunition production. Despite these achievements, the Indian Ammunition industry, like many of its defence counterparts, faces technological challenges across different calibre segments.

To address the broader spectrum of technological challenges, specific R&D hurdles must be overcome. While technological advancements are crucial, the foundation for these innovations lies in robust R&D efforts. Addressing these challenges requires overcoming several critical obstacles, including:

- Substantial costs and high gestation period to see the benefits of R&D have not encouraged private industry from investing in R&D initiatives.
- India needs to develop expertise in designing critical components for advanced munitions, including smart and precision munitions.
- Need to push infrastructure and qualified human capital to support R&D initiatives.
- Lack of competition within Indian R&D agencies.

## Supply-side constraints

Supply-side constraints in the Indian Ammunition sector pose significant challenges, impacting the industry's ability to meet the growing demand for advanced and reliable ammunition. These include:

**Input material availability:** In India, there is no production of Antimony, a raw material used for making small arms and bullets. The entire requirement is met through the import of ores and concentrates. The country is not self-sufficient in the production of copper ore – a crucial component in the manufacturing of bullet cartridges — and also in the production of iron ore, an important element that can withstand high pressures and temperatures generated during firing. Limited production of Toluene, a raw material necessary for making TNT, is also a challenge. Large-scale production of Toluene requires significant infrastructure and technology that Indian industry does not possess. Additionally, there are limited producers of primers and propellant powder in the country.

**Manufacturing:** Owing to proprietary manufacturing techniques as well as quality concerns, a significant portion of medium calibre ammunition is imported by India.

**Quality:** Low-quality products result in failure rate and delays in orders being placed.

**In 2023-24, India exported ammunition of INR 1,230 crore (US$ 147.2 M) in terms of value and 4.7 million in volume. Increased focus on indigenization in the Defence sector under the 'Make in India' policy is enabling the increased participation from private players in terms of ammunition manufacturing.**

**In the Union Budget 2024-25, expenditure on R&D increased by INR 358 crore, an increase of 3 percent over 2023-24. The budget is reserved for industry, start-ups, and academia to support collaborative projects involving private companies and academic institutions.**

## Regulatory barriers

Navigating policy-related obstacles is pertinent for the growth and efficiency of the Ammunition industry. A few of the specific regulatory challenges are as mentioned below:

**Procurement:** L1 based procurement is one of the biggest challenges for private sector companies. Limited tenders/ cancellation of ammunition procurement tenders pose challenges. Procedural delays in terms of conversion of a requirement from Acceptance of Necessity (AoN) to Request for Proposal (RFP) stage to final selection of the vendor is another deterrent.

**Licencing and certifications:** Application process for industrial licence required for ammunition manufacturing has a long turnaround time and is not completely transparent. Quality and safety certification process is a time-consuming process.

**Export:** Procedural delays result in uncertain timelines. Ammunition being a part of the SCOMET list, poses certain restrictions in terms of export items.

## Way forward

As the Indian Ammunition industry strives to overcome its current challenges, it is essential to chart a strategic path forward:

### *International collaboration*

India's Defence sector has witnessed greater international collaborations in recent years. These partnerships exemplify the growing trend of international collaboration, aimed at leveraging foreign expertise and technology to bolster India's defence manufacturing capabilities, which can be replicated in the Ammunition industry.

Moreover, such a collaboration is vital for the Transfer-of-Technology (ToT) in the industry, despite supply-side challenges. Though concerns around Intellectual Property (IP) rights exist, international partnerships can address technological and supply-chain issue by providing access to advanced technologies and establishing reliable procurement networks.

### *Technological capabilities*

To address technological challenges, companies must invest in R&D to innovate and keep pace with global advancements. The Government should create attractive incentives for foreign players to invest, along with access to local resources, which would make India a more appealing destination for international ammunition manufacturers.

In the Union Budget 2024-25, expenditure on Research and Development increased by INR 358 crore, an increase of 3 percent over 2023-24. The budget is reserved for industry, start-ups, and academia to support collaborative projects involving private companies and academic institutions. For instance, India's premier defence research entity could form partnerships with the private sector to co-develop advanced ammunition-related technologies. These collaborations can accelerate the development of cutting-edge solutions, enhance technological capabilities, and create a robust ammunition ecosystem.

## Export Strategy

India aims to be self-reliant and a net exporter soon for certain ammunition and associated components. With the expansion of production capabilities in the country, the industry focus is on supplying to the African, East European, Latin American, and South-East Asian markets, in the short and medium term. There is an opportunity to supply intermediary products, such as propellants, cups, and lead cores, which have the potential to be additional sources of revenue for the industry over and above the final products.

Capitalizing on low-cost manufacturing capabilities, favorable labor laws, and progressive policies, the strategy can also involve promoting joint development, co-production agreements, and collaborative R&D projects, for advanced technologies in the domain of ammunition.

The Government of India needs to implement interventions to propel the manufacturing of ammunition. Firstly, a robust redressal mechanism should be established, allowing companies to track and clarify any deficits in applications, ensuring transparency and accountability. Additionally, a streamlined process must be put in place to guarantee that applications for manufacturing licenses are processed within stipulated timelines, reducing delays.

# CARBIDE ROD CUTTER

**Simple to Fully Automatic Specialized Carbide Rod Cutters**

**SOLUTIONS TO CUT EVERY TYPE OF CARBIDE RODS**


## CUT TO SIZE

**Linear guides / Ball Screws**

Hard rods / Chrome rods


**Chennai Metco**

www.chennaimetco.com

# LEADING THE VACUUM REVOLUTION

Prasanth Sakhamuri, Managing Director, Hind High Vacuum (HHV) Group, India's premier vacuum, optics, and thin-film technology company, in the following interview with MMI's Editor-in-Chief, Soumi Mitra, recounts HHV's extensive and dynamic journey, milestones that define it, and junctures that have led to its diversification while celebrating the company's ability to identify market gaps, the several firsts in the list of its achievements, the National R&D award from the President of India and so much more.

Source: Hind High Vacuum (HHV) Group

Prasanth Sakhamuri, Managing Director, Hind High Vacuum (HHV) Group

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

**The Hind High Vacuum (HHV) Group is India's premier Vacuum, Optics, and Thin-film technology company. Could you please provide an overview of your offerings and their applications in various industries, and elaborate how HHV has diversified into fields such as solar module manufacturing, thin film coating services and equipment development, and optics fabrication?**

Over its 60-year history, HHV has been a pioneer in the manufacturing of vacuum pumps, solar panels, cryogenic vessels, and vacuum flasks. As the country's first vacuum technology company, HHV has consistently met domestic needs, especially during times of high-tech product shortages. During India's time under technical embargo with the limited flow of high-tech production and severe foreign exchange shortage, many technologies like solar, thin film coating, and optics fabrication had to be homegrown.

"HHV's journey has been extensive and dynamic, and we initially focused on mastering diverse technologies and their applications. Early milestones include building India's first space simulation chamber and thin film coating system."

**Prasanth Sakhamuri**
**Managing Director**
**Hind High Vacuum (HHV) Group**

Source: Hind High Vacuum (HHV) Group

The HHV Group operates across several critical sectors, including Space, Aerospace, Automotive, and Defence. It comprises five companies, including HHV Thermal Technologies, with five decades of expertise in vacuum furnace design and manufacturing for heat treatment, brazing, and annealing; and HHV Advanced Technologies, specializing in thin-film coating machinery and optics fabrication for both R&D and production applications.

**Founded in 1965, HHV Group has come a long way from being a small-scale business establishment to a global enterprise employing 800 individuals with sales and service centers worldwide and multi-acre plants in Bangalore. Could you briefly take us through the milestones that have led to your current juncture in the industry?**

HHV's journey has been extensive and dynamic, and we initially focused on mastering diverse technologies and their applications. Early milestones include building India's first space simulation chamber and thin film coating system. These initial leaps and risks allowed us to push ourselves to establish technology quickly and for a purpose.

One significant early venture was the production of stainless-steel vacuum flasks for international markets. While the business ultimately struggled against cheaper imports due to unfavorable industrial policies, it provided valuable insights into international expectations and quality standards.

We then shifted focus to the Solar industry, initially developing thin-film coating equipment for space-qualified solar cells. This transition led to the creation of India's leading solar module manufacturing facilities, reflecting HHV's growing expertise in renewable energy technologies.

In the early 2000s, HHV began contract manufacturing for Edwards High Vacuum. When Edwards was acquired, HHV seized the opportunity to license and purchase thin-film manufacturing technology, which expanded our international presence.

**You have had several firsts in the list of your achievements: developing and manufacturing India's first high vacuum rotary pump in 1968, launching India's first commercial ALD reactor in 2017, and most recently in January 2024, developing India's first Indigenous vacuum coating unit and successfully installing a 3.7 m telescopic mirror coater at Mount Abu, contributing to numerous strategic projects and research initiatives in the country. How do you identify these gaps in the market?**

Our ability to identify market gaps stems from our deep expertise and commitment to advancing domestic manufacturing capabilities. We recognize that numerous everyday products, from smartphones to automobiles, rely on components that are coated or heat-treated using vacuum technology.

Our journey began with a dream to fabricate zoom lenses, which required vacuum coating technology. In the 1960s, faced with limited access to materials and knowledge, we developed our own equipment to meet this need, inadvertently expanding into machine building. Today, we

**HHV's one significant early venture was the production of stainless-steel vacuum flasks for international markets. It provided valuable insights into international expectations and quality standards.**

manufacture the machines and produce the high-precision zoom lenses we originally envisioned.
With 60 years of experience, we continually adapt to advancements in process technology. Collaborations with institutions, such as IIT Bombay, have led to developments like our ALD (Atomic Layer Deposition) system. Our expertise in developing telescopic mirror coatings has also become highly respected.
Our drive to innovate is fueled by customer demands and the multi-use nature of vacuum technology in critical fields such as defence, atomic energy, and space. Our advancements are fueled by commercial needs, business opportunities, and partnerships with research institutions.

**The award from the President underscores HHV's role in fostering indigenous capabilities and aligns with the Government of India's Aatmanirbhar program. Honored to contribute to this national vision, it commits to continue supporting advancements in technology and space exploration.**

**It must be a matter of immense honor to have received the National R&D award from the President of India for establishing the production of thin film metallized substrates. Kindly share the experience and the effort that led to it.**
Receiving this award from the President of India was a great honor. Since its inception, HHV has embraced a 'Make in India' attitude. We have been instrumental in the production of thin film metallized substrates, a key component for the Hybrid Micro Circuit (HMC) program. This involves coating thin alumina wafers with metal inside a vacuum chamber, followed by lithography and dicing. These substrates are essential for space flight applications.
This achievement resulted from a collaboration with the Space Applications Centre (SAC) in Ahmedabad, a unit of ISRO. SAC utilized HHV's expertise to create a unique facility that integrates metallization, lithography, and dicing in one lab—making it the only one of its kind in the country.

> "Investment in skill development and training programs is crucial. By addressing skill gaps through targeted vocational training and educational initiatives, we can improve productivity and better align the workforce with the needs of the Manufacturing sector."
>
> **Prasanth Sakhamuri**
> **Managing Director**
> **Hind High Vacuum (HHV) Group**

Our metallized substrates are used in every ISRO satellite launch, including the Chandrayaan Mission, where they even reached the moon. We are incredibly proud that our work supports ISRO's groundbreaking space research and missions.
This award underscores HHV's role in fostering indigenous capabilities and aligns with the Government of India's Aatmanirbhar (self-reliant) program. We are honored to contribute to this national vision and continue supporting advancements in technology and space exploration.

**You have made a mark in the space arena with your innovations such as an indigenous space simulation chamber to test leaks in pallets and allied components for rocket thrusters. You also have received Space Qualifications for Lithograpy of HMC substrates. Could you elaborate on your developments in this field?**
Our advancements in space technology have been significant. The Lithography HMC substrates were part of a technology transfer from ISRO. While the Space Applications Centre (SAC) could fabricate these substrates in small R&D batches, the growing demand led to the decision to collaborate with HHV to establish a dedicated facility. This partnership reduced SAC's reliance on imports, decreased costs, and provided a reliable domestic production source.
In addition to the lithography facility, HHV has developed specialized capabilities for the Space sector. We pioneered the creation of indigenous space simulation chambers capable of high vacuum and temperature cycling to replicate deep space conditions, which significantly cut costs previously incurred from overseas testing.
We also constructed a hypersonic wind tunnel in Trivandrum for simulating flight and reentry conditions up to 14 times the speed of sound. Additionally, we manufacture equipment for producing carbon-carbon composite components used in spacecraft engines and body shields.
These contributions underscore HHV's role and commitment toward advancing indigenous space technology and supporting the space department's needs.

