TAGMA TIMES

NEWSLETTER

(Technical Info. on Die, Moulds & Toolroom)

Volume: XXVIII / No. 10 (Private Circulation for Members Only) June 2022

FDI: India makes for the world

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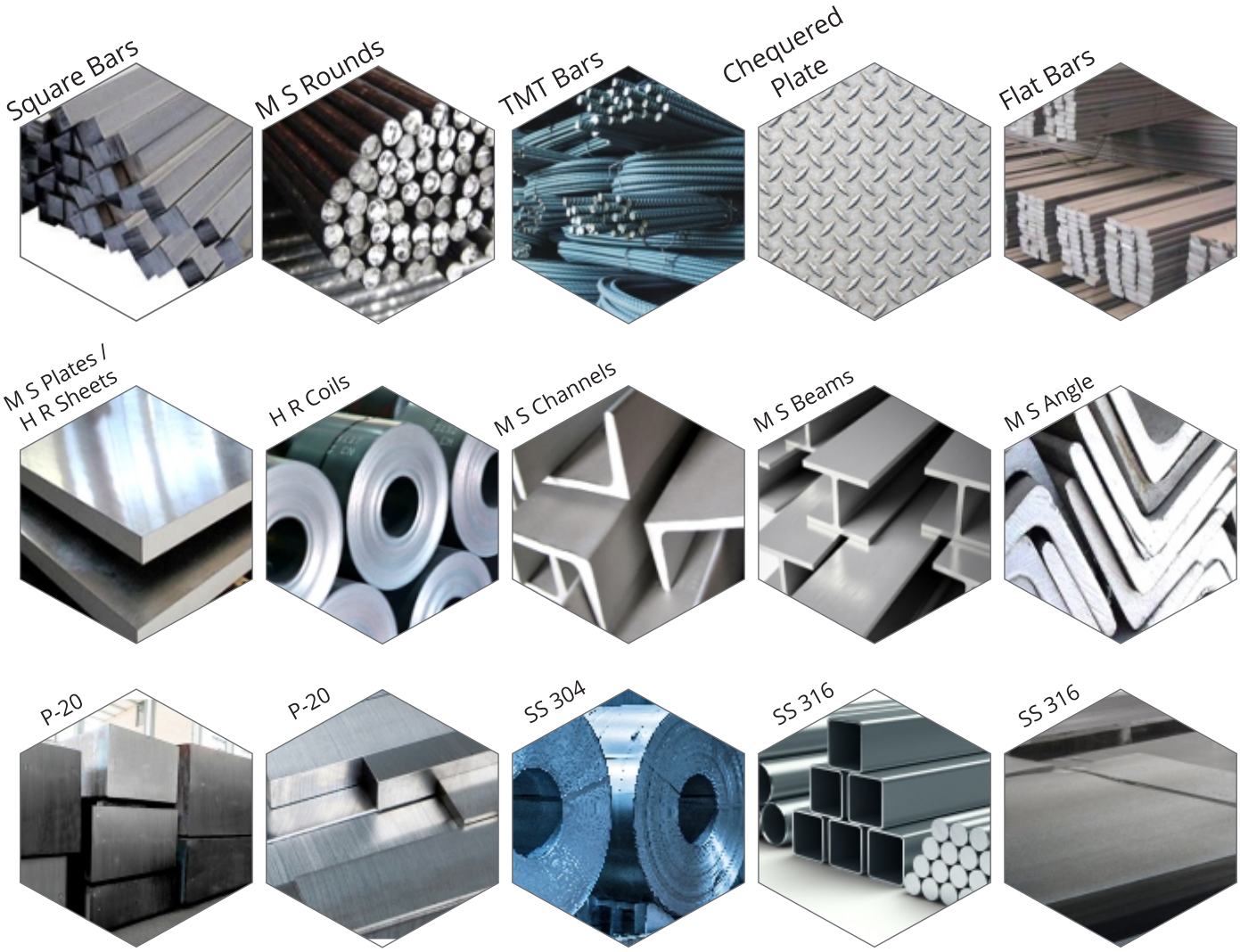

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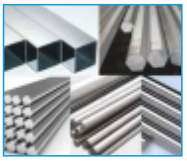
Other Alloy Steel (En19, 24, 31, 36 etc.)

Looking forward for strategic partnership for catering to Aviation Sector

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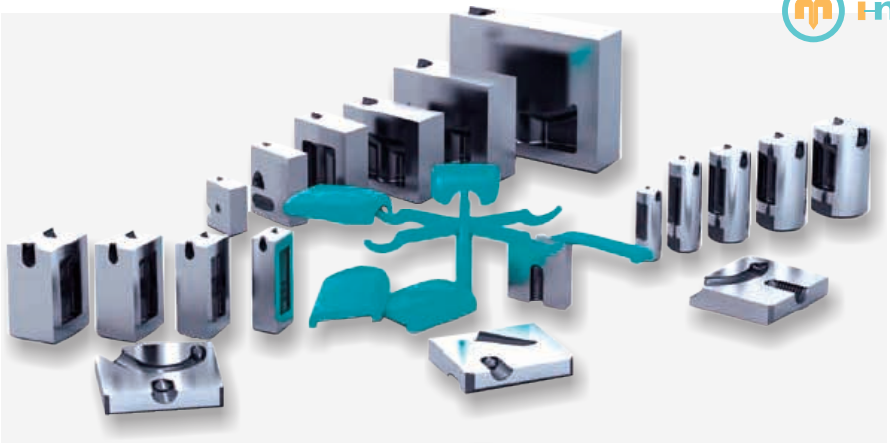

i-mold, Germany tunnel gate inserts are recognized worldwide as innovative products with high cost reducing potential for moldmakers and molders.

- 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
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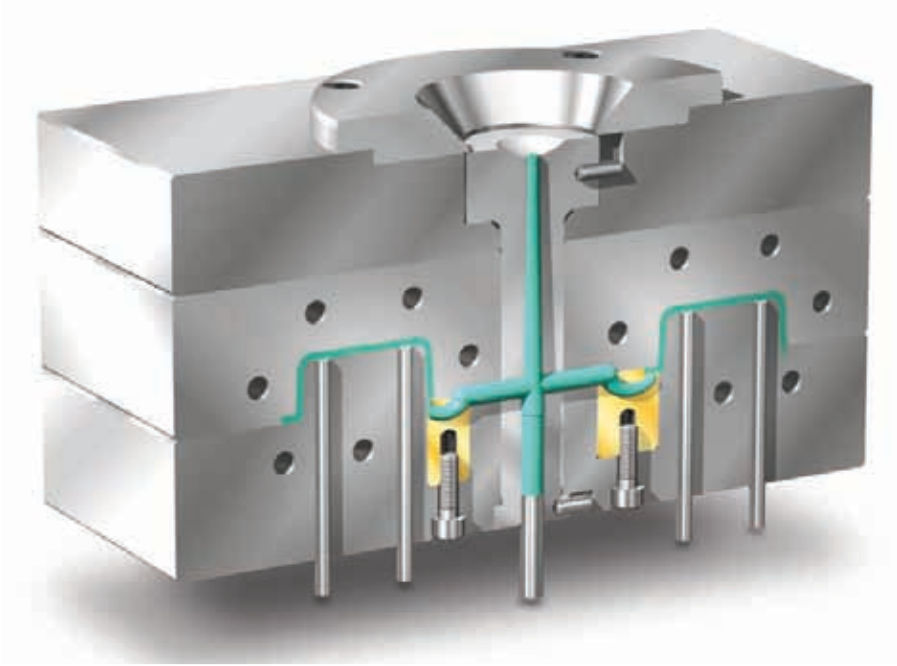
- Suitable for all plastics thanks to optimized feed channel geometry up to 60% filler content (e.g. glass fibre) is possible
- Use of MIM process ensures smooth feed channels and exact gate sizes



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EDITORIAL

India shining!

It's been a few months since the COVID-19 restrictions have eased out. And, by the look of things, it seems like the situation is getting back to normal. People have started physical meetings, trade shows are being organized, and seminars are receiving good turnouts…

Over the past few months, I have had the opportunity to attend quite a few events, where I interacted with industry leaders. While most of them were eager to discuss industry trends, all of them held the opinion that "this decade belongs to India". Their optimism and excitement to talk about the upcoming opportunities really stood out.

I believe that this perception of India shining itself is huge and will have an enormous impact on businesses. Besides, factors like the China-plus-one strategy working in favour of India, the emergence of many sectors in India, the improving policy framework to help Indian MSMEs, and the increasing purchasing power of Indians... are all responsible for their optimistic sentiments.

With all these factors placing India under the spotlight, it's no wonder that foreign direct investments (FDIs) in manufacturing are pouring in. Now, overseas investors are not just excited about making in India to serve the domestic market, but they are also planning on exporting from India. Our 'In Focus' section highlights all you need to know about FDIs, the plans various global companies have for India, and how they are going to impact Indian toolmakers.

Do you also believe that this decade belongs to India? Do send us your views. We will be happy to feature them here.

Happy Reading!

Nishant Kashyap
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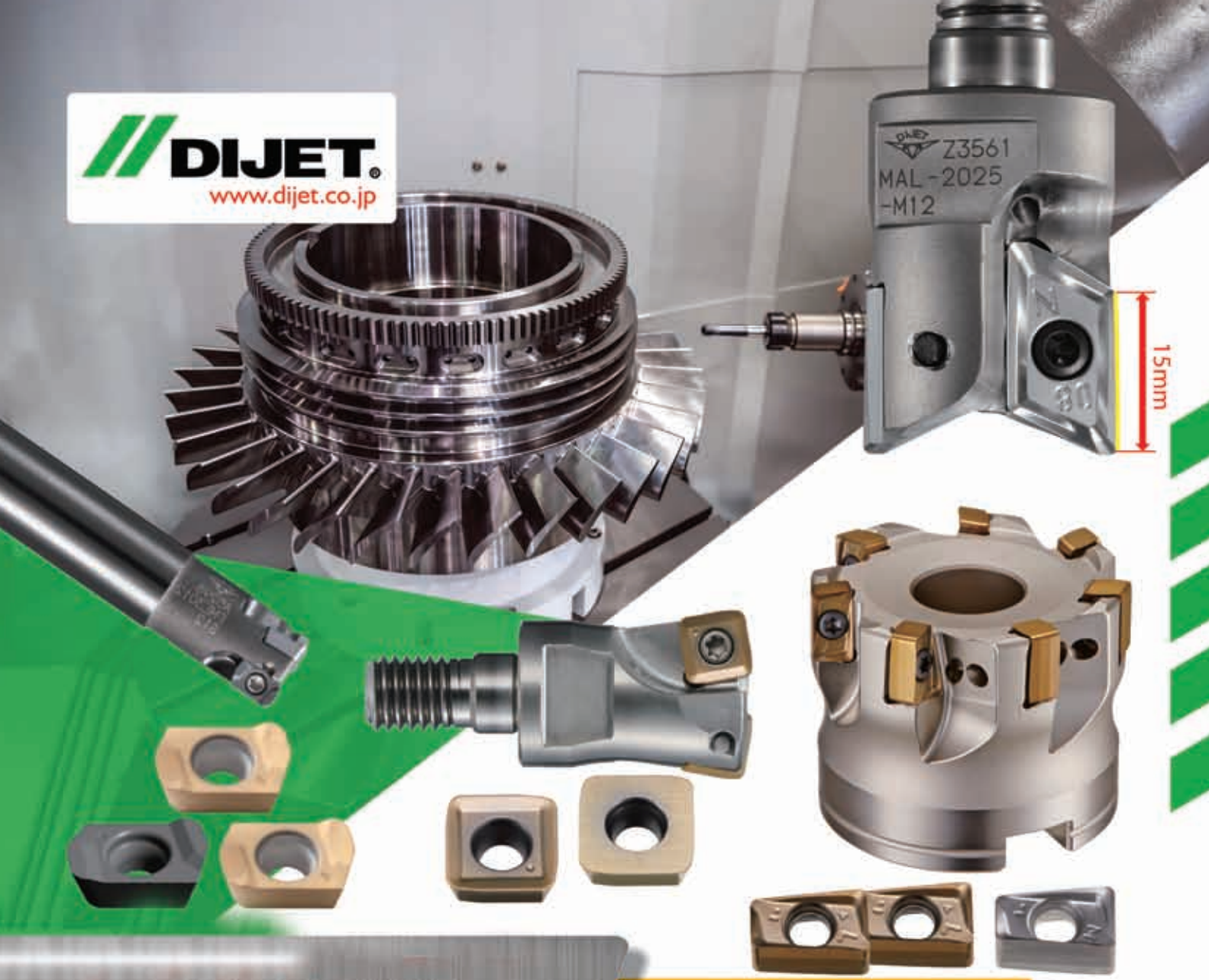

