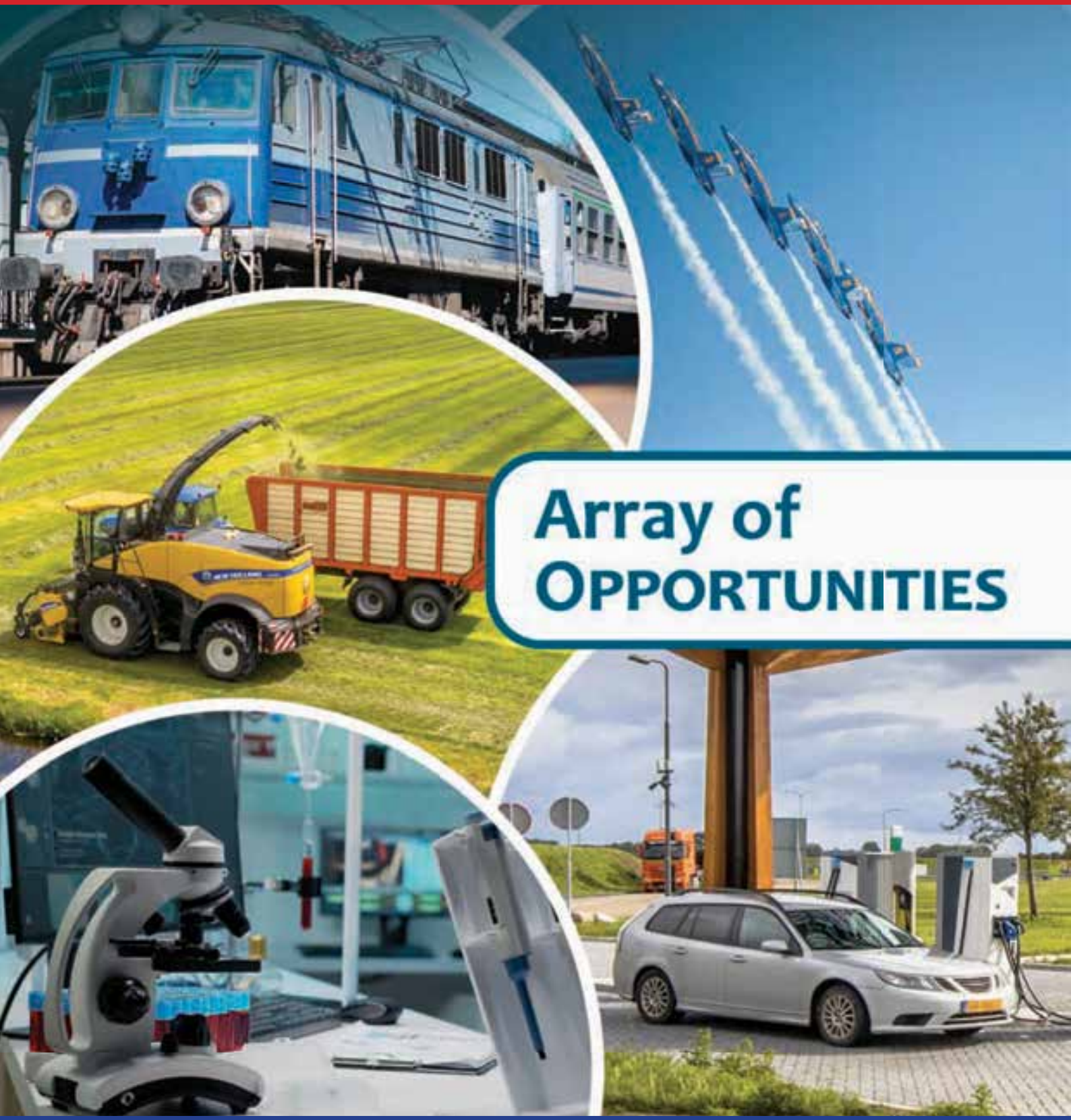
TAGMA TIMES

NEWSLETTER

(Technical Info. on Die, Moulds & Toolroom)

Volume: XXVIII / No. 1 (Private Circulation for Members Only) September 2021



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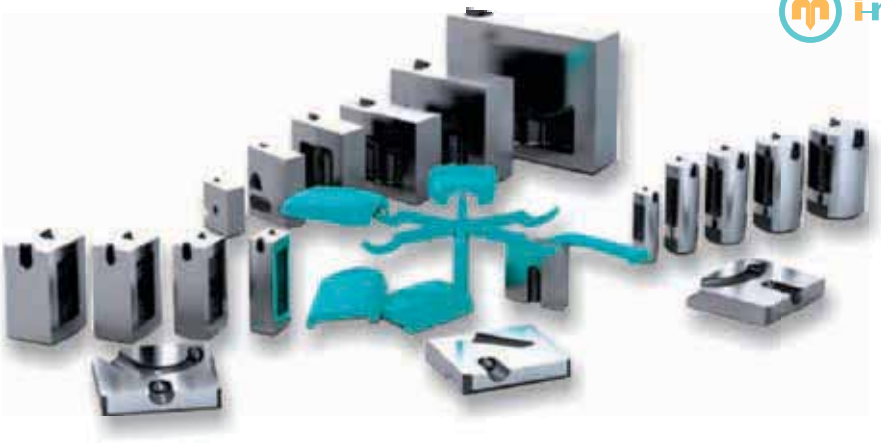
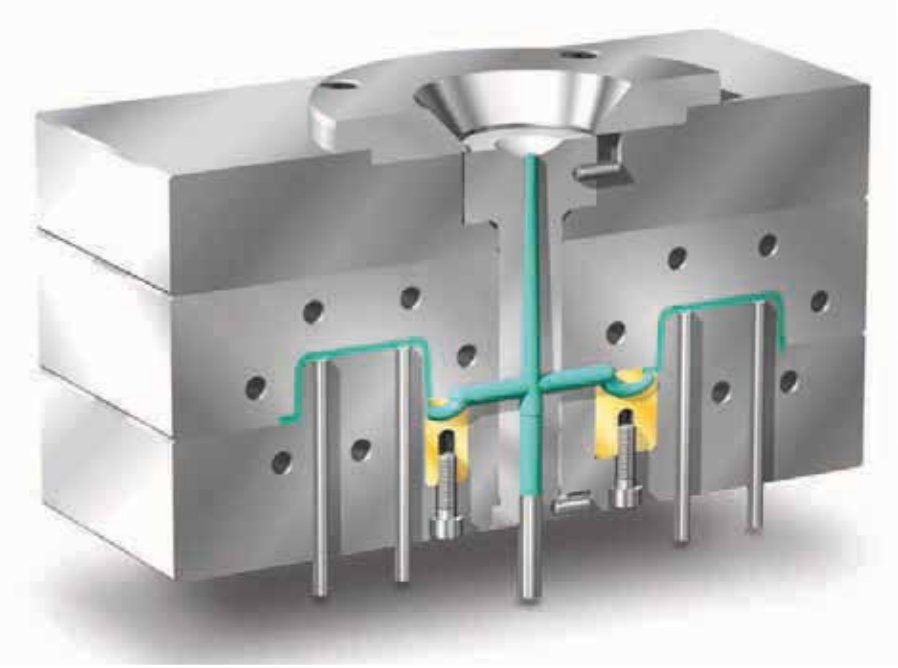


i-mold, Germany tunnel gate inserts are recognized worldwide as innovative products with high cost reducing potential for moldmakers and molders.

- Time and cost reduction thanks to fast and easy application
- Made of highly wear-resistant hot work tool steel M2 (1.3343)
- High degree of reliability in production process
- Invisible gate marks through underside gating
- Single-part design for compact dimensions

- Available in many different versions and sizes
- Integrated cutting edge for exact sprue separation
- Suitable for all plastics thanks to optimized feed channel geometry up to 60% filler content (e.g. glass fibre) is possible
- Use of MIM process ensures smooth feed channels and exact gate sizes



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Injection molded Bumper part

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EDITORIAL

More in store

After announcing Production-Linked Incentive (PLI) schemes for several sectors in Union Budget 2021-22, the government, on September 15, 2021, announced the PLI Scheme for the automobile sector, with an outlay of INR 26,058 crore. The scheme is aimed at incentivising high-value advanced automotive technology vehicles and products.

"It is estimated that over a period of five years, the PLI Scheme for the Automobile and Auto Components Industry will lead to fresh investments of over INR 42,500 crore, incremental production of over INR 2.3 lakh crore, and will create additional employment opportunities of over 7.5 lakh jobs. Further, this will increase India's share in global automotive trade," the government said in a statement.

If you are a toolmaker, this news should cheer you up. The automotive industry, which is the biggest consumer of tools worldwide, is going to witness tremendous growth in the years to come. But the growth opportunities will not be restricted to the automobile and auto components' industry. Aerospace & defence, agricultural equipment, medical devices, and railways, among other sectors, are going to witness exponential growth prospects too.

Our 'Sector Watch' section highlights the opportunities in a few sectors that you could consider exploring. If you foresee, growth probabilities in other sectors that we haven't featured yet, do get in touch with us. We would love to feature your growth story.

Until then, happy reading!

Nishant Kashyap
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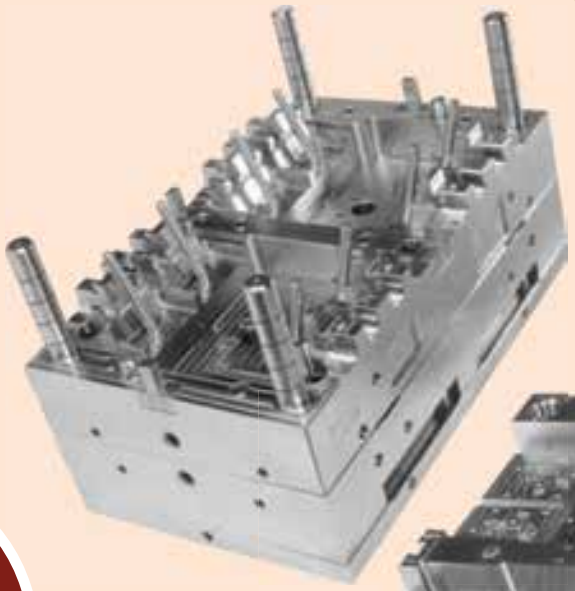

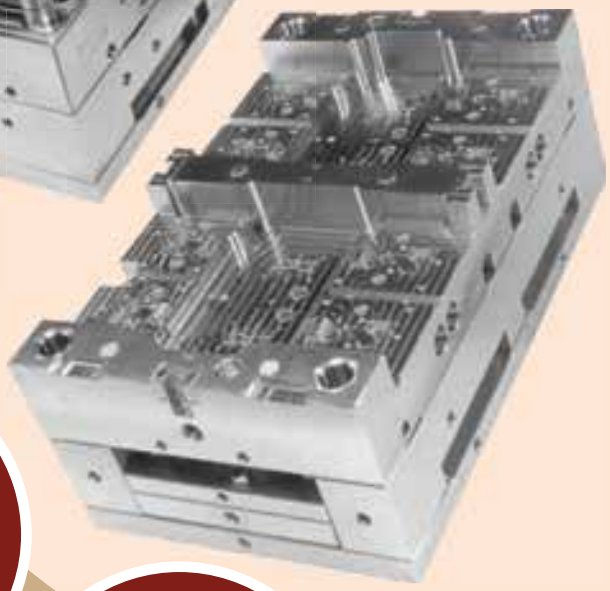

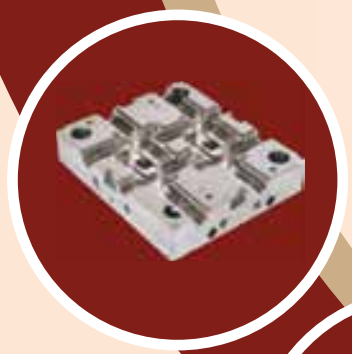

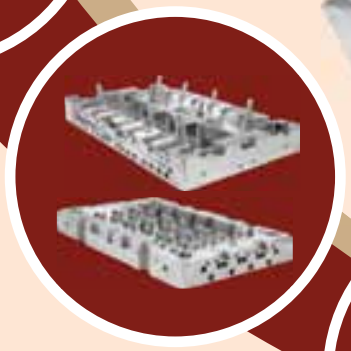

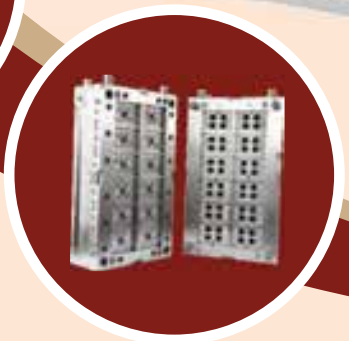

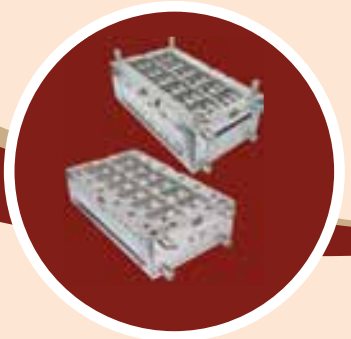

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Boost stability and tool life with optimized solid end mills

IN its continued effort to provide the most cost-effective tooling solutions available, Seco Tools has announced a new family of flexible, highly productive solid end mills, the Seco JSE510 series. Redesigned to offer the rigidity, chip control and tool life to achieve the lowest possible costs per meter machined in steels, stainless steels, cast iron, titanium, and some aluminiums, these solid end mills provide exceptional process reliability across a broad application range.