**The 60th-anniversary celebration at HHV Peenya (Bengaluru) facility featured an exhibition where each company within the group showcased new products and developments achieved in the past year. The Group's Managing Directors also shared the challenges in the high technology department. Our readers would be keen to know the challenges and your plan to overcome them.**
Today's key challenges include a shortage of skilled labor and inadequate infrastructure. Despite having a large potential workforce, there are too few skilled individuals in technical fields. This shortage impacts our operations, as we face high-

Source: Hind High Vacuum (HHV) Group

> "Our long-term vision for the HHV Group is to become a world-class leader in vacuum science and technology. To realize this vision, we are pursuing investment from both domestic and international private equity and strategic investors to expand our capabilities and global presence."
>
> **Prasanth Sakhamuri**
> **Managing Director**
> **Hind High Vacuum (HHV) Group**

er costs and difficulties in managing the movement of goods, people, and services.

Our supply chain also struggles with the availability of high-tech materials, requiring us to import nearly all critical components for advanced work, such as optics and vacuum technology.

A comprehensive policy is needed to address these issues by aligning national demand with capacity building, both in terms of workforce and materials. The Production-Linked Incentive (PLI) program should also include equipment manufacturing, as domestic capability in machine building is crucial for sustaining technological advancements and adapting to changes in technology. The Union Budget's emphasis on 'Make in India' aims to strengthen internal ecosystems and support public sector undertakings. Additionally, the increased allocation for the Department of Science and Technology will further support these goals.

**In 2023, HHV underwent a demerger, creating two 100 percent subsidiaries: HHV Thermal Technologies for furnaces and carbon composite businesses, and HHV Advanced Technologies for thin films and optics businesses. Can you elaborate on how it has impacted the operations and strategic focus of each subsidiary?**

HHV has a strong track record with successful joint ventures (JVs) and demergers. Demerger strategies allow each entity to develop tailored growth plans based on its specific product line, customer base, and market potential. While the businesses share a common foundation in vacuum technology, they serve different applications and operate on distinct cycles.

This approach also facilitates strategic partnerships and customized business plans, accommodating different growth rates and management styles. In a rapidly evolving business environment, flexibility and focused management are crucial for laying strong foundations and achieving sustained growth.

**What are HHV Group's plans for investment and growth, and what is the long-term vision for the Group and its subsidiaries?**

Our long-term vision for the HHV Group is to become a world-class leader in vacuum science and technology. To realize this vision, we are pursuing investment from both domestic and international private equity and strategic investors to expand our capabilities and global presence.

Additionally, we are partnering with educational institutes to develop a comprehensive ecosystem for skill development, ensuring a steady pipeline of talented professionals. We are also exploring joint ventures to diversify into semiconductor and solar equipment, aligning with significant investments happening in India. These strategic moves will not only enhance our technological expertise but also support our goal of driving innovation and growth in these critical sectors.

**Please share your views on how the Union Budget 2024 will impact the Indian manufacturing sector.**

The Union Budget's strong emphasis on 'Make in India' is set to boost the development of our internal ecosystem by encouraging PSUs and other organizations to strengthen domestic manufacturing capabilities. Increased funding for the Department of Science and Technology will drive innovation by supporting R&D, enhancing competitiveness, and helping Indian manufacturers advance up the value chain.

Moreover, investment in skill development and training programs is crucial. By addressing skill gaps through targeted vocational training and educational initiatives, we can improve productivity and better align the workforce with the needs of the Manufacturing sector. This comprehensive approach will not only support current industry demands but also foster long-term growth and competitiveness.

**HHV is partnering with educational institutes to develop a comprehensive ecosystem for skill development. It is also exploring joint ventures to diversify into semiconductor and solar equipment, aligning with significant investments happening in India.**

# MAKING A GLOBAL IMPACT

Chennai Metco Pvt Ltd's humble ascent from a small-scale venture into a globally-recognized provider of metallography and petrography equipment resonates with India's strong manufacturing pulse, affirming the country's growing manufacturing diaspora. The Chennai-based company leverages its technical expertise with custom and in-house manufacturing capability to thin the gap between India and the global market with its high-end machines and consumables.

As in the case with most of the companies in India, Chennai Metco came into existence in the year 2000 armed with its R&D expertise, particularly with the TVS Group, the country's leading auto component manufacturing and distribution Group. "From day one, we were looking to produce products that India was finding difficult to produce. We looked for gaps in Indian industrial product availability in material testing research and quality assurance," shares Renganathan C, Managing Director, Chennai Metco Pvt Ltd. "Strong technical background and close association with central institutions and Indian Institute of Technology Madras (IIT Madras) aided us to meet the technical challenges and produce products with global quality."

## Brand identity rooted in science

As Chennai Metco initially focused on material testing, specifically examining the internal structures of metals, its philosophy and motto are reflected in its brand identity. "The world of seeing inside the metal is quite fascinating. When viewed under a microscope, you get to see mind-boggling designs—God's own creation. We chose the most fundamental structures and placed them as our emblem," explains Renganathan. He notes that the emblem has been appreciated by industry leaders and head honchos.

## Taking to the world

The company expanded into the global market as confidence in its product quality grew. "As we realized that our products are doing well in the Indian market with customers confirming our product quality being at par with similar products from Europe and the US, we developed the confidence to step out of the Indian market and explore exporting to the European market," says Renganathan.


Source: Chennai Metco Pvt Ltd

SOVAN TUDU
Senior Sub-Editor
Magic Wand Media
sovan.tudu@
magicwandmedia.in

> "As we realized that our products are doing well in the Indian market with customers confirming our product quality being at par with similar products from Europe and the US, we developed the confidence to step out of the Indian market and explore exporting to the European market."
>
> **Renganathan C**
> **Managing Director**
> **Chennai Metco Pvt Ltd**

Chennai Metco's familiarity with German industrial contacts helped it to test the waters in exporting to Germany. "Contrary to what we had anticipated, we faced high demands from the German industry. We consistently worked with German customers to upgrade our product quality to meet their high standards," he reflects. "As we gradually began exporting, our product quality got better simultaneously, further stabilizing our market presence in India." However, Renganathan reveals that the real breakthrough occurred when Chennai Metco entered the American market, where the customers were more practical. "No other market in the world has volume like North America and this scale allowed for standardized quality," he adds.

## Global reach and strategic markets

Identifying the UK as the next big market for the company, followed by Germany, France, Spain, Italy, etc., he continues, "Currently, we find our exports to East Asia improving. Interestingly, the Middle East is taking steps to transition from a petro-economic to a general industrial economy. We witness a significant investment in the General Engineering industry in the Gulf Cooperation Council (GCC) zone." Describing Dubai as the 'bazaar' of the Middle East, Renganathan adds, "We have many dealers in Dubai who buy and resell in the Middle East as well as Africa. We also now receive more direct inquiries from various smaller countries of Africa apart from South Africa, which is already a developed industrial market."

Chennai Metco's abrasive cutters and carbide rod cutters are particularly popular in the export market. The company's ability to customize solutions for clients, combined with deep industry knowledge, gives it a competitive edge. "Our experience and technical expertise enable customers to extract the maximum value from the products we supply," he shares.

## Advantage India

Leveraging its expertise in product making, Chennai Metco ventured into allied products like carbide rod cutting, ball screw/linear guide sectioning, and more. The growth of the Electronics industry in India demanded specialized products for electronics applications. Several new products were launched, particularly with support from IIT Madras/Advanced Manufacturing Technology Development Centre (AMTDC).

The new products were also marketed across the world, leading to increased revenue for the company. "Due to Government efforts and other various factors, the brand equity of India is also improving, helping us cater to demanding markets with reasonable success," he adds. "India is in an advantageous position, and we are optimistic about strong growth in the coming years."

Over the last 10 years, he has witnessed a positive trend, with customers no longer questioning the quality of Indian products. This underscores a significant shift in the global acceptance of 'Make in India' products. "In markets such as America and the GCC, there is a preference for Indian products due to many factors. The biggest competition is China, and we have to find our own ways to capture market share," he asserts. "Our perception is that the customers also want to diversify the supply chain, which is beneficial for India as of now."

Emphasizing India's advantageous position in offering quality products at competitive prices, he continues, "Our knowledgeable workforce and ability to quickly produce equipment variants are advantages that no other country currently enjoys. Although the global economy is somewhat in a slow decline, the acceptance of Indian products appears to be improving, thanks to the quality-cost combination."

**Chennai Metco's abrasive cutters and carbide rod cutters are particularly popular in the export market. Its ability to customize solutions for clients, combined with deep industry knowledge, gives it a competitive edge.**


Source: Chennai Metco Pvt Ltd

**Chennai Metco is updating technology and incorporating modern techniques like Artificial Intelligence (AI) to compete with European counterparts. It invests in nurturing young engineers internally who display potential and practical skills, developing them into valuable assets for the company.**

### Targeting global trade challenges

International trade policies and tariffs play a crucial role in shaping export strategies. In this context, Chennai Metco's broad customer base across various regions has helped mitigate potential risks, despite the complexities of global trade. Interestingly, Renganathan believes trade restrictions have also created unexpected opportunities. "Restrictions by the West on Russia have actually helped us grow our volume in that market," he points out. "On the other hand, high tariffs in Brazil limit our entry, while China's high tariffs for America offer us an advantage. Despite the restriction on our exports to Pakistan, some customers there manage to access our products through free trade zones like Singapore, Middle East, etc."

### Adapting to the evolving trends

With changes in traditional automotive manufacturing and the transition to electric vehicles, companies, including Chennai Metco, are facing an evolving landscape. Speaking on the challenges, Renganathan remarks, "As we see disruption in automotive manufacturing, the shift to electric is going to reduce our market volume. We are actively finding solutions to electric vehicles and finding new opportunities in the Electronics market, which seems to be improving in India."

Overall, the Chennai Metco MD believes that the Indian market is generally performing well and hopes this trend will continue for years to come, despite the turbulent global market. "For instance, while the German market is currently down; our favorable price and acceptable quality have allowed us to increase our market penetration," he clarifies. Chennai Metco is simultaneously updating technology and trying to incorporate modern techniques like Artificial Intelligence (AI) so as not to lag behind its European competitors. "Life would not be easy, but we are confident in our ability to manage and succeed," he emphasizes.

### Strengthening Indian manufacturing

Companies like Chennai Metco can always learn from demanding customers. "The market pushes you and guides you through new technologies and changing customer needs," says Renganathan, asserting that the gap between Western and Indian technology is narrowing. "Our close association with tech institutions like IITs helps us constantly upgrade and adapt to changing trends."

Looking towards the industry's future, he expresses concern about new engineering graduates. "The current generation of engineering graduates is often less equipped to face the industry, lacking fundamental science knowledge and having attitudes that are not well-suited to manufacturing," he observes. However, Chennai Metco invests in nurturing young engineers internally who display potential and practical skills, developing them into valuable assets for the company.

With the steady rise of Indian manufacturing, Chennai Metco's global reach affirms its adaptive approach to the growing trends and market. By leveraging its industry expertise to make the most of the presented opportunities, the company continues to contribute to nation-building and the overall economy.

