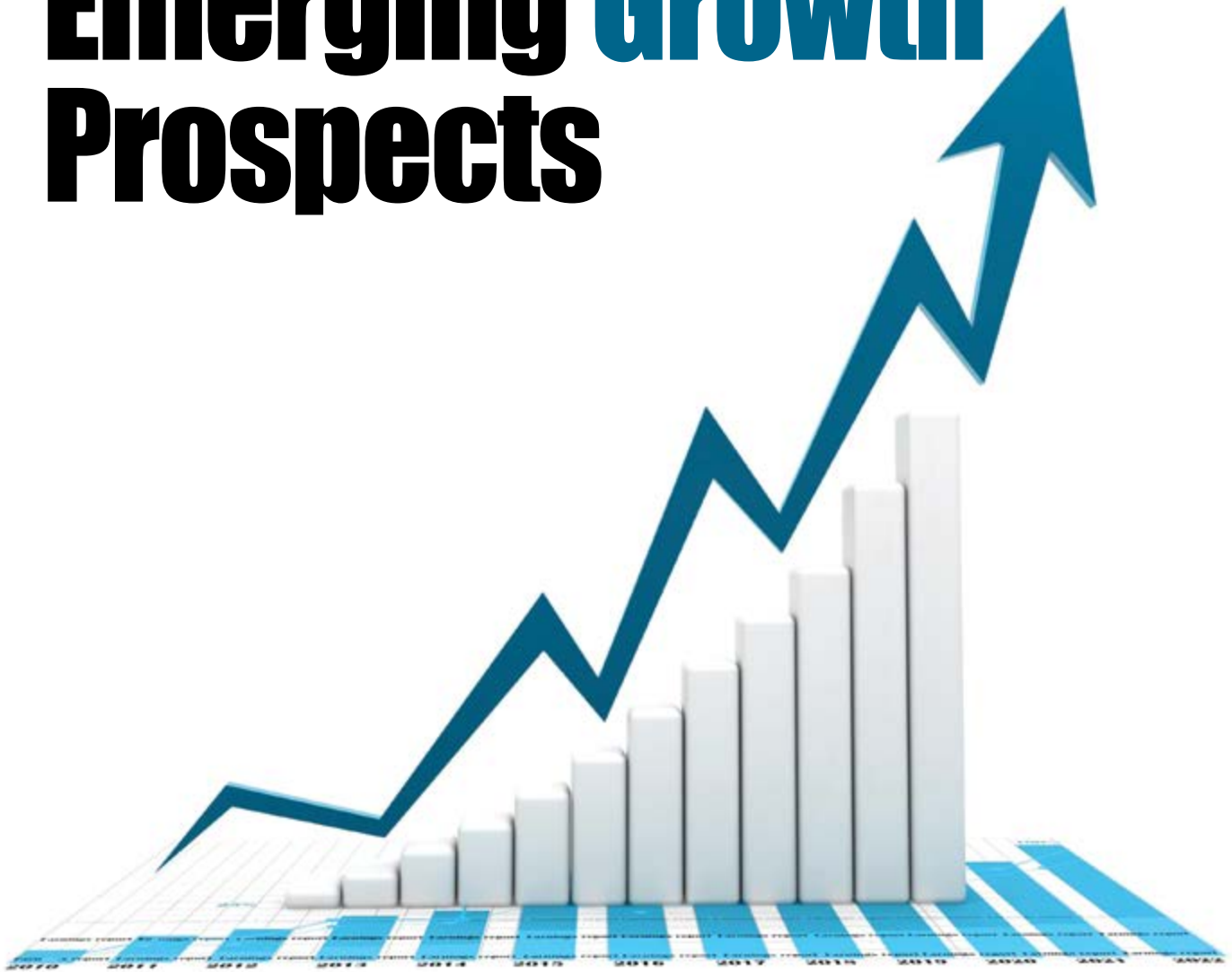


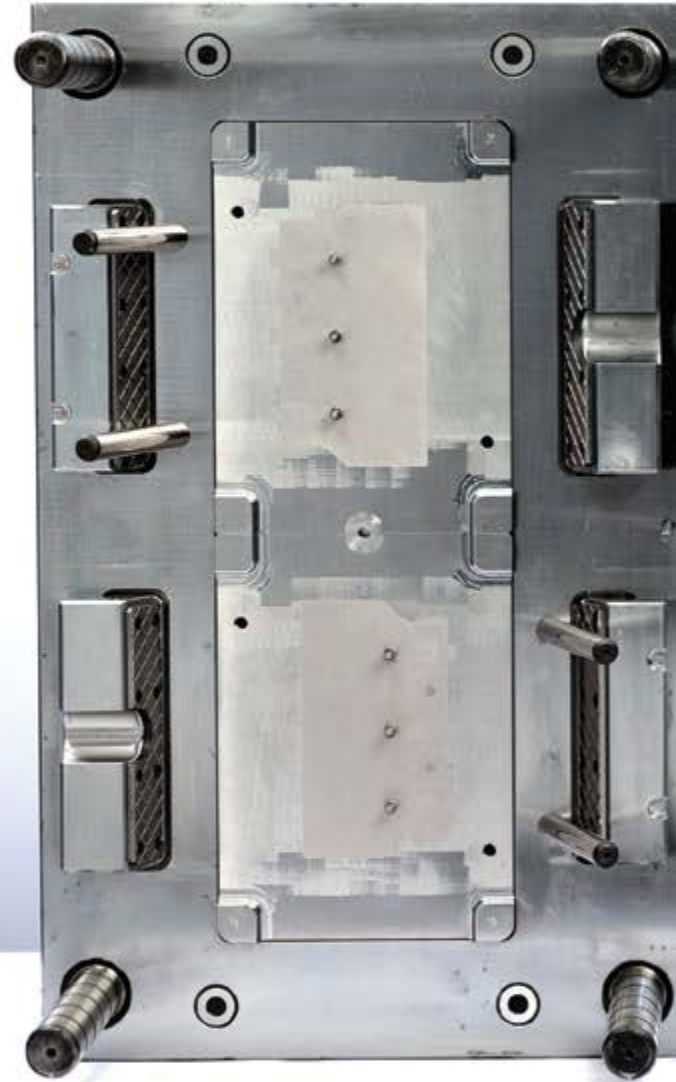
Indian Tooling Industry: Emerging Growth Prospects



LEADERS SPEAK
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DMI 2024
- EXHIBITOR VIEWS
- PRODUCT @ DMI

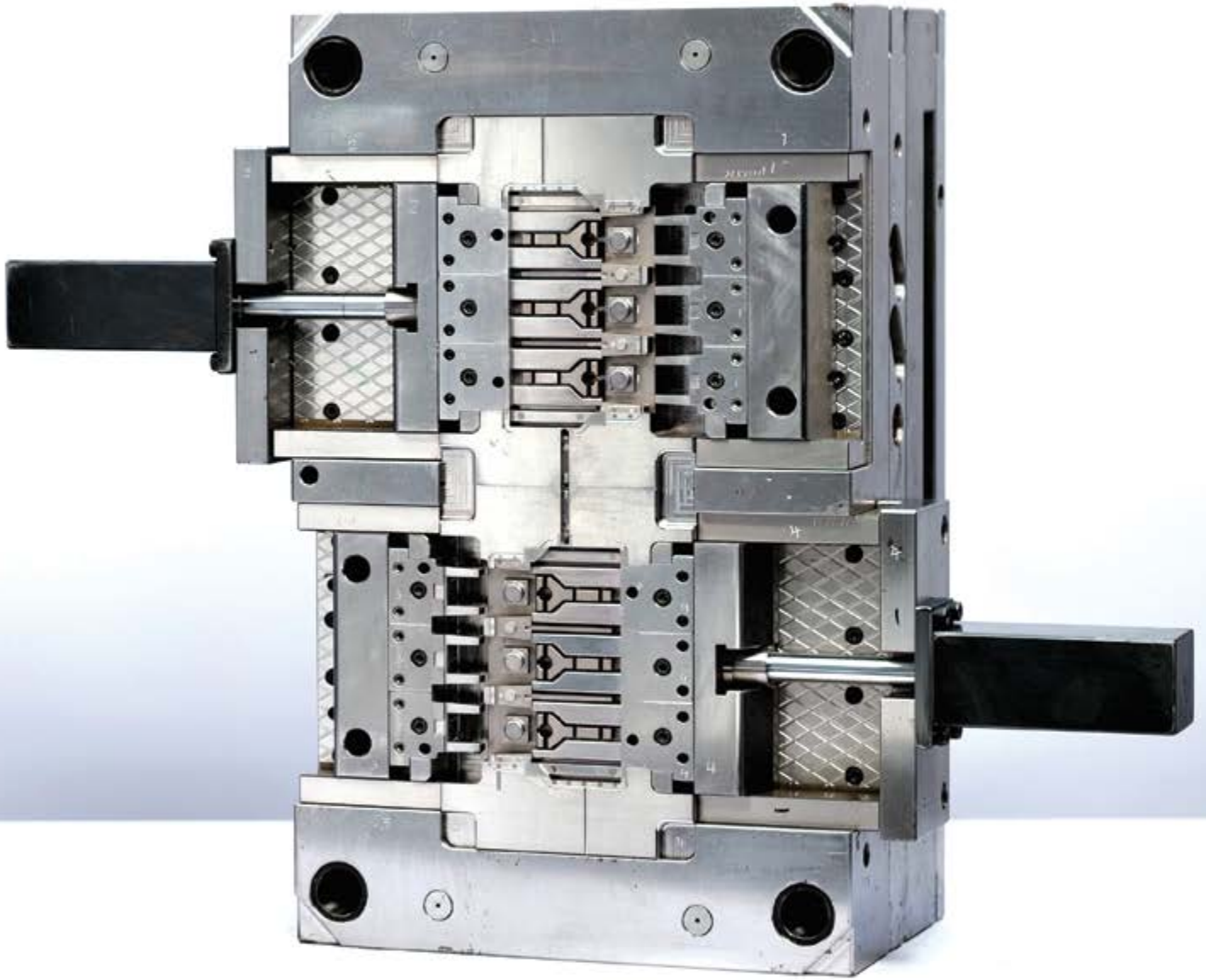
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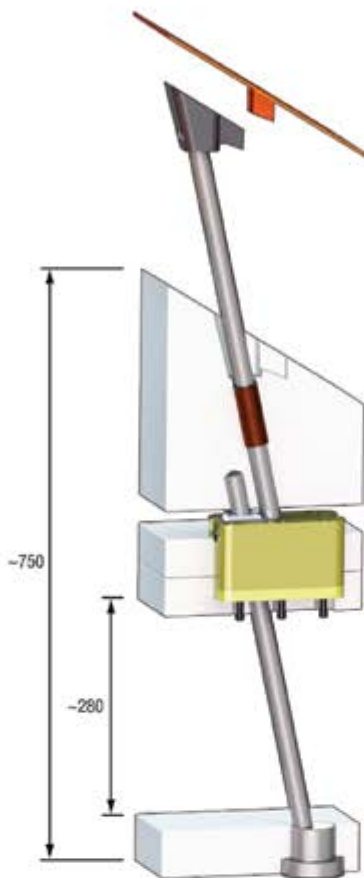
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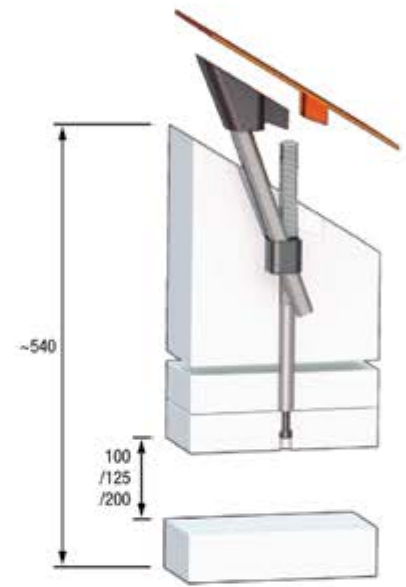
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ORGANISERS' VIEWS



▲
D. M. Sheregar
President,
TAGMA India

Dear TAGMA Members and Industry Colleagues,

As I reflect on the happenings of 2023, it is with immense pride and satisfaction that I declare it as a transformative year for our industry. The tooling sector has witnessed unprecedented growth and marked achievements, reaffirming our collective commitment to excellence and innovation.

In this dynamic landscape, characterised by an increasing variety of products and shrinking product life cycles worldwide, the demand for tooling is set to surge. Those nations endowed with superior capabilities and capacities in tooling are poised for significant advantages. Consequently, it is imperative to foster the growth of Indian toolmakers, offering them opportunities to reach new customers on a global scale.

The benefits of tooling localisation extend beyond individual enterprises, encompassing economic advantages such as job creation, the development of indigenous machine makers, a robust R&D landscape, and streamlined supply chains. The time has come for us to delve into the challenges impeding the growth of Indian toolmakers and formulate strategic measures to overcome them.

Looking ahead, our industry is on the cusp of significant developments, and it is with great anticipation that I invite you to the upcoming Die & Mould India 2024 (DMI) exhibition. This flagship event promises to be a melting pot of the latest trends, cutting-edge technologies, and ground-breaking innovations. At DMI, we will witness the convergence of industry leaders, experts, and professionals, providing a unique platform for collaboration, knowledge exchange, and networking.