New design combines reliability and unparalleled versatility

The reoptimized design of the new JSE510 offers unparalleled versatility based on the previous version of this product range. The new series targets general engineering, contract manufacturers and job shops, as well as the aerospace, medical, and automotive industries. The design is reoptimized to stand up to tough milling applications with a versatile carbide grade, advanced

polished SIRA coatings and a strong, sharp cutting edge. To extend tool life further, these tools offer vibration-damping variable pitch design and optimized helix.

"These solid end mills offer productivity in less-stable machining conditions or when pushed hard to balance productivity and tool life cost effectively," said Rob Mulders, Solid End Mills Global Product Manager. "This versatility makes the JSE510 series particularly useful when shops face increased costs in required tooling because of a greater variety of applications and materials. For these shops, the new tool series' expanded application window allows them to reduce their tooling inventory without affecting their ability to maximize throughput."

Multiple tools, geometries and lengths

The Seco JSE510 family includes 216 tools in four geometries, with two length variants in the three and four-flute version, normal (LV2) and long (LV3). The two-flute JSE512 easily handles the large chips produced in helical interpolation or peck drilling, keyways and slotting applications, while the three-flute JSE513 offers universal milling performance for ramping, full slotting and side milling. The four-flute JSE514 is ideal for optimized side milling and slotting, as well as dynamic milling. Finally, the ball-nose end mill geometry of the JSB512 offers the flexibility required for finishing parts and other ball-nose applications.

WIDIA introduces M1600 face milling platform suitable for variety of machine conditions and set ups

WIDIA™ recently announced the release of the M1600 face mill for roughing to semi-finishing operations in steel, stainless steel, cast iron, and nodular iron materials. With 16 cutting edges and a smart insert design, the M1600 performs in various machining conditions, including low-power machines, unstable, non-rigid set ups, long overhangs, weak machines or weak fixture conditions.

"Face milling is one of the most common machining operations, so we designed a versatile and cost-effective solution that delivers substantial improvements in metal removal rates in steel and cast iron for our customers," said Anna Kim, WIDIA Indexable Milling Global Portfolio Manager. "The M1600 represents a turnkey solution for general engineering, energy and

automotive customers who want to reduce their face milling tooling inventory and increase their machining outputs."

The 16-edged, precision-ground insert with a positive geometry enables low cutting forces and low power consumption, resulting in higher tool life and an excellent cost per edge. The M1600 has one universal insert geometry in three versatile grades: WP35CM, WK15CM and WU20PM.

The WP35CM grade targets all types of steels, while the WK15CM grade is designed for cast iron materials and performs best in dry applications but can also be used in wet conditions. The universal WU20PM grade can be used for the machining of steel, stainless steel and high-temperature alloys in both dry and wet applications.

The 'smart' insert design features a seating surface below the cutting edge that promotes smooth chip flow and reduces cutting forces on the tool. The insert also has a curved cutting edge and is axially positive resulting in reduced power consumption. These key design features coupled with 16 cutting edges make M1600 an economical face milling option.

HEAT TREATMENT

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Hexagon software connects insights from planning, quotation, and sheet-metal manufacturing

NEW manufacturing project management software advances from Hexagon's Manufacturing Intelligence division enable sheet-metal fabricators to connect data from planning, quoting, and manufacturing systems to improve decision making and productivity. By connecting with computer-aided manufacturing (CAM) systems, the software helps production shops to automate planning and production processes, from determining material usage and production time estimation to optimising processes and sheet-metal nesting strategies, from a single dashboard.

Managing inventory to meet just-in-time material requirements can be an intricate balancing act as production teams strive to quickly secure and complete new projects. Hexagon's manufacturing project management software, WORKPLAN, now eliminates manual data entry by making it possible to repurpose existing job-quotation data to rapidly begin projects and provide an overview of job requirements so production teams can track projects throughout planning and production.

Its centralised inventory database oversees supply needs, simplifying the management of materials and supplier information, and enables users to conveniently order materials directly from the system's interface.

Connecting the manufacturing project management system with CAM solutions enables manufacturers to quickly analyse production needs and manage downstream activities by eliminating manual data entry and capturing valuable proprietary information. For sheet-metal fabrication, WORKPLAN now connects directly to Hexagon's RADAN CAM software so that comprehensive material data, including sheet sizes, current pricing, and product codes, can be added to WORKPLAN's inventory and used for job quotations. These more accurate job quotes can include production data used by the system to determine material needs, as well as the time per part and the total time that each project requires.

"Manufacturers need flexible and connected manufacturing project management tools that can be easily tailored to fulfil their distinct needs," said Market and Product Manager Christophe Mas.

"Manufacturing project management software plays an essential role on the shop floor, but when you connect it with CAM software, users gain greater agility in both day-to-day management and in responding to unforeseen challenges. In uncertain times, putting planning, quotation and production data to better use quickly translates to more competitive speed and efficiency," added Mas.

Tapping into Hexagon's specialist sheet-metal solution, WORKPLAN can now manage coils of material as it does other material types, including the option to reserve quantities of material for specific jobs. As the software automatically maintains a current record of inventory, jobs are flagged for follow-up if there is not enough material in stock to complete a project. Because users can simply cut the size of material that they need from the coil, the system's ability to process coil usage reduces the number of material types that need to be digitally stored and managed.

Furthermore, users can now track the progress of nests from the shop floor using barcode scanners that reduce the risk of selecting incorrect projects when working with multiple nests on the shop floor. Using a touchscreen station located in the production department, a manual barcode scanner can be used to scan the barcode on the operator's printed instruction sheet to view the status of a corresponding nest in progress displayed on the touchscreen.

Mould and die shops also benefit from improved connectivity with CAD. WORKPLAN software can now also import a bill of materials (BOM) from Hexagon's VISI solution, automatically updating the information as designs progress within the WORKPLAN dashboard.

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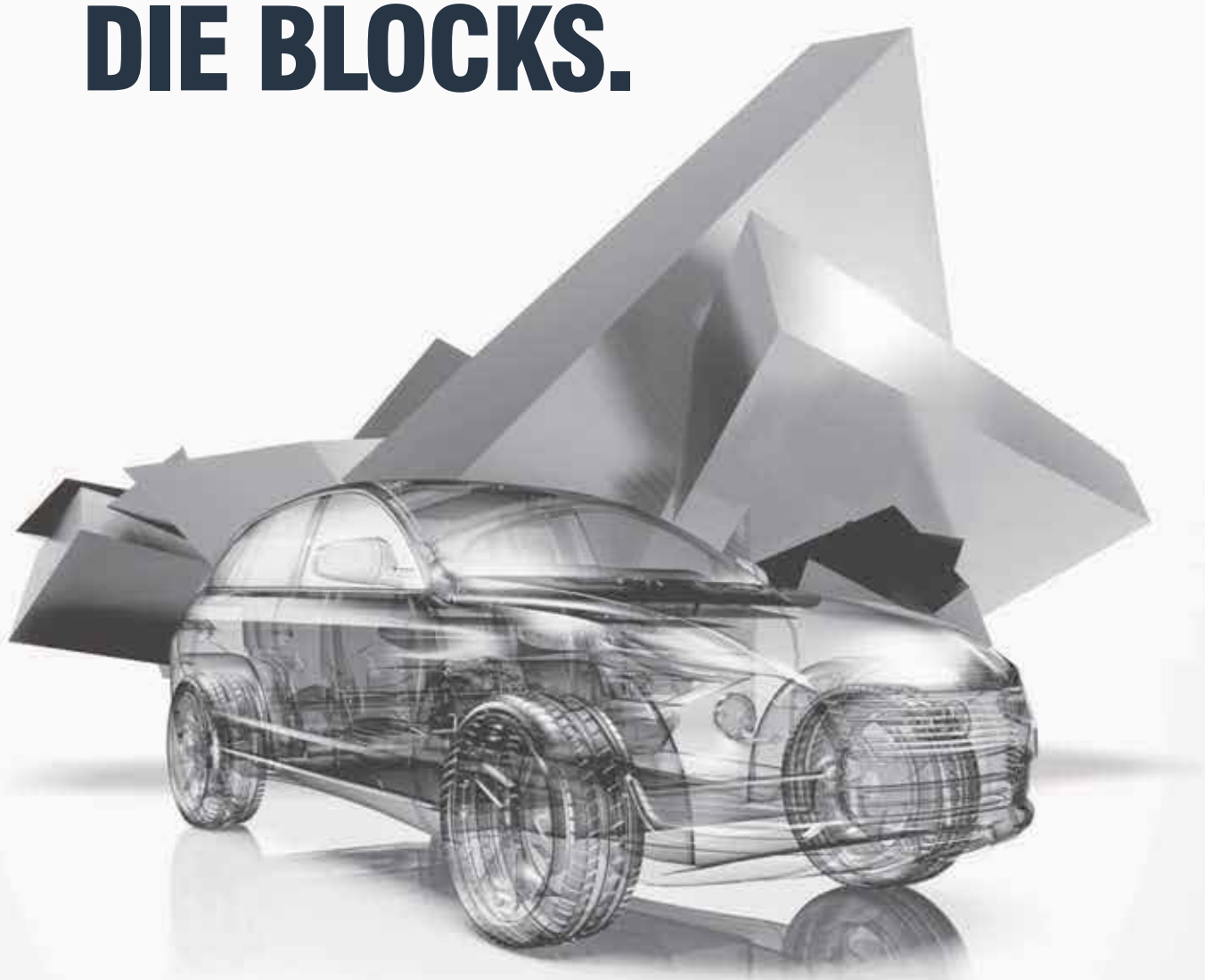

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FARO® launches all-new Max FaroArm with Multiple Laser Line Probes

FARO Technologies, Inc., a global leader of 3D measurement, imaging, and realization solutions for the 3D Metrology, AEC (Architecture, Engineering & Construction), and Public Safety Analytics markets, recently announced the release of its all-new Quantum Max ScanArm, the most advanced portable measurement tool that features three purpose-built hot-swappable Laser Line Probes (LLPs).

Designed to meet a variety of small and medium-sized measurement needs, the LLPs — xR, xP, and xS — ensure that users are no longer forced to choose between speed, accuracy, or resolution. Maximize value and productivity by over 30% with the enhanced performance and scanning capabilities of the Quantum Max. Each LLP is enhanced with FARO CLR (Continuous Light Rectification) technology, which provides users the highest quality scan data on dark, translucent, and reflective surfaces, eliminating the need for sprays, time-consuming surface preparation, and cleanup while avoiding finished product contamination.

"With the next-generation Quantum Max ScanArm, getting the inspection job done as fast and precisely as possible has never been easier," said Ozan Ugurlu, FARO Senior Director of Product Marketing. "Changing probes is quick and easy in just seconds, with no need for recalibration so inspection can continue, virtually uninterrupted."

The new FARO LLP family features:

- **xR:** Suited for high-precision tasks or areas on a part with tight tolerances to capture data with up to 30% better accuracy and resolution.
- **xP:** Offers a balance of the xR for resolution and the xS for speed so coverage and accuracy blend together for overall productivity.
- **xS:** Best for large parts or expansive surface areas when data collection speed is top priority — extra wide laser stripe delivers double the coverage in a single pass, allowing users to collect data over 65% faster.

Quantum Max further enhances speed and accessibility with its kinematic mount that allows each LLP to be interchanged with seamless ease. The portable measurement arm is fitted with a small, light end effector, allowing users to better access hard-to-reach confined spaces while reducing operator fatigue.

Smart Factory ready, Quantum Max is fully compatible with FARO CAM2® software and its Repeat Part Management feature, which allows guided inspection routines to be pre-programmed. Operators can now perform the exact same inspection routine, minimizing variability and maximizing repeatability.

"The new Quantum Max ScanArm exceeded our expectations," added Clay Marsh, Managing Partner at Real Street Performance. "In our many years of industry expertise, we have learned that choosing the right LLP is not always a 'one-size-fits-all' proposition. "There are parts or specific features or areas on a part where you need the most accurate scan possible. For other parts or areas, getting the job done quickly to maintain production speed is most important. The Quantum Max ScanArm solves for both."

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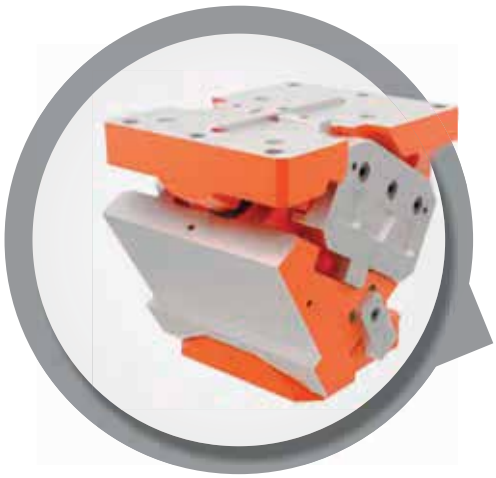

Aerial FCC 2016.24.

1. Working Surface Width Range: 60 to 600 mm
2. Working Forces upto 122 Ton-force
3. Retraction Forces upto 12 Ton-force

Aerial FCC 2016.25.