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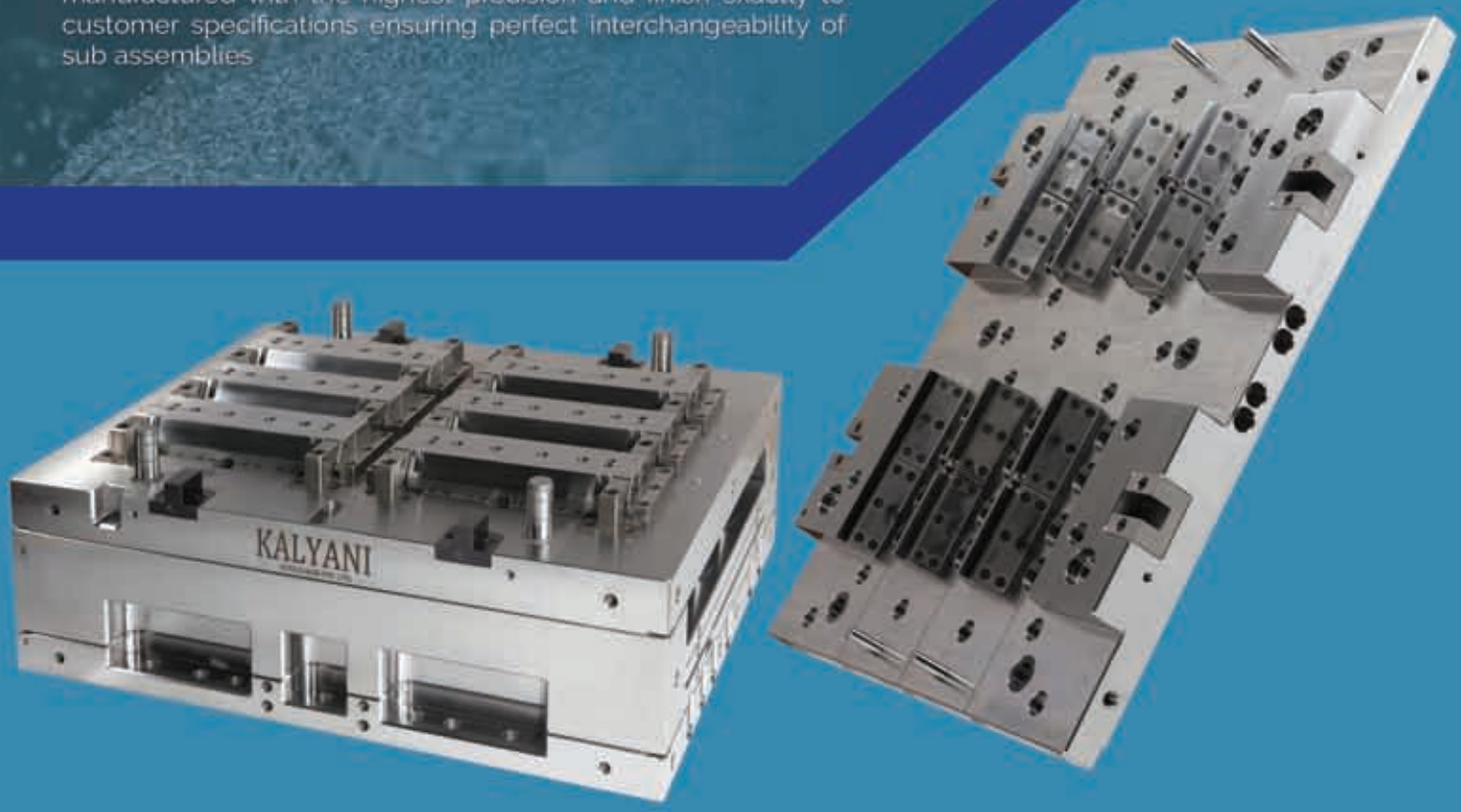

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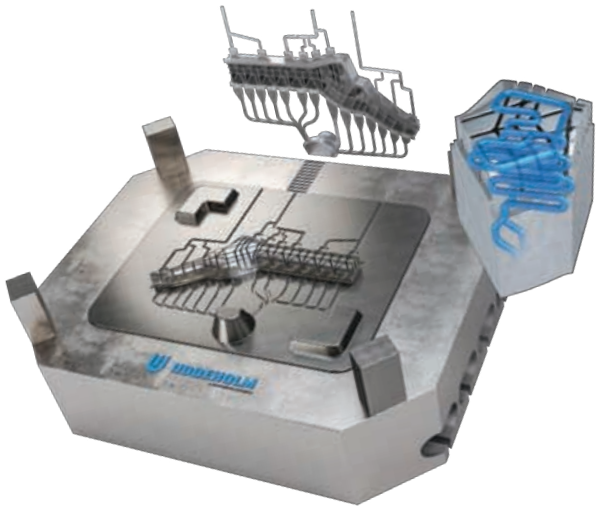

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Toyota Group signs MoU with Government of Karnataka for big investments

IN its effort to contribute to the country's vision of 'Make in India' and to enable a faster reduction in carbon emissions, out of total investment of INR 4,800 crores, Toyota Group of Companies that constitutes of Toyota Kirloskar Motor and Toyota Kirloskar Auto Parts recently announced their Memorandum of Understanding (MoU) with the Government of Karnataka to invest INR 4,100 crores.

In addition to boosting the local manufacturing ecosystem, the new development will provide an impetus to employment generation and local community development. This investment will also spur the growth of local supplier base and hence, result in higher investments and further job creation.

The MoU was exchanged between Hon'ble Chief Minister of Karnataka Shri Basavaraj Bommai and Mr. Vikram S. Kirloskar, Vice-Chairman, Toyota Kirloskar Motor, in the presence of Dr. Murugesh R. Nirani, Hon'ble Minister of Large & Medium Industries, Government of Karnataka, and Mr. Ravi Kumar, IAS, Chief Secretary of Karnataka State, among other dignitaries present at this momentous occasion of MoU Signing Ceremony.

As part of the MoU, Toyota Group of Companies will systematically invest towards making India a self-reliant manufacturing hub, thus contributing towards the Government's 'Make in India' and 'Aatmanirbhar Bharat' mission. The investments are aimed at promoting greener technologies that will help lower dependence on fossil fuels and mitigate carbon emissions. This investment will also enable local production facilities to build electric powertrain parts and components, thereby cater to the electrified vehicle manufacturing in India.

Speaking at the auspicious occasion, Shri Basavaraj Bommai said, "Our aim is to build 'New Karnataka for New India' by creating new 21st century industrial townships and corridors. As a state committed to sustainable development and contributing to the nation's progress, we want to make Karnataka a global supply-chain and manufacturing hub under our 'Build for the World' mission. This MoU with Toyota Group of Companies is a huge stride in this regard, and Karnataka Government is confident of Toyota's commitment towards sustainable growth and local manufacturing quality for Karnataka's growth and development. Karnataka being the hub of electric vehicles, welcomes this MoU, which adds another feather to State's cap as leader in this sector."

Sharing his views on the MoU signing, Dr. Murugesh R. Nirani said, "Toyota Group investments will also enhance the local supplier growth in Karnataka, further leading to higher investments and more job creation. Besides boosting the local manufacturing sector, these investments will also support local community development."

Speaking on this occasion, Mr. Vikram S. Kirloskar said, "Toyota is committed to enhance the pace of electrification strengthen domestic production with 'Make in India'. The MoU signing with the Government of Karnataka, in the gracious presence of Hon'ble Chief Minister Basavaraj Bommaiji and all dignitaries, is a very important milestone in terms of ushering in large-scale investment to make deeper cuts in carbon emissions, higher employment generation, creating local manufacturing hub not only for domestic needs but also for global markets, local community development and advancement in innovation. I believe that such investments are needed to provide technologically viable and economically competitive alternatives to fossil-fuel-intensive technologies in vehicle mobility space. space. As a part of our philosophy, we always conduct deeper studies, analyse and explore multiple technological pathways that are best suited to optimally achieve the national goals on lowering dependence on fossil fuels, make India truly self-reliant, reducing carbon emissions and creating jobs. Toyota remains committed to serve our nation and the community where we operate."

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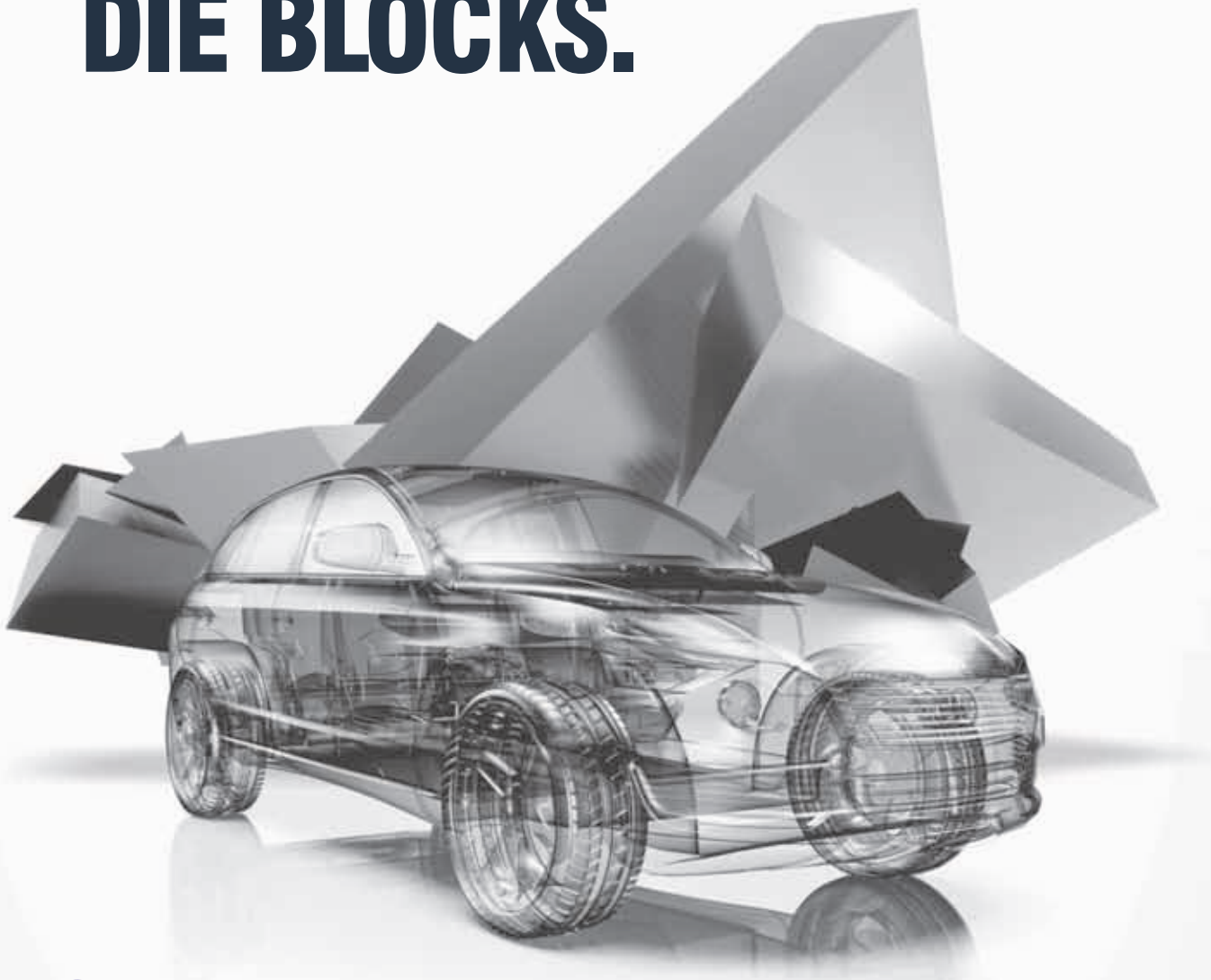

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Hitachi Energy inaugurates transformer components factory in Gujarat

HITACHI Energy India Ltd. recently inaugurated its new transformer components factory in Vadodara, Gujarat. Located in its largest manufacturing location in India, this factory will produce dry bushings with the most reliable technology called 'Resin Impregnated Paper'. This will be the first manufacturing facility in India producing Resin Impregnated Paper bushings up to 400kV voltage level. This dry technology improves the thermal, electrical and mechanical performance of transformer bushings, making them more resilient and reliable – critical in transformers deployed in the power grid.

Strengthening India's power grid – one of the largest operational synchronous grids in the world – is vital for the country as it aims to integrate a greater share of renewables in a step towards its carbon neutral ambitions. Resin Impregnated Paper bushings offer an improvement over traditional oil-based alternatives by preventing moisture ingress, oil leakage and reducing risks of fire in case of failure. This technology enables operators to make the grid safer while reducing downtime and maintenance costs.

This is the first facility producing 400 kV Resin Impregnated Paper bushings in India, with a capacity to manufacture up to 1,000 units per annum of Resin Impregnated Paper bushings ranging from 72.5 kV to 400 kV, catering to a potential domestic market of 50 MUSD over (approximately) the next five years. The factory will produce AirRIP® flex bushings, a unique combination of Hitachi Energy's best practices from pioneering bushing technologies with a modular and flexible design, covering almost every need and design specifications with just one product family.

"Over 80% of our portfolio is manufactured locally, and we are continuously evaluating how best to add capabilities for new technologies," said N. Venu, Managing Director and CEO, Hitachi Energy India Ltd. "By localizing such manufacturing capabilities, we are opening up new avenues and creating even more customer value – all while advancing the energy system to be more sustainable, flexible and secure," he added.

"This future-ready manufacturing facility is designed to minimize environmental impact and conserve natural resources," said Bruno Melles, Managing Director of Hitachi Energy's Transformers business. "Our goal is to ensure that production operations in India aspire to the highest standards of sustainability, in line with our own carbon-neutrality goals," he added. The factory operates on 100% fossil-free electricity. In January 2022, Hitachi Energy announced that it had achieved 100% fossil-free electricity in its own operations as the first-step target set out in its Sustainability 2030 plan.

Helmut Bockshammer, Global Product Group Manager for Transformer Components and Service at Hitachi Energy, said, "Broadening our portfolio available in India reflects our commitment and expectations from this important market." He added, "We are leveraging the AirRIP® flex design and production platform to comply with local standards, benefit from our global capabilities and provide product support where it is needed – close to our customers."

FISME, EQARO partner to create collateral free digital lending platform for MSMEs

TO fulfil the need of urgent funds, a digital lending platform is being jointly created by the Federation of Indian Micro and Small & Medium Enterprises (FISME) and Eqaro Surety Pvt. Ltd., provider of Financial Guarantees. It will provide access to collateral free capital up to INR 25 lakh to Micro and Small & Medium Enterprises (MSMEs). An MoU in this regard was signed by Prashant Patel, President, FISME and Vikash Khandelwal, CEO of Eqaro in Delhi recently. "Lending has traditionally been collateral based. This unique, first time in India initiative will help MSMEs get easier access to credit backed by a surety guarantee without the need to put up collaterals," said CEO of Eqaro.

According to President of FISME, "It is like an Overdraft facility initially pegged at INR 25 lakh, which could be tapped anytime from anywhere should an MSME need funds."

