

TAGMA TIMES

NEWSLETTER

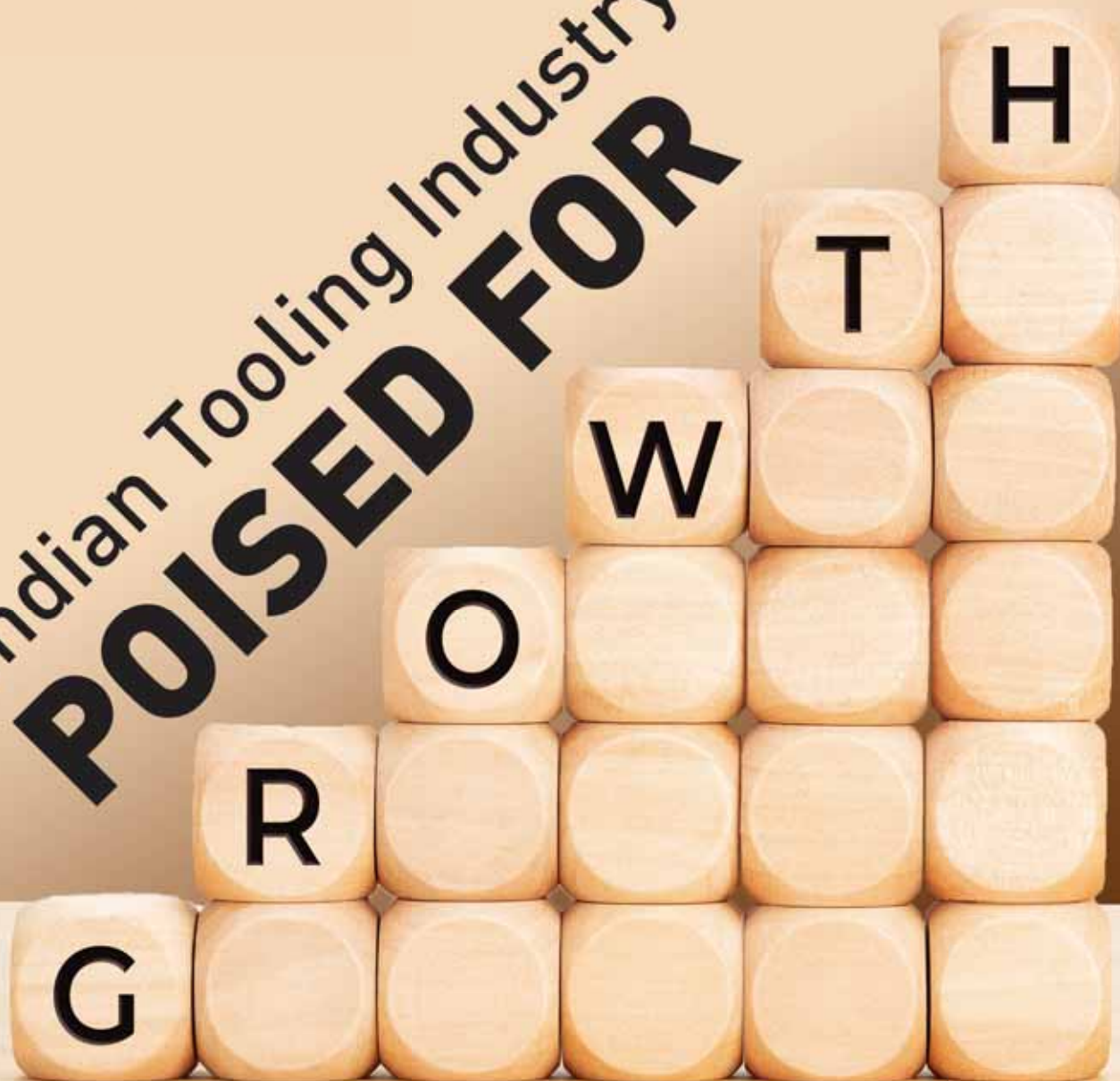
(Technical Info. on Die, Moulds & Toolroom)

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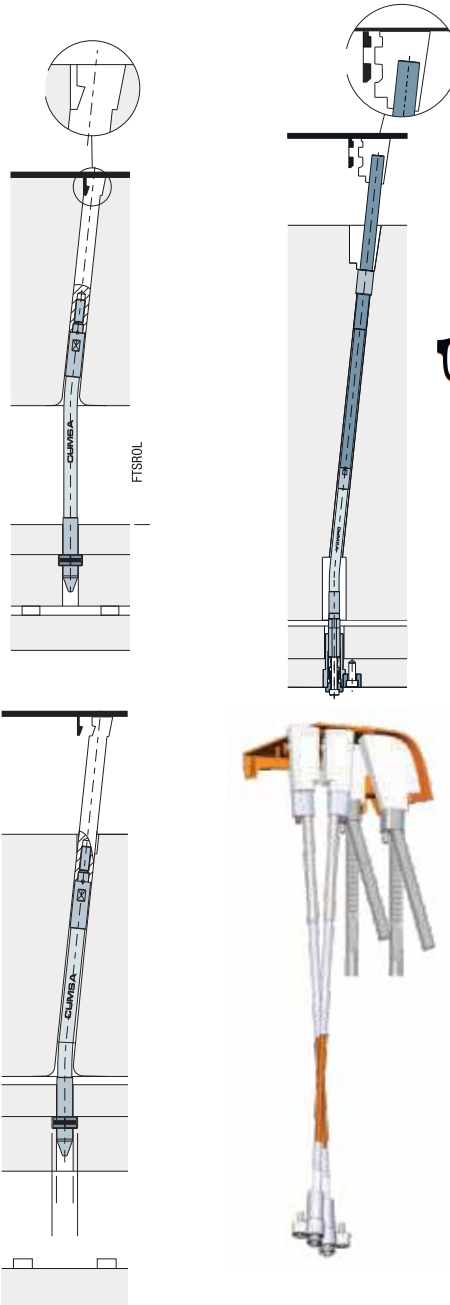
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CONTENTS



In Focus

Indian Tooling Industry:
Poised for Growth

18

Factory Insight

Automated factories of the future

38

Case Study

ALPHACAM "vital" for
orthopaedic implant experts

44

Machining Mantra

The Crucial Connection

46

Tech Know-how

Sandvik Coromant joins forces with Microsoft

48

Tips & Tricks

Five essential preventative
maintenance activities

49

Tool Talk



Rajesh Nath
Managing Director,
VDMA India

32

President's Message	06
Editorial	08
Industry Update	10
Tech Update	24
Ad Index	50

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PRESIDENT'S MESSAGE

I hope you, your family, and colleagues are all keeping well.

We are going through unprecedented times. The pandemic has, in some way or the other, impacted all of us professionally and personally. However, like every good and bad experience, I believe 'this too shall pass'. I am certain that good days are ahead of us and we will bounce back.

The second wave of COVID-19 hit us in April and May. It caused ripples, but the industry has shown signs of growth. No doubt we faced setbacks because of the pandemic. However, the industry has sustained strongly so far. It's only a matter of time; we are poised for significant growth in the coming years.

As per various reports and research agencies, the Indian economy is most likely going to witness a strong growth over the next 10 years. This is definitely going to generate tremendous opportunities for Indian toolmakers. But to make the most of these opportunities, we need to gear up and equip ourselves with the latest infrastructure, technological know-how, and processes to enhance our capacity and efficiency.

No doubt, the industry is riddled with many challenges, such as availability of finance, inverted duty structure, lack of export incentives, common facility to carry out certain operations, finding skilled manpower, and the unavailability of tooling clusters in the country. However, in spite of these challenges, there has been considerable growth.

At TAGMA, we have started working closely with policymakers to present the challenges of the industry. I am sure, with our constant interventions, the Government will soon draft a few industry-friendly policies to help this strategic sector grow.

In the meantime, I would like to invite suggestions from members and industry professionals on what role TAGMA could play to help the industry in this challenging time. Looking forward to hearing your suggestions.

With best wishes,

D. M. Sheregar

President,
TAGMA India



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Onwards and upwards

A few days ago, I had a very interesting conversation with a Pune-based toolmaker, who predominantly deals with the automotive sector. Even though he has a small setup, he boasts of having some large companies on his list of clients. The curiosity of the journalist in me wanted to understand how his business was faring with all the challenges being posed by the pandemic. His response left me pleasantly surprised. What was his reply to my question, you ask? He said, "I absolutely have no issues because of the pandemic. In fact, I have added new machines, hired new members in the team, and bagged orders from the non-automotive sectors."

His response was full of hope and made me realise that at a time when many companies are either facing losses or shutting shop, there are some who haven't given up and are willing to do whatever it takes to stay afloat and thrive. This toolmaker decided to take the plunge and go digital. "Going digital in all the departments was long overdue. This gave us time to explore non-automotive sectors, develop the required skills and invest more in strategizing for the future rather than solely focussing on the operations," he explained.

Going digital is definitely key in any business. Instead of 'why?', it's better to think of 'why not?' Making that shift to meet the market's evolving demands, adopting new technologies and methods to sustain a business... this is definitely the next step. Being open to changes, adopting the latest technologies... this is probably why this Pune-based toolmaker has been enjoying the reliability of some large OEMs.

Toolmakers, this could be your reality too. If you invest in state-of-the-art technology, equip yourself with the required infrastructure and keep your mind open to change, there's no stopping you. The path to preparation may seem like an uphill task, but look at the opportunities around. According to the Indian Tooling Report released by TAGMA last year, "The market size of the tool room industry in India is estimated to be ~INR 18,000 Cr with ~70% of demand being met domestically and ~30% through imports." If you are able to rise up to this challenge, India could reduce its dependency on imports.

The report also highlights that the Indian economy, specifically the manufacturing industry, is going to witness huge growth prospects in the years to come. You can read all about it in our 'In Focus' section. For now, let's shift our focus and work towards becoming a part of this growth story.

Happy reading!

Nishant Kashyap

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We need 'be vocal for local' toys: PM

PRIME Minister Shri Narendra Modi recently interacted with participants of Toycathon-2021 via video conferencing. Union Minister Shri Piyush Goyal and Minister of State Shri Sanjay Dhotre were present on the occasion.

Shri Amit Khare, Secretary, Higher Education, Ministry of Education; Shri Upendra Prasad Singh, Secretary, Ministry of Textiles; Prof. Anil D. Sahasrabudhe, Chairman, AICTE; Dr. Abhay Jere, Chief Innovation Officer, Ministry of Education (MoE) Innovation Cell; Dr. M. P. Poonia, Vice Chairman, AICTE; and Dr. Mohit Gambhir, Director, MoE's Innovation Cell, were also present.

Speaking on the occasion, the Prime Minister said that in the last 5-6 years, the youth of the nation have been connected with the key challenges of the country through the platform of Hackathons. The thinking behind this is to organize the capabilities of the country and to give them a medium, he said.

Apart from the importance of toys as the first friend of children, the Prime Minister also emphasized the economic aspects of toys and gaming, he called it 'Toyconomy'. The Prime Minister said that the global toy market is about 100 billion dollars and India has only 1.5% of this market. India imports almost 80% of its toys. This means that crores of rupees are being drained out of the country. This needs to change, said the Prime Minister. Shri Modi underlined that, beyond numbers, this sector has the capacity to bring progress and growth to the neediest segments of society. The toy industry has its own small-scale industry, artisans comprising of rural population, dalits, poor people and tribal population. The Prime Minister singled out the contribution of women in the sector. In order to take the benefits to these segments, we need 'be vocal for local'

toys. The PM called for new models of innovation and financing to make Indian toys competitive at the global level. There is a need for new ideas to be incubated, new start-ups promoted, taking new technology to traditional toy makers and creating new market

The Prime Minister mentioned that the 75th anniversary of India's Independence is a huge opportunity for the innovators and creators of the toy industry. Many incidents, stories of our freedom fighters and their valour and leadership can be created into gaming concepts. These



Image used for representation only. Courtesy: Envato Elements

demand. This is the inspiration behind events like Toyacathon, the Prime Minister said.

The Prime Minister referred to the cheap data and growth of Internet-led rural connectivity and called for exploration of possibilities in virtual, digital and online gaming in India. The Prime Minister rued the fact that most of the online and digital games available in the market are not based on Indian concepts and many such games promote violence and cause mental stress. The Prime Minister highlighted that the world wants to learn about India's capabilities, art and culture and society. Toys can play a big role in that. India has ample content and competence for digital gaming. Shri Modi called upon the young innovators and startups to be mindful of their responsibility of projecting the true picture of India's capabilities and ideas to the world.

innovators have a big role in connecting 'folk with the future'. There is a need to create interesting and interactive games that 'engage, entertain and educate', said the Prime Minister.

The Minister of State Shri Sanjay Dhotre expressed deep gratitude and thanked Prime Minister Shri Narendra Modi for providing continuous guidance throughout the Toycathon and also for interacting with the participants and guiding them.

Shri Dhotre emphasized that Toycathon will prove to be effective in making India a Production Hub of Toys. He further stressed that it is the endeavour of the government to give a new direction to India's toy industry by connecting it with innovators and researchers of all age groups. Through this Toycathon, an attempt has been made to develop toys in keeping with Indian tradition, history and culture, he added.