As we navigate the exciting prospects and challenges that lie ahead, let us unite in our commitment to advancing the tooling industry. Together, we can shape a future where Indian toolmakers not only meet but surpass global standards, contributing to the growth of our nation and the progress of the entire industry.

I extend a warm invitation to all our readers and industry professionals to join us at Die & Mould India, where the future of tooling will unfold.



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Dear Readers,

As we bid adieu to 2023, it brings me immense pleasure to reflect upon the significant strides and achievements witnessed by the Indian tooling industry. The year has proven to be a resounding success, demonstrating the industry's resilience, adaptability, and commitment to excellence.

In the global context, the tool room industry stood at an impressive USD 80 billion in 2021 post-COVID-19. Notably, the Indian tooling sector's estimated market size is ~INR 23,600 crore, reflecting a robust and growing presence. A fascinating aspect is that ~34% of the tooling demand is met through imports, with key contributors being China, South Korea, Japan, and Taiwan. Furthermore, ~15% of India's tooling production finds its way to international markets, with the USA, Spain, Mexico, and Germany being major export destinations. The upward trajectory is notable, with Commercial Tool Rooms (CTRs) experiencing a growth of ~8.1%, while Captive Tool Rooms grew at ~1.5%. Import dynamics have shown stability, exhibiting minor changes.

In this edition, the 'In Focus' section delves into the insights derived from the recently released 'Indian Tool Room Industry Analysis, August 2023'. This report not only serves as a comprehensive guide to the industry's current landscape but also illuminates the pathways for future growth and development.

As we eagerly anticipate the upcoming Die & Mould India (DMI) expo, the excitement in the Indian tooling fraternity is palpable. DMI stands as the biggest exhibition for our industry, a convergence point for innovation, technology, and collaboration. In this edition, we bring you exclusive features on exhibitor views and cutting-edge products showcased at DMI, providing a sneak peek into the trends that will shape the future of the tooling sector.

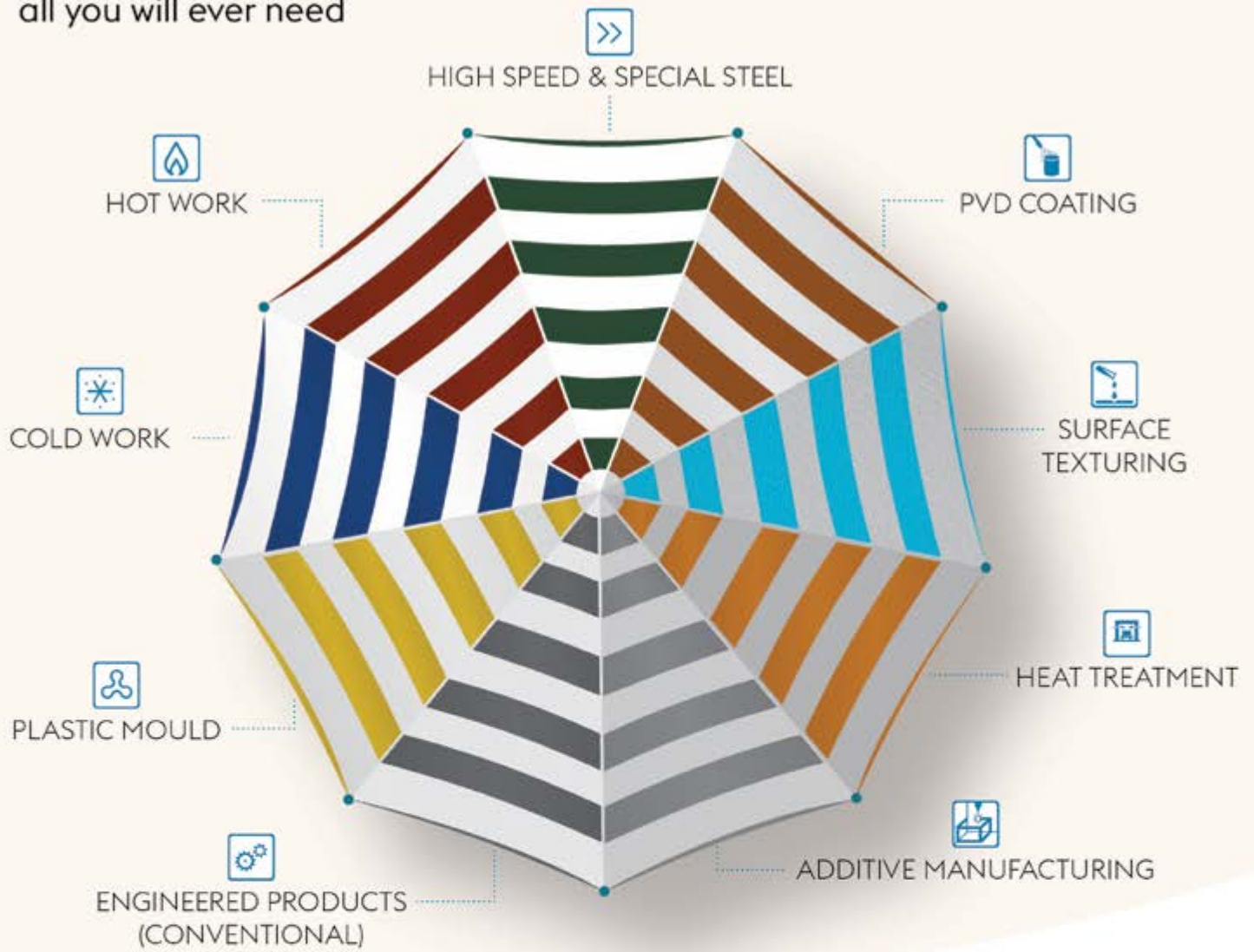
In closing, we would like to extend our heartfelt gratitude to our readers, contributors, and industry partners for making TAGMA Times a trusted source of information and insight. As we step into 2024, let us continue this journey together, propelling the Indian tooling industry to greater heights.

Wishing you all a prosperous and fulfilling year ahead.

Best Regards,

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Tata Power receives the first set of BESS from Tata AutoComp for its Energy Storage Park

Tata Power has received the first set of Battery Energy Storage Systems (BESS) from Tata AutoComp, a leading auto-component conglomerate, recently, at Pune. The BESS were handed over to Dr. Praveer Sinha, CEO & MD, Tata Power. These BESS will be deployed at the construction of the 120-MW Energy Storage Park at Chhattisgarh.

Tata AutoComp also inaugurated its manufacturing facility for state-of-the-art Battery Energy Storage System (BESS). The plant was inaugurated by Dr. Praveer Sinha, CEO & MD, Tata Power, and Mr. Arvind Goel, Chairman, Tata AutoComp Systems Limited. The Li-Ion-based BESS will be manufactured under its joint venture Tata AutoComp Gotion Green Energy Solutions Pvt. Ltd.

Dr. Praveer Sinha, CEO & MD, Tata Power, said, "We are happy to collaborate with Tata AutoComp for Battery Energy Storage Systems (BESS). With the rise of renewables, energy storage has become critical



to address the intermittency of solar and wind energy resources. We shall integrate these BESS at our renewable sites to enable round-the-clock supply of clean power and ensure a speedier green energy transition."

Arvind Goel, Chairman, Tata AutoComp, said, "Tata AutoComp has always been a pioneer in introducing cutting-edge technology to its customers. We are leveraging our knowledge in the automotive domain to serve emerging markets, which have a synergy in technology. We have been pioneers in launching the Li-Ion-based Battery packs

and BMS for the Electric Vehicle segment. We are now leveraging this knowledge to build Battery Energy Storage Systems. We will supply these BESS to Tata Power, which is a leading integrated Energy company of the Tata Group."

Spread over 22,227 square feet, the newly inaugurated BESS facility will have a capacity of 6 GWH and will serve the emerging energy storage industry. Tata AutoComp had earlier entered into an agreement with Tata Power Solar Systems Ltd., a subsidiary of Tata Power Renewable Energy Limited, to supply BESS for its renewable projects. ♦

Ola Electric raises INR 3,200 crore to fund EV business

Ola Electric recently said it has raised INR 3,200 crore from Temasek-led investors and State Bank of India. The company announced the successful closure of the funding round from Temasek-led investors and State Bank of India.

The funds raised would be utilised towards expansion of Ola's EV business and setting up India's first lithium-ion cell manufacturing facility at Krishnagiri, Tamil Nadu, the company said in a statement.

The Bengaluru-based firm aims to accelerate its growth by ramping up its two-wheeler manufacturing capacity, launching electric motorcycles followed by electric cars and fast-tracking the construction of gigafactory, it added.



"At Ola, our vision is to end ICE (internal combustion engine) age in automobiles and our upcoming gigafactory will be a big leap in India's journey towards becoming a global EV hub. We are committed towards developing core technologies in EVs and cell and are rapidly scaling up manufacturing to

further accelerate the transition to sustainable mobility," Ola Electric Founder & CEO Bhavish Aggarwal said.

Ola Electric was selected by the government under its ambitious cell PLI scheme, receiving a maximum capacity of 20 GWh. ♦

Courtesy: PTI News

Courtesy: @OlaElectric/@bhash on X



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TPEM and JLR announce platform-sharing partnership to accelerate development of 'Avinya'

Tata Passenger Electric Mobility Ltd. (TPEM) and Jaguar Land Rover Plc. (JLR), both 100% subsidiaries of Tata Motors Limited (TML), have entered into a Memorandum of Understanding (MoU) for the licensing of JLR's Electrified Modular Architecture (EMA) platform for a royalty fee (including electrical architecture, electric drive unit, battery pack and manufacturing know-hows) for the development of TPEM's 'premium pure electric' vehicles series 'Avinya' on the EMA platform. TPEM and JLR will also enter into an Engineering Services Agreement (ESA) to support TPEM's change content requirements for the first vehicle development.

JLR's EMA platform will underpin JLR's next generation of 'pure electric' mid-sized SUVs for international markets, to be launched from 2025 onwards. The platform is optimised for native BEV proportions to maximise interior space, comfort and



vision along with advanced electrical and electronic (E&E) architecture, connectivity, software and feature over-the-air capability. The EMA will have a highly integrated propulsion system (cell-to-pack battery technology, battery management and charging system) to deliver world-class vehicle efficiency and range.

The 'Avinya' concept, first showcased in 2022, is an uncompromising vision of electric mobility that is engineered to provide class-leading in-cabin experience with next-generation connectivity, ADAS, performance, refinement and safety. Partnering with JLR on the EMA platform will make the 'Avinya' series of Premium Pure Electric vehicles, globally competitive and

future proof.

Anand Kulkarni, Chief Product Officer and Head HV Programmes, TPEM, said, "Avinya stands for 'Innovation' and represents our vision for a new paradigm in personal mobility. Being built on an architecture that is equipped with the latest advances in new-age technology, software and artificial intelligence, Avinya will spawn a new breed of world-class EVs, with global standards in efficiency and range. We are delighted to collaborate on the EMA platform with JLR for actualizing this vision."

Thomas Mueller, Executive Director, Product Engineering, JLR, said, "We are proud that JLR's world-class engineering expertise, demonstrated by our EMA platform, will help accelerate TPEM's electrification journey. This partnership is a further example of great collaboration within the Tata Group, to share value, knowledge and deliver synergies." ♦

TVS Motor Company forges strategic partnership with Emil Frey for key European markets

TVS Motor Company, a leading global automaker that operates in the two and three-wheeler segments, recently announced its entry into Europe by signing an agreement for import and distribution with Emil Frey, a 100-year-old enterprise and a leading name in automotive distribution.

Announcing the foray into Europe, Sudarshan Venu, Managing Director, TVS Motor Company, said, "This strategic alliance with Emil Frey is a crucial step in our global expansion strategy. Europe will be a key market for us, and through this partnership, we aim to bring our cutting-edge products closer



to European customers. In having a partner like Emil Frey, there is a coming together of two century-old, pedigreed organisations, both driven by shared values of responsible and sustainable mobility and customer service. Together, we are excited to serve customers and two-wheeler aficionados in Europe and look forward to a successful partnership."