# IMTEX 2025

International Machine Tool & Manufacturing Technology Exhibition

Concurrent Shows

**Tooltech 2025**

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

**DIGITAL MANUFACTURING**

International Exhibition on Digital Manufacturing Technology

## 23 - 29 January 2025 : BIEC, Bengaluru

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

Scaling new heights in manufacturing

## KEY HIGHLIGHTS

- 100,000+ Business Visitors
- 85,000 sqm. Exhibition Area
- 1000+ Exhibitors
- 25+ Countries
- Group Country Pavilions
- International Buyer-Seller Meet
- Industry Trade Delegation
- Product Launches & Live Demonstrations
- International Seminar on Machining Technologies
- 20+ Conference Sessions
- Academia Pavilion
- Industry Awards

Organiser

Indian Machine Tool Manufacturers' Association

Venue

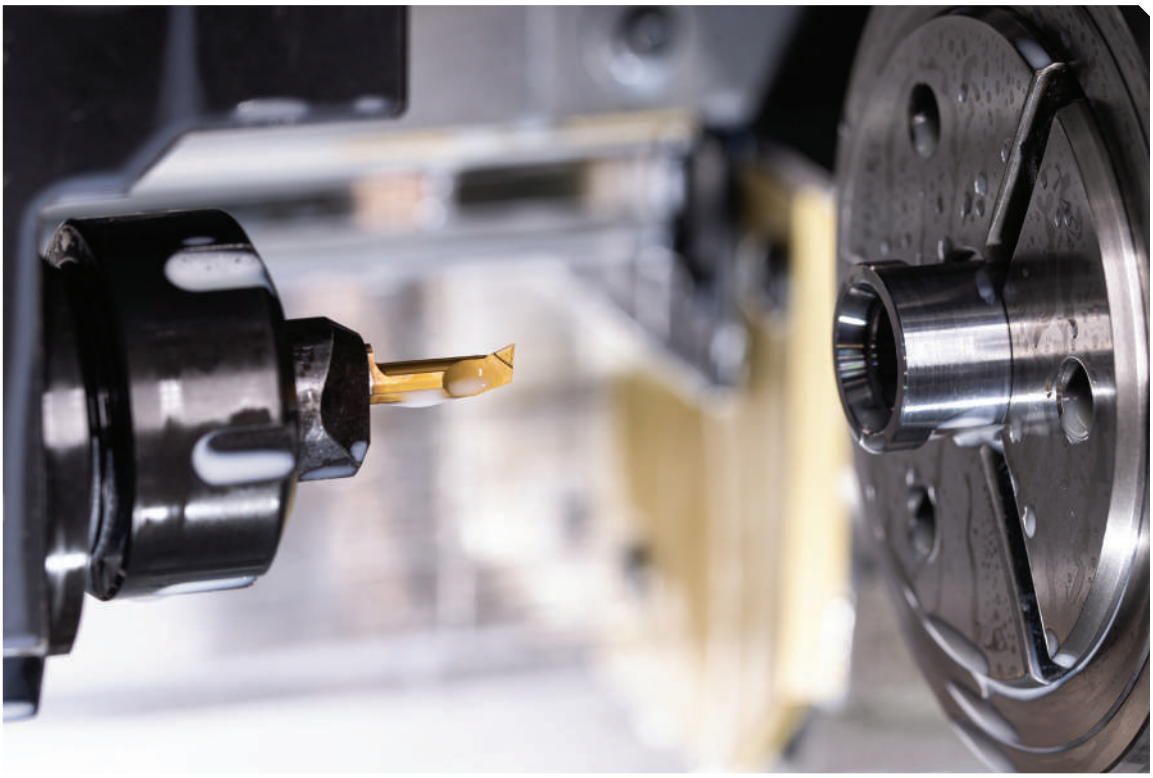
BIEC Bangalore International Exhibition Centre

ufi Approved International Event

www.imtex.in

# WHEN EXCELLENCE IS THE GOAL

RICH Praezision GmbH uses advanced precision tools from Paul Horn GmbH to produce high-quality turned parts, solving chipping problems with Horn's new Supermini tools. The partnership ensures reliable and precise machining, particularly in boring and thread milling applications.



Source: Horn/NNCEA

The new Supermini generation with sintered chip breaking geometry ensures reliable chip removal.

For over 40 years, the brothers Wolfang and Gottfried Rich have relied on precision tools from Paul Horn GmbH. As both a customer and supplier of Horn, RICH Praezision GmbH produces high-quality turned parts for various industries. For boring, the company relies on the new generation of Horn Superminis with sintered chip breaking geometry. "With the new inserts, all chip problems during boring have virtually disappeared into thin air," says Gottfried Rich. The new tool is used for boring the body of the Horn SX interface.

To produce bone screws, hg medical relies on Swiss-type lathes from Traub and whirling tools from Paul Horn GmbH. In addition to conventional whirling, hg medical uses the high-speed whirling process.

RICH Praezision GmbH has been a supplier to Horn for several years. The company produces the body of the precision interface for the Horn tool system SX, which is a further development of the 42X type family. The cutter head is connected to the contact surface of the tool body via a stable, robust, yet highly precise thread. This interface offers several advantages: high stability due to the generous thread size, wide support due to the large contact surface, and precise change-over accuracy in the µ range, which is always in the center of the tolerance band. In addition, changing the cutter head is simple and user-friendly. The replaceable head system is mainly used for milling and skiving tools that are brazed onto a tool body made of tool steel.

"Manufacturing the tool holders was initially a major challenge. The precision that Horn requires is very high," explains Wolfram

NIKHIL NAYAK
Managing Director
NN Combined Engineering Agencies Pvt Ltd

Stiefel, Production Manager, RICH, Praezision GmbH. RICH manufactures tens of thousands of parts of numerous types for Horn every year. Stiefel relies on Horn tools for producing Horn components. Critical features for the machining are, on one hand, the mating thread and, on the other, several very tight tolerances. In addition, the concentricity and axial run-out of the various contact surfaces are important.

Source: Horn/NNCEA

For internal grooving, RICH Praezision GmbH relies on solutions from the Supermini tool family.

## Chipping problems

Several different Horn systems are used for turning the components. RICH generally uses the Supermini system for boring small diameters. In addition to a precision thread, a taper, and an additional fit are used for centring the SX interface with µ-precision. A Supermini type 105 is used to turn the taper and the fit. "The turning process for achieving the very tight tolerances is stable. One problem we have always had when boring small diameters is a long swarf that wraps around the tool. Everyone has this problem, irrespective of the tool manufacturer," explains Wolfgang Rich.

With the new generation of the type 105 Supermini, Horn has solved the problem that otherwise only lasered or ground special cutting inserts could solve. "With the new Supermini type 105, Horn has succeeded in developing the world's first universal boring tool with sintered chip breaking geometry for machining small diameters," explains Frank Blocher, Technician, Horn. The tool offers a high level of process reliability thanks to its excellent chip control. The cutting geometry extends far into the corner radius of the insert. This ensures good chip control even with small infeed settings. The geometry can be used universally for different material groups.

## New Supermini generation in use

The advantages of the new system are evident. "The problem of tangled swarf was solved immediately. Whereas we had to manually remove ribbons from the tool with the previous system, the fine chips are barely visible in the swarf bin thanks to the new geometry," says Wolfang Rich. Tool life is equivalent to that of the inserts without geometry. The same applies to the price of the new generation of inserts, which is almost equivalent to that of the comparable inserts without geometry.

Source: Horn/NNCEA

A type 306 insert is used for milling the precision thread.

## High-precision thread milling

Depending on the diameter of the SX body, the Horn circular interpolation milling system or the DC solid carbide milling system is used to mill the internal thread. The inserts are precision ground as a special tool with a bespoke thread profile. The threads are milled in several in-feeds. "The thread is checked using a plug gauge that Horn provided us with," says Stiefel. Another type 306 circular milling cutter is used for milling an internal groove. Stiefel chose milling, as the process is more stable than turning due to the unfavorable length-to-diameter ratio. "The circular interpolation milling system with interchangeable cutter head or as a monoblock version can be customized precisely for such milling tasks," ex-

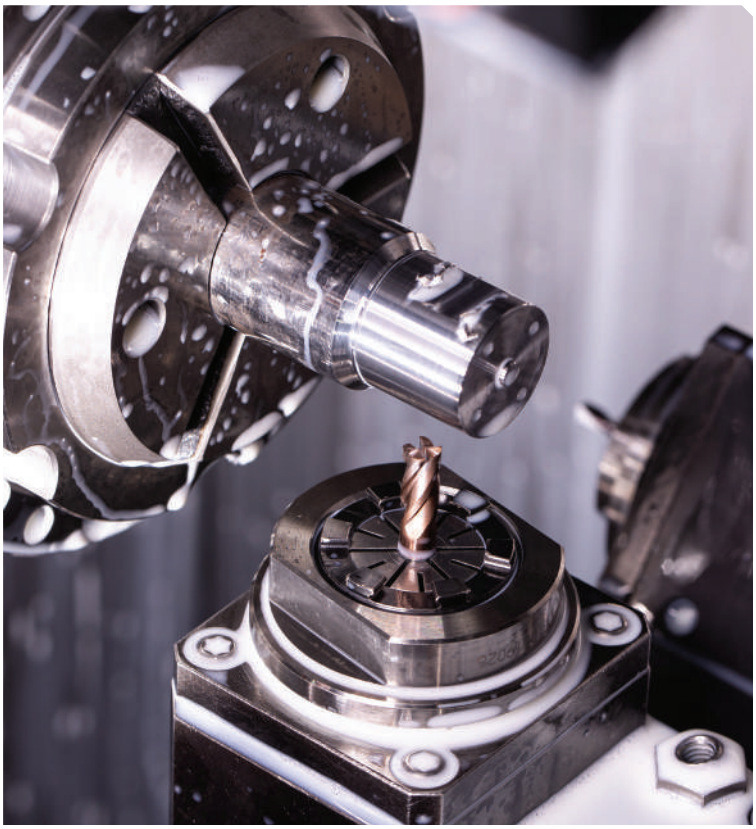
**With the new Supermini type 105, Horn has succeeded in developing the world's first universal boring tool with sintered chip breaking geometry for machining small diameters.**

plains Frank Blocher, Sales Representative, Horn.

Horn's circular interpolation milling system offers the user a number of advantages: It is fast, reliable, and achieves a good surface finish. The tool, which is guided on a helical path, plunges into the material at a steep or very shallow angle. This allows threads, for example, to be produced in reproducibly high quality. Compared to machining with indexable inserts for larger diameters or solid carbide milling cutters for smaller diameters, circular milling is generally more economical. Circular milling cutters have a wide range of applications. They machine steel, special steels, titanium, aluminum and special alloys. The precision tools are particularly suitable for groove milling, helical milling, thread milling, T-slot milling, profile milling, and gear milling. They also perform well in special applications such as milling sealing grooves or connecting rod machining.

"The new generation of Superminis has shown us once again why we have been relying on precision tools from Tübingen for over 40 years. We are excited to see how the problem solvers from Horn will continue to support us in the future," says Gottfried Rich.

**The precision tools are particularly suitable for groove milling, helical milling, thread milling, T-slot milling, profile milling, and gear milling. They also perform well in special applications such as milling sealing grooves or connecting rod machining.**



Source: Horn/NNCEA

Milling of spanner flats with the Horn DS system.

## RICH Praezision GmbH

It all began on March 3, 1949, with Wilhelm Rich, the grandfather of the current Managing Directors. In 1986 and 1990, the Managing Partners Wolfgang Rich and Gottfried Rich joined the company. Today, RICH Praezision GmbH employs more than 40 people. The brothers specialize in the production of precision turned parts and the manufacture of complex workpieces. The assembly of components is becoming increasingly important. According to the motto "Where there's a will, there's a way!", the company manufactures workpieces for numerous industries. Its specialities include components for transmissions, high-quality electrical appliances, hydraulics and pneumatics, and refrigeration.

Source: Horn/NNCEA

Before switching to the new tool generation, RICH Praezision GmbH often had problems with tangled swarf.

## HORN in India

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

WORLD CLASS! One of Japan's largest international machine tool fairs

# JIMTOF2024

## The 32nd JAPAN INTERNATIONAL MACHINE TOOL FAIR

Technologies passed down to the future offer unlimited possibilities

ufi Approved International Event

IMTO TOKYO

## November 5 (Tue.) - November 10 (Sun.) , 2024

**Venue : Tokyo Big Sight (Tokyo International Exhibition Center)**
**Organizers : Japan Machine Tool Builders' Association / Tokyo Big Sight Inc.**

**Visitor Registration – Opens September, 2024**
www.jimtof.org

### Outline

- **Name of Exhibition**
  JIMTOF 2024
  The 32nd JAPAN INTERNATIONAL MACHINE TOOL FAIR
- **Organizers**
  Japan Machine Tool Builders' Association
  Tokyo Big Sight Inc.
- **Date**
  Nov.5 (Tue.) - Nov.10 (Sun.), 2024 (6 days)
- **Venue**
  Tokyo Big Sight (Tokyo International Exhibition Center)
- **Indoor Exhibition Space**
  118,540㎡

- **Exhibits**
  Machine tools (Metal cutting, Metal forming) / Machine tool accessories / Tools for machines (Cutting tool & wear-resistant tool) / Diamond, CBN tools / Grinding wheels and abrasives / Gears and Gear Devices / Oil hydraulic, water hydraulic and pneumatic machinery / Precision measuring machines and instruments / Optical measuring instruments / Testing machinery / Controller and related software (CAD/CAM etc.) / Other associated machinery and equipment, raw materials, technologies and publications

Source: Magic Wand Media

# LEADING THE DIGITIZATION WAY

The shift from traditional to digital engineering processes is more than a change in tools—it is a fundamental transformation. Eplan is at the forefront, providing the tools, services, and support needed to embrace the future of engineering.

BHUVANESH S
Director Professional Service
Eplan Software Pvt Ltd

Eplan is synonymous with innovation in engineering software and services, playing a pivotal role in the digitization of engineering processes worldwide. With a presence in over 50 global locations, the company serves a diverse customer base across various industry verticals, providing cutting-edge tools designed to optimize engineering workflows. The company's reach is extensive, with over 65,000 customers and 209,000 licenses worldwide, highlighting its commitment to delivering solutions that cater to the diverse needs of engineering teams everywhere.

At the core of its offerings is a suite of software designed to automate engineering processes, enhancing efficiency, reducing errors, and fostering collaboration. These tools are critical in industrial automation, where precision, speed, and reliability are essential. Eplan's solutions are utilized by OEMs, system integrators, panel builders and component manufacturers, making it a vital player in the broader ecosystem of industrial automation.

