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5 Important Trends for
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CASE STUDY

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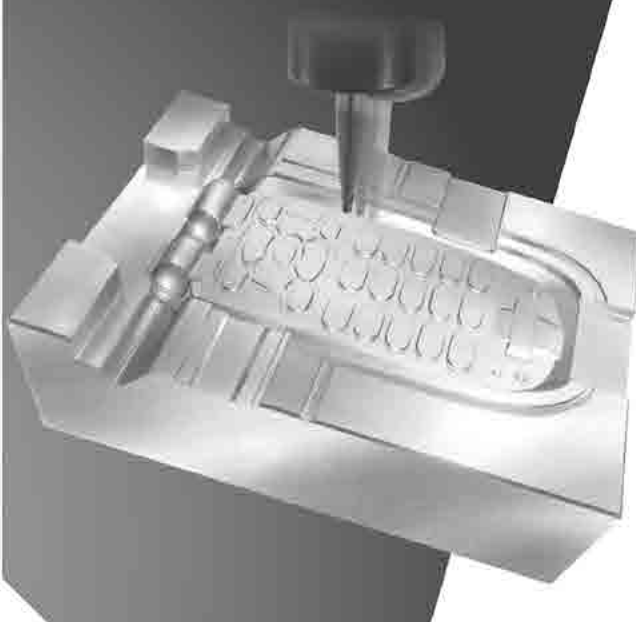


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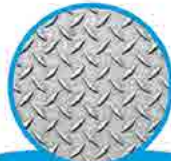
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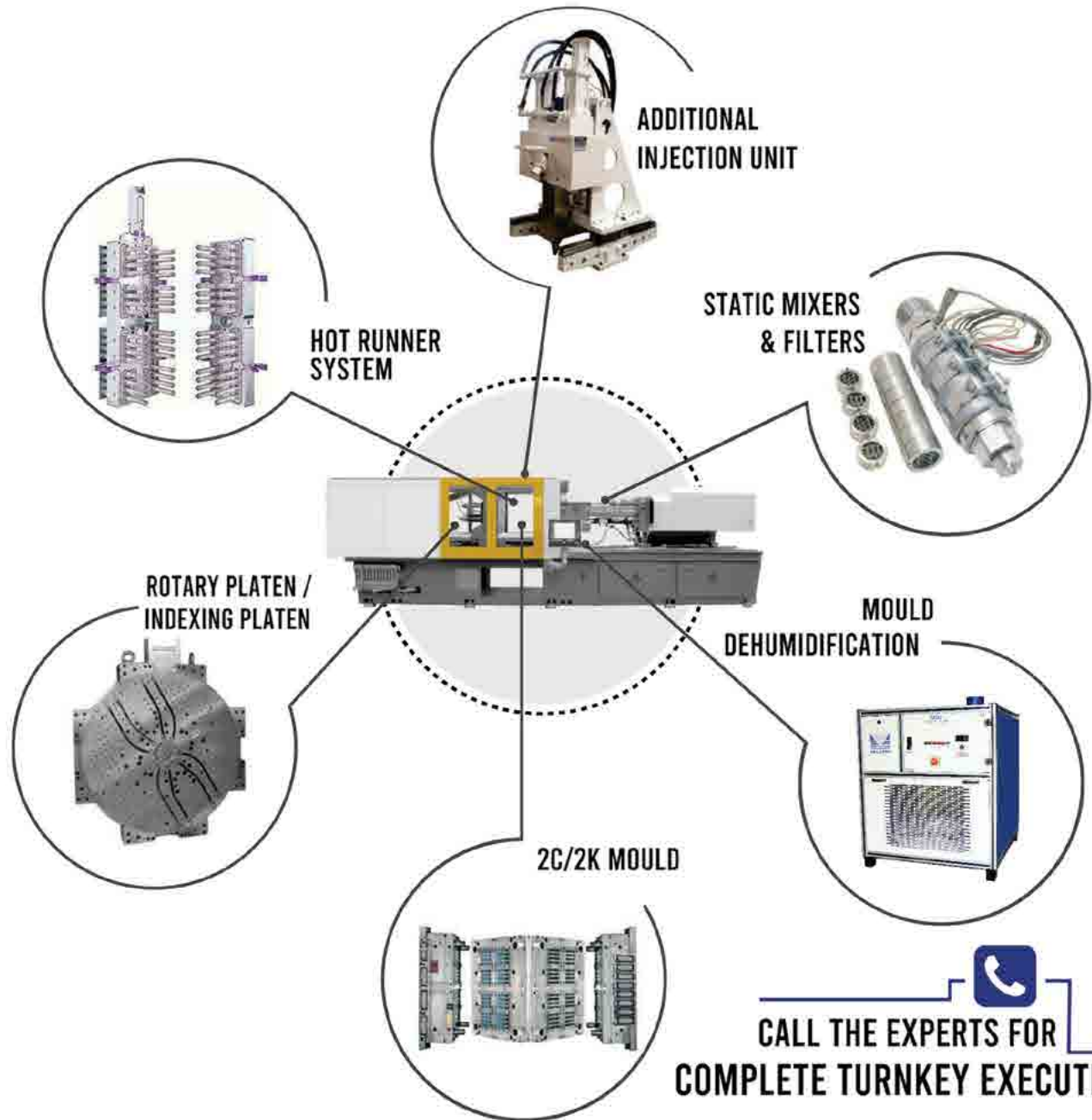
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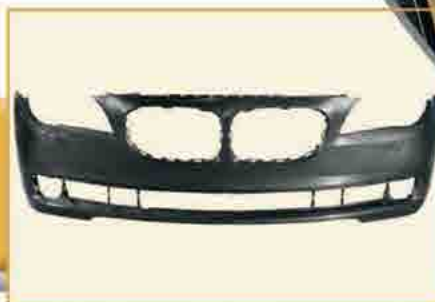


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Injection molded Bumper part



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PRESIDENT'S MESSAGE



D. M. Sheregar
President,
TAGMA India

"Greetings to the Tooling Fraternity, I hope this year 2023 brings happiness and success to all. The start of this decade has brought a sense of positivity to the Indian business community.

The world is full of hope and optimism for us, and our startup story has become a topic of conversation around the globe.

The tooling industry is no exception, as Indian toolmakers are witnessing a surge in demand. The government has made it clear that to become a developed economy, we cannot solely rely on services and must become a manufacturing hub for the world. We must encourage manufacturers worldwide to establish production facilities in India, and the response to this movement has been overwhelmingly positive with a significant increase in FDIs in the country.

As toolmakers, it is crucial that we stay ahead of the curve and make the most of these opportunities. To do this, I suggest that we explore new industries and markets, invest in skill development, upgrade our facilities with the latest technologies, and incorporate more digital solutions into our business operations.

I believe these steps will benefit toolmakers across the board. I am open to ideas and suggestions from my fellow toolmakers on how we can grow as an industry. As the President of TAGMA India, I would like to hear your thoughts on how we can work together to achieve this goal."



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Wish you a very successful New Year 2023!

The manufacturing industry is undergoing major transformations due to advancements in technology and changes in consumer preferences. In the coming years, there will be several crucial trends that will shape the industry and influence the operations of die and mould makers. Trends like digital transformation, sustainability, supply chain resilience, advancements in manufacturing technologies, diversification, localisation, and skill development will transform the industry.

The trends that are shaping the manufacturing industry are having a significant impact on die and mould makers. To be successful in the future, die and mould makers must adopt Industry 4.0 technologies, embrace digital transformation, focus on sustainability, improve supply chain resilience, and invest in advanced manufacturing technologies. By staying ahead of these trends, die and mould makers can remain competitive and meet the changing demands of the market.

The Indian die and mould industry faces several challenges, including competition from low-cost countries, a shortage of skilled labor, a lack of tooling clusters, and slow adoption of technologies. Despite these challenges, the Indian die and mould industry has tremendous potential for growth and can become a major player in the global market. The industry has a strong base of small and medium-sized enterprises (SMEs), which form the backbone of the sector, and the government is providing support for its growth. Additionally, the rising demand for consumer goods in India is driving the growth of the die and mould industry.

In this edition of the TAGMA Times, we have highlighted some of the trends that are shaping the manufacturing industry, the tooling industry, and 3D printing technology. Take a look and let us know what you think.

Material recommendations
for pill punching dies

BÖHLER K390
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BÖHLER K490
MICROCLEAN®

BÖHLER K890
MICROCLEAN®

BÖHLER K360
ISO DUR®

BÖHLER K340
ISO DUR®

BÖHLER K455
ISO DUR®

BÖHLER M390
MICROCLEAN®

BÖHLER M368
MICROCLEAN®

BÖHLER M340
ISO PLAST®

BÖHLER N690

BÖHLER W360
ISO BLOC®

BÖHLER S390
MICROCLEAN®

SHAPING HEALTH

When it comes to people's health, there are no compromises!

Pill punching dies are often exposed to a high pressing force. If necessary, excellent corrosion properties can be requested in addition to high abrasive wear resistance. In order to meet these requirements sustainably, it is important to use high quality tool steel. The production route of the steel (ESR, PM) and an individual heat treatment, tailored to the customer's demands, must be taken into account. voestalpine BÖHLER Edelstahl tool steels meet the sensitive scope of all these requirements. With voestalpine BÖHLER Edelstahl you have a competent and reliable partner in the health supply chain by your side.

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ONE STEP AHEAD.

Cognizant to advance Garuda Aerospace drones with digital technologies



Image used for representation only. Courtesy Envato Elements

Cognizant recently announced that it has signed a memorandum of understanding (MoU) with Garuda Aerospace, one of India's leading drone startups, to power its drones with advanced digital capabilities and bring innovative solutions at scale for enterprises aiming to achieve greater agility, productivity, and overall outcomes.

"We are excited to collaborate with Garuda Aerospace, combine our deep industry knowledge with capabilities such as advanced data analytics, real-time insights and software development to elevate drone-based solutions and new use cases for enterprises across sectors," said Achal Kataria, Vice President and India Country Head, Cognizant. "Drone services are one of the fastest growing technology segments with the potential to provide extraordinary value to industries such as agriculture, manufacturing, energy and utilities, retail and logistics."

Cognizant and Garuda Aerospace are collectively set to bring a plethora of end-to-end drone-based management and monitoring offerings for businesses across sectors. For the agriculture sector, a new offering provides intelligent water and soil management, crop spraying, and aerial planting, among others. For energy and utilities, an aerial intelligence solution helps in asset inspection, storm impact assessment, and fire safety, among other operational areas. And, in warehouse management, the drones can be used for inventory audit, tracking of products, video surveillance, and even help move lightweight objects. These drone-based solutions will also enable businesses achieve their sustainability goals by helping drive efficient use of resources.

"This collaboration with Cognizant will further enhance our 'Made in India' drones with world-class technologies and catalyze new, innovative solutions to help clients and their customers around the world," said Agnishwar Jayaprakash, Founder and CEO, Garuda Aerospace. "We have an innovative business model, an amazing team, and now the right collaboration with Cognizant to reach our desired scale. We hope to propel the entire industry forward with our growth." ♦

© Siemens



Greaves Electric Mobility Private Limited to accelerate electric vehicle development with Siemens Xcelerator

Greaves Electric Mobility Private Limited (GEMPL), the e-mobility business of Greaves Cotton Limited, and one of India's leading E2W to E3W mobility players, has adopted the Siemens Xcelerator portfolio of software and services to design, and develop its electric two and three-wheeler vehicles for the Indian market.

Siemens' NX™ software for product design and engineering and Teamcenter® software for Product Lifecycle Management (PLM), from the Siemens Xcelerator portfolio, will help Greaves Electric Mobility to develop products faster by streamlining and accelerating the product development process through an integrated set of digital product engineering and collaboration capabilities.

These solutions will enable GEMPL to shorten development time by efficiently utilizing digital twins and connecting people and processes across functions. Specifically, digital capabilities will be enabled in the areas of requirements engineering, program planning, mechanical, electrical, and software design management, bill of material management, process, and change management.