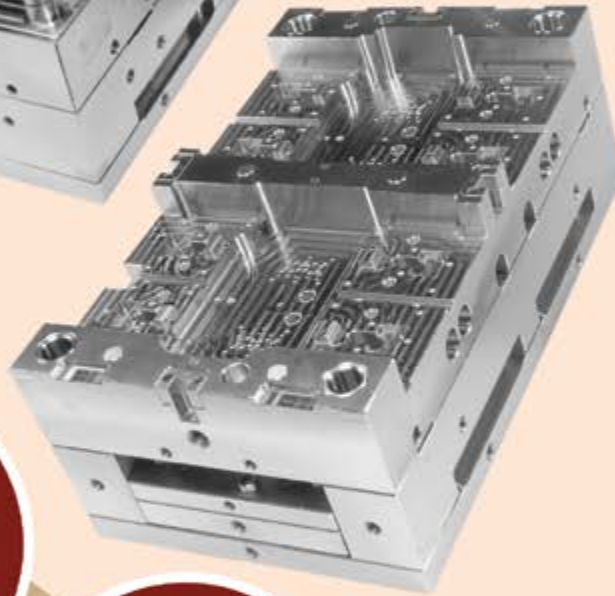
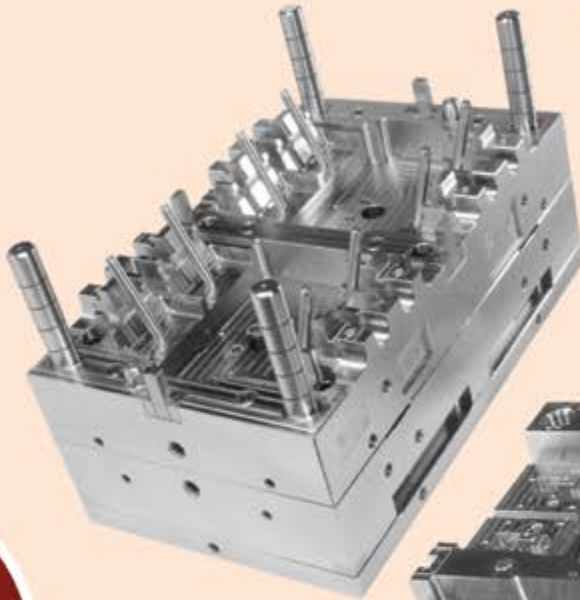
Lorenz Frey-Hilti, Director, Emil Frey Group said, "We take great pride in forging a robust and loyal partnership between our two esteemed traditional companies in the mobility sector. Together, we seamlessly blend heritage with innovation. I am very proud that TVS Motor Company is relying on our expertise in the European market and using our distribution network to bring their great products to customers. Our two companies complement each other perfectly and I look forward to seeing this partnership flourish."

This partnership is based on the principles of trust, mutual respect and performance. ♦

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TKM inks MoU with Karnataka govt. for next round of investments towards setting-up of new plant

Toyota Kirloskar Motor (TKM) recently signed a Memorandum of Understanding (MoU) with the Government of Karnataka to enhance its existing operations in the country through fresh investments. The investments of around INR 3,300 crores, coinciding with the landmark occasion of TKM's 25 years of operations in India, involve setting up of a new plant, thus adding to capacity, thereby resulting in a substantial boost to the local manufacturing ecosystem, along with ushering new technologies to create "mobility for all". This will be the company's third plant in India, all situated at Bidadi near Bangalore, in Karnataka. This development also brings with it potential for further investments and job creation given the expected growth in the supplier ecosystem.

The Memorandum of Understanding with the Karnataka government was signed and exchanged by Hon'ble Chief Minister Shri. Siddaramaiah, Government of Karnataka and Mr. Masakazu



Yoshimura, Managing Director and Chief Executive Officer, Toyota Kirloskar Motor in the august presence of Shri M. B. Patil, Minister for Large and Medium Industries and Infrastructure Development, Government of Karnataka, Mr. Swapnesh R. Maru, Executive Vice President & Chief Compliance Officer, Mr. Vikram Gulati, Executive Vice President, Mr. Sudeep Santram Dalvi, Senior Vice President & Chief Communication Officer, and other top executives of Toyota Kirloskar Motor.

"Karnataka... stands as the leader in attracting investments of INR 25,000 crore, spanning the entire EV value chain. With approximately 2 lakh EVs registered in the state, Karnataka is steadfast in reshaping

the mobility landscape," said Shri Patil, adding, "Furthermore, the government is coming up with a new clean mobility policy that aims to position Karnataka as the premier destination for EV manufacturing, spanning the entire value chain from battery and cell manufacturing, component production, original equipment manufacturers, charging and testing infrastructure, to research and development."

Mr. Yoshimura said, "We will continue to work together with the government to develop a world-class local ecosystem that promotes the best solutions for India by focusing on improving energy security, promoting economic growth & achieving carbon neutrality." ♦

Walter and HELLER sign partnership agreement

Walter AG and Gebr. Heller Maschinenfabrik GmbH recently entered into a technology and development partnership. The collaboration focuses on integrated customer solutions for the machining industry. The companies aim to test, optimise and market their products through the joint development of sustainable machining processes.

The two CEOs of the Baden-Württemberg-based companies are looking forward to working closely together and are more than convinced that this is a win-win strategy. HELLER CEO Dr. Thorsten Schmidt said: "Walter is an excellent technology partner with extensive tooling expertise and



a wealth of experience in machining. In addition, Walter provides the necessary tooling technology to give HELLER's customers a direct productivity advantage in metal cutting. Together with the strengths that HELLER brings to the table, we are able to forge a strong partnership in the areas of development and technology."

According to Christoph Geigges, President of Walter, both companies will clearly benefit from working together. He said: "We see many opportunities in working with HELLER, as they have the knowledge and experience in setting up and machining various workpieces, as required. Together with our large assortment of cutting tools, we can provide the ideal package for customers. To work with HELLER on specific application projects, covering components in the automotive and aerospace industries around the world, is an exciting development which will bring benefits for all parties." ♦

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BoreMeister anti-vibration boring bars offer split sleeves for larger diameter bars

Tungaloy's BoreMeister anti-vibration boring bar system is now offering split sleeve holders for adaptation of larger-diameter boring bars.

The BoreMeister system is supplemented with a variety of exchangeable heads and shanks for internal turning, threading, and grooving applications. The system ensures vibration-free boring operations in a long overhang setup of up to 10xD through a dampener inside the tool body. The boring bars are offered either in a cylindrical shank or with PSC machine-side connection. The bar body is available of either steel or carbide.

Dedicated to the use with BoreMeister cylindrical shank, the RSL style split sleeves achieve maximum



contact area when clamped, enhancing clamping stability and vibration dampening capability of BoreMeister to their fullest potentials.

Six new RSL split sleeves have been added in this expansion for DCONWS (connection diameters workpiece side) of 32, 40, and 50 millimeters (with DCONMS (connection diameters machine side) of 40, 50, and 60 millimeters, respectively), each available in two length variations.

The new split sleeves will make internal turning and grooving operations of large-size components with long overhang and poor accessibility to be less challenging, providing machinists with increased productivity, reduced vibration, and high part quality. ♦



How modern carbide end mill technology increases tool life through the reduction of heat in high-production CNC milling

Heat is the enemy of carbide. Excessive temperature breaks down the Cobalt Binder, which holds the Tungsten Carbide in place. Hanita™ has developed a coating that gets you more time out of your tools.

Hanita Victory solid carbide end mills use a combination of pre-coat process, coating, and post-coat treatment. The pre-coat process removes any grinding damage. You can't see it with the naked eye, but it's there and can affect the cutting-edge integrity and chip flow characteristics. This process smooths all surfaces in preparation for coating. The Victory coating is an Advanced AlTiN treatment with aluminium content, which oxidises with high temperatures

and lends itself to high surface speed capability and better tool life. After coating, the post-coat process creates a smooth and hard surface. This also improves the compressive strength of the coating, preventing it from flaking or wearing too soon. The cutting edge is very consistent for strength and enhanced chip flow.

Innovative edge preparation provides consistent tool life by eliminating most microchipping caused by grinding. The post-coat finish reduces the chip build-up and improves chip flow. Combined, Victory grades increase tool life and provide higher MRR, shorter cycle times, and fewer tool changes. ♦

Revolutionise your milling capabilities

Join the future of high-performance milling with Kyocera's revolutionary PR18 Series insert grades. Kyocera has introduced this innovative lineup of milling inserts that have been meticulously crafted to elevate your machining experience across the most popular milling lines.

At the core of this series lies Kyocera's all-new, next-generation PVD coating technology. Designed to propel your production runs forward, this groundbreaking coating takes milling performance to new heights. With PR18 Series inserts, you can eliminate frequent tool replacements and costly downtime, as this cutting-edge coating brings an unmatched level of longevity to your milling operations in a large variety of workpiece materials.

The PR18 Series incorporates proprietary MEGACOAT NANO EX coating technology, setting a new standard for



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The key to the PR18 Series' success lies in its ability to protect against wear and abrasion like no other. With excellent oxidation

resistance and a higher coating toughness, PR18 suppresses crack growth and remains tougher longer. This results in prolonged tool life, reducing the need for frequent tool changes in the middle of your production runs. With enhanced wear resistance and durability, milling operations can be extended longer while maintaining precision and surface finish, ultimately improving productivity and efficiency. ♦



The VC500i (XYZ Travels: 20.5" x 17.7" x 15.8") is a 5-axis cantilever machining center that includes a 12,000 RPM spindle with a CAT40 spindle taper. The VC Series by Hurco was designed for customers to support a wide range of parts and allows machinists to use standard-length tooling due to the B-axis configuration. The B-axis provides superb undercutting ability with a full 110° in both positive and negative directions. Solid one-piece cast iron frame optimised with both static and dynamic Finite Element Analysis (FEA).

The 5-axis VC Series B-axis trunnion style configuration also allows for shorter tools to be utilised when cutting

Hurco Product Feature: VC500i 5-Axis Cantilever Machining Center

smaller parts. When cutting smaller parts on a traditional A-axis trunnion, the tools approach the part from behind the A-axis trunnion. This means when running smaller 5-axis parts on larger machines, the operator is forced to use longer tools for clearance. Since a B-axis trunnion tilts around the Y-axis, the tool is always approaching the part from a safe direction and the possibility for interference is much less.

The Hurco VC500i is equipped with the Hurco control powered by WinMax® software and the patented motion system called UltiMotion®. The control helps machinists and job shops be more productive and profitable by supporting many programming methods: conversational programming; NC programming; and a Hurco-specific feature called NC/Conversational Merge that optimises efficiency even further. Additionally, the Hurco control's technical specifications lead the industry with 4GB RAM, 128GB Solid State Drive, and 10,000 block look ahead. ♦

Analysing the dynamic tooling landscape



Image Courtesy: Nomura Research Institute Ltd.

The tooling industry is rapidly gaining prominence on the global stage due to its pivotal role in advancing manufacturing processes. With a surge in demand for precision tools, moulds, dies, jigs and fixtures across various sectors, the tooling industry is witnessing increased recognition for its crucial contributions to innovation, efficiency, and quality in production. How could your tooling company reap the rewards of this increasing demand? The 'Indian Tool Room Industry Analysis, August 2023' that's been jointly compiled by TAGMA India and Nomura Research Institute, Ltd., has the answer. *Kimberley D'Mello highlights some interesting excerpts from the report...*

The global tooling industry and the Indian tooling industry have been growing steadily post the pandemic. While the global tool room industry stood at USD 80 billion in 2021 post COVID-19, the total market size of the tool room industry in India is estimated to be ~INR 23,600 crore. Interestingly, ~34% of the tooling demand is met through imports with ~80% of the imports from China, South Korea, Japan, and Taiwan. ~15% of tooling production in India is exported - USA, Spain, Mexico, and Germany are major export destinations. The share of Commercial Tool Rooms (CTRs) in total demand grew at ~8.1% & Captive Tool Rooms grew at ~1.5%, while imports have been almost stagnant with minor changes.

The abovementioned interesting findings were revealed in the 'Indian Tool

Room Industry Analysis, August 2023' that was released at the recently held International Tooling Summit. The report has been jointly compiled by the Tool and Gauge Manufacturers Association (TAGMA) India and Nomura Research Institute, Ltd.

Indian tool room industry

With the demand side of moulds estimated at ~INR 21,900 crore and the demand for jigs, fixtures & gauges estimated at ~INR 1,700 crore, the total market size of the tool room industry in India is estimated to be ~INR 23,600 crore.

Imports and Exports

According to the report, the tooling imports into India are ~4x the tooling exports from India in terms of value with China and Korea being the major exporters.

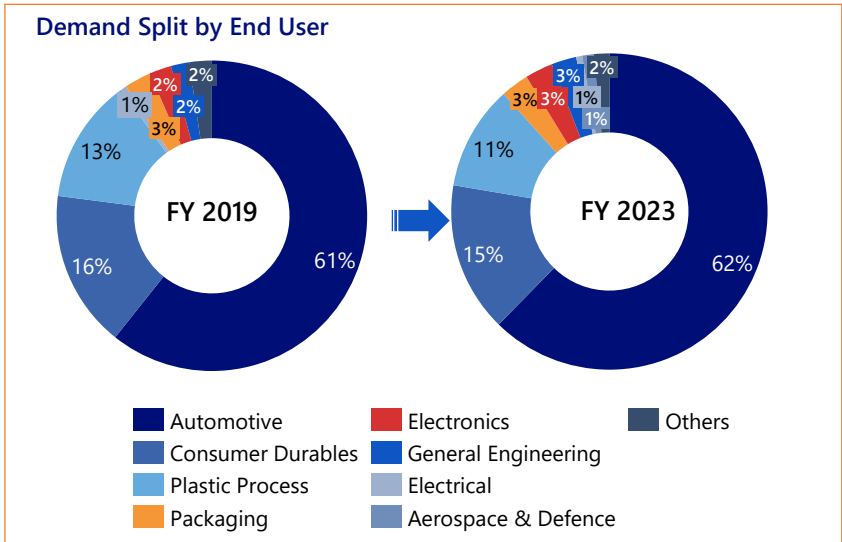
The total tooling imports are estimated at ~INR 8,000 crore. Of this estimate, Sheet Metal Dies comprise ~INR 2,100 crore (i.e. 26%), Plastic Moulds comprise INR 3,000 crore (i.e. 38%), while Die Casting Dies and Jigs, Fixtures & Gauges comprise ~INR 2,000 crore (i.e. 25%) and ~ INR 900 crore (i.e. 11%), respectively. The major import sources are China at 38%, Korea at 35%, Japan at 9%, and Taiwan at 3%.