Former Secretary, Department of Financial Services, D.K. Mittal, who was present during the MoU signing ceremony, has termed the initiative 'path breaking'. "Lack of collateral is the single biggest bottleneck that small entrepreneurs face in accessing institutional funds and obviating the need for asset-based collateral by Sureties can revolutionize MSME lending," he added.

The platform will on board MSMEs after due diligence and will have Banks & NBFCs on board to provide credit backed by guarantees of Eqaro and is expected to launch this year itself.

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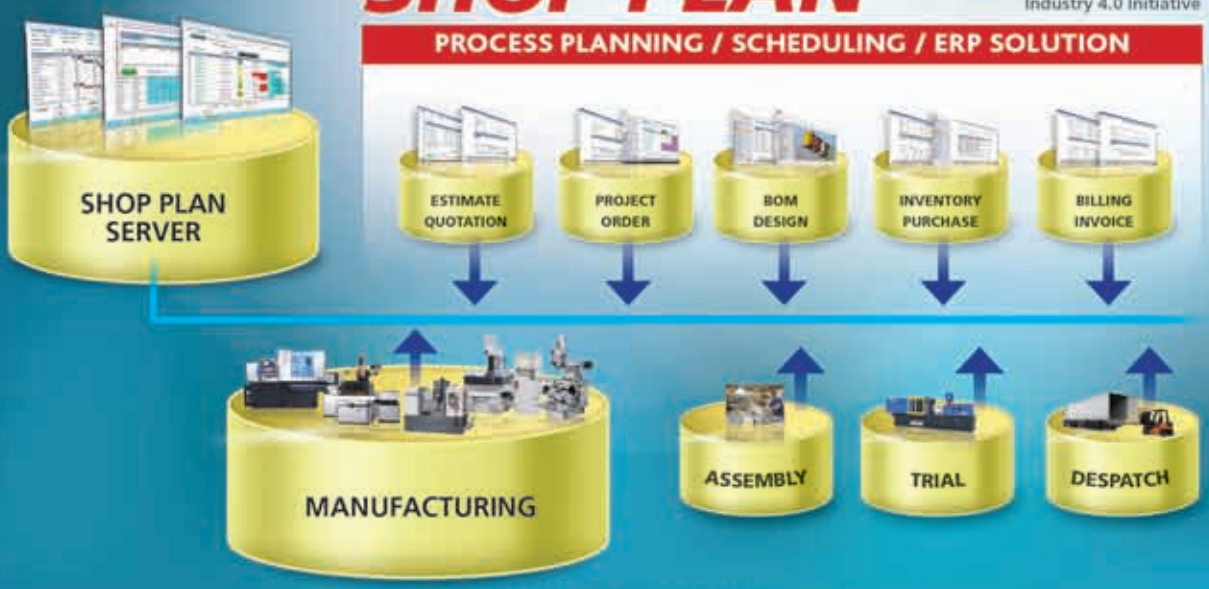

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Tata Motors signs MoU with Lithium Urban Technologies for one of the biggest EV fleet deployments in India

WITH the vision of a clean & green environment and accelerating the transition to sustainable transportation, Tata Motors recently announced a partnership with Lithium Urban Technologies, an EV-based urban transportation service provider founded by Mr. Sanjay Krishnan, which will deploy 5000 XPRES T Electric Sedans, across the country, for employee transportation. Tata Motors will commence deliveries in phases and will complete the deployment by next year.

Speaking on the occasion, Mr. Shailesh Chandra, Managing Director, Tata Motors Passenger Vehicles Ltd., and Tata Passenger Electric Mobility Ltd., said, "With the 'XPRES-T' EV Sedan, we have created a new benchmark in the fleet market. Targeted at mobility services, corporate and government fleet customers, the XPRES-T EV offers an optimal battery size, captive fast charging solution, which will ensure outstandingly low cost of ownership in addition to safety and passenger comfort, making it a comprehensive and attractive proposition for fleet owners and operators. This MoU is a big leap towards faster adoption of EVs in the shared mobility space and we are delighted to take forward our long-term partnership with Lithium Urban Technologies, who are on the path to provide mobility solutions with a focus on sustainability and supporting India's e-mobility mission."

Speaking on the occasion, Mr. Sanjay Krishnan, Founder & CEO of Lithium Urban Technologies said, "Our relationship with Tata Motors dates back to 2019 when we placed the first order for 500 vehicles. We are delighted that Tata Motors has brought to market a portfolio of vehicles that caters to the entire application spectrum of corporate and business travel needs. The order of 5000 vehicles is indeed a momentous occasion for Lithium, Tata Motors and the entire EV ecosystem. It is a testament not only to the demand for Lithium's services but also the quality of the products from Tata Motors. We look forward to strengthening our relationship with Tata Motors in the months and years to come to truly unleash the power of electric mobility not only in India and but across the world."

Chip consortium ISMC to set up $3 billion plant in India's Karnataka

INTERNATIONAL Semiconductor Consortium ISMC will invest $3 billion in India's southern Karnataka state to set up a chip-making plant, the state government recently said. ISMC is a joint venture between Abu Dhabi-based Next Orbit Ventures and Israel's Tower Semiconductor. U.S. chip giant Intel Corp has announced plans to acquire Tower.

India's first semiconductor fabrication unit is expected to generate more than 1,500 direct jobs and 10,000 indirect jobs, the state's investment promotion division said in a tweet.

ISMC and Indian conglomerate Vedanta Ltd. have applied for Prime Minister Narendra Modi's $10-billion incentive plan to push companies to set up semiconductor and display operations in India, the government's next big bet on electronics manufacturing.

Vedanta told Reuters it was in "advanced talks" with Gujarat and Maharashtra in west India and Telangana in the south to choose a site by mid-May. It has a planned investment outlay of $20 billion for its semiconductor and display push.

PM Modi and his IT ministers recently outlined plans for investment incentives in the sector, saying they want India to become a key player in a global chip market dominated by manufacturers in Taiwan and a few other countries.

Courtesy: Reuters

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Alstom delivers India's first semi high-speed regional train for Delhi-Meerut RRTS project

ALSTOM has successfully delivered India's first semi high-speed regional train for National Capital Region Transport Corporation's (NCRTC) 82.5 km long Delhi-Ghaziabad-Meerut RRTS line. The rollout ceremony was held at Alstom's manufacturing site in Savli, Gujarat, in the presence of Shri. Manoj Joshi, Chairman – NCRTC, Secretary, Ministry of Housing & Urban Affairs, Govt. of India, Shri. Vinay Kumar Singh, MD – NCRTC, and Mr. Alain Spohr, Managing Director, Alstom India. Designed and built to move passengers at 180 kmph, these trains are expected to reduce the travel time between Delhi and Meerut by 40%. These semi high-speed aerodynamic trains are energy efficient, designed to offer top-notch comfort and safety features for premium passenger experience for commuters, including those who are disabled.

Speaking at the ceremony, Shri Hardeep Singh Puri, Union Minister for Housing & Urban Affairs, Government of India, said, "It is a proud moment for all of us to witness the rollout of the RRTS trainset, which is a true manifestation of the Hon'ble Prime

Minister's vision of an 'Aatmanirbhar India'. Designed in India, made in India, made for India – it is the perfect demonstration of the PM's 'Make in India' initiative. It is imperative that we plan efficient public transport to fully harness the potential of our metropolitan cities, so that we truly make them the engines of growth for tomorrow's economy."

Commenting on the delivery, Alain Spohr, Managing Director, Alstom India, said, "We are proud to reach another key milestone in making India's first semi high-speed regional commuter service a reality. The RRTS project is one of the most ambitious ventures in India's mobility sector and will prove to be a game-changer in India's regional rail segment. Our trains and ETCS signalling systems will ensure safer and seamless intercity commutes, benefitting millions of people and contributing towards socio-economic development. Delivering the first train within a year of commencing production, reinstates Alstom's commitment to revolutionise India's rail networks. We are honoured to be the preferred partner in delivering ground-breaking sustainable technology solutions that cater to the transportation needs of India's future."

Shri. Manoj Joshi, Chairman – NCRTC, Secretary, Ministry of Housing & Urban Affairs, Govt. of India, said, "With its extensive experience in delivering world-class sustainable mobility solutions globally, Alstom has contributed significantly to make this project a reality. As a mechanical engineering myself, I'm impressed to see the advanced facilities setup here by Alstom. This train is a shining example of our commitment to support the PM's 'Make in India' mission. With the Indian government's ambition to build mass rapid transport systems across the country, we are elated to be contributing towards the development of this ecosystem in India and accelerating the 'Aatmanirbhar Bharat' vision."

Designed at Alstom's Hyderabad engineering centre and manufactured at Savli (Gujarat), these trains are 100% indigenous, in line with the government's 'Make in India' programme and 'Aatmanirbhar Bharat's' ambition. The propulsion systems and electricals are manufactured at the company's factory in Maneja (Gujarat). The Savli site produces bogies, car bodies and undertakes train testing. This Alstom site has also successfully delivered trains for Delhi Metro, Queensland Rail and is currently producing metro trains for Kanpur & Agra cities.

P Ramdas of ACE Micromatic Group has been honored with the Life Time Achievement Award

SHRI P Ramadas, Managing Director of India's one of the largest machine tool groups, ACE Micromatic Group has been recently honored with the prestigious Life Time Achievement Award-"Nalwadi Krishnaraja Wadiyar Jeevan Sadhana Puraskar" by Laghu Udyog Bharati for his outstanding contribution to the Manufacturing Industry and Society.

The event took place at the Hotel Sheraton in Bengaluru on May

27th. The award ceremony was conducted in the presence of Mr Murugesh Nirani- Industry minister, Mr Sunil Kumar-Minister for Kannada & Culture.

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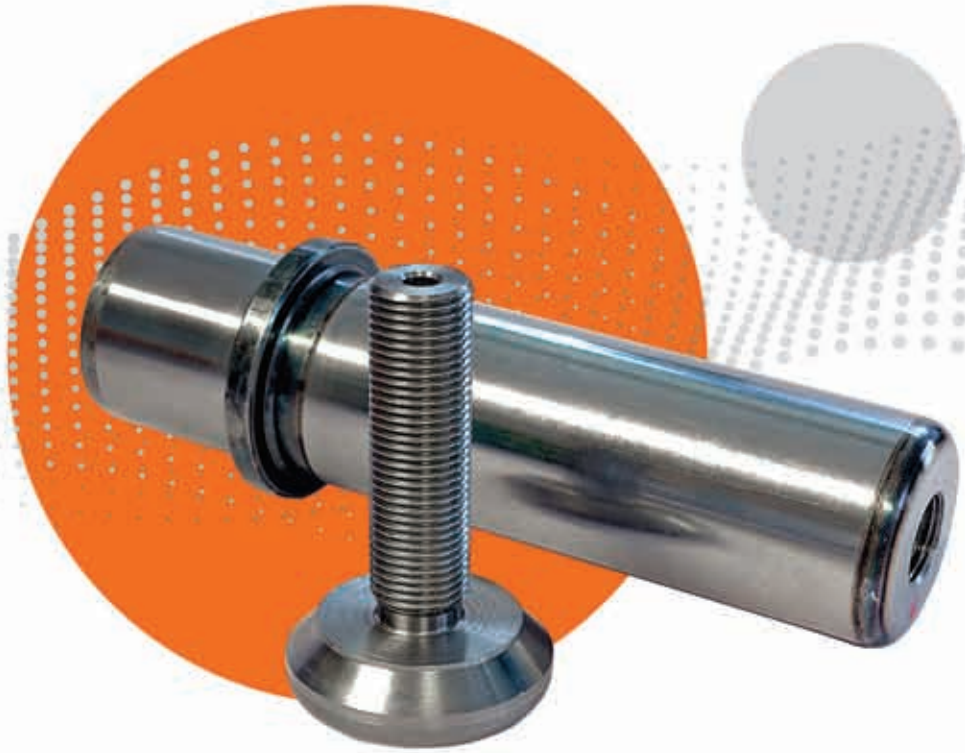

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Hyundai Motor India partners with Tata Power to power-up EV-charging infrastructure in India

HYUNDAI Motor India Ltd. (HMIL) recently announced strategic partnership with Tata Power to build a robust EV charging network and boost EV adoption in India at its dealerships. Through this association, Hyundai Motor India Ltd. will become a key contributor in expansion of quality charging infrastructure. The MoU was signed between Hyundai Motor India Ltd. and Tata Power in the presence of Mr. Unsoo Kim, MD & CEO, Hyundai Motor India Limited and Dr. Praveer Sinha, CEO & MD, Tata Power, at HMIL's Headquarters in Gurugram, Haryana.

HMIL currently has an existing network of 34 EV Dealers in 29 cities, equipped with AC 7.2 kW chargers, and aims to expand the charging infra network across its pan India dealerships. The vehicle charging time of DC 60 kW charger is much lesser than AC 7.2 kW charger. These DC 60 kW charging stations will enhance customer convenience.

Commenting on the announcement, Mr. Kim said, "Hyundai Motor India is glad to announce its partnership with Tata Power to facilitate and strengthen India's robust EV ecosystem and enhance the general outlook on sustainable transportation... This partnership will power-up the nations' electric mobility mission by offering end-to-end EV charging infrastructure at HMIL Dealerships along with supply, installation and commissioning of home charging for HMIL EV customers, thereby, enhancing customer convenience and ease of adoption of electric vehicles."

Commenting on the strategic partnership, Dr. Sinha said, "Our collaboration with Hyundai Motor India aligns with the Government of India's National Electric Mobility Mission Plan and demonstrates our commitment to leading India's clean energy and net-zero goals. Tata Power's expertise in EV charging space coupled with comprehensive charging solutions and countrywide ownership of Hyundai vehicles, will help in the development of sustainable mobility infrastructure, boosting faster EV adoption."

M&M to invest INR 15,300 crore to fortify position in auto, farm equipment and EVs

MAHINDRA and Mahindra (M&M) will incur a capital expenditure of INR 15,300 crore in the auto, farm equipment, and electric vehicle (EV) businesses over 2022-24, the firm said. Of this, it has already pumped in INR 3,200 crore in FY22, while the remaining INR 12,100 crore will be done during FY23 and FY24. This is significantly higher than the capex done by the company in the recent past.