Sanjay Behl, CEO, and Executive Director, GEMPL, said, "We are proud to collaborate with Siemens and use its highly advanced digital capabilities, cutting-edge technologies, and expertise to accelerate our product development and thereby, market expansion of our electric vehicle product portfolio. India's EV ecosystem is on the cusp of tremendous growth, with increasing demand from consumers for sustainable and affordable personal mobility. Siemens' toolset will enable us to reduce the time-to-market introduction of electric two-wheelers under Ampere, as well as help to contribute to the country's goal of achieving 80% EVs in two and three-wheelers by 2030 and net zero carbon emissions by 2070". (Source: NITI Aayog).

"We are delighted to contribute to GEMPL's vision for revolutionizing the mobility space in India with ecofriendly EV product offerings. The Siemens Xcelerator portfolio will enable GEMPL to achieve a faster time-to-market for their electric two (E2W) and three-wheelers (E3W) by supporting an agile product development process," said Mathew Thomas, Vice President, and Managing Director – India, Siemens Digital Industries Software. ♦



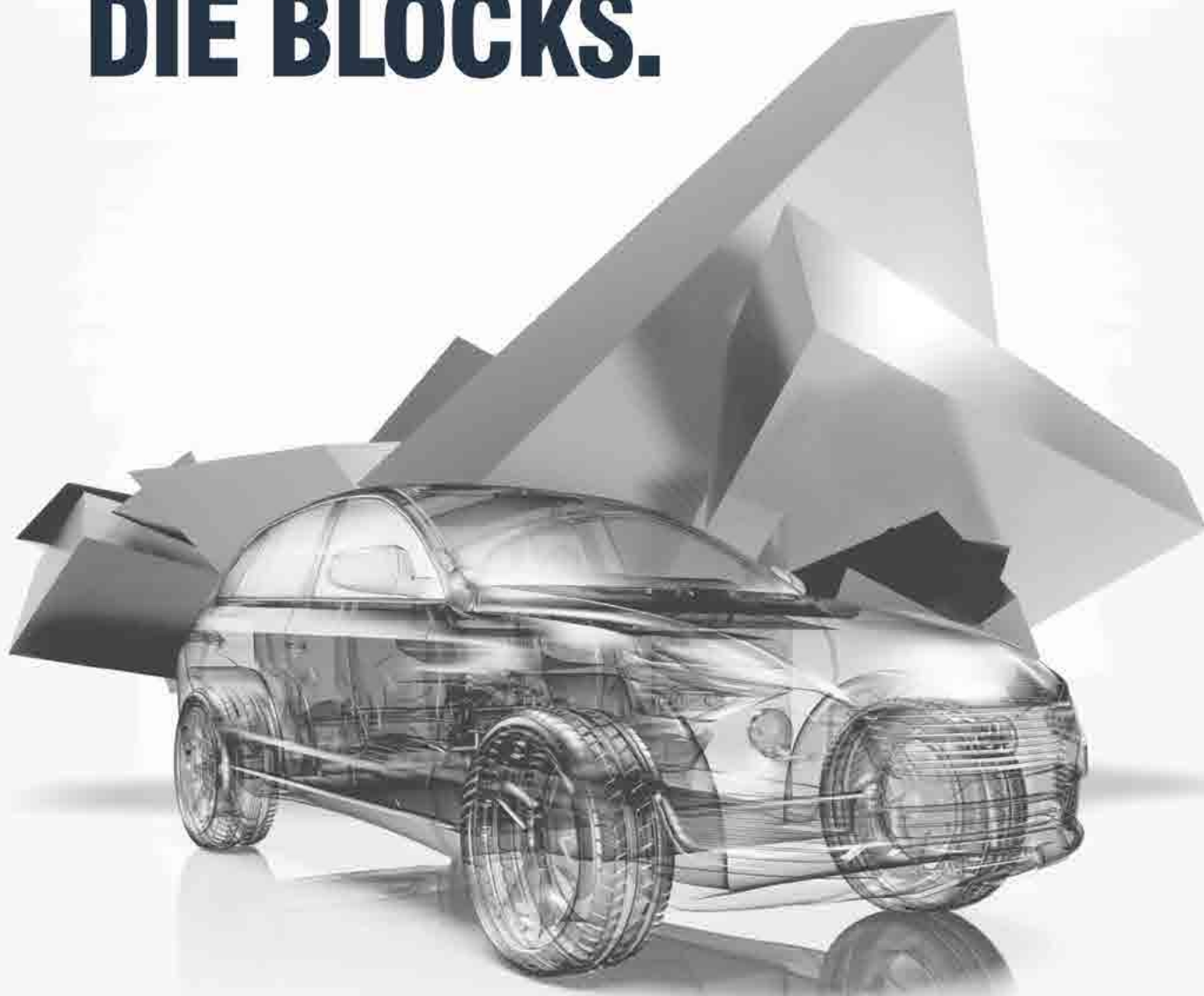
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India's manufacturing sector activity hits 13-month high in December on rise in new orders, strong demand

India's manufacturing sector activity rose to a 13-month high in December, supported by healthy inflows of new business and strong demand conditions, according to a monthly survey. The seasonally adjusted S&P Global India Manufacturing Purchasing Managers' Index (PMI) stood at 57.8 in December, up from 55.7 in November, as business conditions improved to the greatest extent in over two years.

The December PMI data pointed to an improvement in overall operating conditions for the 18th straight month. In PMI parlance, a print above 50 means expansion while a score below 50 indicates contraction. "Following a promising start to 2022, the Indian manufacturing industry maintained a strong performance as time progressed, wrapping the year with the best expansion in production seen since November 2021," Pollyanna De Lima, Economics Associate Director at S&P Global Market Intelligence, said.

Hiring activity was stretched to December, while more inputs were acquired as firms sought to supplement production and add to their inventories. Demand resilience boosted sales growth in December. Panellists continued to obtain healthy inflows of new business, and stepped up production to the greatest extent seen since November 2021.

Factors that supported sales growth include, advertising, product diversification and favourable economic conditions, as per the survey. "Less challenging supply-chain conditions also supported the upturn. Delivery times were reportedly stable, which enabled firms to secure critical materials and boost their input stocks," Lima said.

On the exports front, new orders rose at the slowest pace in five months as several companies reportedly struggled to



Image used for representation only. Courtesy Envato Elements.

secure new work from key export markets, the report said.

On the year-ahead outlook for production, companies were optimistic. Advertising and demand buoyancy were cited as the key opportunities to growth prospects.

"While some may question the resilience of the Indian manufacturing industry in 2023 amid a deteriorating outlook for the global economy, manufacturers were strongly confident in their ability to lift production from present levels," Lima said.

On the inflation front, cost pressures remained relatively muted in December, with the overall rate of inflation little-changed from November and the second-slowest since September 2020.

The S&P Global India Manufacturing PMI is compiled by S&P Global from responses to questionnaires sent to purchasing managers in a panel of around 400 manufacturers. The panel is stratified by detailed sector and company workforce size, based on contributions to GDP. ♦

Courtesy PTI News

Switch to make electric light commercial vehicles at ALL's Hosur plant

Switch Mobility Ltd., the electric vehicle arm of Ashok Leyland, will start producing light commercial vehicles (LCVs) at the latter's plant in Hosur from this year, said CEO Mahesh Babu. "While the eLCV range will be manufactured at ALL's Hosur plant, electric buses will be produced at ALL's Ennore unit," he said.

The production capacity for e buses was 2,500 and for eLCVs, in phase 1, is 3,000 units per annum and is scalable, Mr. Babu added.

"We are going to set up new units within the group premises and will use their existing facilities to optimise cost. The investment will be only in plant and machinery," he said.

Switch said it proposed to manufacture LCVs with payload of 1.2 to 4.5 tonnes and gross vehicle weight

Image Courtesy: Switch Mobility



Mahesh Babu, CEO, Switch Mobility Ltd.

of 2.5 to 7.5 tonnes for cargo and fleet management companies.

"We have showcased our vehicles at the auto show with multiple options and are going to scale it up," the CEO said.

According to Mr. Babu, ALL will produce fuel-based passenger buses, while EVs will be made by Switch.

He also said that currently 500 e buses of the company were plying and Switch had bagged orders for 2,600 buses from Convergence Energy Services Ltd. and others, including for 200 double-decker buses.

"These buses have to be delivered in two years. The deliveries would commence by this month," he said. ♦

Courtesy: The Hindu

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Slow return Die separation Gas springs- NFS-S7

'Made In India, Made For World'



Siemens Mobility awarded a €3 billion project in India

Siemens Mobility has received an order for 1,200 locomotives of 9,000 horsepower (HP) from Indian Railways, marking the single largest locomotive order in the history of Siemens Mobility and single largest order in the history of Siemens India. Siemens Mobility will design, manufacture, commission and test the locomotives. Deliveries are planned over an eleven-year period, and the contract includes 35 years of full service maintenance. The locomotives will be assembled in the Indian Railways factory in Dahod, Gujarat. Maintenance will be performed in four Indian Railways depots located in Vishakhapatnam, Raipur, Kharagpur and Pune. Locomotive assembly and maintenance will be implemented together with the staff of Indian Railways. The contract has a total value of approximately €3 billion, excluding taxes and price variation.

"Siemens is supporting the sustainable transformation of India's transportation sector as the country seeks to almost double freight capacity on its railways," said Siemens CEO Roland Busch. "I'm proud that this major order will help India achieve its ambitious goal of creating the world's largest green rail network, as our locomotives will save more than 800 million tons of CO₂ emissions over their lifecycle."



"We are delighted to partner with Indian Railways and deliver one of the most powerful electric locomotives available. These new locomotives will help increase freight transport on one of the world's largest rail networks, as they can replace between 500,000 to 800,000 trucks over their lifecycle. This historic order cements a firm commitment from Indian Railways to achieve 100% electrification of rail traffic in India. Our partnership will further strengthen Siemens Mobility's position in India and support the country's expanding railway market," said Michael Peter, CEO of Siemens Mobility. ♦

Shree Rapid Technologies announces partnership with API Metrology in India

Shree Rapid Technologies (SRT), a leading 3D Printing and 3D Scanning solutions provider in India, is proud to announce its partnership with Pune-based API Metrology India, a subsidiary of Automated Precision Inc., and manufacturer of world-class 3D metrology solutions. This partnership aims to help manufacturers effectively conduct reverse engineering, inspection and alignment, first article inspection, production measurement, prototype inspection, calibration, etc.

API has pioneered advancements in laser-based metrology equipment for industrial inspection and calibration. It is continually developing products to deliver innovation and automation to the manufacturing floor. With the backing of decades of 3D Scanning and Inspection experience, SRT saw a synergy with API Metrology India in serving the Indian Manufacturing industry, by providing a technology that would propel the time and precision to manufacture.