The total tooling exports are estimated at ~INR 1900 crore. Of this estimate, Sheet Metal Dies comprise ~INR 350 crore (i.e. 18%), Plastic Moulds comprise ~INR 700 crore (i.e. 37%), while Die Casting Dies comprise ~ INR 550 crore (i.e. 29%) and Jigs, Fixtures & Gauges comprise ~INR 300 crore (i.e. 16%). The report cites the major export destinations as USA at 17%, both Spain and Mexico at 5% each, and Germany at 4%.

Demand trends

CTR share grew at ~8.1%, while imports and captive tool rooms have been almost stagnant with minor change.

Commercial tool rooms have a higher growth rate than captive tool rooms. The report states the



Source: NRI Analysis

major reason for this is the capex considerations for the OEMs and Tier-1 suppliers for capacity enhancement. Indian tool rooms have slowly been catching up to meet the requirements of Indian customers, which is reflected in the high growth and marginally reduced imports. The push for localisation by the Indian OEMs have also helped here.

In the automotive sector, EV start-ups are largely looking at one-stop solutions for their tooling requirements. Hence, they rely on imports as a blueprint solution, as they prefer one-stop solution for the components.

The automotive sector continues to be the largest end-user of tooling

in India, with auto OEMs and Tier-1s together accounting for more than 60% of tooling demand India.

The aerospace & defence sector has grown with its current market share of ~1% from an insignificant share in FY 2019 to FY 2023 due to the government's push towards localisation of aerospace & defence equipment.

Plastic moulds continues to be the largest segment; die casting dies grew at slower rate of ~1.1%.

Technology trends: Tooling Demand Side

As the shift to EV gains traction, the demand for plastic moulds, and aluminium forging could replace



SOME PERSPECTIVES

Indian tool rooms can expect to reap benefits of demand growth if they are able to invest in capability development. The 'Indian Tool Room Industry Analysis' report has a few experts expressing their opinions in anonymity. Here's what the experts have to say:

"Tool room industry of India will grow with steady pace in future. Tool rooms should focus on providing products to its consumers on time and with right quality to gain more consumers and growth will follow accordingly."

- Major Indian CTR

"Top management at OEMs now actively seeks to lessen their reliance on imports in order to decrease costs through localization, thanks to the 'Make in India' push and government-friendly laws... With the necessary push from the Government and the OEMs to localize production, the tool rooms now need to step up and improve their capabilities."

- Head of an Indian CTR

"The demand from automotive industry is expected to grow significantly, however, with the advent of EVs, safety requirements and technological advancements, the tool rooms will need to significantly invest in new capabilities like high tensile materials, etc. If the tool rooms are not geared up for that, a large part of this demand will have to be met through imports, which is not for the local tooling industry."

- Major Automotive OEM

"Tooling demand is definitely going to increase. We are planning to have 3X capacity in next 5 years. Looking at the industry, automotive industry will be an important part of the growth, as the shift from ICE to EV will create more localization, & hence more tooling demands."

- Major Indian Plastic Moulds Supplier



conventional demand. Also, the demand for lightweight materials is increasing in industries such as automotive, and new sectors like aviation. Besides, an increase in facelifts and new designs with new technologies at the end of the product lifecycle is creating demand for tooling. And, demand from developing sectors is on the rise with the Government of India's push to localise production through initiatives like 'Make in India', states the report.

► Technology trends: Tooling Supply Side

According to the report, newer production processes like 3D printing, and additive manufacturing, have the potential to drive supply in future, while the durability provided by composite materials could make ITRs more efficient, increasing capabilities and supply.

Government initiatives

The Government of India has undertaken various initiatives to offer a boost to the Indian tooling industry, states the report while highlighting the following:

- In 2014, MHI launched Phase I of 'Enhancement of Competitiveness in Capital Goods Sector' with a budget of ~INR 580 crore.
- In 2022, Phase II of 'Enhancement of Competitiveness in Capital

Goods Sector' was launched with an allocation of INR ~1200 crore.

- The scheme was successful in the tooling industry with development of new prototypes, centres & platforms.
- The Ministry of Commerce and Industry is encouraging the export of capital goods through tax concessions & incentives.
- The Ministry of MSME has reimbursement schemes to encourage certifications and overseas exhibitions.

Future estimations of tooling

According to the report, the Indian tooling industry is estimated to grow at CAGR of ~7-8% by 2028 aligned to strong growth in key end-user segments. Between 2023 and 2028, it estimates the automotive end-user segment to grow at a CAGR of ~9%, consumer durables at ~6%, plastic process at ~7%, packaging at ~6%, electronics at ~6%, electrical at ~7%, general engineering at ~9%, and aerospace & defence at ~7%, respectively.

Challenges faced by tool rooms in India

Indian tool rooms grapple with many challenges. Let's take a look at the ones that the report has highlighted:

► Lack of industry-ready tool room courses:

In Indian Tool Room Training Centers

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(TRTC), students are trained in basic machining and assembly of moulds, but lack hands-on experience in advanced machinery and, thus are not industry-ready. Outside India, long-term courses with a focus on advanced tooling skills are common in Engineering Institutes, Colleges of Technology & specialized Vocational Centers.

► **Lack of competitive salaries:**

CTRs' investment in workforce training does not pay the required dividends due to high instances of attrition of trained workforce to OEMs/ Tier-1 suppliers as well as non-manufacturing jobs in pursuit of better salaries, better work culture and bigger brand names. An average Indian toolmaker is underpaid compared to his Chinese, Korean or Japanese counterparts.

► **High cost of financing:**

Even though Indian tool rooms want to expand their consumer base to new sectors like aerospace & medical equipment manufacturers, the need for high-precision equipment is an issue, as they are expensive to procure. Besides, the lack of low-cost finance hinders ITRs' ability to invest in advanced tooling machinery, equipment & software for precision tools and moulds. Moreover, the challenges in furnishing formal data for credit assessment is an issue since accounting practices are not developed in some cases.

► **Lack of capital funding:**

While global tool rooms have better access to capital funding, Indian tool rooms still face issues to avail of easy financing and subsidized loans.

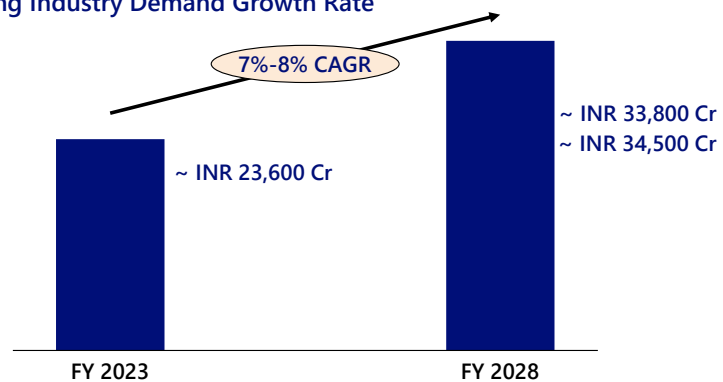
► **Issues related to concurrent engineering:**

OEMs outsource to tool rooms post the designing stage. There is a lack of input/ concurrent engineering from tool rooms on the viability of the part. Due to this, the design for manufacturability shared with tool rooms is not viable, and requires one or more rounds of revision. Delayed manufacturing due to repeated redesigning, increases the lead time

Key end user segments growth rates

End-user	CAGR 2023-2028	End-user	CAGR 2023-2028
Automotive	~ 9%	Electronics	~ 6%
Consumer Durables	~ 6%	Electrical	~ 7%
Plastic Process	~ 7%	General Engineering	~ 9%
packaging	~ 6%	Aerospace & Defence	~ 7%

Tooling Industry Demand Growth Rate



Source : Statista, Fortune India, NRI Analysis

for tool rooms. To accommodate last-minute design modifications, numerous rounds of testing and rework are needed, making the delivery time of Indian tool rooms higher than imports.

► **Lack of outsourcing ecosystem:**

There is a low level of collaboration due to the dispersed presence of tooling suppliers in India, whereas, overseas tool rooms are located close to design and manufacturing facilities, suppliers, etc., which creates an ecosystem enabling large-scale subcontracting. This also enables tool rooms to process large consignments with less delivery time by sharing capacity and capabilities.

Key imperatives

The Indian tooling industry is stuck in a loop of dependencies, which restrict the development

and betterment of ITRs. Attaining excellence in manufacturing and robust project execution will be the key steps towards improving the state of ITRs. However, it is important to control the costs incurred. Once the cost is under control, increased customer confidence will help in winning new projects/repeat orders. Besides, improvement in capabilities can further augment asset utilisation and help in winning new projects too. ♦

The 'Analysis of the Indian Tool Room Industry, August 2023' offers a comprehensive examination of the tool room sector, providing valuable insights to guide your company's strategic growth trajectory. To get a copy of the report, please reach out to TAGMA at: tagma.mumbai@tagmaindia.org

5 AXES HIGH PRECISION MACHINING CENTER

GV60-5C



Applications



AEROSPACE



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MEDICAL



GEN. ENGINEERING

Key Highlights

- Compact Footprint
- High Accuracy
- High Precision
- Dynamic Rigidity

'We are genuinely excited about the unfolding prospects in India'



Nishant Kashyap, Editor of TAGMA Times & ToolingTales, recently had an insightful conversation with Paul J. Gray, Vice President - R&D and Product Development at HURCO. Their discussion delved into the major trends shaping the CNC industry, including automation, digital twin technology, intelligent manufacturing, and substantial investments in research and development (R&D). Paul shed light on HURCO's innovative strides, particularly their emphasis on automation solutions, solid model import software, and collaboration with Universal Robots for cost-effective CNC machine automation.

Q Hurco showcased many technologies at the recently concluded EMO 2023. What were the key highlights or products you showcased?

At EMO 2023, we took automation to the next level. We showcased 2 ProCobots; Hurco's own plug-and-play collaborative robot solution, feeding both a lathe and a vertical machining centre. With Hurco ProCobot software, one can reduce programming time to a minimum, thereby making automation of small batches a possibility. The collaborative robots (cobots) from ProCobots, combined with Hurco technology, ensure the cobots are easy to set up and program. With ProCobots, one operator can run three or four machines at once.

For this, we partnered with Universal Robots (UR) to create practical CNC machine automation solutions that are affordable, practical, flexible, compact and eliminate the need to call an expensive integrator each time you want to change your automation or move the system to different machines.

Another standout feature at our booth was the Solid Model Import software. This ground-breaking technology allows direct programming from an STP file at the machine control, eliminating the necessity for CAD/CAM. For instance, on five-axis machines requiring cuts at various angles, holes, pockets, or even with islands, simply selecting the STP file prompts the control system to automatically generate the toolpath.

Make it Many other technologies were showcased, but these two were the highlight of our booth.

Q What are some of the key technological trends or breakthroughs in CNC machining in recent years?

I would like to highlight the four most important ones here:

Automation: Automation addresses the challenge of skilled manpower shortages while enhancing efficiency, speed, and machining quality. This transformative technology mitigates human errors, minimises waste and downtime, and elevates the safety and productivity of CNC machines.

Utilising diverse technologies, including robotics, cobots, software, and sensors, automation offers comprehensive solutions. For instance, robotics handles workpiece loading and unloading, cobots collaborate with human operators, software optimises machining parameters, and sensors monitor machine conditions and performance.

Digital Twin: Digital twin stands out as a significant trend in the CNC industry, offering a virtual representation of the physical CNC machine and its surroundings. This technology facilitates pre-production simulation, analysis, and optimisation of the machining process. Moreover, digital twin aids in real-time maintenance, troubleshooting, and enhancements by providing valuable data and feedback. It also fosters seamless collaboration among CNC machine operators, engineers, and managers.

Intelligent Manufacturing: This trend seeks to integrate information technology, communication technology, and automation to establish a smart and interconnected CNC machining system. This approach

addresses the evolving customer demands for customisation, quality, and timely delivery. Moreover, intelligent manufacturing enables the CNC industry to adapt to dynamic market and environmental conditions, including competition, regulations, and sustainability. Achieving intelligent manufacturing involves leveraging technologies such as artificial intelligence, machine learning, big data, cloud computing, and the Internet of Things.

Investment in R&D: The commitment to investment in R&D underscores the CNC industry's continuous pursuit of innovation and advancement. Fuelled by escalating customer expectations for enhanced efficiency and productivity, CNC manufacturers worldwide must persistently innovate to meet growing demands. At Hurco, our primary focus is on R&D, and we invest significant efforts in this area.

Q What are the current challenges and opportunities in the CNC machining industry? How is Hurco positioned to address them?