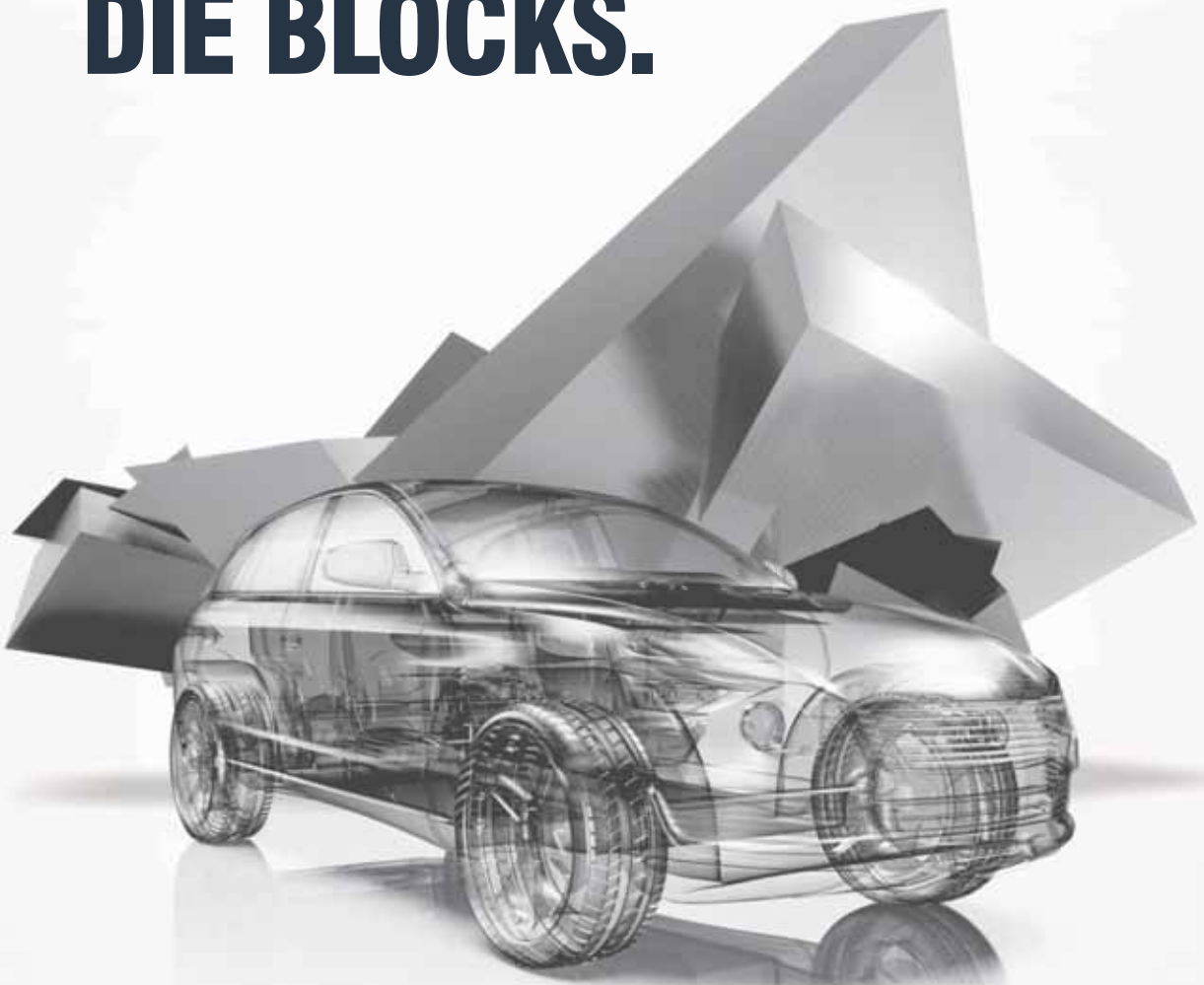
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Volkswagen plans to use new 3D printing process in vehicle production in the years ahead

VOLKSWAGEN is pressing ahead with the use of innovative 3D printers in car production. For the first time, the newest process – known as binder jetting – is being used to manufacture components at the company's main plant in Wolfsburg, Germany. While conventional 3D printing uses a laser to build a component layer by layer from metallic powder, the binder jetting process uses an adhesive. The resulting metallic component is then heated and shaped. Using the binder jetting component reduces costs and increases productivity – for example, the components weigh only half as much as those made from sheet steel.

Volkswagen is currently the only car maker using this 3D printing technology in the production process. "Despite the ongoing challenges of the Coronavirus pandemic, we're continuing to work on innovation," says Christian Vollmer, member of the Board of Management of the Volkswagen Brand responsible for Production and Logistics. "Together, with our partners, we aim to make 3D printing even more efficient in the years ahead and suitable for production-line use."

Cedrik Neike, member of the Managing Board of Siemens AG and CEO Digital Industries, says: "We are very proud to support Volkswagen with our innovative 3D printing solutions. Our automation and software solutions are leading in industrial production applications. Using this technology, Volkswagen will be able to develop and produce components faster, more flexibly and using fewer resources."

To achieve this innovative advance, Volkswagen has invested an amount in the mid-double-digit million euro range over the past five years. In addition, the company has entered into a software partnership with Siemens and expanded its

More than one million components printed in 25 years

Volkswagen has been using 3D printing for 25 years, starting in Technical Development with the goal of accelerating vehicle development and reducing costs. Today, there are 13 units at the Wolfsburg plant using various printing processes to manufacture both plastic and metal components. Typical examples are plastic components for prototypes such as center consoles, door cladding, instrument panels and bumpers. Printed metal components include intake manifolds, radiators, brackets and support elements. Over the past 25 years, more than one million components have been produced.

Volkswagen's collaboration with Siemens is part of a comprehensive strategic partnership in the field of digital production platforms. Christian Vollmer, member of the Board of Management of the Volkswagen Brand responsible for Production and Logistics, says: "I'm pleased that we have a strong and innovative partner in Siemens so we can start working on the car production processes of the future. The example of 3D printing shows that this transformation harbors many diverse opportunities for innovation."



Two Volkswagen employees check the quality of structural parts produced using the binder jetting process for car production in front of the prototype of the special printer at the high-tech 3D printing center in Wolfsburg.

existing collaboration with printer manufacturer HP Inc. With the first full-scale use of binder jetting, they intend to acquire important experience and learn, for example, which components can be produced economically and quickly in the future or how additive manufacturing can support the digital transformation of production at Volkswagen.

HP is providing the high-tech printers needed and Siemens the special software for additive manufacturing. One key process step that has been worked on jointly by Siemens and VW is optimizing the positioning of components in the build chamber. Known as nesting, this technique makes it possible to produce twice as many parts per print session.

From summer, the three companies intend to establish a joint expert team at the high-tech 3D printing center which opened in Wolfsburg at the end of 2018 and enables the manufacture of complex automotive components using 3D printing. The center also trains employees in the use of these technologies.

By 2025, the aim is to produce up to 100,000 components by 3D printing in Wolfsburg each year. The first components made using the binder jetting process have gone to Osnabrück for certification: components for the A pillar of the T-Roc convertible. These weigh almost 50 percent less than conventional components made from sheet steel. This reduction alone makes the process especially interesting for automotive production applications. Volkswagen has already successfully conducted crash tests on 3D-printed metallic vehicle components. Until now, the production of larger volumes was not cost-effective enough. However, the new technology and the collaboration will now make production-line use economically viable.

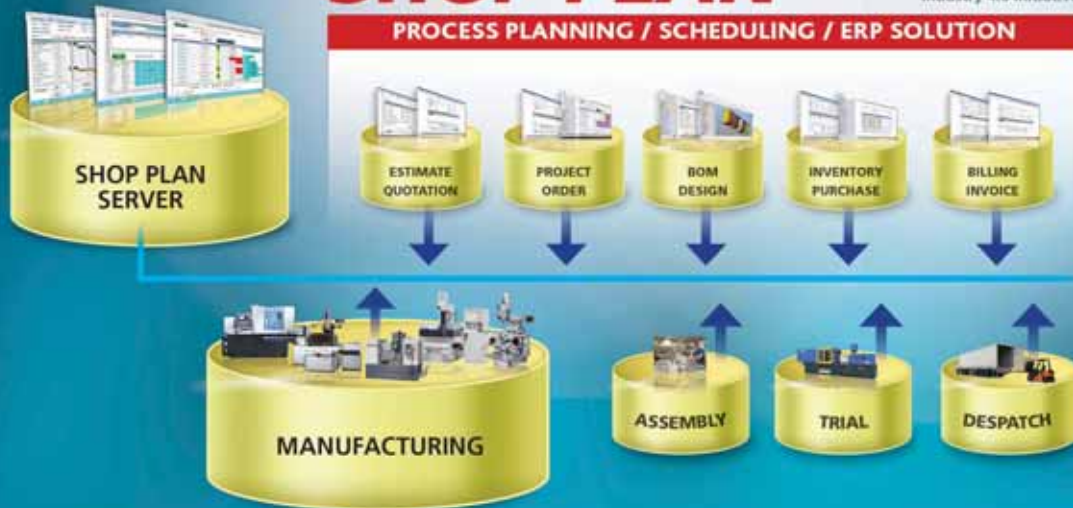
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India EV sales to grow at 26% by FY23: Fitch

THE recently announced electric vehicle (EV) incentives by India along with high fuel prices will be supporting factors for stronger adoption of EVs over 2020-2023, leading to an average annual growth rate of 26%, Fitch Solutions has said.

However, it said the economic impact of Covid-19 pandemic and limited domestically produced EVs will prove to be a challenging barrier to overcome.

"We believe the focus on EV promotion in the Union Budget will improve the longer-term outlook for EV sales, but will continue to fall way short of the country's goal of electrifying all new vehicles sold by 2032," said Fitch.

The key autos related elements include an additional excise duty of Re. 1 per litre of diesel and petrol, lowering of Goods and Services Tax (GST) on EVs to 5% from 12% previously, and other income tax incentives given to individuals who purchase EVs.

In the overall Asia region, the EV market will continue to grow at a fast pace as more countries look to support EV



Image used for representation only.
Courtesy: Envato Elements

uptake, reduce emissions and attract EV-related manufacturing investment.

Fitch forecasts that EV sales in Asia will expand by 78.1% in 2021, up from the estimated growth of just 4.8% in 2020.

It said the total EV sales in the region will reach a high of just under 10.9 million units by the end of 2030, up from an estimated sales volume of just over 1.4

million units in 2020.

Over 2021-2029, a majority of the EV demand will stem from the three most advanced economies in the region - China, Japan and South Korea - given their financial strength and commitment to reducing their emissions.

Courtesy: ANI

Wipro arm buys aerospace manufacturing facility in US for \$31 million

WIPRO Givon USA, an arm of Wipro Infrastructure Engineering, is buying the Washington manufacturing facility of Boeing supplier TECT Aerospace Group Holdings for \$31 million.

Wipro's bid for the manufacturing site was the only qualified offer submitted, TECT told the US Bankruptcy Court for the District of Delaware, a Bloomberg Law report said. The court gave the go-ahead for the deal.

TECT Aerospace manufactures complex aerostructure components, parts, and assemblies. It produces thousands of assemblies and parts that are used in flight controls, fuselage/interior

structures, doors, wings, landing gear, struts & nacelles, and cockpits. An email to Wipro Givon asking for a confirmation and details about the deal did not elicit a response.

Wipro Infrastructure Engineering has several aerospace parts manufacturing facilities, including in Bengaluru. In 2016, it acquired HR Givon, an Israel-headquartered manufacturer of metallic parts and assemblies for the aerospace industry. Wipro Givon operates a manufacturing site in Everett, WA, less than a mile away from Boeing's main factory.

TECT said in a statement to

Worldofaviation.com in April that the company experienced catastrophic financial losses stemming from the suspension of 737 MAX (Boeing) production (in December 2019) followed by the impact of Covid-19 on industry production rates.

"Following 15 months of diligent work with its lenders, customers, and suppliers, and after exhausting all efforts to restructure out of court, TECT has concluded that an orderly and organised Chapter 11 proceeding is in the best interest of its creditors," the company told Worldofaviation.com.

Courtesy: Times of India

Success of pre-pack scheme for MSMEs will lie on its implementation by Committee of Creditors: National Company Law Tribunal

THE success of pre-packaged insolvency resolution or PIRP framework for micro, small and medium enterprises (MSMEs) announced by the government will mainly lie on its implementation by the Committee of Creditors (CoC), Mr. Rajesh Sharma, Member (Technical), National Company Law Tribunal (NCLT), recently said at an ASSOCHAM webinar.

"It is a very welcome move on part of the government as well as IBBI (Insolvency and Bankruptcy Board of India) to bring in PIRP and that too at a very faster pace," said Mr. Sharma addressing the delegates in a virtual interactive session on Pre-Packaged Insolvency Norms for MSMEs conducted by The Associated Chamber of Commerce and Industry of India (ASSOCHAM).

He added, "Incidentally, the overall scenario because of COVID-19 pandemic is not very encouraging for such a good step of bringing PIRP but still let us see within the overall adverse scenario how far and beautifully they implement this overall scheme."

The NCLT Member, however, said that it would be less burdened up to some extent in cases where after receiving application for PIRP, the process takes off and finally some resolutions are found.

Mr. Sharma said that apart from a couple of challenges being faced, the government and the IBBI have incorporated all the best practices in the PIRP framework.

Talking about the challenges, he said that firstly, the Institute of Chartered Accountants of India (ICAI) needs to do a lot with respect to standardisation of forensic audit report as well as up to

what extent responsibility can be cast upon the forensic auditor.

"What we are observing while going through the forensic audit report, 95 per cent of its contents of first two pages is dedicated to disclaimers. Forensic auditor in clear terms says that whatever he has done, he cannot be held responsible for even a single line of the report, in these circumstances it is difficult for the adjudicating authority to rely fully on forensic auditors' report and secondly, if you order anything on the basis of the forensic auditor's report and tomorrow if it is found that the data is not correct, there is no one to be held responsible for that," said Mr. Sharma.

Noting the other challenge being faced, he stated that while getting into PIRP, companies are confronted with a situation where financial creditors are agreeable to the draft proposal of PIRP, however operational creditors, which may be diversified and large in numbers may not be agreeing to the PIRP process.

"I am quite practical in thinking that there is a possibility that your operational creditor who is not happy with the haircut being proposed by you or where his payments will be getting delayed because of the PIRP process and he doesn't have full confidence of getting his full money, he may go ahead and file section-9 application against you," said Mr. Sharma.