Mr. Nitin Chaudhari, Partner, Shree Rapid Technologies, stated: "Shree Rapid Technologies is excited to add another product to its portfolio for measurements of small sized parts (in mm) up to very large parts (of up to 80 mts) – be it optical mode, contact scanning mode or laser source measurements. This partnership with API Metrology completes our search for measurement of intricate shapes, sizes and processes that are now in demand for space, aeronautics and defence



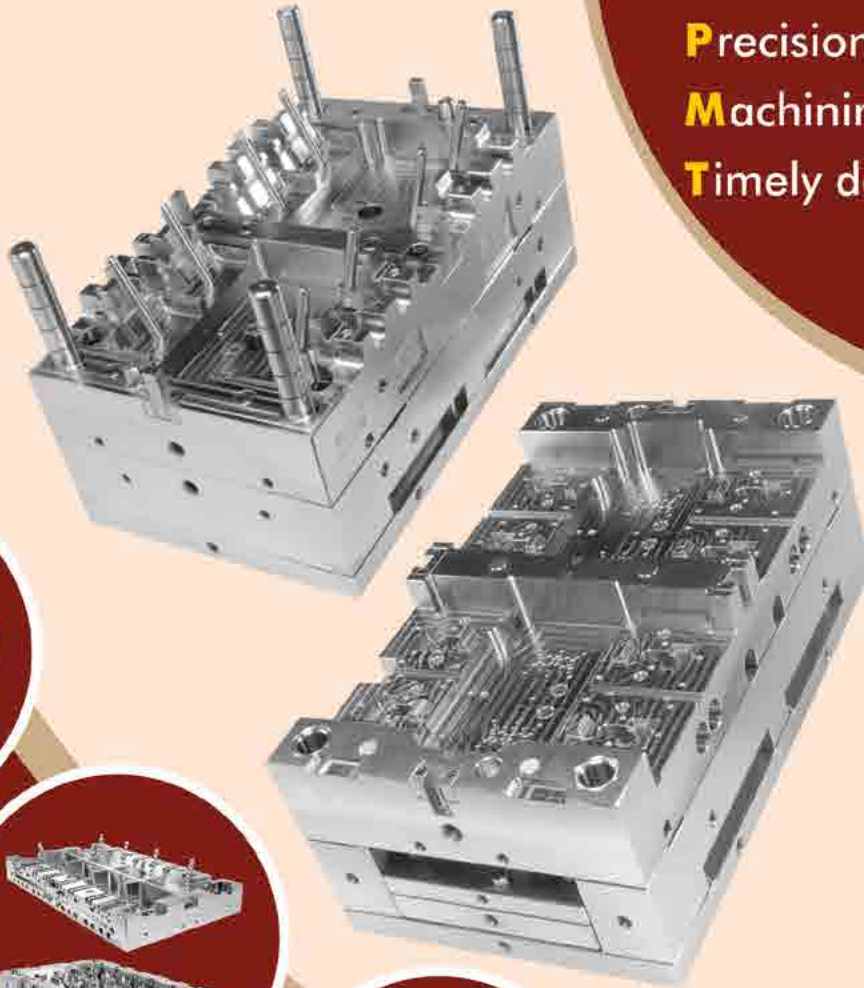
manufacturing organizations."

Mr. Vaibhav Shah, Managing Director, API Metrology India also expressed excitement about the collaboration with SRT. He said: "API India is growing at a rapid pace and closed one of the best years of business in 2022, looking forward with much bigger goals for the next 3 years. API believes in a strong reseller network and SRT fits perfectly with the past 14 years' experience in metrology and scanning with a strong team and excellent market presence. API's brand new 9D LADAR is the future of automated scanning and the best way to measure small to large components of any shape and size. It will completely change the way 3D scanning is done today. We wish SRT team all the best and support to make 2023 a great start of this new journey and to make it successful." ♦

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Tata Passenger Electric Mobility Limited completes acquisition of Ford India's Sanand plant

Tata Passenger Electric Mobility Limited (TPEML), a subsidiary of Tata Motors Limited (TML), and Ford India Private Limited (FIPL and together with TPEML, Parties) had executed a Unit Transfer Agreement on August 7, 2022, for acquisition of FIPL's manufacturing plant situated at Sanand, Gujarat, which inter-alia includes: (i) entire land & buildings (Sanand Property); (ii) Vehicle Manufacturing Plant along with machinery and equipment situated therein (VM Plant and Machinery); and (iii) transfer of all eligible employees of FIPL's vehicle manufacturing operations at Sanand (Eligible VM Employees), for a total consideration, exclusive of taxes, of INR 725.7 crore (Transaction).

Pursuant to the fulfilment of the necessary condition precedents, including receipt of relevant regulatory approvals, the Parties have recently completed the Transaction and TPEML has acquired the Sanand Property and the VM Plant and Machinery. Additionally, all VM Employees are offered employment, and those who have accepted TPEML's offer of employment, have been transferred to TPEML and have become employees of TPEML



with effect from January 10, 2023. TPEML extends a warm welcome to all such VM Employees who have accepted its offer of employment.

Tata Motors Passenger & Electric Vehicles business has delivered market beating growth over the last few years and has strong plans to sustain this momentum, with its robust pipeline of future ready 'New Forever' products and proactive investments in electric vehicles. With existing capacities near saturation, this acquisition will unlock an additional state-of-the-art manufacturing capacity of 300,000 units per annum which is scalable to 420,000 units per annum. ♦

Tata nears iPhone plant takeover to grow Apple supply role

Tata Group is close to taking over a major plant in southern India in a deal that would give the country its first homegrown iPhone maker. The airline-to-software conglomerate has been in talks with the factory's owner, Taiwan's Wistron Corp., for months, and is looking to complete the purchase by the end of March, according to two people familiar with the process. The two firms discussed various potential tieups but talks have now centered on Tata taking a majority of a joint venture, the people said. Tata is set to oversee the main manufacturing operation, with support from Wistron, the people said, asking not to be named because the plans aren't public.

Apple Inc.'s iPhones are mainly assembled by Taiwanese manufacturing giants like Wistron and Foxconn Technology Group. Tata's deal would advance India's efforts to create local contenders to challenge China's dominance in electronics, which has been jeopardized by political tensions with the US and Covid-related hurdles. The Indian conglomerate aims to complete a due diligence process by March 31 so that its Tata Electronics arm can formally take over Wistron's position in a program that gives it government incentives, one of the people said. The next cycle of incentives will begin from April 1, which marks the start of India's financial year.

The acquisition could value Wistron's only iPhone manufacturing operation in India at more than \$600 million if the Taiwanese company meets the requirements to receive



Image used for representation only. Courtesy Envato Elements.

the expected incentives for the current financial year, one of the people said.

A Tata representative declined to comment. Wistron and Apple didn't respond to requests for comment.

"I am not directly involved in that, but it should be really good for India because this is going to create an opportunity in India to manufacture electronics and microelectronics," said N. Ganapathy Subramaniam, operating chief at Tata Consultancy Services Ltd., the IT giant that's Tata's biggest listed unit. A deal would mark a step toward establishing India as a cutting-edge electronic manufacturing base, said Subramaniam, who is brother to Tata Group Chairman Natarajan Chandrasekaran. ♦

Courtesy: Bloomberg



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TAGMA India at IMTEX 2023

India's largest machine tool exhibition, IMTEX 2023, took place after a gap of four years. Organised by IMTMA, the event was held during January 19 to 25, 2023, at the Bangalore International Exhibition Centre.

IMTEX 2023 focused on metal-cutting machine tools and manufacturing technologies. The exhibition was held in an area of 77,000 square meters in 5 halls. Concurrent shows Tooltech 2023 and Digital Manufacturing were trendsetters in many ways. IMTEX 2023 was a great platform for the machine tool and manufacturing fraternity to renew relationships, explore collaborations and partnerships, and network with warm handshakes.

TAGMA India had the privilege to put up a booth at the premier exhibition and highlighted various activities of the association. "After discussing with many exhibitors and other industry leaders, I can sense that everyone is very positive about the Indian market, which is a great sign for Indian toolmakers as well. During the exhibition, we were able to make many new contacts.



I congratulate the IMTMA team for putting us on a great show," said Mr. Bhaskar Kanchan, Director, TAGMA India. ♦

Indonesian President Joko Widodo to personally attend HANNOVER MESSE

Indonesia is this year's Partner Country at HANNOVER MESSE. Indonesian President Joko Widodo has confirmed his personal attendance at the world's leading industrial trade fair and will speak at the opening ceremony on April 16. In addition, together with German Chancellor Olaf Scholz, he will also take part in the traditional Chancellor's Tour the next day, opening day Monday, at the fair. The last time these two heads of government met was at the G20 summit in Bali, Indonesia, in November 2022.

At the meeting in Bali, Indonesian President Joko Widodo and leaders of the International Partners Group (IPG) launched the Just Energy Transition Partnership (JETP). In addition to Germany, the IPG includes the United States, Japan, Denmark, the European Union, France, the United Kingdom, Italy, Canada and Norway. On the basis of this partnership, Indonesia intends to create an investment plan to achieve its ambitious climate protection goals. This makes Indonesia, the world's fourth most populous country, a highly relevant buyer of energy and industrial technology as well as a potential customer for exhibiting companies at HANNOVER MESSE.



With an economic growth rate of over five percent, Indonesia is on the road to recovery following the pandemic. The main reason for this is the high price of raw materials: Coal, palm oil, nickel and rubber from Indonesia are in some cases fetching record prices on world markets. However, Indonesia's goal is to attract more labour-intensive manufacturing to the country. Following the liberalisation of investment as well as labour law, international investors now have a greater scope of action.

Indonesia will take advantage of its presence at HANNOVER MESSE to attract more business from abroad. More than 150 Indonesian companies are already committed to exhibiting at the world's leading industrial trade fair. ♦

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Hurco introduces the VM ONE

Hurco was built on dreams, hard work, and calculated risks. A model called the VM1 was an important part of its history and recent growth. More important than the number of units sold worldwide, was the role the VM1 played in helping machinists make their entrepreneurial dreams come true. One machinist after another embraced the power of the Hurco control and started or expanded their small shop with the purchase of a new VM1. As these shops grew, Hurco grew. Admiration of its customers' drive, determination, and perseverance became embedded in the culture at Hurco and the compact VM1 is what gave it the opportunity to do business with so many of them.

Hurco has released a reboot of the popular VM1 with the revitalized VM ONE model. With a height that's less than 7 feet, the VM ONE is sized, priced, and packaged to be the CNC machine that gives small shops and startups a jumpstart to control their future.

The Hurco VM ONE mill has a compact footprint, one-



piece machine base, solid cast iron frame, and the flexible Hurco CNC control with more memory and lookahead than competitive models. With travels of 26 x 16 x 14, this compact CNC machine is loaded with remarkably big capacity, productivity, and user flexibility.

The most important feature of the VM ONE is the Hurco control powered by WinMax, which is the same control used on all Hurco CNC machines. With an intuitive user interface, the Hurco control has the flexibility shops need for high-mix manufacturing because it supports both conversational programming and NC. ♦

Precise temperature control with the profiTEMP IM



Meusburger has created a new hot runner controller especially for injection moulders. The profiTEMP IM is a compact, handy and powerful hot runner control unit, which features many advantages and easy handling. The device is available from stock at Meusburger.

The profiTEMP IM hot runner controller enables precise temperature control with a short heating phase thanks to a fast control algorithm. Tailored to the requirements of injection moulders, the control unit for 12 control zones also has other advantageous features, such as:

- Compact and mobile hot runner controller
- Clear, user-friendly touch screen user interface

- Internal or USB storage of mould data
- Can be used anywhere – user interface available in 15 languages
- Secure operation and simple maintenance after short incorporation phase
- Retrieval of stored mould data guarantees quick mould changing and prevents errors during input.

Customers benefit from the combination of basic and additional innovative functions. Moreover, the surveillance functions guarantee maximum process safety.

Further advantages

- Real-time detection of plastic leakages
- Load guard in case of short circuit of heater
- Choice of 5 operating modes per zone
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What's trending in 2023?

In 2020, COVID-19 raised its ugly head and introduced a series of hurdles for economies of the world. Lockdowns, supply chain instability, transportation challenges, manpower & raw materials shortages, and inflation defined the period between 2020 and 2021. In 2022, the scenario gradually started getting better. It was all about reversing the damage caused and attempting to recreate the growth momentum by working on adopting digital technologies, formulating growth strategies, and building a resilient supply chain. 2023 appears to be the year of revival, wherein the manufacturing and tooling industries are hopeful of converting all of their challenges into opportunities. In fact, 2023 is already off to a good start with tradeshowes being organised in full swing, automotive companies posting great sales results, and there is so much demand for travel that one has to wait for months to get a visa. All these are signs of revival. As hopeful businessmen keep their fingers crossed, **Nishant Kashyap and Kimberley D'Mello** take a look at some of the trends that are shaping the tooling and manufacturing industries.