The challenges and opportunities for the CNC industry after COVID are closely related to the trend of automation. Automation can help the CNC industry overcome the problems caused by the disruption of the supply chain, the shortage of skilled manpower, and the changing customer demands. Automation can also help the CNC industry improve the efficiency, quality, and flexibility of the machining process. Automation can be achieved by using various technologies, such as robotics, software, sensors, artificial intelligence, and cloud computing.

The opportunities for the CNC industry after COVID are also influenced by the recovery and growth of the global market, especially in the US and India. These markets have a high demand for CNC machines and services, especially for the healthcare, aerospace, and defence sectors. The CNC industry can leverage these

opportunities by offering innovative and customised solutions, such as digital twin, intelligent manufacturing, and remote diagnostics. The CNC industry can also benefit from the increased investment in R&D, which can help create new and improved products, services, and processes.

Q What advice can you offer manufacturers looking to choose the right CNC machine for their specific applications and industries?

There are numerous options available when it comes to choosing a CNC machine, each with its own set of features and capabilities. While budget considerations are crucial, the key lies in collaborating with representatives from machine tool companies. Engaging with sales representatives and distributors allows for a tailored approach to finding the most suitable solution for your specific needs.

For instance, our division in Hurco, India, works closely with clients to offer CNC machines that align with operator requirements. This involves understanding factors like ease of programming and familiarity with specific controls, such as the widely used FANUC control on Takumi systems.

Maintaining continuity in your shop's operations is vital. If your operators are accustomed to a particular control system, like FANUC, it makes sense to stick with it. In the context of die and mould manufacturing, serious consideration should be given to five-axis machining. Even if a company feels it may not be fully ready for it, modern solutions, like Hurco's simplified five-axis system, streamline the process by automatically programming angles.

Companies exploring new CNC machines should assess their setups and operations, giving due consideration to five-axis capabilities. The advantages, including enhanced part accuracy, fixture reliability, and the efficiency gained from machining multiple sides in a single setup, often

outweigh the complexities associated with traditional three-axis machines and multiple fixtures.

Q Can you provide insights into Hurco's R&D efforts and any upcoming innovations or projects that the company is excited about?

Engaging in R&D is an exciting aspect of our work, where we constantly strive to push boundaries. We have initiated a research program in collaboration with the University of Waterloo in Ontario, Canada, focusing on leveraging artificial intelligence (AI) in intelligent ways with CNC machines.

Over the past few years, our research has delved into areas such as anomaly detection for chatter suppression, feature recognition, and analysing work volume using camera systems. Our vision is straightforward: with the simplest control on the market, we are committed to making operators' and programmers' lives easier. Any step that contributes to this goal is a step we're eager to take.

Incorporating AI solutions to enhance the autonomy of CNC machines is a key focus. Through ongoing research, we aim to develop practical solutions that empower our customers to benefit from advancements in technology.

Q What are your views on the Indian market?

The Indian market presents a tremendous opportunity for everyone, extending beyond just Hurco and our division. Hurco India has made remarkable progress in establishing our name brand, strengthening our service and sales organisations, and effectively communicating the opportunities inherent in our products and controls. Additionally, the Takumi brand, positioned as a sister brand, complements what we can offer to the Indian market. We are genuinely excited about the unfolding prospects in India. For any business looking ahead, considering India is imperative. ♦

Precision Machining: Crafting intricate dies with accuracy



Image Courtesy: Canva

Precision machining is an indispensable tool in the hands of skilled die makers. Its ability to create highly accurate, complex, and durable dies is crucial for the production of high-quality parts in various industries. As technology continues to evolve, the role of precision machining in die making will undoubtedly become even more vital and transformative.

Sudhanshu Nayak

Precision machining serves as the backbone of die making and plays a pivotal role in the intricate and exacting process of creating dies for various industrial applications. In the realm of manufacturing, dies act as precision tools that mould, cut, or shape materials into specific forms, and the quality of these dies directly influences the accuracy and consistency of the final products.

Precision machining techniques, including turning, milling, grinding, and advanced methods such as electrical discharge machining (EDM), are instrumental in shaping the components of dies with meticulous accuracy.

The role of precision machining in die making is multifaceted. It involves achieving tight tolerances, crafting complex geometries, refining surface finishes, and ensuring

compatibility with a diverse range of materials. As industries demand increasingly sophisticated and precise components, the importance of precision machining in die making becomes even more pronounced. This synergy between precision machining and die making not only ensures the efficient mass production of components but also underpins the quality, durability, and versatility of dies across various manufacturing

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processes. This introduction sets the stage for an exploration of how precision machining techniques are intricately woven into the fabric of die making, influencing every aspect from design to performance.

Its crucial functions

Precision machining plays an essential and irreplaceable role in the art and science of die making. It provides the necessary tools and techniques to create highly accurate and complex dies that are the backbone of modern manufacturing. Here's a breakdown of its crucial functions:

► **Crafting precise geometries:**

Precision machining allows for the creation of dies with intricate and complex shapes, often featuring micro-features and tight tolerances. This is vital for producing high-quality parts with precise dimensions and finishes. Techniques like CNC machining, EDM (Electrical Discharge Machining), and laser machining enable the meticulous shaping of die cavities, cores, and other components with unwavering accuracy.

► **Ensuring consistent performance:**

Precision machining guarantees the uniformity of die dimensions and features, leading to consistent and reliable production of identical parts. This is crucial for mass production processes, where even minor deviations can have significant consequences. Advanced machining technologies eliminate human error and ensure repeatable results batch after batch, enhancing the overall efficiency and quality of the manufacturing process.

► **Enhancing die durability and lifespan:**

Through the use of high-quality materials and sophisticated machining techniques, dies can be made exceptionally strong and resistant to wear and tear. This prolongs their lifespan, reduces downtime for repairs and replacements, and ultimately

leads to cost savings. Additionally, precision machining can create intricate cooling channels within the die, ensuring efficient heat dissipation and preventing thermal damage, further increasing its longevity.

► **Expanding design possibilities:** The capabilities of precision machining have expanded the horizons of die design, allowing for the creation of intricate and previously impossible geometries. This opens doors for innovative product development and the production of complex parts with advanced functionalities. The ability to precisely control surface finishes and textures further enhances the design possibilities, enabling the creation of dies that produce parts with specific aesthetic and performance characteristics.

► **Optimising manufacturing**

processes: Precision machining can contribute to streamlining and optimising various manufacturing processes. By ensuring accurate and consistent die performance, it reduces scrap rates, eliminates rework, and optimises production

times. Additionally, advanced machining techniques often enable the creation of dies that require fewer components or assembly steps, further simplifying the overall manufacturing process.

The advanced techniques that enable precision machining

Die making, the art of creating specialised tools for shaping materials, relies heavily on the precision machining arsenal. These advanced techniques enable the creation of highly accurate and complex dies, forming the backbone of modern manufacturing.

► **CNC machining:**

CNC machining reigns supreme in die making, offering versatility and the ability to handle intricate geometries. Through computer control, CNC machines perform various operations like milling, turning, and grinding, bringing die designs to life with exceptional accuracy and repeatability.

► **Electrical Discharge Machining**

(EDM): EDM utilises the power of electrical sparks to erode material. This unique approach tackles



Image Courtesy: Canva

hardened materials and intricate shapes that would be challenging or impossible with conventional machining. In Wire EDM, a thin wire electrode acts as a scalpel, cutting intricate shapes and profiles with unparalleled accuracy whereas in Sink EDM, a graphite electrode meticulously erodes material, creating cavities, punches, and other crucial die components.

- ▶ **Laser machining:** Laser machining wields a focused beam of light to melt and evaporate material, enabling the creation of precise cuts, grooves, and holes. This technique offers exceptional accuracy, minimal heat-affected zones, and the ability to machine a diverse range of materials.
- ▶ **Micromachining:** Micromachining techniques push the boundaries of precision, creating miniature dies and components with features on the order of micrometres. This unlocks possibilities for miniaturised parts and complex geometries across various industries like electronics, optics, and medical devices.
- ▶ **Five-axis machining:** Five-axis machining utilises advanced CNC machines with five axes of motion, enabling the simultaneous

machining of complex geometries from multiple angles. This eliminates the need for multiple setups and reduces machining time, significantly increasing efficiency.

- ▶ **Hybrid machining:** Combining two or more machining techniques in a single process can unlock customised solutions tailored to specific die requirements. For instance, combining EDM with CNC machining can create complex features while maintaining high accuracy and surface finish.

Tooling and materials: The vital equation

The success of any precision machining operation, particularly in die making, hinges critically on the selection of the right tooling and materials. This intricate interplay between tools and workpiece materials dictates the outcome of the machining process, impacting factors like accuracy, efficiency, and surface finish.

Choosing the right tool and material ensures:

- ▶ **Optimal performance:** Selecting the ideal tool and material combination ensures optimal performance, maximising efficiency,

reducing machining time, and minimising tool wear.

- ▶ **Desired results:** The correct combination ensures the desired results are achieved, including the attainment of precise geometries, high-quality surface finishes, and dimensional accuracy.
- ▶ **Cost efficiency:** The right choices can lead to cost savings by minimising tool wear, optimising machining time, and reducing the need for rework or scrap.
- ▶ **Increased productivity:** Optimised tooling and materials contribute to increased productivity and efficiency by ensuring smooth operation and reducing downtime.

Tool materials and their compatibility

- ▶ **Carbide tools:** These are versatile tools with high hardness, wear resistance, and durability, making them ideal for machining various materials, including steel, aluminium, and plastics.
- ▶ **Diamond tools:** These offer superior hardness and wear resistance, making them suitable for machining highly abrasive materials like ceramics and composites. However, they are more expensive than carbide tools.
- ▶ **High-Speed Steel (HSS) tools:** These are cost-effective options for general-purpose machining of softer materials like aluminium and brass. However, they are less wear-resistant than carbide tools and require more frequent sharpening.
- ▶ **Ceramic tools:** These are a newer category with excellent high-temperature properties and resistance to wear and tear. They are especially suitable for machining hardened steels and other challenging materials.

What to keep in mind when selecting die materials?

- ▶ **Application:** The intended application of the die plays a crucial role. High-strength steels are typical for dies used in forming

Emerging trends

The landscape of precision machining is experiencing a wave of innovation, with several emerging trends poised to transform the future of die making. These advancements promise a future of increased design freedom, faster production times, improved die performance, enhanced quality control, and reduced costs, paving the way for innovation and growth in the die making industry.

Additive manufacturing, with its ability to create intricate geometries and conformal cooling channels, is reducing lead times and enabling weight optimisation.

Digital twin technology offers a virtual representation of dies for predictive maintenance, process optimisation, and virtual testing, leading to minimised downtime and improved performance.

Artificial intelligence and machine learning are optimising machining processes, predicting tool wear, and automating quality control, resulting in increased efficiency and reduced waste.

Ultra-precision machining techniques are pushing the boundaries of die complexity and surface finish, particularly relevant for micro dies.

Automation and robotics are enhancing safety, reducing labour costs, and increasing production volume, while collaborative robots are opening doors for safe and efficient human-robot interaction.



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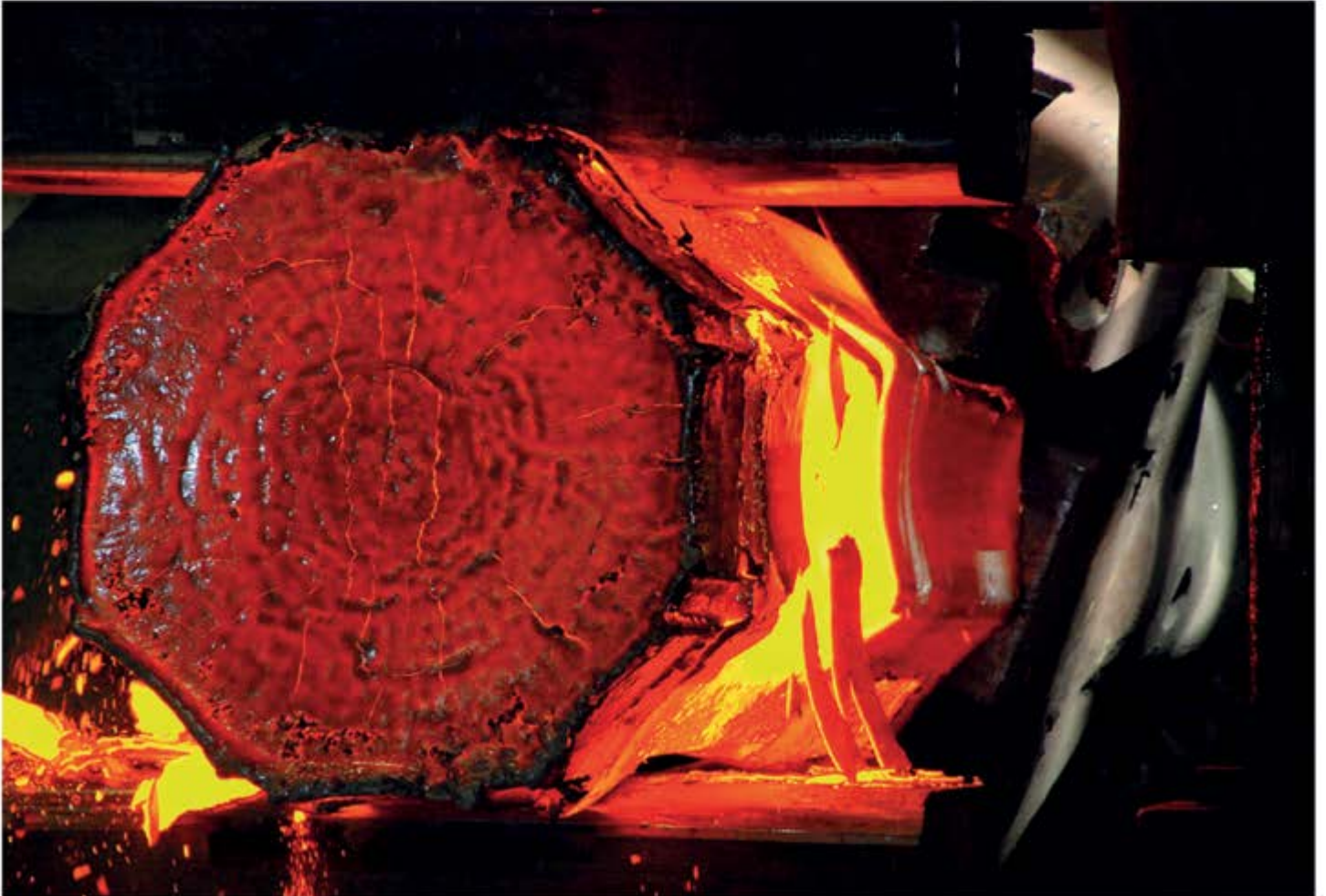




Image Courtesy: Canva

hard materials, while aluminium alloys are suitable for lower-stress applications.