1. Working Surface Width Range: 700 to 1050 mm
2. Working Forces upto 203 Ton-force
3. Retraction Forces upto 29.5 Ton-force

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'IBSA forum provides hand-holding support to MSMEs through capacity building trainings, exchange of best practices and technologies'

SECRETARY (MSME) Shri B. B. Swain has said that the IBSA forum plays an important role in creating awareness about the strengths, opportunities and challenges of MSMEs and helps in creating markets for finished products and provides hand-holding support to MSMEs through capacity building trainings, exchange of best practices and technologies. Inaugurating the IBSA 6th Tri-nation Virtual Conference on Small and Medium-sized Enterprises (SMEs), Shri Swain stated that these meetings are being held with the objective of promoting trade, understanding trade barriers, and facilitating investments through collective efforts towards better collaborations amongst the three nations.

IBSA is a unique forum, which brings together India, Brazil and South Africa — three large democracies and major economies from three different continents facing similar challenges.

The conference was hosted by the Ministry of MSME recently in association with the National Small Industries Corporation Ltd. (NSIC), Brazilian Micro and Small Business Support Service (SEBRAE), Department of Small Business Development (DSBD), and Small Enterprise Development Agency (SEDA), South Africa.

Mr. Vijayendra, CMD, NSIC, during his address, informed that the main theme of the 6th IBSA Conference was 'Democracy for Demography and Development'. He briefed about the various topics of technical sessions to be discussed. He emphasized that there is much to share and learn from each other's experiences and best practices in terms of regulatory environment, technology support, and access to finance, and initiatives taken amid the COVID-19 pandemic by IBSA members.

Mr. Eduardo Diogo, Director of Administration and Finance of SEBRAE, Brazil, said that despite the challenges faced due to the COVID-19 pandemic, SMEs

are still reinventing and generating employment and IBSA needs to work towards their sustainable development.

Mr. Lindokuhle Mkhumane, Director General, DSBD, South Africa, emphasized that issues like poverty, inequality and unemployment, can be addressed by promoting MSMEs. He said that the youth and women should also be skilled to promote inclusivity.

Ms. Mercy Epao, Joint Secretary (SME), Ministry of MSME, talked about the contributions of the MSME sector in India's socio-economic development and various policy interventions of the Government of India to help the growth of MSMEs in India. She also spoke about the impact of COVID-19 pandemic on MSMEs.

The IBSA 6th Tri-Nations Virtual Conference had four technical sessions divided over two days during which experts and senior officials from Ministry of MSME, Government of India; SEBRAE, Brazil; DSBD & SEDA, South Africa, deliberated on topics like: Enabling MSMEs in National Entrepreneurial Ecosystem, Innovation & Inclusivity, Integration into Global Value Chains, Sustainable Development: Preparedness of IBSA to deal with COVID-19 like crisis in the future.

ARE YOU A TOOLMAKER?

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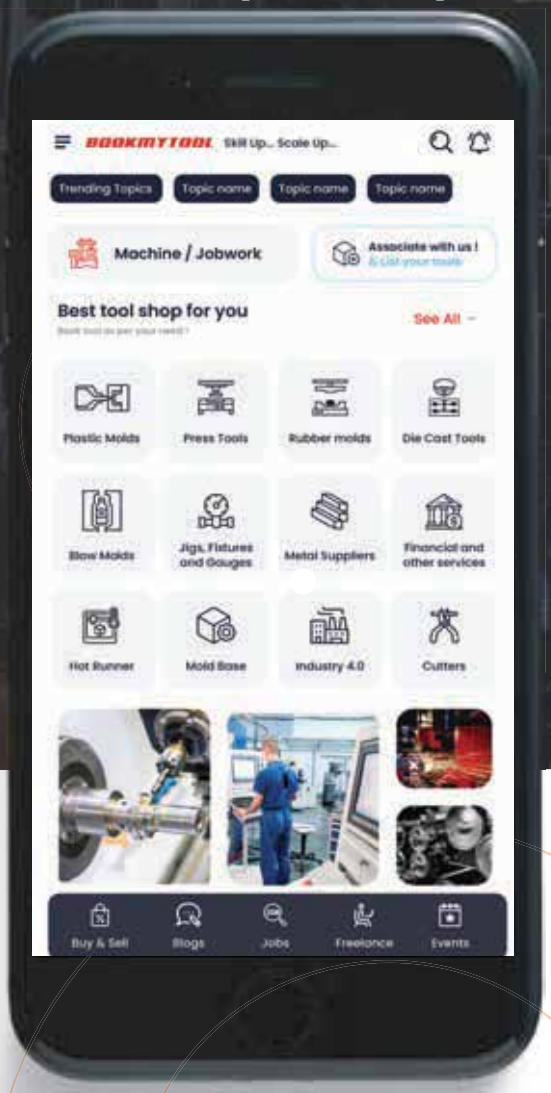
Skill Up...Scale Up...

And does your business belong to

- Plastic Mould
- Rubber Mould
- Press Tool
- Die Cast Tool
- Blow Mold



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HAL, Rolls-Royce sign pact for 'Make in India' Adour engine parts for global markets

HAL and Rolls-Royce have recently signed an agreement for 'Make in India' Adour engine parts to support Rolls-Royce's international defence customer base.

The agreement was exchanged between Mr. B. Krishna Kumar, Executive Director (Engine & IMGT), HAL, and Mr. Abhishek Singh, Senior Vice President – Defence, India and South East Asia, Rolls Royce, in Bengaluru.

Through this partnership, Rolls-Royce aims to strengthen the ecosystem for Adour engines in India by building on HAL's existing capabilities for manufacturing and supporting the Adour engines for Indian customers over several decades. This follows the MoU signed by Rolls-Royce and HAL during the 'Aero India 2021' to establish an Authorized Maintenance Centre for Adour at HAL to support international military customers and operators.

On the occasion, Mr. R. Madhavan, CMD, HAL, said, "With over 30 years' experience of supporting repair and maintenance services for the Adour engines in India, HAL has the capability and capacity to support a large defence customer base. This is the first order for supply of spares for the Adour global supply chain. We plan to be a key player in the supply chain of Adour engines and expect more orders to follow. We look forward to working with Rolls-Royce to build on this capability to serve the global market for the supply of spares and MRO of Adour engines. This new partnership will create avenues for the two companies to expand the defence sourcing footprint in India."

Commenting on the partnership with HAL, Mr. Kishore Jayaraman, President, Rolls-Royce India and South Asia from Rolls-Royce, said, "Our valued partnership with HAL has grown from strength-to-strength over the last few decades and this is a significant step towards strengthening the defence manufacturing ecosystem in India, and to help catapult India's vision for the defence sector to 'Make in India' for the world."

'Government will support establishing semiconductor industry in India'

THE government is committed to support establishing the semiconductor industry in the country, which will also help in reducing foreign exchange outflows, Union minister Piyush Goyal said recently. The Commerce and Industry Minister's remarks come days after Tata Group announced its intention to enter the semiconductor segment, amid significant shortage of semiconductors worldwide that has also started impacting various industries.

Speaking at an event organised by the Commerce Ministry, Goyal said that creating the semiconductor industry and strengthening the shipping industry will help push the 'Aatmanirbhar' or self-reliance initiative of the government. "There is a worldwide shortage of semiconductors and the government is very much focused on bringing the semiconductor industry to India… the government is committed to supporting both these sectors," he said, specifying that the other sector to be supported is the shipping industry.

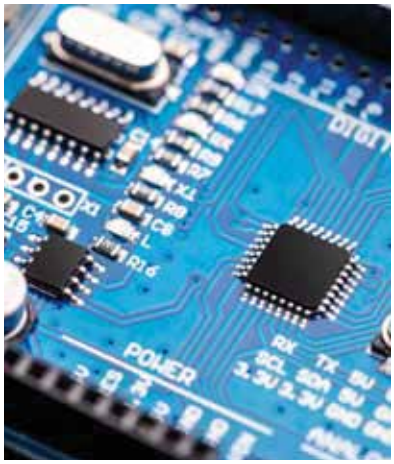

Image used for representation only. Courtesy: Envato Elements

Recently, Tata Sons Chairman N. Chandrasekaran announced that the conglomerate is mulling manufacturing the critical components in the semiconductor industry. The group's auto business is itself facing a shortage of semiconductors.

Goyal also hoped that "large corporates" will be taking interest in the shipping industry, which will give the right impetus to the crucial sector for the country's foreign trade.

Acknowledging that exim trade is facing issues on the container front, Goyal explained that much of it was due to global problems. The government is trying to be self-sufficient in manufacturing new containers and the state-owned Concor has come out with a policy for the same. As many as 34 domestic entities have evinced interest in the expression of interest floated by Concor for the container manufacturing contract and added that India has the potential to be self-sufficient on this front as well, he noted. The minister also assured the industry that there will be consistency in policies.

Courtesy: PTI

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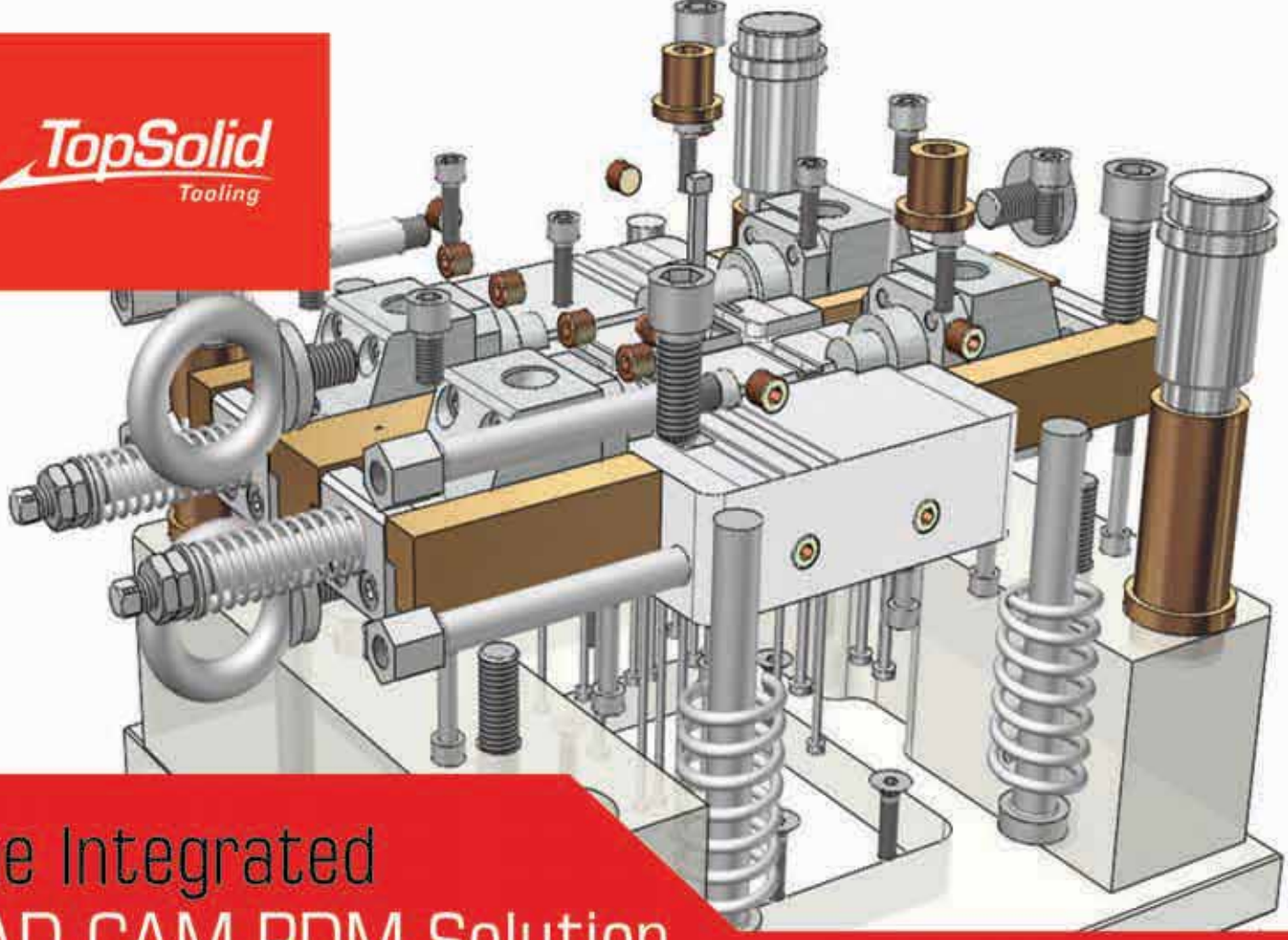

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Tata Motors delivers 35 state-of-the-art electric buses to BEST, as a part of the larger order of 340 e-buses

TATA Motors, India's largest commercial vehicle manufacturer, recently delivered 35 state-of-the-art Starbus electric buses, as a part of the larger order of 340 electric buses to Brihanmumbai Electric Supply and Transport (BEST). The 35-seater Tata Starbus electric AC buses were flagged off by the Hon'ble Chief Minister of Maharashtra, Mr. Uddhav Thackeray, in the presence of dignitaries from the Maharashtra state government, BEST, and Tata Motors, at an event at Mahim, Mumbai. The buses are procured by BEST under the government of India's FAME II initiative, and the delivery is a part of the first-ever Gross Cost Contract (GCC) by BEST. Tata Motors will be undertaking to build, deploy, maintain and operate the complete charging infrastructure along with the buses. The company will deliver the rest of the order in a phased manner, as per the schedule.

