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Indian Machine Tool  
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# LANDSCAPE



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Pursuing Excellence in  
Tool Manufacturing

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INSIGHT - INDIAN DEFENCE MANUFACTURING  
Capitalizing On The Indigenization Push

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MAYANK VARMA  
Business Head - Tooling & Technology  
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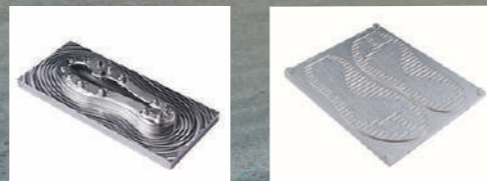
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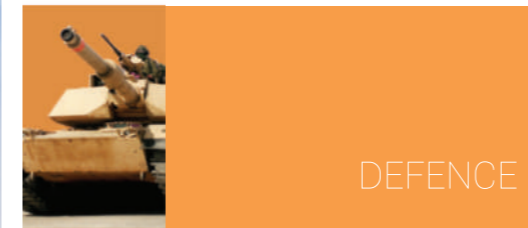
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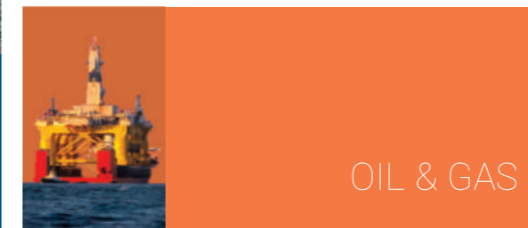
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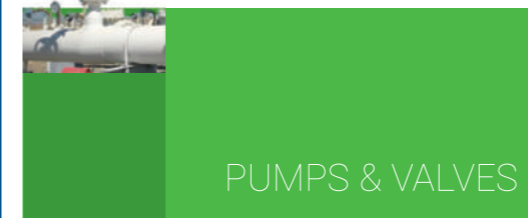
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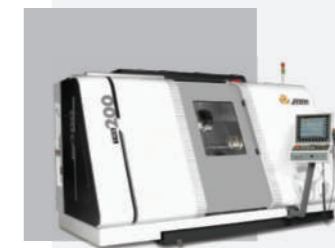
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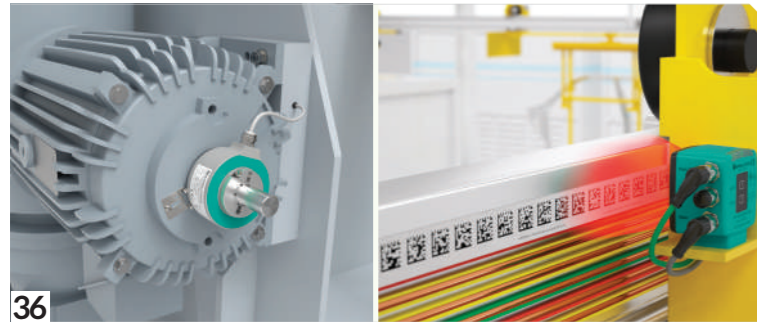
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# CHARTING INDIA'S MANUFACTURING GROWTH



*Rajamane*

**RAJENDRA S RAJAMANE**  
PRESIDENT  
IMTMA

I am privileged to present this foreword to the readers of Modern Manufacturing India (MMI) magazine as the President of Indian Machine Tool Manufacturers' Association (IMTMA).

India is one of the fastest-growing global economies with the latest World Economic Outlook report by the International Monetary Fund (IMF) projecting India's growth to remain strong at 6.3 percent in 2023 as well as in 2024.

India aspires to become the third-largest global economy while becoming a US\$10 trillion economy by around 2035. As this happens, we can see advancements in all three vital constituents of the economy, viz., Agrarian, Manufacturing, And Services sectors.

Manufacturing share in India's GDP can rise from around 17 percent to around 25 percent by around 2030. India's merchandise exports, likewise, is expected to double up to one trillion USD by the end of the current decade.

Government spending, PLIs, and Make-in-India are giving a push for manufacturing, and businesses are taking advantage of these programs. India's Capital Goods sector including the Machine Tool industry needs to come up with progressive strategies to meet aspirational objectives.

Asia's leading exhibition on metal forming and manufacturing technologies, IMTEX FORMING 2024, along with concurrent shows Tooltech, Digital Manufacturing, and WELDEXPO, will be held from January 19 - 23, 2024 at Bangalore International Exhibition Centre (BIEC), Bengaluru.

It would be a great opportunity for industries to participate in both these events and reap full benefits. Looking at the overall scenario, we perceive that there are plentiful avenues for the Machine Tool and Manufacturing industries to grow in the years to come.

IMTMA will continue with its endeavors while keeping its readers updated on the developments happening in the Manufacturing industry.

Happy reading.

*Asia's leading exhibition on metal forming and manufacturing technologies, IMTEX FORMING 2024, along with concurrent shows Tooltech, Digital Manufacturing, and WELDEXPO, will be held from January 19 - 23, 2024 at Bangalore International Exhibition Centre (BIEC), Bengaluru.*

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

Dear Readers,

As I write this note, I am glad to share that the Manufacturing industry in India is undergoing a holistic transformation with many industry sectors showing good growth. This is evident through the responses that we are seeing in various exhibitions and events that are held across the country. Recently, we saw shows at the Bangalore International Exhibition Centre (BIEC) which have registered a significant growth compared to their previous edition.

It gives me immense pleasure to share that our next metal forming show IMTEX FORMING has also received a tremendous response. IMTEX FORMING 2024 will be held in January 2024, and we hope to see a record number of visitors. In this edition of Modern Manufacturing India (MMI), readers get a sneak peek into the exhibition.

I would certainly like to acknowledge here the support that we have been receiving from manufacturing communities across the globe which always spurs us to scale greater heights. IMTMA will remain

thankful and look forward to engaging with its readers in all possible ways. I extend my greetings to all readers in this festive season. Please do write back to us with any suggestions for improvements. We would be glad to hear from you.

Enjoy reading.

*"Our next metal forming show IMTEX FORMING has also received a tremendous response. IMTEX FORMING 2024 will be held in January 2024, and we hope to see a record number of visitors."*



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*Soumi Mitra*

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## WHEN THE ONLY OPTION LEFT IS SUCCESS

**O**ur in-person attendance at the 2023 edition of EMO Hannover made us witness the ascent of India's presence on the world economic stage. The resonating success of Indian exhibitors and the impressive footfalls of visitors from India seeking innovation at the world's largest production technology show successfully captured the narrative of India's transformative growth.

We were immensely proud to be part of the show as it unfolded, featuring a diverse range of technologies and products proudly bearing the label 'Made in India'.

Collectively, the present digital transformation, the country's commitment to foster business, the growth projection of 7.5 percent for 2023-24, and Foreign Direct Investments (FDIs) underline India's journey to becoming the third-largest global economy by 2027.

Other than the above stats, the successful turnaround of the international audience in the press conference organized by Indian Machine Tool Manufacturers' Association (IMTMA) at EMO Hannover testified to our confirmed status in the global manufacturing arena. Similarly, a remarkable

number of delegates from diverse industry sectors attended the 'India Opportunities Session' at EMO Hannover. Organized by IMTMA with VDW (German Machine Tool Builder's Association) and VDMA India (German Engineering Federation), the session focused on the business potential that India offers to global players. Eminent industry stalwarts also graced the event with their presence.

Back home, IMTEX Forming & Tooltech 2024 is all set to feature the latest in metal forming, welding, and digital manufacturing. Once again, the global

manufacturing community will gather on a single platform from January 19-23, 2024, at Bangalore International Exhibition Center to get a glimpse of India's manufacturing prowess and gain insight into the current trends and technologies.

Continuing our tradition of bringing forth breakthrough stories of Indian manufacturing players and reaffirming the nation's growth, we are back with our newest edition of MMI and are looking forward to your support in the form of feedback.

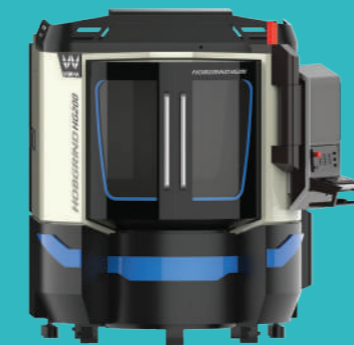
*"Set your sights high, the higher the better. Expect the most wonderful things to happen, not in the future but right now. Realize that nothing is too good. Allow absolutely nothing to hamper you or hold you up in any way."*

*- Eileen Caddy*

### CNC Tool Grinding Machines



Ecogrind SX<sup>5</sup> LiMo



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## Tool Grinding Machines

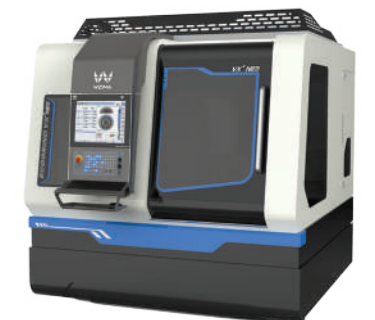
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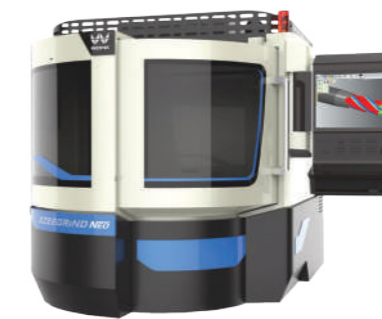
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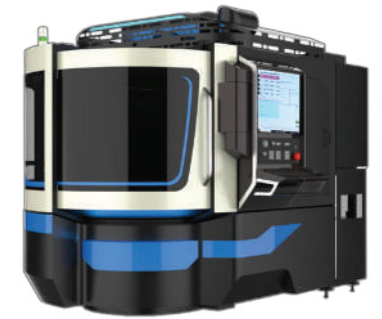
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Ezeegrind Neo



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## INDICATING PROMISING SIGNS

The Indian economic outlook for October 2023 reflects a mix of positive and challenging indicators.

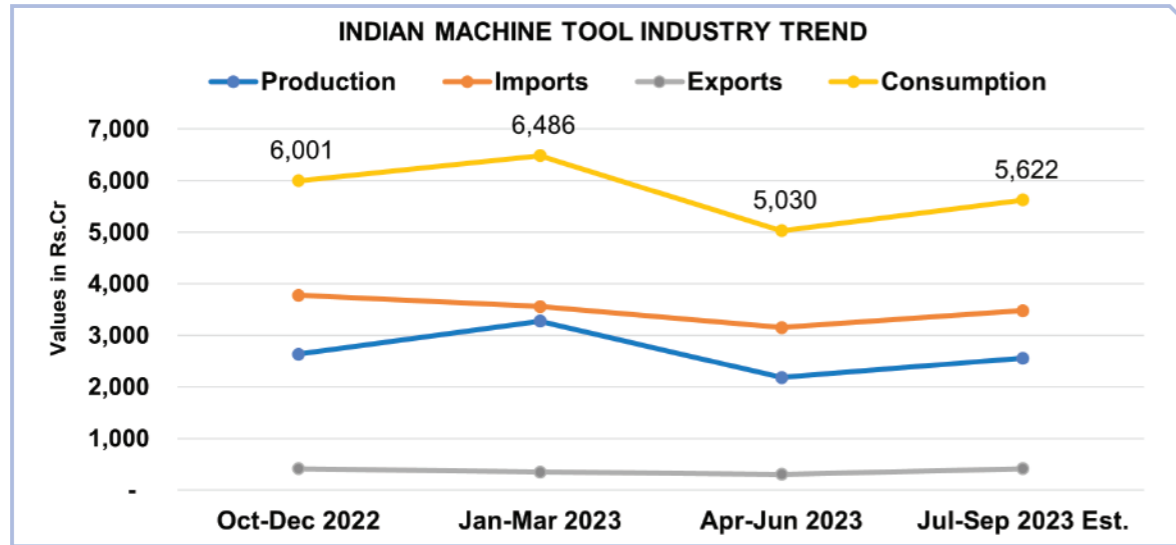


Table 1. Indian Machine Tool Industry Trend

**The Machine Tool industry production and orders booked in Q1FY24 remained impressive despite the flat growth in exports. The Indian machine tool market continues to expand, with consumption reaching ₹10,651 Crore (US\$1.3 B) at 7 percent Y/Y growth in H1FY24.**

The Purchasing Managers' Index (PMI) for manufacturing, although slightly lower at 57.5 in September, continues to indicate expansion, remaining well above the benchmark of 50. PMI services surged to 61 in September, marking one of its highest levels in over 13 years, indicating robust growth in the services sector. Industrial production (IIP) showed promising signs, accelerating to a 14-month high of 10.3 percent in August 2023, reflecting enhanced manufacturing and production activity.

On the monetary front, the Reserve Bank of India's Monetary Policy Committee retained the repo rate at 6.5 percent in its October 2023 review, signaling a continued focus on maintaining stability in the financial markets. Inflationary pressures have eased with CPI inflation falling to 5.0 percent in September.

The fiscal picture showed a mixed performance, with the Government's gross tax revenues (GTR) for April-August FY24 growing by 16.5 percent, reflecting robust direct tax growth. India's merchandise trade balance

remained a concern as both exports and imports contracted for the tenth successive month in September. The current account deficit increased to 1.1 percent of GDP in Q1FY24 due to a higher merchandise trade deficit.


### Promising despite challenges

Meanwhile, net foreign direct investments (FDIs) turned negative, with outflows exceeding inflows in August. Despite these challenges, India's economic growth remains promising, with the OECD and IMF forecasting global growth at 3 percent in 2023 and India's FY24 growth projected at 6.3 percent, indicating the potential for an economic rebound in the coming year.

On the machine tool front, production for the July to September quarter of 2023 (Q2FY24) increased by an estimated 12 percent year-on-year (Y/Y), reaching ₹2,558 Crore (US\$ 309 M). Orders booked during the same period witnessed an impressive growth of an estimated 18 percent Y/Y, totaling ₹3,742 Crore (US\$ 453 M). The industry's

imports in Q2FY24 saw a rise of 7 percent year-on-year, amounting to ₹3,476 Crore (US\$ 420 M). Machine tool exports from India reported a flat 1 percent growth, amounting to ₹413 Crore (US\$50 M) and consumption is estimated to have increased by 10 percent to reach ₹5,622 Crore (US\$ 680 M) in Q2FY24.

China, Japan, and Germany emerged as the top countries exporting to India, contributing 58 percent of the total machine tool imports in April to September 2023 (H1FY24). Lathes, Presses, and Vertical Machining Centers (VMCs) were the top machinery imported valued at ₹2,303 Crore (US\$ 279 M) at about 35 percent of total machine tool imports in H1FY24.

As for exports, Russia, China, and the USA emerged as the top three export destinations, accounting for 44 percent of total machine tool exports in H1FY24. Lathes, Horizontal, and Vertical Machining Centers were the top three machinery exported valued at ₹269 Crore (US\$ 33 M) at about 38 percent of total machine tool exports in H1FY24. 

Source: Data & Policy Team, IMTMA

## CHARTING A GROWTH MAP

At the 77<sup>th</sup> Annual General Meeting (AGM) of Indian Machine Tool Manufacturers' Association (IMTMA), President Ravi Raghavan set an optimistic tone for the year ahead by highlighting factors favoring India as we aspire to be a US\$5 trillion economy and disclosing the positive order book position for machine tools.



L-R: Rajendra S Rajamane, Saugata Bhattacharya, Tarun Sharma, Ravi Raghavan, and Jibak Dasgupta at the 77<sup>th</sup> IMTMA - AGM

**The Indian Machine Tool industry needs to tap newer geographies and diversify its products in potential markets to maximize its exports.**

Indian Machine Tool Manufacturers' Association (IMTMA) held its 77<sup>th</sup> Annual General Meeting (AGM) on September 29, 2023 at BIEC, Bengaluru. IMTMA Past Presidents, Executive Committee Members, and Members of the Association were among the dignitaries in attendance at the AGM.

### Prepping for the future

Prior to the AGM, in a special session, Saugata Bhattacharya, Executive Vice President and Chief Economist, Axis Bank, made a presentation on the Indian economy and the likely scenario for the future. He listed out some of the key challenges confronting the Indian economy in its quest to be a US\$7 trillion economy and increase

the share of manufacturing in India's GDP from around 16 percent to 25 percent. The rupee is largely stable which bodes well for foreign investments.

Tarun Sharma, Deputy Managing Director, EXIM Bank, presented on leveraging export opportunity and potential for machine tool and capital goods industries. He added that India's merchandise exports have been growing steadily rising to US\$451 billion in FY2023. Stressing further he said that the Indian Machine Tool industry needs to tap newer geographies and diversify its products in potential markets to maximize its exports.

In his address during the business session, Ravi Raghavan, President, IMTMA, highlighted

several factors that favor India as it aspires to be a US\$5 trillion economy. He added that for the Indian Machine Tool industry there was good news as the order book position, an indicator of growing consumption, looks positive for the forthcoming financial year.

At the Executive Committee meeting following the AGM, a new Executive Committee of IMTMA for 2023-2024 was formed. Rajendra S Rajamane, Managing Director, Rajamane Industries Pvt Ltd, was elected as the President of IMTMA for the year 2023-2024. Mohini Kelkar, Director - Business Development, Grind Master Machines Pvt Ltd was elected as the Vice President of IMTMA for the year 2023-2024. 

Source: IMTMA

# IMTEX FORMING 2024: BACK AS THE BEST

Indian Machine Tool Manufacturers' Association's flagship event IMTEX FORMING is set to take place from January 19 to 23, 2024 at Bangalore International Exhibition Centre (BIEC), Bengaluru. The 8<sup>th</sup> edition of Asia's leading exhibition on metal forming and technologies has been garnering rave response and is poised to turn out to be the largest IMTEX FORMING ever held.



Source: Magic Wand Media

**I**MTEX FORMING 2024 is set to make history as the most extensive IMTEX FORMING to date. Indian Machine Tool Manufacturers' Association (IMTMA), the organizer of the influential exhibition, is thrilled with the response from the manufacturing community. Tooltech, Digital Manufacturing, and Weld Expo will run concur-

rently. Tooltech 2024 will focus on machine tool accessories, forming tools, die and mold, metrology, and CAD/CAM. Digital Manufacturing will feature the latest innovations in additive manufacturing and Industry 4.0. Weld Expo will associate with the Indian Institute of Welding (IIW India) to exhibit innovations in welding and cutting. MOLDEX India and

FASTNEX will focus on molding, fasteners, and fixing technologies. Additionally, the 6<sup>th</sup> International Congress 2024 on welding technology will be organized by IIW-India from January 22 - 24, 2024 at BIEC. The International Congress would offer a platform to young professionals in the field of welding through an exclusive Young Professional

International Conference (YPIC). Around 500 delegates are expected to participate in the International Congress.