- ▶ **Desired properties:** The desired properties of the die, such as wear resistance, corrosion resistance, and heat resistance, guide the material selection process.
- ▶ **Machinability:** The ease of machining the chosen material is important for efficient die production and minimising production costs.

Some examples of material combinations are:

- ▶ **HSS tools for machining aluminium dies:** This is a cost-effective combination suitable for low-volume production of dies for forming soft materials.
- ▶ **Carbide tools for machining steel dies:** This combination offers a good balance of wear resistance and cost, making it suitable for medium to high-volume production of steel dies.
- ▶ **Diamond tools for machining ceramic dies:** This combination is essential for machining highly abrasive ceramic materials, even though it requires a higher initial investment.

Importance of quality control & inspection

In the realm of precision die making, where accuracy and functionality

are paramount, quality control and inspection stand as the unwavering guardians. They ensure that dies meet stringent specifications, guaranteeing the production of high-quality parts and the longevity of the dies themselves.

Quality control can ensure:

- ▶ **Accuracy:** Quality control ensures that dies are fabricated within the specified tolerances, guaranteeing the production of parts with consistent and precise dimensions.
- ▶ **Functionality:** It verifies that the dies operate as intended, ensuring smooth production and preventing defects in the final parts.
- ▶ **Lifespan:** By identifying potential issues early on, quality control helps prevent premature wear and tear, extending the lifespan of the dies and reducing maintenance costs.
- ▶ **Cost effectiveness:** Identifying and rectifying errors during the production process minimises scrap and rework, leading to cost savings and improved production efficiency.
- ▶ **Improved die design and production:** Quality control data provides valuable insights for improving die design and production processes, leading to continuous improvement and enhanced performance.
- ▶ **Brand and reputation protection:** By ensuring consistent quality in the

production of parts, quality control protects the brand reputation and fosters customer trust.

How to measure and inspect die features?

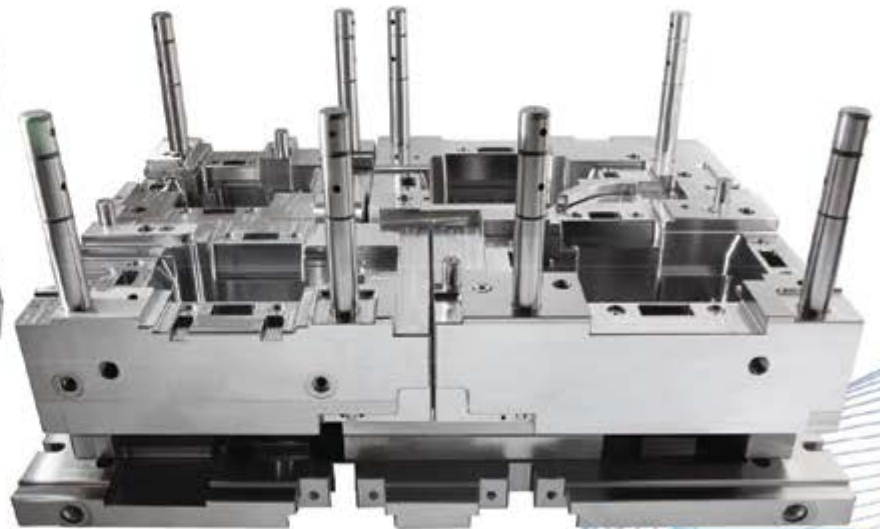
- ▶ **Coordinate Measuring Machines (CMMs):** These sophisticated instruments measure the dimensions and geometry of the die with high accuracy, providing detailed data on critical features.
- ▶ **Optical comparators:** These devices compare the die to a master image or drawing, visually highlighting any deviations or inconsistencies.
- ▶ **Surface roughness testers:** These instruments measure the surface finish of the die, ensuring it meets the required specifications for smooth operation and part quality.
- ▶ **Hardness testers:** They measure the hardness of the die material, ensuring it is strong enough to withstand the forces involved in the forming process.
- ▶ **Ultrasonic testing:** This non-destructive technique detects internal defects and cracks in the die material, ensuring its structural integrity.

What lies ahead?

The future of precision die making is not only about technological advancement, it's also about unlocking new opportunities and driving progress in various industries. From medical devices and aerospace to consumer electronics and automotive components, the ripple effect of these advancements will be felt throughout the global economy. As we look towards the future, we can expect precision die making to play a pivotal role in shaping the landscape of innovation, fostering economic growth, and ultimately, improving the quality of life for people around the world. This exciting journey promises to be one of continuous evolution, pushing the boundaries of what's possible and shaping the future of manufacturing across diverse industries. ♦

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Deepak Kumar

Business Development Associate,
M/S BHAKTA INDUSTRIES

Current trends

Smart manufacturing (Industry 4.0), accommodating advanced materials, precision in intricate designs, meeting customisation demands within shorter lead times, and emphasising on sustainability, are some of the current trends in the Indian die & mould industry. The development of skills required for operating advanced machinery has also become pivotal.

Business outlook

The business outlook for the die and mould industry in India is looking positive, especially with regard to the adoption of advanced technologies like Industry 4.0. Creating moulds using advanced materials and meeting the demand for customised products within shorter lead times offer tremendous growth potential.

Participating in DMI 2024

Participating in this exhibition has been beneficial for our business. It provides a great platform to network with industry professionals, showcase our products, and stay updated on the latest trends. The event has increased our visibility, allowed us to engage with customers, and build our brand. Additionally, we've gained valuable insights through workshops and seminars.

Solutions/products on display

We are excited to showcase our diverse product portfolio at 13th Die & Mould India International Exhibition, with a primary focus on

injection mould manufacturing. Our expertise extends to serving the specific needs of the automotive, electrical, and medical plastic wear equipment sectors.

Message to attendees/ visitors

As exhibitors at Die Mould India, our message is simple yet impactful. We want attendees to know that our company is a pioneer in injection mould manufacturing, specialising in innovative solutions for the automotive, electrical, and medical, among other sectors. Choosing our products means choosing a reliable partner dedicated to innovation, quality, and customer success.

Expectations from DMI 2024

As exhibitors, we expect the show to be a valuable opportunity for lead generation, brand promotion, and gaining market insights. We anticipate engaging with industry professionals, building relationships, and validating the market acceptance of our products. ♦



Kairav Domadia

Proprietor,
Dali Electronics

Current trends

A prominent trend in the die and mould market is the increasing demand for products that are environmentally sustainable and eco-friendly. Another significant observation in this market is the rising incorporation of technology

to elevate both the quality and efficiency of products.

Business outlook

The outlook for the die and mould market is optimistic, with sustained growth expected in the coming years. Increasing consumer demand, advancements in technology, and investments from key industry players are poised to drive growth and advance innovation within the market.

Participating in DMI 2024

We are excited about participating in the 13th Die & Mould India International Exhibition and are looking forward to the opportunities we will get in terms of networking, showcasing our products and innovations and generating leads.

Solutions/products on display

We will be showcasing beryllium copper for electrical connectors and contacts, springs and switches, industrial tools and equipment, aerospace components, oil and gas exploration, plastic injection moulding, medical instruments, defence and military applications, and hot runners.

Expectations from DMI 2024

We are looking forward to networking opportunities and interactions with the government and industry. It's the perfect exhibition for global collaborations, technology transfer and adoption, market expansion, and skill development. For us, DMI 2024 is an ideal platform for knowledge sharing and showcasing sustainable innovations. We are also looking to learn about the market trends and gain valuable insights. ♦



Hiroshi Tsuji
CEO,
struclab Co., Ltd.

Current trends

The 'Make in India' initiative, we believe, is helping the die and mould industry grow well in India. struclab will be exhibiting for the first time in India and is excited to do so at the Die & Mould India International Exhibition 2024. We look forward to observing and understanding the current trends and demands through this exhibition.

Business outlook

The mould industry catering to automobiles and home appliances in India is already developing well in the fields of precision processing and heat treatment. However, we believe that the real challenge will be working towards decarbonisation during production while producing with exceptional quality.

Participating in DMI 2024

We hope to meet with potential clients who would use simulation and analysis services. This will help us expand business opportunities in India and allow us to contribute our expertise to the ever-growing die and mould industry in India.

Solutions/products on display

We look forward to showcasing how we have been helping clients working in fields as diverse as theme parks and dental health using simulations and analysis. We support them while creating tools and structural designs along with

the development of equipment. We help them identify issues before the actual production begins.

Message to attendees/ visitors

We can help you by analysing and simulating your products through software and identifying any setbacks that might occur even before production. By outsourcing these services to use, you can eliminate the need for internal simulation specialists. This will allow you to cut costs without compromising on quality.

Expectations from DMI 2024

We think that the Die & Mould India International Exhibition 2024 will help create a strong community by connecting businesses that can help each other while growing together. At this year's show, we expect to understand the industrial product trends in India and look forward to interacting with fellow exhibiting companies as well as attendees. ♦



Prince Arulsingh
Proprietor, Eltec Engineering

Current trends

The industry is gaining momentum after COVID-19, thanks to the government subsidy and 'Make in India' initiative that helped many small tool rooms and machine shops ramp up their production capabilities and provide international-standard moulds at competitive prices.

Business outlook

The future outlook of the die and mould

industry is very bright. All the efficient and capable tool rooms will expand and grow exponentially due to strong demand from major industries like automotive, medical, defence, aerospace, durables and precision engineering. Although tool rooms can invest in the latest machinery and technologies, the unfair cost squeezing from big corporate customers leads to erosion of profit margin. Those who operate tool rooms with bank loans will find it difficult to grow their business from this thin margin. To redress this issue, big corporates need to give their vendors space to grow alongside them rather than only focusing on one-sided growth.

Participating in DMI 2024

We started our business as mould-base manufacturers in Coimbatore. Since inception, we faced several struggles to get consistent orders from customers, who were Tier-2 suppliers for OEMs and only received a miniscule share of the profit, when we were Tier-3. Participating in DMI got us orders directly from OEM

customers and made us known to the tool room fraternity all over India.

Solutions/products on display

Eltec Engineering has now expanded its machining size capacity and can fulfill the requirements of a vast majority of PDC tool rooms by supplying mould bases to maximum size of 2000-mm length and 1000-mm width. Also, we can supply the complete mould base along with mould components from leading brands like HASCO among others.

Message to attendees/ visitors

We manufacture export-quality mould bases. Our tagline of 'timely delivery and high-precision' always drives us.

Expectations from DMI 2024

This year, we expect more visitors than the previous year because of the rapid growth in this industry. You could visit us at Hall No. 1 stall C11 and lend us your support. ♦



Lovkesh V.
Founder,
Nulo Innovations (OPC) Pvt. Ltd.

Current trends

A prominent trend in the die and mould market is the increasing demand for products that are environmentally sustainable and eco-friendly. Another significant observation in this market is the rising incorporation of technology to elevate the quality and efficiency of products. The current trends in the Indian die and mould industry include adopting advanced manufacturing technologies such as 3D modeling software, CAE/CAM solutions, and 3D printing.

Business outlook

The business outlook for the die

and mould industry in India appears promising, driven by consistent growth trends, technological advancements, and government initiatives like 'Make in India'. Anticipated growth areas include increased demand from the automotive sector, adoption of advanced manufacturing technologies, and the potential for exports. The EV revolution has given wings to the growth of the die & mould industry.