## Comprehensive services for a global market

Eplan's services extend beyond software. The company offers consulting, where experts work closely with clients to tailor solutions that fit specific workflows. This personalized approach ensures that Eplan's tools are integrated seamlessly into existing operations, maximizing their impact.

Training is another cornerstone of Eplan's service offerings. The Eplan Training Academy provides extensive programs to equip engineers with the skills needed to fully leverage Eplan software. These programs ensure that teams are proficient and capable of applying the tools in ways that drive innovation and efficiency.

The company also offers robust customer support through a global network, including online systems that provide prompt assistance. This commitment underscores Eplan's dedication to offering a comprehensive solution that includes ongoing support and development.

## Digitalization: The shift from traditional to modern engineering processes

As engineering evolves, the shift from traditional to digital pro-

cesses is reshaping how work is done. The traditional process, characterized by linear workflows and significant manual intervention, is being transformed by digital technologies that enhance efficiency, reduce errors, and foster greater collaboration.

## The traditional engineering process: A linear approach

Historically, the engineering process followed a linear progression from concept development to manufacturing and maintenance, marked by manual intervention, resulting in inefficiencies and increased costs.

***Concept Development:*** Engineers begin by identifying problems and brainstorming solutions. This stage relies heavily on manual documentation, making it time-consuming and error-prone.

***Design:*** The design stage involves creating detailed designs and documentation. While digital tools are sometimes used, much of the documentation still involves manual input and physical iterations, leading to multiple design cycles, errors, and potential delays.

***Manufacturing:*** After finalizing the design, the product moves into manufacturing. Shopfloor often gets a hard copy of the drawing and in most cases no documentation, leading to potential discrepancies and inefficiencies.

***Maintenance:*** Once delivered, products require ongoing maintenance. Traditionally, this involves manual tracking of user feedback and performance, which is labor-intensive and can delay addressing issues or improvements.

## The engineering process of tomorrow: Embracing digitalization

The future of engineering is digital. The engineering process of tomorrow, as envisioned by Eplan, leverages digital technologies to create a more efficient, interconnected, and responsive workflow. This shift is not just about adopting new tools but rethinking the entire approach to better meet the demands of a rapidly changing world.

***Smart Customization:*** Engineers will use predefined libraries, allowing quick access to existing components and templates. This enables rapid customization, making the engineering process more agile and responsive. By reducing manual copy/paste, engineers can focus on innovation and optimization.

***Digital Design and Documentation:*** A significant shift is the move towards fully digital design and documentation. This reduces the need for physical paperwork and streamlines the design process, allowing for easy updates, version control, and improved collaboration across teams. Digital documentation ensures that all team members have access to up-to-date information, reducing errors and keeping projects on track.

***Seamless Transition to Production:*** Once designs are finalized, project files are sent digitally directly to production, eliminating delays and errors associated with manual handoffs. Eplan's digital solutions facilitate this seamless integration, enabling faster time-to-market and higher-quality outputs. The reduced manual intervention in the engineering process ensures greater accuracy and efficiency.

***Digital Upkeep and Maintenance:*** The future process also includes a digital approach to maintenance. After delivery, a digital copy of the design is accessible for easy maintenance and future upgrades. Eplan's tools enable support to real-time project updates based on updated data, enhancing the customer experience and ensuring long-term reliability.

## The future is digital, and Eplan is leading the way

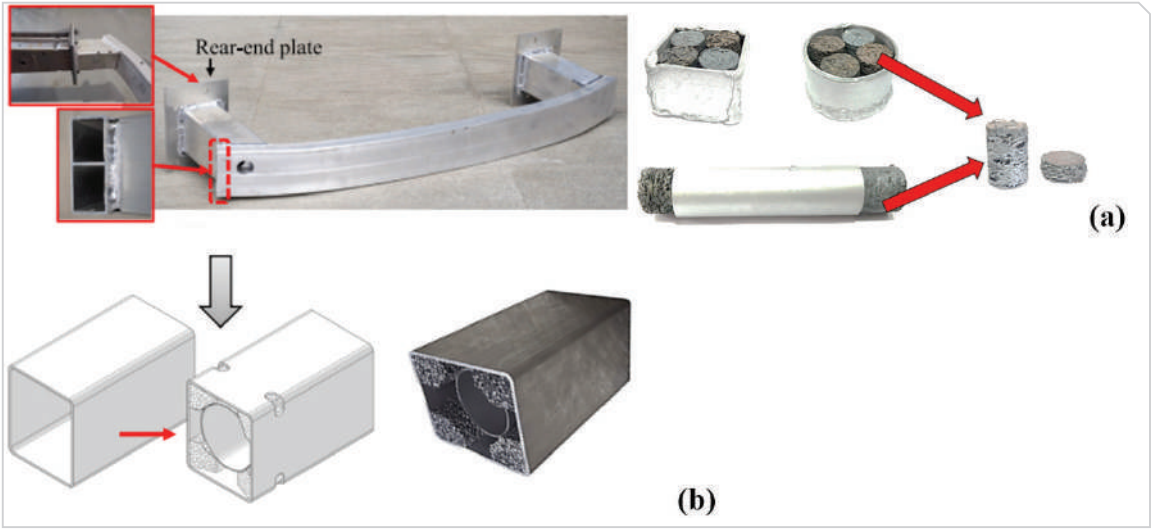
The shift from traditional to digital engineering processes is more than a change in tools—it is a fundamental transformation. Eplan is at the forefront, providing the tools, services, and support needed to embrace the future of engineering. By enabling smart customization, digital design and documentation, seamless transitions to production, and digital maintenance, the company is helping companies move away from inefficiencies and toward a more efficient, interconnected future. Modern markets demand faster, more accurate, and responsive processes. Eplan's solutions provide the foundation for this new way of working, enabling engineers to increase engineering efficiency and deliver better designs and products with greater precision.

The future of engineering is here, and Eplan is leading the way. By embracing digital technologies and rethinking traditional approaches, the industry can build better, faster, and more efficiently.

**Eplan's services extend beyond software. The company offers consulting, where experts work closely with clients to tailor solutions that fit specific workflows. This personalized approach ensures that Eplan's tools are integrated seamlessly into existing operations, maximizing their impact.**

# IN SEARCH OF SUSTAINABLE SOLUTIONS

This academic project explores the development of innovative steel foams made from machining waste through microwave sintering and the addition of carbamide. These foams, designed for the automotive industry, offer superior energy absorption capabilities, significantly enhancing vehicle safety in crash situations.




Source: KLS Gogte Institute of Technology, Belagavi

Fig. 1 (a) Images of developed foams from SS316 machining waste introduced in crash boxes of frontal members for passenger vehicles (b) possible configuration of foam deposition/location in the box

The proposed work focuses on developing novel steel foams derived from machining waste using innovative Microwave Sintering techniques and the inclusion of carbamide to enhance foaming characteristics. These foams present a groundbreaking opportunity for the Automotive industry due to their exceptional specific energy absorption capabilities compared to those currently available in the market. As a result, they hold significant potential for enhancing passenger vehicle safety in India. By incorporating these foams into crash boxes (Fig. 1), the industry can substantially improve safety ratings, making vehicles more impact-resistant and potentially saving lives. This innovative approach not only promotes sustainability through the utilization of waste but also raises safety standards in the rapidly evolving automotive landscape, ensuring a safer future for all.

DR VINAYAK MALIK
Associate Professor
Department of Mechanical Engineering
KLS Gogte Institute of Technology, Belagavi

## Key highlights of the work and methodology

- Development of foams from machining waste by setting different parameters of temperature, soak time, and compaction pressure using a hydraulic press to consolidate the machining waste/scrap into the required dimensions referring to the ASTM standards and then microwave sintered to obtain the end product.
- Choosing the optimal parameters and amount of carbamide for machining chips + carbamide specimens and the layer-by-layer combination of hybrid specimens for the best results in terms of energy absorption (Fig. 3 b), strain, and reduced cycle time.
- Compression testing of the specimens made (Fig. 3 a), followed by computation and analysis of results.
- Macro-structural analysis of the foams (Fig.2).

## Significant outcome from the work

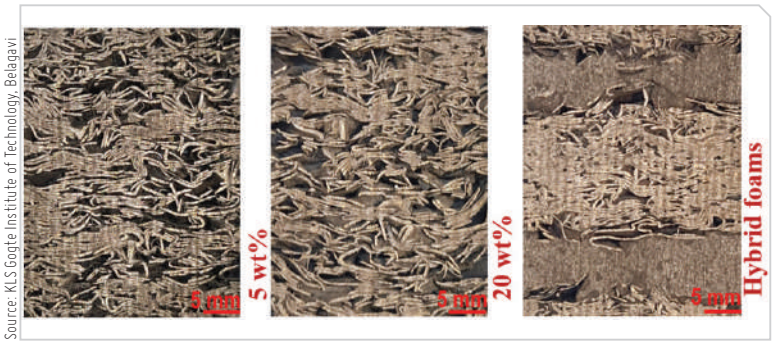
**Higher Energy Absorption:** Values of up to 90 MJ/m$^3$ can be observed for 100 percent strain which is significantly

high compared to the existing foams in the market and based on the data obtained from the reported scientific work. Specific Energy Absorption (SEA) of up to 30 KJ/Kg has been observed, which is high compared to existing crash boxes used for automobiles.

**Weight Reduction:** A significant amount of weight was reduced in all the types of foams experimented on during this project, particularly, machining chips with urea foams which have 76 percent weight reduction compared to an SS 316 bulk material of the same dimensions. Further, the weight reduction based on the density parameter is also on the lower side compared to the foams available in the market.

**Higher Straining Capabilities:** A deformation of about 75 percent of the initial height was observed with a maximum strain of 1.24 in the case of chips plus urea samples and an average of 0.5 strain in the case of plain machining chips foam and higher strains of 0.7 in hybrid foams which exhibited a combination of strain and energy absorption.

**Reduced Cycle Time:** The overall cycle time for manufacturing a single foam was less than an hour whereas the data from the literature survey indicates an average cycle time for a foam of around 2 to 3 hours and some cases even more.



Source: KLS Gogte Institute of Technology, Belagavi

Fig. 2 Unique macro-structures exhibited by developed steel foams.

**Highly Economical:** Since the end product was manufactured from machining waste, the cost of raw material was significantly reduced in comparison to that produced by powder metallurgy. Further, hybrid microwave sintering processing route was employed, which, additionally reduced the overall consumption of kilowatt-hours during the manufacturing cycle.

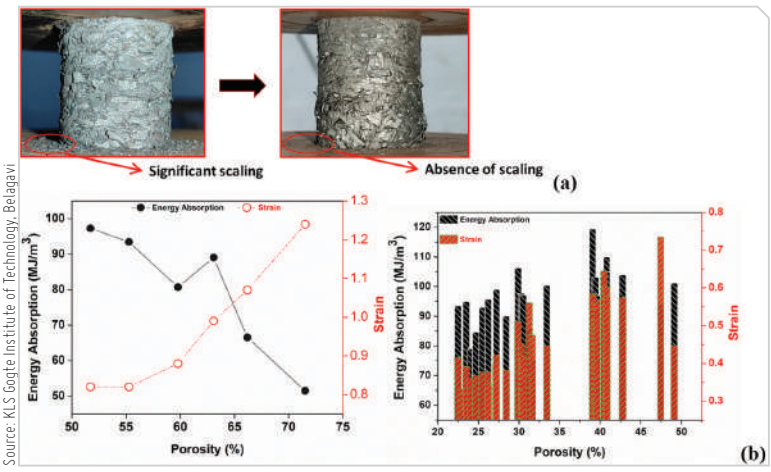
## Typical product applications of developed foams

The developed steel foams have a wide variety of applications in different fields. For example, they are used in automobile bumpers for crash protection and in batteries for weight reduction. Metal foams are also used in medical applications as prosthetics, as filtration and catalysis devices at high temperatures, as sound absorbers in the field of acoustics, for radiation protection, and in ship fenders for impact protection.

Among these applications, steel foam is particularly well-suited for automobile crash protection. This is owing to its unique property of withstanding very high damage with relatively lesser deformation. Steel foams can be placed in the frontal and side sections of a car as anti-intrusion bars (Fig. 1) or in the crash box (attached to the bumper) to absorb sudden impacts caused by abrupt and sharp deceleration of the vehicles in the event of the crash, thereby increasing passenger safety.

Typical results have shown that individual foams can absorb up to 119.865 MJ/m$^3$ of energy, meaning that when 3-4 foams are placed inside a crash box, the total impact energy absorbed will be much higher. A combination of different foams (such as plain, hybrid, and urea-mixed) can be arranged side by side or diagonally to achieve higher energy absorption and significant strain. However, the arrangement of the foams depends on the shape and structure of the crash box. Crash boxes can vary in shape and size depending on their application. Some common types include square, rectangular, circular, slender and hollow, and honeycomb-shaped crash boxes.