He further said, "Of course, within 14 days, if you file PIRP, his application will not be considered, but if you fail because of various processes being involved, there is a possibility that the 14-day period gets over and your application is filed after 14 days and in that case your operational creditors' application will be first taken up by

NCLT rather than PIRP application, this is one area you need to look at extensively."

In his address, Mr. Ritesh Kavadia, Executive Director, Insolvency and Bankruptcy Board of India (IBBI) said that the government because of urgent need of MSMEs has used pre-pack scheme as a special insolvency resolution process, if this scheme sees some success, it may be expanded to other corporate debtors and other structures as well.

"If this performs well, there is no reason it should not expand to other corporate debtors as well. Globally, some sort of pre-pack is available in advanced jurisdictions and with our maturity and relatively in short period of five years, we are hopeful to reach a stage where we can try our hands at pre-pack," said Mr Kavadia.

He further said, "Even the MSME definition itself covers more than 50 per cent of companies registered as on today, so this is not short-term, once we see result and address the concerns arising out of this, we are very-very hopeful to see its role expanding to other companies in time to come."

Other key speakers who addressed the ASSOCHAM virtual conference included: Mr. Anil Goel, Member, ASSOCHAM and Founder & Chairman, AAA Insolvency Professional LLP; Mr. Alok Dhir, Co-chairman, ASSOCHAM National Council for IBC & Valuation and Founder & Managing Partner, Dhir & Dhir Associates; Mr. Sahil Narula, Partner, RNC Valuecon LLP; Ms. Manisha Chaudhary, Managing Partner, UKCA and Partners; Mr. Ankur Shrivastava, Managing Partner, EZY Laws; Ms. Anju Agarwal, Partner, ASC Group; Mr. N.K. Dilip, Partner, Tatva Legal.

India's GDP growth can slip to 8.2 pc in FY22: Crisil

INDIA'S gross domestic product (GDP) growth can drop to 8.2 per cent in the current financial year (2021-22), if the second wave of coronavirus peaks by June-end, according to rating agency Crisil. However, it maintained its baseline estimate of 11 per cent growth. But the risk is firmly tilted downwards to the projection of 11 per cent growth in FY22, said Crisil while giving two scenarios.

In a moderate scenario, under which the second wave peaks by May-end, GDP growth will drop to 9.8 per cent, but will slip to 8.2 per cent in a severe scenario. In both the cases, the permanent loss to GDP over the medium-term will rise to 12 per cent from 11 per cent in the base case. "The intensity of the second wave of COVID-19 infections has come

as a surprise and is haemorrhaging the country's healthcare infrastructure. That has made lockdowns and restrictions inevitable," said Crisil.



Image used for representation only. Courtesy: Envato Elements

Dispersion of cases across states now mirrors the September 2020 peak. "Worryingly, the number of cases has exceeded the peak by over 3x, highlighting the increased burden on

healthcare services," it said adding that caseloads are spreading to rural areas, where the healthcare infrastructure is weak.

However, lockdowns have been less restrictive for economic activity and are concentrated in the most-hit states. Agriculture, construction, manufacturing, and other essential activities are permitted to continue. Still, the impact of the second wave on India's economic recovery can further hit capital inflows, said Crisil. "The second wave can have moderate to severe impact on growth depending on how long it lasts. The pandemic will leave scars that will take time to erase," it said.

Courtesy: ANI

'Fastest adoption of electric vehicles expected in 2-wheeler, 3-wheeler sectors'

THE fastest adoption of electric vehicles is expected to be in two-wheeler and three-wheeler sectors, and it is expected that up to 4 million of such vehicles could be sold each year by 2025, growing to almost 10 million by 2030, an official statement said recently.

The Office of Principal Scientific Advisor also said any charging solution to serve this sector must be highly scalable, easily accessible by the public, should support interoperability, and be affordable.

Most systems developed across the globe address higher levels of power and are very expensive for wide-spread deployment, it said. "Several Indian manufacturers are already on board to make this Charge Point Device, as per Indian Standards, with target prices starting as low as INR 3500," it said.

"The LAC (Low-Cost AC Chargepoint) device is intended to be highly scalable and deployed in any place where a 220V 15A single phase line is available – mainly targeting parking lots of metro and railway stations, shopping malls, hospitals, office complexes, apartments and even kirana and other shops," it said.

Courtesy: PTI News

Shri Piyush Goyal applauds exporters for encouraging performance during pandemic

UNION Commerce and Industry Minister Shri Piyush Goyal, and senior officers of the Department of Commerce and Directorate General of Foreign Trade (DGFT) recently held a meeting with the Export Promotion Councils to discuss various issues concerning international trade.

Shri Goyal complimented the Exporters for their encouraging performance, even during such trying times. He noted that India's merchandise exports in April 2021 was USD 30.21 billion, an increase of 197.03% over USD 10.17 billion in April 2020 and an increase of 16.03% over USD 26.04 billion in April 2019. He said that the value of Export in the first week of May 2021 is also up by almost 9% over the same period of 2019-20 (6.48 billion USD). He said that Export, excluding POL, is even better, and has increased in this period by 15% over same period of 2019-20. He

said that performance of exports in April'21 and 2020-21 gives hope that an ambitious target of \$400 billion merchandise exports can be achieved this year. There is a large potential for enhancing exports in several sectors like pharma, engineering, auto-component, fisheries, and agro-products, he added.

Regarding the issues raised by the participants, Shri Goyal said that they should approach the COVID helpdesk of the Department for resolving the problems emanating due to COVID-related measures. He said that the Department of Commerce has taken up several issues of exporters with the Ministry of Finance for their early resolution, like RoDTEP, MEIS, inverted duty structure, etc. He called upon the exporters to take advantage of the Production-Linked Incentive schemes for various sectors, which have been announced.

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Poised for Growth

The Indian tooling market is at an inflection point today. It has grown at 5% CAGR since 2005 and continues to be an ever important cog in the manufacturing wheel. However, in spite of significant enhancements in the capabilities of Indian toolmakers, a significant volume of tools continues to be imported. This trend needs to be reversed to enable Indian players to take the next step in their growth journey. A report...

The tooling industry 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 Cr, with more than half of the total demand attributed to the automotive and auto components sector. Most major global auto manufacturing hubs have a strong domestic tooling industry. India, however, is a notable exception, as a significant portion of its tooling demand is still met via imports.

With an increase in the variety of products and shortening of product lifecycles across the globe, the worldwide demand for tooling is well poised to grow significantly in the 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. Therefore, it is time to understand the hurdles to growth faced by the

Major highlights of the Indian tooling sector

- » The market size of the tool room industry in India is estimated to be ~INR 18,000 Cr with ~70% of demand being met domestically and ~30% through imports.
- » Tooling imports into India are ~5x tooling exports from India by value; China and Korea account for almost 40% of the total tooling imports into India.
- » Plastic moulds is the biggest segment accounting for 42% of total demand, followed by sheet metal dies at 37%.
- » Automotive is the largest end user accounting for 60% of the total demand, followed by consumer durables at 16%.

Indian toolmakers and focus on the measures required to overcome these hurdles.

Role of tool rooms in economic development

India is one of the fastest growing economies in the world. The country's GDP has grown 2.7x over a span of 10 years, i.e., from ~1 trillion USD in 2008 to ~2.7 trillion USD in 2018. As per government estimates, India has the potential to reach 5 trillion USD by 2024-25. The Indian manufacturing industry currently constitutes ~15% of the GDP. Under the 'Make in India' initiative, the Government of India plans to increase this to 25% of the GDP by 2025.

Tooling enables mass production in any industry and major global manufacturing hubs have grown on the base of a strong tooling industry. However, India is still lacking in this regard.

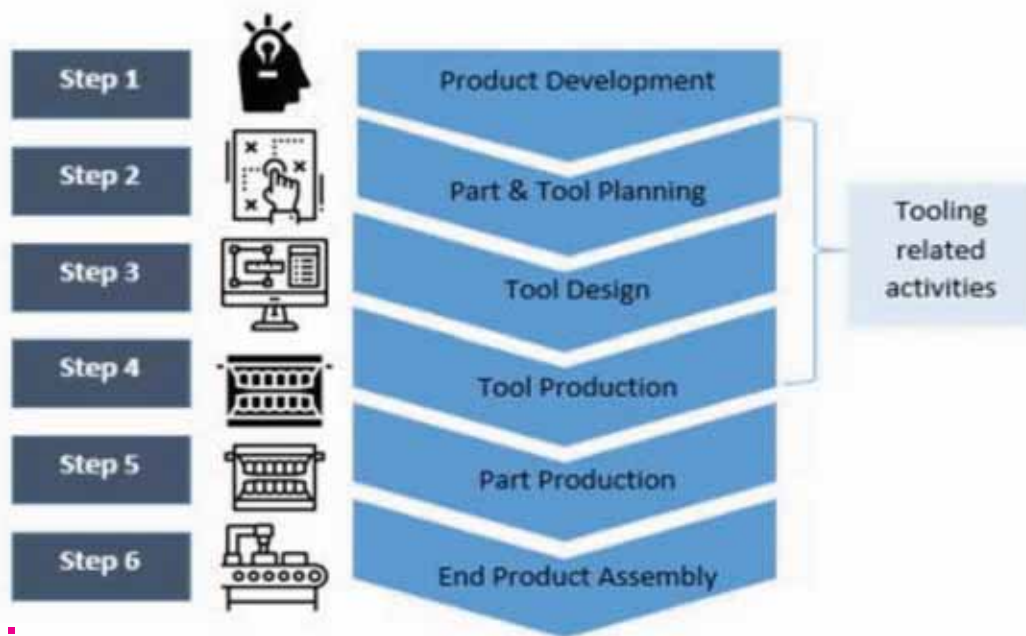
Clearly, the manufacturing sector is key to attaining the ambitious target of economic growth. Now, let's understand the role that the tooling industry will play in helping the manufacturing industry achieve its target.

A mother industry

Tool rooms play a critical role in the manufacturing value chain by providing the dies and moulds needed for mass production of various parts. The tool room industry forms an integral part of the production process in almost every industry and is considered the mother industry of all manufacturing units in the country.

Enabler in global manufacturing hubs

The global demand for tool producing companies has been continuously rising over the last few years, except during the economic crisis of 2008 and 2009. All major manufacturing hubs have a well-developed tooling industry that forms the backbone of industrial



Tooling in Manufacturing Value Chain



■ Key Hurdles to Growth of Indian Tool Rooms

growth in these geographies. For instance, countries with the highest vehicle production are also the ones leading in tooling production. India, however, is a notable exception here.

Economic benefits of localization

India has been witnessing a growing demand for tooling over the past few years. However, a significant amount of tools is still imported. This is not a desirable scenario, as it results in significant value addition happening outside the borders. Promoting indigenous manufacturing provides advantages such as employment creation; development of domestic machinery manufacturers; boost in R&D, and reduction in supply chain inefficiencies and risks.

Key challenges

Indian tool rooms are faced with major challenges such as high financing costs, inverted import duty structure, duty-free moulds from certain countries, lack of skilled labour and lack of an outsourcing ecosystem. However, there are six major obstacles that are currently impeding the growth of Indian tool rooms. They are:

Access to finance: Indian toolmakers face many challenges with respect to easy access to finance. Indian tool rooms avail of interest at much higher rates

as compared to their global counterparts due to the higher risk premium for SMEs. Furthermore, in other countries, government loan guarantees are available to SMEs such as tool rooms. This, however, is not the case in India.

Inverted duty structure: It is observed that the import duty on tools is lower than the import duty on raw materials and bought-out components used in manufacturing these tools. This not only lowers the cost competitiveness of Indian tool rooms as compared to global players, but is also resulting in rising tool imports.

Duty-free moulds imports from certain countries:

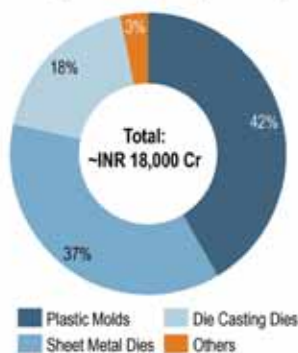
According to the CEPA agreement signed between the Government of India and South Korea in FY2008-09, injection moulds fall under the category of 100% tariff reduction. As a result, there was a 28% increase in injection moulds imports from South Korea during FY2010-FY2019. This has dealt a severe blow to domestic toolmakers and has further accentuated the already dire situation due to the inverted duty structure.

Lack of export Incentives: Toolmakers in other countries receive state-sponsored incentives to explore export markets. But this is not the case in India.

Demand Split by Tool Type and End User Segments

Plastic moulds is the biggest segment accounting for 42% of total demand; automotive is the largest end user accounting for ~60% of the total demand

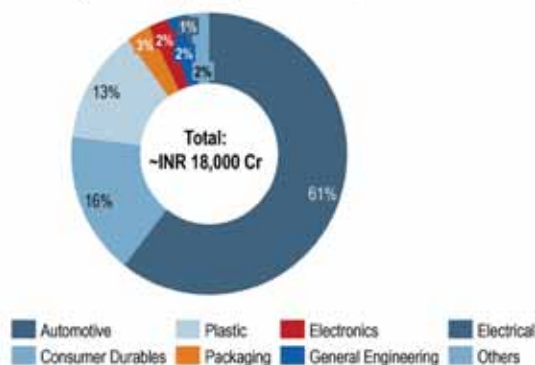
Tooling Demand Split by Tool Type



Note: Others includes forging dies, rubber moulds, jigs, fixtures and gauges

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Tooling Demand Split by End User Segments



Note: Others includes general engineering, medical equipment, industrial machinery, railways, metro coaches, aerospace, defence, construction & mining equipment

Source: NRI Analysis

Indian tool rooms, majorly being small and medium scale, cannot afford to go abroad and participate in exhibitions year after year on their own to develop a professional relationship with customers in other countries and understand their requirements.