**On a grander scale**  
 India's Manufacturing sector is thriving and factors such as pent-up demand, export incentives, Production-Linked Incentive (PLI) schemes, resilient foreign direct investment (FDI) inflows, ease of doing business, and several other incentives are contributing to its progress. This growth will continue to lead to the demand for more manufacturing technologies and will be reflected at this grand metal forming exhibition. IMTEX FORMING was last held in June 2022, featuring 350 exhibitors from 19 countries. The exhibition attracted 25,656 visitors from 45 countries including trade delegations and institutional buyers. Trade delegations

from 250 companies from across various industry sectors visited the show. Business orders worth around ₹500 crore and enquiries worth around ₹4,600 crore were generated, as reported on the last day of the show.

**What's more in store at IMTEX FORMING 2024**  
 Expressing his thoughts on the upcoming edition of IMTEX FORMING, Rajendra S Rajamane, President, IMTMA, said, "IMTEX FORMING 2024 offers great opportunities for manufacturing industries to capitalize on the positive business environment in the country". He further added, "As most visitors to IMTEX FORMING would comprise key decision makers nurturing an intention to invest, exhibitors can have effective face-to-face business meetings". Jibak Dasgupta, Director General & CEO, IMTMA, shared his

view, "The economic outlook in the Metal Forming sector looks promising and IMTEX FORMING will play a catalytic role in addressing the needs of Manufacturing industries. It will be a great opportunity for all stakeholders across sectors to visit the exhibition and explore the latest technologies, products, and solutions that will mutually benefit exhibitors and visitors." Exhibitors at IMTEX FORMING 2024 will showcase machines, tools, and IT solutions for cutting, punching and forming, joining, welding, and fastening. Surface treatment and finishing, process control and quality assurance, machine elements and components, CAD/CAM systems, warehouse and factory equipment, material recycling, and other solutions related to the processing of metal sheets will also be on display. 

For the first time ever, Messe Stuttgart India-organized MOLDEX India and FASTNEX will be held as co-located shows at IMTEX FORMING 2024.



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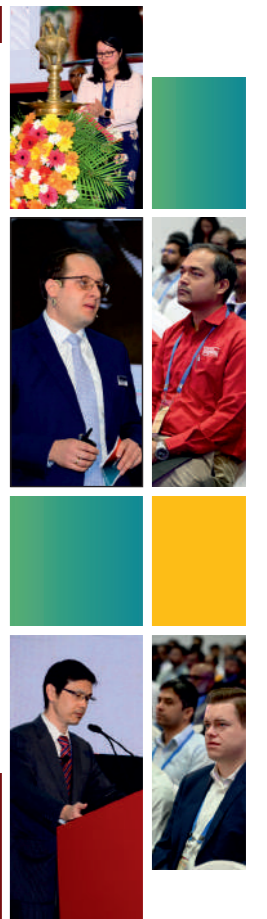
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# THE EVOLUTION OF ROBOTICS

The evolution of robotics has been a fascinating journey. We take a closer look at the history of industrial robotics, the state of the industry currently and how robots might shape our world in the future.



Source: Magic Wand Media

The word 'robot' comes from the Czech word 'robota' meaning forced labor. Over a century ago, in 1921, the word was first used by Czech author Karel Capel for one of his plays titled 'Rossum's Universal Robots'.

The first known industrial robot dates back to 1937 when Griffith Taylor built a crane-like device capable of automating the stacking of wooden blocks from pre-programmed patterns. In 1954, the first industrial robotics patent was awarded to George Devol, who would come to be known as the 'Grandfather of Robotics'.

## George Devol

George Charles Devol Jr. was an American inventor, best known for creating Unimate, the first industrial robot. Devol's invention earned him the title 'Grandfather of Robotics'. In 1954, he applied for and was awarded a U.S. Patent for 'Programmed Article

Transfer'. The National Inventors Hall of Fame says, 'Devol's patent for the first digitally operated programmable robotic arm represents the foundation of the modern robotics industry'.

After receiving the patent, Devol searched for a company willing to give him financial backing to develop his invention. In 1956, Devol met Joseph Engleberger who was Chief Engineer of Manning, Maxwell, and Moore, and Engleberger agreed to license Devol's patent to his company. However, the company was sold later that year but Engleberger sought a backer to finance the continued development of the robot under a new company, Unimation Incorporated, with Devol and Engleberger as co-founders.

## Joseph Engleberger

Joseph Engleberger received his M.S. in Electrical Engineering in 1949 from Columbia University and is often referred to as the 'Father of Robotics'.

As President and Co-founder of Unimation, Engelberger collaborated with Devol to engineer and produce an industrial robot under the brand name Unimate. The first Unimate robotic arm was installed at a General Motors Plant in Ewing Township, New Jersey, USA in 1961.

Chrysler and the Ford Motor Company soon followed General Motors' lead by installing Unimate Robots in their manufacturing facilities. The first Unimate Robot was sold at a US\$35,000 loss, but as demand increased, the company was able to begin building the robots for significantly less and began to turn a substantial profit. By 1966, Engelberger expanded Unimation's distribution internationally. Engelberger introduced robots to the European and Asian markets by granting licenses to Nokia of Finland and Kawasaki Heavy Industries (now Kawasaki Robotics) of Japan to manufacture and market Unimate robots. In the 70s and 80s, the Japanese took the lead by investing heavily in robots. By the 80's, many of the automotive companies that were Unimation's early clients began to move away from the hydraulically powered Unimate robotic arms to robots powered by electric motors. Sales of Unimation fell and the company was eventually acquired by Westinghouse in 1982.

## The global robotics industry

According to a 2021 report by the International Federation of Robotics, over 3 million industrial robots are operating in factories around the world, with half a million installations added in 2021, representing an annual growth of 14 percent from 2016 to 2021. Asia was the world's largest market for industrial robots with 74 percent of all newly deployed robots in 2021 installed in Asia.



"The Robotics industry is still in a growing phase. The ideal scenario would be when robots are able to do gross and fine manipulations of objects with the ability of human beings and animals, and then surpass them. They also need to be substantially autonomous. The technologies needed to develop such robots have not reached the required levels currently."

**Dr K Kurien Issac**  
Former Professor of Mechanical Engg, IIT Bombay  
Former Professor of Aerospace Engg IIST Thiruvananthapuram

One of the major factors driving the growth of industrial robots is the increasing adoption of Industry 4.0, which involves the integration of advanced technologies such as IoT, AI, and machine learning into industrial processes. This has led to the development of more sophisticated and capable industrial robots that can perform a wide range of tasks and interact more naturally with humans.

As per the 2022 McKinsey Global Industrial Robotics Survey, automated systems will account for 25 percent of capital spending over the next five years with the Retail and Consumer Goods industry poised to be the largest spenders. Industrial robots and automation will enable productivity gains, create stable supply chains, and solve skilled labor shortages. According to the World Robotics Report 2022, the five major markets for industrial robots are China, Japan, the United States, the Republic of Korea, and Germany.

These countries accounted for 78 percent of global robot installations. China ranked first in terms of annual installations of industrial robots with 2,68,200 units in 2022 followed by Japan and USA. China now installs more industrial robots per year than the rest of the world put together. The growth in China's robotization of industries can be attributed to multiple government interventions including the Five-Year Plan for the Robotics industry, released by the Ministry of Industry and Information Technology (MIIT) in Beijing in 2021. The uptake of robotic automation in these countries is supported by strong Government support, a focus on economic competitiveness and industrial automation, a skilled workforce, a strong industrial base, and significant investment in robotics R&D and innovation. On the future of the Robotics industry worldwide, Dr K Kurien Issac, Former Professor of Mechanical Engg, IIT Bombay and former Professor of Aerospace Engg at IIST Thiruvananthapuram, says, "The Robotics industry is still in a growing phase. The ideal scenario would be when robots are able to do gross and fine manipulations of objects with the ability of human beings and animals, and then surpass them. They also need to be substantially autonomous. The technologies needed to develop such robots have not reached the required levels currently. Machine vision and artificial intelligence are two such areas which need to advance to higher levels. These technologies will definitely reach more advanced levels as there is significant demand for these technologies not only from the Robotics industry but from many other sectors too." "Manufacturing and other industries are looking for more autonomous, flexible, intelligent,

Overall, India's robotic strategy aims to bring about a paradigm shift in the field of Robotics and enable the country to become a global leader in the research, design, development, and manufacturing of robotics.

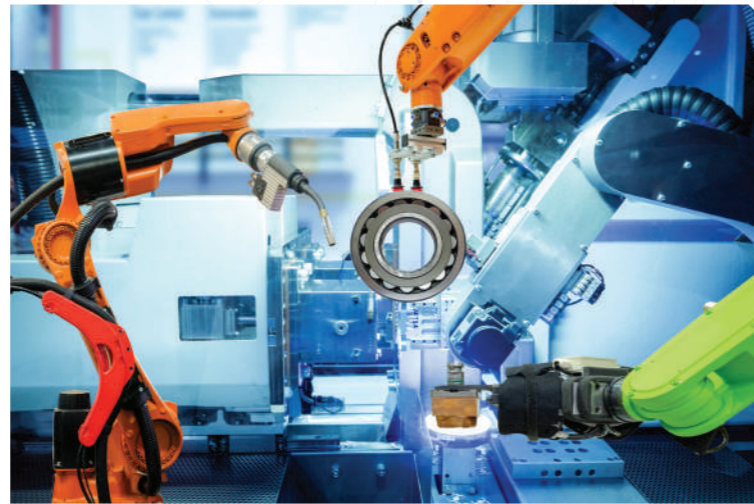
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and accurate robots capable of also working in hazardous environments. The elderly and the handicapped also need robots which can assist them in day to day activities in their homes and outside. There is also going to be a significant demand for robots that can accomplish tasks humans would prefer to stay away from, like clearing sewers, mining, surveillance from the air, deep sea exploration, and defence. Healthcare is another major area for application of robotics where the capabilities of robots have to reach more advanced levels," Dr Isaac adds.

#### India's national robotics mission

Over the past decade, India has made big strides toward strengthening its industrial base with the adoption of advanced manufacturing technologies such as robotics. Since 2016, industrial robots in India have more than doubled to reach 33,220 units in 2021, averaging an annual growth rate of 16 percent. Currently, in terms of annual industrial installations, India ranks 10<sup>th</sup> globally as per the World Robotics Report, 2022. The long-term potential of robotics in India is enormous and robotics could be a catalyst for revolutionizing industries and driving inclusive growth. However, despite its potential, the growth of the robotics ecosystem in India has been slower in comparison to certain developed economies. This can be attributed to several challenges, such as high import dependence, costly hardware components, and insufficient investments in research and development. Additionally, the paucity of



trained personnel for the implementation, integration, and maintenance of robots further hinders the development of the domestic ecosystem. Therefore, to establish India as a global hub for robotics, concerted efforts are required towards mitigation of current ecosystem challenges as well as augmentation of national and state efforts.

India's Ministry of Electronics and Information Technology (MeitY), serving as the nodal agency for Robotics, have proposed a two-tier institutional framework to facilitate the implementation of the National Strategy on Robotics. To reap the benefits of deploying robotics at scale, multiple interventions have been recommended across the key pillars of a robotics innovation cycle which include Research and Development, Demonstration and Testing, Commercialization and Supply Chain Development, and Adoption and Awareness. Dr Isaac says, "The rover of the recent successful Chandrayan moon landing is an example of a space robot. It worked successfully in harsh conditions

- moving on sandy and uneven terrain, handling direct radiation from the sun, and working in high temperatures. The basic version of the rover was developed by ISRO more than a decade back."

"For manned missions, ISRO is in the process of developing humanoid robots that can assist and eventually even replace human beings. As a first phase, a robot which is like a human, torso upwards, and is fixed to a base, is being developed. Non-fixed robots that can float inside the spacecraft in the microgravity environment, and do human like tasks, are also of interest to space agencies," he adds.

Overall, India's robotic strategy aims to bring about a paradigm shift in the field of Robotics and enable the country to become a global leader in the research, design, development, and manufacturing of robotics. The Ministry of Electronics & IT (MeitY) is working with various Government organizations and other stakeholders in implementing this strategy and maximising the transformation potential of robotics for India. 

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

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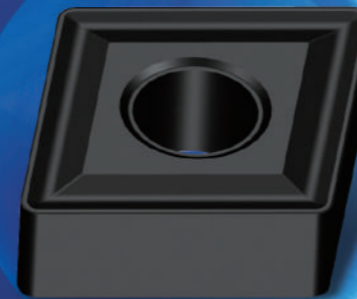
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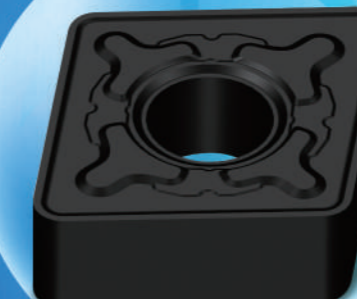
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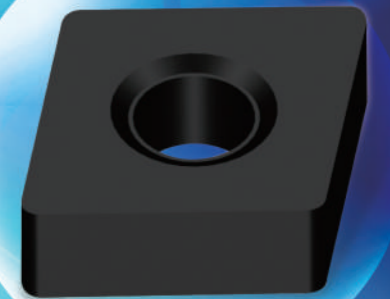
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# CAPITALIZING ON THE INDIGENIZATION PUSH

It is time that the Indian Defence Manufacturing industry took a leaf out of the electronics industry playbook to build a strong defence industrial ecosystem. To do this, India needs to focus on certain key areas to tap into the country's rich mineral resources and widely available talent pool.



Source: Magic Wand Media

**T**he multi-billion dollar defence deals recently signed between India and the US are a testament to the former's commitment to strengthen its Arms and Aerospace industry. Unlike the previous era when the focus was more on imports, the recent deals revolve around gaining access to the technological prowess in military equipment of nations like the US to embolden India's defence manufacturing capabilities. India has repeatedly emphasized the need to reduce im-

ports, enhance export competitiveness, and strengthen its indigenous capabilities while doing both. India has made its intentions evident through multiple policies including the 100 percent Foreign Direct Investment (FDI) through the Government route as well as the Defence Production Policy of 2018 (DPrP) that at the end of the day, the country wishes to be self-reliant. This is not a mere pipe dream – the success of the approach has been proven by the Electronics industry where the indigeniza-

tion push led to domestic mobile manufacturing capabilities rising from ₹18,900 crore in 2014-15 to ₹2,75,000 crore in 2021-22. And now with the Government pushing for domestic manufacturing of semi-conductors after bearing the brunt of international logistics snarl-ups post-pandemic, the Electronics industry is almost on the verge of building its own ecosystem in a step closer to self-reliance. It is time that the Indian Defence Manufacturing industry took a leaf out of the Electronics industry playbook to build a strong

defence industrial ecosystem. To do this, India needs to focus on certain key areas to tap into the country's rich mineral resources and widely available talent pool. However, to begin with, there are at least three areas where the Defence Manufacturing industry needs to invest and build immediate capabilities for a strong industrial ecosystem.

## Build strengths in materials and manufacturing capabilities

The private Indian Defence Manufacturing industry has come a long way ever since the sector was opened up in 2001. For the first time, defence production in India crossed ₹1 lakh crore mark in 2022-23. Yet, this is only the tip of the iceberg. Today, the Government is looking for technology for multiple defence projects, of which 14 mega defence projects carry a total investment potential of US\$1.05 billion. Already, the likes of Airbus, Boeing, Lockheed Martin, and Rafael are touted to be major investors in these projects.

However, such and many more upcoming projects, be it in Aerospace, Defence Equipment or the development of indigenous technologies such as radars and tracking systems, will require more and more domestic participation which can only be attained by building manufacturing capabilities.

Keeping a long-term view of potential opportunities, the Defence industry will have to tap into the country's rich mineral resources for developing key components that build and support the entire defence industrial ecosystem. The full potential of materials like ceramic, aluminum, steel, composites, graphene and others that are used in defence manufacturing needs to be released through strengthening the supply chain

and building infrastructure and expertise in refining, testing and standardization.

## Nurturing a talent pool for defence manufacturing and technology

Many of the deals India has been signing with other nations in defence manufacturing revolve around the transfer of technology (ToT). Also, every import opportunity in Aerospace and Defence is going to create offset opportunities for the domestic Defence Manufacturing industry.

Yet, there is still a significant talent gap that acts as an impediment to building a strong industrial ecosystem. On the upside, a McKinsey report cited that talent costs in India are available at 50-60 percent of the costs in developed markets. On the flip side, despite being one of the world's largest producers of engineers at more than 1.5 million per annum, only a fraction are aeronautical engineers and hardly 16 percent are employed in core engineering jobs.

For Indian aeronautical and defence companies to build an ecosystem that propels the country towards self-reliance, the lack of skilled talent and expertise must be addressed. Keeping a long-term perspective of building such an ecosystem would mean that collaborating across the industry to invest in programs with academia and skills building, creating upskilling opportunities, and even attracting global talent. Given that an entire industrial ecosystem is being nurtured, talent planning must include both blue collar and white collar and span across technical and non-technical competencies.


## Invest in technology, research & development

On its part, the Government

has not only increased the overall outlay for the Defence sector by 13 percent to ₹5.94 lakh crore but also for research in the sector by 9 percent to over ₹23,000 crore. But when compared to other nations like China that spend nearly 10 percent of their budget allocation for defence on research, the Indian figure looks paltry.

Given that policy efforts and diplomatic relations have unlocked vast opportunity for the Indian Defence Manufacturing industry, it is time for industry players to step up by investing heavily in research and building technological prowess as complementary efforts to the Indian Government. Again, such investment in research and technology must be made while keeping a long-term horizon, akin to what the Semiconductor industry is doing within the electronics ecosystem.

Also, investment in technology and R&D cannot be left to merely large manufacturers. A strong and healthy industrial ecosystem for defence would mean hand-holding small and medium players in building their research and technological capabilities. Tapping into the country's thriving innovation excellence as well, large players and industry collaborations with startups on defence will also give the sector the technological edge. India already has around 194 high-tech defence startups building innovative solutions for defence.

The groundwork has been laid for India's Defence and Aerospace industry to grow and thrive, making the country not only self-sufficient, but to become a key exporter. The private sector must take cognizance of this opportunity and collaborate to achieve this dream. 

The Government has not only increased the overall outlay for the Defence sector by 13 percent to ₹5.94 lakh crore but also for research in the sector by 9 percent to over ₹23,000 crore. But when compared to other nations like China that spend nearly 10 percent of their budget allocation for defence on research, the Indian figure looks paltry.

SUBBU  
VENKATACHALAM  
Head of Marketing  
Carborundum  
Universal Ltd



# EXPLORING THE TRANSFORMATIVE INDUSTRY

# LANDSCAPE

A panoramic view of the technological breakthroughs and a thoughtful examination of the challenges and opportunities accompanying them. From Artificial Intelligence and the Internet of Things to advanced robotics and sustainable practices, the following report encapsulates the essence of the transition towards the next technological era.

**T**he ongoing revolution in Industry 4.0 signifies a fundamental transformation in the way industries operate. The revolution revolves around the convergence of the Internet of Things (IoT), data analytics, cyber-physical systems, and Artificial Intelligence (AI). These have been working in harmony to revolutionize productivity, enhance product quality, and nurture agility in manufacturing sectors.

The Industry 4.0 wave continues to gather strength in India and across the globe. Digital technologies are likely to constitute about 40 percent of the manufacturing tech spend by 2025 in India. Of which, 50 percent of the digital technology spend will be on Industry 4.0. Further, 50 percent of the spend on Industry 4.0 in India would be on foundational technology, such as Cloud and IoT. Most manufacturing companies across the world are contemplating or implementing a minimum of one metaverse-related use case.