Prior to FY21, it was pumping in INR 3,000-4,000 crore annually. The pandemic, coupled with chip shortage, made the company defer the expenditure. M&M's capex plans are in line with the trend at its peers Tata Motors and Maruti Suzuki India. Both companies are incurring higher capex in the current fiscal year compared to pre-pandemic years, to capitalise on the demand momentum.

M&M's aim is to fortify its position in the SUV and tractor segments and enter the electric passenger vehicle business with the 'born EV' platform from 2025, the company's top officials said at a recently held annual press meet.

Of the aforesaid amount earmarked by Mahindra, INR 11,900 crore has been earmarked for the automotive business, including EVs, while INR 1,900 crore will be used to ramp up the capacity of the XUV7OO and other models.

The XUV700, the firm's flagship model that was launched in August 2021, has a wait time of 18-24 months and the investment will help reduce this to some extent, said Rajesh Jejurikar, the firm's executive director for auto and farm equipment sectors. On an average, the company has received bookings of over 9,500 units per month and has 78,000-plus open bookings, he said.

"We have overcome the chip shortage through a variety of actions we have taken to mitigate the situation, including creating alternate suppliers, and they have helped. The effect can be seen on our volumes in the year gone by," he said.

For the SUV business, where it claims to be the market leader revenue-wise with 17.9 per cent share, Mahindra has identified maintaining a strong brand value, developing platform and EV strategy, de-risking the supply chain, and cost optimisation as the key pillars.

Courtesy: Business Standard

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Global opportunities knock on India's door

A recently published Deloitte report said that India remains an attractive market for international investors in terms of both short-term and long-term prospects. Even as India finds itself as a lucrative option to foreign investors, toolmakers will need to focus on improving quality, enhancing capacity and adopting the latest technologies, among other aspects, if they want to play a crucial role in the global growth story.

Kimberley D'Mello

According to the PHD Chamber of Commerce and Industry (PHDCCI), India is expected to attract USD 100 billion FDI in 2022-23. PHDCCI is a proactive National Apex Chamber working at the grass-root level and with strong national and international linkages. A PTI News report quoting PHDCCI stated, "India is expected to attract a USD 100 billion FDI inflow in 2022-23 supported by various ground touching economic reforms and significant ease of doing business in recent years. The current financial year is expected to attain a GDP growth of more than 8 per cent."

"It has suggested a ten-pronged strategy to strengthen economic growth and achieve the target of becoming a USD 5 trillion economy in the next five years. The suggestions include speedy infrastructure investments, inclusion of more sectors under the PLI scheme, increase in public investments in agriculture sector, addressing the high commodity prices, and shortages of raw materials," added the PTI News report.

The growth drivers

On its website, the India Brand Equity Foundation (IBEF) informed that "the manufacturing sector FDI inflow has shown phenomenal growth – it stood at US$ 27.69 billion as of December 2011, growing to US$ 104.18 billion in December 2021, at a CAGR of 14.17%. This growth is spurred on by a variety of factors, which are listed below:

- **India's large consumer base:** With a population of almost 1.4 billion people, India has the second-largest consumer base in the world. With gross national income (GNI) per capita at current prices growing from INR 63,682 (US$ 828.53) in 2010-11 to INR 144,319 (US$ 1,877.66) in 2020-21, India's disposable income, and consequently, people's willingness to spend, has been increasing steadily over the past decade. Multiple MNCs are setting up operations in India to cater to the huge consumer base, and one of their main focus areas is to get their prices down. The easiest way to do this is to set up manufacturing bases in India, which invites FDI proposals.

- **Availability of cheap labour:** For manufacturing operations, India has plenty of cheap, skilled labour available. India has nearly 500 million people of working age, with a large share of this population being young and ready to work.

- **Reducing import dependency:** With initiatives like 'Make in India' and 'Aatmanirbhar Bharat', the government's end goal is to reduce India's heavy dependency on imports and instead, set up manufacturing units domestically to increase self-reliance."

FDI Inflow

India has recorded the highest ever annual FDI inflow of USD 83.57 billion in FY 2021-22, informed a press release issued by the Press Information Bureau.

The details of total FDI inflows reported during the last four financial years are as under:

S No	Financial Year	Amount of FDI inflows (in USD billion)
1	2018-19	62.00
2	2019-20	74.39
3	2020-21	81.97
4	2021-22	83.57

Source: Reserve Bank of India.

Plethora of opportunities

Some of the recent developments in the FDI space include the following:

Toyota Group Signs MoU with Government of Karnataka for big investments

In its effort to contribute to the country's vision of 'Make in India' and to enable a faster reduction in carbon emissions, out of total investment of INR 4,800 crores, Toyota Group of Companies, in May 2022, announced their Memorandum of Understanding (MoU) with the Government of Karnataka to invest INR 4,100 crores, informed a press release issued by Toyota Group.

"As part of the MoU, Toyota Group of Companies will systematically invest towards making India a self-reliant manufacturing hub. The investments are aimed at promoting greener technologies that will help lower dependence on fossil fuels and mitigate carbon emissions. This investment will also enable local production facilities to build electric powertrain parts and components, thereby cater to the electrified vehicle manufacturing in India," added the press release.

Apple looks to boost production outside China, Wall Street Journal reports

Quoting a Wall Street Journal report, Reuters stated: "Apple Inc. has told some of its contract manufacturers that it wants to increase production outside China, the Wall Street Journal reported, citing people familiar with the matter. India and Vietnam,

which are already sites of Apple production, are among the countries short-listed by the company as alternatives," the report added.

Continental inaugurates 200-crore Greenfield Surface Solutions Plant in Pune

According to a press release issued by Continental, in April 2022, the technology company inaugurated its greenfield plant in Pune, manufacturing surface solutions materials mainly for the Indian automotive and two-wheeler market. With investments totalling about INR 2 billion covering facilities and machinery, Continental will produce premium surface materials for car interiors, including electric vehicles as well as two-wheeler seats, catering primarily to the domestic market and exports.

"The 149,000 square feet manufacturing facility, with an initial annual capacity of five million square meters of surface materials, can be scaled up to 10 million square meters. The new surface solutions plant in Pune will primarily manufacture Acella Eco and Acella Lux materials, which add aesthetic value to vehicle interiors. Eco-friendly foam foil Yorn and Yorn Light will also be produced in the near future," it added.

LG starts manufacturing dual inverter window air conditioners at Noida plant

According to various news reports, LG Electronics has begun manufacturing their dual inverter window air conditioners at their Noida plant in India. The company said that it will be investing in building the infrastructure with the capability of manufacturing up to 3,00,000 units of the window air conditioners.

LG Electronics has a manufacturing unit in Greater Noida. Their second greenfield facility located at Ranjangaon in Pune manufactures LED television sets, air conditioners, commercial air conditioning systems, washing machines, refrigerators, and monitors. The company plans to make more India-specific products both for domestic as well as global consumers, informed various news reports.

Image used for representation only. Courtesy: Envato Elements

Samsung reaffirms commitment to India with INR 1588 crore investment to set up new compressor plant for refrigerators

In March 2022, Samsung announced an investment of INR 1588 crore in India to set up a new compressor manufacturing plant in Sriperumbudur, near Chennai. Spread over 22 acres, the facility will have a capacity to produce 8 million compressor units a year, which will be expanded in the future. Compressors produced at the plant will be used in refrigerators that Samsung manufactures in India and also be exported. The company has also signed a Memorandum of Understanding (MoU) with the Government of Tamil Nadu for the new plant, expanding and strengthening the component ecosystem in the state, stated a press release issued by Samsung.

Set up in 2007, the manufacturing facility in Sriperumbudur is one of two factories that Samsung operates in India. Since its entry into India in 1995, Samsung has set new benchmarks in innovation-led manufacturing and consumer marketing, and established itself as a national brand. It has consolidated its market leadership in the country with two factories, in Noida, near New Delhi and in Sriperumbudur, five R&D centers and one design center, added the press release.

Volvo Group expands its R&D operations in India to become the largest site outside Sweden

According to a press release issued by the Volvo Group, the increased focus on product and project responsibility within Volvo Group's R&D operations in India, has led to a demand for a framework that will support the enhancement of product knowledge and prototype validation capability within India. Today, this capability is being enhanced with the set-up of the Vehicle TechLab – which is a first in the industry in India. This lab can house complete trucks, chassis and aggregates. It has various supporting equipment for engineers to test, innovate, validate and experiment their ongoing work - through a set up equipped with driving simulators, test benches, 3D scanners, among various other tools and systems.

The projects being worked upon cover a range of areas: General vehicle technology, electric,

Image used for representation only. Courtesy: Envato Elements

autonomous as well as connectivity solutions. Engineers will have access to complete products, which could well include battery electric or fuel cell electric trucks too among other options. This Vehicle TechLab adds to the growing capabilities of Volvo Group's R&D operations in India. Earlier, in July 2021, Volvo Group launched CampX – Volvo Group's Global Innovation Arena - in Bengaluru. CampX in India has already engaged with close to 70 start-ups and is now building multiple proofs of concept with several start-ups, it informed.

Google to invest up to $1 billion in Bharti Airtel

In January 2022, Bharti Airtel and Google announced that they will partner on a long-term, multi-year agreement to accelerate the growth of India's digital ecosystem. As part of this partnership, Google intends to invest up to $1B, as part of its Google for India Digitization Fund, which includes equity investment as well as a corpus for potential commercial agreements, to be identified and agreed on mutually agreeable terms over the course of the next five years, informed a press release issued by Airtel.

"As a part of its first commercial agreement, Airtel and Google will work together to build on Airtel's extensive offerings that covers a range of Android-enabled devices to consumers via innovative affordability programs. Together, the companies will continue to explore further opportunities to bring down the barriers of owning a smartphone across a range of price points, in partnership with various device manufacturers," it informed.

Under the larger strategic goals of the partnership, both companies will also potentially co-create India-specific network domain use cases for 5G and other standards, with cutting-edge implementations. Airtel is already using Google's 5G-ready Evolved Packet Core & Software Defined Network platforms, and plans to explore scaling up the deployment of Google's network virtualisation solutions to deliver a superior network experience to their customers. Both the companies will also focus on shaping and growing the cloud ecosystem in India to accelerate their digital transformation journeys, it added.

Alstom inaugurated a new components manufacturing facility in Coimbatore

According to a press release issued by Alstom, in November 2021, Alstom inaugurated its new components manufacturing facility in Coimbatore. This is the largest components manufacturing facility in Asia and is dedicated to improving industrial efficiency in manufacturing components for various prestigious national and international projects.

In the Pipeline…

Uttar Pradesh to get investment boost worth INR 7,500 crore from foreign firms

In June, an India Today news report stated that an investment of over INR 75,000 crore is proposed on manufacturing units in Uttar Pradesh, from which the state will soon receive foreign projects worth around INR 7,500 crore. It is also expected that 1,500 projects worth more than INR 70,000 crore will be launched during the third ground-breaking ceremony.

Karnataka expects to receive FDI worth INR 75,000 crore: Education Minister

Quoting the state's Education Minister Dr. Ashwath Narayana, a PTI News report in May stated that Karnataka is expecting a Foreign Direct Investment worth INR 75,000 crore in sectors like biotech and start-ups. The Karnataka Government has assured special incentives for the company to set up its production unit for medical equipment.

Did you know?

Chennai has been ranked the world's cheapest FDI location for electronics R&D with estimated annual operating costs of $1.24 million for a 50-person centre. Penang ($1.32 million) took the second spot followed by Gurgaon ($1.52 million) and Pune ($1.53 million), says fDi Benchmark, an investment location comparison tool from the Financial Times.

Source: The Hindu BusinessLine

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Alstom's industrial presence in Coimbatore has evolved across 3 sites since 1978. This new site is spread over a total area of 15 acres and has an installed capacity of 2.1 million hours, that will offer a higher degree of production diversity & complexity – integration & testing of tractions, auxiliary convertors, cubicles, driver desks and Rolling Stock looms, it informed.

The Coimbatore site currently delivers not just to Alstom's Indian sites but also to major sites across 5 continents – Asia, Australia, Europe, North America and South America. Some of the key countries include – France, Canada, Italy, Belgium, Germany, Netherlands, Saudi Arabia, Vietnam, UAE, etc., it added.

Roadmap for toolmakers

According to the CII-EY survey on 'FDI in India – Now, Next and Beyond, Reforms and opportunities', "India can expect to attract US$120 billion to US$160 billion of FDI annually by 2025 if it manages to increase the FDI to GDP ratio between 3% to 4% range by 2025. This can aid in bringing back India's GDP growth rate to 7%-8% range. The above growth will be stimulated by the recent structural reforms, raising of the FDI limits in multiple sectors."

The report, based on a CII-EY Survey to gauge the market sentiment amongst the Indian as well as non-Indian companies, notes that India has emerged as one of the top three choices for overseas investments.

Indian toolmakers will discover a lot of opportunities in electronics, medical equipment, aerospace & defence, and whitegoods, among others industries. Even as India finds itself as a lucrative option to foreign investors, toolmakers will need to focus on the following aspects:

Improving Quality: Toolmakers have made significant contributions to the global manufacturing industry. However, they need to work on improving the quality of their work. For this, there's a need to focus on the global market, forge strategic partnerships, and skill up manpower.

Enhance Capacity: A few industries, like the automobile industry, are still highly reliant on global toolmakers because of their limited capacity. Toolmakers need to find a way to maximise capacity utilization.

Adopting Latest Technologies: The tooling industry has seen a lot of advancements and is now catering to demands from some global customers. Indian tooling companies lack the specialization that the global market demands and need to focus on adopting the latest technologies, like their global counterparts.

Indian toolmakers need to focus on the factors that are not letting them take that giant leap. They need to work on their drawbacks and convert them into strengths. If they succeed in doing so, they will be able to meet the fast-paced demands of various sectors and will be able to tap the growing opportunities.