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Tooling Trends: Above and Beyond



DIVERSIFICATION:

Automotive has been and will be the biggest contributor to the tool and die making industry. However, the emergence of COVID-19 and the changes happening in the automotive industry were a wake-up call for the tooling fraternity, which realised that depending on one industry might not be sustainable. Also, over the last few years, we have read about many industries such as aerospace, defence, railways, toy making, home appliances, and infrastructure, among others, growing rapidly in India. It therefore makes sense to venture into other industries while getting stronger in the automotive industry. If we can call the years between 2020 and 2022 as an exploration period, 2023 might be the year when the industry starts doing business in other industries. Diversification is going to be the biggest trend in 2023.



SKILL DEVELOPMENT:

Finding skilled manpower has been one of the biggest challenges for toolmakers in India. Indian toolmakers have undoubtedly been using the same machines, software and other technologies as their global counterparts. Yet, some of the tools are being imported or we find that Indian toolmakers are unable to match the speed of their global peers. Toolmakers believe that this problem can be resolved if they put in dedicated efforts towards skill development of their manpower. This year, we are likely to see companies aggressively investing in skill development programs and partnering with technical institutes to skill up the workforce.



TECHNOLOGY UPGRADATION:

With the growing foreign direct investments and presence of global manufacturing giants in the country, who are looking to source tools locally, Indian toolmakers will have to invest in the latest technologies. To cater to the requirements of these global giants, who demand higher accuracy and efficiency, technological upgradation will be key in 2023.



VENTURING INTO EXPORTS:

So far, there have been talks about Indian companies' requiring to work hard to reduce India's imports. But, at the same time, some companies are faring well in exports. Many toolmakers are constantly targeting overseas markets. And, this year, we may see more and more companies joining the bandwagon to explore overseas markets.



DIGITISATION:

The only positive outcome of COVID-19 is that it taught the world that going digital is key to a sustainable future. Toolmakers have realised this and are looking for solutions that can help them digitise the existing setup – be it production, shop-floor management, project management, sales, or marketing, among others. This year, we will see many digital solutions finding a place in Indian tool rooms.



MARKETING ACTIVITIES:

Toolmakers rely on word-of-mouth, tradeshow and other conventional methods to connect with customers. While these methods are still very effective and will continue to be in the coming years, we cannot overlook the digital marketing space comprising social media and content marketing. There are many companies, with good social media and SEO strategies in place, which get a huge number of leads from their social media channels and websites. It is the most cost-effective marketing method and will be key in 2023 as well.



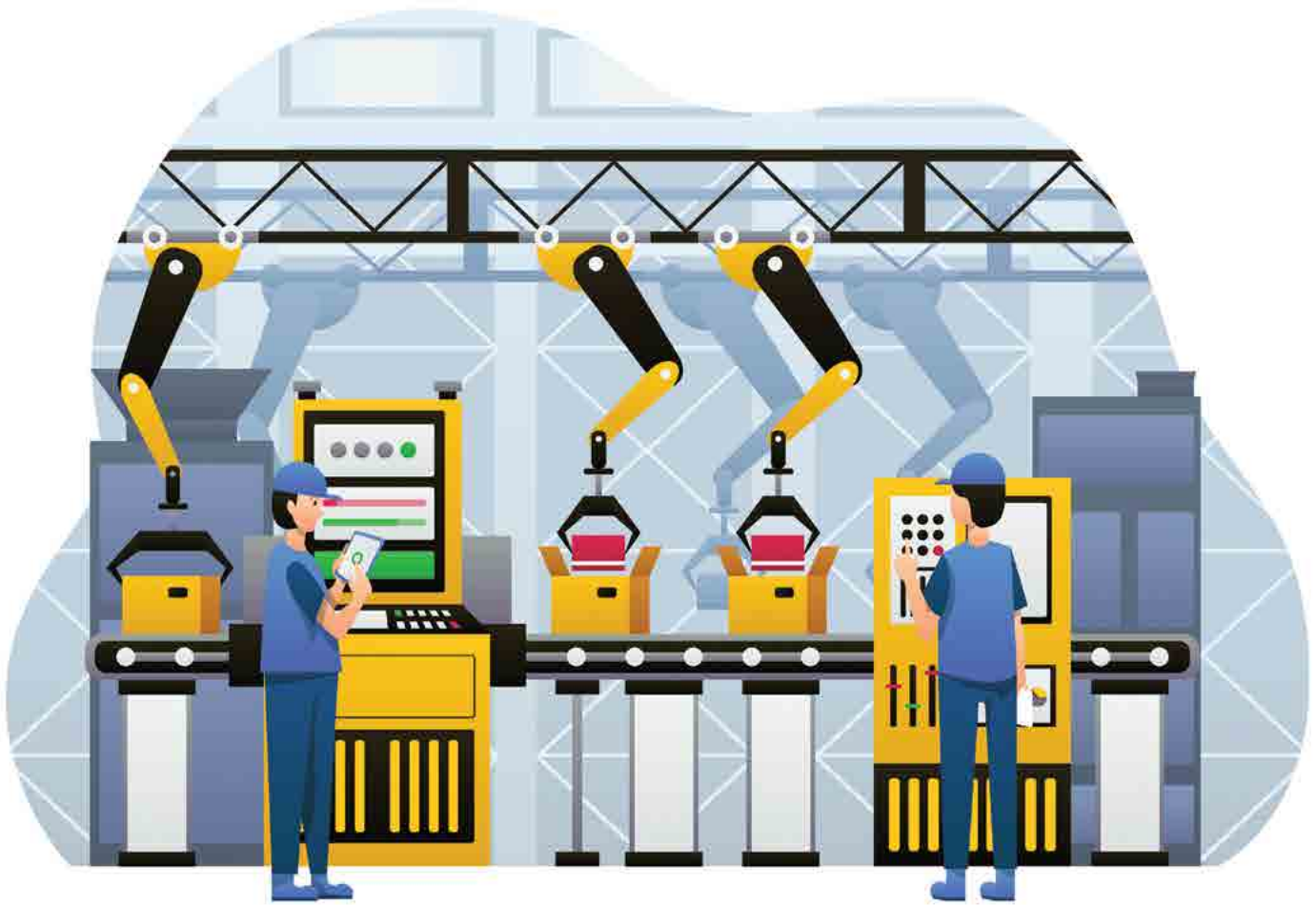
ADOPTION OF ADDITIVE MANUFACTURING:

There is no doubt that additive manufacturing is going to play a huge role in the future of manufacturing and it will find greater applications in the tooling industry because of its ability to produce complex shapes. Some of the things, such as making conformal cooling channels, would take a lot of time, but you still are not going to be sure about the output with conventional subtractive methods. Additive manufacturing can redress this issue. Because of its application in the prototype stage, additive manufacturing will be adopted by toolmakers.



REVERSE ENGINEERING:

The production of prototype moulds using traditional manufacturing technologies is time-consuming and financially unsustainable. To speed up the manufacturing of prototype moulds, various techniques have been developed to produce a mould without using the existing model. One of the hottest techniques currently used in modern tool rooms is reverse engineering. This method involves obtaining the virtual 3D model from the existing part or model using a 3D scanner. Sometimes, the customer may have the product but no design file, etc. In such cases, reverse engineering plays a vital role. The tooling industry might utilise the benefits of 3D scanners for reverse engineering in 2023.



Graphic used for representation only. Courtesy Envato Elements.

Manufacturing Trends: Converting Challenges into Opportunities

LET'S GO DIGITAL!

The pandemic has taught manufacturers the importance of going digital. This will not only help manufacturers tackle issues arising because of manpower shortages but will also help them attract the “next-gen employees”, who are well-versed with the digital world. Manufacturers need to be prepared for the generation of workers who are defined by “always-on connectivity and data at their fingertips”. To ensure the same, they need to introduce intelligent mobile experiences and intuitive machine interfaces at the workplace. This will not only improve safety at the workplace but also better the working experience and create greater business efficiencies.

CLOUD OF INFORMATION

The benefits of storing information on the cloud are not unknown. This wealth of information on the cloud will give manufacturers more access to analyse data and arrive at smarter decisions. Manufacturers, this year, will seek to utilize the benefits of analytics to their advantage. Currently, some manufacturers have been analyzing data for security purposes and to inspect quality. However, in 2023, manufacturers will most likely be using analytics in areas such as production performance, tracing products, and even to understand their customer's experience.



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CYBERSECURITY

Migrating critical information on the cloud also has its risks. According to a report released in January 2023 at the World Economic Forum in Davos, Switzerland, by SecurityScorecard, "An increased number of cyberattacks and highly publicized breaches have undermined the public's trust in the resilience of our societies, prompting both business leaders and policymakers globally to seek solutions for this mounting trust deficit. Specifically, we found that 48% of critical manufacturing companies (e.g., primary metals, machinery, electrical appliances and components, transportation) are rated "C" or "D" or "F," specifically struggling with applying key system patches, likely due to an increased volume of vulnerabilities. We also detected 37% of such organizations have malware infections." This year, manufacturers are more likely to focus on ensuring cybersecurity, as it's a critical business decision, which can make or break an organization's operations.

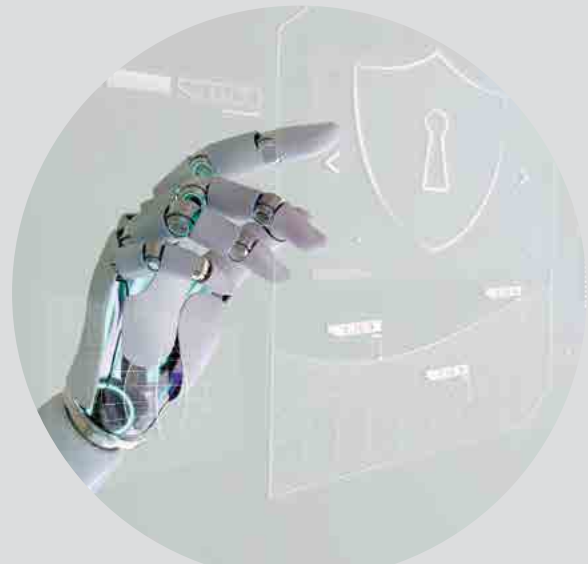


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PRODUCT AS A SERVICE

After generating quite the buzz in recent years, Product as a Service (PaaS) is set to become a manufacturing trend in 2023. According to this business model, manufacturers lease equipment to customers, instead of selling it to them. This presents a win-win situation for both the customers as well as the manufacturers. Customers end up only paying for what they need; they receive the much-needed support from OEMs, and gain access to several value-added services. PaaS offers manufacturers the opportunity to capitalize on recurring revenue, and collect equipment usage data from customers to understand their varying needs and optimize existing offerings.



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IloT's STILL TRENDING

Years down the line, Industrial Internet of Things (IIoT) continues to trend owing to emerging cases. Through the connection of state-of-the-art devices to the internet, IIoT offers manufacturers real-time data, which can help them make informed decisions as well as enhance their efficiency and safety levels, among other benefits. Interestingly, PaaS also has a role to play here. PaaS requires manufacturers to embed IIoT sensors into the equipment they plan on leasing out. These sensors will help manufacturers collect customer usage data, thereby offering them valuable insights.

MACHINE LEARNING

The World Bank, in a January 2023 press release, has warned of economic uncertainty and a looming recession in 2023. This prediction will force manufacturers to micro inspect their operations, and introspect on how they collect and utilize data in order to gain better visibility of their shop floor. The latest AI-powered machine learning can help manufacturers here by generating informed production and inventory forecasts. After all, better visibility will help manufacturers steer through unpredictable markets, improve their performance and outperform their competitors in terms of cost and speed.



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POWER OF BIG DATA

Big Data is bigger than ever! It gives manufacturers the power to collate data from 'n' number of sources, offers tremendous capabilities to analyse that data and gain comprehensive understanding of their business. Big Data offers manufacturers access to insightful information and enables them to make data-driven decisions revolving around sourcing, production, fulfillment, and cost reduction among other aspects. This will enable manufacturers to better support their company's growth strategy, understand what went wrong and accordingly modify their approach. So essentially, 2023 will be about discovering the benefits of Big Data.