Lack of skilled labour: Indian tool rooms are currently facing a dearth of skilled workforce. This can be attributed to two key reasons. Firstly, insufficient number of training institutions leading to a huge demand-supply gap and secondly, shortcomings in the quality of curriculum due to which the graduating students are not industry ready.

Lack of outsourcing ecosystem: Global tool rooms outsource some of the manufacturing activities, but Indian tool rooms don't have this option due to lack of a cohesive outsourcing ecosystem. A close-knit tooling cluster for job-sharing and subcontracting are prevalent in major tooling countries such as Taiwan & Korea. This helps tool rooms in meeting the stringent delivery timelines or making up for capacity shortfall at times.

Potential solutions

Reduction in loan interest rates: Making loans at subsidised interest rates available to Indian tool rooms can help them become cost competitive. It will help them increase their net income, which can be reinvested in technological/ infrastructural upgradation. This would help Indian players get more orders from the existing customer base and acquire

new customers too. There are additional benefits as well. If the Government of India were to subsidise loans by bearing 25% of the annual financing costs of tool rooms, it would result in additional ~INR 30 Cr net benefit from increased tax revenue on an annual basis (after offsetting the cost of providing subsidy), as well as creation of approximately 4,000 to 8,000 new jobs.

Reduction in import duty on raw materials and components: Removal of the inverted duty structure prevalent in the Indian tooling industry would reduce input costs for tool rooms and aid in enhanced cost competitiveness. As explained in the previous point, this leads to higher revenues and additional economic benefits. It would bring about a net benefit of ~INR 80 Cr annually for the Government of India through increased tax revenue (after offsetting for loss in import duties) and creation of approximately 6,000 to 11,000 new jobs.

Removing moulds from the import duty exempted products list in CEPA: Removing moulds from the list of products with 100% tariff exemption when imported from Korea and subjecting them to usual duty norms applicable can result in additional duty collection of ~INR 80 Cr annually. It will also help Indian mould makers to compete with Korean tool rooms on an even footing without impacting the trade relations with Korea significantly.

Export incentives for tool rooms: Government of India can also look into providing export incentives

Future expectations

- ▶▶ The Indian tool room industry is estimated to grow to INR 25,000 Cr-INR 26,000 Cr in value by 2025 on the back of strong growth in key end-user segments.
- ▶▶ OEM's perception of Indian tool rooms is slowly changing. They are much more willing to trust Indian tool rooms and localize to achieve cost benefits.
- ▶▶ Commercial tool rooms can expect to reap benefits of the localization trend if they are able to invest in capacity enhancement, technology upgrade & worker skill development.

to tool rooms. Following global benchmarks, such incentives need to be in range of INR 40 lakh-200 lakh per annum depending on the percentage of turnover from the exports for the tool room. This will help tool manufacturers to develop their client base outside India and give them exposure beyond Indian markets, improving their quality standards in an effort to meet global customer needs. It will also give a boost to overall exports from India.

Setting up new tool room training centres: Skill enhancement needs long-term planning to upskill the current workforce and impart relevant skills at the entry level. The Government of India can aim to double the existing number of training centres by opening 20 new Tool Room Training Centres (TRTCs) to match the global benchmark. Also, the existing TRTCs can collaborate with global toolmakers to understand the differences in curriculum and also with end user industries to update the curriculum and training methods as per the current requirements.

Developing tooling clusters on the lines of Special Economic Zones: To promote colocation of industry players and enable holistic development of a sound tooling ecosystem in India, the Government of India can consider setting up tooling SEZs in automotive hubs such as Delhi-NCR, Maharashtra and Tamil Nadu. Since the automotive sector accounts for major share of tooling consumption in India, this will result in a more efficient supply chain, reduced delivery times and higher levels of collaboration between all the key stakeholders.

What the future holds?

The Indian tooling industry is at a crossroads. The Indian manufacturing sector is poised to grow significantly in

the near future. And, to support the higher volumes of production, the demand for tools is likely to increase. However, whether this demand is met by domestic toolmakers or imports are able to tap into a larger share of the pie depends on several factors, many of which are beyond the control of toolmakers.

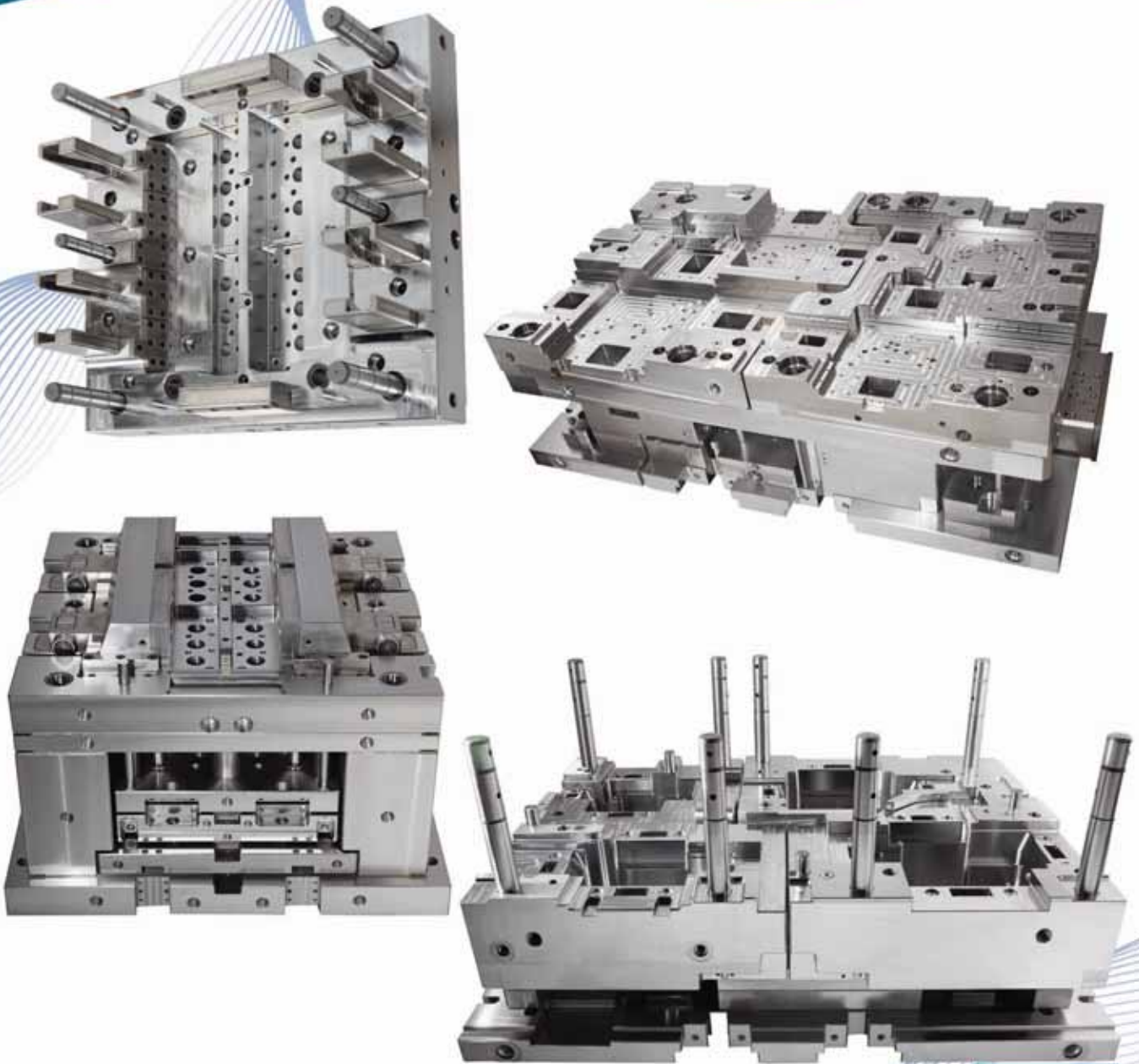
Talking about the automotive sector, in particular. After localization of vehicle and component production, tooling localization is the next frontier. Several major OEMs are taking active steps in this direction. A major PV OEM has increased tooling localization from 60-65% to 80-85% in their direct procurement in last 2-3 years and is also instructing their Tier-1 suppliers to utilize cost-competitive Indian toolmakers and meet the requirements of quality and delivery time.

Indian tool rooms have to enhance their capacities as well as capabilities in order to be ready to take advantage of the expected increase in demand. Many of them are already doing it. In fact, more than 80% of tool rooms have invested in upgrading their manufacturing setup over the last 3 years and more than 50% have invested in skill development of workforce. This shows that the tool rooms are doing their bit.

However, policy support is needed on several fronts in order to ensure cost competitiveness in the face of stiff competition from imported moulds and dies. Inverted duty structure and duty free imports make it difficult for domestic toolmakers to compete on an even footing. They face higher financing costs than their global counterparts and do not have access to a large pool of skilled labour or outsourcing firms that can support them in manufacturing tools in a more efficient manner and delivering in lesser time. These hurdles to growth need to be tackled to ensure Indian players get a fair chance while competing with global tool rooms.

Indian tool rooms have the potential to be at par with Chinese and Korean toolmakers, but they need a helping hand from the Government of India to realize this potential. Many of these issues can be resolved through policy interventions in the upcoming Union budget. Some of the issues such as lack of skilled labour and outsourcing ecosystem cannot be completely resolved in the short term, but collective effort from toolmakers, OEMs and the government, can be the first step of the Indian tooling industry towards development. The Indian tooling industry is poised for growth. All it needs is attention from all the stakeholders. 🌈

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Hexagon reduces blisk measurement cycle time with production-ready solution

HEXAGON'S Manufacturing Intelligence division has launched a new Leitz Reference HP HTA blisk solution, enabling aerospace manufacturers to reduce blisk inspection times by as much as 50%.



By bringing together the Leitz Reference CMM, the HP-O non-contact interferometric laser sensor and specialised Bladed Rotors Measurement software in a single solution, Hexagon enables manufacturers to significantly cut the time it takes to develop and execute blisk measurement routines.

Ryan Toole, North American Product Manager for Automated Measurement Systems, says: "Hexagon's new Leitz Reference HP HTA solution for blisks overcomes the obstacles that have

traditionally made complex blisk inspection a slow, painstaking task. Now, aerospace manufacturers can increase productivity by creating and running an optimised blisk measurement routine in hours, when before it typically took days or even weeks."

Blisks have complex geometries that make them difficult and time-consuming to inspect. The Leitz Reference HP HTA solution works with Hexagon's HP-O non-contact interferometric laser

sensor and Bladed Rotors Measurement software to deliver precise inspection data with market-leading speed and flexibility. Hexagon's Bladed Rotors Measurement software uses a combination of parametric techniques, automated path planning for airfoil measurement and collision avoidance to reduce measurement routine creation time by as much as 70%, while also facilitating measurement execution.

Other advantages of the system include the ability to automatically adjust scanning speeds depending on the complexity and importance of the area being measured.

WIDIA Introduces M8065HD Indexable Milling Platform for Heavy Roughing

WIDIA™ recently announced the release of the M8065HD indexable milling platform for heavy-duty milling operations in steel and cast iron materials. Designed with eight cutting edges and extra wide chip gashes, the M8065HD is capable of achieving deep depths of cuts while producing high metal removal rates during face milling applications.



"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 Christine Schneider, WIDIA Senior

Global Portfolio Manager. "The M8065HD 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."

Engineered with a 65-degree approach angle with a

6.35 mm thick insert, the M8065HD 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.

All inserts are designed with a 2.37 mm wiper facet to provide superior reliability and surface finish. These key design features coupled with eight cutting-edge inserts enable customers to reduce overall machine set up times and inventory costs by utilizing one tool for multiple operations.

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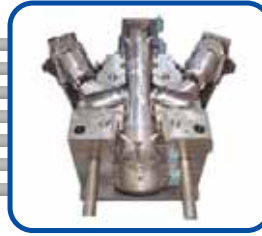
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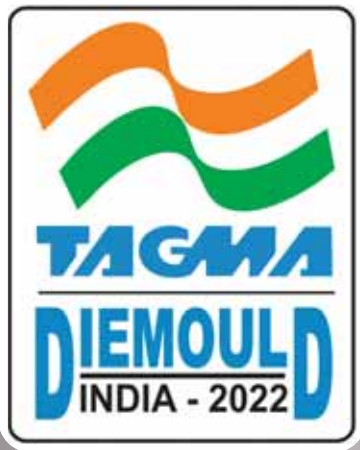
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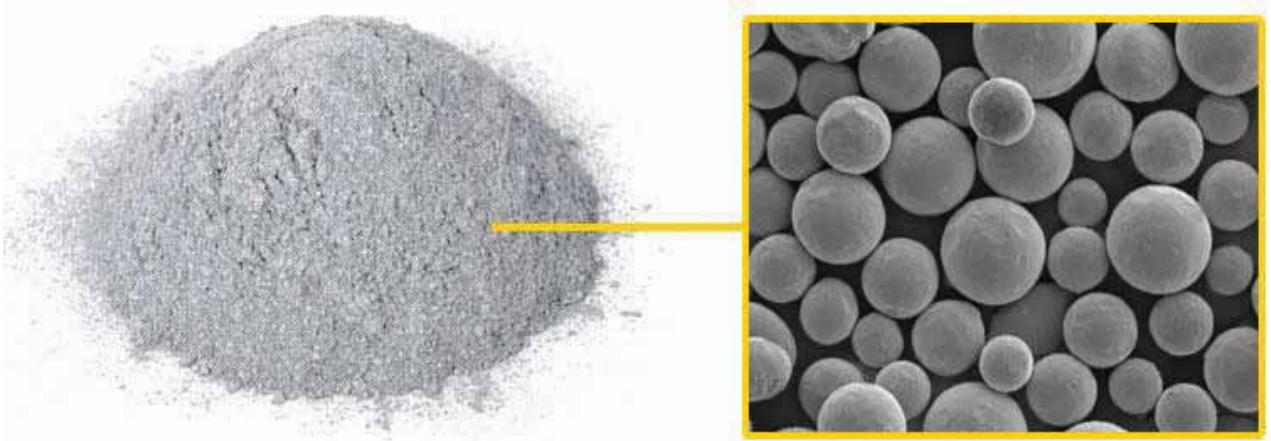
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Kennametal introduces first Stellite powder for laser powder bed additive manufacturing



KENNAMETAL Inc. recently announced the launch of Stellite 21 AM™ powder, the first Stellite™ powder qualified for laser powder bed additive manufacturing, and the latest addition to Kennametal Additive Manufacturing's portfolio of high-performance metal powders optimized for 3D printing. With Stellite 21 AM powder, the unique corrosion and wear-resistant properties of the Stellite alloy family are now available for laser powder bed additive platforms to produce high-performance wear components for the oil and gas and power generation industries. Kennametal Additive Manufacturing is the Company's 3D printing and production business unit within its Infrastructure segment.