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Overmolding in the Plastics Industry

Have you ever wondered the type of techniques in overmolding or the type of materials that you can use for the overmolding process? This article is your definitive guide to acquiring in-depth insights upon overmolding techniques and processes.

Overmolding is also referred to as 'two-stage' injection molding. Overmolding is a type of injection molding process in which two or more components are molded over one another. The overmolding technique primarily involves covering the substrate, which is the first material, either partially or completely, by the subsequent materials.

Process Explained

The uniqueness of the overmolding process is such that various materials can be seamlessly combined into a single product or part. Some of the most common examples of overmolding are power tools that often use textured materials to add an ergonomic grip. Another example includes manufacturing car tail-lights that encompass multiple colour parts. The overmolding process generally includes a rigid, plastic-base overlaid with a thin exterior layer. This can be done using either a single-shot (insert molding) or two-shot (multiple-shot molding) technique. The most important aspect of the overmolding process is to ensure that the melting temperature of the substrate is considerably higher than the second molding material.

There are typically 4 types of combinations that we can implement to develop a product. These are listed below:

- **Plastic Overmold – Plastic Substrate** – In this case, a rigid plastic substrate is first molded after which another rigid plastic is molded around the substrate. Both the plastics that are used could differ in colour and the type of material. This is particularly known as 'overmolding'.

- **Rubber Overmold – Plastic Substrate** – In this case, the substrate is a rigid plastic, upon which, a soft rubber, such as thermoplastic elastomer, is molded. This gives an ergonomic grip to the rigid part.

- **Plastic Overmold – Metal Substrate** – This type of molding is used when we want to include metal components in plastic parts. In this type of overmolding, first a substrate of metal material is inserted into an injection molding tool. The plastic is now molded around the metal substrate. This type of molding is commonly known as insert molding.

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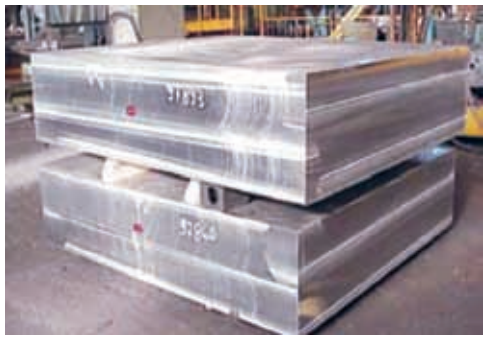
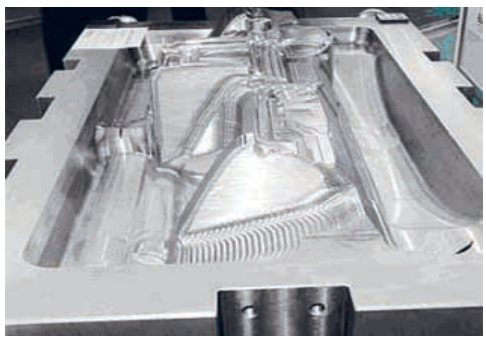
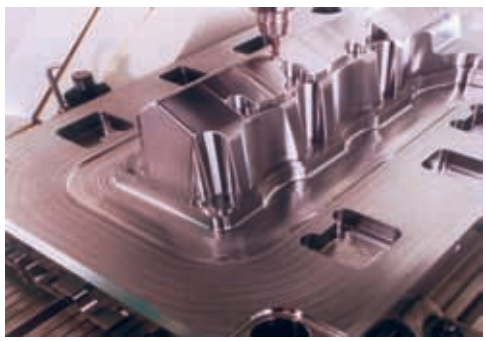


6 Sides milled with Lifting hole



3D pre-Milled Dash board Mold



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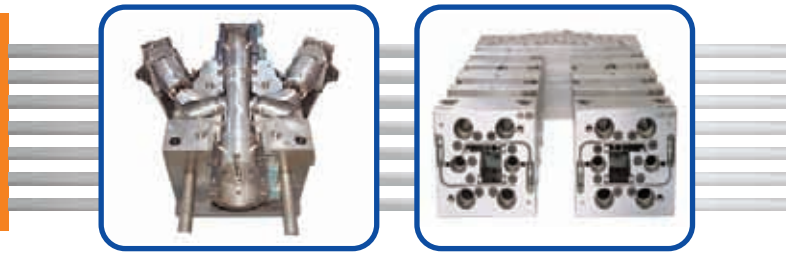

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- **Rubber Overmold – Metal Substrate** – Just like the rubber over plastic overmolding, this type of overmolding is used to get an ergonomic grip to the rigid metallic part. In this case, a substrate of metal material is inserted into an injection molding tool. The rubber plastic is now molded around the metal substrate.

You must, however, note that product developers and engineers are not always restricted to using only 2 materials in the overmolding process.

Overmolding Techniques

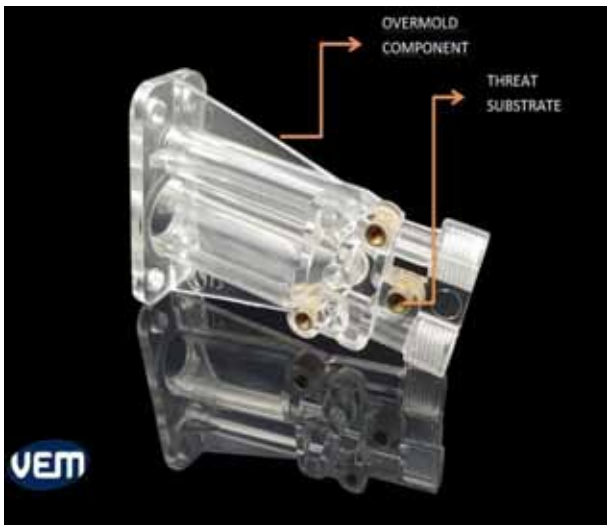
- **Insert molding,** also known as single-shot molding, primarily involves positioning an insert in the injection mold after which the second material (either the thermoplastic or elastomer) is then injection molded over the insert.

  The total cost of insert molding is low as compared to the other 2 techniques, which is why it is widely known as a low-cost overmolding technique. The Insert Molding process is a 3-step process:

  1. The first step is to position the substrate inside the injection mold.

  2. Once the substrate is positioned in the injection mold, the second material, which is either the thermoplastic or elastomer, is injected inside the injection mold.

  3. The third step is to allow it to cool down, after which the part or the product is ejected from the injection mold.



- **Multiple-shot** also known as two-shot molding requires an injection molding machine consisting of tool rotating arrangements and multiple barrels.

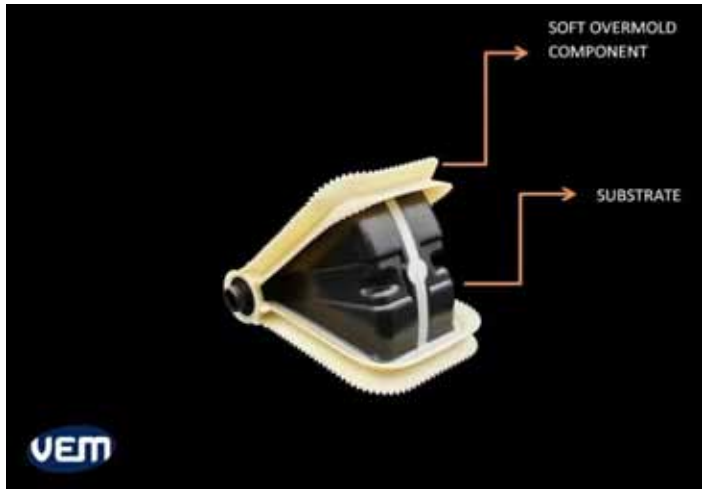
  1. The first step is to inject molten plastic from the first barrel into the injection mold, which is allowed to cool. Here, the core and cavities separate upon cooling.

  2. In the next step, the injection mold is rotated to be in position with the second barrel.

  3. The mold is now closed and the machine now injects the molten plastic from the second barrel.

  4. The final step includes the cooling of the material in which the part ejects out of the injection molding machine.

  At VEM, overmolding techniques can also be automated with robotics to varying degrees for precise placement of parts and fast turnaround times. With robotics, molded parts can be automatically placed from one injection molding machine into another, which reduces labour and assembly costs.



- **Plastic Co-Injection Molding** is a relatively more complex and expensive process than the former 2. It involves injecting 2 or more plastics that have different material properties in 1 mold. A high bonding strength between the 2 materials can be achieved, as during the co-injection process, both the materials are in a completely molten state.

Manual overmolding process

The overmolding process can also be performed manually by taking out part of mold 1 from the injection molding machine and placing it in mold 2. This is typically done for small batches of up to 10,000 pieces. Manual overmolding is not suited for large-scale productions, as it is constantly manual. Thus, it is not cost optimized for mass production; however, it is the best solution for smaller batches.

Overmolding versus Insert Molding

While the 2 terminologies are very interchangeably used, there are some differences. Overmolding combines multiple materials seamlessly into a single part or product, whereas insert molding requires pre-placement of an insert, which is typically metal, in the tool. After which, the injected plastic flows around encapsulating the insert. This creates a single molded plastic piece. Generally, the final part that is made using insert molding is more durable than the one made by secondary assembly.

Overmolding versus Two-Shot Molding

Two-shot molding or 2K Injection Molding is a type of overmolding technique. They are essentially similar. We must note, however, that two-shot injection molding is often used for huge production runs as opposed to smaller production runs.

Material Combinations for Overmolding

One of the most important steps in overmolding and the product development process is the 'material selection' stage. It is imperative to choose the best-suited plastic resins for the application, as this will ensure the combination of required material properties to guarantee a durable and optimally performing product.

- **ABS** abbreviated for acrylonitrile butadiene styrene is a commonly used plastic for components in electronic and automotive industries. ABS has high-impact strength and a great resistance to chemicals. In addition, ABS has a low melting temperature and excellent tensile strength. It also has the ability to alloy with polymers, such as high-density polyethylene (HDPE) and low-density polyethylene (LDPE).

- **PEEK** Resin, abbreviated for Polyether ether ketone, is known for its tremendous resistance to high temperatures, hydrolysis and chemicals. PEEK also has excellent resistance to fatigue, which is why it is popularly used for the production of medical device appliances. Apart from medical appliances, it is also widely used in aerospace, automotive, military and electrical industry.

- **PMMA,** abbreviated for polymethyl methacrylate acrylic, is naturally transparent. It is also known as 'acrylic glass' or 'acrylic thermoplastics'. It has a high resistance to wear out and UV rays.

- **HDPE** is a strong, lightweight plastic that is also impact and weather resistant. One of the most important properties is that it is highly malleable, thus, it is a popular choice for complex parts. HDPE is best suited for parts and products, where durability is of the utmost importance, such as corrosion-resistant pipes.

Scope of Overmolding Applications

Overmolding has an expansive scope in improving the aesthetics and functionality of a product. It can be used to either add colours, textures, shapes, or improve upon the functionality of the product.

Overmolding process is a technique that when applied, alters the physical properties of the part or product to suit the requirements that may vary from upgrading the functionality of the product to enhancing the aesthetics in order to differentiate it from the competition. The overmolding process is typically used to manufacture innovative products to promote user experience and boost sales. Manufacturing modern and new designs also helps to differentiate a product visually from competitors.

The overmolding process can be applied to a myriad of industries and has diversified applications. Some of these applications are listed below:

Medical Industry

Medical overmolding is one of the most specialized applications of overmolding. Many medical devices are required to have a rigid substrate with a soft overmold. By utilizing medial overmolding, VEM can produce a range of medical devices, and high-performance equipment that has a non-slip design.

When it comes to medical device manufacturing, we ensure to conform to the stringent requirements of the medical manufacturing industry to manufacture the highest quality product. Our mold design, engineering and manufacturing team follows rigorous standards. Our Thailand plant is ISO 13485 certified and has an ISO 7/Class 10,000 cleanroom after ISO 14644-1:2015 certification.

Automotive Industry

The overmolding process is also a very popular injection molding technique in the automotive industry. It is often

a preferred technique to produce handles, components of car seats and headrest, car handles, energy absorber mounts, car hood, and dashboard accessories.

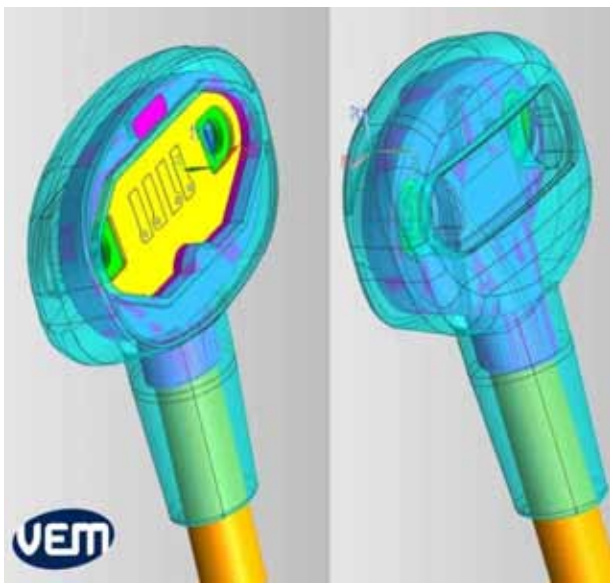
Prior to overmolding, these components were manufactured either solely or largely with metal to maintain durability. Post over-molding, these components can be manufactured to be not only durable but also light-weight and desirable for the consumer.

When molding automotive products and parts, it is imperative to take into account the numerous factors that are related to vehicle movement. Today, molding automotive products and parts requires material behaviour and manufacturing processes to be considered at an early design stage. This helps us to streamline any obstacles that may arise in manufacturing.

Electronics Industry

Another industry where overmolding techniques are very extensively used is the electronics industry. Many parts are overmolded in the electronics industry to seal the sensitive electronics components and connect it with the cables.