PREDICTIVE MAINTENANCE MATTERS

Maintaining the integrity of assets and complying with safety standards are factors that have convinced businesses to transition to a more proactive maintenance approach to predict failures and track equipment performance in real time. Predictive maintenance will offer manufacturers the potential to optimize maintenance tasks in real time by utilizing data from sources, such as equipment sensors, enterprise resource planning (ERP) systems, computerized maintenance management systems (CMMS), and production data. It will enable companies to maximize the useful life of their parts, avoid unplanned downtime and minimize planned downtime.

EVOLUTION OF ERP

The ability to streamline processes through automation, provide accurate, real-time information, and to reduce costs have ensured that manufacturing companies utilize the services of Enterprise Resource Planning (ERP) systems. With changing times and to address the changing industry needs, ERP software solutions have advanced. The year 2023 shall see the rise of Intelligent ERP systems, which use Industry 4.0 technologies like AI, Big Data, Cloud, IoT, and Web 3.0 technologies in modern-day ERP systems. Likewise, mobile ERP applications will gain prominence because of their ability to ease the management of routine operations.



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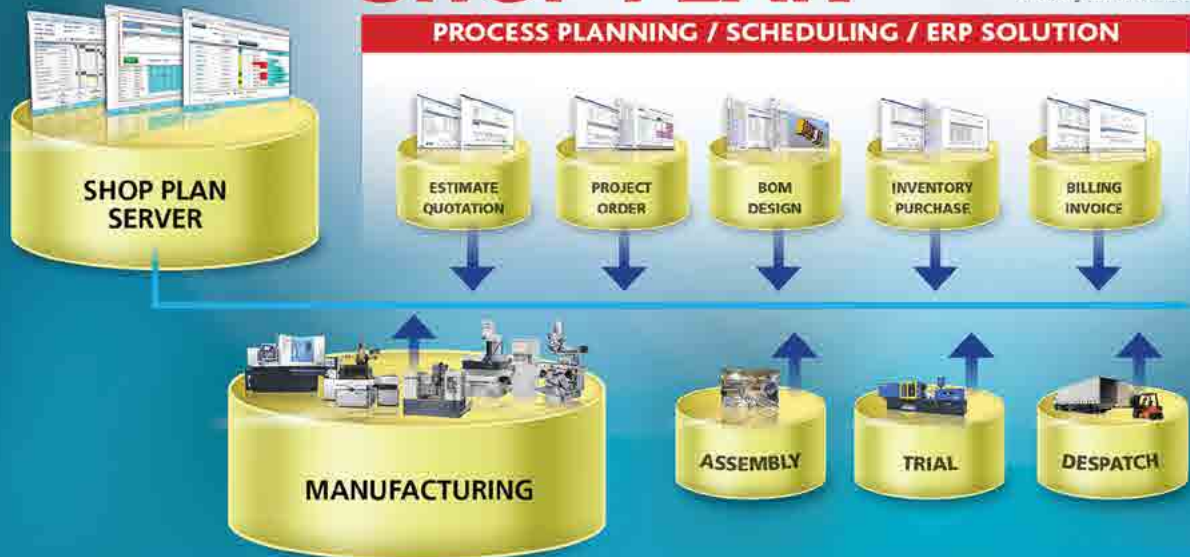
DIGITAL TWIN WINS

Digital Twin refers to an exact copy of an equipment or a particular component created virtually. It is an exact copy in terms of appearance, functionality, and how it connects to other components or machines. Thanks to Digital Twin, manufacturers can run tests, model scenarios, conduct trainings, and see how an equipment performs under varying conditions without interacting with the actual asset. Digital Twin can help manufacturers easily test out new production lines and prototype new products as well as repairs and improvements, optimize production by identifying potential bottlenecks and inefficiencies, and even provide technicians with hands-on training using the most up-to-date models of machines. Given the scope Digital Twin has, it will definitely be a major trend for the manufacturing industry in 2023.

GROW AND PROSPER

Adopting the latest technologies is crucial for manufacturers, especially the ones with manual processes, legacy systems, and siloed operations and data. Manufacturers need to observe and understand the latest technologies that can provide them with a competitive advantage in the marketplace. The year 2023 will be a year of innovation. Adopting the latest technologies will help manufacturers not only defy the odds but also aggressively pursue growth strategies, and drive optimal business outcomes. ♦

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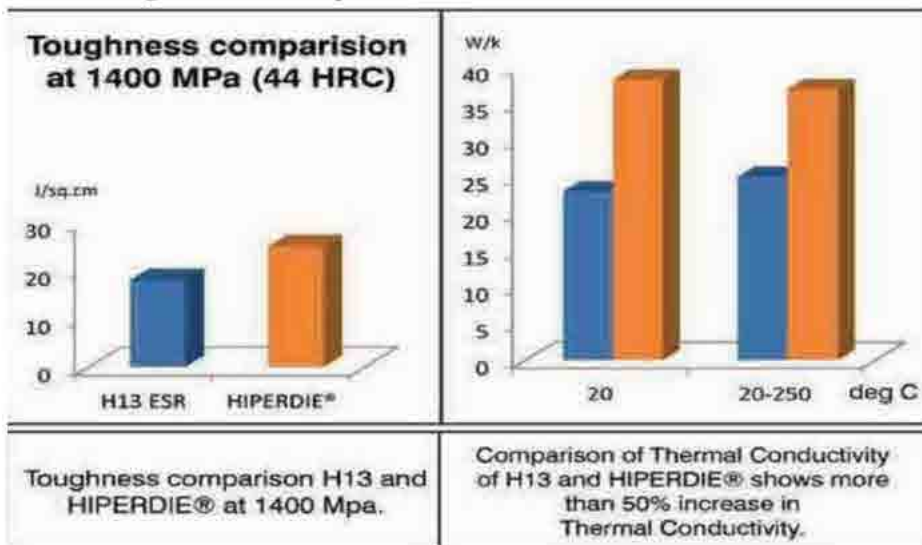
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5 Important Trends for Industrial 3D Printing in 2023



With the year 2022 coming to conclusion, we turn towards what 2023 has in store for industrial 3D printing. We've broken down the five most important trends in the development of the additive manufacturing industry that will help to scale production.

It has been a challenging three years for manufacturing industries worldwide, and it looks set to continue into 2023 with uncertainty over fuel and production costs and the continuing war in Ukraine. Despite these challenges, Additive Manufacturing (AM) has played a vital role in helping manufacturers overcome supply chain disruption while also enabling them to produce final products that are stronger, lighter, and redesigned to contain fewer parts.

The industrial 3D printing market has been seeing strong growth, which is expected to continue according to CONTEXT, which predicted in its Q1 2022 Additive Manufacturing and 3D Printing Report that 3D printing materials, hardware, and services sales combined will rise from \$12 billion in 2021 to an estimated \$38 billion by 2026. These are incredible figures, but the market is developing in other ways as confidence increases around Additive Manufacturing and associated digital manufacturing technologies. Here is our take on the trends for 2023 and beyond.

Additive Manufacturing Trend #1: The Industry Upskill

The Additive Manufacturing world still falls into two groups: Advanced users who are invested in 3D printing technologies and want increased reliability and performance from their printers. And exploratory users that can see the value of Additive Manufacturing but need support on how to deploy it and overcome their manufacturing status quo.

Additive Manufacturing will continue to build industrial acceptance, and therefore competitive business opportunities will accelerate across large and small manufacturers. The advantages of Additive Manufacturing, being promised and realized for years in smaller manufacturers, will start to be discovered on a larger industrial scale. Training and upskilling will be a core component of this. We expect to see continued growth in demand for online and virtual training and education and requests to visit our digital manufacturing facilities, where customers can experience how a full-scale digital manufacturing

production line can operate.

The Additive Manufacturing industry is moving to better remote training, but we have seen demand continuously rise for visits to our facilities, too. Production organizations of all sizes now see Additive Manufacturing as an integral part of their factories and not just a rapid prototyping capability in the corner of the factory.

Additive Manufacturing Trend #2: Application-Driven Production

A trend that will start to gain further traction is that factory concepts are application-driven. This will require the optimization of the industrial 3D printers, periphery, and post-processing to maximize throughput and minimize cost. Optimizing an Additive Manufacturing production line can move a business case from an unviable to a viable scenario or increase the potential for profit and design innovation. This will mean a change for many manufacturers, as only some 3D printing application combinations would have the same optimized solution.

Today EOS is helping customers design their future factory concepts to ensure they can exceed the expectations they had with traditional manufacturing solutions. Reliable, repeatable, and transferable industrial 3D printing equipment is vital to enable plug-and-play scalability in future factories.

Additive Manufacturing Trend #3: The Digital Thread

With Additive Manufacturing, manufacturers are now connecting the physical supply chain with a digital thread that allows them to manage products more efficiently from concept to end-of-life. Manufacturing can be distributed across any location with a digital manufacturing system in place, simply by sending a file. This decentralization enables a more collaborative, transparent and efficient supply chain, as was

highlighted by the role of Additive Manufacturing during the Covid-19 pandemic in overcoming supply chain challenges.

If a disaster hits, natural or man-made, industrial 3D printing will be able to right itself and move forward much more quickly than traditional manufacturing by transferring manufacturing to another site with the same equipment.

Additive Manufacturing Trend #4: Hybrid Materials Innovation

Going forward, we will continue to see an actual acceleration of the synergy between material science, manufacturing, and technology – unlocking innovation opportunities that have not been conceived before. While substantial investments in all parts of the Additive Manufacturing ecosystem are fueling growth, it would be hard to overstate the significance of 3D printing materials.

We will start to see the availability of hybrid 3D printing materials, uniquely engineered and application-specific, to meet the needs of different challenges that each industry faces. Material characteristics such as ductility and tensile strength can be modified by adjusting process parameters at different points in the additive build process.

Hybrid materials will transform a new generation of applications, especially in heavily regulated industries such as medical and aerospace.

Additive Manufacturing Trend #5: Sustainability

Environmental sustainability has been an important trend for several years as manufacturers and brands move to lessen their impact on our world. There has been lots of action on lowering energy consumption, reducing waste in manufacturing, and steadily removing non-recyclable materials from products and packaging. End customers are now starting to demand evidence of sustainability credentials of the

products and services they buy.

People want to lead more sustainable lives, and new industries such as renewable energy, electromobility, and changes in the lifestyle sector, mean that sustainability is undoubtedly here to stay, and manufacturers are realizing this.

For the Additive Manufacturing industry, we will see continued innovations throughout 2023 to support this trend. While Additive Manufacturing is more sustainable than traditional manufacturing by definition, we'll also see more manufacturers using the data machines produce on the manufacturing workflows and processes to help them evidence the efficiency of their manufacturing processes for customers.

EOS and other manufacturers are constantly working to make 3D printers and materials more energy efficient and sustainable, supporting the circular economy model with improved recyclability and biodegradability.

Looking Ahead

Like many other sectors, global manufacturing is being substantially affected by events on the world stage. It is hard to predict how it will fare in 2023, but every time the industry has faced challenges, it has shown how tenacious and innovative it can weather the storm. Additive Manufacturing has proved itself in recent years to give manufacturers and supply chains a vast amount of flexibility and is set to become the dominant manufacturing technique for certain applications. ♦

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FOR DETAILS:



Hexagon solves complex issues for specialist packaging solution provider with productivity-boosting CAD to CNC workflow



A company that specializes in producing bespoke complex, high-end mould tools for injection and stretch-blown plastic bottles is moving forward with a highly automated workflow that integrates three design and CAM solutions from Hexagon's Manufacturing Intelligence division with its preferred design software to increase efficiency by up to 40% and meet demanding lead times for customers.

"While the COVID-19 pandemic made 2020 the worst year for the world, continuing to automate as much of our manufacturing process as we could allowed us to generate the manufacturing capacity to support record revenues," says Andy Phillips, Manufacturing Manager for R&D Leverage.

R&D Leverage is the world's largest independent solution provider to the single-stage Injection Stretch Blow Moulding (ISBM) packaging market sector, offering the global plastic converters and consumer product brand owners what Andy Phillips calls a "complete solution" for a range of ISBM machines. Its tools are designed and manufactured using the highest quality materials. All tools are made in-house, on a vast array of the highest quality CNC machines: "The tools then go into our dedicated Product Solutions Laboratory (PSL) for testing, before we release them to customers."