"Kennametal Additive Manufacturing is drawing on our longstanding expertise in metal powder production to help our customers leverage the advantages of 3D printing and make better parts,

faster and more efficiently," said Sam Lomasney, Marketing Portfolio Manager, Kennametal. "The addition of Stellite 21 AM powder to our portfolio of high-performance cobalt, nickel and iron powders is another proof point of how we continue to innovate in materials for additive manufacturing."

The business drew on deep expertise in metal powder production for hard facing and thermal spray applications to develop Stellite 21 AM powder. It is available direct to customers for use in their own 3D printing applications or in combination with Kennametal's end-to-end additive production capabilities to make fully finished components.

Valued for its superior wear and corrosion resistance, the Stellite 21 alloy has a long history of success in traditional manufacturing applications in the oil and gas, power generation and

aerospace industries. Stellite 21 AM powder enables customers to achieve similar wear and corrosion resistance properties in additively manufactured parts. It is ideally suited for flow control applications and can be integrated into complex designs to mitigate cavitation, erosion, or corrosion failures.

The new powder's composition features a Cobalt Chrome Molybdenum alloy matrix, containing dispersed hard carbides, which strengthen the alloy and increase its hardness while decreasing the material's ductility. It also has excellent corrosion and thermal shock and mechanical shock resistance.

Kennametal Additive Manufacturing offers comprehensive 3D printing solutions, from raw material to finished part. It utilizes gas atomization powder production capabilities to supply cobalt, nickel and iron powders optimized

for specific additive manufacturing processes. In addition to the new Stellite 21 AM powder, the business also recently added Delcrome 17-4 AM™ and Delcrome 316L AM™ powders for direct metal laser sintering (DMLS) systems to its portfolio of additive powders. At its research and development, prototyping and production center in Latrobe, Pennsylvania, Kennametal Additive Manufacturing utilizes laser powder bed and binder jet printing technologies, combined with post-print processing capabilities, including sintering, hot isostatic pressing and machining, to produce fully finished wear components. These include parts printed with powders specifically designed for 3D printing, including Kennametal KAC89 tungsten carbide and Stellite 6 AM™, a wear resistant cobalt-chrome alloy.



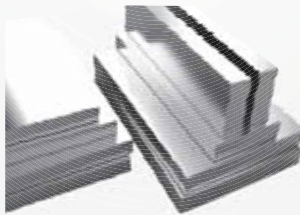
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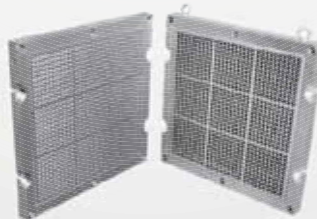


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‘I am highly optimistic about the India growth story’



“In the last 20 years, the commitment of German companies in India has only gotten stronger. Earlier, German companies were mostly present in India for sales and service support. But now, many have established manufacturing facilities here. This is a great sign for India,” says **Mr. Rajesh Nath**, Managing Director, VDMA India.

over the years. In fact, presently, the bilateral trade between these two countries is almost approximately worth 20 billion euros and it's been growing at the rate of 4% to 5% year-on-year. The last two years, however, have been an exception; we witnessed a slight dip during this time because of the economic slowdown caused by the pandemic.

Germany is India's largest trading partner in Europe. Did you know that there are around 1,700 well-established German companies in India? These companies collectively employ almost 4 lakh people directly or indirectly. I believe this shows the commitment of the German industry to the Indian market. Indian companies, too, are doing good business in Germany. So, you see, it's not just one way! I think, as we go ahead, this bilateral trade relationship will only get stronger.

Q India and Germany share a strategic partnership that has its basis in strong business and economic links. With a trade history of over 500 years, India and Germany are linked by a common past of economic cooperation. In the 19th century, it was German company, Siemens, which built the first telegraph connection between Kolkata and London, via Berlin. How have the economic and trade relations matured between the two countries over the years?

As you rightly mentioned, the Indo-German relationship dates back to more than 500 years. And yes, the trade relations between India and Germany have also been developing very well

Q That's very insightful! The growth of the Indo-German trade relations is clearly evident considering the number of German products — consumer and B2B — which we see around us. What is the role of VDMA India in facilitating Indo-German business activities?

VDMA is the German Machinery and Plant Manufacturers' Association. We are the largest

Tool Talk

industrial association, not only in Germany, but in the whole of Europe. We have at least 3,320 companies as members of our association. The combined turnover of our members is to the tune of approximately 205 billion euros. Ours is a 127-year-old association, and so, it is very well established.

In the last 20 years, the commitment of German companies in India has only gotten stronger. Earlier, German companies were mostly present in India for sales and service support. But now, many have established manufacturing facilities here. This is a great sign for India.

An interesting thing to note is that a good chunk of this bilateral trade comes from the machinery industry. When we specifically talk about German machinery exports to India, it is close to 3,000 million euros, while from India to Germany it is about 850 million euros. We have about 600 members in India, and every year, we see more and more German companies establishing their facilities in India.

I am happy to share that VDMA has played a key role in these bilateral trades between these two countries over the years.

Q Indian businessmen have immense respect for German engineering. What is it that the Germans do differently? What should India learn from Germany?

I would like to highlight a few aspects here.

Firstly, I believe, what distinguishes Germany from other countries is the dual system of education or training it offers. I think this plays an important role in the development of the German engineering industry. Allow me to elaborate. When students graduate, they have the option to avail of practical training. The curriculum is framed in such a way that a significant amount of time is spent on practical training in a real work environment with companies. So, when they graduate, they are ready for the job and don't have to undergo much training. In India, the education system is more theory based. Not much emphasis is put on the practical training aspect. I think this should be made a part of our education system.

Secondly, I'd like to discuss the importance Germany gives to research and development (R&D) activities. This is a critical distinguishing factor. Germany spends roughly around 3.5%

to 4% on R&D activities. If you see the global average, it is around 2% to 2.5%. However, in India, it's less than 1%. India needs to increase its spending on R&D activities.

Thirdly, a stronger industry-academia interaction needs to be facilitated. I think this is very strong in Germany. In fact, many projects that are done in Germany are conducted jointly by the industry and the academic institutions. This not only boosts the R&D activities but also furthers the cause of skill development.

So largely, I think these three factors are what, perhaps, we can also try to inculcate in India or, at least, try to start this practice in our country.

Q According to the VDMA, its member companies in China, Russia, Brazil, and India, expect a double-digit increase in sales in 2021. What factors will particularly drive the sales in India?

We are all in the midst of a very strong second wave. The pandemic has significantly impacted the industry. Last year, our GDP contracted by about 7% to 8% largely because of the pandemic. This year, different rating agencies have projected an approximate 12.5% growth. The year 2021 started on a good note. Things were going well until we got hit by the second wave. The GDP growth has now been pegged down to 8.5% to 9%.

Now, everything depends on how soon we are able to recover from this lockdown. Most states are currently under lockdown and their ability to bounce back will define the growth in the coming months. Of course, there will be a lot of pent-up demands to meet. We have seen this before. The largest customers of tooling, and automotive industries bounced back once the market opened after the first wave of the pandemic.

Government initiatives are also likely to offer a fillip. For instance, the PLI scheme will help various Indian industries in the long run. In the last budget, the government increased its allocation to infrastructure projects by 10%. When we talk about infrastructure and the automotive industry, it will help the growth of sectors such as the cement industry, steel industry, capital goods industry, and power sector, among others. Industries such as medical, agricultural equipment, construction equipment, white goods, and electrical & electronics industries

are also poised for growth in the coming days. Keeping all these factors in mind, I believe the Indian manufacturing industry is ready for significant growth in coming years.

Q Germany is a frontrunner in the adoption and promotion of smart manufacturing. In fact, Industry 4.0, which is the current buzzword in the global manufacturing industry, was coined by Germany. How can the Industry 4.0 concept help Indian MSMEs, especially the tool and die makers?

When it comes to Industry 4.0, there are many myths surrounding it, especially among MSMEs. Many think that adopting Industry 4.0 may not be financially feasible, while others feel it is very complex and they may not be able to deal with it. However, to put it simply, Industry 4.0 is nothing but connecting machines, gathering data from the machines, and using this data for analytical purposes. So, one does not need to have an Industry 4.0 setup in one go. It's a journey; one can adopt it step-by-step, as per their requirements and understanding.

Industry 4.0 is very much relevant and needed in MSMEs. Let's compare the scenario of a one-day breakdown in a small enterprise and a large enterprise. Considering the finances, infrastructure and resources, among other factors, of these two enterprises, the impact on the small enterprise is most likely to be greater as compared to what a large enterprise will have to deal with. However, with Industry 4.0 in place, MSMEs can avoid breakdowns and enhance their efficiency. I am sure that tool and die makers will immensely benefit if they adopt Industry 4.0.

Q What are the major manufacturing trends shaping the manufacturing industry? How will they impact the tool and die makers?

There are a few noteworthy trends that are shaping the manufacturing industry and are having a significant impact. The trends include:

- » **Industry 4.0:** As mentioned earlier, Industry 4.0 is going to significantly change the way we manufacture and source parts. All the trends will definitely revolve around Industry 4.0 and smart manufacturing.
- » **Automation will be key:** The pandemic has taught industries an important lesson — automation is key to sustain in this uncertain economy. I feel the usage of robotics will increase in the future. Collaborative robots are going to

play a vital role, as they can work collaboratively with humans and could be a great addition for applications that are dangerous or unhygienic.

- » **Additive Manufacturing (AM):** AM is gradually becoming a mainstream manufacturing technology. With the level of innovations happening in the 3D-printing space, I am sure that the adoption of AM will increase in all the industries.
- » **Virtual Reality (VR) and Augmented Reality (AR):** VR and AR are already impacting the consumer industry in a big way. They are gradually stepping up in manufacturing as well.

Q Any words of advice for Indian toolmakers? Is there something they should learn from their German counterparts?

Germany is the leader in manufacturing technologies because they absolutely refuse to compromise on quality. This is something that stands out when we talk about German technologies and processes. German companies, whether they are small job shops or large OEMs, always stress upon quality and consistency. However, in India, we go a little flexible on quality. We must learn to maintain the quality with consistency. Having said that there has been considerable progress in the Indian industry as well. And now, Indian companies are servicing global giants, which is only possible if we maintain quality. I am sure things will improve in the coming days.

Q How can toolmakers from these two countries collaborate to leverage on each other's strength?

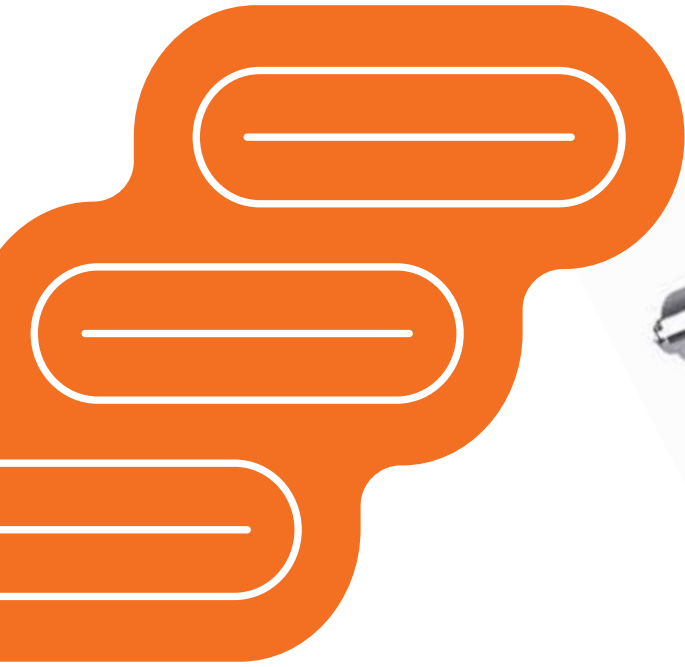
India holds huge business opportunities, as we are one of the fastest-growing economies, we have the largest population of youth, and our consumer purchasing power is increasing at a fast pace. Germany is an engineering powerhouse that exports technologies to the world.

This is like the perfect match. Germans need markets and Indians need access to technologies. Indian tooling companies should explore partnership opportunities with German companies. Germans have the technological know-how, while Indians have a good understanding of the market. The two need to leverage on each other's strengths.

All in all, I am highly optimistic about the India growth story. We are going to witness a GDP growth of 11% to 12% in the years to come. 🌈

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Automated factories of the future

The future we have all been waiting for and have, so far, seen only in the movies is almost here. Consistent new technological accomplishments and breakthroughs, ranging from new machines that make manufacturing simpler, and new 3D printers that can collaborate with various materials to complex robotics systems, indicate that the sci-fi future has arrived.



The concept of 'lights-out manufacturing' is relatively new. It does not require human supervision, or even lights... all its machines can function in the dark. While this may seem like a scene straight out of science fiction, such factories have been a reality for over 15 years. Unbelievable? It's true! This evolution in industrial technology, or Industry 4.0, has already ushered in the wave of digitisation and automation.