The most significant overmolding applications in the electronics industry are PCB, thermostat and circuit board overmolding. In this type of overmolding, electronic assemblies are positioned within a mold. Once they are positioned, they are then injected upon with molten plastic, which then hardens into a protective layer. This ultimately reduces the damage risk by sealing the junction between the wires and connectors. Almost every electronical product that you can see has some degree of overmolding involved in their production. Just take a look at your USB charger or HDMI cable, just to name a few.



When should you choose Overmolding?

The primary reason to use overmolding techniques is to develop more innovative products and complex designs but in addition to that, it offers various benefits that can significantly impact your manufacturing cycle.

- Overmolding process can save both time and money, because it eliminates assembly steps. Instead of manufacturing 2 parts separately and then joining them together, you can overmold the parts and eliminate the need for assembly altogether.
- It can significantly improve the material flexibility.
- It can be used to either add a soft grip surface above the substrate or add flexible areas to a rigid part.
- It also helps to develop durable products and parts that match the design language of the product developer.
- It also eliminates the need for fasteners or adhesives. Overmolding helps to capture one part inside, thus eliminating the requirement of fasteners or adhesives.

Disadvantages

Though there are various benefits of developing products with overmolding techniques, there are a few disadvantages that we must note as well. Some of these are listed below:

- Overmolded parts and products are made in a two-step process. This 2 step process can increase part cycle time significantly, making the production cycle more expensive. At VEM, we can suggest an alternative in which our engineers help to create two separate injection-molded parts. If we consider this alternative, it generally takes the same amount of time for overmolding parts and products. These 2 parts are then further assembled.
- Debonding – Sometimes, bonding two different materials in an injection mold may result in delamination if the temperatures are not in the optimal range. This may happen if one does not have an adequate knowledge of specific material combinations. At VEM, we eliminate these errors and ensure that such errors are avoided. If there is a chance that we cannot rely upon heat for material bonding, then mechanical interlocks can also be used.

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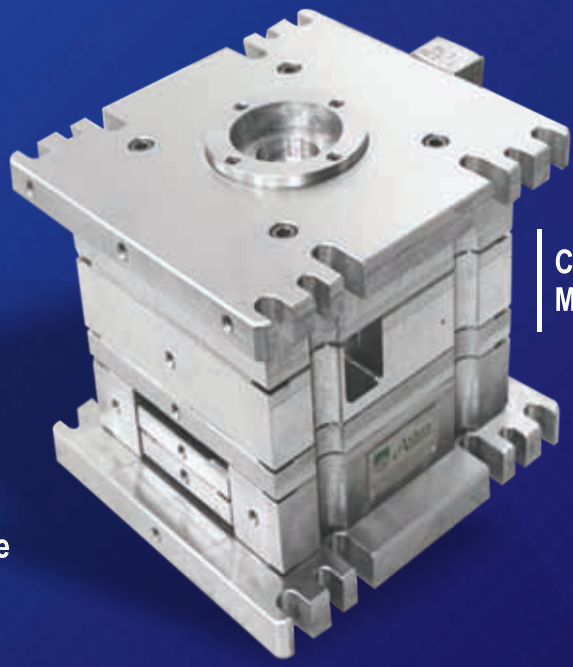

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Mould Base

PDC
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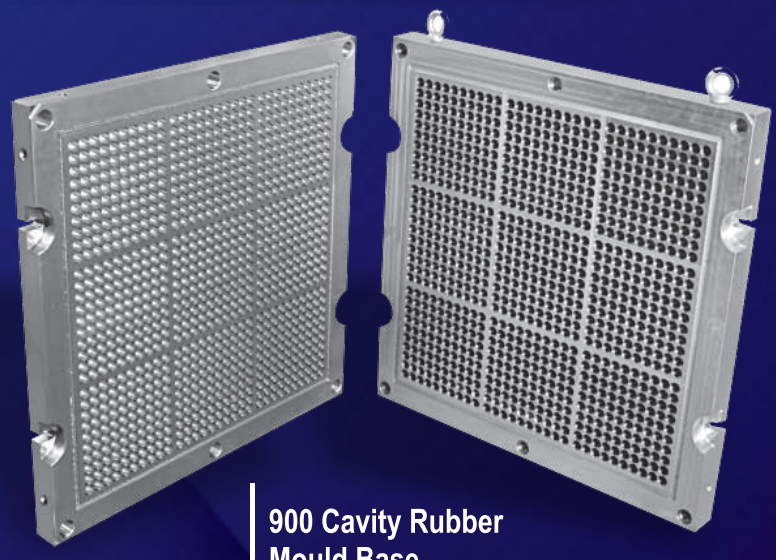

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CVs, PVs to drive auto sector growth this fiscal

Two-wheeler, tractor growth to stay sluggish; profitability of auto OEMs to rebound from a low

Image used for representation only. Courtesy Envato Elements

Commercial (CV) and passenger (PV) vehicles will continue to drive recovery in India's automotive sector volume this fiscal, while two-wheelers and tractors are expected to underperform once again.

CV and PV volume could grow 18% and 12%, respectively, this fiscal after rising 26% and 13%, respectively, last fiscal. Two-wheelers will see a modest sales growth of 6% after a 10% cut last fiscal, while tractor volume growth is expected to be flat or in the low single digit compared with a 6% decline.

Says Pushan Sharma, Director, CRISIL Research, "CV demand growth, particularly for medium and heavy commercial vehicles (MHCVs), is expected to be backed by replacement demand because of improved utilisation and profitability of fleet operators, and government spending on infrastructure. Light CVs will be propelled by a surge in e-commerce and better last-mile connectivity, while demand for buses will be driven by the gradual reopening of schools and offices, and easing of mobility restrictions. That said, overall CV demand, despite double-digit growth last fiscal, and likely this fiscal, will still be 16% below fiscal 2019 level."

PV volume, meanwhile, will be driven by easing of chip shortages, particularly in the second half, as capacity additions by chip manufacturers come

onstream, helping clear the sizeable order backlog built over the past six months. Besides, inventory build-up from the current low of 15-20 days to the normative levels of 30-35 days will account for about a third of the incremental volume.

Two-wheelers sales, on the other hand, is expected to register a modest recovery after declining for three successive fiscals, driven by the opening up of educational institutes and improved mobility. However, like last fiscal, a sharp increase in the total cost of ownership and petrol prices will weigh on demand. Consequently, volume would be massive ~28% lower than in fiscal 2019.

The tractor segment will be bogged down by high-base effect. While volume had declined last fiscal, it was still on the back of an all-time high of fiscal 2021, when purchases had surged following reverse migration of labour following the pandemic, and farmers redirecting savings from fewer social events. Volume this fiscal will likely be supported by healthy farm income, driven by higher crop prices. It presumes a normal southwest monsoon, as predicted by the Indian Metrological Department.

Says Naveen Vaidyanathan, Director, CRISIL Ratings, "We expect higher volume and easing commodity prices in the second half to ease the pressure on profitability of original equipment manufacturers (OEMs) this fiscal[1]. With variable cost accounting for about 85% of overall cost, the sharp surge in commodity prices, especially steel, combined with modest volume growth, has led to OEMs absorbing a significant part of the cost inflation. Operating margins — likely to improve to 9-10% this fiscal from an expected record low of ~8% last fiscal, will remain well below the 12.5% average during fiscals 2017-21."

Strong balance sheets and modest debt have helped OEMs buttress the impact of profitability pressures and sustain their credit profiles in the recent past. Higher accrual driven by better revenue and a slight improvement in operating profitability will support higher capital expenditure by OEMs, including for enhancing electrification, and will keep credit profiles 'Stable' over the medium term.

Any resurgence in COVID-19 cases, continuing semi-conductor shortages, and the progress of monsoon will bear watching in the road ahead.

[1] This is based on an analysis of 14 OEMs rated by CRISIL Ratings, which account for over 60% of the sector's capacity

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Ease of doing business for MSMEs steady, digitization help significantly, says PHDCCI Ease of Doing Business (EODB) Survey

Overall ease of doing business for MSMEs at the scale of 100 is 64; manufacturing MSMEs at 67 and service MSMEs at 61.

Survey

According to an extensive survey of more than 5,000 MSMEs, conducted by PHD Research Bureau of PHD Chamber of Commerce and Industry for Ease of Doing Business (EODB) for MSMEs, the overall EODB for MSMEs has been observed at 64 on the scale of 100, of which EODB for manufacturing MSMEs is at 67 and service MSMEs is at 61.

The Industry Body PHD Chamber of Commerce and Industry, in collaboration with the Department of Commerce, Delhi School of Economics (DSE), Delhi University, has conducted a survey study on 'Ease of Doing Business for MSMEs in India: Percolating EODB Reforms at Factory Level'. The study is based on a pan-India stratified random sample survey of MSMEs from manufacturing and services sectors, through a structured questionnaire on 25 parameters of ease of doing business.

The survey study was recently released at PHD House by Ms. Sumita Dawra IAS, Additional Secretary, Department for Promotion of Industry and Internal Trade, Ministry of Commerce & Industry, Government of India. While unveiling the survey study, Ms. Sumita Dawra appreciated the contribution of PHD Chamber for putting forward micro-level issues of the industry and practical suggestions to improve ease of doing business. She emphasised on the current macroeconomic scenario of India, as the country is the fastest growing economies in G20. She highlighted that India is at the top in smartphone data consumption, ranks second in internet usage, third in startup ecosystem and energy consumption, among others. In all these sectors, there are huge opportunities for domestic and foreign investors.

She highlighted that it is the opportune time for the investors of the world to make major investments in India, as the Government has undertaken a significant step to boost road, rail and airport infrastructure. She mentioned that due to geopolitical disruptions, opportunities lie in the collaboration with the other countries by matching and mapping of potential sectors.

Ms. Sumita Dawra urged all industry members to collaborate and build B2B relations with our trading partner countries, specifically in the areas of green technology. She opined that PHD Chamber can play a critical role in bridging the gap to make foreign investors more aware and comfortable in investing in India. She urged the PHD Chamber to conduct more and more meetings, brainstorming sessions, and delegation visits abroad to attract foreign investors into India.

The survey reveals that the adoption of digitization has been the top-scoring parameter for ease of doing business for manufacturing MSMEs, followed by availability of information on business procedures & compliances, adequate power supply availability, process of tax registration and tax compliances and availability of Infrastructure (internet, telecom and other utilities), said Mr. Pradeep Multani, President, PHD Chamber of Commerce and Industry.

The top-scoring parameters for ease of doing business for services sector MSMEs include availability of information on business procedures & compliances, processes and procedures for starting a business, regulatory environment, dissolution of business and adoption of digitization, said Mr. Pradeep Multani.

Whereas, the low scoring parameters for ease of doing business for manufacturing MSMEs came out to be the Government support for marketing, reduction in time taken to obtain credit and reduction in cost of power, said Mr. Pradeep Multani.

On the services sector MSMEs front, the low scoring parameters for ease of doing business include cost of compliances, reduction in time taken to obtain credit and reduction in the overall costs of doing business, said Mr. Pradeep Multani.

For further enhancing the ease of doing business for MSMEs, the report has suggested the following measures:

Nodal officers for handholding- There is a need for dedicated officers for Facilitating Domestic and Foreign Companies.

One-time registration and no license- There should be a one-time registration instead of issuing a license every year for renewal, which causes a lot of time and effort.

Merger of all 25-30 departments in a Single Window System for approval- To start a business, there should be one window clearance instead of running after 25-30 departments.

Inspector/officials to be an Enabler, Motivator, and Guide- The inspector should be an enabler, motivator, and guide for improving the business and giving positive confidence to the investors.

Speedy and timely Justice for litigation under GST and other laws- The various Departments should not be allowed to issue summons / notices without

a valid reason. The litigation should be time-bound and speedy.

Reservation on Local Labour- Employment should be productivity linked. Local reservation on labour must be abolished in states in order to provide justice to skilled employees if hired from outside the state. Recently, the declared "reservation policy" in Haryana is one example.

Fixed-term Employment- Fixed-term employment provision announced by Government of India but the State should fully implement it at the ground level.

Uninterrupted Power and Gas supply- To ensure uninterrupted power and gas supply to the industrial areas at reasonable rates.

Decriminalisation of the minor offences will significantly improve the EODB in the Country.

Bank Financing for setting up new projects- Clear-cut instructions should be issued and there should not be unreasonable collateral requirement for the loans disbursed to the businesses

Lesser compliances for MSMEs will create visible ease of doing business at the ground level and a lower tax regime will increase the personal disposable income of the people and create an overall virtuous circle of growth and development in the economy.

PLI Scheme should include more sectors from manufacturing for the benefits of businesses/industry.

Simplification of land acquisitions is required, as it remains complex, because of the difficulties in establishing legal ownership and a 'clean' holding for purchase.

The event was sponsored by PHDCCI's Annual Sponsors - Multani Pharmaceuticals Ltd; Star Wire; PG Industry; Uflex Ltd; DLF Ltd; Continental Carriers Pvt Ltd; Belair Travel & Cargo Pvt Ltd; Radico Khaitan Ltd; Jindal Steel & Power; MMG Group; Paramount Communications; Superior Industries Limited; JK Tyre & Industries Ltd; SMC Investments and Advisors Ltd; Crystal Crop Protection Ltd; Sagar Group of Industries; Samsung India Electronics; Comtech Interio; R E Rogers; AYUSH Herbs Private Ltd; Apeejay Stya Group; DCM Shriram; EaseMyTrip; Blossom Kochhar Beauty Products Pvt Ltd; Oswal Greentech; Trident Group; MV Cotspin Ltd; Synergy Environics Ltd; Ajit Industries Pvt Ltd; P S BEDI & Co.; Indian Farmer &Fertilizers Corporation Ltd; Jindal Steel; Hindware Sanitary; Modern Automobiles; Livit Ltd; Central Coalfields Ltd; Axa Parenterals; Bhagwati Plastic and Pipes Industries; J K Insurance Brokers Ltd; DD Pharmaceutical Ltd.