With the consumer market evolving, R&D Leverage's high-end customers were requesting more complex geometries for end-users,

incorporating significant undercuts, honeycombs and freeform surfaces. Those evolving requirements and the need to produce more complex 5-axis tooling in addition to their long-standing 2D milling and turning, meant they needed to invest in the latest technology to provide the necessary capability and cost reduction with confidence that its high-quality standards would be maintained.

After a lengthy trawl through the marketplace to ensure they were investing in the best possible solution for their specific requirements, they now have a highly integrated workflow comprising DESIGNER, EDGE CAM and WORKNC from Hexagon, and an automated pallet system feeding the machines so operators can be more productive.

That investment needed to address four critical challenges:

- Improving turning cycle times
- The need to produce rapid-prototype 3D moulds and execute 5-axis programs with a high level of automation to respond quickly to customers
- Automating the repeated 2D milling of back plate variations
- Editing models to prepare them for manufacture.

They had already been using EDGE CAM to program their machine tools for 2D milling and turning for eight years, and Andy Phillips says when they were looking to upgrade their software to program complex 3D geometries, they quickly saw WORKNC's potential. As Hexagon's CAM solution for complex models in the mould, die and tooling industries for 2- to 5-axis CNC programming, the software was ideal for these specific needs. "Many of the bottles for which we produce moulds are extremely complicated. Some have engravings all the way down the sides, and the honey bottles have a lot of honeycombs in the form. With our old software, all angles and anything complex, had to be programmed manually, and there was no 5-axis capability. This meant we had to carry out a number of twists on the machine, which gave scope for error." This was not acceptable for R&D Leverage.

R&D Leverage's CNC Milling Programmer, Robert Dods, takes up the story: "When we create our toolpaths now, we can do the whole program in one action with WORKNC. Then I check everything out to ensure there are no collisions, or any holder collisions, and that the machine is capable of performing all of the manoeuvres that we're asking of it. This means that when we send the program to the shop floor, the operators can run it with full confidence, knowing it's going to be 100% accurate."

The Hexagon team also gave the company additional peace of mind

by building a virtual replica of the machine and its internal kinematics inside WORKNC, so the outputted program can be fully visualized in a digital environment. "We didn't have anything like that with our previous software," says Andy Phillips. "We were simply relying on the programmer's knowledge and experience. But now, with this extra failsafe in WORKNC, we can check there are no collisions in the program before we start machining."

To enable greater automation, he says their digital workflow begins with importing PTC Creo design files that conform to the templates from their American owners, and R&D Leverage standards, so that the digital workflow can progress seamlessly through the entire manufacturing workflow to cutting metal on the machines.

This includes the automation tools to utilize 2D information and vastly reduce programming time in EDGE CAM and WORKNC. Occasionally, there is the requirement with their 3D work to modify a model for manufacture, such as capping holes and removing faces. This is carried out in Hexagon's specialist CAD-for-CAM product, Designer, which provides one agnostic platform to exchange files with both EDGE CAM and WORKNC without any translation or data loss, ensuring the data is accurate and the program is right the first time.

In a nutshell, the workflow begins

with designing the preform around the original 2D drawing. This has to be completely accurate as this is later "blown" to create the bottle. The tooling is designed around that in PTC Creo, and the data is exported to the CNC programming team. The .prt files are then run through EDGE CAM for plateline work, utilizing a complex and customized algorithmic ruleset in EDGE CAM Strategy Manager, defined by R&D Leverage, to ensure the right tooling and cutting strategies are utilized depending on the 2D featuring, improving standardization, reducing programming time and improving quality. For any complex 3D moulds, the .prt is pulled into Designer for model preparation before one-click integration into WORKNC, where the expert programming team undertake complex 5-axis work, utilizing their pre-determined templates. These templates sit within WORKNC and use previously approved and proven strategies and tooling, that are dynamically adapted to the new subject model. Finished programs are then output in either Heidenhain or Fanuc NC code through proven post processors, depending on which machine will be carrying out the subtractive manufacturing.

The team have also built an accurate tool library inside both WORKNC and EDGE CAM, detailing a variety of information including feeds, speeds and depth of cut. And everything is fully collision-



checked with the cutter holder, shank, machine table, column, and the fixture. This complements the approved templates (or strategies) which govern part of their automation process. Robert Dods explains: "When we need to make a specific plate, we bring in the strategy for it, and it fully automates feeds, speeds and tooling."

As well as the technical capabilities of the products, the key factor in R&D Leverage's successful deployment, has been the human factor, as Andy Phillips explains: "With our changing requirements in recent years, we once again surveyed our options to understand the best provider. The real differentiator for Hexagon has been the expertise and commitment of the people."

"Given the complexity of the project and the internal pressure to make it succeed, ensuring it was managed correctly was a huge factor for us. Phil Smith, Hexagon's Enterprise Application Engineer, set out a clear project plan with sensible but challenging milestones, and has worked tirelessly to deliver on those objectives. The software makes

The project was only successful because Andy and his team were so open with us. They were open about their challenges and where they wanted to get to and we plotted a course together.

Matt Martin, Hexagon's Enterprise Sales Manager

our lives easier now, but this was only because of Phil's hard work in understanding our exact needs and providing a true turn-key solution."

Matt Martin, Hexagon's Enterprise Sales Manager, suggested the human factor was a two-way deal: "The project was only successful because Andy and his team were so open with us. They were open about their challenges and where they wanted to get to and we plotted a course together."

The inter-operability between all components of their integrated Hexagon workflow gives R&D

Leverage the ability to guarantee a quick turnaround of mould tools that are 100 per cent accurate for their packaging customers. One component, in particular, that was commonly used within all of their mould tool assemblies really challenged the turning capabilities of their previous software, but bringing EDGECAM's innovative Waveform Turning capabilities into the equation now offers game-changing efficiency gains.

Andy Phillips concludes: "This complex component has seen a 40% reduction in run time per unit. We machine around 2,500 of those per year – so it's a massive time saving. In order to continue providing a better solution than our competitors, we needed to continue our investment in new state-of-the-art technology. Our overall fully integrated, automated solution from Hexagon is absolutely vital in ensuring R&D Leverage is always one step ahead in offering our customers the highest quality solution with 100% reliability on lead times." ♦

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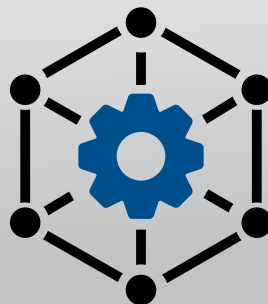
7 things you need to know about CAD/CAM software



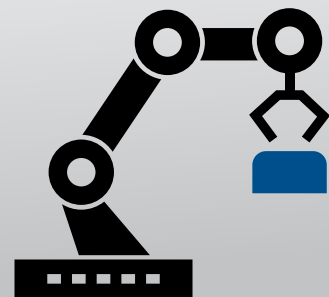
1 A software is only as good as the user in front of it!
Do you think being a hobby pilot is enough to fly an Airbus? Likewise, professional CAD/CAM software is not manageable without sufficient training and permanent excellent support. Most buyers forget this, as they often only look at the price of the software licences.

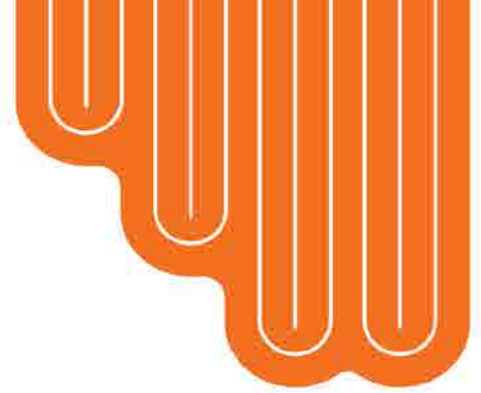


2 Don't skimp on quality for machine models and PPs!
In order to simulate your production machines as realistically as possible, a virtual image is required that precisely simulates the movements of the machine. In addition to the machine, the tool, bracket and clamping device must also be faithfully mapped in 3D. Since each machine reacts differently, it depends on the professional adaptation of the post processors on site.



3 Forget the easy way!
When choosing CAD/CAM software, one tends to choose the product that is easy to use and has few functions. However, this software reaches its limits in everyday life and in retrospect prepares you more work than the somewhat more complex professional software. Time is money, so don't shy away from the learning effort that makes your work easier and choose your CAD/CAM software wisely.





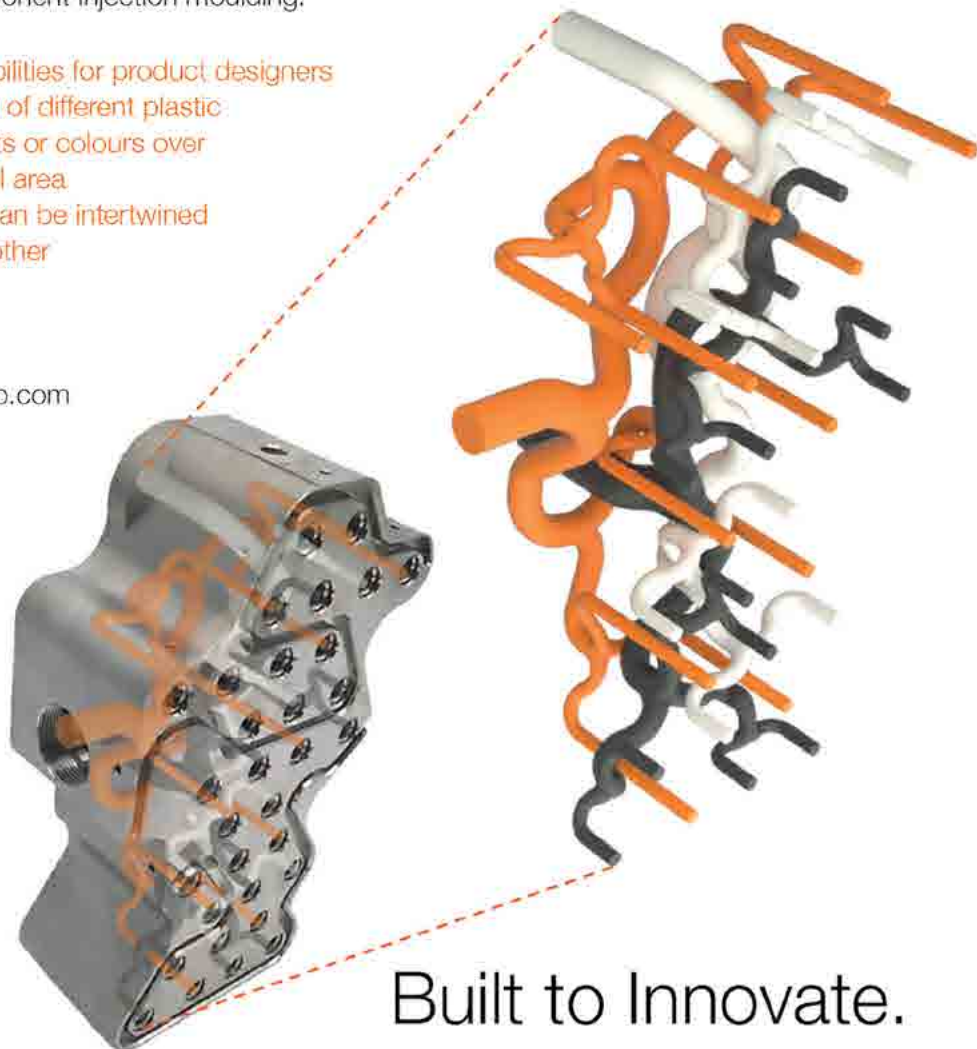
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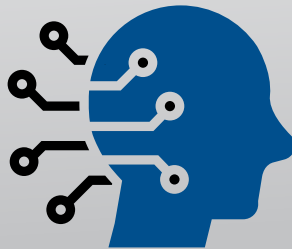
4 Fully integrated software programs make work easier!