Futuristic factories and manufacturing are heading for an upgrade. Years down the line, futuristic technologies will change the face of manufacturing. Let's take a look at some of the technologies that will immensely impact factories and understand what they are likely to resemble in the near future.

Implementation of collaborative robots

Robots are a common sight in quite a few factories! Initially they were brought onboard for the sole

purpose of doing repetitive tasks. But over the years, they have evolved to perform innovative tasks. For instance, now, with cutting-edge programming software and safety mechanisms, robots are working in sync with humans on production lines.

These collaborative robots, also known as cobots, are machines designed to work with and assist human workers. Not only can they handle repetitive jobs to increase productivity, improve consistency, and minimize errors, but they can also assist humans to become more productive. As a result, factory employees get more opportunities to work on creative tasks and get progressively associated with the process.

Fully automated manufacturing

The manufacturing industry has moved with the times. It has adopted state-of-the-art technologies, including automation, to enhance its efficiency and

Factory Insight

improve its productivity. Over the years, more and more factories are automating their processes. And, by 2020, the number of industrial robots is projected to reach 3 million, which is practically double the existing number.

As factories and shop floors across the world realise the benefits of automating their processes, those, which are still skeptical about adopting automation, will have to jump onto the automation bandwagon soon if they want to compete with their counterparts and thrive. Eventually, in the near future, fully automated factories will be a standard practice.

AI and robots

Artificial intelligence has made it possible to enhance factory robots and give them increasingly complex capabilities. For instance, AI has given factory robots environmental awareness and cutting-edge cognitive programmability, permitting them to adapt comparably to employees, reenact human behaviour, and investigate it.

Each of these improvements has led to increased productivity and manufacturing proficiency, as robots don't need assistance to deal with mundane, repetitive, and technical tasks. Robots have a superior understanding of their tasks and how to deal with them effectively without "getting confused". This allows human employees to focus on the sophisticated parts of production.

Robotic automation can be utilised across industries by numerous types and sizes of manufacturing businesses. Here's why:

» Robots are scalable

Robots are utilized in high-production, high-volume environments and can be scaled down to function in growing organizations. Modern robots can be utilized in low- to medium-volume manufacturing environments. Thanks to recent advancements, they can be customised and promptly programmed for new tasks. Mobile bases permit them to be utilised in numerous areas of manufacturing facilities.

» Robots are easy to program

One no longer needs to learn complex programming languages to educate robots. Modern robots can be educated using two simple methods. They are:

- 1) The primary method, offline programming, which allows a user to model a work area, or

complete cell, and build up the sequence of moves to complete a task.

- 2) The second way robots can be instructed is with a teach pendant. An engineer or a programmer basically guides the robot through a sequence of steps. With some fine-tuning, the instructions are put away. The robot goes through the program gradually to check for collisions with humans or objects. After various successful test runs, the robot can operate at full speed.

» Robotics saves time and money

Robots were initially being utilized in the industry in the mid-1960s. Since then, they have made considerable progress. Unlike in the earlier decades, robots can now be installed in less time and at a cheaper cost. Moreover, increased sales have seen prices come down drastically. Besides, in built-in best-in-class facilities, robots include quality enhancements and regulated safety benchmarks, which translate into savings on unscheduled downtime and labour costs. Also, robots can work 24/7, thereby expanding production and minimizing downtime.

» Robotics creates more jobs

Numerous manufacturers needed to send jobs offshore since they couldn't compete with low-cost foreign labour. However, robotic automation has proved to be a game changer for them. Besides, automation has created more jobs in robotics and related fields. For instance, programming, engineering, end-effector design, data analysts, robot manufacturing, operators, and systems integration are some of the job opportunities.



Besides this, manpower is required to help service the machines. Robots permit manufacturers to bring down costs and create jobs. Robots can also protect workers from doing mundane, repetitive, and risky tasks that could negatively impact their ability to work.

Thus, robotic automation offers manufacturers, opportunities to save on costs, improve production, and stay competitive. The ROI can equal growth that not only doubles profits but also creates jobs for the community and investment funds for customers.

What does the future of factories hold?

To answer this question, let's delve into nine unique steps of the manufacturing process, to see how they are beginning to change:

Step 1: Product R&D

According to a recent survey, accelerating product development is the No. 1 priority of organizations utilizing 3D printing. 3D printing and robotics have known to improve product development across many verticals. It's no wonder then that organizations are exploring 3D printing, robotics, and artificial intelligence as roads to improve the R&D procedure and decrease uncertainty when going into production.

In addition, 3D printing is mostly used for prototyping new technology and has become a staple in any



design studio. Before ordering a large number of physical parts, designers can use 3D printing to create a model of the product and work on it.

Robotics basically involves automating the physical procedure of experimentation over a wide array of verticals. Robotics-related projects mostly focus on digital transition of the manufacturing process, solutions to assist workers, enhanced cognition, and human-robot collaboration.

Step 2: Resource planning & sourcing

On-demand decentralized manufacturing and blockchain ventures are trying to figure out the complexities of integrating suppliers. Assembly lines today are so lean that they're incorporating an almost real-time inflow of parts and collecting them as quickly as they arrive. Honda's UK-based assembly factory, for instance, just keeps one hour's worth of parts ready. After Brexit, the organization reported longer hold ups for incoming parts at the border and said that every 15-minute delay costs up to £850,000 every year.

Step 3: Blockchain for resource tracking

Enterprise Resource Planning (ERP) software tracks resource allocation from raw material acquirement right through Customer Relationship Management (CRM). However, a manufacturing business can have such a huge number of different ERP systems and siloed data that, unexpectedly, the ERP "stack" would itself be able to turn into a tangled mess of cobbled-together software. In fact, a 2017 PwC report found that numerous large industrial manufacturers have around 100 diverse ERP systems. Distributed Ledger Technologies (DLT) and Blockchain projects unite data from different processes of an organization and stakeholders into a universal data structure. Many corporate pioneers are piloting blockchain projects to reduce the unpredictability and disparities of their siloed databases.

Step 4: Operations technology monitoring & machine data

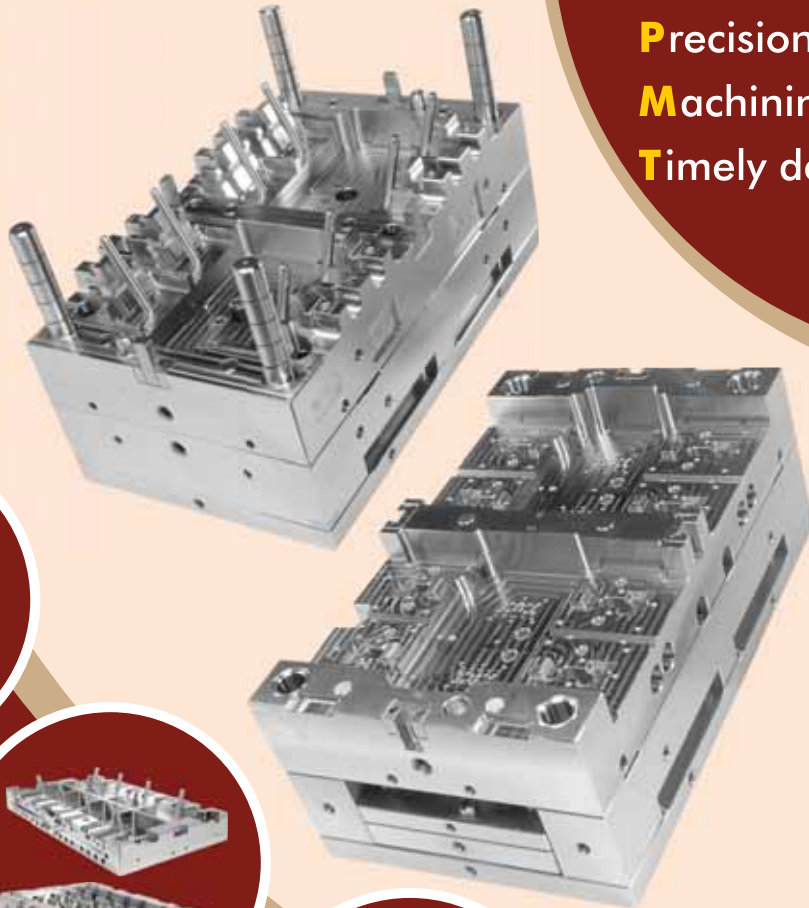
Future factories will get the essential digitization, and further along, we will see more prominent predictive power. As per lean manufacturing metrics (estimated by overall equipment adequacy, or OEE), world-class manufacturing sites are working at 85% of their hypothetical limit. However, the average factory is at about 60%, which means there's tremendous scope to improve and streamline its activities.

For manufacturers, the OT stack ordinarily incorporates:

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- » Connected manufacturing equipment (frequently with retrofitted industrial IoT sensors)
- » Supervisory control and data acquisition (SCADA) systems and human-machine interfaces (HMI), which give modern monitoring for operations analysts
- » Programmable logic controllers (PLCs), the ruggedized computers that snatch information on factory machines
- » 3D printers and computer numerical control (CNC) machines for subtractive manufacturing
- » In a way, OT and IT could be viewed as different sides of the same coin. Traditionally, IT and OT have had well demarcated roles within an organization. However, as manufacturing gets digitized, i.e. as machinery integrates with networked sensors and software, the lines between the two will blur.

Step 5: Labour augmentation & management

Wearables, AR, and exoskeletons are enlarging human capabilities on the factory floor.

Notwithstanding being a hands-free “browser” that can impart factory performance indicators and appoint work, AR can break down complicated machine environments and utilize computer vision to outline a machine’s parts, similar to a real-time visual manual. This makes a profoundly skilled labour like field service a “downloadable” skill.

Step 6: Machining, production & assembly

Custom machines and modular equipment such as 3D printers are empowering manufacturers to deal with more prominent demand for variety. Visions for Industry 4.0 include a totally intelligent factory where networked machines and products communicate through IoT technology, and not just prototype and assemble a particular series of products, yet additionally, repeat on those products based on customer feedback and predictive data.

Presently, mass-production is, as of now, refashioning itself to deal with consumer demand for noteworthy customization and variety. Nearly 90% of automakers in a 2016 BCG study said they expect a modular line setup will be applicable in the final gathering by 2030.

Step 7: Quality Assurance (QA)

A gander at how computer vision will discover imperfections, and how blockchain tech and software will have the option to identify issues.

Step 8: Warehousing

New warehouse demand could bring “lights-out” warehouses significantly quicker than an unmanned



factory, with the assistance of visual tracking and robotics.

Step 9: Transport & Supply Chain Management

IoT, Telematics, and autonomous vehicles will bring more noteworthy proficiency and granularity to manufacturers delivering their products.

Conclusion

Manufacturing is becoming increasingly effective, customized, modular, and automated even as factories remain in transition. Manufacturers are called slow adopters of technology, and many may oppose making new ventures. In any case, as digitization turns into the new standard in the industry, competitive pressures will heighten the incentive to evolve.

The most remarkable results manufacturers can achieve will be possible if they apply AI, robotics, and basic IoT digitization. More extravagant data and smart robotics will expand a factory’s output while limiting expense and defects. At the unmanned factory in Dongguan, utilizing robotics dropped the deformity rate from 25% to under 5%.

A majority of US manufacturers, in a study led by BCG, said that lower automation costs have made the US progressively competitive.

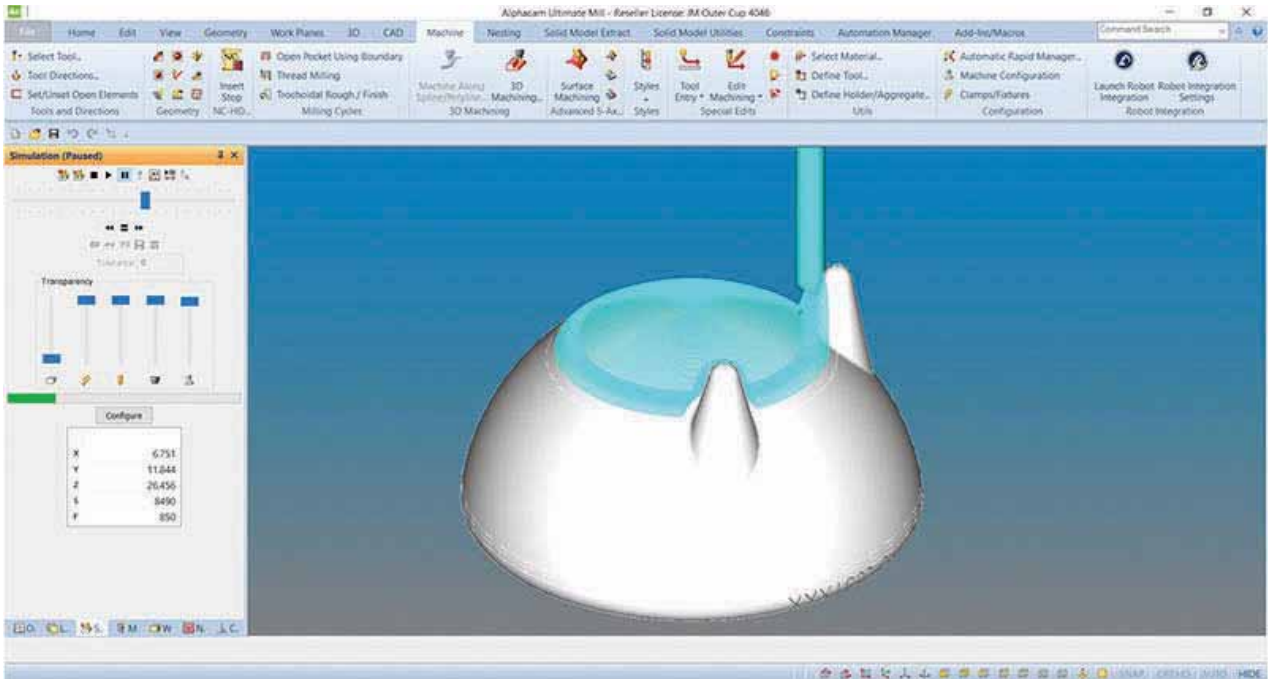
Manufacturing is profoundly changing with new technology, and almost every manufacturing vertical — from electronics to cars, to pharmaceuticals — is implicated. The technologies and timelines will differ by sector, yet most steps in nearly each vertical will see improvement.