The 12-metre long, 35-seater Tata Starbus AC electric buses are equipped with advanced features for the comfort of the driver and the passengers like: 'Lift Mechanism' that extends an automated ramp for easy ingress and egress of specially abled passengers, along with ergonomic seats, roomy interiors, utility provisions like charging ports and wide entry and exit passages. The full-electric buses come with Intelligent Transport System (ITS), telematics system, regenerative braking system, amongst other features, for efficient and smooth operations. The buses have been extensively tested and validated by Tata Motors across varied terrains and conditions and are engineered to deliver high standard of performance.

Speaking about the vehicle deliveries, Shri Lokesh Chandra, IAS, General Manager, BEST Undertaking, said, "We are delighted to take delivery of 35 Starbus AC electric buses from Tata Motors. BEST's vision of introducing more and more electric buses will go a long way in reducing the tail-pipe emissions and will benefit millions of Mumbaikars. BEST stays committed to the Government's focus on electrification of the fleet."

Commenting on the occasion, Mr. Rohit Srivastava, Vice President, Product Line – Buses, Tata Motors, said, "We are pleased to deliver the 12-metre Tata Starbus electric buses to BEST, as a part of the larger contract. Tata Motors has been at the forefront of technology innovation with green fuels and has been leading the electric mobility solutions in the country. The delivery of these buses will further fortify our partnership with BEST and help in environment-friendly mass mobility for the city of Mumbai. The unique 'One Tata' initiative will leverage the core proficiencies of various Tata Group companies to offer the best comfort, performance and low cost of operations. The buses are equipped with modern features that will enable ease of use, and offer comfort and convenience with roomy interiors and ergonomic seats."

Tata Motors, with its state-of-the-art research and development facilities, has been leading from the front with alternate fuel technology to provide environment-friendly transportation and mobility solutions to the country, including battery-electric, hybrid, CNG, LNG and hydrogen fuel cell technology. The company has received an order of 15 hydrogen fuel cell buses from Indian Oil Corporation Ltd. Tata Motors' vast experience in electric vehicles, provides critical data to further upgrade the electric vehicle portfolio. It has supplied 525 electric buses across several states, which have cumulatively clocked more than 15 million kilometres.

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Expand Your HORIZONS

The Indian tooling industry has always basked and flourished in the opportunities provided by the automotive and auto components sectors. However, the COVID-19 pandemic presented unheard of challenges, which threw even global economies in a tizzy. Many businesses shut down, but there were many others, which decided to explore opportunities in other sectors. Here, we take a look at some sectors that toolmakers can consider exploring.

Kimberley D'Mello

The tooling industry in India plays a critical role in the manufacturing value chain. It provides dies and moulds needed to mass produce various parts and thereby forms the backbone of industrial growth. As per the latest estimates, the market size of the Indian tooling industry stands at ~INR 18,000 crore, with more than half of the total demand attributed to the automotive and auto components sectors.

So far, automotive and auto components have been the key sectors that the tooling industry has been catering to. In early 2020, when the pandemic struck, it disrupted the functioning of global economies and taught entrepreneurs a very important lesson — change is the only constant. While toolmakers can continue to focus on meeting the demands of the automotive and auto components sectors, the pandemic has brought to the fore the need to also look at diversifying their services. Here, we take a look at some of the sectors that have the potential to help toolmakers grow and thrive.

AEROSPACE & DEFENCE

Overview

The Indian aerospace and defence industries are growing significantly, presenting startups as well as existing players tremendous opportunities to grow. According to a report by the India Brand Equity Foundation (IBEF), "The Indian aerospace & defence (A&D) market is projected to reach ~US$ 70 billion by 2030, driven by the burgeoning demand for advanced infrastructure and government thrust."

The government has introduced a slew of investment-friendly policies to attract foreign direct investments for the aerospace and defence sectors. Among the other prominent initiatives is 'Aero India'. Through 'Aero India', industries get an opportunity to boost business, as they gain market insights and announce new developments while showcasing their unique capabilities. Besides this, campaigns such as 'Make in India' and 'Vocal for Local' promoting 'atmanirbharta' or self-reliance have also opened up a plethora of opportunities.

Did you know?

- **As India is rapidly modernising its military sector, the aerospace and defence industry is expected to consume electronics worth US$ 70-72 billion over the next decade in agreement with two industry associations—the National Association of Software & Services Companies and the India Electronics and Semiconductor Association.**
- **In the third and latest edition of FDI's Aerospace Cities of the Future 2020-21 rankings, Hyderabad was ranked number one by FDI Intellegence.com, a division of the Financial Times Group, under the category 'Top 10 Aerospace Cities in Cost Effectiveness'. The other Indian cities that also made it to the top 10 list include New Delhi and Bengaluru.**

Source: ibef.org

Latest Developments

MoD places supply order for 118 Main Battle Tanks Arjun Mk-1A for Indian Army

In September, the Ministry of Defence (MoD) placed an order with Heavy Vehicles Factory (HVF), Avadi, Chennai, for the supply of 118 Main Battle Tanks (MBTs) Arjun Mk-1A for the Indian Army. "The order, worth INR 7,523 crore, will provide a further boost to the 'Make in India' initiative in the defence sector and is a big step towards achieving 'Aatmanirbhar Bharat'," said a government press release. This production order to HVF, Avadi, opens up a large avenue in defence manufacturing for over 200 Indian vendors, including MSMEs, with employment opportunities to around 8,000 people, it stated.

Aerospace Engineers Pvt. Ltd. wins long-term Boeing contract

In September, Aerospace Engineers Private Limited (AEPL), a Tamil Nadu-based manufacturing company, bagged a long-time contract from global aerospace giant, Boeing, to supply critical aviation components, stated a PTI News report. "Investing INR 150 crore, AEPL would be setting up a new manufacturing facility, dedicated for civil aerospace production at Hosur over the next 24 months with a covered building space of 1,25,000 square feet and also expand its present Salem facility by 50,000 square feet. The additional facilities would create job opportunities for 1,000 youngsters, the government said," added the report.

Tata, Airbus sign INR 20,000-crore contract to manufacture military aircraft

A PTI News report revealed that in September, the Defence Ministry inked a nearly INR 20,000 crore deal with Airbus Defence and Space of Spain to procure 56 C-295 medium transport aircraft to replace the ageing Avro-748 planes of the Indian Air Force. "Under the deal, 16 aircraft will be delivered in a flyaway condition by the Airbus Defence and Space of Spain within 48 months of signing the contract. The remaining 40 planes will be manufactured in India by a consortium of the Airbus Defence and Space and Tata Advanced Systems Limited (TASL) within 10 years of signing the contract, officials said," added the report.

AGRICULTURE

Overview

The agriculture industry has witnessed a dramatic change over the past few years. A major factor influencing this change has been the availability of agriculture equipment at reasonable prices, which makes them affordable for small farmers with restricted access to modern equipment, stated a report by IMARC Group, titled 'Indian Agricultural Equipment Market: Industry Trends, Share, Size, Growth, Opportunity and Forecast 2018-2023'. "Various mechanical equipment are available in the market for performing day-to-day farming activities like tilling, sowing, irrigating and threshing. As they help in reducing the manual work and improving crop yield, several farmers across the country are switching to these machines," added the report.

Latest Developments

Sonalika invests INR 200 crore for new plant in Himachal

Tractor manufacturer Sonalika recently said that it invested INR 200 crore to come up with a new manufacturing facility spread across 29 acres to produce harvesters at Amb in Himachal Pradesh, revealed a PTI News report. "Our new plant at Amb, HP, has been installed with world-class technologies to manufacture harvesters," Sonalika Group Executive Director Raman Mittal said in a statement.

KisanKraft Ltd. invests over INR 75 crores in its upcoming Nellore facility

KisanKraft has invested over INR 75 crores in its upcoming Nellore facility in Andhra Pradesh. "We have set up a 46-acre campus at Nellore (AP, India) with state-of-the-art facility for manufacturing Agricultural Machinery, R&D, Testing, Skilling, Service, Warehousing," Mr. Ravindra Agrawal, MD, KisanKraft told Vizag Industrial Scan. The Nellore plant, once ready, shall house four new industrial buildings, which will be used to indigenously manufacture engines, water pumps and intercultivators. The upcoming facility is likely to provide employment to close to 200 people, added the report.

SIETZ Technologies' Haryana-based new agri implements plant is operational

In February this year, SIETZ Technologies India Pvt. Ltd., commenced operations at its newly upgraded manufacturing plant at Prithla Industrial Area in Haryana, reported Agro Spectrum India. Equipped with state-of-the-art technology, the plant aims to expand SOILTECH range of products from rotary tillers, disc harrows, disc ploughs & MB ploughs to new products such as super seeders reversible ploughs, laser levelers and mulchers. The new plant has an advanced manufacturing assembly line all the way from fabrication to the final testing, informed the report.

Did you know?

- **The agricultural implements market in India has been categorized on the basis of product type including tractors, rotavators, threshers and power tillers. Amongst these, tractors dominate this market.**
- **On a regional basis, the Indian agricultural implements market has been segregated into North India, South India, West and Central India, and East India. Presently, North India is the leading region with the highest level of mechanization.**

Source: IMARC Group report on 'Indian Agricultural Implements Market: Industry Trends, Share, Size, Growth, Opportunity and Forecast 2021-2026'

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ELECTRIC VEHICLES

Overview

The need to reduce carbon footprint has prompted the automotive industry to manufacture Electric Vehicles (EVs). Industry experts forecast that EVs will most likely dominate the automotive landscape in the coming years. Compared to vehicles that run on diesel or petrol, EVs emit less greenhouse gases, which make them an environment-friendly option. "While many countries have included EVs as an element of transportation policy, their responses have varied according to their stage of economic development, energy resource endowments, technological capabilities, and political prioritization of responses to climate change. In India, a particular set of circumstances, which are conducive to a sustainable mobility paradigm, have created an opportunity for accelerated adoption of EVs over ICE [internal combustion engines] vehicles," explained a NITI Aayog report titled, 'Zero Emission Vehicles (ZEVs): Towards A Policy Framework'.

Latest Developments

Ultraviolette Automotive to invest INR 500 crore to scale up business

According to a PTI News report, electric two-wheeler maker, Ultraviolette Automotive Pvt. Ltd., will invest INR 500 crore in the next three to five years to scale up business, including setting up of a new manufacturing unit and product development, according to top company officials. The company, in which TVS Motor Company is an investor, is setting up its manufacturing and assembling facility near Electronics City, Bengaluru, from where it will start producing its high-performance electric motorcycle - the F77 - in the first quarter of 2022.

Mahindra to invest INR 3,000 crore on electric vehicle business in next 3 years

A PTI News report released in April this year stated that Mahindra & Mahindra Ltd. will put in fresh investments to the tune of INR 3,000 crore on its electric vehicles' business in the next three years, while it looks for more alliances and partnerships in the vertical, according to a top company official. "While it has already opened its electric technologies plant in Bengaluru that produces battery packs, power electronics and motors, it has also invested in a new manufacturing unit at its Chakan plant to produce EVs," informed the report.

Omega Seiki to invest INR 800 crore to manufacture EVs

A news report in the Hindu quoted Uday Narang, chairman of Omega Seiki Mobility, an electric vehicle (EV) company of the Anglian Omega Group, divulging the company's plans to invest INR 800 crore in manufacturing EVs and to expand operations beyond India. "We are a solutions provider and we will supply anything that the customers would want… we are addressing the range anxiety issue as well as laying out charging infrastructure," the news report quoted Mr. Narang.

Did you know?

- **e2W, e4W, EV component producers, electric commercial vehicles, and last-mile delivery firms invested a total of INR 25,045.31 crore (US$ 3.37 billion) between January and July 2021.**
- **According to an independent research undertaken by the CEEW Centre for Energy Finance (CEEW-CEF), if India meets its 2030 objective, the EV market in India will be valued at US$206 billion by 2030. This will necessitate a total investment in vehicle manufacture and charging infrastructure of more than US$180 billion.**

Source: ibef.org

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MEDICAL EQUIPMENT

Overview

The COVID-19 pandemic has created an unprecedented increase in demand for medical devices. "There is a huge gap in the current demand and supply of medical devices in India and this provides a significant opportunity for manufacturing devices in India. At present, many medical device manufacturers (domestic and international) are chasing this massive under penetration of medical devices in India as a significant growth opportunity," reported the India Brand Equity Foundation (IBEF), a Trust established by the Department of Commerce, Ministry of Commerce and Industry, Government of India.

Healthcare and medical device sectors have witnessed substantial growth over the past decade. "India is among the top 20 markets for medical devices worldwide. The market is expected to increase at a 37% CAGR to reach US$ 50 billion in 2025, from INR 75,611 crore (US$ 10.36 billion) in 2020," added the report.

Government Initiatives

- In July 2021, the government announced to build a medical park in Uttar Pradesh, which is expected to generate an estimated INR 500 crore (US$ 67.13 million) business in the state.
- In June 2021, the Quality Council of India and the Association of Indian Manufacturers of Medical Devices launched the Indian Certification of Medical Devices 13485 Plus scheme to undertake verification of the quality, safety and efficacy of medical devices
- To boost domestic manufacturing of medical devices and attract huge investments in India, the Department of Pharmaceuticals launched a PLI Scheme for domestic manufacturing of medical devices, with a total outlay of funds worth INR 3,420 crore (US$ 468.78 million) for the period FY21-FY28.