#### Learning from implementations

More successful use cases are coming up as Industry 4.0 is becoming mainstream. IoT projects have a 14 percent higher success rate today than five years ago. Successful Industry 4.0 projects often share common characteristics, such as strong executive

leadership support, a clear strategic vision, effective change management, and a dedicated cross-functional team. In addition, common challenges, such as lack of funding, complex projects, and data management, have reduced by about 50 percent.

Indian manufacturing firms are emulating the global trend of deploying Industry 4.0 solutions, such as connected operations, additive manufacturing, predictive maintenance, and AR/VR. However, about 34 percent of companies are still in the Proof of Concept (PoC) stages in terms of implementing technologies such as AI/ Machine Learning (ML). Thirty percent of Indian manufacturing companies follow a reactive approach when it comes to analyzing data. This is because the data is captured only for a few occasions involving decision-making. In addition, 86 percent of Indian manufacturers have different data management systems with isolated MES, PLM, SCM, and ERP systems. Overall, digital transformation projects across industries have resulted in a more than 25 percent reduction in time taken from PoC to the adoption of RoI.

However, not each Industry 4.0 initiative yields positive results. Challenges are often associated with a lack of alignment between technology adoption and an organization's goals, inadequate change management strat-

egies, and failure to consider specific contextual factors. Failed initiatives can result in wasted resources, demotivation among employees, and a setback to the organization's competitiveness.

#### Need for reference architecture

One of the common problems that manufacturing companies face is siloed systems, resulting in failed Industry 4.0 implementation. This happens as data and insights from systems cannot be used beyond a certain point due to a lack of integration as they cannot connect to other systems, workflows, or other transactional systems. Therefore, organizations are unable to leverage the full potential of Industry 4.0.

Rather than blind replication of solutions from similar initiatives across industries, companies should come up with reference architecture that will detail the L0 to L5 stack. This would ensure that data flows seamlessly, applications get integrated with each other etc. When an organization implements an Industry 4.0 solution, the reference architecture acts as the guiding framework, thus ensuring that every time a step is taken, it is in line with this reference architecture.

#### Integrated approach

Integrating systems such as ERP, material management, and analytics tools, helps minimize the

The Industry 4.0 wave continues to gather strength in India and across the globe. Digital technologies are likely to constitute about 40 percent of the manufacturing tech spend by 2025 in India.



Source: Deloitte Touche Tohmatsu India LLP

Let us explore a case study based on industry 4.0.

Indian manufacturing companies have been able to significantly improve metrics in various KPIs.

The future of Indian manufacturing is imbued with promise and technological prowess. By adopting a visionary perspective and embracing innovative technologies, Indian companies can spearhead the global Industry 4.0 ecosystem.

time taken to carry out maintenance activities. The below flow chart shows how an order is completed with minimal interventions (just carrying out actual maintenance) from workers.

### Leadership acceptance

Organizations should implement a multifaceted strategy that includes conducting leadership workshops and educational sessions to showcase the potential benefits of Industry 4.0. Furthermore, showcasing successful

pilot projects and demonstrating their tangible impact on the organization's bottom line can be a persuasive means of convincing leadership of the initiative's value. In India, a leading automotive company, under the leadership of its CEO, embarked on a comprehensive Industry 4.0 transformation. It initiated a company-wide narrative for change management, emphasizing the need for digitalization and automation. This commitment from the top-down catalyzed the adop-

tion of Industry 4.0 technologies throughout the organization.

### Build vs buy dilemma

Manufacturing companies often find it difficult to decide whether to deploy off-the-shelf Industry 4.0 solution or build a customized one. Their objective is to weigh the benefits of customized solutions with expertise, time taken, and expenses needed for building from scratch and gains from existing solutions with vendors. Conducting a cost-benefit analysis that considers the advantages of off-the-shelf solutions (such as vendor expertise and shorter deployment times) will lead to a more informed decision-making process.

### Success stories from industries

Let us explore a case study based on Industry 4.0.

#### Low-voltage switchgear manufacturer - brownfield transformation using Industry 4.0

A Mumbai-based low-voltage switchgear manufacturer wanted to transform its plant from three production lines manufacturing variants of switches to a single production line manufacturing more than 200 variants. The challenge was to ensure a balance between productivity improvement and capital infusion. The manufacturer decided to implement an automation and digitalization-based transformation plan.

#### Goals

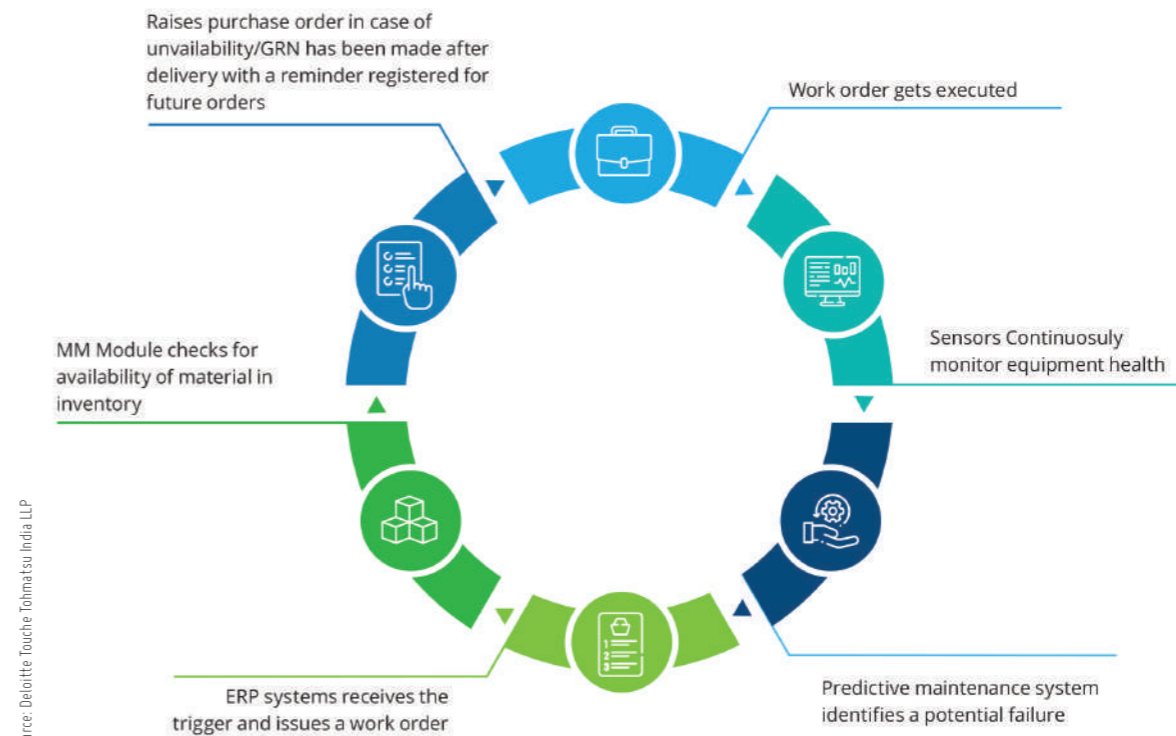
The manufacturer started with the following steps:

- Merging three conventional lines into a single production line that is capable of managing more variants and higher production over the combined capacity of the original three lines;

## What is the future going to look like?

Industry 4.0 would transform key manufacturing functions in the following manner:

- **Product development:** Generative AI can be integrated with CAD software and 3D printing systems to assist in new product development. This would facilitate collective brainstorming and out-of-the-box thinking while optimizing functionality and minimizing material wastage.
- **Operations:** Manufacturing operations will derive immense benefits from the confluence of AI and metaverse. Digital twin will conduct simulations that are harder to carry out in real factory settings and provide output for production. AR and voice-based training would guide employees in operating machines, whereas production or warehouse robots will help in material movement.
- **Maintenance:** Real-time sensor data from manufacturing equipment shall be analyzed by generative AI to identify possible failures and schedule maintenance plans.
- **Quality and compliance:** Generative AI shall analyze huge volumes of production data to detect anomalies, predict possible defects, and provide better inputs for quality issues, thus allowing manufacturers to improve product quality.
- **IT and cyber security:** Cyber reliance strategy will be a prominent trend that would need automation of cyber defence using AI, ML, and integrated frameworks that combine security measures with the awareness of social factors and continuity protocols (as cyber threats will become more sophisticated).



Source: Deloitte Touche Tohmatsu India LLP

The flow chart shows how an order is completed with minimal interventions (just carrying out actual maintenance) from workers.

- Ensuring flexibility in production to allow the production of batch sizes that consisted of a single switch;
- Minimizing cycle time;
- Decreasing the time-to-market to 18-20 months from the initial 36 months;
- Meeting higher compliance needs for next-generation products - 68 checks compared with 22 for the older generation.

#### Methodology

Three technologies - digital twin, a proprietary cloud and IoT system, and video analytics - were used at the core of the transformation. Digital twin was used to simulate the production process. It virtually replicated design, production, and the end-product. This helped the manufacturer optimize process-based iterations and remove expenditure to produce real-size prototypes, thereby conserving capital while building traceability at subcomponent levels.

Physical assets were connected to the digital ecosystem through a proprietary cloud and IoT system. This helped use data analytics and foster process innovation. The platform helped manufacturers to digitally thread business-side systems, such as ERP with manufacturing execution systems, thus providing greater visibility across the value chain.

Video analytics was used to capture process parameters pertaining to design, make machines smart, and reduce cycle time from 12 to 9 seconds by generating data sets that digital twin had reprocessed.

#### Results

The facility could manufacture more than 200 variants in one manufacturing line compared with 77 variants in three lines. The entire transition process took only 18 months. Overall Equipment Effectiveness (OEE) levels increased com-

pared to the manufacturer's plant in Germany. Cycle time reduced by more than 50 percent from the original 21 seconds to 9 seconds.

#### Future forward: 5G, GenAI, and Industry 4.0 powerplay

The ever-evolving technological landscape continues to reshape the Manufacturing industry. Some technologies, such as industrial robots, IoT, and 3D printing, have already stabilized, while others such as digital twin, AR/VR in manufacturing, wearables, and sensors are yet to be fully adopted. Some futuristic technologies are discussed below.

#### 5G connectivity

Given the significant improvement in network characteristics, 5G shall act as a catalyst for digital transformation for enterprises. The new architecture (low latency, high speed,

Through digital transformation initiatives, Indian manufacturing companies have been able to significantly improve metrics in various KPIs.

The convergence of 5G, generative AI, model-based enterprise, and digital thread heralds a new era for manufacturing. AI-driven insights, agile production systems, and real-time data processing will transform industries, enhance adaptability, efficiency, and agility to new levels.



Source: Deloitte Touche Tohmatsu India LLP

etc.) would make it suitable for time-sensitive applications, such as autonomous vehicles, first responder devices, and smart wearables. Further, the built-in redundancy would enable the network to continuously operate even during emergencies. Private 5G networks would drive innovations in many industrial and enterprise applications and increase reliability, connectivity, scalability, and security compared with previous communication technologies. 5G's speed and reliability outshine previous communication technologies. It offers continuous connectivity even in demanding industrial environments. It facilitates real-time data exchange which is critical for

Industry 4.0 applications.

For example, car manufacturers can employ private 5G networks in their factories to power autonomous transport robots, leading to increased efficiency and safety.

#### Generative AI

Adapting generative AI would help avoid cost, increase operational efficiencies, and improve worker safety. Companies should also consider legal implications related to copyright infringement and IP ownership of GenAI-generated content prior to implementation. Some use cases include the following:

#### Increasing worker safety

**Issue:** Conventional Occupational Health and Safety (OHS)

training often focuses on specific situations and does not offer hands-on chances to apply newly acquired skills and information.

**Solution:** Companies can create tailored and immersive OHS training resources using GenAI and provide trainees safe exposure to authentic scenarios, helping them minimize the occurrence of or improve their responses to real-life OHS incidents.

For example, virtual reality training can replicate operational environment, help employees traverse dangerous situations, identify risks, improve awareness and thereby, respond in a safer manner. Gen AI can help provide customized training materials for select work

roles, environments, or regulatory needs.

Furthermore, the content should be designed to be inclusive and accessible to different types of learners including those with disabilities. Companies can also take steps such as adding closed captions and modifying training scenarios in sync with various skill levels.

#### Providing field assistance to workers

**Issue:** Shop floor workers often work in challenging or remote environments and usually face challenges due to a lack of information. These challenges include determining the paucity of manuals and identifying the root cause of a problem. This necessitates shop floor workers to reach out to seek additional guidance and arrive back at the site after a period of time.

**Solution:** A generative AI-enabled field assistant can help engineers provide on-demand access to technical knowledge while supporting them in solving problems, enhancing effi-

ciency, and enabling them to make better decisions.

For example, a generative AI-enabled virtual field assistant can give quick access to a large amount of engineering knowledge and thus serve as a ready reference. Further, the field assistant can help workers by answering questions on fundamental concepts, principles, or calculations. On encountering a challenge in the field, workers can explain the problem to a virtual field assistant. In turn, the assistant can reply with necessary questions to help workers identify the root cause of the problem or provide steps to seek resolution. Companies must ensure that the training data is robust and reliable. Outdated or inaccurate data would lead to incorrect output, resulting in downtime, and compromising the safety of workers and equipment. Further, companies should ensure that skilled workers cross-verify information, especially something that is related to safety, to rule out the

possibility of misinterpretation or misinformation.

Companies should train workers to apply their own skills and judgment to avoid overdependency on the virtual assistant as complex situations might require creative problem-solving or critical thinking.


Finally, to avoid complex liability issues in case of incorrect advice leading to accidents or failure in operations, clear guidelines and procedures to address the situations are needed.

#### Model-Based Enterprise and digital thread

The Model-Based Enterprise (MBE) and digital thread are emerging technologies that can serve as the backbone for manufacturing innovation. MBE lays emphasis on using digital 3D models throughout the product lifecycle – from design and engineering to production and maintenance. MBE and digital thread technologies enhance collaboration, reduce errors, and improve efficiency by enabling seamless data flow across the entire product lifecycle.

A global aircraft manufacturer uses digital thread to streamline aircraft production, reducing costs and improving quality by ensuring that teams have access to the latest design and manufacturing information.

#### Going forward

The journey of Indian manufacturing companies towards Industry 4.0 has been a testament to their resilience and capacity for growth. Certain technologies such as predictive analytics and 3D printing have already attained a level of stability. Organizations should continue to invest in the latest technologies, such as GenAI, 5G, and digital threads, to remain competitive. 

Companies should be constantly looking out to explore how new technologies, such as 5G, can be used to improve existing systems and prepare themselves for futuristic technologies, such as 6G.

#### What should companies do?

- **Demonstrate 'never give up' attitude:** Leaders should craft an inspiring narrative for change management, allocating resources strategically across the enterprise to motivate employees. They should encourage experimentation and not give up if earlier pilots were unsuccessful.
- **Have a reference architecture in place:** Companies should adopt a proof-of-concept-driven, cross-functional approach guided by a reference architecture towards creating an integrated solution.
- **Upgrade existing systems and use technological advancements:** Companies should be constantly looking out to explore how new technologies, such as 5G, can be used to improve existing systems and prepare themselves for futuristic technologies, such as 6G.

## PRESERVING LEADERSHIP EXCELLENCE

Mayank Varma, Business Head - Tooling & Technology, JBM Group, reveals the company's important milestones marking its successful journey and shares his observations on the manufacturing technologies showcased at EMO, views on Indian machine tool makers, with insights into the trends, challenges, and opportunities prevalent in the machine tools manufacturing landscape in the following interview.



Mayank Varma, Business Head — Tooling & Technology, JBM Group at EMO Hannover 2023

**JBM Group has evolved over the last four decades from being a cost-driven company to a value-driven dynamic conglomerate that provides total cost-of-ownership solutions. Take us through this growth journey and highlight important milestones of your Tooling and Technology business.**

Yes, JBM has truly grown in the last four decades and is now a big conglomerate with 60 plants, over 25,000 employees, and a presence in more than 30

countries. It has expanded from an Auto Component business to other business segments in E-Mobility, covering the entire EV ecosystem, Renewable Energy, and Environment Management. We also export to 25 countries.

In our Auto Component business, we have grown to become a leading supplier of Automotive Stamping Parts, including Skin Parts, High-level Welded Assemblies, Chassis and Suspension parts, Exhaust Sys-

tems, CNG Cylinders, Pulleys, Steel Processing, and Tubular Parts. Our Tooling and Technology business has also grown from strength to strength and is India's largest Tooling business, offering a one-stop source for Automotive Sheet Metal Tooling and Robotic Welding systems. We have eight Tooling plants spread across North, Central, and Western India. We serve more than 30 customers across segments in the Automotive domain.

**JBM has a substantial presence in Europe. Talking of Europe, you were one of the eminent panelists in an insightful panel discussion held by IMTMA, VDW, and VDMA India at EMO Hannover. Can you please share your observations on the manufacturing technologies that you witnessed at the show in terms of implementing those in the Indian Manufacturing sector?**

EMO Hannover has always been the most significant global platform to showcase the latest products, processes, and technology trends in the Machine Tool industry. Out of all the manufacturing technologies on display, there was a clear focus on precision machining in Turning, Grinding and CNC machining, Wire Cut, and Conventional machining. Also, many new things are coming up in automated inspection and scanning systems. In terms of applicability for Indian manufacturing, I believe that all technologies offering high-speed productivity with sustainable product quality will be very useful for our industries offering precision products for Indian and global markets. All the latest machine tools offering Industry 4.0 features and a highly digitized user experience would become basic for our industries focused on import substitution and export potential. With the Government's strong push for 'Make in India', I see huge potential for these technologies for our industries in the Automotive and Non-Automotive segments. However, the cost competitiveness of new technologies and machine tools would also play a crucial role in their adaptation in the context of Indian industry.

**What are your views on Indian machine tool makers? How do you assess their strengths and areas for improvement and how**



"I have been keenly observing the growth and expansion of Indian machine tool makers over the last two decades. I must acknowledge that tremendous growth has happened in terms of scale, capability, time-to-market, and product quality across all ranges of machine tools made in India."

**Mayank Varma**  
Business Head - Tooling & Technology  
JBM Group

**do they fair vis-à-vis their global counterparts? What crucial changes must they embrace to step up their game?**

I have been keenly observing the growth and expansion of Indian machine tool makers over the last two decades. I must acknowledge that tremendous growth has happened in terms of scale, capability, time-to-market, and product quality across all ranges of machine tools made in India. Talking of strengths, cost competitiveness remains our biggest advantage along with time-to-market, especially for domestic use. Also, ease of operation and prompt service support availability remains a favorable factor for customers.

While a positive intent and change are visible overall, a few areas of improvement could be product quality, repeatability, and robustness in terms of long years of trouble-free usage. The design of the product both from the productivity and quality perspective can be looked upon as an area of improvement. Also, awareness and incorporation of the latest technologies in line with global benchmarks can be enhanced in order to compete with global markets and more importantly with global players in the Indian market.