**Steel foam is particularly well-suited for automobile crash protection. This is owing to its unique property of withstanding very high damage with relatively lesser deformation.**



Source: KLS Gogte Institute of Technology, Belagavi

Fig. 3 (a) Foams being tested made in ambient and controlled atmospheric conditions (b) Superior energy absorption and deformation capabilities exhibited by newly developed foams

Source: Teledyne FLIR, LLC

# ENSURING SEAMLESS PRODUCTION

Preventative maintenance is the cornerstone of efficient and cost-effective industrial operations. By prioritizing the proactive care of equipment through scheduled inspections and the incorporation of prescriptive methods such as thermography, organizations can significantly reduce downtime, extend the life of machinery, and optimize overall productivity, all while ensuring workplace safety.

In the fast-paced world of industrial operations, maintaining the efficiency and reliability of machinery is crucial for seamless production, asset availability, and operational continuity. Preventative maintenance is a strategic approach that plays a pivotal role in ensuring the longevity and optimal performance of equipment.

Given the complexities and demands of modern industrial environments, it is crucial to grasp the importance of preventative maintenance, explore its impact on operations, the role of advanced technologies, and the benefits of adopting a proactive maintenance approach.

Source: Teledyne FLIR, LLC

### Overview of preventative maintenance

Preventative maintenance involves scheduled inspections, tasks, and repairs aimed at preventing equipment failure before it occurs. Unlike reactive maintenance, which addresses issues after they have already disrupted operations, preventative maintenance takes a proactive stance to identify and address potential problems beforehand. This systematic approach is essential for minimizing unexpected downtime, extending the lifespan of machinery, optimizing overall operational efficiency, and keeping employees safe. Simply put, as organizations focus on the consequence of failure, actions can be taken to ensure alignment with preventing or mitigating those consequences.

### Impact of equipment downtime on operations and costs

Downtime in industrial settings can have far-reaching consequences. Every minute of equipment failure translates into lost productivity, missed deadlines, and increased costs. Unplanned downtime not only disrupts the immediate production process but also has a domino effect on downstream operations. The financial impact, in many cases, can be significant when considering the costs associated with emergency repairs, replacement parts, and the potential loss of customer trust. Preventative maintenance acts as a safeguard against these disruptions, helping organizations avoid the detrimental effects of unexpected equipment failures.

### Role of thermography and electrical inspections in preventative maintenance

With the changes to NFPA 70B in 2023, shifting from a recommended to a required activity, thermography has become a requirement every 6 months. Beyond being a requirement, the value that thermography brings to an electrical maintenance program should be recognized as a critical component of an effective Electrical Preventative Maintenance program.

To enhance the effectiveness of preventative maintenance, industrial facilities are increasingly turning to advanced technologies such as thermography. The use of thermography enables maintenance teams to identify potential issues in electrical systems and machinery components that may not be visible through traditional methods. By using infrared thermography, anomalies in temperature can be detected, indicating potential faults or inefficiencies. Electrical inspections help pinpoint issues like loose connections or overloaded circuits, allowing for timely intervention before a breakdown occurs.

### Benefits of a proactive maintenance approach

Adopting a proactive maintenance approach brings a multitude of benefits to industrial operations including:

- At its core, it helps in extending the lifespan of equipment, reducing the frequency of breakdowns, and minimizing the need for costly emergency repairs.
- By identifying and addressing potential issues early on, organizations can plan maintenance activities during scheduled downtimes, avoiding disruptions to regular production schedules.
- Lastly, and more importantly, this approach also enhances workplace safety by preventing accidents that may result from equipment failures.

In conclusion, preventative maintenance is the cornerstone of efficient and cost-effective industrial operations. By prioritizing the proactive care of equipment through scheduled inspections and the incorporation of prescriptive methods such as thermography, organizations can significantly reduce downtime, extend the life of machinery, and optimize overall productivity, all while ensuring workplace safety. Embracing a preventative maintenance culture in one's organization is not just a strategic choice but a necessary one for those seeking to ensure reliability and safety.

**The use of thermography enables maintenance teams to identify potential issues in electrical systems and machinery components that may not be visible through traditional methods. By using infrared thermography, anomalies in temperature can be detected, indicating potential faults or inefficiencies.**

# AUTOMATING INDIAN MANUFACTURING

Organized by Indian Machine Tool Manufacturers' Association (IMTMA), the 'Symposium on Automation & Robotics' is all set for September 25-26, 2024, at Hotel Tip Top International, Pune. Themed 'Robotize, Automate, and Transform Manufacturing', the event will convene industry experts to shed light on the latest developments in the field of automation and robotics within the manufacturing sector.

**Packed with keynote addresses, panel discussions, and sessions on automation and robotics, the event emphasizes smart manufacturing and technology integration. Simultaneously, attendees will benefit from a co-located exhibition, which will offer a peek into the latest industry trends.**

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

India's manufacturing industries have been deploying robots and adopting automation in their processes for many years. However, advances in automation and robotics technology are taking place rapidly, making it crucial for industries to keep up with them and adopt them to remain competitive.

The seventh edition of the Symposium on Automation & Robotics, scheduled on September 25–26, 2024, in Pune, will feature enriching keynotes, technical presentations, panel discussions, networking sessions, and a concurrent exhibition to delve deep into the subject and have a close look at the advancements in the field.

The symposium will have sessions for startups, on 'innovation' and 'self-reliance'. The panel discussions will address challenges in adopting smart manufacturing in industries. The advancements in artificial intelligence for manufacturing, machine learning, factory automation, automation on pneumatics, augmented reality, virtual reality, and its application in various industries will also be highlighted.

## Setting the wheels in motion

The event will feature keynote addresses on embracing automation — 'Global and Indian Perspective and India's Way Forward' and 'Creation of Human Resource for Automation, I4.0, Smart Manufacturing'.

Source: Magic Wand Media

Special attention is given to startups, with dedicated sessions, beginning with 'Start-up Opportunity - Case study on Innovation and Self-reliance' and a panel discussion on 'Challenges and Opportunities in Adopting Automation'.

Other sessions include 'Robotics and Automation for Enhancing Efficiency and Productivity', 'Cyber Physical Technology for Productivity Enhancement: a. Digital Twin or b. Generative AI for Manufacturing (Machine Learning)', 'Automation of Assembly and Inspection Resulting in Traceability, Real-time Information Availability and MIS', and 'Machine Vision for Factory Automation'.

## Full throttle into the future

Stressing the adoption of smart manufacturing technologies and trending advancements, Day 2 begins with 'A Case Study on Lightsout Factory' and 'Modular Automation for Smart Factory'. It further delves into 'Industries on CLOUD nine (The need for Cultural Adoption)' and a panel discussion on 'What HR challenges does Digital Transformation Bring With It?'. The last day concludes with key topics in the session as 'Automation on Pneumatics' and 'Augmented Reality (AR) and Virtual Reality (VR). Its application and uses in Various Industries'.

The Symposium will also have a co-located exhibition for the delegates to interact and gain insights into the latest technological trends in the Automation and Robotics industry. This hands-on experience is designed to enable the participants to practically fathom how these innovations can be used to address common challenges in their day-to-day operations.

Organised by

Indian Machine Tool Manufacturers' Association


7th Edition

# SYMPOSIUM ON AUTOMATION & ROBOTICS

25 - 26 September 2024

Hotel Tip Top International, Pune

## Highlights

- Enriching Keynotes
- Panel Discussion
- Technical Presentations
- Networking
- Exhibition

## Registration Fee (Per Delegate)

| | | |
|---|---|---|
| IMTMA Members, Micro & Small Enterprises, Research & Educational Institutions | **Rs. 5000*** | • 5% discount applicable for each delegate for companies nominating 3-5 delegates<br>• 10% discount applicable for each delegate for companies nominating more than 5 delegates |
| All Other Companies | **Rs. 5500*** | |

* Add 18% GST

**For more details, please contact**

**Madan**

Mob : 7899437625, madan@imtma.in

**To Register, logon to: www.imtma.in/automation**

Source: AMT

# IMTS 2024: A PLATFORM FOR LEVERAGING OPPORTUNITIES

Hailed as the largest trade show in the Western Hemisphere, IMTS 2024 – The International Manufacturing Technology Show, organized by the Association For Manufacturing Technology (AMT), is set to run from September 9-14, 2024, at McCormick Place, Chicago. Indian companies and delegations are all set to attend the event and explore technological breakthroughs that can aid in shaping India's industrial future.

SOVAN TUDU
Senior Sub-Editor
Magic Wand Media
sovan.tudu@
magicwandmedia.in

IMTS in its 2024 edition continues to be a platform where creators, builders, sellers, and drivers of manufacturing technology come together to connect and be inspired. With an expansive exhibit space of 1.2 million sq ft, housing 1,500 booths of 65 first-time exhibitors from over 110 countries, the event promises to delight its participants with unforeseen technological advancements.

Showcasing a plethora of innovations in CNC machining, automation, robotics, additives, software, inspection, and transformative digital technologies, the event has been a treasure trove for stakeholders in search of unique and vital solutions. Some examples comprise haptic feedback to improve remote robot operation and digital training, quality control software capable of managing millions of data points, additive manufacturing powders and gases, business services that address labor issues through an app, and many more.

"Organized by Indian Machine Tool Manufacturers' Association (IMTMA), the 'India Opportunities' Session will provide a more focused approach to elevating India's manufacturing aspirations and strengthening collaborations between India and the US."

**Rajendra Rajamane**
**President**
**Indian Machine Tool Manufacturers' Association (IMTMA)**

According to Peter R Eelman, Chief Experience Officer, AMT, what makes IMTS 2024 extraordinary is that every aisle offers new approaches to improve productivity, lower costs, and solve problems. He adds, "One of the comments I hear at every show is, 'We would have never learned about this solution if we didn't come to IMTS'. The event offers solutions that range from foundational products to technologies that transform your business operation."

### Insightful conferences

The show's key features include the IMTS 2024 Conference. It expands its focus with 10 other targeted new conferences addressing crucial industry issues, including several IMTS ELEVATE sessions. The roost-

**More than 1,200 exhibitors from the manufacturing industry will display their products and productivity solutions at IMTS 2024 in Chicago.**

## India Opportunities Session at IMTS 2024

**Venue:** East Building, Level 2, Room No. E263
**Date:** Tuesday, September 10, 2024

| | |
|---|---|
| **10.45** | Registration |
| **11.00** | Welcome by Jibak Dasgupta, Director General & CEO, IMTMA |
| **11.05** | **India Opportunities for Manufacturing and Machine Tools**<br>Rajendra S Rajamane, President, IMTMA |
| **11.15** | **Doing Business in India**<br>Robert Murray, CEO & GM, HAAS Automation, Inc., USA |
| **11.25** | **Keynote Address:** Somnath Ghosh, Consul General of India in Chicago, Government of India |
| **11.35** | **Panel Discussion on Synergy for Indo-US Partnership in Manufacturing**<br>Rajendra S Rajamane, President, IMTMA & Managing Director, Rajamane Industries Pvt Ltd<br>Ravi Raghavan, Past President, IMTMA & Managing Director, BFW<br>David Moskey, Territory Manager – India, South East Asia & Middle East, Mastercam<br>Arun Mahajan, Director – India, AMT<br>**Moderator:** TK Ramesh, Managing Director, Ace Designers Ltd |
| **12.10** | Q&A Session |

"We consider the US market as a focus market for catering to the advanced industries of Aerospace, Automotive, and Defence through our high-performance Solid Carbide End Mills, Drills, and Machine Taps. This event is an ideal opportunity for us to partner with innovative and technologically advanced firms. It can help us expand our horizons into emerging countries of South America as well as strengthen ourselves in Europe and Asian markets."

**Vedant Birla**
**Chairman & Managing Director**
**Birla Precision Technologies Ltd**

er is three IMTS ELEVATE Job Shops workshops, two IMTS ELEVATE Women Make Manufacturing Move (WMMM) events, and a half-day IMTS ELEVATE LATAM session, highlighting growth opportunities in Mexico, Latin America, and Spain. The other two notable conferences at this year's event are the IMTS Supply Chain Forum and IMTS Investor Forum,

**The show will feature more than 2,000 exhibitors covering an area of 100,000 sq mt of exhibit space.**

## Birla Precision Technologies Ltd

## Hall & Stall: West Building, Level 3, 432188

Source: Birla Precision Technologies Ltd

Birla Precision Technologies is a regular participant in IMTS. We consider the US market as a focus market to cater to the advanced industries of Aerospace, Automotive, and Defence through our high-performance Solid Carbide End Mills, Drills, and Machine Taps. This event provides us the platform to present ourselves as a viable partner of advanced companies. Considering its scale and innovation-driven companies, the US remains our go-to market. It is an ideal opportunity for us to partner with innovative and technologically advanced firms, enabling us to provide tooling solutions and stay a step ahead of the competition.