Participating in DMI 2024

By participating in Die Mould India, we benefit from exposure, potential collaborations, and gain insights into competitors, contributing to overall business development. For our company, the importance of participating in DMI lies in the multifaceted impact it has on our business development. From enhancing our visibility and networking to gaining insights and fostering collaborations, the show significantly contributes to our overall success and growth within the industry.

Solutions/products on display

Nulo Innovations seeks to showcase how its technology-driven approach can empower businesses, helping them stay ahead of competitors and explore new

horizons. Our vision is to set new standards of excellence across industries and at DMI. We look forward to highlighting how our solutions contribute to this vision by fostering efficiency, productivity, and innovation throughout the value chain.

Message to attendees/ visitors

Visitors can anticipate learning about the tangible benefits of partnering with Nulo Innovations—measurable value, seamless integration, optimised processes, and a commitment to driving innovation in the ever-evolving landscape of engineering solutions.

Expectations from DMI 2024

DMI serves as a platform for industry players to showcase their innovations, exchange knowledge, and, most importantly, explore collaborative opportunities. It facilitates the dissemination of the latest technological advancements and industry trends. By bringing together professionals, manufacturers, and stakeholders, the exhibition promotes networking and synergies that can lead to improved efficiency and competitiveness within the sector. The event contributes to the overall visibility and recognition of the Indian die and mould industry on a global scale. ♦

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Suresh Patil
 Director, Accurate Sales & Services Pvt. Ltd.

Current trends

Customers are increasingly demanding intricate and precise dies and moulds to meet the evolving needs of various industries, including automotive, aerospace, electronics, and consumer goods. This demand for complex designs has led to an increased focus on high-precision measurement.

Business outlook

Continuous technological advancements, especially in CAD/CAM integration and additive manufacturing, will drive innovation. This will allow for more intricate and precise die and mould designs and thus, precise measurements. Also, the integration of Industry 4.0 technologies will transform operations, enhancing efficiency, productivity, and predictive maintenance in die and mould manufacturing.

Participating in DMI 2024

Participating in Die & Mould India has been pivotal for Accurate Gauging & Instruments Pvt. Ltd. It's an invaluable platform, fostering networking opportunities, showcasing our innovations, and connecting us with industry leaders.

Message to attendees/ visitors

At Die Mould India, Accurate Gauging & Instruments Pvt. Ltd. invites attendees to explore how our cutting-edge technologies empower smarter quality control, intricate design analysis, and Industry 4.0 integration. Experience our solutions first-hand to witness how Accurate's offerings optimise production, ensuring unparalleled quality and reliability in the evolving die and mould industry.

Expectations from DMI 2024

Die & Mould India plays a pivotal role by fostering collaboration, showcasing innovations, and disseminating industry trends. The show accelerates knowledge exchange and technology adoption, propelling the die and mould industry's growth. Our expectations from this year's show include networking opportunities, insightful interactions, and forging strategic partnerships for mutual industry advancement. ♦



Vineet Seth
 Managing Director, Mastercam

Current trends

The die and mould industry in India is currently expanding into other high-precision markets such as medical, aerospace, EV and chip manufacturing. This is largely due to the precision manufacturing expertise and talent that this industry carries and nurtures.

Business outlook

The die and mould industry is a

perennial business. The players may diversify into allied domains. However, the crucial aspects of this industry – which are precision manufacturing, innovative manufacturing techniques, and application of traditional and modern methods of manufacturing based on best practices – help this industry grow organically as well as inorganically.

Participating in DMI 2024

Die & Mould India International Exhibition is our direct connect with the die, mould and precision manufacturing industry in the country. This is also an event, where we work with partners and customers to overcome technical challenges, innovate together and help in keeping input costs low, while delivering high-quality output. Therefore, this exhibition is not just a sales platform, but rather a collaborative effort of all stakeholders in this industry to continually raise the standards of each offering.

Solutions/products on display

We will be showcasing Mastercam 2024, our new version, which has over 100 new features and enhancements. We will also be demonstrating embedded NC code verification tools at this exhibition, which will help our customers and partners verify that what they have programmed runs correctly on the machine tool.

Message to attendees/ visitors

My message to the visitors would be that Die & Mould India gets under its roof, the makers and consumers of advanced manufacturing technologies. Further, they are all present at the event to answer any questions, collaborate and innovate together. So, do not miss the opportunity to visit the show and interact with the domain experts.

Expectations from DMI 2024

I look forward to seeing both the familiar as well as new and young faces at the show. We also look forward to a healthy exchange of ideas and collaboration with our partners in the industry. ♦

Italian Technology Centre showcases excellence in machine tool industry for India's sustainable manufacturing future



The Italian Technology Centre (ITC) recently organised a significant event at Saya Ji Hotel, Pune, on November 29, 2023, on the theme 'Italian Machine Tool Industry for India's Sustainable Future Manufacturing'. The event aimed to shed light on the prowess of the Italian machine tool sector and its crucial role in India's evolving manufacturing landscape.

The event's distinguished speakers included Ms. Barbara Colombo, President of UCIMU and ITC India, who emphasised the significance of the Indian market for the Italian machine tool sector. Mr. Alessandro De Masi, Consul General of the Italian Consulate in Mumbai, delivered a keynote address, and Mr. Satish Kumar, Sr Advisor at IMTMA, provided insights into the Indian machine tool sector,

with a focus on sustainability.

ITC member companies, such as BLM Group, Buffoli Industries, FICEP India, Lorenzon Srl, Losma India, and Millutensil Srl, presented their offerings, showcasing cutting-edge technologies. The presentations were followed by productive B2B meetings, where professionals from diverse industries engaged with the companies based on their specific interests and requirements.

The event drew participation from industry leaders, including Alfa Laval India, AMPCO Metal, Century Enka Ltd, Dristikon Technology Services, FIBRO India, Forbes Marshall Pvt Ltd, Multiple Special Steel Pvt.Ltd., Mutual Engineering Pvt Ltd, thyssenkrupp Industries I Pvt Ltd, Tork Motors Pvt Ltd, and Bajaj Auto, among others.

The event's success was palpable, with attendees expressing satisfaction over the quality of interactions and potential collaborations. Mr. Ashish Kamat, General Manager of Italian Technology Centre, expressed his delight at the overwhelming response. He stated, "We aimed to increase awareness among Indian companies about the exceptional Italian technologies through this event. The growing enthusiasm in the Indian manufacturing industry is truly promising."

The event concluded on a positive note, marking a step forward in fostering collaborations between the Italian and Indian machine tool sectors, contributing to the sustainability and innovation of the manufacturing industry in India. ♦



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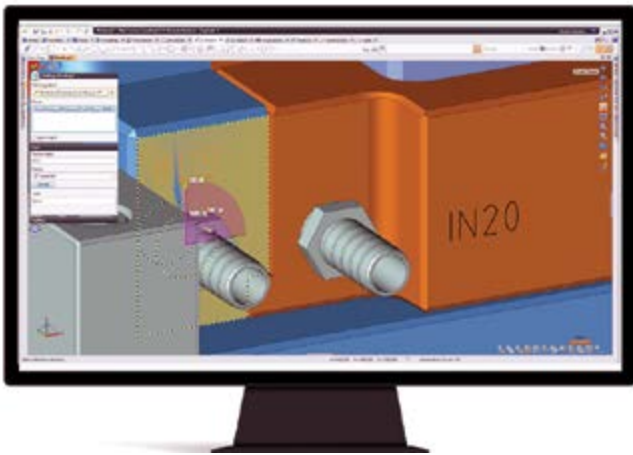
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A standout feature is the software's capability to simulate material deformations and retractions, crucial considerations in tool development. Additionally, it enables the simulation of tool mechanics, detecting potential collisions in the design phase. The software further supports direct machining aligned with the design, accommodating manufacturing processes like grinding and electrode erosion, along with associated tolerances. With a keen focus on the specific needs of toolmakers, TopSolid Tooling leverages Missler Software's extensive experience in tool and die manufacturing.

For More details, contact:

Company: TopSolid India
Phone: 98201 18840
Email: melvyn@designcell.org



Metal 3D Printer

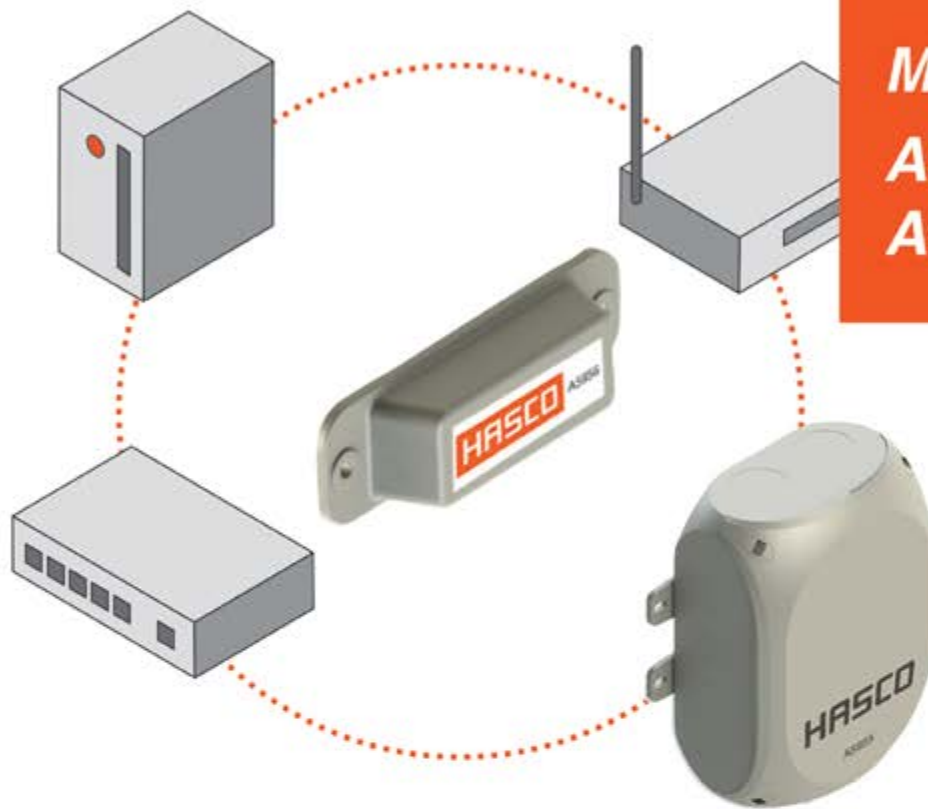
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The STL-400 boasts a smart powder management system that continuously monitors powder levels and dynamically predicts the powder required for real-time print job completion. The patented multi-blade recoating system ensures a uniform distribution of powder during the build, contributing to consistent and high-quality prints. An in-house developed VoluMelt™ technique sets the STL-400 apart, enabling faster completion of the printing process and making it cost-effective. This innovative metal printer is not just a tool; it's a solution that accelerates manufacturing processes, enhances precision, and delivers superior results. Welcome to the future of metal printing with the STL-400.

For More details, contact:

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Accelerating product design simulations with IIT-Madras

Simulation and Digital Twin Technologies have drastically shortened product development cycles and made rapid prototyping an industry norm. However, hiring experienced product designers and developers can be expensive for small companies, especially in the MSME sector. Siemens Technology, India, in collaboration with the Indian Institute of Technology Madras (IIT-M), is developing i3PLM, a framework that democratizes high-end competitive product design and development for small and medium-sized industry segments.

i3PLM automates product design by capturing key user intent from product requirement documents at early design stages. This prevents expensive product design iterations at later stages of product development and shortens product lifecycle management. This leads to faster design feature enhancements and new version releases for existing products.

Collaboration for market success

Product interpretability, interoperability and user interaction are crucial factors for market success and the overall Product Lifecycle Management (PLM). Product designers can sketch the desired product within the i3PLM framework and leverage its advanced simulation and machine learning models to derive complete product designs. This also reduces product development cost significantly.

The i3PLM project addresses three attributes of product

development, namely, interpretability, interoperability and interaction.

The first phase addresses interpretability, which is the ability for machine learning models to understand the human intent in decision making. So far, project outcomes have been well received by Siemens' businesses and the Simulation and Digital Twin Research Group at Siemens Technology. The project team also plans to pilot i3PLM for real-world automotive and aerospace engineering spaces, as they are highly dependent on design experts for complex and innovative parts. Original Equipment Manufacturers (OEMs) in these sectors will hugely benefit, as the framework addresses challenging interdependencies between design, engineering, manufacturing, supply chain, field operations, service and maintenance verticals. The framework also enables seamless knowledge capture and reuse, thereby helping OEMs to be more agile and competitive in the market. One of the unique features of i3PLM is its search functionality, which enables product designers to search for the right part based on user sketches.