According to Henry Ford: “If you always do what you generally did, you’ll always get what you always got.” To reach its maximum capacity, the manufacturing industry should continue its efforts towards getting a grasp on new technology. 🌈

Article Courtesy: *Truventor.ai*

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ALPHACAM “vital” for orthopaedic implant experts



Jointmedica Ltd., based in Worcestershire, UK, produces Class 3 implants in the orthopaedic sector, and has, in its product portfolio, an innovative mobile bearing Knee Replacement, as well as development activities relating to Hip Resurfacing and the manufacture of custom-made devices for specific patients created directly from CT scans.

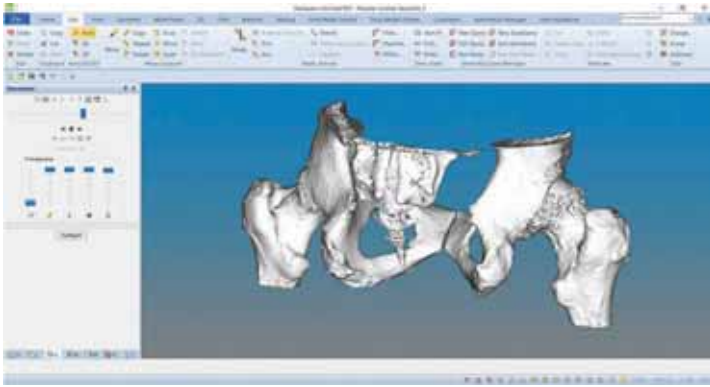
Development done in-house!

The high-level development activities can now be undertaken in-house at Jointmedica's facility in Hallow, utilising ALPHACAM's computer-aided machining software. As well as allowing them to take advantage of the brain trust and Intellectual Property available via the company's founder, Prof Derek McMinn, ALPHACAM assists the design team to further explore these innovative new designs and incorporate new materials driving the advancement of Orthopaedic Hip and Knee Replacement surgery, therefore exacting controls, and the highest quality, is paramount.

Technical Director, Roger Ashton, says: "If we consider the Hip Resurfacing market in isolation, several years after the procedure began, a small number of patients suffered physiological problems due to hypersensitivity to various metals. The end result was that a small percentage had bearing related failures. This led to a sharp decline in the use of metal-on-metal articulations in the Resurfacing context. It is Jointmedica's purpose to work with alternative bearing materials such as ultra-high molecular weight polyethylene, using the successful Resurfacing methodology to generate a product that will re-establish the Hip Resurfacing market. In terms of our surgeon team, we are privileged in being associated with the most experienced Hip Resurfacing designers and surgical innovators in the world."

When the company brought their manufacturing research and development in-house, the need for investing in a suitable machine and CAD/CAM software became apparent. Roger says: "It was clear we were going to have an interesting combination

Case Study



of 2D turned profiles and surface machining with milling, drilling, and slotting, and we were conscious that we had a lot of complex geometries to deal with. So, we needed a CNC machine tool and software that could manage all of our milling and turning requirements, including sometimes more than 3-axis." And, he says, their Brother Speedio M140x2 full 5-axis CNC machining centre fit the bill perfectly. "Many products require a combination of 3-axis and 4-axis machining, plus turning operations. So ALPHACAM will always be an integral part of our manufacturing process now."

Customizing implants

Generating custom implants at Jointmedica begins the moment they receive the patient's CT scan, which allows them to start modelling the bespoke product. They use two CAD systems to design the solid models - mainly Creo, and occasionally SolidWorks. The files are usually sent as an XT file, STEP file, or as a DXF file for the turning cycle in the lathe software.

The company uses ALPHACAM Ultimate Mill and Standard Lathe to machine the finished product with the Brother capable of both turning and milling. Oliver Clayton, Manufacturing Engineer at Jointmedica, explains: "I take ALPHACAM's 3+2

system and incorporate it into some of the bespoke custom devices, and then, an easier 3-axis and turning program definition on the cutting paths for a simpler, axisymmetric product. In the turning program, I mainly use the CAD side in drawing the geometry and applying the toolpath. That's extremely useful because I can incorporate not only the model, but draw my own toolpaths in there with the geometry."

As an example, the materials for a ball and socket type of bearing, which work well when implanted in the body as a Hip Replacement, can include ultra-high molecular weight polyethylene of differing formulas, and a counter face of cobalt chrome, ceramic, or other material.

"Through accurate machining driven by ALPHACAM, material wastage is kept to a minimum, and we can also ensure the final, bespoke product is suitable for the patient." Oliver says it's of the utmost importance that the implants are of the highest precision. "When we come to CMM measurements they must be dimensionally correct, and ALPHACAM ensures we get the right results every time. When considering our prototyping expectations, we are comfortably achieving the industry expected tolerances, and a bearing surface finish of 0.8 Roughness Average for one-offs. We know that future production capability will significantly exceed these figures, and we are confident in the solution afforded by the Brother CNC driven by ALPHACAM."

"Due to ALPHACAM's accuracy, I can be totally confident that ALPHACAM guarantees the product will be right first time, every time."

ALPHACAM's accuracy

For Jointmedica, a particular challenge facing the manufacturing process was manipulating the toolpath to get the quickest machining time for a particular part. ALPHACAM's ability to define the best cutting tools and toolpaths allow these to be manipulated to set the quickest timescale with the best path for the device to be manufactured accurately. Oliver concludes: "When I refer to accuracy, I don't just mean the speed and accuracy of a geometric toolpath I put over a CAD model that's come into ALPHACAM; I mean combining a number of different types of operations - the accuracy and ease of ALPHACAM coming in and picking up at a point that I've designated on the software, at a later stage on the product with an alternative type of machining method. It picks up accurately, as verified with our CMM equipment, and it is always within the specified critical dimensions. This is a huge benefit." 🌈



The Crucial Connection

If we consider a CAM program as the brain of a machining operation and the cutting edge as its limbs, then the spindle can be regarded as the heart of the machine. Hence, like the arteries, which connect the heart to the limbs, the tool holder (adaptor) becomes the crucial connection between the spindle and the cutting edge.



NT Tool Corporation, Japan, is the only manufacturer in the world, who has integrated the principle of hollowness in BT holders. Their NBT/WBT AHO (A Hollow) holders conform to the BT/BBT norms, but the shank is hollow.

Compared to the whole machine set-up, a tool holder seems to be of minor importance. However, it is key to several factors, the most important being the life of the spindle. Therefore, it is critical to understand and take care of this crucial connection.

Types of tool holders

Every tool holder is specific to the machine spindle's taper design. So, one cannot interchange a specific tool holder with any other spindle. The tapers are of mainly two types, namely, SK/SA and Hollow.

SK/SA (Stiel Kegel/Steep Angle) Taper norms include:

- ▶ ISO (International Organization for Standardization)
- ▶ DIN (Deutsche Industries Norm)
- ▶ ANSI (American National Standard Institute)
- ▶ CAT (Caterpillar 'V' Flange Standard)
- ▶ JIS/BT (Japanese Institute for Standardization)

Hollow Taper norms include:

- ▶ HSK (Hohl Schaft Kegel/Hollow Shank Taper)
- ▶ Capto/PSC (Polygonal Shank Coupling, ISO 26623)

SA tapers

The angle of all SA tapers is 7/24, which is actually

3.5/12, the forerunner being the Morse taper. It is defined as a cone, which tapers off at 3.5" per foot and conforms to the DIN 2080 standard. The other features include the length, dimensions of V flange, driving notches for gripper & storage, and shape/dimensions of the pull stud, among others.

Pull studs

Pull studs or the retention knobs, though small, are the crucial link for the crucial connection. As the name indicates, it pulls or retains the tool holder to the spindle. Though the norms are according to DIN, CAT, ISO, or BT, there exists a full-blown list of pull studs adapted to each and every machine tool or spindle manufacturer's specification. So, while selecting the pull stud, there can be some confusions. Hence, it is particularly important to get the correct angles and dimensions from the manufacturer concerned.

HSK

HSK, as the name indicates, is hollow and comes in different forms like A, B, C, D, E and F. The principal difference between these is the size of the taper. The B, D, F taper size is smaller than A, C, E tapers with flange of same size. HSK-T is a recent development based on the ISO 12164-1: 2001 HSK standard shank. It improves tool position accuracy with the help of an additional key fit of very precise tolerance.

Machining Mantra

Capto/PSC holder

Capto/PSC holder, also known as PSK (Polygon Schaft Kegel), are hollow and can self-orient thanks to the three unique contact areas. These contact areas are capable of transmitting high torque. PSC offers different sizes depending upon the diameter and GPL, namely, C4, C5, C6, C8 and C10. Each size of these also has different variants. For example, each C4 and C5 have 6 variants. Capto is considered as a universal system, as it can be used on turning centres, machining centres and multi-tasking machines. Also known as quick-change tooling, Capto can considerably reduce tool change and set up time as well as inventory.

Did you know?

'Capto' is a Latin word, which means 'I grab'. Another very well-known Latin word is 'Volvo', which means 'I roll'.

Above mentioned are the most commonly used taper norms. There are several other norms, namely, NBT, WBT, BBT, BCV, KM, etc., which are specific to tool holder manufacturers with some additional niche advantages.

The 'hollow' advantages

Why are electric and traffic poles hollow? It is not just economics that the poles are not made of solid cylinders. Hollow cylinders have a higher resistance against twist while in rotation (torque) compared to solid cylinders. Hence, hollow cylinders can withstand storms and hurricanes much better than solid ones. They have lesser chances of bending and breakage. The same advantage is there with hollow shanks also with resistance to bending while in rotation. Apart from the above advantages hollow shanks put less strain on the ATC and tool magazine.

The advantages of hollow shank are:

- ▶ Light weight due to the hollowness, whereas SK/SA tapers are comparatively heavy.
- ▶ Due its less weight, hollow shanks can sustain the dynamics of centrifugal forces, while in rotation.
- ▶ They have higher resistance to momentum of torque compared to solid shanks and are thereby less susceptible to bending/deformation.



Is your tool holder safe?

Tool holders should be well balanced to ensure problem-free metal cutting and longevity of the machine spindles. While in rotation, if the holder is unbalanced, centrifugal forces will drag the tool holder away from its centre line. This means that both the spindle and the cutting edge will also get dragged and will generate vibrations. Vibrations will lead to undesired consequences like poor tool life, reduction in cutting parameters, bad surface quality, screeching noises and accidents. Moreover, this will damage the spindle bearings and will cause costly consequences. In short, trying to save a few rupees for short-term benefits by using a sub-standard tool holder will turn out to be a very costly affair in the long run.

A tool holder, especially the backend, can easily get infected. Surprised? The disease that affects the tool holder is 'Rust'. Under Indian climatic conditions, if not well maintained, tool holders are prone to rust. Unfortunately, rusted tool holders are a common sight in many shop floors across India. It is said that after inspection, if an 'OK' sticker is stuck on a balanced tool holder it will get unbalanced! So imagine the unbalance that can be caused by a rusted tool holder. Rust corrodes the metal and small particles of the holder are lost.

Prevention is better

A damaged tool holder will naturally create imbalance. Even a miniscule dent could ruin the balancing quality. Machining with a damaged tool holder is literally inviting disaster, if not in the short term then definitely in the long term. To prevent damage to the shank, good quality tool boys should be used while setting outside the machine.

Similar to the preventive maintenance plan for machines, it is highly advisable to have a regular maintenance plan for tool holders also in place. Each and every tool holder, whether in the magazine or on the rack, should be inspected periodically for damages and stored with a film of rust preventive oil applied on it. Holders with anti-rust coatings are highly suitable for Indian climatic conditions. NT Tool, Japan, is a pioneer for tool holders with anti-rust coating.

Tool holders should be handled delicately. Operators should be made aware of the importance of this crucial connection. They should be educated and trained to respect, carefully handle, and maintain tool holders. As mentioned earlier, implementation of a preventive maintenance plan for tool holders will make life much easier and ensure better performance results. To achieve a problem-free metal cutting process, rust-free, damage-free and well-balanced tool holders are vital.

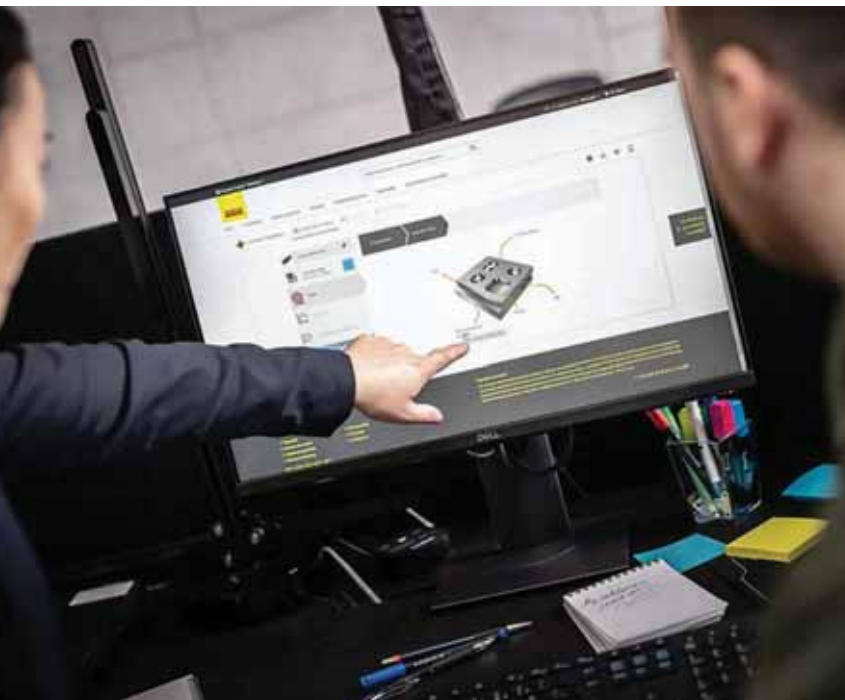


About the Author:

Mr. Sashi Menon is the Technical Advisor at Stitch Overseas Private Limited.