We also look at IMTS as a way to expand our horizons into emerging countries of South America as well as to strengthen ourselves in Europe and Asian markets where IMTS acts as a meeting place.

We will showcase our high-performance machine taps, solid carbide end mills, and drills, along with NAS standard drills, tailored for the Aerospace and Defence industries. Additionally, we will present our entire range of DIY drill sets in various shank types, targeting big-box retailers and catalog houses. 'Made in India' products are well accepted and can compete with the best-in-class companies from the Western world. With the advantage of competitive manufacturing, India is firmly positioned to become the world's manufacturing base, capturing market share in an exponential growth trajectory. As the world increasingly views India as a manufacturing hub through the 'China+1' strategy, India stands to be the biggest beneficiary. We have positioned ourselves to be ready with the capacity to make significant inroads in the time to come.

> "Currently, we are selling our products on a large scale and exporting to Europe and Southeast Asia. In the US, we do have customers, but the business volume is still small at present. However, we have been receiving more inquiries since our last participation in IMTS 2022, and some of these inquiries have already been converted into orders. There are still tremendous business opportunities in the US, which is why we are participating in IMTS 2024."
>
> **Avinash Sharma**
> **General Marketing – Marketing (Domestic & Export)**
> **Solar Diamond Tools (India) Pvt Ltd**

offering insights into streamlining operations and opportunities for investment professionals, respectively.

### India's strategic play

One of the special highlights during IMTS 2024 is the 'India Opportunities' session, which is being jointly organized by Indian Machine Tool Manufacturers' Association (IMTMA) and AMT. It is scheduled for

## Solar Diamond Tools (India) Pvt Ltd

## Hall & Stall: North Building, Level 3, 237171


Source: Solar Diamond Tools (India) Pvt Ltd

Currently, we are selling our products on a large scale and exporting to Europe and Southeast Asia. In the US, we do have customers, but the business volume is still small at present. However, we have been receiving more inquiries since our last participation in IMTS 2022, and some of these inquiries have already been converted into orders. There are still tremendous business opportunities in the US, which is why we are participating in IMTS 2024.

We are in the Diamond Tools industry, and our product range comprises almost all diamond tools used in industries. Our focus is on the automotive OEM, its ancillaries, automotive parts, and spares manufacturers, bearing industries, rotary tools industries, bearing industries, glass industries, ceramic industries, paper roll manufacturers, sanitary products and tiles manufacturers, medical implant manufacturers, razor blade industry, aviation, defence, and many more industries. IMTS is an opportunity for us to showcase our products to visitors from all the above-mentioned industries.

The products that we are to display include Stationary Diamond Dressers, Rotating Diamond Dressers, Diamond and CBN Honing Stones, Tools and Accessories, Single Pass Honing Sleeve and Mandrel, Diamond and CBN Electroplated Products, PCD and PCBN Inserts & Tools, Diamond Lapping Products, Diamond Gauging Products, Diamond & CBN Resin and Metal Bond Grinding Wheels, Diamond & CBN Hybrid and Vitrified Bond Grinding Wheels, Diamond Rolls, CVD Rolls, and Grinding Wheels.

Through the 'Make in India' initiative, we reduced manufacturing costs while maintaining the highest quality level of our products. This enabled us to penetrate markets in which we previously struggled. Our cost-effective products, combined with the current global political disturbances, have led to several countries prioritizing Indian products, thus creating substantial business opportunities for us.

**Powered by AMT and Gardner Business Media, three, half-day workshops are exclusively designed to offer job shop stakeholders new and creative opportunities.**

> "IMTS 2024 provides an opportunity for global companies to explore and embrace technologies that are essential for making rapid advancements in digitalization and manufacturing. India and America have fundamental commonalities. Both are thriving democracies with strong value systems and open market economies. The investment climate in India is cordial for American companies willing to set up industrial units."
>
> **Jibak Dasgupta**
> **Director General & CEO**
> **Indian Machine Tool Manufacturers' Association (IMTMA)**
> **Bangalore International Exhibition Centre (BIEC)**

**One of the special highlights during IMTS 2024 is the 'India Opportunities' session, which is being jointly organized by IMTMA and AMT. It is scheduled for September 10, 2024, from 11:00 am to 12:15 pm.**

September 10, 2024, from 11:00 am to 12:15 pm in E263, East Building, Level 2. Titled, 'Synergy for Indo-US Partnership in Manufacturing', this session will provide an outlook on the Indian Manufacturing and Machine Tool industry.

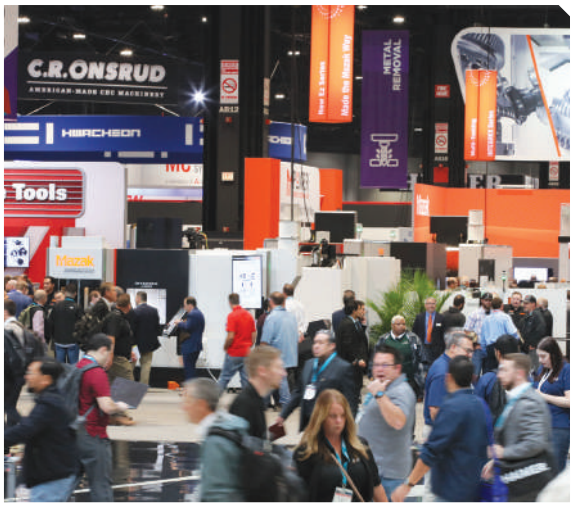
Jibak Dasgupta, Director General & CEO, IMTMA, notes, "IMTS 2024 provides an opportunity for global companies to explore and embrace technologies that are essential for making rapid advancements in digitalization and manufacturing. India and America have fundamental commonalities. Both are thriving democracies with strong value systems and open market economies. The investment climate in India is cordial for American companies willing to set up industrial units."

In this context of fostering business partnerships for India's industries, a brief look into how seasoned Indian IMTS participants are gearing up to target key sectors and present their highly anticipated solutions in this edition.

## Show & Registration Hours

**All hours are central time**

| Building / Level | Exhibit Hall Hours |
|---|---|
| East Building, Level 3 | 9:00 am - 5:00 pm |
| West Building, Level 3 | 9:00 am - 5:00 pm |
| North Building, Level 3 | 10:00 am - 6:00 pm |
| South Building, Level 3 | 10:00 am - 6:00 pm |
| North Building, Level 1 | 9:00 am - 3:00 pm |




Source: AMT

2nd Edition

# MTX-ONNECT

RUDRAPUR

(B2B Expo for Machine Tool & Manufacturing Technologies)

## 3 - 4 October 2024

## Ark Hotel & Resorts
## Rudrapur (Uttarakhand)

Delivered by IMTMA, organizer of IMTEX®

A perfect platform to connect with regional industries

Organiser

Indian Machine Tool Manufacturers' Association

For more details contact: **exhibitions@imtma.in**

# FORGING NEW PATHS FOR INDIA

Organized by Landesmesse Stuttgart GmbH, AMB 2024, the International Exhibition for Metal Working, is poised to once again set a benchmark as the industry's leading event in the global manufacturing calendar. From September 10-14, 2024, Messe Stuttgart in Stuttgart, Germany, will be the epicenter of metalworking technologies where Indian companies will present 'Made in India' products that exemplify innovation, quality, and commitment.


Source: Messe Stuttgart GmbH

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

Held every even year, AMB occupies a leading position among the exhibitions in the industry and ranks among the world's top five events. "A visit to AMB in Stuttgart, Germany, is especially valuable for gaining a comprehensive overview of the European market," says Roland Bleinroth, President & CEO, Landesmesse Stuttgart GmbH. "Leading global companies and technology pioneers showcase their latest innovations and technologies shaping the world market."

With a total exhibition area of over 1,20,000 sq mt, the event will house over 1,200 exhibitors from 30 countries, and the number is expected to increase after subsequent registrations by co-exhibitors. An extensive list of exhibitors includes established international companies and breakthrough regional newcomers to present metalworking technology's entire spectrum and trends. "We are very pleased to welcome over 1,200 exhibiting companies at this year's AMB," notes Bleinroth. "Numerous new products

"A visit to AMB in Stuttgart, Germany, is especially valuable for gaining a comprehensive overview of the European market. We are highly pleased to welcome over 1,200 exhibiting companies at this year's AMB. Numerous new products and technologies will be showcased at the event. Among them, GF Machining and Yamazaki Mazak will be unveiling world premieres at AMB."

**Roland Bleinroth**
**President and CEO**
**Landesmesse Stuttgart GmbH**

and technologies will be showcased at the event. Among them, GF Machining and Yamazaki Mazak will be unveiling world premieres at AMB."

AMB 2024 will be devoted to presenting innovative solutions for machine tools, production systems, control and drive systems, automation solutions, and the use of smart technologies from Industry 4.0, CAD/CAM applications, and AI-driven automation.

Separate special shows include German Machine Tools Builders' Association (VDW) and German Engineering Federation (VDMA)-backed umati (universal machine technology interface) initiative, which will spotlight open interface standards based on OPC UA, demonstrating seamless machine communication. The SmartFactory showcase at Entrance East will provide a fully automated process chain, allowing visitors to witness real-time production and machine interactions.

## Insights from leading supporters

In its capacity as the promotional supporter of AMB, VDW represents machine tool manufacturers at the exhibition. "The Mechanical Engineering Youth Foundation, which was initially founded by VDW and is now being continued together with VDMA, has promoted young industrial employees in metalworking occupations for many years and will also do so at AMB 2024," says Dr Markus Heering, Managing Director, VDW. "This Foundation will stage the special show on training under the motto 'Do something with a future—your opportunity in mechanical engineering'—in the atrium at the Entrance East."

He adds, "The school students' rally TechVenture—technology is more than just mathematics—of the German Academic Association for Production Technology (WGP) will be held

**AMB 2024 will feature over 1,200 exhibitors from 30 countries, showcasing cutting-edge technologies and innovations in metalworking across a 120,000 sq mt area.**

"The Mechanical Engineering Youth Foundation, which was initially founded by German Machine Tools Builders' Association (VDW) and is now being continued together with German Engineering Federation (VDMA), has promoted young industrial employees in metalworking occupations for many years and will also do so at AMB 2024. We will also be present with umati, universal machine technology interface, our standardized interface for machine communication in the factory."

**Dr Markus Heering**
**Managing Director**
**German Machine Tools Builders' Association (VDW)**

"Indian companies can greatly benefit from AMB 2024 by leveraging the platform to connect with global industry leaders, showcase their innovations, and explore new markets. VDMA India aims to enhance the global presence of Indian companies and foster meaningful business relationships across the international manufacturing sector."

**Rajesh Nath**
**Managing Director**
**VDMA India Services Pvt Ltd**

**AMB 2024 will provide valuable insights into the European market and opportunities for global networking, making it a strategic platform for international business relationships and collaborations.**

at AMB for the first time. We will also be present with umati, universal machine technology interface, our standardized interface for machine communication in the factory."

Through 'India Day', VDMA India will be highlighting opportunities in the Indian market. "VDMA India aims to enhance the global presence of Indian companies and foster meaningful business relationships across the international manufacturing sector," emphasizes Rajesh Nath, Managing Director, VDMA India Services Pvt Ltd. "Indian companies can greatly benefit from AMB 2024 by leveraging the platform to connect with global industry leaders, showcase their innovations, and explore new markets."

For exhibitors, he continues, the fair offers a chance to present their cutting-edge technologies and products to a diverse audience, which can lead to valuable partnerships and increased visibility in international markets. "Attendees can gain insights into the latest industry trends, technological advancements, and best practices by engaging with global experts," Nath further states.

## Strategic platform for Indian manufacturing

'India Day' at AMB 2024 is a special event being organized by VDMA India on September 12, 2024. "Scheduled for the third day of the exhibition, this event is designed to showcase India's potential as a growing industrial hub and highlight its progress towards becoming a US$ 5 trillion economy by 2028," stresses Nath.

This one-day event features a series of presentations, panel discussions, and networking sessions with key industry stakeholders, including Government representatives and business leaders. "These activities aim to provide valuable insights into the Indian market and share best practices adopted by European companies in the Indian market," he asserts. "By facilitating these interactions, 'India Day' seeks to strengthen business ties, foster international partnerships, and promote India's role in the global manufacturing landscape."

## From strongholds to new frontiers

Indian machines and products are increasingly gaining acceptance in the European market due to several factors. "Firstly, the improved standards of quality and competitive pricing of Indian manufacturing products make them attractive to European buyers looking for cost-effective solutions," Nath elaborates. "Indian companies have made significant strides in adopting advanced technologies and adhering to international quality standards, which has bolstered their credibility and appeal."

India's growing focus on innovation and sustainable practices aligns well with European market demands for technologically advanced and eco-friendly products, he adds. "Enhanced trade relations and strategic collaborations facilitated by events like AMB 2024 further aid in building trust and showcasing Indian products to a broader European audience," he explains.