Did you know?

India has a 75%-80% import dependency on medical devices, with exports at INR 14,802 crore (US$2.1 billion) in 2019 and is expected to increase at a CAGR of 29.7% to reach INR 70,490 crore (US$10 billion) in 2025.

Source: ibef.org

Market Size

- The medical devices sector in India comprises large multinationals and small and midsized companies
- The Government of India has commenced various initiatives to strengthen the medical devices sector, with emphasis on research and development and 100% FDI for medical devices to boost the market. From April 2000 to March 2021, FDI inflow in the medical and surgical appliances sector stood at US$ 2.19 billion.

Source: ibef.org

- On March 25, 2021, the Department of Pharmaceuticals released a revised notice on the Public Procurement Order (PPO), incorporating 19 medical devices in the revised guidelines of the PPO, which is expected to improve domestic medical devices manufacturing (and strengthen 'Make in India') and reduce import bills by ~INR 4,000 crore (US$ 538.62 million).

Source: ibef.org

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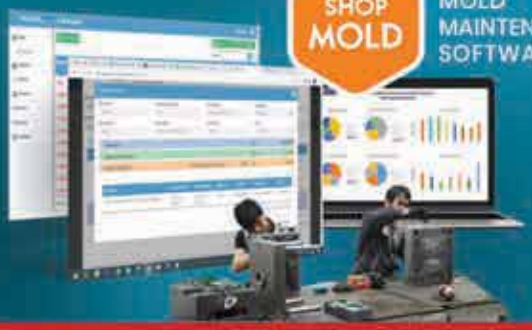

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RAILWAYS

Overview

The Indian Railways is among the largest rail networks in the world. "The Government of India has focused on investing in railway infrastructure by making investor-friendly policies. It has moved quickly to enable Foreign Direct Investment (FDI) in railways to improve infrastructure for freight and high-speed trains. At present, several domestic and foreign companies are also looking to invest in Indian rail projects," stated a report by the India Brand Equity Foundation.

Latest Developments

Godrej announces partnership with Indian Railways

In August, Godrej announced a partnership with Indian Railways to help halve the time taken to assemble a coach to 12 hours and is eyeing a INR 100 crore revenue from the industrial machines segment in the next three years, said a PTI News report. "Godrej Tooling will be designing and developing the universal coach assembly station as an indigenous solution for coach assembly fabrication in the Marathwada Railcoach Factory at Latur in Maharashtra," according to a statement.

Indian Railways gearing up for critical and super critical projects

According to ibef.org, the Indian Railways is likely to deliver 58 super critical as well as 68 critical projects worth more than INR 1,15,000 crore (US$ 15.44 billion) in the next few years. 27 super critical projects will be completed by December 2021, while two projects will be handed over by March 2022. 29 super critical projects—spanning 1,044 kms and costing INR 11,588 crore (US$ 1.5 billion)—have been commissioned. Four projects worth INR 1,408 crore (US$ 189.05 million) have been completed and the remaining projects are targeted for completion by March 2024.

Did you know?

The Ministry of Railways plans to monetise assets including Eastern and Western Dedicated Freight Corridors after commissioning, induction of 150 modern rakes through PPP, station redevelopment through PPP, railway land parcels, multifunctional complexes (MFC), railway colonies, hill railways and stadiums.

Source: ibef.org

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Opportunities await

The demand for tooling is poised to grow in future. "Countries with superior capabilities and capacities in tooling will be at an advantage. Hence, it becomes imperative to facilitate the growth of Indian toolmakers and enable access to new customers beyond national borders. Tooling localisation would also result in many economic benefits such as employment creation, development of indigenous machine makers, better R&D landscape and more efficient supply chains," stated a recently released report on the Indian Tool Room Industry by Nomura Research Institute Consulting & Solutions India Pvt. Ltd (NRI Consulting) and TAGMA (Tool and Gauge Manufacturers Association).

However, there are some factors that toolmakers need to focus on. They include:

- **Equipping themselves with the required infrastructure:** Often, toolmakers lose out on good contracts because their tool rooms lack the required infrastructure. If toolmakers are looking to cater to other sectors, they have to possess the necessary machines, technologies, etc.

- **Quality of tool design:** The importance of quality tool design should never be underestimated. The right quality of tool design can bring down costs and ensure efficiency in the manufacturing process. Besides, designing tools are user-friendly.

- **Skill development:** As manufacturing across the globe veers towards digitalization, tool rooms need to adopt IIoT technologies if they don't want to be left behind. Employees working in tool rooms need to upskill themselves to meet the evolving requirements of the industry.

Toolmakers need to gear up. The situation now may seem very challenging. But, in the long run, several opportunities are likely to present themselves. And, when the opportunities arrive, toolmakers need to be ready to meet the global demands.

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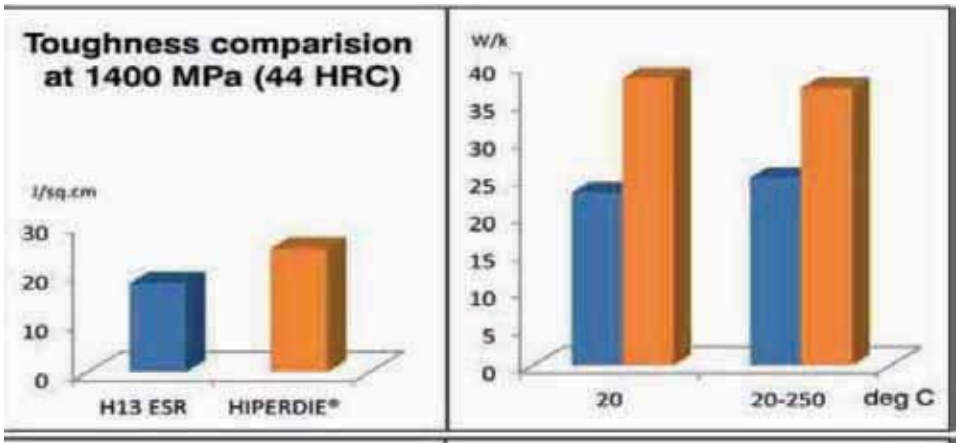

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'Toolmakers must embrace Additive Manufacturing technology'

"It is going to be a great addition to their existing services, which will enhance their productivity. It may also increase their tools' life. This, in turn, will help them make more tools," says Dr. Dheepa Srinivasan, Chief Engineer, Pratt and Whitney R&D Center.

Nishant Kashyap

Q Could you please elaborate on the trends and developments in the field of Additive Manufacturing?

Additive Manufacturing (AM) has been utilised extensively as a mainstream manufacturing technology over the past three to four years. Gone are the days when it was only looked at from a prototyping perspective. Today, AM has witnessed tremendous developments in terms of speed and the materials it can process. That's why we can now see AM in a main production environment.

I started working with AM to make parts for aerospace and power generation gas turbines in 2008-09. This was much before it became a buzzword. At that time, we didn't have any conventional manufacturing methods that could give us the expected results. We faced several losses in terms of productivity and wastage. These are very expensive parts and so, AM became the most feasible solution that we could use. Moreover, back then, we didn't have any service bureaus in India with metal 3D-printing machines, who could help us with this project. We collaborated globally to explore R&D to enable AM as a unique manufacturing solution.

By 2015, India had the first metal 3D-printing service bureau. Today, I am happy that there

are several entrepreneurs and OEMs, who have metal 3D-printing machines and this technology has enabled many new start-ups to mushroom. I think that by now, there will be close to 150 metal 3D-printing machines operating in India, including academic institutions, national labs, private companies and industries. India has made good progress over the past few years. There is a good level of understanding of the technology and now, more and more companies are increasing 3D-printing content in their manufacturing in India.

In terms of technological trends, there is a growing interest for hybrid manufacturing, development of new materials to expand the adoption of AM, and machines with enhanced productivity and a larger footprint.

Q What are the various performance metrics in the aerospace industry?

In the aerospace industry, I think, there are 5-6 key performance metrics for AM. They are:

1. **Simplification of parts:** Combining many parts and manufacturing operations into one, via near net shape manufacturing.

2. **Reducing weight:** Weight reduction in the aerospace industry has always been the biggest concern. Via design for additive manufacturing (DFAM), AM offers a unique opportunity for new light weight designs, that was unthought of before.

3. **Reduced wastage:** Avoiding unnecessary wastage by machining away the bulk.

4. **Efficiency and Performance enhancement** by adopting newer designs via near net share forming.

5. **Productivity enhancement:** Via all the above acceleration of new designs to a product.

Q Besides the cost factor, AM has certain limitations. Do you think these could be some of the factors that are discouraging SMEs and the manufacturing industry from adopting AM?

Compared to conventional manufacturing methods, AM is definitely expensive (at least at present). It's not only the machines, but also the overall process that makes it expensive. One of the challenges is, it is still a low throughput process and is nowhere close to machining methods for mass production. Additionally, it cannot process some of the highly used materials, such as mild steel. And, almost every 3D-printing method needs some kind of post-processing. However, AM has unique advantages that make it a useful technology for many applications. I feel that when the conventional methods and AM go hand-in-hand, it will prove to be beneficial for the entire manufacturing community.

"I think one of the best users of AM could be the tooling industry. Using AM to fabricate tooling can not only reduce lead time and costs, but also improve functionality and enhance the ability to customise. Because tooling is often produced in low volumes and in complex shapes specific to a particular usage, AM is becoming increasingly attractive as a tooling fabrication method."

Machining methods are proven technologies for mass production. They have gone through huge developments over a period of time and cannot be replaced entirely by AM. But yes, AM may take away some part of the job that was otherwise done by machining.

Q Some toolmakers opine that AM could replace tooling up to a certain point, while others feel it could add a lot of value to the toolmaking process. Can both these scenarios work together?

I think one of the best users of AM could be the tooling industry. Using AM to fabricate tooling can not only reduce lead time and costs, but also improve functionality and enhance the ability to customise. Because tooling is often produced in low volumes and in complex shapes specific to a particular usage, AM is becoming increasingly attractive as a tooling fabrication method. AM, for tooling, covers a range of applications, such as tooling used in casting and machining processes, and jigs & fixtures, among others. With such a wide range of applications, many industries have already embraced the use of AM for tooling, including automotive, aerospace and medical, defence, consumer products, etc.

In fact, the tooling fraternity appreciates conformal cooling by AM, as it has significantly

AM has unique advantages that make it a useful technology for many applications. I feel that when the conventional methods and AM go hand-in-hand, it will prove to be beneficial for the entire manufacturing community

improved the overall performance. It reduces time and is effectively able to churn out complex shapes, which was otherwise impossible to achieve using conventional methods.

Q So, let's say, there is a small tool room, which is equipped with all the necessary machines and technologies to manufacture moulds for the automotive and aerospace industries. And, the owner of the tool room wants to start AM services at his own premises. How can he do so in-house?

It is not very difficult to set up AM, but it will be faster on the learning curve and adoption for the tool room to utilize the experience that service providers have already gained via dedicated resources that have been trained for this, by building on the right skill set. Based on their experience, the toolmaker can invest in independent resources, both machines and people to start on their own. Nowadays there are courses offered by academic institutions as well as other organizations to develop specific design and manufacturing skills in Industry 4.0. So having a skilled resource is important if you plan to start AM services.

Q It is believed that digital manufacturing will play a key role in transforming the current manufacturing centre. What role will AM play in this transformation?

AM is one of the four pillars of Industry 4.0, which has been referred to as digital manufacturing by many. I have been to many steel plants, where they practise organic automation without calling it as digital. It is only in the last four or five years that it got coined as digital and was presented as the next revolution in the industry.

Fundamentally, the conventional six sigma practice has always stressed upon reducing defects and ensuring productivity. The inherent advantage of AM is that it reduces wastage and defects, thereby ensuring productivity. So, I believe, it is going to play a huge role in how we develop products in the future. With continuous technology innovation, it is going to get faster and cheaper.

Q Any suggestions to toolmakers on adopting AM?

I would say that toolmakers must embrace this technology. It is going to be a great addition to their existing services, which will enhance their productivity. It may also increase their tools' life. This, in turn, will help them make more tools. Of course, there is a constraint at the moment. For example, if you want to make a 6x4 feet forge tool, it's not possible to do so in one piece. You will have to make it in parts and join it.

Overall, my take would be that AM technology still has limitations and is expensive, but it's going to add lots of value in the coming days. The benefits, especially, in the field of conformal cooling are mind-blowing from the standpoint of design. Also, toolmakers need to stay abreast with the latest developments and adopt futuristic technologies in order to remain competitive in the global platform.