Sandvik Coromant joins forces with Microsoft to shape the future of manufacturing

Sandvik Coromant is collaborating with Microsoft to drive forward the development and digitalization of the manufacturing industry and accelerate the internal digitalization network for Sandvik Coromant. Combining Sandvik Coromant's expertise in machining with solutions from Microsoft, the collaboration will seek to link up parts of the production chain to create solutions for the next generation of manufacturing.



Sandvik Coromant's CoroPlus® offering is based on Microsoft Azure IoT and Dynamics 365 Field Service. Among other things, the offering connects people, machines, tools and data on a single platform to offer Sandvik Coromant's customers a better basis for decision making, and provides an overview of the various developments in the manufacturing process. This can enable savings, for example, by reducing machine downtimes.

"We see this collaboration with Microsoft as key to the success of our digital strategy. We have a historic relationship with them and look forward to continuing our journey, creating value by working together to develop and implement solutions for the manufacturing industry to guarantee efficiency, sustainability and growth," explained Nadine Crauwels, President of Sandvik Coromant.

One unique aspect of Sandvik Coromant's CoroPlus® offering is that the data is not only gathered at the machine level to adjust equipment, notify technicians about maintenance requirements and warn managers about potential problems. Data is also gathered at the tool level, which means that the customer's industrial tool becomes "smart" and can be adapted and adjusted at any time for efficient use and to prevent production stoppages.

The collaboration with Microsoft adopts an integrated approach to digitizing the data, expertise and experience used on a daily basis by Sandvik Coromant to guide their customers, and will serve as an additional tool to facilitate streamlining of production.

"Sandvik Coromant is a world leader in machining and has a track record of driving development in the industrial sector both in Sweden and internationally. It is incredibly inspiring that they have chosen to take the next step of the journey with us, and this is a really striking example of how digitalization can create new opportunities for the company to develop and become even better at what it does," states Hélène Barnekow, CEO of Microsoft Sweden. 🇸🇪

Five essential preventative maintenance activities

Preventative maintenance is crucial to extending the life of your injection moulding machine and avoiding costly, unscheduled downtime. Checking your machine regularly during shift changes is an easy way to avoid minor issues and an opportunity for early intervention with problems that, over time, could result in unscheduled downtime events.

Here are five essential preventive maintenance activities that will help keep your machines running, reduce unforeseen downtime events, and protect your operators:

1. Level and Parallel

Confirm your machine is level and parallel to the moving platen and stationary platen. During normal operations, your machines can jostle. A machine out of level will have uneven wear to the skate-ways, rods, bushings, and everything that guides the moving platen and mould.

The experienced operator should be able to visually look and see if wear is occurring. Watch out for uneven grease flow around the rods. This is a red flag that can indicate a machine that is out of level or parallel. Make this part of your monthly observations and checks and yearly preventive maintenance program.

2. Heater Bands

For most machines, temperature set points range from 350° to 600° F. Irrespective of what your set point is, you want to make sure your bands are reaching the correct temperatures. You will also want to verify the bands are in contact with the barrel and that each zone is heating to spec. If you see temperature variations or temperature fluctuations, it can indicate that you have a burnt-out heater band. You'll want to check that zone with a trained electrician to ensure the band is working properly. You should replace it if found to be defective. If you find a heater band in need of replacement, to minimize down time event, you should consider replacement of the set. Call your

regional service manager for additional details or to set up a Milacron Service Tech visit to inspect and replace.

3. Grease Flows

Operators should look inside the operator door to make sure all parts are moving and to make sure there is a film of grease on the rods and skates. You will also want to make sure the nylon tubing that runs to the distribution blocks doesn't have air bubble in the lines. This indicates the grease flow is not making to the lube points on the machine and can cause premature failure to your machine.

4. Safety Checks

You should always check all your safety limit switches on a regular basis. Over time, limit switches can be bumped or damaged. This can cause intermittent alarms dropping your machine out of cycle. You want to make sure that the bolts holding the limit switch to the device are snug and that the trip arms are adjusted for proper usage.

5. Cabinet Filters/ Tank Breathers

Cabinet air filters should be replaced regularly for appropriate air flow inside the panel. You can remove the cover from the outside of your cabinet doors. This allows you to access the air filter elements for cleaning and replacement. Tank air breathers, which are typically located on top of the tank, should be free and clean of debris as well. Dirty tank breathers will cause your tank to expand and contract as oil flows to and from the tank. If not maintained, this could potentially cause fatigue cracks to occur in the weld seams of your reservoir.

Doing these five preventative maintenance activities will help your machine operate safely and efficiently. It will also help you avoid costly unscheduled downtime. 🌈

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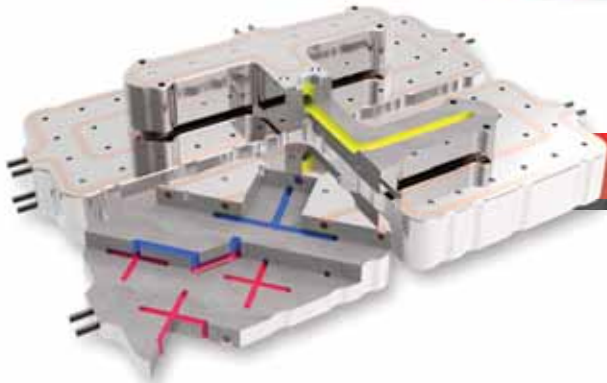
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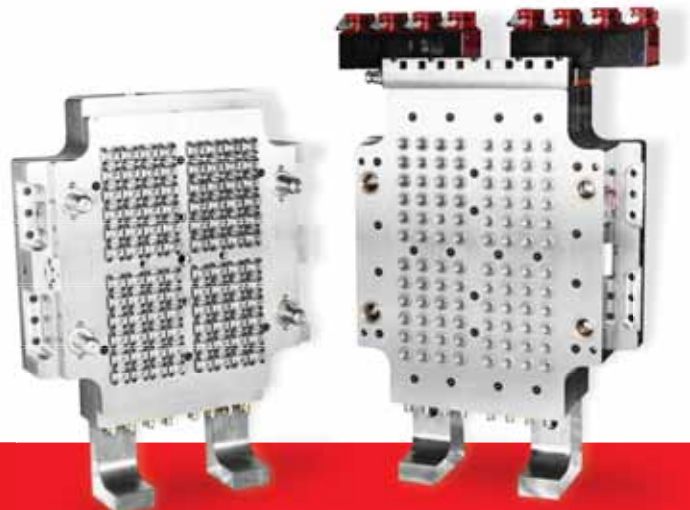
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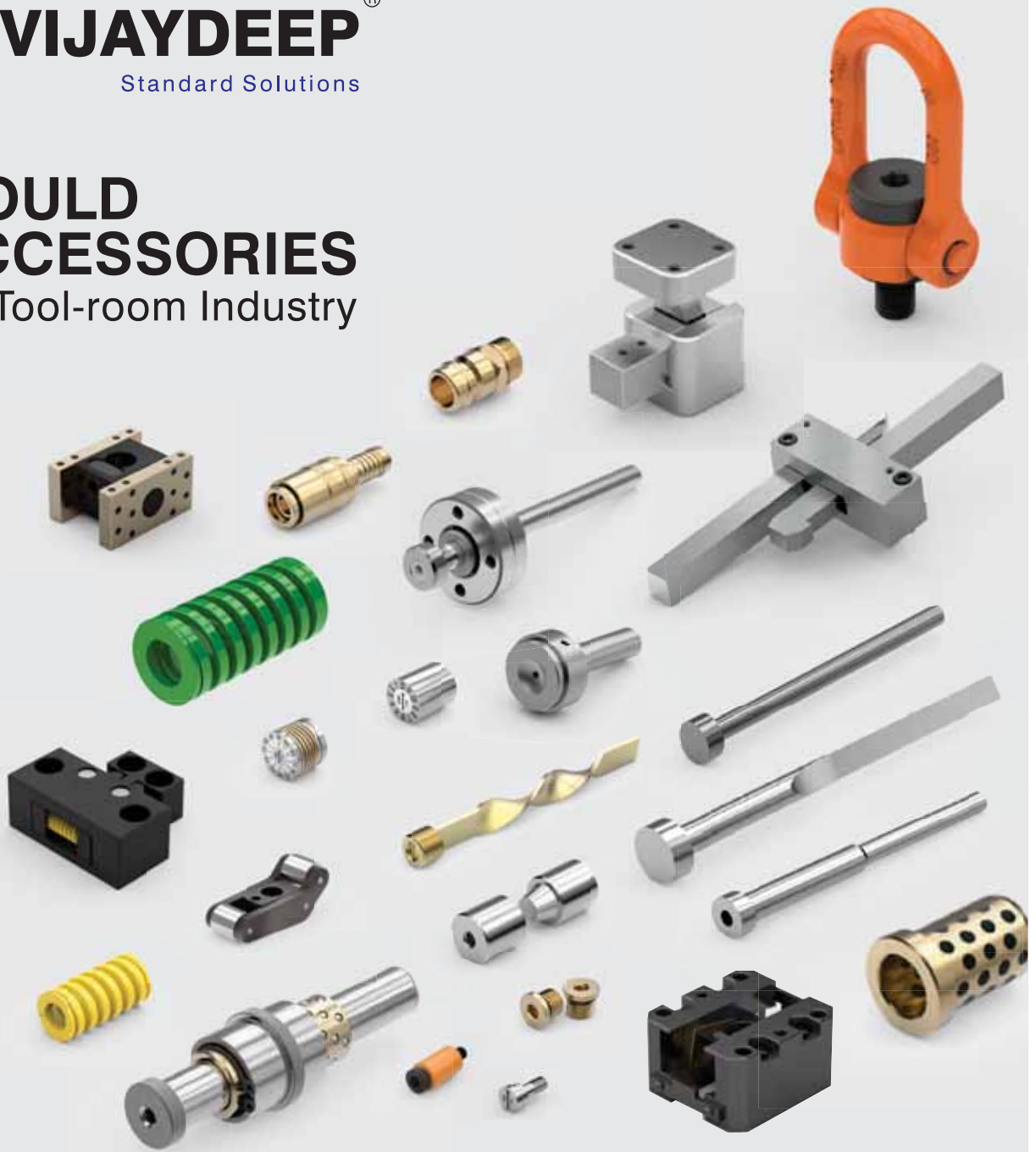


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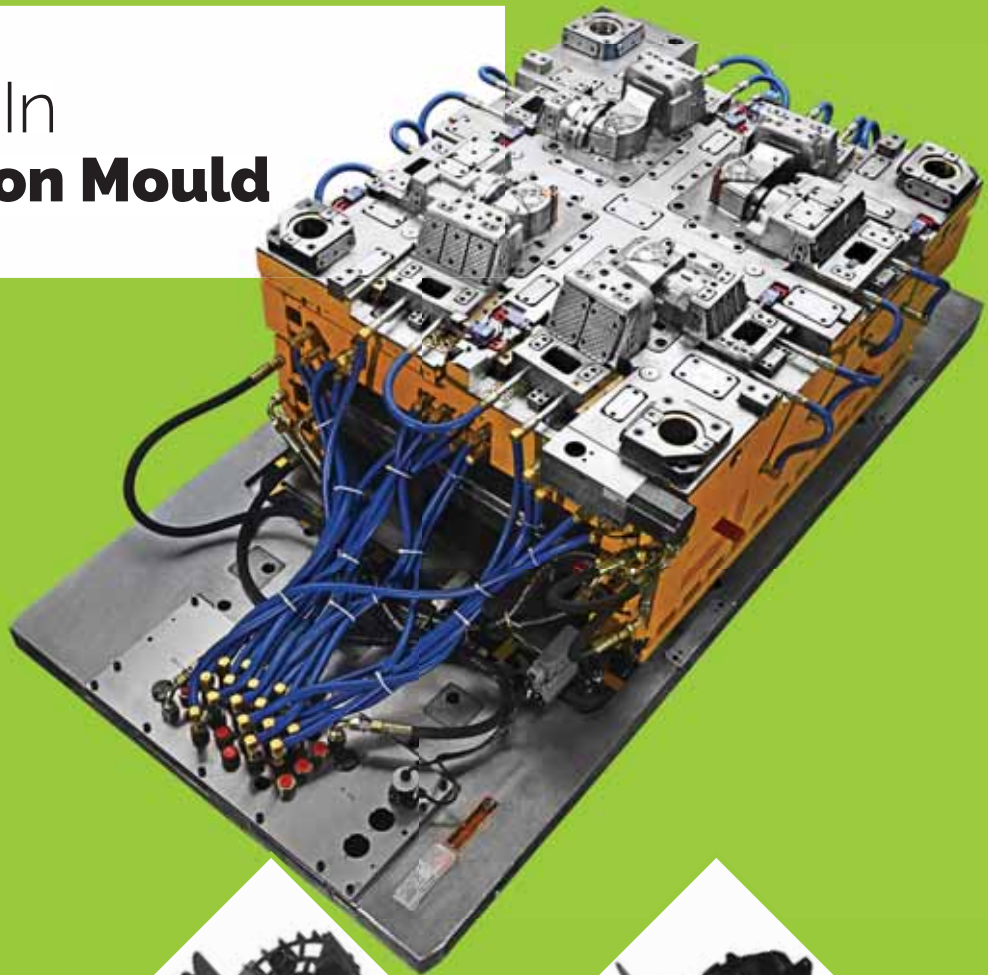
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