The most crucial change that needs to be incorporated is the quality mindset, a commitment towards the 'First time right, Every time right' philosophy across all stakeholders responsible for the end product. Also, robust micro-level planning, review, and control mechanism is essential to meet time-to-market and compete globally.

**Could you please provide us with insights into the trends, challenges, and opportunities prevalent in the machine tools manufacturing landscape? How does your company contribute to the advancement and growth of the machine tools sector in the country? Kindly provide the breakdown of the usage percentages for machines and tools on the Indian shop floor at JBM, distinguishing between those manufactured domestically and those of foreign origin.**

I see immense potential in the machine tools manufacturing landscape. With the Automotive sector reaching 12-15 percent of the total GDP and more than 40 percent of the manufacturing GDP, huge growth and impetus is imminent in the industry. With import substitution and export enhancement in focus, there will be no dearth of opportunities for the Indian Machine Tool sector. As men-

**With the Automotive sector reaching 12-15 percent of the total GDP and more than 40 percent of the manufacturing GDP, huge growth and impetus is imminent in the Machine Tools industry.**

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# Latest MACHINE TOOL Solutions



Mayank Varma, Business Head — Tooling & Technology, JBM Group (third from left) along with industry stalwarts at EMO Hannover 2023 post panel discussion on India Opportunities.

The most crucial change that needs to be incorporated is the quality mindset, a commitment towards the 'First time right, Every time right' philosophy across all stakeholders responsible for the end product.

tioned previously, the primary challenges persist in maintaining quality and technology that align with global competition standards. The increasing trend toward automation creates a high demand for robots, which currently predominantly rely on imports.

We, at JBM, strongly encourage and use Indian machine tools for all relevant requirements from Stamping presses, Weld accessories, CNC machines, Conventional machines, Special purpose machines, Inspection systems and many more products used across our shop

floors. A significant percentage of machine tools are locally sourced and will grow only higher as our Machine Tools industry further evolves and competes with global peers on all critical product metrics.

**Kindly share the long-term vision of the Group's role in the Automotive industry, especially in the context of the tooling and technology business and its transition to electric mobility.**

Our long-term vision is to sustain and strengthen our leadership in the Automotive and Tooling business. We endeavor

to enhance our product portfolio by the Full Service Supplier approach through forward and backward integration. As a Tooling and Technology business, we wish to build scale and capability in terms of enhancing our value proposition. In the realm of Dies, we plan to ascend the value chain by specializing in ultra-high Tensile Tooling, White Goods, Skin Parts, and Large Progressive Dies. This strategic move aims to position us as the favored choice for customers seeking import substitution. In Welding Systems, the vision is to strengthen our Robotics portfolio, build advanced automation capability, imbibe upcoming technologies like Automotive Laser Welding, etc., and also further venture into Prototyping and Alternate Materials. We also wish to strengthen our R&D capabilities for new products and new technology introduction to capitalize on new trends.

We will also explore the potential for our business in E-Mobility and related products across the EV ecosystem, thus keeping our business product and technology agnostic and remaining adaptive and competitive in the changing automotive landscape. 



Mayank Varma, Business Head — Tooling & Technology, JBM Group (third from left) along with eminent panelists at the India Opportunities Session at EMO Hannover 2023.



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FOR DETAILS



# TOWARDS INNOVATION AND SELF-RELIANCE

India's Railway sector stands as a testament to the nation's dedication to self-reliant development. In its transformation to a dynamic force, private companies including Godrej Tooling are playing a vital role of infusing fresh perspectives, enhanced capabilities, and valuable resources.



Source: Magic Wand Media

India's Railway sector echoes the nation's pursuit of self-reliant development. Indigenous production, modernization, and innovation have underpinned this journey. By nurturing a robust ecosystem of manufacturing and technology, India has significantly reduced its dependence on foreign imports, contributing to a more self-reliant railway infrastructure. This shift from imports to domestic manufacturing required not just the establishment of manufacturing units but also the de-

velopment of advanced engineering capabilities. The push for self-reliance has also brought about a transformation in research and development (R&D) efforts within the Railway sector, paving the way for innovative collaborations that are reshaping the industry.

### Public-Private Partnership

Public-Private Partnerships (PPPs) play a pivotal role in the transformation of Indian Railways by leveraging the strengths of both sectors to drive progress. These partnerships infuse the Private

sector's expertise, innovation, and resources into the railway ecosystem, accelerating modernization efforts and enhancing service quality. From station redevelopment to high-speed rail projects, PPPs bring cutting-edge technology and investment, helping Indian Railways overcome infrastructure challenges and operational bottlenecks. The collaborative synergy between the Public and Private sectors has paved the way for the creation of a knowledge-sharing ecosystem. With India's commitment to advance its self-reliance across

sectors gathering momentum, Godrej Tooling, a business unit of Godrej & Boyce, has partnered with the Indian Railways to strengthen the railway network across the nation. In 2021, the business collaborated with the Indian Railways to design and develop the universal coach assembly station as an indigenous solution for coach assembly fabrication in the Marathwada Rail Coach Factory in Latur, Maharashtra. The company has been a trusted partner of Indian Railways for over 15 years.

### Technological advancements

In Budget 2023-24, a capital outlay of ₹2.4 lakh crore has been allotted to the Indian Railways. The allocated funds will be used to build new trains and railway tracks, increase passenger facilities, and ramp up the infrastructure to a world-class level. Over the next five years, Indian Railways aims to enhance operations through modernization and 100 percent electrification, boost train speeds, involve the Private sector in station redevelopment and train operations, and monetize operational infrastructure assets. The Central Government has given the green signal for producing Vande Bharat rakes in three more railway coach manufacturing units in the country. The Railway Minister has also announced the plan to design a Vande Metro train, which is a kind of suburban train, similar to the Vande Bharat train.

The evolution of technology within the railway domain has been instrumental in shaping the sector's transformation. India's commitment to introducing cutting-edge trains such as Vande Bharat has led to a fruitful alliance between Godrej Tooling and Renmakch. This ten-year collaboration aims to

develop depot equipment that serves as a domestic substitute under the 'Make in India' and 'Atmanirbhar Bharat' initiatives. The ultimate goal is to promote the indigenization of products, provide comprehensive solutions for major M&P investments in modern technologies, introduce the latest technology for the Rail industry from Europe and other developed countries, and indigenize it for India. By improving the speed, quality, and safety of railway and metro coaches during maintenance, this collaboration will undoubtedly enhance the overall efficiency of railway services. This partnership will enable private companies such as Godrej & Boyce to offer a complete value chain that ranges from design to construction for the Railways, as well as allow them to bid on larger projects.

### Digitalization of Indian railways

The emergence of Industry 4.0, as well as the more recent concepts of digital railway, distinctly embodies the shift towards meeting the contemporary demands of the digital economy. From digitalization to automation, technology has permeated every aspect of railway operations, enabling greater efficiency, safety, and sustainability. For instance, digitalization has led to the implementation of smart ticketing systems that streamline the booking process, enhance passenger convenience, and enable efficient data management for improved planning. This digital transformation not only redefines how railways operate but also lays the groundwork for a future of innovation and growth in this vital sector.

To create an automated and environmentally sustainable washing system for both the

Indian Railways and Metro networks, Godrej Tooling has partnered with JCW Japan, a renowned Japanese manufacturer of vehicle cleaning machines. This partnership is poised to introduce cutting-edge international technology to India while simultaneously advancing the localization and indigenization of various automated washing systems. The project undertaken by Godrej Tooling will entail the process of indigenous adaptation at a scale of 20-30 percent. However, the long-term vision is far-reaching, aspiring to elevate domestic capabilities to a remarkable 80 percent within the next five years. This ambitious trajectory, steeped in digitization and innovation, mirrors India's overarching mission to be at the forefront of technological self-reliance.

### Way forward

India's Railway sector stands as a testament to the nation's dedication to self-reliant development. Through indigenous production, collaborative efforts, and technological advancements, the sector has evolved into a dynamic force poised for further growth and innovation. In this transformation, private companies are vital contributors, infusing fresh perspectives, enhanced capabilities, and valuable resources into the dynamic railway landscape. Their strategic partnerships with the Indian Railways have brought forth modernization, efficiency improvements, and the infusion of advanced technologies. The journey towards a self-reliant future continues, fueled by the combined efforts of Public and Private sectors, driving India's railways towards excellence and ensuring that the tracks of progress lead to a promising and self-sufficient tomorrow. 

The ultimate goal is to promote the indigenization of products, provide comprehensive solutions for major M&P investments in modern technologies, introduce the latest technology for the Rail industry from Europe and other developed countries, and indigenize it for India.

PANKAJ ABHYANKAR  
Senior Vice President &  
Business Head  
Godrej Tooling  
Godrej & Boyce  
Manufacturing  
Company Ltd



# INNOVATIONS FOR SIMPLIFIED ADAPTABILITY

With the increased demands in the automation industry today, handling solutions must be quick to integrate, flexible to redesign, completely open regarding connectivity, and ensure safe gripping. Here's a list of a few boasting the same qualities...



EGU and EGK Mechatronic Grippers

Source: SCHUNK Intec India Pvt Ltd

**T**he automation experts at SCHUNK have paid utmost heed to the increased demands in the Automation industry and, as a result, have come up with new product innovations that offer a maximum level of flexibility, enable networked processes in every industry, and include customization options that are easy for anyone to implement.

**EGU and EGK – Robust mechatronic gripping modules**  
The new mechatronic grippers EGU and EGK grippers have in-

tegrated gripping force maintenance with workpiece loss detection. No referencing is required during integration or after start-up. This saves time and reduces commissioning work. With permanent position detection, users always keep absolute control over their processes. SCHUNK offers the components with all the common communication interfaces, PLC function modules, and plug-ins from leading robot manufacturers. This means that they can be integrated quickly and easily without any additional gateways or programming.

### PGL+P – Pneumatic gripper with potential

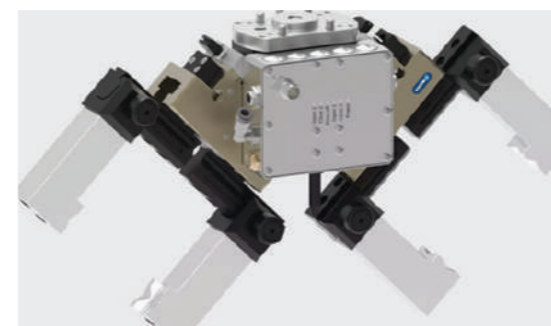
With the new PGL+P, SCHUNK is introducing a flexible and robust powerhouse that shines above all with increased safety. The pneumatic gripper is the first in the world to have certified safe gripping force maintenance. The pneumatic universal gripper in five sizes offers a unique performance package of stroke, force, and connectivity, making it perfectly suited for handling tasks where flexibility is required. Due to its large jaw stroke per finger, users can handle a wide range of parts with just



The pneumatic gripper PGL+P



ADHESO is a bionically inspired gripper



MTB Kits for workpiece handling and clamping



REMENDO automates deburring, polishing and grinding processes

one gripper. This saves investment costs and is particularly interesting for small batch sizes and high part variance, such as in machine loading and assembly.

### ADHESO – Bionically inspired gripper

ADHESO gripper technology is based on the principle of adhesion and uses intermolecularly acting Van der Waals forces to handle various workpieces. SCHUNK's application experts take advantage of these benefits and develop customer-specific adhesive grippers with ADHESO gripper technology. Due to the high variability of the adhesive structures, grippers with ADHESO technology can be directly tailored to the requirements of applications in Packaging, Pharma, and Electronic industries.


The advantages include • Gripping without residue; • Sensitive gripping without mechanical force; and • No external power supply.

### MTB Kits – Application kits for seamless integration of EOAT

The MTB application kits enable quick and easy implementation of automated machine loading. The specific application kits take on the important key role of workpiece handling and workpiece clamping. They seamlessly fit into the machine environment. One can choose the right solution for their application from three application kits MTB. The single gripper kit, the double gripper kit; and the clamping force block kit are available.

### REMENDO – From manual to automated machining of workpieces

REMENDO Product portfolio

of SCHUNK allows one to automate the deburring, polishing and grinding process. Manual machining of workpieces with hand tools is often associated with putting ergonomic strain on employees. In addition, health risks are often incurred due to fine particle emissions such as abrasive dust or chips. The changing over to automated machining minimizes these risks but also creates surplus values. There is a rising trend towards greater automation in all major industries like Automotive, Life Sciences, E-mobility, and Packaging. An important reason for this is the lack of skilled workforce. Hence, more and more small and medium-sized companies are taking steps towards automated systems and preferring simple and flexible solutions. 

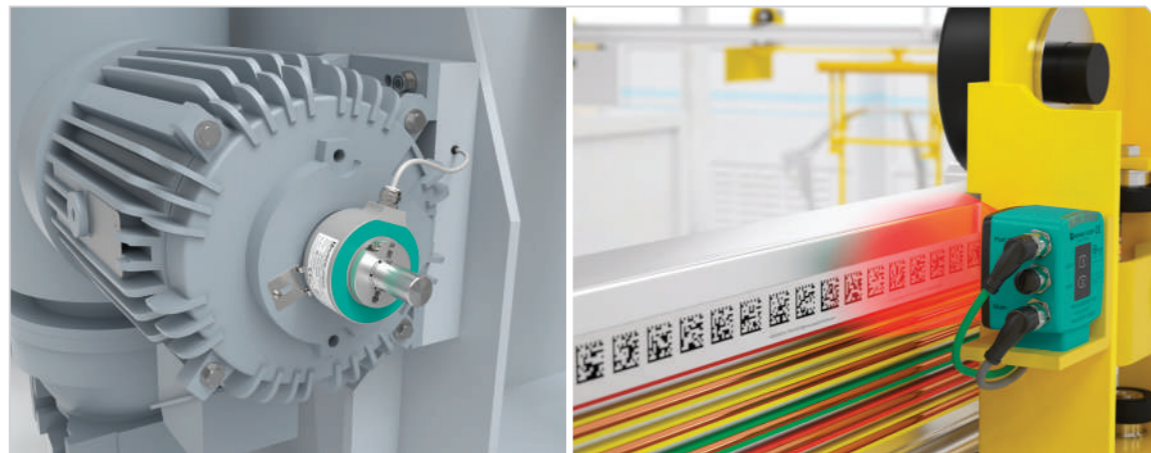
There is a rising trend towards greater automation in all major industries like Automotive, Life Sciences, E-mobility, and Packaging. An important reason for this is the lack of skilled workforce

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National Sales Manager  
– Gripping Technology  
& Automation  
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# SMART SENSING

New, state-of-the-art smart sensors maximize the potential advantages that offer and have evolved to provide unprecedented levels of intelligence and communications capabilities to extend the useful life of legacy industrial equipment. Here's knowing more about them and their types that are out to revolutionize industrial automation.



Smart Positioning

Source: Pepperl+Fuchs Factory Automation Pvt Ltd

**A** transformative advance in the field of sensor technology has been the development of smart sensor systems. Smart sensors are basic sensing elements with embedded intelligence. The sensor signal is fed to the microprocessor, which processes the data and provides an informative output to an external user. The smart sensor is also a crucial and integral element in the Internet of Things (IoT), the increasingly prevalent environment in which almost anything imaginable can be outfitted with a unique identifier and the ability to transmit data over the internet or a similar network.

## Evolution in smart sensing technology

Sensors are key to the success of modernizing industrial automation, and conventional sensor types, which convert physical

variables into electrical signals, may not provide enough information in the new world of IIoT. New, state-of-the-art smart sensors maximize the potential advantages that offer and have evolved to provide unprecedented levels of intelligence and communications capabilities to extend the useful life of legacy industrial equipment.

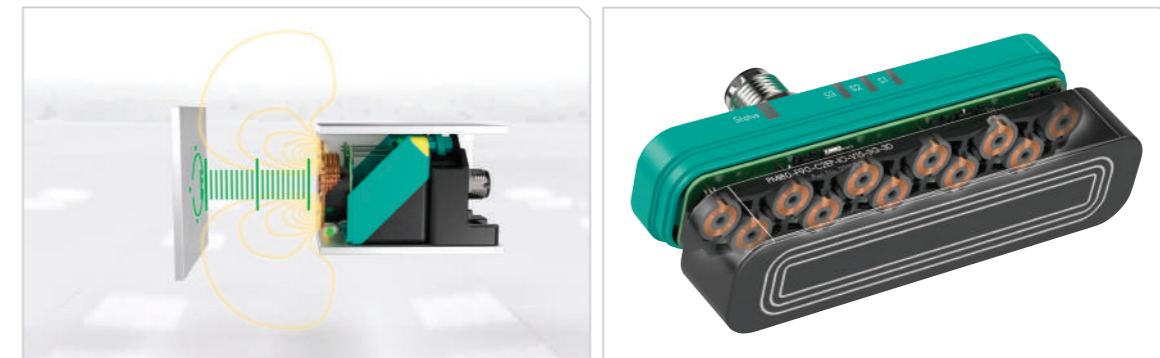
## Types of technological improvement

**Single Coil to Multi-Coil Sensor:** Non-contact inductive technology detects position using a few different configurations. One sensor housing can be combined with one inductive coil for discrete or analog output. Alternatively, today one sensor housing can be combined with many inductive coils to get linear or rotary position.

**Single Pixel to Multi-Pixel:** Single Pixel Sensor works on the

phenomena of the amount of energy or light received back to the receiver. Traditionally, this is one of the most basic methods used in pyroelectric sensors to detect any target but as application gets complicated, there is a further requirement for precise and accurate measurement. Here comes Multi-Pixel Technology where we use Advance Triangulation to track the light spot along the multi-pixel arrays. It measures true distance to an object, regardless of color up to sub-millimeter precision.

**Pulse Ranging Technology:** In this measurement method, a powerful light source emits short, high-energy pulses, which are reflected by the target object and then recaptured by a light-sensitive receiver. During this process, the emission and reception times are detected with a high degree of precision. From the values determined, the dis-



Single Coil to Multi-Coil Sensor

tance to the target object is calculated using the runtime of the light pulses. If the target object is close, the light propagation time is short. If the object is further away, the light propagation time is longer.

The superiority of this technology lies in the power density of the light pulses, which is 1,000 times greater than in sensors with constant light sources. The benefits that this technology delivers include large measurement ranges, high detection ranges, and absolute levels of precision. Negative influences such as extraneous light or different reflection characteristics cannot impact the function of PRT sensors.