TK Ramesh, Managing Director, Ace Designers Ltd, part of Ace-Micromatic Group, shares similar sentiments regarding the rising acceptance and growing potential of 'Made in India' machines capturing a larger share of the global market. "Our reach is expanding beyond traditional strongholds like Germany, Italy, and France to new territories such as Poland, Slovenia, and Romania," Ramesh notes. He attributes this growth to

> "Our reach is expanding beyond traditional strongholds like Germany, Italy, and France to new territories such as Poland, Slovenia, and Romania. Our primary objective is to establish strong partnerships with dealer distribution networks across Europe. These alliances will be key to boosting our market presence and propelling our growth in the region."
>
> **TK Ramesh**
> **Managing Director**
> **Ace Designers Ltd**

the increasing participation of Indian manufacturers in international exhibitions like AMB, coupled with advancements in India's IT and space sectors.

Similarly, Kaushik Kale, Managing Director & CEO, Stamp It Robotai & Solutions Pvt Ltd, comments, "'Make in India' products, especially in the Machinery and Automation sectors, are steadily gaining global market share. With a strong emphasis on quality, innovation, and competitive pricing, Indian manufacturers are now recognized for delivering world-class solutions. At Stamp It Robotai & Solutions, we are proud to contribute to this trend by offering robust and efficient machines that meet international standards, further strengthening India's position as a key player in the global manufacturing arena."

## All roads lead to Europe

In an age where global markets are more intertwined than ever, business leaders' strategies can influence the destiny of whole industries by leveraging international events as AMB. On these grounds, companies like AceMicromatic Group, India's largest and most comprehensive CNC machine tools group, is strategizing for the upcoming event, aiming to become a major player in the European market. "Our primary objective is to establish strong partnerships with dealer distribution networks across Europe," Ramesh states. "These alliances will be key to boosting our market presence and propelling our growth in the region."

The Group's German facility, AceMicromatic International GmbH, plays a crucial rol in this expansion. He emphasizes its importance, saying, "Our German facility has been pivotal in ensuring quick deliveries and providing comprehensive technical support to European customers."

CR Raguramachandran, Chief Executive Officer, AceMicromatic International (AMI) Pvt Ltd—export division of the Group, adds, "Located in Nesselwang, this facility is a sales and technical service center, but most importantly, as the epicenter of the company's European operations. It serves as a lifeline for markets in Italy, Spain, Poland, and Romania."

Sharing the company's ambitious revenue target, he reveals, "We're pursuing US$ 1 billion in revenue by 2029. It's an ambitious goal, but we believe it is achievable."

In a similar vein, Stamp It Robotai & Solutions Pvt Ltd is also ready to make waves at AMB 2024, as the event offers an ideal stage to unveil its latest technological advancements, reinforcing its position as a forward-thinking player in the European market. Kale explains the company's participation: "We are here to showcase our brand, MarknStamp, innovative marking solutions tailored to meet the evolving demands of the global Manufacturing industry. This platform allows us to demonstrate our commitment to precision and quality, connect with industry leaders, and explore new partnerships."

Through its participation, Stamp It Robotai & Solutions aims to extend its reach to European markets, particularly in Germany, France, and Italy, where there is a growing demand for advanced marking solutions. "We are targeting emerging markets in Eastern Europe and expanding our footprints there," he further opines. "Our goal is to forge strong connections and increase our market presence in these regions by showcasing our cutting-edge technologies."

**The event will spotlight new advancements in machine tools, automation, and smart technologies, including world premieres from major companies like GF Machining and Yamazaki Mazak.**

## Seizing the moment

The global manufacturing com-

"Located in Nesselwang, AceMicromatic International GmbH facility is a sales and technical service center, but most importantly, it serves as the epicenter of the company's European operations. We're pursuing US$ 1 billion in revenue by 2029. It's an ambitious goal, but we believe it is achievable."

**C R Raguramachandran**
**Chief Executive Officer**
**AceMicromatic International (AMI) Pvt Ltd**

## AceMicromatic International Features at AMB 2024

## Ace Designers Ltd Hall & Stall: 4/4A-01 www.acemicromatic.net

**India will be prominently represented through 'India Day,' highlighting the country's growing industrial capabilities and its advancements toward becoming a US$ 5 trillion economy by 2028.**

AceMicromatic International GmbH, the international division of India's largest machine tool conglomerate, AceMicromatic Group, is showcasing three advanced machines from its leading brands: Ace Designers – Machining Centre Division, Ace-AMS (Ace Manufacturing Systems Ltd), and Micromatic Grinding Technologies Pvt Ltd (MGT).


**DTC-400 XL from Ace-AMS:** The DTC-400 XL is designed specifically for high-speed drill tap applications along with full milling capabilities. The machine is compact and powerful, loaded with BT-30/ BBT-30 spindles and is built with an optimally designed structure to take care of cutting forces, cushioning high speed and ensuring accurate tapping. The machine is equipped with roller-type LM guideways to deliver better rigidity and superior performance.

**J10 LM M from Ace Designers:** It is a Turn Mill powerhouse in precision machining, engineered to handle the most demanding tasks with ease and efficiency. The machine can meet requirements of various sectors including automotive, aerospace, and general manufacturing. It boasts high torque capability supported by a powerful AC Spindle motor, making it ideal for heavy-duty machining and material removal.

**ECO 200 U from MGT:** It is a cutting-edge hydraulic external grinding machine that redefines precision and efficiency in small component production and tool room applications. The ECO 200 U - Precision Hydraulic External Grinding Machine features a swing diameter of 200 mm and a distance of 400 mm between centers, making it suitable for a variety of grinding tasks. It can accommodate a maximum grinding wheel size of 350 mm in diameter and 50 mm in width.

Source: AceMicromatic Group

"We at AMB 2024 will showcase our brand, MarknStamp, innovative marking solutions tailored to meet the evolving demands of the global manufacturing industry. Our goal is to forge strong connections and increase our market presence in these regions by showcasing our cutting-edge technologies."

**Kaushik Kale**
**Managing Director & CEO**
**Stamp It Robotai & Solutions Pvt Ltd**

munity is eagerly anticipating and looking forward to seeing what will be unveiled during the AMB 2024 event. Ace Designers Ltd is to showcase the DTC-400XL - High speed Drill Tap Machining center, J10 LM M - Turn Mill Powerhouse, and ECO 200 U - Precision Hydraulic External Grinding Machine. On the other hand, Stamp It Robotai & Solutions' key exhibits include MarknStamp Brand and its innovations.

For the Indian counterparts, it is an apt platform to demonstrate their competencies, potential, and readiness for overseas cooperation and appreciation. With the support of VDMA India and other important players of the Indian Metalworking industry, AMB 2024 will therefore be a defining moment in solidifying India's position in the global Metalworking industry.

**The Smart-Factory showcase at Entrance East will provide a fully automated process chain, allowing visitors to witness real-time production and machine interactions.**

## Stamp It Robotai & Solutions Pvt Ltd Showcases its innovative brands at AMB 2024

**Stamp It Robotai & Solutions Pvt Ltd**
**Hall & Stall: 9/9D51**
**www.MarknStamp.com**

Stamp It Robotai & Solutions will talk about its brand MarknStamp, innovative marking solutions tailored to meet the evolving demands of the global manufacturing industry. At AMB 2024, the company is slated to unveil its latest technological advancements. On display at the booth will be:

Battery Operated Wi-Fi Enabled Hand Engraving Machine

Touch Screen Dot Peen Portable Machine

Source: Stamp It Robotai & Solutions Pvt Ltd

# JIMTOF 2024: INNOVATING FOR TOMORROW

Japan Machine Tool Builders' Association and Tokyo Big Sight Inc., the organizers of the 32nd Japan International Machine Tool Fair, JIMTOF 2024, have announced the fair to be held from November 5–10, 2024 at Tokyo Big Sight. The highly regarded event will feature state-of-the-art technologies from renowned and emerging manufacturing players from around the world, providing a conducive platform for information exchange and exploring opportunities.

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

The 32nd edition of Japan International Machine Tool Fair (JIMTOF) is all set to take the industry by storm with its unprecedented scale and exhibitor lineup.

The monumental gathering of the machine tool industry will utilize the entire Tokyo Big Sight venue, covering a sprawling exhibition area of 1,18,540 sq mt and hosting 1,019 exhibitors across 5,726 booths, marking a new record in its history.

Of the 1,019 exhibitors, 794 will be domestic and 225 will be international exhibitors, underscoring the global significance of JIMTOF as a premier platform for showcasing the latest advancements in machine tools and related technologies

## Themed exhibitions and special areas

As in the 2022 edition, JIMTOF 2024 will categorize exhibitors'


Source: JMTBA

Source: JMTBA

booths according to the products being showcased. To highlight the growing importance and innovation in additive manufacturing technologies, a special concurrent exhibition 'Additive Manufacturing Area in JIMTOF 2024' will feature on the first floor of the South Hall. This area will spotlight 47 exhibitors across 179 booths.

## Event details

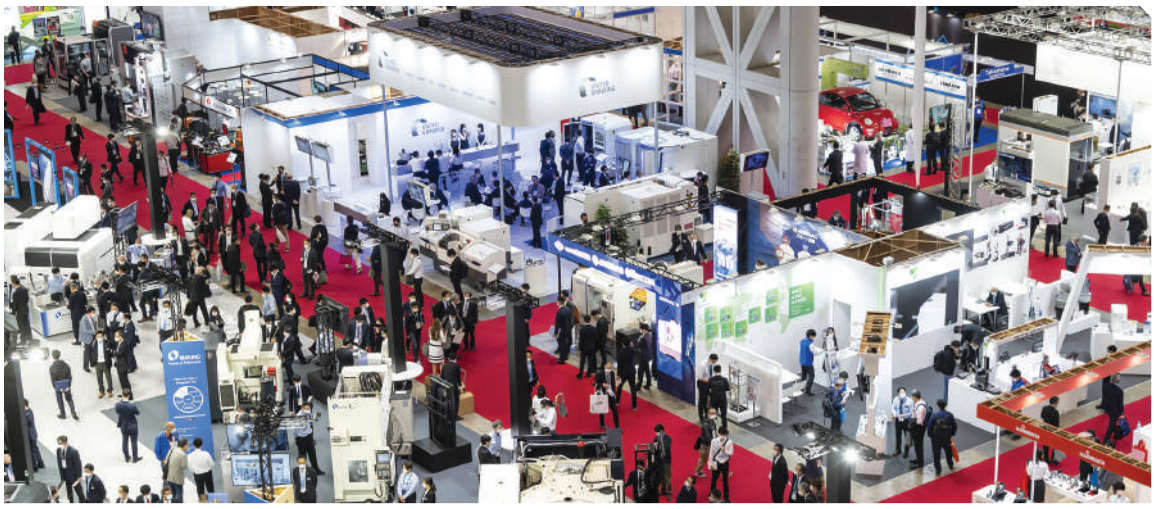
With the theme 'Technologies Passed Down to the Future Offer Unlimited Possibilities', JIMTOF 2024 aims to focus on innovation and the future of manufacturing.

The event will span six days, with varied opening hours across different halls. The East Halls will be open from 10:00 AM to 6:00 PM, while the West and South Halls will operate from 9:00 AM to 5:00 PM, with an earlier closing on the final day.