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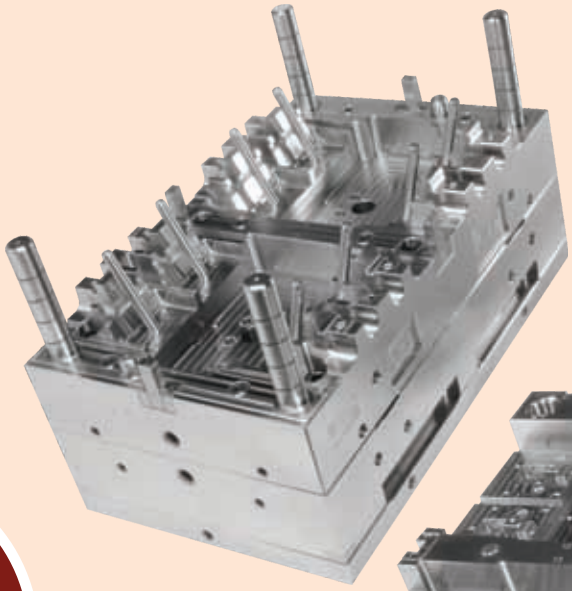

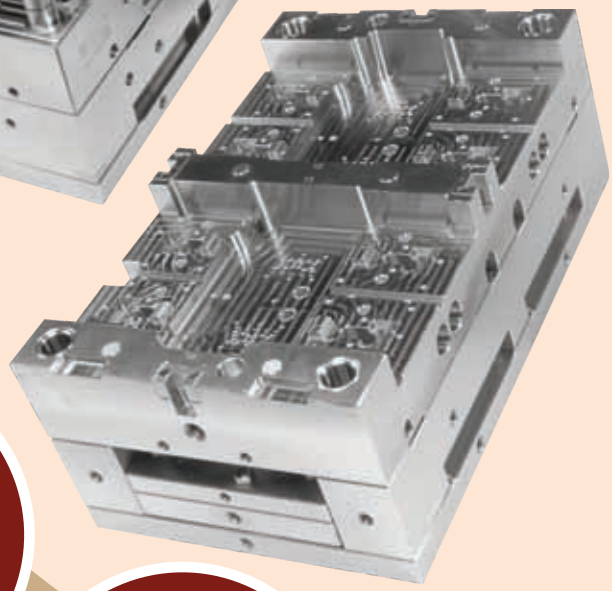

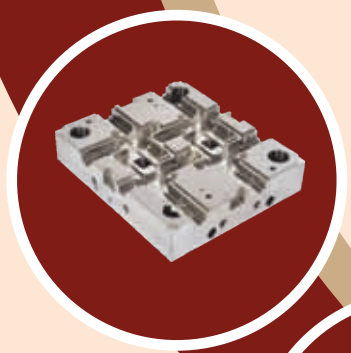

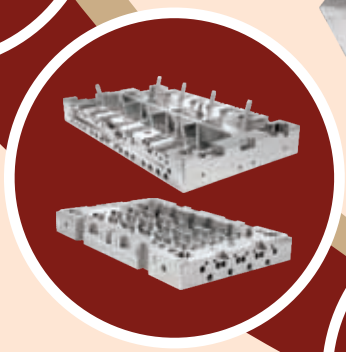

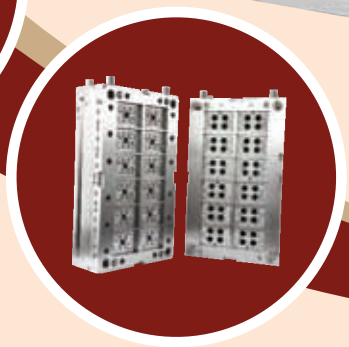

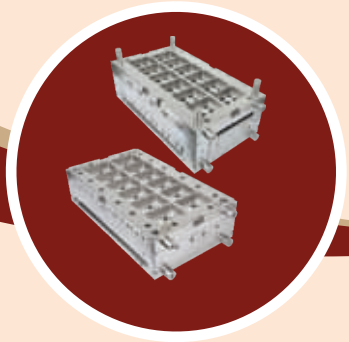

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Customer Challenge:

Double Enveloping Worm Threading on a Multi-Tasking Machine

Recently, a customer challenged Mazak to develop a programming and machining solution for producing a variety of Double Enveloping Worm Threads. The customer not only wanted the solution to be user-friendly and provide the ability to adjust the thread geometry based on inspection data (such as a roll test with a Master Worm Gear), but to also allow for the use of common off-the-shelf cutters.

Worm drives are designed in sets – namely, the worm and the worm gear or wheel. The thread geometry on these are parts is complex. However, when the mating worm gear geometry is a known, it is possible to calculate the thread toolpath trajectory. While it's common for many shops these days to cut gears on Multi-Tasking machines, such as our INTEGREX i-450ST, fulfilling the customer's request for tailored software to aid in programming proved a bit challenging to overcome.

There are several benefits to gear machining on a Multi-Tasking machine. Doing so is cost-effective when it comes to producing a wide variety of gear types, and the machines allow for complete part processing from raw stock to finished part on a single platform. For gear machining, a Multi-Tasking machine offers the ability finish turn datums (i.e., bearing diameters) and gear teeth in the same setup, which gives more control between the gear pitch diameter and the mounting geometry. Additionally, Multi-Tasking machines simplify workholding and reduce tooling because they compress the machining cycle from multiple machines down to a single machine.

There are two process options to machine the Double Enveloping Worm Thread on the Multi-Tasking machine – turning and milling. Turning is a process option that, depending on whether or not the machine's longitude axis (in this case the Z-axis), can travel at the required speed. Much like chasing threads on a lathe, the Z-axis travel speed is based on the part rpm and the thread pitch. For multi-start threads, the Z-axis speed requirement increases even further.

Milling is a process option that offers the ability to machine multi-start threads using a mill/turning technique. Essentially, the milling spindle delivers the cutting speed and the machines X, Y, Z, B and C axes provide the toolpath travel that replicates the rotation of the mating worm gear tooth.

Case Study

Figure 1: Double Enveloping Worm Thread GUI

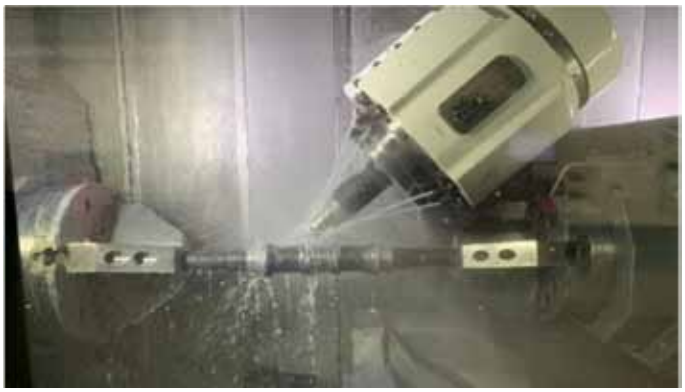


Figure 3 & 4: Toolpath Simulations & Machining Between Spindles

Figure 2: Toolpath Review

Figure 5: Finish Thread

For these operations, Mazak's SMOOTH state-of-the-art control technology provides the high processing speed and ensures smooth toolpath contours, resulting in superior finish and geometry. The technology also allows for unique machining operations such as Friction Stir Welding, Additive Manufacturing and Gear machining along with the execution of customized applications.

Custom applications are developed to run on the machine's control. They create toolpaths for unique machining operations that would otherwise require a part model and a CAD/CAM system. An example is computing the toolpath to cut a Double Enveloping Worm Thread. This thread possesses an hourglass pitch silhouette, meaning as the worm thread rotates, the cutting tool follows the lead in the same manner as the mating worm gear tooth.

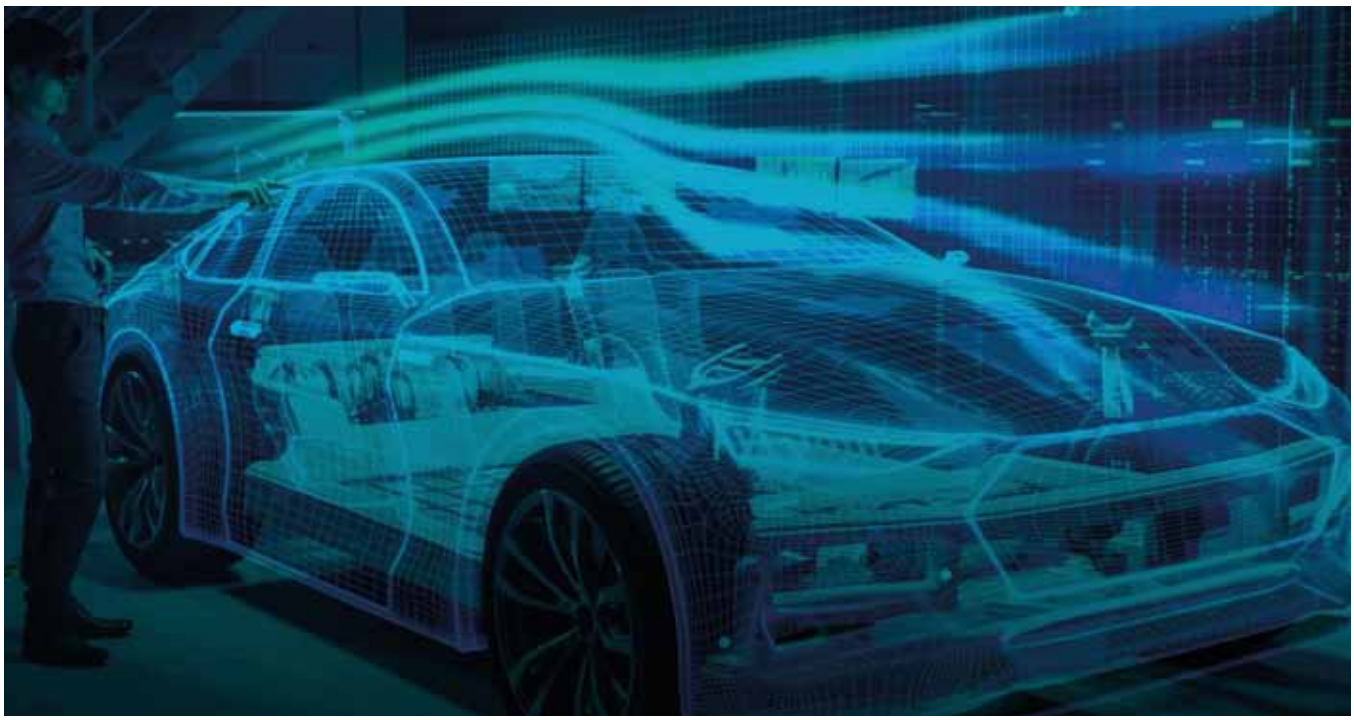
To accomplish this, the Mazak Applications Engineering department created a Double Enveloping Worm Thread Application that calculates the toolpath from graphical user interface data input. This Application runs on the MAZATROL SmoothAi control, where the user simply enters the worm drive data such as number of worm gear teeth, number of thread-starts and pressure angle, along with cutting conditions.

Upon completion of the data input, the G-code program is date-stamped and posted into the control's hard drive. The customer can then review the posted G-code program toolpath on the machine control. Upon confirming the posted program, they can machine the thread.

Besides Double Enveloping Worm Threads, Mazak Multi-Tasking Machines such as the INTEGREX i-450ST are capable of various other operations ranging from simple 2-axis turning to complex 5-axis simultaneous milling. The machine is truly an effective platform to cut parts traditionally produced on dedicated equipment, and Mazak continues to be the world leader in Multi-Tasking Machine Tool technology.

The versatility of Mazak's INTEGREX i-450ST gives customers – like the one wishing to machine Double Enveloping Worm Threads – the flexibility to adjust to market demands. Many customers over the 30-plus years of the INTEGREX's existence have put the machine to good use machining shafts, turbine blades, gears and so much more. Multi-Tasking Machines, like the INTEGREX, offer manufacturers more solutions and ways to boost their competitiveness in today's world markets.

Manufacturing a smarter pivot to electric vehicles



For over a century, the automotive industry has been a dominant influence over all aspects of industrial manufacturing. Today, as the process of moving from internal combustion engines (ICE) to electric vehicles (EV) gathers pace rapidly, we continue to see the wide-ranging impact of technology convergence within this sector.

The recent numbers are staggering – sales of battery electric vehicles (BEVs) rose by 40% and plug-in hybrid vehicles (PHEVs) by 74% worldwide in 2020, with the main growth stemming from Europe. But for OEMs and the supply chain, there are major challenges ahead as revealed in Wards Intelligence's report, commissioned by Hexagon: 'The electric vehicle pivot: Why smart manufacturing, not scale, may be the key to success'.

A disrupted sector

The path towards a 100% EV future represents the most significant upheaval in the automotive sector since the Model T Ford in 1908, and with that comes a transformation in the entire manufacturing process and supply chain. 90% of the components supplied to ICE cars are redundant in the new EV supply chain, leaving the door wide open for external competition. Notably, this includes players from the global electronics sector, which is now far more closely aligned to car manufacturing than it was previously.

But is this potential threat being acknowledged by established industry players? The report's survey data suggests maybe not. Only 8% of respondents viewed pure-play EV manufacturers winning market share as a threat. As the report details, new challengers entering the EV space have a number of logistic and economic advantages which will require existing manufacturers to re-think their strategy to remain competitive.

Economies of scale still the answer?

Traditionally, economies of scale have been a

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car manufacturer's friend. Since Ford with the Model T first presented the possibilities of mass production, scaling up has been a primary strategy for keeping costs down. Aligned with this, the 'just in time' method pioneered by Toyota in the 1970s delivered significant improvements in both quality and capacity. But recent issues with supply chains brought about by freak weather incidents, the Suez Canal blockage and the COVID-19 pandemic have highlighted the fragility of this methodology.

The development of EVs has provided the automotive industry an opportunity to start afresh with a new way of doing things that doesn't lean so heavily on economies of scale and is more resistant to supply chain disruption. Smaller, cheaper 'microfactories' have been designed and built to deliver EVs at a much lower cost than the usual $1 billion+ plants, with fully automated production processes reducing costs even further.