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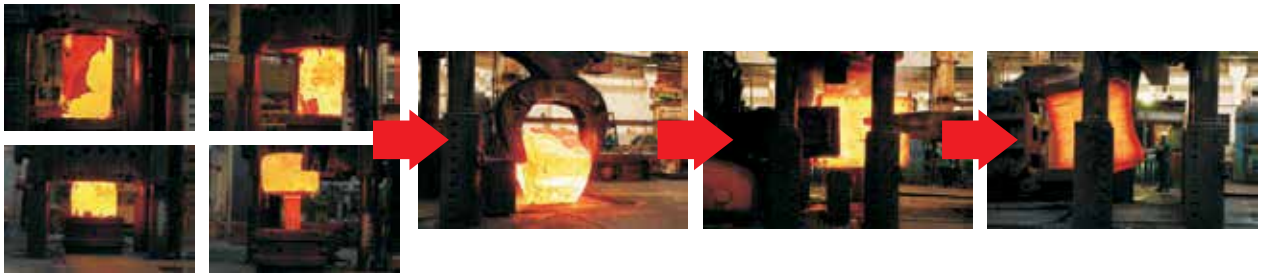

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'We need to have policies in place in order to uplift the Indian tooling industry'

"Currently, the costs of land and initial setup are high. Additionally, the interest rates are high too. So, those who wish to take a loan to start their tool room business are discouraged from doing so as all these factors deter them," says Abhijeet Raut, Director, Abhijeet Group.

Amol Padhye

Q How would you describe the present state of the Indian tooling industry?

The Indian tooling industry, like any other industry, has been adversely impacted by COVID-19. When the pandemic struck, our operations were stalled for almost two months. After the first wave, there was a huge demand for tools in India. However, owing to the unavailability of labour and production engineers, companies found it difficult to meet the demands and deliver tools on time.

When things began to improve, the second wave hit. Once again, companies faced a shortage of manpower; there were lockdowns and production shutdowns. OEMs, too, delayed their projects and the demand for tools got affected. Currently, in the Indian tooling industry, the demand is less and companies are having spare capacity.

Q As per reports, the market size of the Indian tool room industry is estimated to be ~INR 18,000 crore with ~70% of the demand being met domestically and ~30% through imports. What can Indian toolmakers do to reduce imports?

Yes, a high percentage of the demands are being met through imports. A majority of tools including zero parting lines, bumpers, and IPs, among others, are being imported. Besides these, some critical harden tools (like those for lenses) are being imported too because there is a shortage of skilled manpower to handle such critical tools.

We need to work on many aspects, such as enhancing our capacities, skills and quality, in order to earn the confidence of OEMs. Most importantly, we definitely need to enhance our capabilities and capacity to cater to both the Indian as well as global tooling demands.

Q The industry is facing many challenges related to skilled manpower, finance, and lack of industry-friendly policies, among others. What, according to you, are the major hurdles faced by the tooling industry?

The tooling industry is the backbone of the manufacturing industry. That is why the tooling industry needs specific policies and support on the lines of what the tooling industries in China, Taiwan and South Korea receive. The governments in those countries support tooling

suppliers with quality infrastructure, finance with low interest rates and a lot of export incentives. Also, those countries have dedicated clusters for the tooling industry, where all the players of the ecosystem are present. This helps them in manufacturing tools efficiently and without wasting much time.

We need to have policies in place in order to uplift the Indian tooling industry. Currently, the costs of land and initial setup are high. Additionally, the interest rates are high too. So, those who wish to take a loan to start their tool room business are discouraged from doing so as all these factors deter them.

Q We definitely need much more policy support. Can you elaborate on the policies and schemes to support the Indian tooling industry?

I don't think there are any specific policies for the Indian tooling industry. Along with TAGMA, we need to approach the government and communicate the same to the authorities concerned.

Q How can campaigns like 'Aatmanirbhar Bharat' and Production Linked Incentive (PLI) Scheme help domestic toolmakers in the long run?

I think both the initiatives are good for the tooling industry. 'Aatmanirbhar Bharat' has prompted companies to look for Indian alternatives, which otherwise were imported into the country. With the PLI Scheme, we will see global players coming and setting up manufacturing plants in India. This will generate a huge demand for tools in India. It will also help us diversify and think of venturing into other sectors such as medical, aerospace, drones, and electronics, among others.

Q Automotive is the largest consumer of tooling accounting for almost 60% of the total demand. However, the new trends in automotive such as EVs, BS-VI, shared mobility, etc. are generating uncertainties among the suppliers. In such cases, what are the other emerging sectors that toolmakers should explore?

Other than automotive, defence and aerospace sectors are growing rapidly in India and are likely to generate good business for us in the coming years. Also, electric vehicles (EV) are something we should be aware of. We must be prepared for the EV revolution. Apart from that, packaging is one industry that has good demand and most of the tool suppliers are already supporting it.

Q What are the technologies and trends in the tooling industry? How will the emergence of industry 4.0, hybrid manufacturing, and machine learning shape the industry?

Internet of Things (IoT) will definitely help the tooling industry to improve the efficiency of machines. This will, in turn, enhance their capacity as well. Also, there is a technology like Steam Injection Moulding for which major moulds are being imported. We need to start developing such technologies in India through collaborations.

Q Do you think the COVID-19 situation and geo-political situation could help India?

It should help India. There are a lot of policy changes among OEMs, like Maruti and Mahindra, as they have aggressively started looking for suppliers in India. For example, earlier, Lumax was getting tools from China for their headlamp housing project. Now, we are making tools for Lumax. This is just one example. I am sure there are many others.

Q What are your plans for the future?

Recently, we added advanced machines to our tool room. As a result, our lead time change has from 70 days to 50-55 days for two-wheeler tooling business. Going forward, we plan to replace our old machines with state-of-the-art ones.

'A host of other industries are growing rapidly in India'

"Consumer appliances is one market that I feel will generate huge opportunities for toolmakers. We can also look at medical appliances' parts, which are mostly imported. Aerospace and defence are two other promising sectors. We must keep an eye on these developments and develop our skills accordingly," says Guruprasad Puranmath, Director – Technical, Mutual Industries.

Amol Padhye

Q How would you describe the present state of the Indian tooling industry?

The Indian tooling industry is growing. Currently, toolmakers have been receiving a good number of orders. The only challenge for them is the poor cash flow. In order to sustain in this business, apart from a good number of orders, timely payment is equally important.

The Indian tooling industry is witnessing good requirements and the future also looks promising. Interestingly, a lot of good enquiries are coming in from non-automotive sectors, which is good sign for the industry. Overall, I see, exciting times ahead for Indian toolmakers.

Q As per reports, the market size of the Indian tool room industry is estimated to be ~INR 18,000 crore with ~70% of the demand being met domestically and ~30% through imports. What can Indian toolmakers do to reduce imports?

Yes, this 30% is a huge number. Mostly, these imports are for the tools where expertise, technology availability and capacity could be a question with Indian toolmakers. However, things are changing rapidly, and many Indian tool rooms are supplying world-class tools to large companies in India and overseas as well.

We understand that we still need to catch up, but I would request customers to gradually start approaching Indian toolmakers for the tools they are importing. We definitely have got the required capabilities. However, customers can start with small tools and analyse its going with Indian toolmakers. This will help them in the long run. Also, I would urge large companies to handhold toolmakers, offer them the required knowledge and other support. This, in turn, will help OEMs in cutting cost and time by procuring tools within the country.

Q How do you rate skill development programs in India?

Indian engineers are highly skilled and are very adaptive. Yes, we need to build on our expertise, but we are getting there. In the developed world, engineers opt for a certain stream and work throughout their career in the same stream. In India, however, engineers pick up various things

and try to learn it. This helps in overall project management, but it also has a side-effect—they do not develop expertise. In my opinion, we should aim for expertise and then try to learn things that matter.

It is also important that toolmakers conduct internal training programs for their staff. We should develop skilled manpower within the organisation instead of only headhunting. Also, we cannot expect the government to arrange skill development programs all the time. We, as an industry, need to come together and help each other in skill development. Once we have all these things in place, I am sure we will have a huge number of skilled manpower.

Q Can you elaborate on the policies and schemes to support the Indian tooling industry?

As per what I know, I don't think there is any policy specifically for the Indian tooling industry. There are schemes for MSMEs. While most tooling companies fall under MSMEs, the schemes are not sufficient. To achieve the expected scale in terms of business growth for tooling MSMEs, good policy support is required.

The tooling industry is a very important industry for the development of the manufacturing sector in India. We need support from the government in terms of better taxation rates, export incentives, infrastructure, and availability of finance with low interest rates.

Lots of critical machines and tool steels are imported in India, but the taxes are very high for these, which makes our overall costing and timeline higher. On the other hand, if companies are importing our tools, the imports taxes are not much. This definitely needs amendment.

The interest rates on loans and finance is another crucial factor. Companies in China, South Korea, and Taiwan enjoy low interest rates on finance, which helps them in establishment. They don't have to worry about loans and EMIs and can freely focus on building their business and gaining expertise. In our case, the interest rates are in double digits, which is huge. The tooling industry is capital intensive and any investment will attract high monthly EMIs. Because of this, capacity enhancement becomes a big challenge for Indian players.

Q How can campaigns like 'Aatmanirbhar Bharat' and Production Linked Incentive (PLI) Scheme help domestic toolmakers in the long run?

Campaigns like 'Aatmanirbhar Bharat' and the PLI Scheme are good initiatives. The 'Aatmanirbhar Bharat' campaign is very encouraging, as many large companies have started looking for domestic suppliers. This will have long-term benefits for both small suppliers as well as large OEMs. Eventually, it will prove to be beneficial for the economy, as it will increase the manufacturing output and consumption. The impact of this campaign is evident. Many OEMs have started enquiring about domestic suppliers. As toolmakers, we need to capitalise on this situation and be ready to deal with the future demands.

The PLI Scheme is an excellent way to attract FDIs, create employment opportunities, and generate business for small manufacturers. Also, since most toolmakers are dependent on the automotive industry, the PLI Scheme will help them work towards diversification. However, as I mentioned earlier, Indian toolmakers need to work on building the required capabilities, capacities, and skills, if they want to reap the benefits of this.

Q Automotive is the largest consumer of tooling, accounting for almost 60% of the total demand. However, the new trends in automotive such as EVs, BS-VI, shared mobility, etc. are generating uncertainties among the suppliers. In such cases, what are the other emerging sectors that toolmakers should explore?

The automotive sector is the biggest consumer, but there are a host of other industries that are growing rapidly in India. Consumer appliances is one market that I feel will generate huge opportunities for toolmakers. We can also look at medical appliances' parts, which are mostly imported. Aerospace and defence are two other promising sectors. We must keep an eye on these developments and develop our skills accordingly.

Apart from this, technological developments are also taking place in the industry. We need to be aware of them. For example, there is additive manufacturing. We should not limit ourselves to conventional manufacturing techniques but must adopt new technologies if we want our businesses to grow.

Q What are the technologies and trends in the tooling industry? How will the emergence of industry 4.0, hybrid manufacturing, and machine learning shape the industry?

There is continuous upgradation in nesting and mould flow related software. In terms of machines, the high rpm multi-axis machines are always in demand. We also use EDM machines with double head or twin head. Also, double colour mould is in demand these days and we have got the expertise in it.

Regarding industry 4.0 and AI, I would say these technologies are the future of manufacturing. However, there is a step-by-step process to it. Adoption of these technologies depends on where there is a need for high volumes and a limitation of skilled manpower. Companies should gradually adopt these technologies into their system.

Q What short and long-term opportunities do you see amid this COVID-19 crisis and growing geopolitical situation?

Looking at the positive side, I would say COVID-19 has given us the time that we always wanted. During the lockdown, most of our employees returned home and spent quality time with family. They were always connected with us and worked hard. We never experienced any productivity loss, but rather achieved newer heights. During this lockdown, we also spent time on training and developing our employees. They are definitely more confident now.

In the long term, I feel it will help us bag better and bigger business prospects. World-over companies have realised that they cannot put all their eggs in one basket. They need to diversify their supplier network and no longer want to depend on one country or one supplier. Thanks to this trend, Indian companies are witnessing good enquiries from the developed world for custom part manufacturing and moulds. Indian companies need to rise to the occasion and grab the opportunities.

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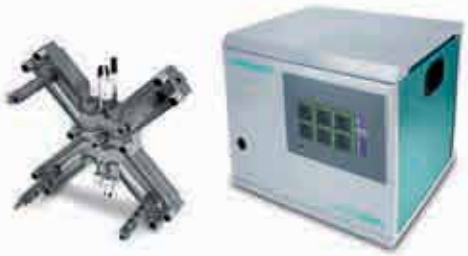

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YoY GDP expansion forecast at deceptively high 20.0% in Q1 FY2022: ICRA

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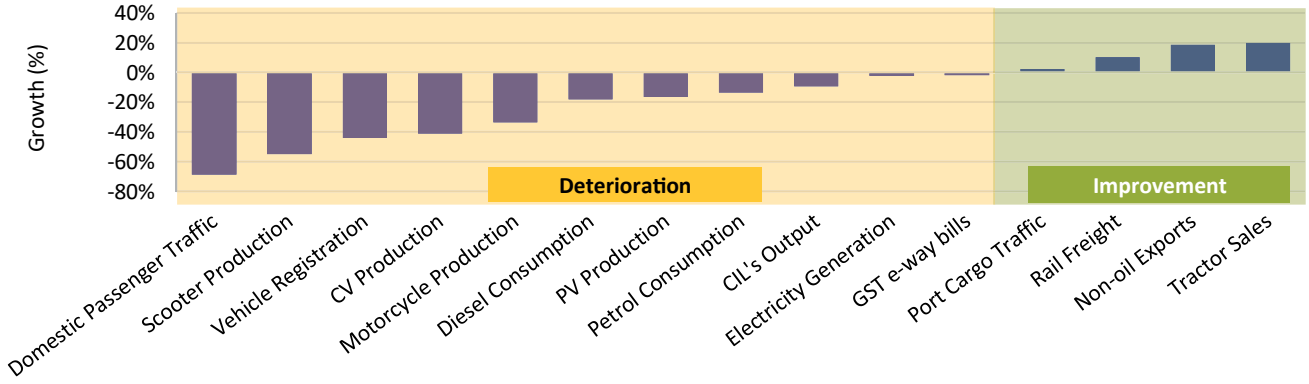
Courtesy Envato Elements

Economic activity boosted by robust government capex, merchandise exports, demand from farm sector. Low base of nationwide lockdown conceals impact of second wave of COVID-19, according to ICRA.