Vinay Ramanath, Principal Key Expert at Siemens Technology, India, says: "This is a highly collaborative project with Siemens defining the problem statement, scope, reviews and final sign off. IIT Madras is responsible for the execution with expert guidance of four professors and several students involved in prototype development."

i3PLM has been validated with known samples from an exhaustive database of parts and sketches from the automotive domain. It currently shows greater potential for Siemens products such as Siemens Simcenter, which already enables rapid product development through advanced simulations. The Siemens Teamcenter product, which connects people and processes, across functional silos, with a digital thread for innovation, also stands to benefit. The i3PLM project team is currently exploring opportunities to extend capabilities in phase 1 with regards to interpretability. The team also sees the potential to extend i3PLM's scope to metaverse, thanks to its interactive features. ♦

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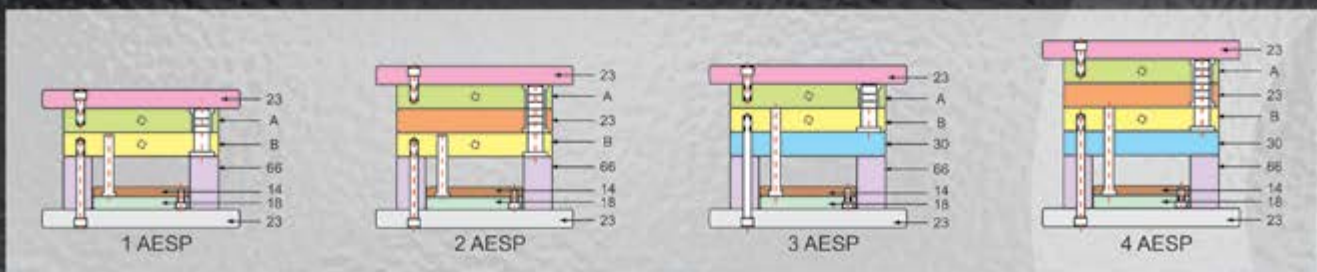
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5-axis solutions open new doors for McAfee Tool & Die

McAfee Tool & Die is known for taking on unique jobs, and the reason for that is their dedication to constant progress. When 5-axis milling started to become more popular, McAfee immediately looked for ways to maximise the benefits of the new technology, choosing an investment in Mastercam for best results.



McAfee Tool & Die has been providing tool and die stampings, reverse engineering, concept design, prototyping, and permanent tooling services for Northeast Ohio since 1977. In more than forty years of operation, McAfee Tool & Die has expanded their customer base across many other states and foreign countries. Being certified to ISO 9001:2015, as well as for aerospace with AS 9100:2016 (Rev. D), rounds out this company's ability to serve the manufacturing industry.

Owner Gary McAfee appreciates the value of running a shop that is versatile and can take on a wide variety of jobs.

"When it comes to software, we wanted something that's functional

for everything we do, and we do a lot of different things. It's important that this software is flexible enough," said Plant Manager Joseph Lysiak. That's why his team chose Mastercam as the company's CAD/CAM solution.

John Stiles, a Senior

The improvement in programming and the new technology that the software is always evolving helps us stay ahead of the curve and meet customer demand.

- Joseph Lysiak, Plant Manager, McAfee Tool & Die, Uniontown, Ohio

Programmer, reached out to Mastercam Reseller, FASTech, Inc. to ask Kevin Richardson, Sales Manager and Technical Expert, about the specific features within the software. Richardson personally visited the McAfee Tool & Die shop with Technical Expert Scott Harding to give a demonstration. During his visit, Richardson programmed a real part for one of McAfee Tool & Die's orders, explaining each step to Stiles and Programmer Ben Ohler. "We got a time-pressing job completed and were able to see firsthand the high level of support," said Ohler.

While there, Harding explained the training, support, and troubleshooting help McAfee Tool & Die could expect from FASTech. McAfee knew that a transition to a



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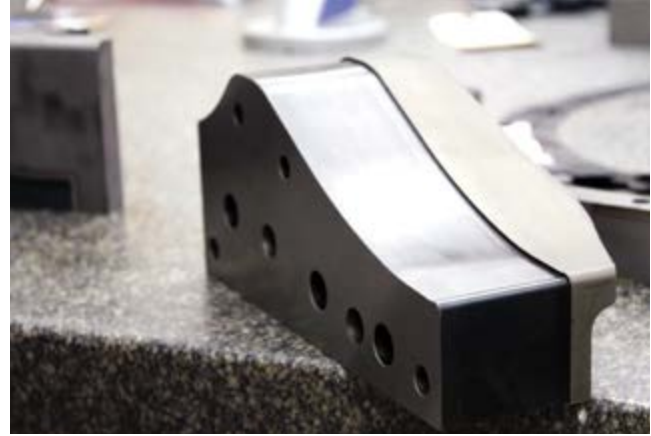
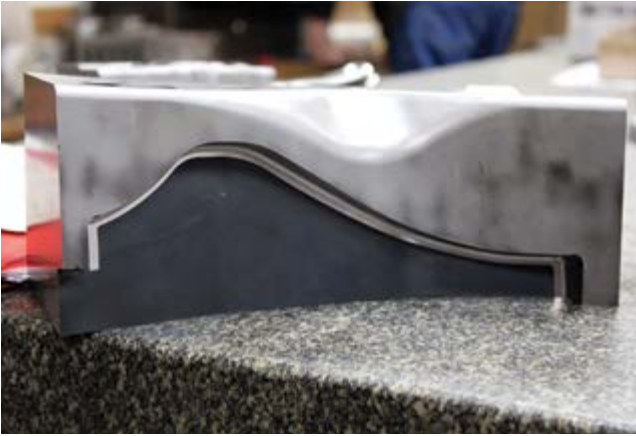


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new CAD/CAM software might be expensive at first, but he quickly realised that FASTech's support contract was the best deal on the market. McAfee Tool & Die made the switch to Mastercam and hasn't looked back since.

Stiles explained, "They included translators, post processors, and support in the base cost. With some software companies, many things are extras that add to your base cost as well as the annual cost of your support contract. With the overall time and support we get from them, it means everything when you come down to it."

The McAfee Tool & Die team relies on Harding's continued support as new technologies become available. "Once in a while, we'll run into something that makes us call support. They get right on, and we share screens so they can walk us through it," Stiles said. "It's most valuable to have them when we need to learn something new, though." Over about four days via on-site training, Harding walked the McAfee Tool & Die programmers through the intricacies and

advantages of 5-axis milling.

5-axis milling with Mastercam has changed the way McAfee Tool & Die manufactures parts by

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eliminating setups and streamlining the entire machining process. Now, Lysiak is unconcerned about damaging his stock material, even though machining with 5-axis is inherently faster.

"We have parts with tolerances of less than 1/2 thousandths, but we don't have to worry. We can have anyone put it in, push a button, and go. He won't have to take it off and put it back in again and again, either. Time is money," Lysiak shared. With McAfee Tool & Die's expanded capabilities, his only concern now is keeping up with increased orders.

While updating equipment and software on a regular basis creates some challenges, the McAfee Tool & Die team agrees that it creates many more opportunities for expanding business. "The improvement in programming and the new technology that the software is always evolving helps us stay ahead of the curve and meet customer demand," said Lysiak. "When I talk about bringing in more work, the guys in programming just say, 'Bring it on!'"

McAfee Tool & Die continues to push boundaries and learn new ways to approach projects. It not only makes the company more productive and competitive, it opens the door for new customers and expanded opportunities. ♦

They included translators, post processors, and support in the base cost. With some software companies, many things are extras that add to your base cost as well as the annual cost of your support contract. With the overall time and support we get from them, it means everything when you come down to it.

- John Stiles, Senior Programmer, McAfee Tool & Die, Uniontown, Ohio

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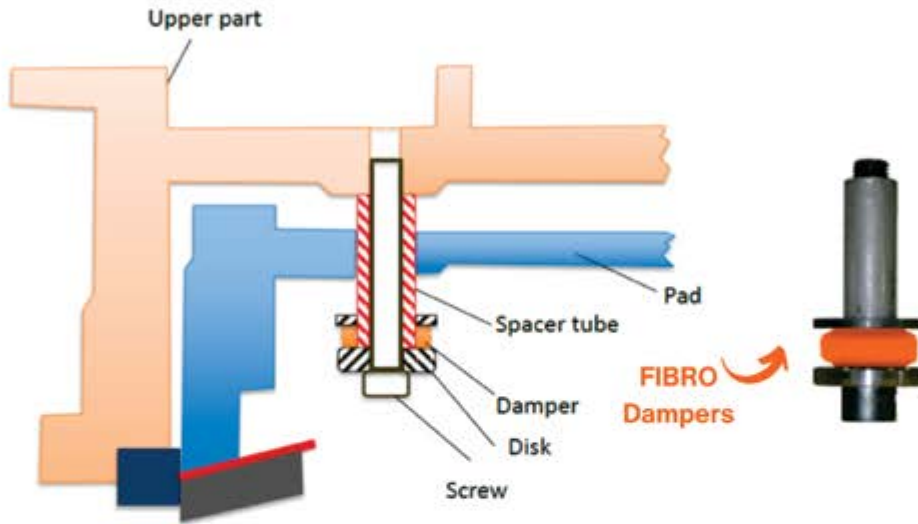
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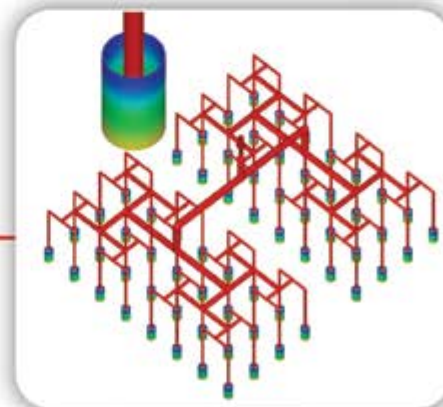
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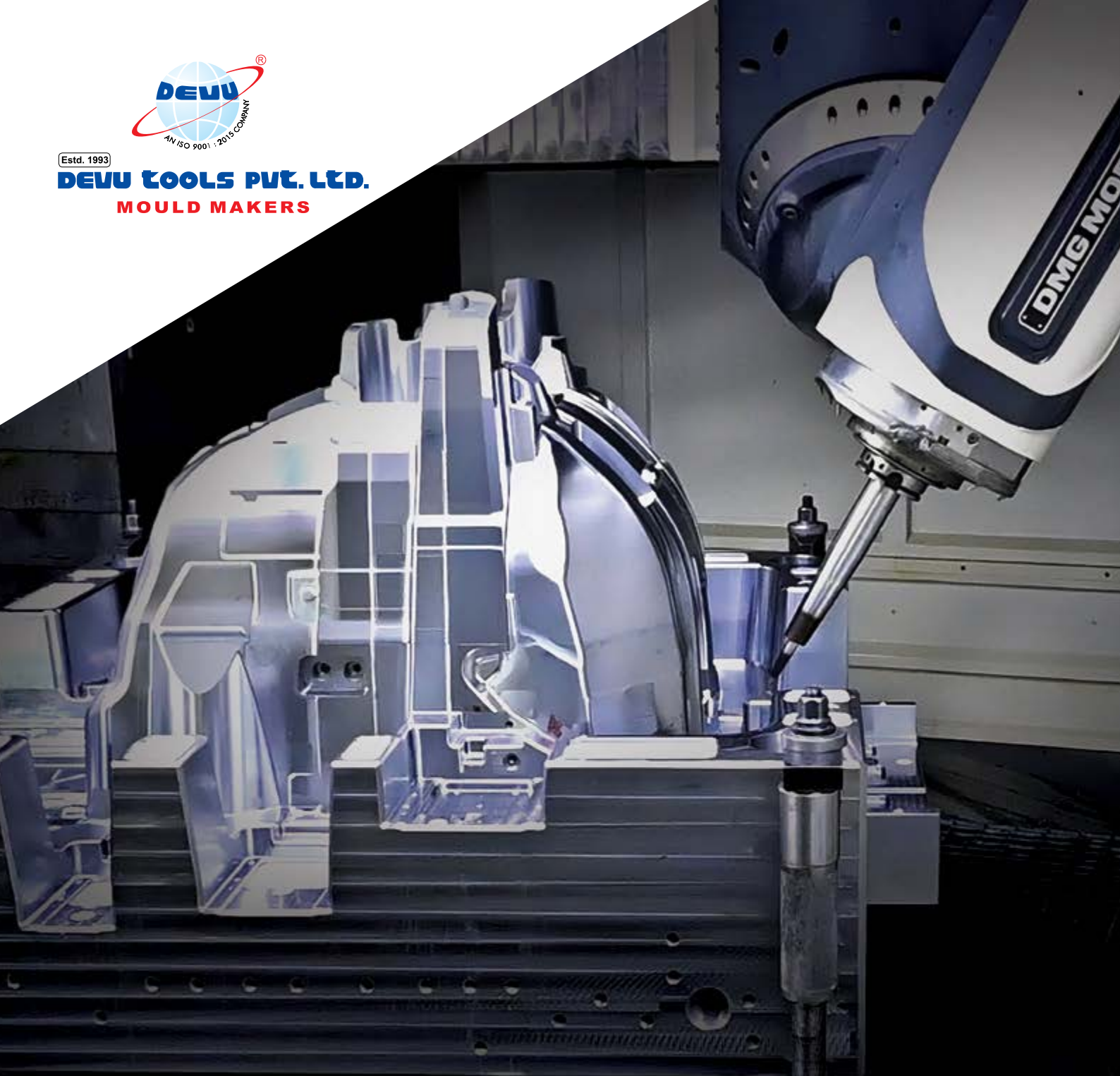
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