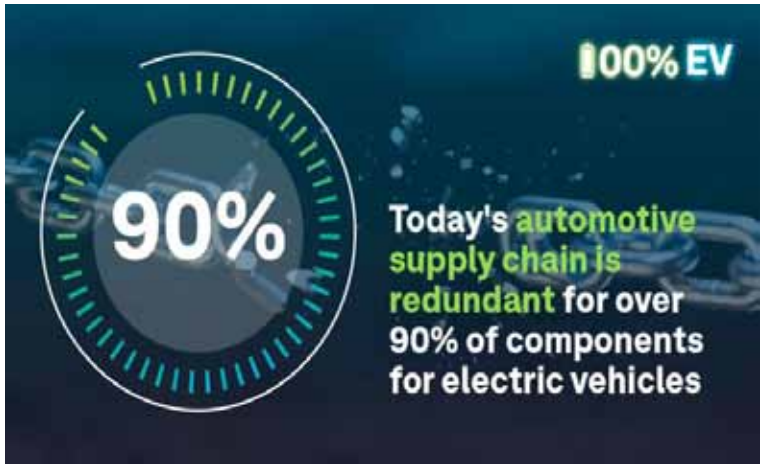
Becoming smarter

One of the key benefits of the 'just in time' method is avoiding waste, but this is achievable without the inherent risk of supply chain disruption. Smart manufacturing offers OEMs and the supply chain an opportunity to optimise processes at every stage of EV production – from design to assembly line – through an interconnected array of sensor technology, autonomous QC and AI-driven software. By delivering improvements in the productivity, quality and connectivity of design and manufacturing processes, material wastage and time-to-market can be reduced.

The harvesting of data and putting it to work in smarter, more autonomous ways is fundamental to the future of EV and ICE car manufacturing. For example, ŠKODA AUTO's tailor-made smart measurement cells that have significantly increased measurement capacity and quality as part of an initiative to reconfigure their inspection processes for automated 3D optical systems instead of tactile measurement.

Using smart systems such as these to increase the level of automation in manufacturing processes gives EV industry manufacturers a much-needed opportunity to maximise profitability and quality throughout the product lifecycle and compete with a raft of new players entering the market.

Keith Perrin, Senior Director – Digital Transformation for Hexagon's Manufacturing Intelligence division, a global leader in sensor, software and autonomous



solutions, commented: "The old industry was a finely tuned machine… OEMs assembling parts from suppliers. All of a sudden, the traditional norms are no longer there and people are looking with fresh eyes about car manufacturing, which means re-tooling. However, this isn't just an engineering problem, the entire business model needs to be re-tooled. The new players entering the market? They don't have that problem.

"Trying to adapt to the new world might appear chaotic, but it's just a different way of doing things. The rates of innovation with these new methodologies iterate and deliver much faster than before. The longer companies take to adapt to the new way, the further behind they will become."

The power of knowledge

The Wards Intelligence report from Hexagon also reveals that while awareness in this sector of smart manufacturing is growing, full engagement is still two or three years away. With the automotive industry on the threshold of immense change, those who get to grips now with all that smart manufacturing technology has to offer are giving themselves a crucial advantage in an increasingly competitive landscape..

Richard Scott

With more than a decade of experience editing B2B publications, Richard joined Hexagon in 2021 as Global Content Programmes Lead. Located in the UK, Richard has written for and edited a wide range of journals focused on subject areas such as electrical engineering and the chemicals industry.

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Driverless, fully electric, vehicle model-independent – Continental redefines tire braking tests

Continental's fully electric and driverless test vehicle 'AVA' enables high-precision braking distance measurements on dry and wet roads. The tire braking tests under fully controlled test conditions will set new standards for tire development.

AVA enables precise monitoring of the friction characteristics of tires during braking maneuvers on dry and wet roads.

Continental has presented a driverless and fully electric test vehicle, which it has developed for measuring the braking performance of passenger car tires. The objective of the fully automated test is to further reduce the braking distance of tires to ensure greater road safety. The AVA – 'Analytic Vehicle AIBA' – enables precise monitoring of the frictional properties of tires during braking manoeuvers on dry and wet roads. For the first time, the Continental AVA combines the advantages of a test method, which is independent of the vehicle model, with the controlled and reproducible test environment of the Automated Indoor Braking Analyzer (AIBA). Continental's tire testing experts can, therefore, perform tests regardless of vehicle-specific characteristics. With this, Continental has one of the world's most advanced and precise tire braking test methods. The cutting-edge and globally unique test vehicle is used on the company's proving ground Contidrom near Hanover, Germany.

"Our analytic vehicle AVA helps us to analyze the performance of our premium tires in even greater detail and systematically develop them," explains Dr. Boris Mergell, Head of Research and Development of Continental's Tires group sector. Transmission of forces between the tire and the road surface is decisive for tire braking performance. It is equally important for cornering characteristics or when changing direction.

With the AVA, Continental combines the advantages of a model-independent test method with the controlled and reproducible test environment.

The unique cutting edge test vehicle is used on the company's proving ground Contidrom near Hanover, Germany.

"The performance of the tire during braking is essential for the safety of the vehicle. For this reason, we make great efforts to analyze our tires as precisely as possible," emphasizes Mergell.

For the tire braking tests, the AVA is accelerated to a test speed of 65 km/h with the aid of an electromagnetic linear drive, which is derived from modern roller-coaster technology. Then, several fully automated braking tests are carried out. The AVA drive system is equipped with two electrically driven axles, which are powered by a high-performance battery. The high maximum torque ensures that a constant speed can be maintained, while the test tires on the third axle can be systematically braked. The integrated braking system of the AVA is equipped with Brake-by-Wire technology from Continental's Automotive business sector. Unlike conventional hydraulic braking systems, the braking signal is transferred electronically. The brake response is very quick and precise, which is essential for accurate testing or measuring.

"Our AVA determines the transmission of forces between the tire and the road surface, while various slipping states, so-called "µ-slip curves", are precisely reproducible. With the state-of-the-art measuring technology we measure all of the forces, which act between the tire and the road surface during braking. We can compare our tires and their various compound compositions even more precisely and optimize them for their special uses," explains Meletis Xigakis, who is responsible for global tire testing at Continental. The AVA is used in the Automated Indoor Braking Analyzer, which started operation in 2012. Brake tests on various road surfaces are performed on the 75-meter test track. The air-conditioned area of the test hall has up to five road surfaces, which can be exchanged hydraulically. In the weather-independent facility, up to 100,000 braking tests can be performed annually on dry, wet or even icy roads. The system is integrated into a 350-meter-long and up to 30-meter-wide hall.

In total, new Continental tire models are run for the equivalent of 25 million kilometers per year on test beds and test tracks. This corresponds to 625 times around the world. This great effort is fully justified. It is the basis of the premium quality of Continental tires. Together, with the company test tracks in Uvalde, Texas (USA), and in Arvidsjaur, Sweden, the Contidrom in Jeversen, near Hannover, Germany, is one of the most modern proving grounds in the world. The test track near Hanover was opened in 1967 and since then, it has been continuously modernized to meet the increasing requirements on tire tests.

In 2013, the Contidrom was awarded the title 'Proving Ground of the Year' by the international jury of the Automotive Testing Technology International Award. It is considered to be a benchmark by many customers in the automotive industry. On a total area of 160 hectares, the proving ground provides every conceivable option for tire testing. On a ten-kilometer track with a large variety of partly water-covered road surfaces, and the legendary circuit with banked turns, speeds of more than 250 km/h are achieved. In addition, there are also tracks for testing chassis elements. During 2022, an innovative dynamic driving simulator, which can calculate the exact dynamic parameters of the tires and the test vehicle involved will be commissioned at the Contidrom. This provides the professional Continental test drivers with exactly the same subjective driving feel as tire tests on the test track.

Article and images courtesy: © Continental AG

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Density ρ	g / cm³	8.71	8.7	8.7
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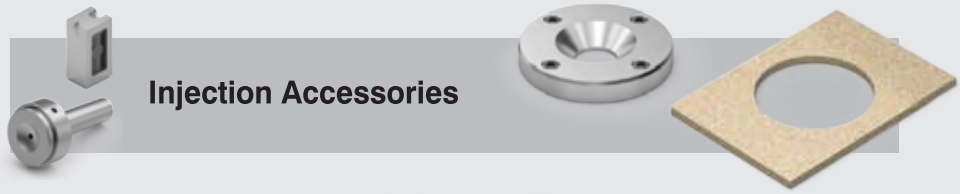

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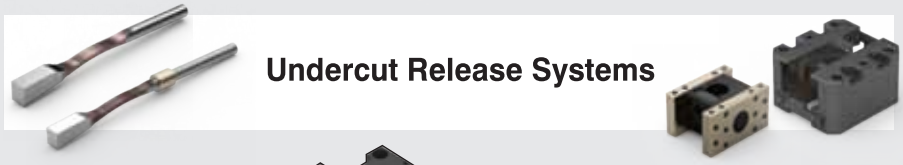

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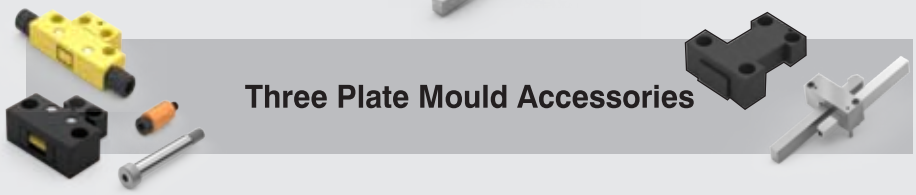
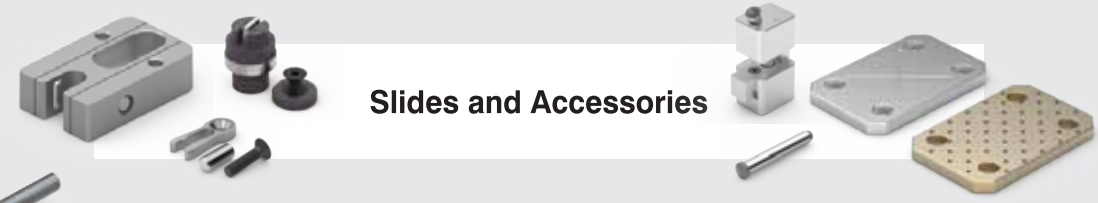
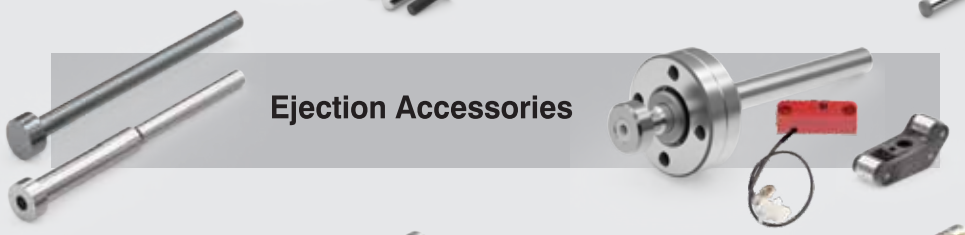


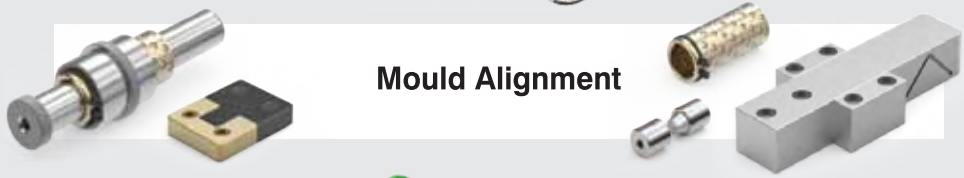
Three Plate Mould Accessories



Slides and Accessories



Ejection Accessories



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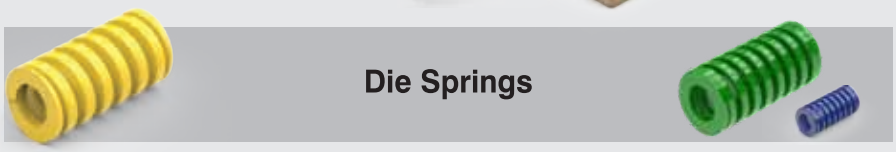
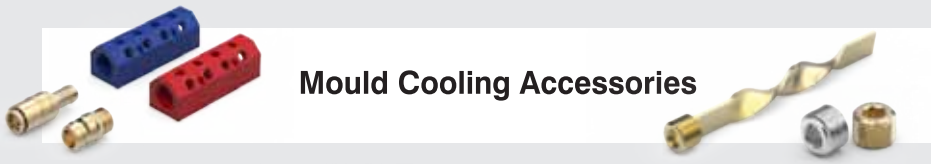
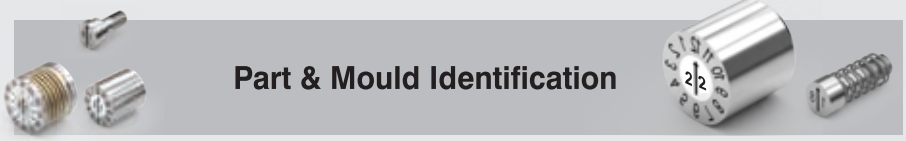


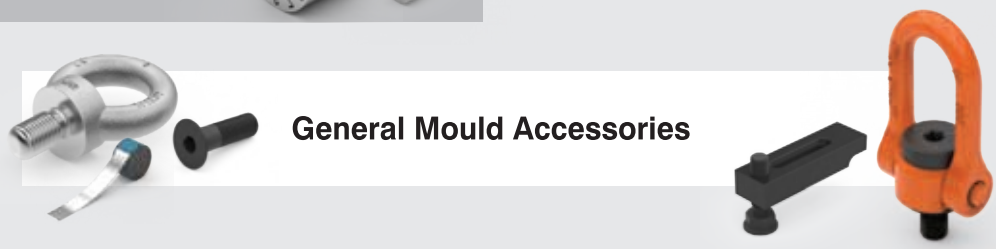
Die Springs



Mould Cooling Accessories



Part & Mould Identification



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