ICRA has forecast the year-on-year (YoY) growth of the GDP and gross value added (GVA) at basic prices (at constant 2011-12 prices) at 20.0% and 17.0%, respectively, in Q1 FY2022, benefitting from healthy Central and state Government capital spending, robust merchandise exports and resilient demand from the farm sector. Regardless, the muted base of last year's nationwide lockdown has aided in concealing the impact of the second wave of COVID-19.

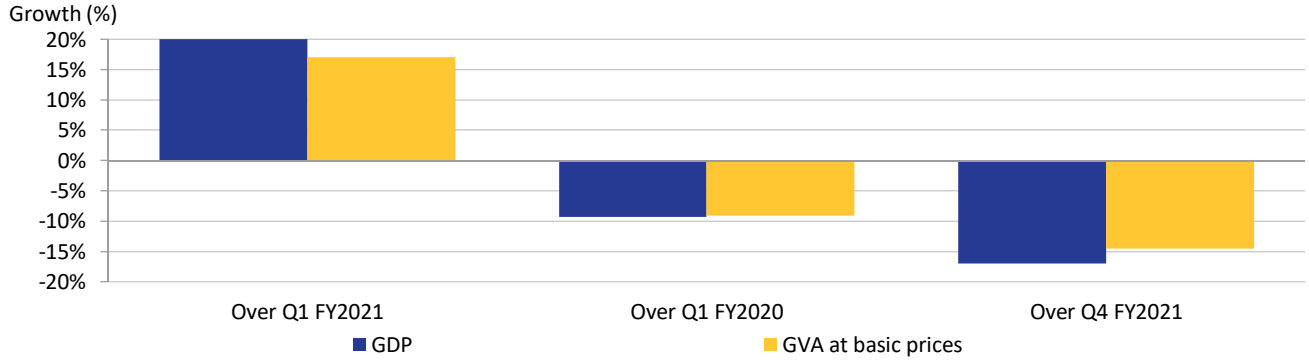
According to Ms. Aditi Nayar, Chief Economist, ICRA Ltd: "Based on our assessment of volumes and available earnings, we have forecast the GVA expansion in industry at a considerable 37.5% in Q1 FY2022, led by construction and manufacturing, which experienced significantly less curbs in the just-concluded quarter compared to the situation during last year's stringent nationwide lockdown. In particular, construction activity benefitted from the healthy Central and the state government capex

Exhibit 1: Performance of economic indicators in Q1 FY2022 relative to Q1 FY2020



***Source**: SIAM; DGCA; CEA; Ministry of Commerce, GoI; Indian Railways; IPA; CIL; CMIE; Vaahan portal; GSTN; PPAC; CEIC; ICRA Research*

Exhibit 2: ICRA's forecasts of real GDP and GVA growth in Q1 FY2022* over Q1 FY2021, Q1 FY2020 and Q4 FY2021



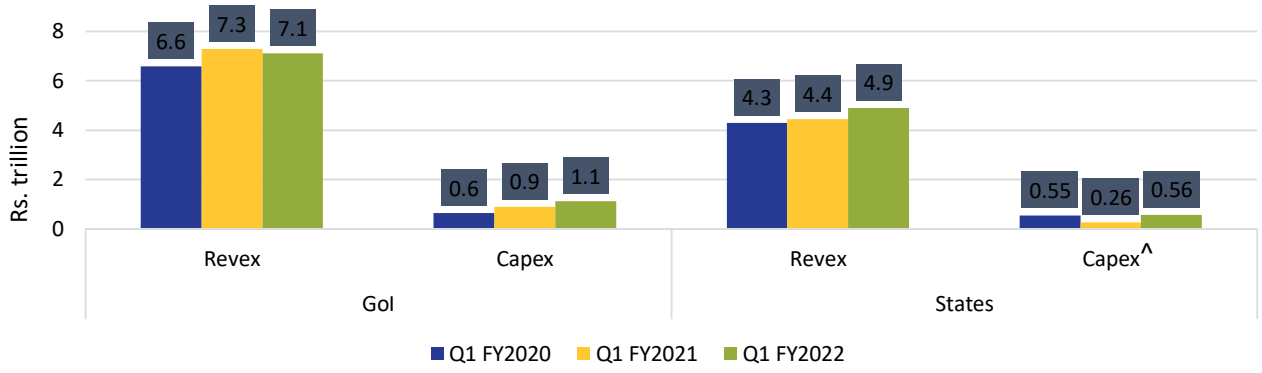
Q1 FY2022 is based on ICRA's projections; **Source: NSO; CEIC; ICRA Research*

spending in Q1 FY2022, which exceeded even the pre-COVID levels of Q1 FY2020."

"With a contraction in the Government of India's (GoI's) non-interest non-subsidy revenue expenditure and continued impairment in demand for contact-intensive services, we expect the GVA in the services sector to post a relatively lower, albeit double-digit expansion of 12.7% in Q1 FY2022. The GVA growth in agriculture, forestry and fishing is likely to print at 3.0%, benefitting from the healthy rabi harvest. Despite the higher incidence of COVID-19 cases in rural India in the second wave, healthy crop output and procurement, as well as higher minimum support prices appear to have buffered the farm sector's demand during this challenging period. We expect the overall GVA growth in Q1 FY2022 to be as high as 17.0%. Given the sharp rise in the indirect taxes, we anticipate that the National Statistics Office (NSO) may peg the GDP expansion at a relatively higher 20% for Q1 FY2022. In our view, the GVA growth provides a better gauge of the economic performance than the GDP in the current year," Ms. Nayar said.

"Nevertheless, the double-digit expansion expected in YoY terms in Q1 FY2022 is deceptively high, as it benefits inordinately from last year's contracted base. We forecast GVA and the GDP to have shrunk by around 9% each in Q1 FY2022, relative to the pre-COVID level of Q1 FY2020, highlighting the

Exhibit 3: Revenue expenditure and capital expenditure of the GoI and 19 state governments* (Rs. trillion)



These include Chhattisgarh, Gujarat, Himachal Pradesh, Haryana, Jharkhand, Kerala, Karnataka, Maharashtra, Madhya Pradesh, Nagaland, Odisha, Punjab, Rajasthan, Sikkim, Tripura, Telangana, Tamil Nadu, Uttarakhand and Uttar Pradesh; ^Capital outlay by states; **Source:** CGA; ICRA Research*

tangible distress being experienced by economic agents in the less formal and contact-intensive sectors. Additionally, the impact of the second wave of COVID-19 can be seen in the likely sequential contraction of ~15% in the GVA in Q1 FY2022, compared to Q4 FY2021," added Ms. Nayar.

The GoI's capital expenditure and net lending stood at INR 1.1 trillion in Q1 FY2022, a YoY growth of 27.6%, and a sharp 78.4% higher than Q1 FY2020, when the model code of conduct was in place during the parliamentary elections. Moreover, the capital outlay of 19 state governments, for which the CGA data is available, stood at INR 0.6 trillion in Q1 FY2022, more than twice as high as Q1 FY2021 (+120.0%) reflecting the lockdown base effect (-53.4% in Q1 FY2021), and a mild 2.6% higher than the pre-COVID level of Q1 FY2020.

Merchandise exports expanded to US$95.4 billion in Q1 FY2022 from US$81.1 billion in Q1 FY2020 and US$51.3 billion in Q1 FY2021, capitalising on the robust economic rebound in major export destinations, following the widening vaccine coverage, and also boosted by the elevated global commodity prices. Moreover, services exports improved to US$54.6 billion in Q1 FY2022 from US$49.1 billion in Q1 FY2021, while trailing the US$55.3 billion in Q1 FY2020, given the continuing impact of the pandemic on sectors such as tourism.

The 4th Advance Estimate of crop production has forecast a favourable trend, with record production of several rabi crops. Available data suggests that the wholesale domestic tractor sales during April-July 2021 were a robust 24.4% higher than the corresponding pre-COVID period of FY2020, evidence that farm demand remains resilient.

The rating agency cautioned that the organised sector is expected to have gained at the cost of the less formal space during this period. The available statistics are often unable to capture the pain experienced by the latter, which may result in an overestimation of growth under the present circumstances.

"The consumer confidence survey conducted by the RBI serves as a useful proxy for demand from the less formal sectors. Its July 2021 round indicated that the Current Situation Index barely rose to 48.6 from the record-low 48.5 in May 2021 round, highlighting the continued impact of the loss of income and employment, as well as higher medical expenses experienced by many households as a result of the second wave of COVID-19," Ms. Nayar reiterated.

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'Outlook for Q-2 manufacturing rises significantly'

Image used for representation only. Courtesy Envato Elements.

FICCI's Manufacturing Survey states a higher percentage of respondents reported increased production. A higher percentage of respondents also reported rising cost, indicating that the cost of doing business has gone up too.

FICCI's latest quarterly survey (Q2) on Manufacturing reveals that after experiencing a subdued Q-1 (April-June 2021-22), the outlook seems to have improved significantly in Q-2 (July-September 2021-22). The percentage of respondents reporting higher production in the second quarter of 2021-22 (July-September 2021-22) was much above the fifty percent mark (around 61%). This was significantly higher than the similar percentage of last year's Q-2 quarter (around 24%). This assessment is also reflective in order books, as 72% of the respondents in July-September 2021-22 expected higher number of orders vis-a-vis April-June 2021-22.

Cost of Doing Business and Production

However, the survey noticed a high percentage of respondents experiencing rising cost of doing business and production. The cost of production as a percentage of sales for manufacturers in the survey has risen for 80% respondents in Q-1 2021-22. This is considerably higher than that reported in Q4 2020-21, where 72% respondents recorded increase in their production costs. Industry respondents have attributed the hike in productions costs primarily to high fixed costs, higher overhead costs for ensuring safety protocols, drastic reduction in volumes due to lockdown, lower capacity utilization, high freight charges and other logistic costs, increased cost of raw materials, power cost and high interest rates.

Figure: % of Respondents Expecting Higher Production in the Quarter vis-a-vis Respective Last Year's Quarter

FICCI's latest quarterly survey assessed the sentiments of manufacturers for Q-2 (July-September 2021-22) for eleven major sectors, namely, automotive, capital goods, cement and ceramics, chemicals, fertilizers and pharmaceuticals, electronics & electricals, metal & metal products, paper products, textiles, textiles machinery, toys and miscellaneous. Responses have been drawn from over 300 manufacturing units from both large and SME segments with a combined annual turnover of over 2.7 lakh crore.

Capacity Addition & Utilization

* The overall capacity utilization in manufacturing was 72% in Q2 2021-22, which again reflects signs of recovery in manufacturing. The future investment outlook, however, remains that of cautious optimism, as 32% respondents reported plans for capacity additions for the next six months.

* As mentioned earlier, the cost of doing business remains a cause for concern for the sector. High raw material prices, high cost of finance, uncertainty of demand, shortage of skilled labour, and working capital, high logistics cost, low domestic and global demand due to imposition of lockdown across all countries to contain spread of coronavirus, excess capacities due to high volume of cheap imports into India, unstable market, high power tariff, are some of the major constraints, which are affecting expansion plans of the respondents.

* The table below, gives average capacity utilization for Q1 2021-22 for various sub-sectors of manufacturing.

Table: Current Average Capacity Utilization Levels as Reported in Survey (%)

Sector	Average Capacity Utilization in Q-1 2021-22	Average Capacity Utilization in Q-3 2020-21	Average Capacity Utilization in Q-2 2020-21	Average Capacity Utilization in Q-1 2020-21	Average Capacity Utilization in Q-4 2019-20	Average Capacity Utilization in Q-3 2019-20
Automotive	73	67	73	60	50	67
Capital Goods	75	72	72	64	53	67
Cement and Ceramics	80	70	73	60	70	70
Chemicals, Fertilizers & Pharmaceuticals	67	71	78	68	69	76
Electronics & Electricals	60	85	72	66	60	67
Metals & Metal Products	78	84	82	75	73	80
Paper Products	70	87	80	60	55	90
Textiles	74	81	76	67	60	83

Inventories

* 85% of the respondents expect either more or same level of inventory in July-September 2021-22, which is higher as compared to the previous quarter, where around 79% respondents expected either more or same level of inventory in Q-1 2021-22

Exports

* The outlook for exports seems to be improving, as around 58% of the participants are expecting a rise in their exports for Q-2 2021-22 and 30% are expecting exports to continue to be on same path as that of same quarter last year.

Hiring

* The hiring outlook for the sector remains subdued as 68% of the respondents mentioned that they are not likely to hire additional workforce in the next three months. This presents a near stable situation in the hiring scenario as compared to the previous quarter Q-1 of 2021-22, where 69% of the respondents maintained similar sentiments.