You don't have to worry about programs stopping working or reacting differently when it comes to updates. Fully integrated software programs are based on a common platform or product database. Thus, changes in the 3D design in CAD are transferred to CAM, since the document base is the same. You work in the same working environment and can make changes in CAD from the CAM. If the ShopFloor administration is also integrated, you have insight into the current tool availability and location from the CAM. This brings speed and efficiency to your production!



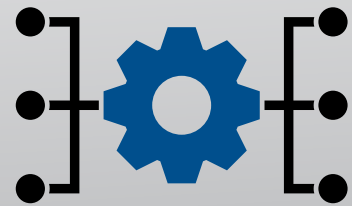
5 CAD/CAM software should be "thinking" and "intelligent"!

Professional CAD/CAM software can protect you from errors and recommend better work steps. You don't have to think about everything yourself and you don't have to program every single processing step yourself. There is "intelligent" CAD/CAM software for this! It shows you collisions and takes over the necessary further processing steps with the standard part. For example, the screw drills its own hole in a plate with a suitable thread. In the same way, entire processing sections can be saved as a method and then transferred to other projects. Or the software automatically suggests the optimal milling strategy.



6 Your software should be a team player!

The world of work is becoming increasingly agile and flexible. The place of work plays less and less of a role, but voting must take place earlier and online. The sooner subsequent work processes are informed, the better, because then major undesirable developments cannot happen in the first place. Your CAD/CAM software should therefore enable parallel work and also provide insights into your work for other departments. The machine operator in the workshop should also be able to adapt to the CAM program so that the CAM programmer can take it into account in the future. For example, you should be able to define milestones in your software and provide feedback loops.



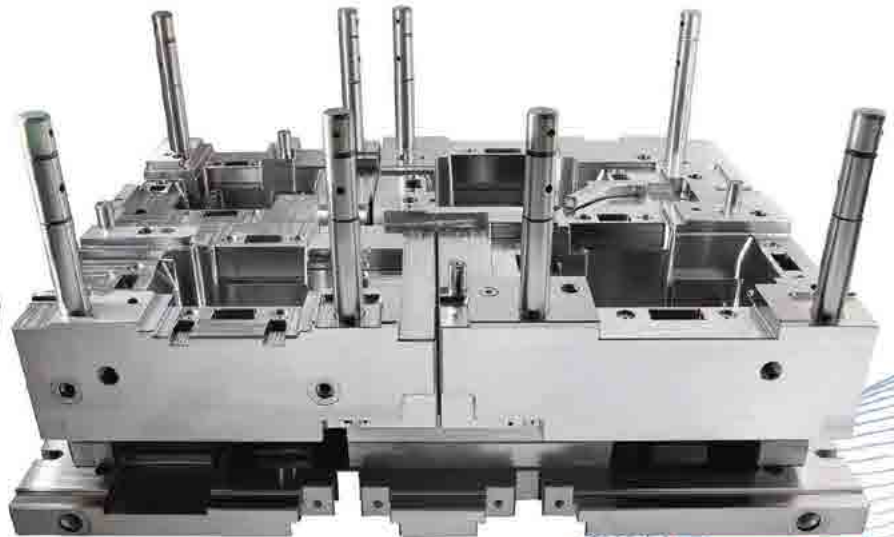
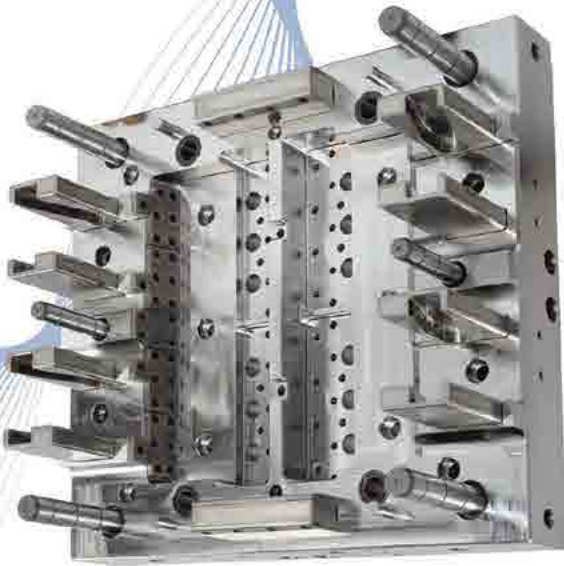
7 Your software should store your application know-how and evolve with you!

With professional CAD/CAM software, standards can be developed for the company, which new colleagues can use as a guide and which can be successively improved. The software is your tool that supports you in optimizing your processes.



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Indian economy to hold firm ground in 2023, says ASSOCHAM

The Indian economy is expected to navigate rough global weather with resilient consumer demand in 2023 with a clearer glide path of private investment and abating of inflation, ASSOCHAM has said. It said 2023 is going to be full of challenges and opportunities, testing the resolve of the people and nations.

"While the global outlook seems rather tough, the Indian economy is set to stay on a steady ground, helped by a strong domestic demand, healthy financial sector and improved corporate balance sheets. Early signs of brighter prospects of Rabi crops point towards a robust performance of agriculture, leaving an improved second round effect for several connected industries like FMCG, tractors, two-wheelers, speciality chemicals and fertilisers," ASSOCHAM Secretary General Mr. Deepak Sood said in his New Year's message of expectations and challenges.

He said while there is an overwhelming consumer response in contact services like travel, hotels and transport, a positive domino effect is visible in transport, housing, power, electronics, discretionary consumer goods and automobiles.

"Our domestic

demand is bound to offset the risk of global demand slowdown," said Mr. Sood, adding, however, "we need to be watchful about international currency fluctuations, particularly in the emerging economies". He said as per the recent assessment shared by the Reserve Bank of India, the global economy is projected to grow by a mere 2.7 per cent even as some of the key developed economies face recession, being exasperated by their central banks' policies of monetary tightening. To an extent, the impact of higher interest would be reflected in the balance sheets of Indian corporates as well. However, the corporate sector is expected to continue with the policy of deleveraging, taking advantage of a resilient stock market and reversal in commodity prices.

"Despite global head winds including recession looming large in several economies, unabated geo-political situation, inflation, India is set to register an economic expansion between 6.8 and 7

per cent in financial year 2022-23. Going forward, FY '2024 should hold steady," the ASSOCHAM Secretary General said.

He said, being the last regular Budget (2023-24), it is going to drive investment in several infrastructure projects like roads and rails, rural infrastructure like housing, drinking water and welfare schemes. "All this would provide an impetus to the growth momentum." As far as the fiscal situation is concerned, robust tax revenue to be further enabled by improved compliance and economic growth should provide a cushion. For the ninth consecutive month, the GST collection crossed INR 1.40 lakh crore per month.

"The positive message is: the year 2023 is going to be full of challenges and opportunities," Mr. Sood said. ♦

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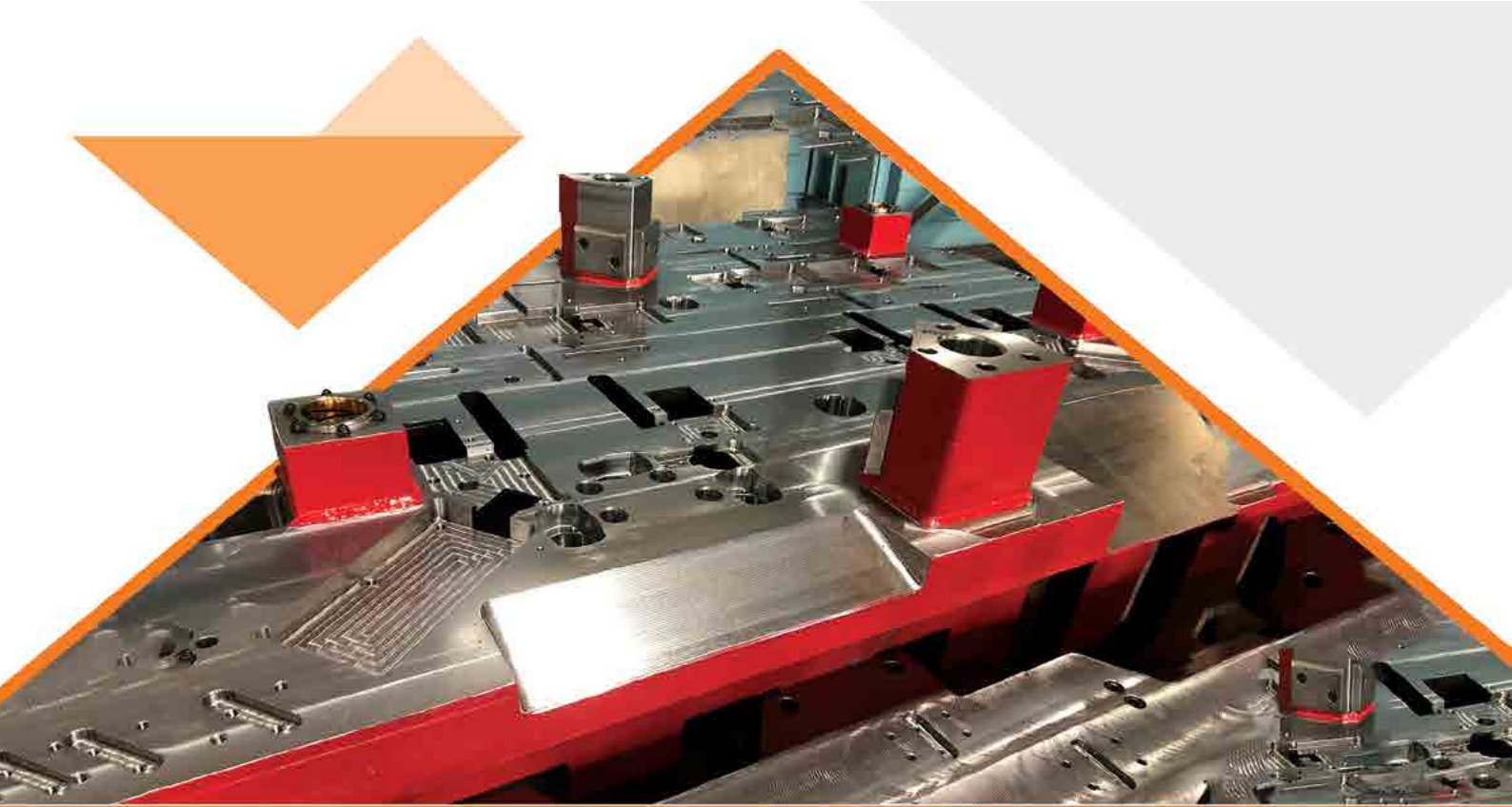
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Boosting efficiency of mould and tool & die production

Anchor Danly increases spindle uptime, improves quality with CAMWorks and CAMWorks ShopFloor.



Anchor Danly is a leading international manufacturer and distributor of high quality die sets, components, steel plates, and metal fabrications. Their products are used in tools, dies, and moulds for metalworking and plastics injection moulding, machine bases, mining & construction equipment, and general fabrications. With four facilities in Canada and the United States, Anchor Danly is the original equipment manufacturer (OEM) and distributor of the Danly: Lempco & Anchor style die set. In addition to producing these products, the company serves as a distributor for the Danly-LEM, Lamina, Lempco

and Special Springs nitrogen lines of tools and mould components, and provides precision ground/machined plate of various grades of steel, as well as large metal plate fabrications.

The company is the largest North American manufacturer of large engineered die sets used by automotive and automotive parts industries. The automotive industry constitutes Anchor Danly's largest single custom metal parts market. Other important markets include manufacturers of industrial and textile machinery, motors, generators,

electronic equipment, aircraft, diesel and other internal combustion engines, household appliances and fixtures, hardware, office equipment, agricultural equipment, railroad equipment, general machinery, and automation.

In short, Anchor Danly offers nearly every type of pin and bushing required for precision tooling, offering an extensive line of metal wear components and assemblies. The company's product lines include pins, bushings, die springs, punches, and wear/guide components used in

die sets, moulds, and machinery; large heavy cams used in stamping dies; and Lamina hydraulic motors and hydraulic equipment.