**Smart Positioning:** In the automation world, many different types of positioning systems are available. Today, the Positioning System is reshaped from mechanical encoder-based posi-

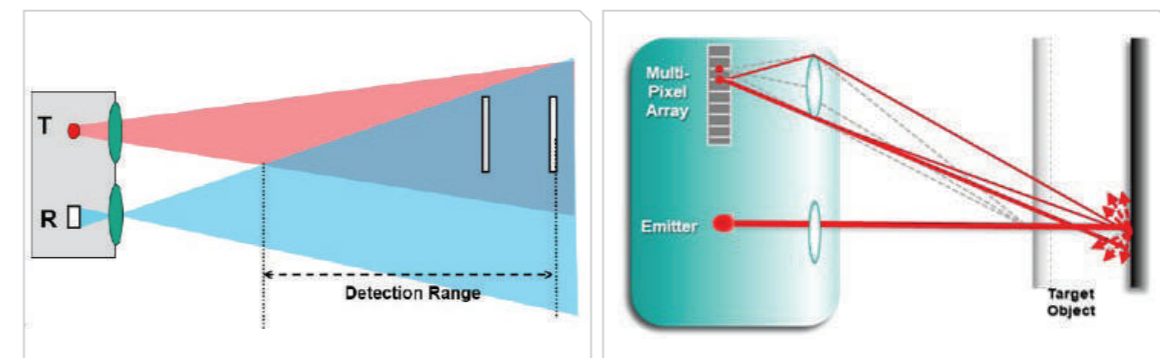
tioning to more advanced camera-based positioning systems. Rotary Encoders use optical or magnetic sensing to monitor precise position, angle, and velocity. It includes different mechanical and electronic connection options including a wide selection of accessories. Encoders require slight efforts to fix them with a mechanical shaft or coupling with precise torque and proper alignment. However, in the digital age, we have 2-D camera-based positioning systems such as the Data Matrix positioning systems for non-contact linear and absolute positioning use Data Matrix codes to position vehicles along a track in the X-axis.

**Single Layer (2D) to Multi-Layer LiDAR (3D):** 2D LiDAR sensors use a single plane of lasers to capture X and Y dimensions. This could be accomplished with a continuous ring of projected light

or a single spinning laser beam. Either way, ring lasers, and 2D LiDAR sensors collect the same type of X and Y dimensional data. The movement of the sensors down a pipe facilitates the collection of successive slices of 2D data that are often presented in 3D formats.

Over the past decade, there have been significant advances in 3D sensor technologies and methodologies. 3D LiDAR sensors function like their 2D counterparts, but additional measurements are taken along the Z axis to collect real 3D data. The third-axis data collection is most often accomplished with multiple lasers at varying angles or lines of vertical projection. Modern laser projection and wide-area scanning technologies allow high-accuracy, high-resolution 3D data to be collected without blind spots.

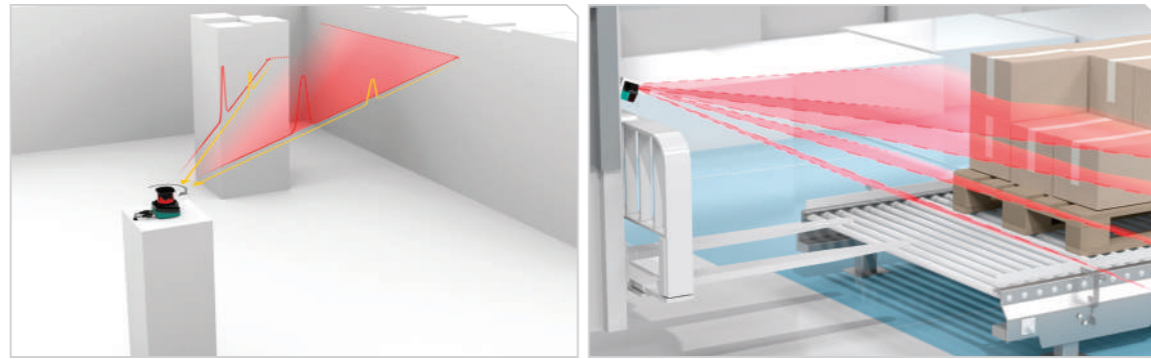
Smart sensors are basic sensing elements with embedded intelligence. The sensor signal is fed to the microprocessor, which processes the data and provides an informative output to an external user.



Single Pixel to Multi-Pixel

LAKSH MALHOTRA  
Product Manager  
Pepperl+Fuchs Factory  
Automation Pvt Ltd





Single Layer (2D) to Multi-Layer Lidar (3D)

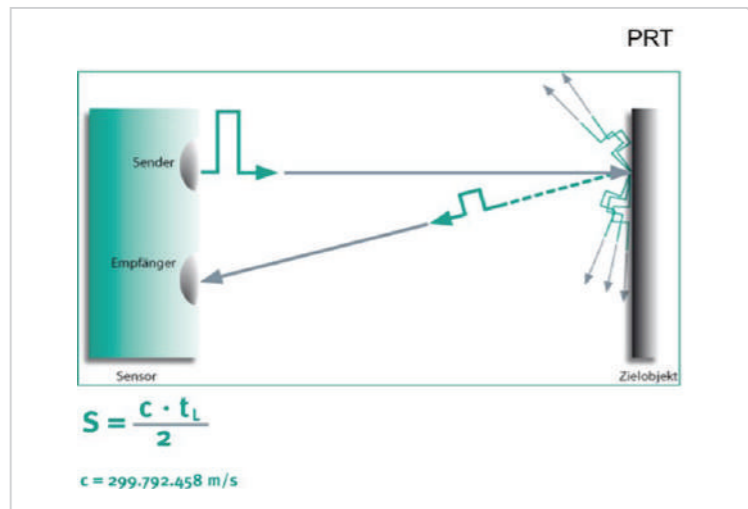
**2D Vision to 3D Vision Sensors:** The traditional two-dimensional machine vision system, when used in tandem with imaging library software, has been proven to be very successful in applications such as barcode reading, presence detection, and object tracking, and these technologies are only improving

with time. However, since 2D cameras simply take an image of light reflected from the object, changes in illumination can have adverse effects on accuracy when taking measurements. Too much light can create an overexposed shot, leading to light bleeding or blurred edges of the object, and insufficient il-

lumination can adversely affect the clarity of edges and features that appear on the 2-dimensional image. In applications where illumination cannot be easily controlled, and therefore, cannot be altered to fix the shot, this creates a problem within 2D machine vision systems.

3D machine vision cameras can offset this by having the capability of recording accurate depth information, thus generating a point cloud, which is a far superior object in terms of accuracy. Every pixel of the object is accounted for in space, and the user is provided with X, Y, and Z plane data as well as the corresponding rotational data for each of the axes. This makes 3D machine vision an exceptional option compared to 2D in the context of applications involving dimensioning, space management, thickness measurement, Z-axis surface detection, and quality control involving depth.

Since 2D cameras simply take an image of light reflected from the object, changes in illumination can have adverse effects on accuracy when taking measurements.



Pulse Ranging Technology



2D Vision to 3D Vision Sensors

# BREAKING THE MOLD

Bengaluru-based trailblazer of a startup RLZ Motorsports Pvt Ltd is reshaping the narrative of carbon fiber manufacturing while defying convention and fusing artistry with cutting-edge technology. Let's unravel its founding story and explore the challenges it has surmounted to savor its success.



Team RLZ Motorsports with the founding members of the company

**R**LZ Motorsports Pvt Ltd, headquartered in Bengaluru, is India's first automotive pre-impregnated carbon fiber composite parts manufacturer. Founded in 2014 by Tilak Gowda, the company's vision was to engineer lightweight, high-strength carbon fiber components primarily for aerospace enterprises. Tilak has in-depth experience in drone manufacturing which intrigued him towards intricate design and mechanisms of aerospace components. Moreover, he is a skilled motorcycle stunt rider and led a motorsport team named RLZ. As a prominent stunting team in India, they

showcased their stunting prowess in stunt shows for various automobile brands such as Bajaj and Honda. As a motorsport enthusiast, he recognized the dire need for lightweight materials to reduce vehicle weight that can consequently enhance speed and revolutionize motorsports. He is also an artist by passion, and, hence, has a keen eye for aesthetics and beauty in complicated mechanical components. These combined interests led to the inception of RLZ Motorsports where the strength, performance, and aesthetics of carbon fiber composite materials can give cutting-edge performance to automobiles. Leverag-

ing his extensive knowledge in manufacturing, aerodynamics, and metallurgy, Tilak oversees the entire product development process at RLZ Motorsports. In this journey, Kavana Gowda, his wife, has assumed a crucial role in managing the company's finances, while Gaurav Sham, the Director of the company, handles the company's operational and procurement aspects. "I joined RLZ in 2021. I am an aerospace engineer turned entrepreneur and founded the first LED lighting company in India to create a range of LED lighting solutions for various industries. The company was later acquired by Havells," shares

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Despite its higher cost, carbon fiber's advantages are undeniable in the Automotive industry where a significant goal is the substantial reduction of vehicle weight to achieve heightened engine power and reduced fuel consumption.

Nikhil Das, Director, RLZ Motorsports Pvt Ltd.

In his quest to channel his career, RLZ Motorsports captured his interest as an immensely promising venture, offering cutting-edge carbon fiber products to prime customers of the Aerospace industry including NAL, Honeywell, and Collins.

Over the years, the company shifted its focus towards the Automotive industry, recognizing the immense potential for pre-impregnated carbon fiber parts. With over a decade of experience in innovation, analysis, and development, it has strengthened its position as a premier full-service manufacturer, specializing in top-tier carbon fiber automobile composites. RLZ Motorsports has emerged as a dominant player in the Indian market and holds an oligopoly in the global industry. "Carbon fiber is a unique material that is increasingly capturing the attention of major automotive companies, driving RLZ Motorsports to develop a diverse product range that meets the cutting-edge demands of the Automotive industry," adds Das.

### Carbon fiber's triumph in auto evolution

Despite its higher cost, carbon fiber's advantages are undeniable in the Automotive industry where a significant goal is the substantial reduction of vehicle weight to achieve heightened engine power and reduced fuel consumption.

"Carbon fiber serves as a substitute for metal, boasting a weight that is merely one-tenth of metal's weight, making it exceptionally lightweight. Moreover, it is non-flammable and resistant to corrosion. Its flexibility allows for customized shaping and usage as per specific requirements, unlike metals. In terms of power-to-weight ra-



Source: RLZ Motorsports Pvt Ltd

"Over the years, RLZ Motorsports shifted its focus towards the automotive industry, recognizing the immense potential for pre-impregnated carbon fiber parts. With over a decade of experience in innovation, analysis, and development, the company has strengthened its position as a premier full-service manufacturer, specializing in top-tier carbon fiber automobile composites."

**Nikhil Das**  
Director  
RLZ Motorsports Pvt Ltd

tio, carbon fiber surpasses metals, leading to enhanced engine power," explains Das. Additionally, carbon fiber contributes to superior aerodynamics in vehicles compared to metal, as it can be easily molded into shapes that optimize aerodynamic efficiency. Carbon fibers are the preferred material in sports cars and bikes, enabling exceptionally high speeds and outstanding balance.

### Catering to the demand

Initially, Das reveals, there was a lot of resistance in the market to adopt carbon fiber composites, mainly because automotive companies could not gauge an Indian company manufacturing high-end carbon fiber composites. "The majority of carbon fiber manufacturing companies are concentrated in Germany or Japan, and there were no players in this domain within the APAC region. However, this skepticism subsided as a few companies, including BMW and TVS, approached us with specific requirements," he points out. "Coming from an aerospace background, the entire RLZ Motorsports team found it relatively easy to develop the required products. Remarkably, we managed to deliver the initial products in under 25 days." "The precision, quality, and timely delivery impressed our

clients, leading them to recognize our potential. Consequently, we started receiving bulk orders, attracting attention from major global automotive companies. Presently, RLZ Motorsports is a key supplier of pre-impregnated carbon fiber composite parts to a wide array of major brands in India and internationally," he reveals.

### Innovation in every fiber

RLZ Motorsports' unique approach is deeply rooted in Gowda's artistic vision, ensuring a harmonious blend of style and functionality in every component. "He personally designs and meticulously inspects each component as per specified guidelines. Additionally, stringent quality control measures are defined with precise tolerance levels to ensure international standards in design and development. This distinct approach makes our products unique, giving us a competitive advantage on a global scale," says Das. The R&D team, under Gowda's leadership, stands at the forefront of innovation. It recently developed a carbon fiber fuel tank, which required nearly two years to achieve precise tolerance with oil or petrol. "In another breakthrough, we significantly reduced the chassis weight from 14 kg to merely 3 kg using carbon fiber. This achievement stands as

a monumental advancement in the Automotive sector, which is constantly in search of means to decrease overall vehicle weight," he adds.

The company's choice of a specialized team for precision cutting reflects its innovative approach to manufacturing. The engineering department comprises a team of 10 individuals, complemented by a production team of 10 more. Interestingly, a specialized team of 70 to 80 female staff, all with a background in the Garment industry, are responsible for the precision cutting of carbon fiber. "This unique choice is because carbon fiber is a fabric-like material, and these skilled women possess an innate understanding of the precision cutting requirements of this material," he explains.

### Collaborating with the best

RLZ Motorsports' impressive clientele, including BMW and Hero, signifies its global recognition, and these collaborations were forged through meticulous testing. "Given our collaboration with companies building racing bikes, our components undergo rigorous testing by some of the world's top racing teams. It is evident that these companies exclusively select the best and most advanced technologies


available globally," he stresses. "Working closely with these companies provides us with invaluable insights into the future of the Automotive industry. Thus, we find ourselves at the forefront of innovation, eliminating the need to invest effort in predicting upcoming trends. We are future-ready already compared to other companies." Quality control is paramount at RLZ Motorsports, with a stringent seven-gate process ensuring that all quality parameters are met at every stage of product development. "This meticulous process guarantees that all quality parameters are met at each stage of the product development cycle," he further says. "Consequently, our customers receive products of the highest quality with every individual component."

### Integrating sustainability

At RLZ, sustainability is a core focus at every stage of its process flow, aligning with its goal to achieve a sustainable approach. "Our products are environmentally friendly and of utmost quality," notes Das. Internationally, the production of carbon fiber fabrics is limited to a handful of companies. Consequently, RLZ sources its materials from vendors who guarantee adherence to pre-established

quality standards for each sheet. "Our quality parameters are exceptionally strict, ensuring the highest quality standards. Additionally, all our materials are free from volatile organic compounds (VOCs), emphasizing our commitment to minimizing environmental impacts. Our production process is devoid of any harmful materials," he adds.

### Exciting developments

The company is gearing up for a foray into the Electric Vehicle (EV) sector, focusing on leveraging carbon fiber's weight-reduction properties to enhance EV efficiency. Das explains, "Every EV manufacturer is focused on maximizing its range, and this can be achieved in two ways. Firstly, by augmenting the battery capacity, which, in turn, increases the vehicle weight. Secondly, by substantially reducing the vehicle's body weight, an area where carbon fiber can play a vital role." The Director also envisions the company becoming the leading producer of pre-impregnated carbon fiber parts globally. With an ambitious goal to supply every automotive company across the world, RLZ Motorsports aims to revolutionize the Automotive industry with its cutting-edge products. 

In another breakthrough, RLZ significantly reduced the chassis weight from 14 kg to merely 3 kg using carbon fiber. This stands as a monumental advancement in the Automotive sector that is in search of means to decrease overall vehicle weight.



Source: RLZ Motorsports Pvt Ltd

## PURSUING EXCELLENCE IN TOOL MANUFACTURING

Sphoorti Machine Tools Pvt Ltd's remarkable ascent from a small unit to a global player in tool discs and tool holders is a testament to the potential and resilience of Indian MSMEs in the manufacturing sector. The company's pursuit of quality, global expansion, and excellence has taken it on an impressive journey, one which is worth sharing.



Source: Sphoorti Machine Tools

**I**n February 1996, Sphoorti Machine Tools embarked on its path to success with just two Vertical Machining Centers, under the able guidance of Late Shri. A V Sathe one of the founding fathers of AceMicromatic Group. The company since then has had remarkable growth, emerging as one of India's leading manufacturers of Tool Discs and Tool Holders for CNC Turning Centers and Turn Mill Centers. Reminiscing the journey that started with a tiny unit involved in contract manufacturing, RK Purohit, Managing Director, Sphoorti

Machine Tools, says "Sphoorti, today, boasts an impressive product basket containing nearly 1,000 varieties of Tool Holders and Parts. We take pride in being a one-stop solution provider for manufacturers or dealers of CNC Lathes, CNC Turning Centers, and CNC Turn Mill Centers, offering a wide range of Tool Holders, whether static or driven holder type." Furthermore, the company's infrastructure has been vital to its success. Encompassing one acre, the facility comprises a 16,000 sq ft Shop area and a 7,600 sq ft Design and Admin area. Its manu-

facturing process is enhanced by state-of-the-art machinery and equipment, such as 5-axis Machining Centers and high-precision HMCs.

### Sphoorti's commitment to excellence

Sphoorti prides itself on its commitment to quality. Certified by TUV SUD South Asia Pvt Ltd as a quality supplier of Tool Discs and Tool Holders, the company follows rigorous testing processes that meet international standards. As Purohit explains, "Sphoorti has come a long way in establishing

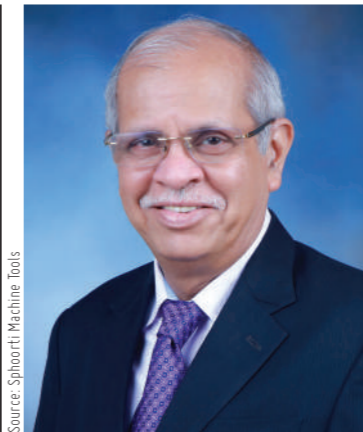
quality systems as a commitment to improvement. Our team is guided by principles of achieving quality right at the outset, prioritizing simplicity, and ensuring easy documentation. Our testing processes meet international standards and are accepted globally. Be it a micro or a macro requisite to meet the product deliverables, Sphoorti never compromises."

While the Indian Government has introduced various initiatives to support new businesses, Sphoorti has chosen to utilize schemes such as RoDTEP (Remission of Duties and Taxes on Exported Products) and duty drawbacks, rather than schemes like the Credit Guarantee Scheme for Micro and Small Enterprises (CGTMSE) and Government e-Marketplace (GeM).

### Success in exports

A remarkable 47 percent of Sphoorti's turnover comes from exports. On the key export markets that drive the company's business, Purohit shares that CNC Lathes are used globally, and the world serves as the company's market. Sphoorti's exports reach major markets such as the US, Russia, Europe, and others. Notably, the upsurge in demand for BMT-type Tool Holders has been a significant contributor to export revenues.

"This is the most rigid type of tool holding on a CNC Machine and is being implemented largely by North America, Korea, Japan, etc. Ironically, all other European countries, India, Taiwan, and China, are complying with the market needs," he points out. "This BMT Turret and Tool Holder System will drive the future of CNC Machines and will be good for visualizing cohesiveness globally. Sphoorti is always on track to be a front-end supplier of tool holders for new developments, existing markets, and even products which are discontinued by machine



Source: Sphoorti Machine Tools

"Sphoorti has set ambitious goals for the future and is determined to increase its turnover by 40 percent by 2025. We are highly ambitious to scale up our business as we have affirmative business indicators and strong customer feedback."

**RK Purohit**  
Managing Director  
Sphoorti Machine Tools Pvt Ltd

builders. We wish to ensure CNC Machines do not stop running."

### Expanding international presence

To expand its international presence, Sphoorti actively participates in major global exhibitions like EMO, IMTS, TIMTOS, IMTEX, EXPOMAFE, and EXPOMANUFACTURA. "We are on a war footing to upscale the demands of machine tool builders from the West and our sales partners all over India and abroad," Purohit states. "To support externally, we are continuously adding customers from the US, Brazil, Mexico, Russia, Taiwan, etc. They are all highly positive and shaking hands with Sphoorti in its growth graphs."