## A comprehensive range of exhibits

One of the world's largest international technology exhibitions, JIMTOF, has been held biennially for over 50 years since 1962,

**JIMTOF 2024 will span six days, with varied opening hours across different halls. The East Halls will be open from 10:00 AM to 6:00 PM, while the West and South Halls will operate from 9:00 AM to 5:00 PM, with an earlier closing on the final day.**



Source: JMTBA

Source: JMTBA

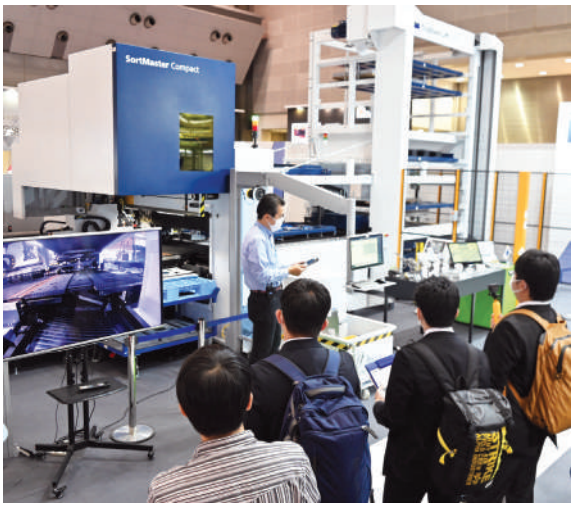
**JIMTOF 2024 will utilize the entire Tokyo Big Sight venue, covering a sprawling exhibition area of 1,18,540 sq mt and hosting 1,019 exhibitors across 5,726 booths, marking a new record in its history.**

## Event Outline

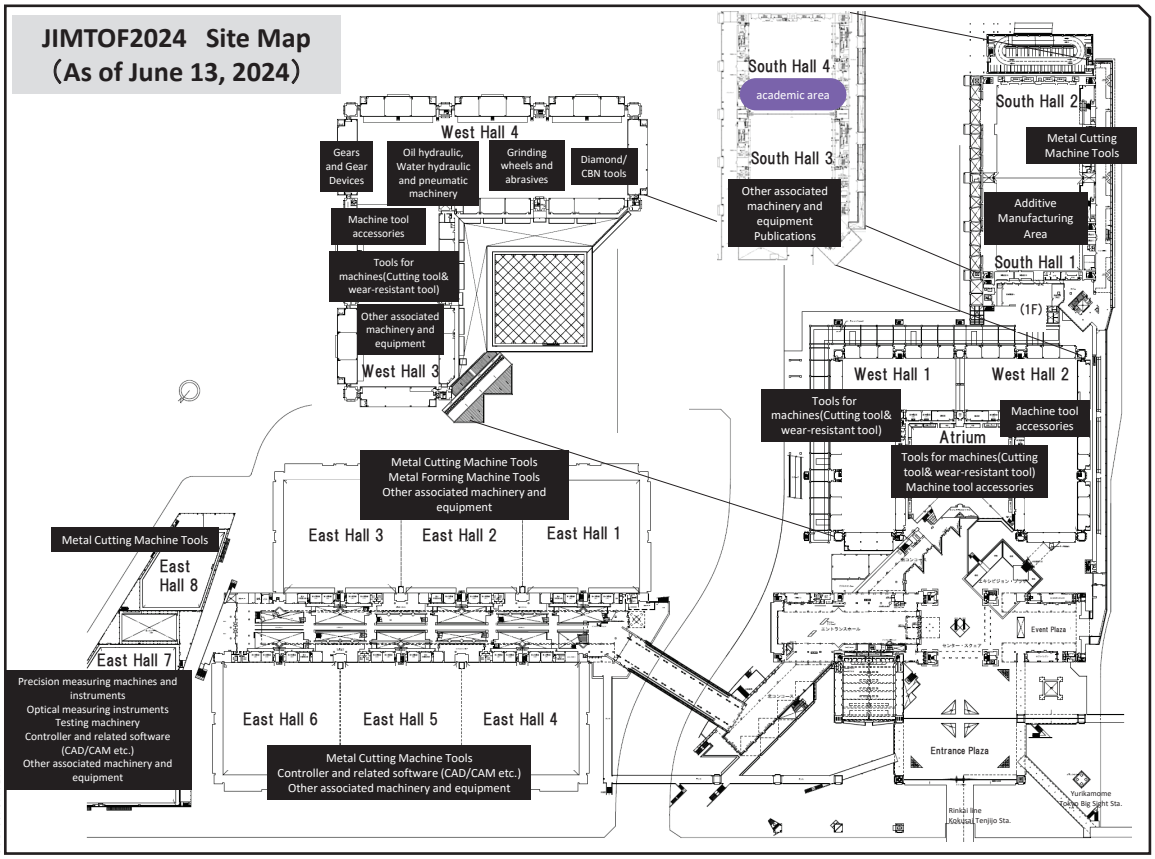
- ***Name:*** JIMTOF 2024 (The 32nd Japan International Machine Tool Fair)
- ***Theme:*** 'Technologies Passed Down to the Future Offer Unlimited Possibilities'
- ***Purpose:*** To foster industry development and promote international trade through technical exchanges in machine tools and related equipment.
- ***Date:*** November 5–10, 2024
- ***Venue:*** Tokyo Big Sight (Tokyo International Exhibition Center)
- ***Exhibition Space:*** 1,18,540 sq mt
- ***Admission Fee:*** JPY 1,000 (Advance tickets), JPY 3,000 (On-the-day tickets), Free for students (Registration required)
- ***Official Website:*** www.jimtof.org/en

marking its 32nd edition in 2024. The trade fair promises a wide array of exhibits, including Machine tools (Metal cutting, Metal forming), Machine tool accessories, Tools for machines (Cutting tools and wear-resistant tools), Diamond and CBN tools, Grinding wheels and abrasives, Gears and Gear Devices, Oil/water hydraulic and pneumatic machinery, Precision measuring machines and instruments, Optical measuring instruments, Testing machinery, Controller and related software (CAD/CAM, etc.), and other associated machinery and equipment, raw materials, technologies, and publications are among the exhibitor profile of the exhibition.

The event is supported by Ministry of Economy, Trade and Industry; Tokyo Metropolitan Government; and The Japan Chamber of Commerce and Industry. Some of the cooperating organizations include Japan Machine Tool Importers' Association, Japan Forming Machinery Association, Japan



Source: JMTBA



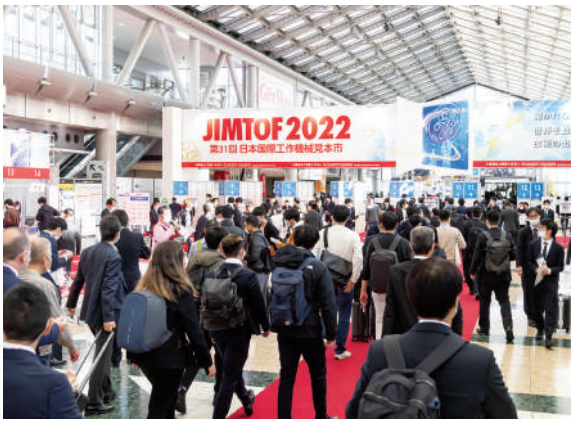

Source: JMTBA

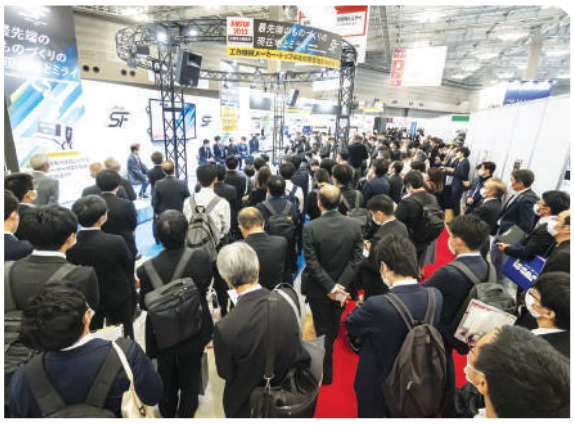
Precision Machine Association, Japan Cutting & Wear-resistant Tool Association, Japan Machine Accessory Association, Japan Precision Measuring Instruments Manufacturers Association, Japan Grinding Wheel Association, Industrial Diamond Association of Japan, Japan Optical Measuring Instruments Manufacturers' Association, Japan Fluid Power Association, Japan Testing Machinery Association, and Japan Gear Manufacturers' Association.

## A global platform for innovation

Globally recognized as the premier event for introducing cutting-edge technologies in the Machine Tool industry, JIMTOF 2024 is expected to draw visitors from around the world for dynamic exchanges of technical information and to explore the latest developments showcased by national and international exhibitors. The event also serves as a focal point for industry stakeholders to forge business bonds and gather insights into customer needs for future product development.

**To highlight the growing importance and innovation in additive manufacturing technologies, a special concurrent exhibition 'Additive Manufacturing Area in JIMTOF 2024' will feature on the first floor of the South Hall, housing 47 exhibitors across 179 booths.**



Source: JMTBA

Indian Machine Tool Manufacturers' Association

# FACTEQ® 2025

Factory Equipment Expo

**8 - 11 May 2025**

**Pragati Maidan, New Delhi**

Powered by IMTMA, organizer of

IMTEX®

## FACTORIES OF TOMORROW

**BUILD**

**MAINTAIN**

**UPGRADE**

Co-located with

DELHI MACHINE TOOL EXPO™ 2025

**For stall bookings**

Visit: www.facteq.in


**Hannah Victoria**
M: 9731040077 | E: hannah@imtma.in

**Nishant Singh**
M: 9823174010 | E: nishant@imtma.in

Indian Machine Tool
Manufacturers' Association

# Transforming Indian Manufacturing

- Membership Services
- Reports & Publications
- Technology Development
- Business Development
- Skill Development
- Networking
- Exhibitions

Locate us
@
Bengaluru • Pune • Gurugram

For Membership, contact:
**Swapna P**
+91 96639 96888 ; swapna@imtma.in

Follow us on:

www.imtma.in

# Company Index



# Advertiser Index

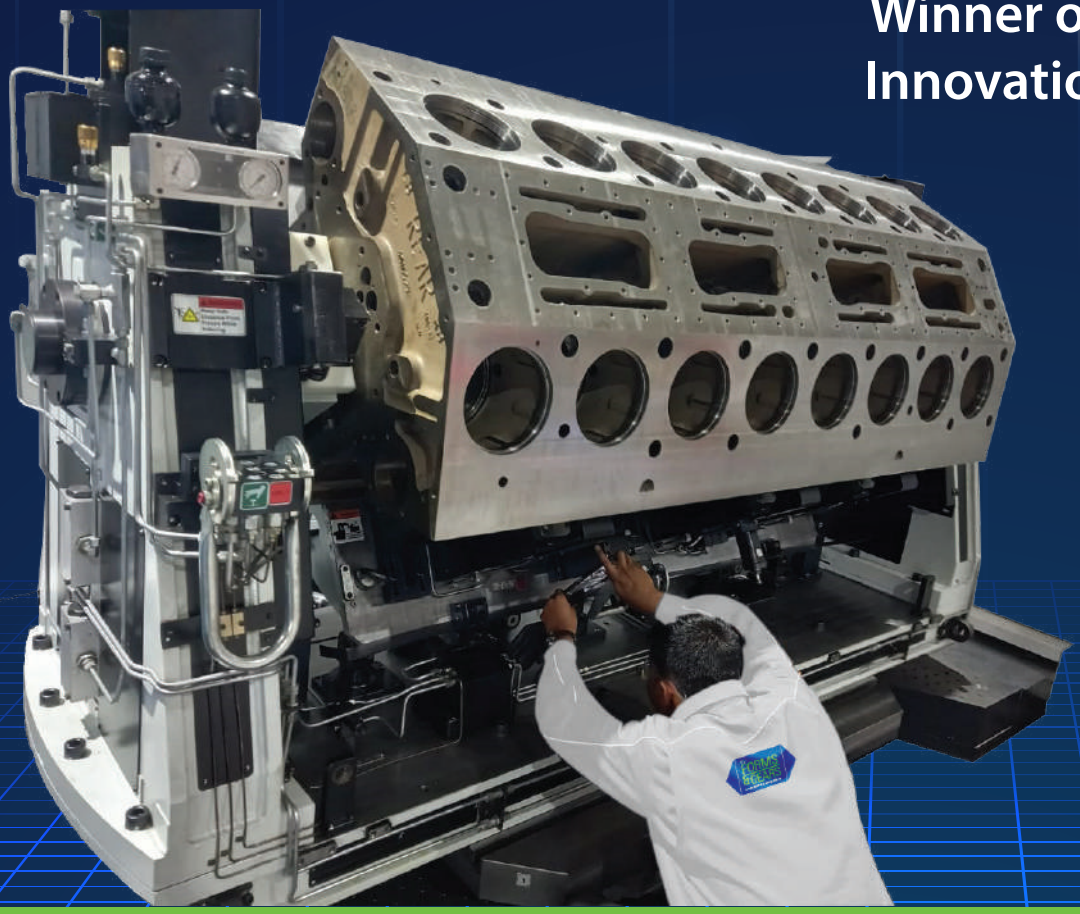
RV FORMS & GEARS
An ASM Technologies Group Company

50 Years of Engineering Excellence

# SmartFix4.0®

## Intelligent Fixtures

**Winner of CII Industrial Innovation Award 2020**



## Asia's leading fixture builder

For over 50 years Forms & Gears has been designing and manufacturing Precision Fixtures to the world's leading Auto OEMs and Machine Makers in 10 countries across the globe.


RV Forms & Gears LLP
MF 11, SIDCO Industrial Estate, Guindy,
Chennai - 600 032, Tamilnadu, India
Call +91 77570 53326 or email us on
marketing@rvformsandgears.com
www.rvformsandgears.com

# EFFECTIVE MEDICAL TECHNOLOGY DEPENDS ON SELECTING THE CORRECT BORING TOOL

## EXPLORE HORN

Exceptional performance comes from pairing the optimal machining process with the perfect tool. HORN combines cutting-edge technology with outstanding performance and reliability.

AMB

Explore HORN
at AMB Stuttgart
10.– 14. September 2024

horn-group-com/de

IMTS
POWERED BY AMT

Explore HORN
at IMTS Chicago
09.– 14. September 2024

horn-group-com/us