Interest Rate

* The average interest rate paid by the manufacturers has reduced slightly to 8.7% p.a. as against 9% p.a. during the last quarter and the highest rate remains as high as 14%. The recent cuts in repo rate by RBI has not led to a consequential reduction in the lending rate as reported by 66% of the respondents.

Sectoral Growth

* Based on expectations in different sectors, some sectors are likely to register strong growth in Q-2 2021-22 except a few as given in the table below.

Table: Growth expectations for Q-2 2021-22 compared with Q-2 2020-21

Sector	Growth Expectation
Capital Goods	Strong
Cement & Ceramics	Strong
Electronics & Electricals	Strong
Metals and Metal Products	Strong
Textiles	Strong
Textiles Machinery	Moderate
Toys	Low
Paper Products	Moderate
Miscellaneous	Moderate
Automotive	Moderate
Chemicals, Fertilizers & Pharmaceuticals	Moderate

Note: Strong > 10%; 5% < Moderate < 10%; Low < 5%
Source: FICCI Survey

Back to Business Scenario in Manufacturing (Unlockdown period)

Table: Operations taking place in facilities post easing of the Lockdown Restrictions

Sector	% of Active Operations
Chemicals, Fertilizers & Pharmaceuticals	75%
Cement & Ceramics	88%
Textiles	76%
Electronics & Electricals	88%
Capital Goods	72%
Paper Products	75%
Automotive	69%
Metals and Metal Products	82%
Textiles Machinery	63%
Miscellaneous	79%
Toys	50%

* As evident from the table above, some sectors like toys, textiles machinery are more affected in terms of ongoing operations in the factories as per the demand and current orders post easing out of lockdown restrictions.

Workforce Availability

Table: Workforce Engagement in Factories

Sector	% of workforce engaged in the current operations
Automotive	88%
Capital Goods	88%
Cement and Ceramics	100%
Chemicals, Fertilizers & Pharmaceuticals	78%
Electronics & Electricals	100%
Metals & Metal Products	85%
Miscellaneous	90%
Paper Products	100%
Textiles	88%
Textiles Machinery	55%
Toys	82%

* Most sectors have sufficient labour force engaged in their operations and are not facing shortage of labour at factories.

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Everything you need to know about overmolding

Overmolding is an injection molding process used in many industrial capabilities. It is an integral part of prototyping and custom production, where it is essential in the overlay of plastics (plastic overmolding) and metals. In this article, you will get to know more about the overmolding process. This will involve how the process works, the materials, and how it is used. When you finish reading this article, you will understand a lot about the process. Let's get right on it.

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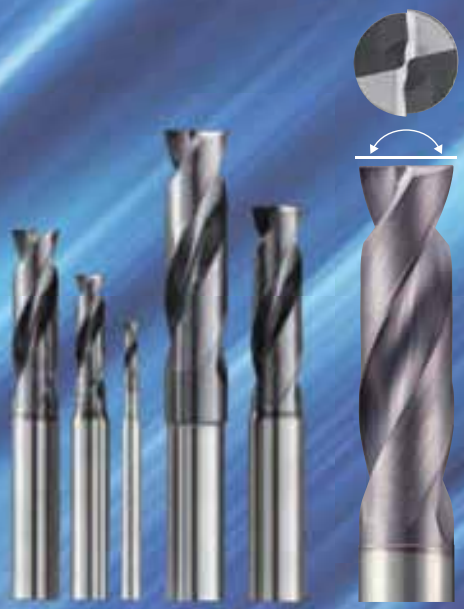

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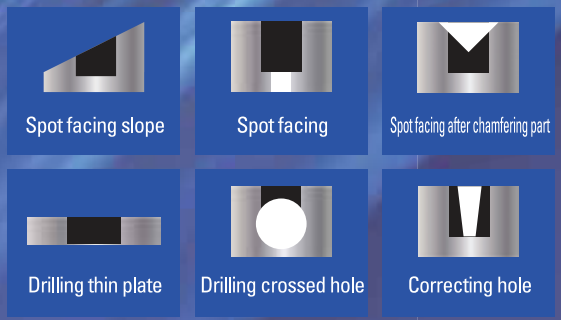

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The overmolding injection molding process involves creating a single material by combining two or more materials through molding. The material could be the same or of a different type. A proper understanding of the overmolding injection molding process comes with understanding the two types of materials utilized in the process. These materials are the substrate and the overmold. Overmold is the type of material molded on the substrate, while the substrate is the primary material. There can be two or more overmolds based on the end-product and the manufacturer's innovation.

How does the process work?

To understand the plastic overmolding process, you need to know the three basic categories, which include:

1) **Insert Molding:** In rigid molding plastic or soft elastomers, insert molding is the ideal sort of overmolding, as it is economical and easier than the others. In insert molding, the hard segments are initially separated into tools before the soft materials' ejection. It additionally involves the usage of elastomers as an adhesion bond. This can be in the form of chemicals, mechanical locks, etc. For chemical adhesion to occur, you should heat the elastomer at the right temperature. This will require you to heat the hard segment's surface.

2) **Two-Shot Molding:** The two-shot molding needs you to utilize two injection molding machines. You can inject the hard segment-first, following the elastomeric mold into the injection molding machine. The heated substrate utilized is always in a gel or a semi-solid state. The mold's design will be modeled to project the indirect part of the hard segment on the substrate. The two-shot overmolding injection molding process is ideal for those who value stable mechanical bonds.

3) **Co-Injection Molding:** Of the three different types of overmolding, co-injection molding is the most expensive and difficult to control. Its process is additionally different, as it demands the injection of the substrate and the elastomer into the same mold. The materials should also be compatible. With regard to quality overmolding, co-injection is the ideal choice. This is because all the materials are in the same molten state.

Commonly used materials

Overmolding can be utilized with a wide range of materials, including:

- ABS (Acrylonitrile Butadiene Styrene)
- HDPE (High-density Polyethylene)
- PEEK (Polyether Ether Ketone)
- Nylon (Polyamide)
- PC (Polycarbonate)
- PE (Polyethylene)
- PEI (Polyetherimide)
- PBTR (Polybutylene Terephthalate)
- PMMA (Acrylic)
- POM (Polyoxymethylene)
- PP (Polypropylene)
- SI (Silicone)
- TPE (Thermoplastic Elastomers)
- TPU (Thermoplastic Polyurethane)
- TPR (Thermoplastic Rubber)

Uses of overmolding

The overmolding process is utilized for many reasons that vary as per the characteristics of a particular project. Some common materials include: toothbrushes, tool handgrips (e.g., cordless drills and screwdrivers), and personal care products (e.g., shaving razors and shampoo bottles).

Here are some examples of regular overmolding applications:

Rubber Over Plastic: A rigid plastic substrate is first molded. Then, soft rubber or TPE is molded onto or around the substrate. This is frequently utilized to give a soft grip area to a rigid part.

Plastic Over Plastic: Here, a rigid plastic substrate is first molded. Then, a different rigid plastic is molded onto or around the substrate. The plastics can vary in colour and/or resin.

Plastic Over Metal: Here, a metal substrate is machined, formed, or cast. Then, the substrate is entered into an injection molding tool, and the plastic is molded around the metal. This is usually utilized to capture metal elements in a plastic part.

Rubber Over Metal: A metal substrate is cast, formed, or machined. Then, the substrate is inserted into an injection molding tool, and the rubber or TPE is molded onto or around the metal. This is often used to provide a soft-grip surface.

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Things to consider

There are many compatibility issues and limitations to note between different types of materials.

You aren't limited to just two materials. For instance, Truventor has made some products with three different types of materials on one part to accomplish colour breaks and grip surfaces. Here is a simple instance with a product you will be intimately familiar with — scissors.

The advantages

Manufacturers, who want to add a soft-touch exterior to their products that enhance the grip or "feel" and provide a stylish appearance attractive to consumers, are the prime candidates for overmolding. Overmolding also reduces shock and vibration, dampens sound, provides electrical insulation, and improves chemical/UV resistance, increasing product longevity. Besides, overmolding lowers production costs while improving product viability and customer satisfaction.

Below mentioned are the advantages of using overmolding:

- Better product performance
- Increased shelf appeal
- Lower production cost.

Is overmolding better for your project?

Here is a guide to decide which manufacturing process is ideal for your project.

You should select overmolding when:

- Your finished piece can be made of rubber and/or thermoplastics.
- Your finished design comprises multiple layers, materials, and/or colours.
- You will be manufacturing both the substrate and lower layer.
- Your finished piece won't need to be taken apart or disassembled.

You should select insert molding when:

- You are utilizing a prefabricated substrate.
- Your substrate is made of wires, metal, or computerized parts.
- You're looking for the finished part to be one solid piece.

Collaborating with an experienced custom injection molder — especially one with scientific molding expertise, like Truventor — will assist you with navigating through the pros and cons of utilizing overmolding on your project and guide you with the right decision for your project, your application, and bottom line.

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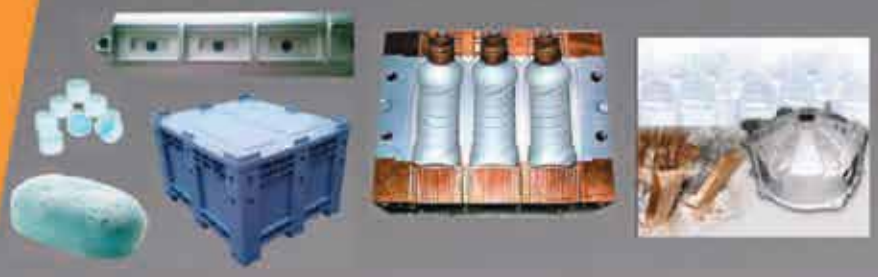

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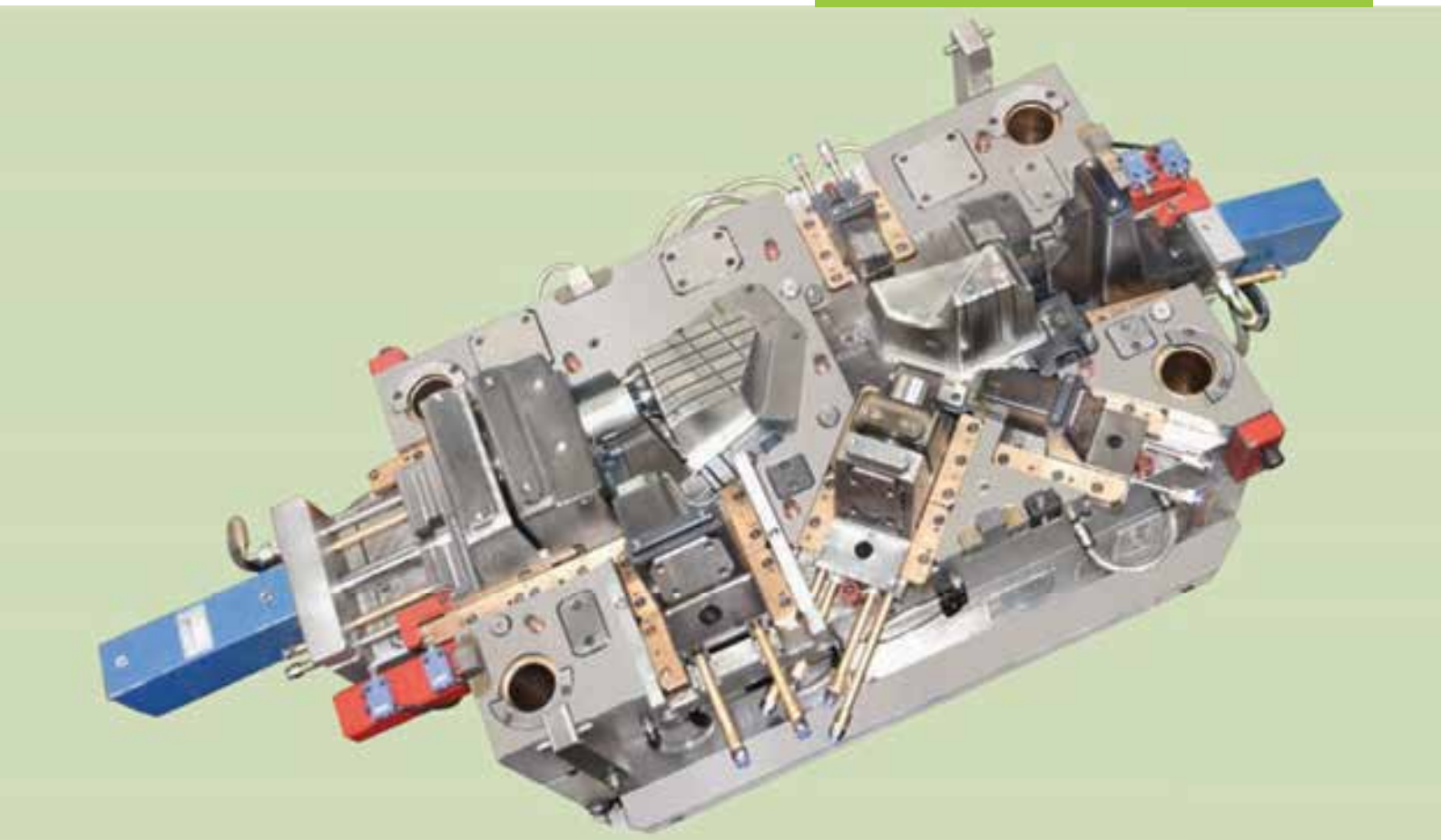

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