As a company participating in major global exhibitions, it had a strong presence at EMO Hannover 2023. Purohit found the event more effective, with interactions being quite encouraging amidst the ongoing turbulence in the European market. "The number of visitors may have been lower than in previous years, but the quality of interactions and

business discussions remained high," he shares. "EMO Hannover continues to be a key platform for Sphoorti's export business and a vital part of our global presence."

### Collaboration and growth strategy

Being a part of the AceMicromatic Group—one of the largest and most comprehensive machine tools groups—has had a substantial impact on Sphoorti's growth and stability. The Managing Director elaborates, "Sphoorti is one of the group companies of the AceMicromatic Group that enjoys a major share of Tool Discs and Tool Holders business. We do have a special system of KANBAN to support instant supplies to Ace, and we strive to keep buffers to ensure a seamless supply chain. Micromatic's sales offices across India play a crucial role in connecting Sphoorti products with the customers who require them."

Sphoorti has set ambitious goals for the future and is determined to increase its turnover by 40 percent by 2025. It understands that growth depends not only on resources but also on the dedication of its employees. The company's vision and mission drive it to provide high-quality products that lead to customer delight and value for money. "Sphoorti is on a speedy trajectory of growth plans. More than a mere expansion, we are meticulously looking at optimizing the efficiency of machines, equipment, vendors, infrastructure, and, most importantly, 'people,'" says Purohit. "We are highly ambitious to scale up our business as we have affirmative business indicators and strong customer feedback. We strongly believe businesses can grow partially with their sources and significantly with their soul-hearted employees. Collectively, we are committed to becoming a major global player in the field of Tool Discs and Tool Holders." 

Sphoorti derives approximately 47 percent of its turnover from exports, demonstrating its global reach and the demand for its products. The company's strategic focus on quality and its ability to cater to international markets, including the US, Russia, Europe, and others, has been instrumental in driving export revenues.



## DMTX 2023: ELEVATING THE REGIONAL GAME

IMTMA, through its Delhi Machine Tool Expo 2023 (DMTX 2023)—Northern India’s premier B2B machine tool exhibition—achieved remarkable success in enabling India’s regional industrial units to keep pace with changing technologies. The show, held from August 24-27, 2023, at Pragati Maidan, New Delhi, attracted visitors from neighboring states and smaller cities of the region.



Source: IMTMA

**I**ndian Machine Tool Manufacturers’ Association (IMTMA), through its regional shows, aims to offer businesses and professionals the significant opportunity to stay abreast of the latest technologies in their respective sectors, expand their knowledge, and broaden their business networks. The highly anticipated 4<sup>th</sup> edition of Delhi Machine Tool Expo (DMTX 2023) showcased Indian machine tool manufacturers’ cutting-edge innovations in met-

al cutting, forming, automation, robotics, and tooling trends. Concurrent exhibitions included Metrology Expo, Weld Expo, and Digital Manufacturing. The show succeeded in convening leading industry players, manufacturers, and suppliers from Delhi and NCR region and also attracted delegates and visitors from the tier II and tier III cities such as Jagadhri, Sangrur, Rudrapur, Chandigarh, Ludhiana, Jalandhar, Manesar, Faridabad, Panipat and the neighbor-

ing states of Rajasthan, Uttar Pradesh, Himachal Pradesh, Uttarakhand, and others. The four-day event was inaugurated by Bharat Bhushan, Director, Tubetech Equipment Pvt Ltd, in the presence of Ravi Raghavan, Former President, IMTMA; Rajendra S Rajamane, President, IMTMA; and Jibak Dasgupta, Director General & CEO, IMTMA. Raghavan expressed the transformative growth of Indian manufacturing, emphasizing the remarkable progress and the ac-



celerated pace of advancements. Bhushan noted the industry’s resurgence and its robust rebound from pandemic challenges.

### Stats reflecting success

DMTX 2023 unveiled the latest manufacturing technologies that would enable original equipment manufacturers as well as small and medium enterprises to leverage and enhance their manufacturing capabilities. The expo attracted 13,528 visitors over the four days. Spread across three halls (Hall 11, 12, and 12A), the expo showcased state-of-the-art technologies focusing on manufacturing solutions for metal working

industries based in and around Delhi and NCR. It had a significant presence of 208 exhibitors representing 10 countries. Visitors from 45 industry sectors, majorly from Auto Components, Automobiles, Die & Mold, Industrial Machinery, Machine Tools, etc. attended the expo. Exhibitors were extremely satisfied with more than 75 percent expressing their willingness to participate in the next edition of the show in 2025.

### Outline of the Exhibition

**Organizer**  
Indian Machine Tool Manufacturers’ Association

**Venue**  
Pragati Maidan, New Delhi

**Number of Exhibitors**  
208 from 10 countries (India included)

**Number of Visitors**  
13,528

**Net Exhibit Space**  
12,000 sq mt (approx.)



Visitors from 45 industry sectors, majorly from Auto Components, Automobiles, Die & Mold, Industrial Machinery, Machine Tools, etc. attended the expo. Exhibitors were extremely satisfied with more than 75 percent expressing their willingness to participate in the next edition of the show in 2025.



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# EMO HANNOVER 2023 SPARKS INNOVATION AND EXCELLENCE

Organized by VDW (German Machine Tool Builders' Association) after a four-year hiatus, EMO Hannover 2023 was nothing short of spectacular. With innovation as its cornerstone, this international gathering exceeded expectations, drawing visionaries from around the world. A look into the symphony of progress that unfolded at Hannover Fair Ground from September 18-23, 2023.



Opening Ceremony of EMO Hannover 2023

**W**oven around the theme of 'Innovate Manufacturing', EMO Hannover 2023 reflected the trade show's strengths, featuring the internationality of its exhibitors and attendees. The world's leading metalworking trade fair served as an apt platform for world-class technical advances. EMO Hannover 2023 featured a remarkable display of innovations and an impressive visitor interest from all around the world. "After the four-year break, the relaunch has been a huge success for EMO Hannover," summed up Carl Martin Welcker, Commissioner

General, EMO Hannover 2023, at the end of the six-day show in Hannover.

"We saw everything here for the future of production: new solutions for automation, for networking within the factory, and for sustainable production. When digitalization finds its way into the factory, there is no end to the potential for new solutions and increased efficiency. This was impressively demonstrated by the exhibitors," continued Welcker.

#### International resonance

Around 1,850 exhibitors attended the show from 45 dif-

ferent countries. With approximately 92,000 trade visitors, 54 percent came from 130 countries. Leading the pack among visitor countries were Turkey, China, the Netherlands, Italy, and Poland. Notably, a substantial one-third of attendees hailed from Asia, signaling the event's global magnetism.

#### Innovation at the core

In a survey, 30 percent of visitors highlighted their priority as 'obtaining information about innovations and trends', and a further goal was finding concrete solutions for their specific problems. This underlines EMO



L-R: Dr Wilfried Schäfer, Executive Director, VDW; Franz-Xaver Bernhard, Chairman VDW; Carl Martin Welcker, General Commissioner, EMO Hannover; and Dr Markus Heering, Executive Director, VDW



A core area of interest at EMO Hannover 2023 for exhibitors and visitors alike was the switch to electric drive technologies.

Hannover's role as a crucible for pioneering solutions.

#### Shaping the future of manufacturing

Addressing the pressing issue of skilled labor shortages, automation took center stage at the trade fair. Over a third of visitors identified this as a significant concern, with nearly a quarter focusing on digitalization and networking. They were able to find just what they were looking for on the many stands. Several hundred robots were showcased across the halls at EMO Hannover.

A new trend was seen with respect to operating the cobots (collaborative robots). It is no longer necessary to have programming skills in order to use cobots for different applications such as loading and unloading, quality control, painting, washing, as well as connecting to measuring devices.

The cobots are equipped with sensors that mimic the human sense of touch. This allows them to compensate for workpiece tolerances or work around obstacles in the workspace. In collaboration with employees, this facilitates enclosure-free operation, for example. This trend also means that robot manufacturers are currently doing good business.

Another focus area was connectivity. The main emphasis was on the open exchange of

data - based on OPC UA, for example. This is the basis for the Companion Specification OPC UA for Machine Tools under the umati umbrella. Retrieving large amounts of data from digital controls without affecting the process is a key factor here. The availability of transparent process data is crucial for process monitoring and related quality management.

The Future of Sustainability in Production was high on the agenda for 68 percent of visitors. Foreigners accounted for three-quarters of this group as they were represented more than their German counterparts. A key aspect was efficiency. Some examples such as the Product Carbon Footprint indicate the level of carbon emissions during production and provides customers with detailed information on what indirect emissions the tools they use contribute to their overall carbon footprint. Another example was the structure of spindles, which are designed for energy efficiency and not primarily for maximum performance. Finally, cooling lubricants can be used for longer through monitoring and filtering.

#### Newcomers en masse

More than half of the visitors to EMO Hannover were attending for the first time according to the organizers. This dovetailed

nicely with the exhibitors' goal of attracting new customer business. Similarly, around one-fifth of the exhibitors participated in the show for the first time.

#### Where the top brass meet

It is important for exhibitors to be seen at EMO Hannover; to showcase their offerings, and demonstrate competence. EMO is therefore a trade fair for executives and decision-makers from the Mechanical Engineering, Automotive and Supplier industries, Metal Processing, Precision Mechanics, Optics, Aerospace industry, and many more.

Almost 60 percent of the visitors were top executives. Just under half have decision-making authority for purchasing and procurement. Indeed, half of the trade visitors actually stated that they came to EMO with concrete investment plans. On average, these visitors planned to invest just under €3 million. More than a quarter said they had placed orders at the fair.

"EMO Hannover has once again confirmed and consolidated its position as the world's leading trade fair for production technology," Welcker concluded. The next edition of the show is expected to attract more exhibitors in two years' time. In 1975, 50 years ago, the first EMO Hannover took place. In 2025, it will be held from September 22-27. 

EMO Hannover 2023 attracted around 1,850 exhibitors from 45 different countries and approximately 92,000 trade visitors from 130 countries. Notably, one-third of attendees came from Asia, highlighting the event's global appeal.

# WELL-RECEIVED GLOBALLY AT EMO HANNOVER 2023

Industry titans who represented India at EMO Hannover share the highly positive response they garnered at the global platform for their advanced and innovative offerings. The acknowledgment serves as an ideal encouragement to persist on the growth path and strive for continuous improvement.

**C Raguramachandran, CEO, AceMicromatic International**



Source: Magic Wand Media

EMO Hannover 2023 was a resounding success for AceMicromatic International, the export division of AceMicromatic Group, the largest machine tool conglomerate in India. A range of globally engineered products were displayed in four different exhibits, attracting visitors from various regions across the globe.

Ace Designers Turning products included Vantage 800 MY, a multi-axis CNC lathe and LT-2 LM MSY, a horizontal turnmill center capable of performing an extensive range of turning operations in a single setup, including milling, drilling, tapping, and front/back end turning.

Ace Designers Machining Centre products included AMS DTC 400 XL, a high-speed drill tap center ideal for applications in the Automotive, Electronics, General Engineering, and Medical sectors.



Source: Magic Wand Media

Source: Magic Wand Media

(3<sup>rd</sup> from L) C Raguramachandran, CEO, AceMicromatic International with his team members, international dealers and customers at EMO Hannover. (2<sup>nd</sup> from L) Benedict Machado from Ace Designers Ltd along with team members from Micromatic Grinding Technologies at EMO Hannover.

Micromatic Grinding products included ECO 200 U, a compact hydraulic grinding machine and Pluto 18 CNC, an innovative grinding available in straight and angular configurations.

Pragati Automation demonstrated a variety of turrets, including a selection of automatic tool changers and Tool turrets with live tool capabilities with BMT and VDI tools.

We had visitors as our customers, distributors, and supply chain partners from around the globe. Our products generated considerable interest from Turkey, United Kingdom, Italy, Poland, Mexico, USA, Germany, and the eastern part of Europe.

EMO 2023 was a highly effective platform for Indian companies to proudly showcase their progressively innovative products to the global market. India, with its robust economic growth and bright prospects, is not only emerging as a strong consumer of machine tools but also as a leading alternative supplier of machine tools globally. Numerous visitors from various countries showed positive interest in the offerings of Indian exhibitors, particularly in the affordable technology range of machines along with automation, including I.E. and energy-efficient machines.

**Rajendra S Rajamane, Managing Director, Rajamane Industries Pvt Ltd  
President, Indian Machine Tool Manufacturers' Association**



Source: Magic Wand Media

(2<sup>nd</sup> from L) Rajendra S Rajamane, Managing Director, Rajamane Industries Pvt Ltd and President, Indian Machine Tool Manufacturers' Association at Rajamane Industries booth in Hannover.

This global event in the Metalworking industry provided us with a valuable platform to showcase our Coolant Pumps, Oil Skimmers, Motors, and other products, expanding our business opportunities beyond India.

The diverse audience from around the world demonstrated a keen interest in the advancements and innovations within the Machine Tool industry. We are proud to have received recognition for the quality of RAJAMANE products, reinforcing the acceptance of Indian products by offshore clients across continents.

Visitors from various countries, including Italy, China, Taiwan, Japan, France, and more, were enthusiastic to explore Indian offerings. With India emerging as the most populous country and ranking among the world's largest machine tool markets, the nation's strong economic growth positions it as a key player in the global manufacturing and export landscape.

As the fifth-largest economy with a promising future, India is a focal point for the Machine Tool industry. EMO Hannover 2023 provided a platform to showcase India's manufacturing potential, complemented by valuable insights from the Indian Machine Tool Manufacturers' Association (IMTMA) about the Indian market.

We anticipate that this exposure will stimulate increased demand for Indian machines and technologies, creating robust global opportunities for the industry.

**Parakramsinh G Jadeja, Chairman & Managing Director, Jyoti CNC Automation Ltd**



(4<sup>th</sup> from L) Parakramsinh G Jadeja, Chairman & Managing Director, Jyoti CNC Automation Ltd and (3<sup>rd</sup> from R) Marc Troia, General Manager, Huron Graffenstaden with team members at EMO Hannover.

After a hiatus of four years, EMO 2023 featured an impressive array of innovations and technologies from the manufacturing world. Once again, this edition of the exhibition spanned six highly eventful days, capturing significant international attention and providing an ideal platform for top-notch technological excellence. The Jyoti-Huron booth stood out as a fusion of technology and innovative solutions tailored for various sectors.

Within our booth, we proudly presented our inventive solutions, including the blade machining center ABX 40, the feature-rich horizontal machining center HP 5000, and the newly developed 5 Axis machine with advanced innovative technologies, GU5 FIVE. These machines excel in applications across Aerospace, Die-Mold, Energy, Telecommunication, and General Engineering sectors. The positive inquiries for our solutions made this edition of EMO highly successful for Jyoti CNC.

Our booth hosted a diverse and international visitors from various countries, representing almost all continents. Among them, visitors from Germany, Europe, and Asia took the lead. Our collaboration with Huron conferred an added advantage, opening doors in the European market. Currently, we boast over 600 Indian-made machine installations in Europe. Indian machines are viewed not merely as a low-profile option but as a substituting solution, with an economical range attracting significant demand worldwide. As an Indian Machine Tool manufacturer, our showcased products at EMO position us as a robust alternative to other international brands.



**C Renganathan, Managing Director, Chennai Metco Pvt Ltd**



(2<sup>nd</sup> from R) C Renganathan, Managing Director, Chennai Metco Pvt Ltd along with team at EMO Hannover.

The response received at EMO 2023 was overwhelming. We observed the sentiment of saving on the capital cost and that makes an average European customer source machine tools at a lower price.

India is now being accepted as an option. The products displayed by us were very well-received. The attendees were from various parts of Europe and also from around the globe.

There was a particular interest from countries like Turkey, Slovakia, the Czech Republic, etc. which are known to be more cautious about the pricing of the equipment.

The recognition of India as a reliable source for machine tools has significantly improved. This was evident in the visitors' confidence as they sought more information and considered potential procurement.

**IMTMA at EMO Hannover**



L-R: Guru Prasath, ED-Trade Fairs, IMTMA; Rajendra Rajamane, President, IMTMA; Ravi Raghavan, Past President, IMTMA and Jibak Dasgupta, Director General & CEO, IMTMA and BIEC, post IMTEX 2025 press conference at EMO Hannover.



The session on India Opportunities at EMO Hannover was a huge success. Audience from diverse sectors attended the session.

## EMPOWERING MANUFACTURING AUTOMATION

The 6<sup>th</sup> edition of the 'Symposium on Automation & Robotics' on October 5 and 6, 2023, at Hotel TipTop International in Pune, by IMTMA, was a successful gathering of industry professionals and leaders from across the manufacturing automation sector that provided an engaging platform for knowledge exchange and technological advancements. Here are a few glimpses of the enlightening event...



Source: IMTMA

**H**eld by Indian Machine Tools Manufacturers' Association (IMTMA), the 'Symposium on Automation & Robotics 2023' garnered an overwhelming response from over 250 delegates representing over 80 companies from 15 cities. A comprehensive experience was offered to visitors by housing an exhibition that ran parallel to the conference. The exhibition was for the visitors to explore cutting-edge products and technology related to automation and robotics, in addition to partaking in technical deliberations at the conference. Inaugurated at the hands of Rajendra Rajamane, President, IMTMA,

the symposium witnessed the gracious presence of the Guests of Honor Sunil Mehta, President, Automation Industry Association; G Sundararaman, Co-CEO, Wipro PARI Pvt Ltd, and Dr Sadashib Padhee, Director, Samarth Udyog Technology Forum. Delighted at the unprecedented response received by the event, Rajamane said, "This edition of the symposium has witnessed the largest number of registrations and the participants are surely to benefit from the valuable insights shared. The overwhelming response of the visitors reflects their keenness to embrace automation, which will play a key role in the growth of Indian business."

### Underlining automation as a need of the hour

The IMTMA President emphasized the pivotal role of automation and robotics in enhancing manufacturing efficiency and product quality. He underlined the versatility of robots, which are increasingly becoming affordable and adaptable to automate intricate tasks and facilitate large-scale production. IMTMA's contribution to developing indigenous industrial robots through its Advanced Manufacturing Technology Development Centre at IIT-Madras in Chennai was also highlighted. The symposium delved deep into relevant topics of discussions and presentations in the arena of ro-

botics and automation including artificial intelligence, automation, laser welding, sensors for Industry 4.0, robotics, machine learning for manufacturing, digital manufacturing, cobots, use of digital imaging, etc. The session also focused on the new developments in human-centric automation.

### Insightful deliberations

The topics of the presentations included 'AI at Edge - Making Automation Easier'; 'Factory Automation - Case study on EV Battery'; 'Hydraulic Muscle for Automation'; 'Sensors for Industry 4.0'; 'Digital Imaging based Intelligent Inspection'; 'MSMEs on CLOUD nine'; 'Welding Automation for Deskill-ing the welding process'; 'Gripping and Automation Technology - Innovations for Simplified Adaptability'; 'Robots with Intelligence'; 'AI-ML applied to Manufacturing'; 'Human-Centric Approach to Automation and Industry 4.0'; 'Robots for Adaptive Automation'; 'Success story and tips for Digital Manufacturing Implementation'; and 'Globally Proven Strategies for effective Cobot application deployment'. Panel discussions were held that brought forth highly insightful outlooks of the industry specialists from Mitsubishi Electric, Pepperl+Fuchs, Titan Engineering & Automation, Wipro PARI, Siemens, Google Cloud, Bajaj Auto, Ather Energy, InnovaPoint, Accurate Gauging & Instruments, Fine Handling, Ascent Intellimation, Trumpf (India), Bystronic,

APM Technologies, and ISGEC. The topics were 'New Technology Trends in Manufacturing Automation'; 'Is Automation Driven by Push or Pull?'; 'Affordable Automation'; and 'Automation in Sheet Metal Forming'.

### What the industry had to say

Applauding IMTMA for its inspiring work and wishing it success in the Association's future endeavors, Dr Padhee commented, "The symposium by IMTMA holds significance and it's crucial that our young engineers embrace automation and robotics technologies." Mehta who is also General Manager, Mitsubishi Electric India Pvt Ltd & Director, Foundation for Smart Manufacturing (FSM), concurred, "This year's 'Symposium on Automation & Robotics' has garnered an impressive response. Numerous participants have showcased their state-of-the-art automation and robotics technologies. Participants are sure to gain valuable insights into the latest technologies for smart manufacturing implementation. This edition of the symposium will prove both valuable and successful in every aspect."

Visibly impressed by the substantial level of participation at the event, Sundararaman noted relevantly that the Indian Machine Tools industry is actively pursuing initiatives related to automation. "This evolution is essential as the machine tools serve as the foundation for comprehensive automation solutions, encompassing

electrical, hydraulics, electronics, computers, and software. The industry must reinvent itself beyond traditional metal cutting, injection molding, grinding, and drilling applications, venturing into newer domains, notably electronics manufacturing, packaging, and palletizing, especially within the burgeoning e-commerce sector. There are great opportunities for IMTMA to work closely with automation system providers in taking these automation solutions forward for India," he added. Sridhar Neelakantan, Chief Executive Officer, Titan Engineering & Automation Ltd, had a fantastic experience at the symposium where the entire automation fraternity came together under the same roof. "It is an interesting opportunity to observe the ecosystem, share ideas, and explore new technologies. There are a lot of takeaways from the excellent presentations held on a wide array of topics on automation," he added. Since the association between Schunk and IMTMA spans more than a decade, marking a remarkable and highly fruitful journey, Ashwin Udayashankar, National Sales Manager, represented Schunk Intec India Pvt Ltd at the symposium, which the company has always been a part of. "The symposium offers a significant platform for technology leaders such as Schunk to connect with its users for meaningful discussions. We are eagerly anticipating our continued participation in future editions too." 

The symposium delved deep into relevant topics of discussions and presentations in the arena of robotics and automation including AI, laser welding, sensors for Industry 4.0, ML for manufacturing, digital manufacturing, cobots, use of digital imaging, etc.



Source: IMTMA



# A PLATFORM TO THRIVE

The resounding success of the first edition of Machine Tool Connect Expo in Kolhapur, known as MTX Connect Kolhapur 2023, held on October 8 and 9, 2023, at the Pavillion Hotel, underlined the need for manufacturing expos in tier II and III cities for the local manufacturers and buyers to stay attuned to the latest trends and technologies in the field and expand their horizons.



Source: IMTMA

Organized by Indian Machine Tool Manufacturers' Association (IMTMA), the inaugural edition of Machine Tool Connect Expo in Kolhapur, MTX Connect Kolhapur 2023, featured a significant presence of regional industries. The focused B2B exhibition was organized primarily for exhibitors from across the country to promote their brands and reach untapped markets in tier II and III cities and in and around Kolhapur. MTX Connect Kolhapur 2023 proved to be an excellent opportunity for exhibitors to enhance product marketability, create awareness, acquire new custom-

ers, and meet channel partners. They could visit user industries through factory visits to gain an in-depth understanding of the demand for machine tools. They found the platform to be conducive for sharing knowledge and exchanging ideas through tech talks and workshops.

### The right beginning

With over 1,300 registered visitors, nearly 900 attendees participated in the two-day B2B expo. The inauguration of MTX Connect Kolhapur 2023 was graced by RV Gumaste, Managing Director, Kirloskar Ferrous Industries Ltd; Nitin Deshpande,

Chief Human Resources, Cooper Corporation, who was representing Farrokh N Cooper, Chairman & Managing Director, Cooper Corporation Pvt Ltd; and Rajendra S Rajamane, President, IMTMA and Managing Director, Rajamane Industries Pvt Ltd. Speaking at the inaugural ceremony, Rajamane noted, "The first edition of Machine Tool Connect in Kolhapur, designed to offer manufacturers from tier II and III cities a platform to widen their reach and gain an insight into the cutting-edge, kicked off today with a fantastic response. We are overwhelmed at the robust participation with 42 exhibitors



present at the show. Additionally, associations in and around the Kolhapur region have extended their support. The event has garnered significant foot traffic, with visitors from places like Satara, Hubli, and Belgaum who are here to show their support and encouragement."

He added that IMTMA's goal of bringing advanced technologies closer to industries was successfully achieved through this show, making it an essential platform for MSMEs in the region.


The prominent industry associations, included Gokul Shirgaon Manufacturers Association, Kolhapur Engineering Association, Kolhapur Chamber of Commerce and Industries, Manufacturers Association of Kagal & Hatkanangale, Shirolu Manufacturers Association, Indian Institute of Foundrymen - Kolhapur Chapter, Shri Laxmi Industries Association, Ichalkaranji Engineering Association, and others.

### Exhibitors' experience

The 42 featured exhibitors from across the country presented their manufacturing solutions and established connections to boost their businesses. They showcased cutting-edge technologies in machine tools, digital manufacturing, laser technologies, tooling, and metrology, all of which are driving the manufacturing industry forward. Visitors from various engineering industries in Kolhapur, Karad, Jaisinghpura, Satara, and Belgaum regions attended the expo, representing sectors such as Agriculture Implements, Automobile and Auto Components, Construction, Die & Mold, Engineering Goods, Foundry, Railways, Textiles, and more. Well-acquainted with the biennial event of IMTEX, which traditionally takes place in Bangalore, Ravindranath Gumaste, Managing Director, Kirloskar Ferrous Industries Ltd, was thrilled with IMTMA's initiative

of taking exhibitions to other cities also. "I am delighted to be a part of this expansion, and it's been met with enthusiasm by numerous participants. I extend my gratitude to IMTMA for introducing this positive change," he added.

Nitin Deshpande, Chief Human Resources, Cooper Corporation Pvt Ltd, felt similarly privileged to be part of MTXConnect, "IMTMA's initiative of holding exhibitions and connection programs in tier II and III cities is commendable. Their efforts are being highly appreciated, and we will continue to extend our support to them."

During the event, IMTMA signed a memorandum of understanding (MoU) with the Centre of Excellence Kolhapur Foundry & Engineering Cluster to jointly organize conferences, seminars, training programs, and workshops aimed at enhancing the competitiveness of the Manufacturing industry in the Kolhapur region. 

Visitors from various engineering industries in Kolhapur, Karad, Jaisinghpura, Satara, and Belgaum regions attended the expo, representing sectors such as Agriculture Implements, Automobile and Auto Components, Construction, Die & Mold, Engineering Goods, Foundry, Railways, Textiles, and more.

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# ENHANCING PRODUCTIVITY

Organized by Indian Machine Tool Manufacturers' Association (IMTMA), National Productivity Summit (NPS), emerged as a beacon of innovation and unfolded its dynamic narrative on November 9-10, 2023, at the prestigious Indian Institute of Technology, Madras Research Park, Chennai.



All images source: IMTMA

**N**ational Productivity Summit, in its 17<sup>th</sup> edition, was a convergence of innovation and collaboration and served as a beacon for industry leaders, professionals, and enthusiasts eager to explore the transformative power of productivity. It was a melting pot of ideas, featuring a diverse range of sessions, including keynote presentations, live case studies, plant visits, and interactive panel discussions.

### President's perspective

Rajendra S Rajamane, President, IMTMA, and Managing Director, Rajamane Industries Pvt Ltd, provided a comprehensive overview of the summit's objectives. He highlighted the sum-

mit as a gateway to innovation, cost reduction, and sustainable growth within the ever-evolving manufacturing landscape. Speaking about the summit's significance, he remarked, "National Productivity Summit began its 17<sup>th</sup> edition on November 9, 2023, marking its return to Chennai since 2006. We are thrilled to see over 200 participants registered, with more than 100 actively engaged in the summit. This event encompasses presentations on productivity improvement across diverse sectors, including tractors and automobiles, with a keen focus on enhancing production and quality."

The morning session was inaugurated by S Muralishankar,

Managing Director, Super Auto Forge (P) Ltd, who emphasized the pivotal role of productivity in India's growth story. With an exciting lineup of presentations and keynote speakers ahead, he encouraged everyone to attend the program and collectively embrace the significance of productivity in shaping India's growth narrative.

### Essence of NPS

PJ Mohanram, Senior Advisor, IMTMA, set the stage, underscoring the evolution of the summit since its inception in 2006. "National Productivity Summit is a nexus of innovation, where industry leaders, presenters, and delegates converge to explore the transfor-



mative power of productivity. It's not just a showcase; it's a competition of ideas, pushing boundaries and defining the future of manufacturing in India," he remarked, encapsulating the essence of the summit's journey. TK Ramesh, Managing Director, Ace Designers Ltd, emphasized the summit's unique role as a nexus of innovation and the crucial need for industry-academia collaboration. He acknowledged the valuable partnership with Prof Ramesh Babu, Professor & Head of the Department of Mechanical Engineering, IIT Madras, and the collaborative efforts with the Machine Tools industry. "The spirit of the summit is about sharing, evolving, and carrying back collective wisdom," he said, urging participants to recognize the tangi-

ble outcomes that emerge from such collaborative endeavors.

### Merging technology and productivity

Having attended the past editions of NPS, Muralishankar stated, "National Productivity Summit has always served as an apt technology platform to connect innovators and collaborators from the Manufacturing sector."

Keynote speaker. Parthipan G, CEO, ZF Rane Automotive India Pvt Ltd, shared his perspective on the significance of the summit and acknowledged IMTMA's pivotal role in driving productivity improvements. He highlighted the rich history of the summit, having participated in six editions. Commending the high level of interaction, he

said, "IMTMA, beyond being a conventional association of machine tools manufacturers, takes on the crucial role of driving productivity improvements and educating their stakeholders through these summits."

### And the winner takes it all

At the pinnacle of the summit, companies unveiling groundbreaking innovations were acknowledged with the Ace-Micromatic Group presenting awards aimed at fostering productivity in manufacturing processes. These accolades, showcasing the dynamism and unwavering commitment to excellence within the manufacturing community, were distributed across various categories. In the 'Auto' category, TAFE - Tractors and Farm Equipment

**NPS 2023 attracted over 200 participants, actively engaging in presentations on productivity improvement across diverse sectors.**



First Prize Auto Category: TAFE - Tractors and Farm Equipment Ltd



First Prize Non-Auto Category: Durgapur Steel Plant



Second Prize Auto Category: Hero MotoCorp Ltd

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# INNOVATIONS AT IMTEX FORMING 2024



Second Prize Non-Auto Category: Godrej & Boyce Mfg. Co. Ltd



Third Prize Auto Category: Tata Motors Ltd



Third Prize Non-Auto Category: SLTL Group - Sahajanand Laser Technology Ltd

Ltd secured the first prize, followed by Hero MotoCorp Ltd clinching the second prize and Tata Motors Ltd securing the third prize. In the 'Non-Auto' category, the first prize was awarded to Durgapur Steel Plant, the second prize went to Godrej & Boyce Mfg. Co. Ltd and the third prize was secured by SLTL Group Sahajanand Laser Technology Ltd.

Distinct Productivity Solutions - India emerged as the SME Productivity Champion, while GK Industrial Components LLP received the SME Jury Recommendation. Milacron India Pvt Ltd was honored with the Certificate of Merit, and Toyota Kirloskar Auto Parts Pvt Ltd received the Vox Populi award. These laurels extend beyond mere recognition; they symbolize a commitment to the on-

going journey of productivity in manufacturing, resonating with the core values of National Productivity Summit.

### Closing thoughts

As the curtains drew on the 17<sup>th</sup> National Productivity Summit, the resonance of shared ideas,

collaborative spirit, and commitment to innovation lingered in the air. The summit, with its fusion of industry titans, academia, and manufacturing enthusiasts, has once again propelled the Indian Manufacturing sector toward new heights of excellence.

The echoes of NPS 2023 will undoubtedly reverberate through boardrooms and shop floors, shaping the future of manufacturing in India.

## National Productivity 2023: Award Winners

### Auto Category Winners

- 1st Prize: TAFE - Tractors and Farm Equipment Ltd
- 2nd Prize: Hero MotoCorp Ltd
- 3rd Prize: Tata Motors Ltd

### Non-Auto Category Winners

- 1st Prize: Durgapur Steel Plant
- 2nd Prize: Godrej & Boyce Mfg Co Ltd
- 3rd Prize: SLTL Group Sahajanand Laser Technology Ltd

### SME Productivity Champion

- Distinct Productivity Solutions - India

### SME Jury Recommendation

- GK Industrial Components LLP

### Certificate of Merit

- Milacron India Pvt Ltd

### Vox Populi

- Toyota Kirloskar Auto Parts Pvt Ltd



Vox Populi: Toyota Kirloskar Auto Parts Pvt Ltd



SME Productivity Champion: Distinct Productivity Solutions - India



SME Jury Recommendation: GK Industrial Components LLP



Certificate of Merit: Milacron India Pvt Ltd

## FIBER LASER MACHINES

# VENTIS-AJE SERIES WITH LBC TECHNOLOGY

The VENTIS-AJe Series is equipped with a high-intensity single-module oscillator, featuring unique beam control patterns for different materials and sheet thicknesses and offering unparalleled performance. The series is available in 4/6kW power options.

### Features of VENTIS-AJe Series

Available in two models VN-3015AJe and VN-4020AJe that feature axis movements of 3070 x 1550 x 100 and 4070 x 2050 x 100, the series allows a maximum work mass of 920 kg and 1570 kg, respectively.

**New NC AMNC 4ie:** The VENTIS-AJe Series is equipped with the innovative NC AMNC 4ie, designed with a focus on sustainability and addressing people and environmental concerns. This control system not only manages machine operations but also offers comprehensive support to customers.

**Face Recognition:** The machine employs face recognition technology to identify the operator and load their preferred language and privileges. Voice-activated commands can reduce setup time to a great extent.

**Start-of-Work Inspection Guidance:** A navigation video guides anyone through the start-up inspection process step by step.

**CO<sub>2</sub> Emissions Reporting:** CO<sub>2</sub> emissions can be measured for each part, and reports and output files can be generated.

**Mobile HMI:** One can check the status of the processing machine (status, remaining cycle time, on-site video) on the smartphone by scheduling editing. Start/stop can be performed remotely. An optional V-monitor is required to use the start/stop function.

**LIS (Laser Integration System):** LIS automates operations related to laser processing, reducing operator variation, and waiting time. It supports stable processing with zero downtime and contributes to increased productivity.

**Soft Joint:** This is a new joint that uses the thermal strain generated in the slit to sandwich the product. It prevents parts from standing up, reduces disassembly time, and reduces man-hours for finishing joint marks.

**Smart Edge:** This is a processing technology that achieves sharp edge quality when processing thick mild steel plates.

**LBC Flash Cut:** Using LBC flash cut round hole can be processed at approximately 3.3 times speed.

### Advantages of LBC Technology

LBC stands for Locus Beam Control and is the world's first beam control technology that makes it possible to freely control the trajectory of a laser beam.

High-intensity oscillator coupled with LBC realizes the fastest cutting speed and quality processing in its class. The technology reduces piercing time by 1/4<sup>th</sup> of a conventional fiber laser and also reduces energy consumption. Materials that are difficult to laser process, such as blast furnace materials and wear-resistant steel sheets, can be cut using the same processing conditions as electric furnace materials.



Amada (India) Pvt Ltd  
www.amadaindia.co.in  
Hall & Stall: 5/B-105

BUSBAR PROCESSING TECHNOLOGY

## 3 IN 1 BUSBAR PROCESSING MACHINE

The manufacturing landscape is undergoing a paradigm shift with the relentless pursuit of precision and efficiency. In this dynamic environment, TL Pathak Group, a renowned name in the Machinery industry, proudly presents its state-of-the-art Busbar Processing machines, manufactured in India. Available in two variants CNC and Non CNC, they are mainly used by electric panelboard manufacturers and transformer manufacturers.

These machines are engineered to meet the evolving needs of the industry, providing manufacturers with a competitive edge in terms of accuracy, speed, and reliability.

### Engineered for the world

TL Pathak Group's Busbar Processing machines exemplify the 'Make in India' initiative, standing tall as a symbol of the country's manufacturing prowess. These machines are not just products; they are a testament to the Group's dedication to delivering world-class solutions. The integration of advanced technology, precision engineering, and a robust build ensures that these machines can seamlessly compete on the global stage.

### Key features and innovations:

**Precision Redefined:** TL Pathak Group's Busbar Processing machines are designed with a focus on precision, ensuring that every cut, bend, and punch is executed with unparalleled accuracy. This precision translates to enhanced product quality and reduced wastage.

**Versatility at its Core:** These machines are engineered to handle a wide range of busbar sizes and materials, offering manufacturers the flexibility needed to adapt to diverse production requirements. Whether it's copper or aluminum, thick or thin, these machines excel in versatility.

**Speed and Efficiency:** Busbar Processing Machines boast impressive speed and efficiency, contributing to faster production cycles without compromising on quality.

**User-friendly Interface:** The machines come equipped with an intuitive and user-friendly interface, ensuring that operators can harness their full potential with minimal training. This emphasis on usability enhances overall productivity on the shop floor.

**Reliability and Durability:** Built to withstand the rigors of industrial usage, TL Pathak Group's Busbar Processing machines are durable and reliable, minimizing downtime and maintenance costs.



Pathak Industries Kol  
www.tlpathakgroup.com  
Hall & Stall: 2A/C-103



Kjellberg Finsterwalde Plasma und Maschinen GmbH  
www.kjellberg.de  
Hall & Stall: 4/B-118

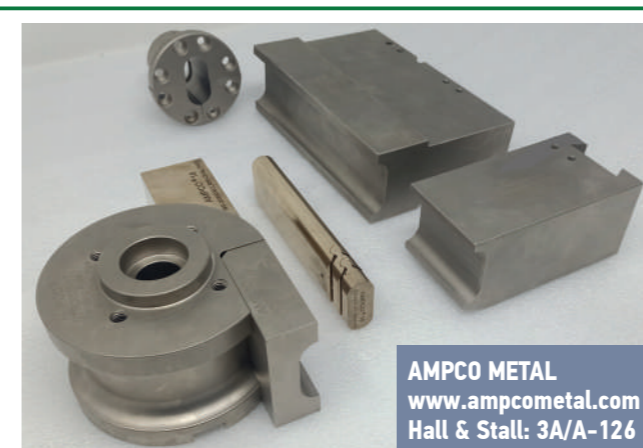
PLASMA CUTTING

## KJELLBERG'S NEW PLASMA POWER SOURCE K 200

Kjellberg is expanding its portfolio for plasma cutting with the new power source K 200. With the K 200, users can focus on the essentials of plasma cutting: optimal and reliable cutting results with easy operation and low investment and operating costs.

The power source cuts with oxygen, air, and nitrogen in the material thickness range from 1 to 60 mm with a maximum cutting current of 200 A. In addition, the K 200 has a marking function. It has integrated automatic gas control and a torch with direct connection. A manual torch extends the range of application to manual cutting and gouging. Overall, the user benefits from low investment costs and easy installation, operation, and maintenance of the system.

The K 200 can be fully integrated into CNC guidance systems or controlled and monitored via smartphone. The accompanying app also allows the user to see all parameters and settings at a glance and customize cutting data.



AMPCO METAL  
www.ampcometal.com  
Hall & Stall: 3A/A-126

TUBE BENDING SOLUTIONS

## BEND IT LIKE AMPCO

Tube bending is a metal forming process used to permanently form tubes by bending them. Tubes are an integral part of many industries. Be it exhaust systems in the Automotive industry, handrails in the Furniture industry, lines for service in the Marine industry, fuel lines in the Aerospace industry, bulk carriers in the Process industry, or fluid transfer in the HVC industry, bent tubes are significantly more useful than in their straight form.

To ensure that the resistant tubes can be bent at all by rotary draw bending, special tools are needed. Knowing that these tube bending tools require unparalleled quality and production tool longevity, AMPCO METAL offers end-to-end solutions for the entire rotary draw tube bending tool set. This includes durable items like bend die, clamp die, pressure die, collet in special steel material and consumables like ball mandrel and wiper die in AMPCO® Bronzes such as AMPCO® 18, AMPCO® 18.23, AMPCO® 21, AMPCO® 22, and AMPCO® M4. The selection of tool material depends upon the material and bend configuration of the tube. AMPCO® Bronzes offer substantial benefits when it comes to bending stainless steel and titanium tubes. They:

- Ensure flawless tubes with high-quality surface finish;
- Significantly extend the lifespan of production tooling;
- Lead to cost savings by reducing maintenance-related downtime;
- Eliminate the need for hardening or costly coatings on the consumables;
- Maximize tool speed and product quality;
- Improve sliding properties;
- Reduce production costs.

AMPCO METAL's offerings encompass conducting a feasibility study for tube bend configurations, designing the complete toolset, manufacturing the toolset, and demonstrating its performance on the customer's machine. The innovative solutions offer exceptional durability, cost savings, and improved product quality and productivity.



Blue Star Engineering & Electronics Ltd  
www.bluestar-ee.com  
Hall & Stall: 5/A-114

PRECISION TESTING AND METROLOGY SOLUTIONS

## ENSURING RELIABILITY AND EFFICIENCY

Blue Star Industrial Solutions is at the forefront of precision testing and metrology solutions, offering cutting-edge technology for accurate material analysis. A comprehensive range of material testing solutions, including universal testing machines, hardness testers, fatigue testing machines, and customized solutions, ensures unparalleled accuracy in material assessment. These state-of-the-art machines guarantee reliability and efficiency in various industrial applications.

In addition to material testing solutions, Blue Star Industrial Solutions provides advanced environmental chambers and plant growth chambers with customizable features, meeting the diverse needs of research and industrial sectors. Their chambers maintain precise environmental conditions, enabling scientists and researchers to conduct experiments with confidence.

Blue Star Industrial Solutions offers a diverse range of 3D scanning solutions, including handheld and tripod-based scanners, enhancing efficiency in measurements and inspections. These tools, combined with their engineering inspection services, empower industries to maintain quality standards and enhance productivity.

COMPACT DRIVE TECHNOLOGY

## ELM72XX FROM BECKHOFF

The ELM72xx EtherCAT Terminals offer high performance and functionality in the field of compact drive technology from Beckhoff. In addition to the ability to execute rotational movements in this small form factor in connection with the AM8100 servomotors, it is now also possible to perform translatory movements with the AA3100 electric cylinders and the AL8100 linear motors.

As full-fledged servo drives in a robust metal housing, and with up to 16 A output current (I<sub>eff</sub>) at a power supply voltage of 48 V DC, the ELM72xx EtherCAT Terminals expand the Beckhoff portfolio of compact drive technology in terminal format. What's more, they also include all the latest technological features along with increased performance and functionality when compared to the EL versions. The latter include the convenient connector front end, an integrated absolute value interface, One Cable Technology (OCT), and the STO/SS1 and TwinSAFE Logic safety functions. The new AA3100 electric cylinder series designed for the ELM72xx for the extra-low voltage range from 24 to 48 V DC extends the range of applications of Beckhoff electric cylinders to include compact drive technology. This makes them ideal as direct drives for linear applications, particularly with high process forces. It also means that virtually the same forces as in the AA3000 series are now also available for 48 V applications, without compromising functionality or robustness. The two available flange sizes offer a peak force of 2,650 to 12,000 N and a maximum speed of 0.12 to 0.56 m/s, depending on the lead.



Beckhoff Automation Pvt Ltd  
www.beckhoff.com  
Hall & Stall: 5/C-122

The new AL8100 linear motors also enable the highly dynamic, modular linear technology from Beckhoff to be used in the field of compact drive technology. They are available with a width of 50 mm (AL812x) and are optimally matched to the ELM72xx. In addition to their wide availability and flexibility, the fact that the motors are developed and produced in Germany guarantees a consistently high level of manufacturing quality, which, in turn, ensures that durable and highly reliable applications can be executed with linear motor technology.

WATERJET CUTTING TECHNOLOGY

## CUTTING WITH WATER

Flow International Corporation, USA is a company that specializes in industrial waterjet machines and technology. It is well known for its advanced waterjet cutting and cleaning solutions. Flow International Corporation was founded in 1974 in Kent, Washington, USA. Flow is a pioneer in innovative development and commercialization of waterjet cutting technology. Waterjet cutting is a process where Ultra and Hyper Pressure Water is converted to a high-velocity stream of water, often mixed with abrasive particles, to cut any industrial materials, including metals, non-metals, and composites.

It is a precise and versatile method that minimizes heat-affected zones, making it suitable for a wide range of applications. Flow's waterjet cutting technology is used in various industries, including Aerospace, Automotive, Medical Devices, and Manufacturing of Architectural Elements. It is valued for its ability to cut complex shapes and materials that would be challenging to cut with traditional methods. Since 1974, Flow has delivered over 15,000 waterjet and abrasive waterjet systems to customers in more than 100 countries.



Flow Asia Corporation, Taiwan  
www.flowwaterjet.com  
Hall & Stall: 4/C-116

THERMAL CUTTING SOLUTIONS

## FOR ENHANCED PRODUCTIVITY AND PRECISION

ELEMENT 400 is the pioneer of Messer Cutting Systems India's new platform solution. As a highly flexible all-rounder, it embodies everything it stands for. Safe, efficient, suitable for automation, versatile, and upgradable with hardware and software from a single source, it combines the company's entire experience from more than 120 years in the field of thermal cutting.

**Bevel-U**

With the specially developed Bevel-U, precise and repeatable bevel parts can be produced. Edge shapes such as I, V, Y, and K are possible for a subsequent welding process of the workpieces.

The actual cutting angles depend on the material type, thickness, and bevel type such as AS or DS. The bevel angle can be changed on the fly during the laser cutting process. Consistent quality after nozzle changes is ensured by an automatic test and calibration routine. There is also magnetic collision protection for cutting head safeguard.

**Benefits of Element Machine**

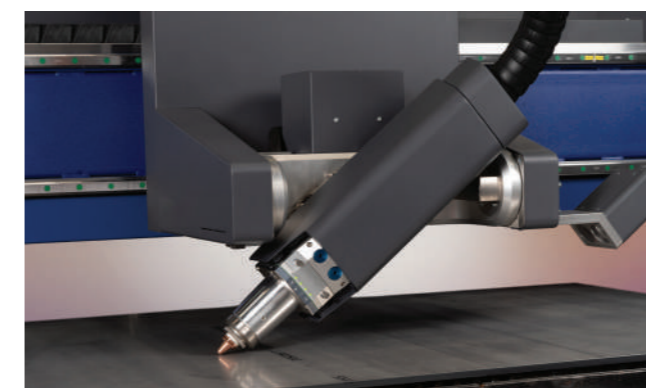
**Increased productivity:** High acceleration and positioning speeds of the machine;

**Improved cutting quality:** Selected premium components and smooth, vibration-free tool path movements, thanks to helical rack and pinion drive systems;

**Increased safety:** Compliance with all applicable standards and specifications, e.g., using a moving light barrier;

**Efficient operation:** Floor-mounted rails for clearing and unloading of parts leads to time savings;

**Improved user experience:** The new, easy-to-operate Global Connect CNC control equipped with 18.5 in. touch-screen helps to save paper and provides a clear overview of all production data in digital form.



The ELEMENT 400 is the company's multi-talent for all common cutting and additional processes, for serial tasks in continuous operation and special tasks with a focus on perfect cuts.

Apart from the high level of productivity and precision, this solution offers customized configuration options and updates, enabling one to respond to future requirements.

Messer Cutting Systems India Pvt Ltd  
www.messer-cutting.com  
Hall & Stall: 5/A-110

CONVEYORIZED BELT GRINDING AND BRUSHING MACHINES

## FOR PRECISION DEBURRING OF FLAT SURFACES

Grind Master offers a wide range of Conveyorized Belt Grinding and Brushing machines which are used for precision deburring of flat punched and fine blanked parts like clutch plates, discs, sector gears, brake pads, bearing thrust washers and sintered parts like stator, rotor, cover plate, distribution plate of common rail pump, fuel injection parts, valve plates of compressors etc.

These machines are offered with multiple belt grinding heads and planetary brushing heads, depending on the amount of burr and customer requirement of deburred edge, finish, and micro radius. The new platen type belt grinder ensures the flatness on the parts. The machine can deburr even non-magnetic small parts. This process improves the surface contact area of flat parts which is important for parts like engine thrust washers.

Equipped with PLC logic control system, magnetized conveyor, inline demagnetizer, and auto load and unload system, these are highly robust and rugged machines.



Grind Master Machines Pvt Ltd  
www.grindmaster.co.in  
Hall & Stall: 4/A-110



Heatly & Gresham India Pvt Ltd  
www.hgresham.com  
Hall & Stall: 4/C-109

PRECISION LEVELERS

## FLATMASTER® SERIES FROM ARKU

ARKU, founded in 1928 as a family-owned company, is the world market leader in roller levelers and press-feeding technology with nearly 60 years of experience. The company provides a complete range of high-performance levelers, from precision levelers for metal parts, sheets, and plates to high-performance coil straighteners capable of processing AHSS materials. The company also provides deburring and edge-rounding machines.

### Tight tolerances in assemblies make straightening indispensable

Precisely manufactured parts and assemblies are required in the market. If the need is for tight tolerances and enhancing production efficiency, it is critical to include leveling. The ARKU precision leveler FlatMaster® ensures flat metal sheets, parts, and plates with reduced internal stresses – for materials as thin as 0.1 mm up to a max thickness of 60 mm.

The advantages include immediate processing instead of time-consuming reworking. Subsequent processes including welding, cutting, or bending become much more efficient, reliable, and accurate. Both man and machine are able to process flat and stress-free parts, sheets, and plates without any rework. The leveling process takes only a few seconds and achieves consistent high-quality results. The FlatMaster® series offers servo-hydraulic leveling gap control and is equipped with hydraulic overload protection to protect the drive and leveling unit.



Alstrut India Pvt Ltd  
www.alstrut.com  
Hall & Stall: 3A/B-104

COBOT WELDING SOLUTIONS

## BEATING WELDER SHORTAGE

The welding industry is facing a significant shortage of skilled workers. Fortunately, a solution to this labor shortage is emerging: Cobot Welding.

This innovative technology combines the skill of human welders with the precision and efficiency of robots to transform the welding industry. By leveraging the advantages of a cobot welder, companies can improve their productivity, reduce costs, and overcome the labor shortage in the Welding industry.

### What is Cobot Welding?

Cobot welding refers to the use of collaborative robots, or cobots, to automate certain welding processes. A cobot welder consists of a robotic arm, welding torch kit, power source, cooling system, and a way to program the robot. The robot can be mounted on a welding table, cart, or magnetic mount, depending on the specific application.

The key advantage of a cobot welder is that it allows human welders to work alongside the robot, rather than being replaced by it. This collaboration between human and machine brings together the unique skills of both to create a more efficient and precise welding process.

Cobot welding has already been successfully employed in a wide range of industries, including Automotive, Aerospace, and Electronics. By leveraging the benefits of cobot welding, companies can improve the quality of their welds, increase productivity, and reduce labor costs.

Since the current welder shortage is not going away anytime soon, now is a great time to look into modernizing and semi-automating one's welding practices.

FIBER LASER CUTTING SYSTEMS

## EXPLORING EXCELLENCE WITH INFINITY F1

SLTL Group, a pioneer in Fiber Laser Cutting Systems, has unveiled the groundbreaking 'Infinity F1' fiber laser cutting machine. This technologically advanced system boasts an all-new in-house developed software upgrade known as IMPACT, seamlessly integrated with IoT i.e. sltl dynamix, catering to the unique demands of the Metal Cutting industry.

This exceptional machine is engineered for precision metal cutting. At the same time, its cutting-edge software empowers real-time optimization of the entire production process, facilitating data collection and generating operational and performance insights, ultimately boosting productivity. It excels in cutting various materials, including MS, SS, Aluminum, Brass, Copper, Inconel, specialty alloys, and coated and textured metal sheets.

The Infinity F1 caters to the high-end market, offering a power range from 3 kW to 30 kW. Enriched with premium features, it consistently delivers precise cuts; its smart hardware and software ensure impressive cutting speeds without compromising output quality. Moreover, the inclusion of Material Engineering, 3 Stage Piercing, Anti Collision Mechanism, Dynamic Fume Suction, Smart Gas Selection, and Wi-Fi connectivity elevates these machines, making them intelligent and easily manageable. Their adaptability allows for effortless customization, empowering businesses to optimize productivity and efficiency.

All-new Infinity F1 is rapidly emerging as the industry's preferred choice, thanks to its refined design and cutting-edge software framework.

This system transforms factories into smarter facilities by delivering remarkable cut quality and integrating features that reduce production costs while maximizing output. The system features SLTL's in-house developed software, enhancing the user experience, providing intuitive control, and unlocking a world of capabilities.



Sahajanand Laser Technology Ltd (SLTL Group)  
www.sltl.com  
Hall & Stall: 5/B-106

DIE FORGING HAMMER TECHNOLOGYS

## LASCO'S UNCONVENTIONAL HAMMER DRIVE SYSTEM

The newly developed LASCO hydraulic drive concept offers a significant improvement over conventional hammer drive systems. It uses two proportional valves instead of the known conventional blow valve or control piston, which is controlled by a pilot valve.

The new drive technology has only two connections compared to the previous hammer drive, with one proportional valve each for blowing and rising connected to the piston side. The use of a proportional valve for the upward motion opens up the possibility of operating the hammer with a variable stroke starting position instead of a fixed top dead centre. By using a proportional valve to accelerate the ram, several control variables are available with which the acceleration phase can be controlled, including adjustable characteristic curves for opening and closing the valve, the actual opening and the controllable volume flow that can flow through it, and the time period for which it remains open.



LASCO Umformtechnik GmbH  
www.lasco.com  
Hall & Stall: 4/B-111

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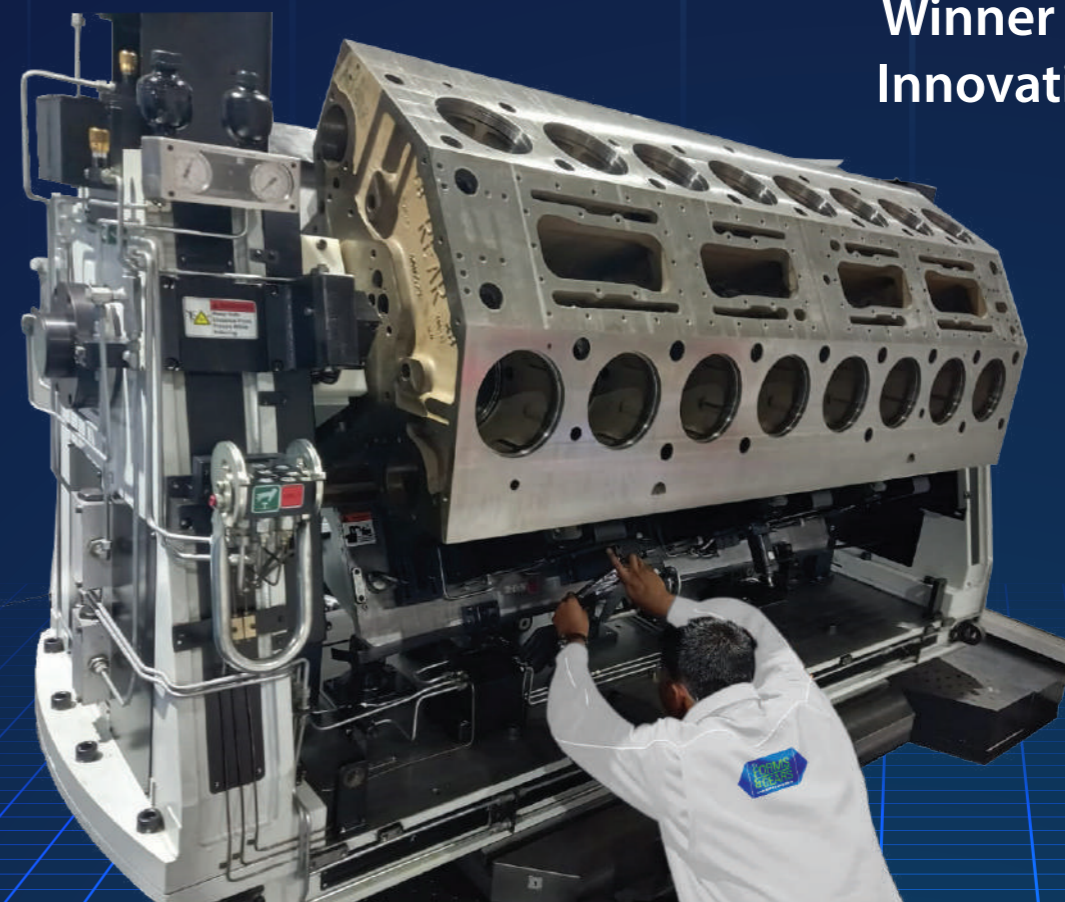
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# SmartFix4.0® Intelligent Fixtures



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.

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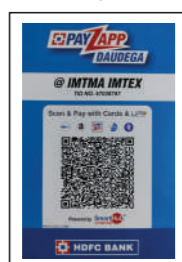
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