According to Customer Service/ Process Manager Ryan Wozniak, using an efficient, integrated CAM package is critically important for achieving the productivity gains that Anchor Danly needs to continue to grow and be successful. "Up until 2005, the company used SmartCAM® machining software for fabrication and production, but management actively sought something that would improve G Code programming consistency, boost productivity, improve quality, and facilitate more accurate estimating and quoting," Wozniak, who works out of the Cambridge facility, recalls.

"Recently, we took another look at whether CAMWorks remains the best machining solution for Anchor Danly—evaluating MasterCAM® and VISI®, among others—and confirmed that CAMWorks—and the CAMWorks ShopFloor application that we've since implemented—is the best solution for helping us cut metal quickly and accurately," Wozniak notes. "We were in the process of reviewing CAM systems when the announcement was made that it had been fully integrated with SOLIDWORKS® CAD software, which affirmed that we had made the right decision."

Simultaneously improving spindle uptime and quality

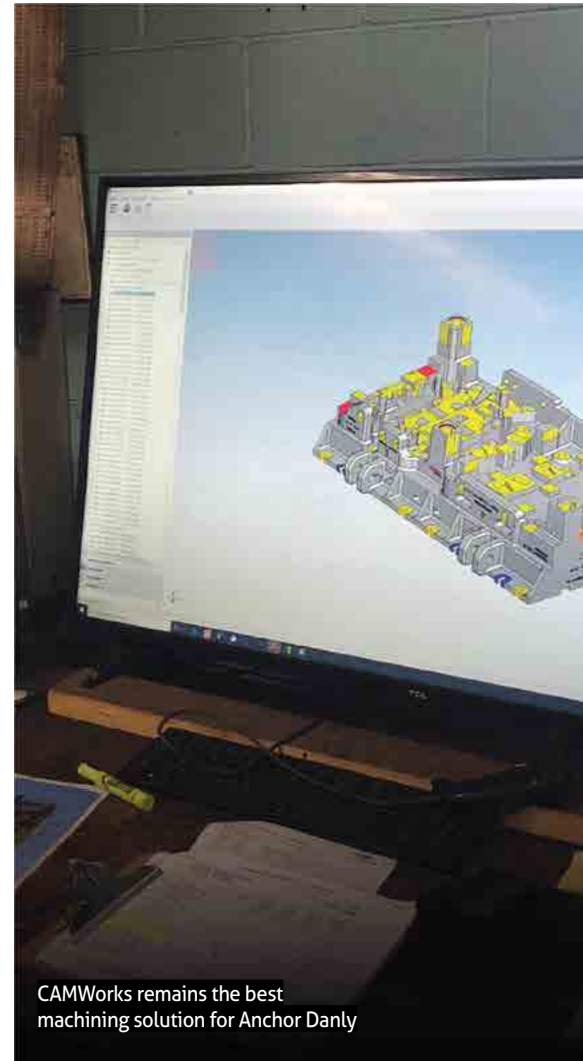
Using CAMWorks milling and CAMWorks ShopFloor measurement, cross-sectioning, and machining simulation capabilities, Anchor Danly has been able to increase spindle uptime while simultaneously improving quality and reducing scrap and rework. "With CAMWorks, and more recently with the addition of CAMWorks ShopFloor, just about every facet of our operations has improved," Wozniak stresses.

"From the way that CAMWorks works hand-in-hand with SOLIDWORKS CAD software to the ability to simulate tool paths and access sub-routines



Up until 2005, the company used SmartCAM® machining software for fabrication and production, but management actively sought something that would improve G Code programming consistency, boost productivity, improve quality, and facilitate more accurate estimating and quoting.
Ryan Wozniak, Customer Service, Process Manager at Anchor Danly

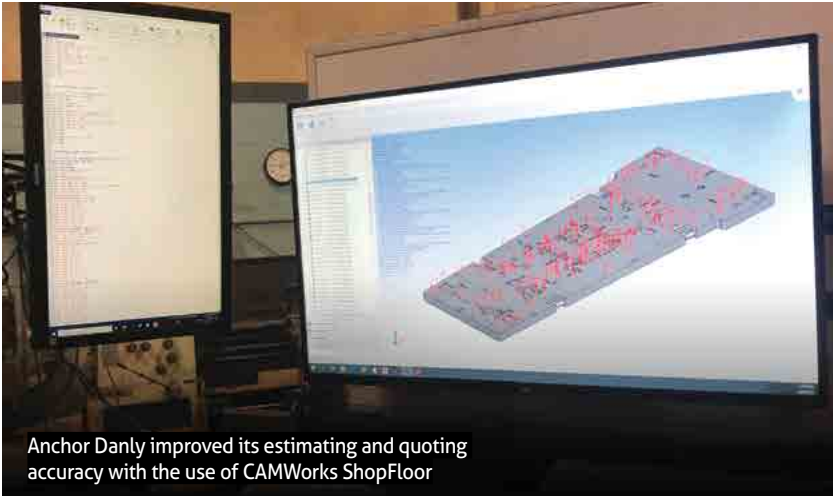
from the technology database, CAMWorks has helped us to improve our quality and increase spindle uptime, which is up at least 15 to 20 percent," Wozniak adds. "We're not



CAMWorks remains the best machining solution for Anchor Danly



Anchor Danly is a leading international manufacturer and distributor of tool, die, and mould components for the metal working and plastics industries.



Anchor Danly improved its estimating and quoting accuracy with the use of CAMWorks ShopFloor

wasting time re-programming or dealing with inconsistency in the G Code we're running because it's all in the database."

Greater confidence, more accurate quotes

With the combination of CAMWorks and CAMWorks ShopFloor solutions, Anchor Danly has not only been able to improve its estimating and quoting accuracy but has also increased the confidence of machine operators. This results in less down time, because machine operators now have tools to interrogate 3D SOLIDWORKS models directly and update G Code automatically when design changes are made, as well as tap existing G Code in the technology database for common and complex operations.

"CAMWorks ShopFloor is the

product that I've been looking for during the past 10 years," Wozniak says. "With CAMWorks ShopFloor, there's greater ease of understanding about what's going on among the operators. Every mill has a large 60-inch monitor on which operators can view the 3D solid model, measure/cross-section features, and simulate the entire toolpath. In addition to helping our mill operators, the ability to simulate an entire milling operation in CAMWorks has helped our estimators become more accurate with quoting complex work because they can take the time calculated by the simulation, add a plus factor for bio breaks and tool changes, and produce a very accurate quote."

Eliminating paper/printing costs with CAMWorks ShopFloor

In addition to increasing machine up-time, boosting quality, and improving quoting accuracy, the combination of CAMWorks and CAMWorks ShopFloor solutions has allowed Anchor Danly to implement a completely paperless system—with all drawings, setup sheets, shop prints, tool lists, models, and machining processes digitally represented via monitors on the shop floor. This digital system has enabled the company to completely eliminate paper and printing costs from its operations.

"We used to print off 50-page prints for every milling operation for reference by our operators and then throw them away once the operations were complete," Wozniak explains. "Although it took some time to adjust to the change, now there is an appreciation for having easy and quick access to all of the information about each job—from the 3D model to the machining simulation to all related information. CAMWorks ShopFloor helps our operators work smarter, not harder, helping us to increase throughput and keep the spindles turning." ♦

Article and images courtesy: HCL Technologies



Anchor Danly has implemented a digital system that enabled the company to eliminate paper and printing costs.

Factory Automation for Industry 4.0

Industry 4.0 is intended to computerize the factory world. What this means is the technical integration of cyber-physical systems (CPS) into production and logistics and the use of the internet in industrial processes. FANUC is prepared for this change. A continuous flow of information is already the basis for 'Factory Automation' long before Industry 4.0.



The aim of networking machines, storage systems and equipment with each other results in 'Smart Factory', in which intelligent machines exchange information with each other independently while constantly adapting to current production requirements themselves. Experts hope to obtain a rapid increase in productivity and major material and energy savings as a result.

The high level of integration, seamless communications and consequent networking of means of production are characteristic of all Industry 4.0 ideas. Even if many modules have already been developed and are available, it will not be possible to buy Industry 4.0 because it is still a vision.

How much of a vision? How much of a reality?

At FANUC, the networked way of thinking has resulted in developments which can be integrated into an Industry 4.0 world or meet basic requirements today. For example, rapid communications. FANUC controls have long operated with a separate CPU for the processing of operating data and communications. The support of many fieldbus protocols, flexible functions to link CNC and robots to control systems are standard and do not need to be developed, at least in FANUC's view. An extremely powerful programming interface already exists. This API (Application Programming Interface) tool is available both for PC and for embedded computers. API enables the efficient exchange of

data between the FANUC world in the form of a CNC and other devices.

Matthias Fritz, Technical Manager at FANUC Deutschland GmbH, said: "Regardless of the form in which Industry 4.0 finds its way into the production halls, we must strike a balance between a standardized platform on the control side and customized adaptation. FANUC has expanded this standardization with the new 'Seamless Concept' for all CNC controls. Part of this concept is to create communications processes and data exchange in the production process in real time wherever possible and to use separate processors/CPU for this."

In addition to controls, robots have become a core element of Industry 4.0 scenarios. Flexibility is incorporated in the robots. If FANUC

scenarios from own production and/or solutions, which have implemented system integrators, are analyzed, this flexibility becomes clear: These solutions dispense with rigid peripherals and are based on 'intelligent input' for the robot, be it via the inclusion of sensors, flexible software modules and 'Dual Check Safety' (DCS) or 'Learning Vibration Control' (LVC). Vision technology has emerged as an extremely flexible sensor instrument, a technology which FANUC itself has already been developing and implementing for more than 25 years.

How safely production data is processed (safety) and how secure operating data (security) is

will be a key question for largely networked production. No instances of viruses or Trojans that have found their way into the control systems through the proprietary operating system are known of to date.

Robots as an integral part of Industry 4.0

The idea of regarding robot technology as an integral part of production is not new, but nevertheless challenging. Cross-connections and interface control are a given at FANUC because Factory Automation forms the chain from CNC control through processing machinery to automation with robots here. Operating robots via the interface

of a CNC machine has long ceased to make the headlines, at least at FANUC.

Whether robots will be able to or should perform all the production steps in future is perhaps less a question of time than of money. Fundamentally, full-automation is indeed conceivable. In principle, it makes no difference to the robot whether it assembles fabric or leather seats. Our robots can see with integrated vision and other sensors and develop a certain sensitivity when touching, joining or carrying out assembly.

The question will be: can decision-making strategies, which the robot dutifully implements, be developed and employed at reasonable expense? ♦

Article and image courtesy: FANUC



If you deal with some sophisticated software, high-end CNC machines, the latest injection moulding machines, tool steel, or any technology that makes a toolmaker's life easy, send us your product writeup along with images and we will feature the same in TAGMA Times Newsletter.

Writeup Format

(300 words max):

- Product Description
- Application & features
- Product image
- Contact details

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Bannari Amman Institute of Technology introduces Additive Manufacturing Technology at Gurugulam COE



Markforged Metal X 3D Printer with Washer and Sinter

Making its emergence into the education sector, Phillips Machine Tools India and Markforged recently collaborated with Bannari Amman Institute of Technology, located in Sathyamangalam, Erode, Tamil Nadu, to establish its new Centre of Excellence named 'Gurugulam' on campus. The MoU was signed to implement a Metal XTM System – an accessible end-to-end metal 3D-printing solution, which would facilitate all the engineering students across departments to develop their skills and drive research and development for their industrial projects.

The Gurugulam Centre of Excellence (CoE) would offer opportunities to the students to learn metalworking technologies such as turning, milling, grinding, welding, additive, etc. This will develop their skills before becoming a sophomore, where they can opt for specific courses to learn elaborately. Among many academic reforms adopted by the institute, the 'Gurugulam' will augment students' ability in the direction of emerging technologies like additive manufacturing that will propel growth and open new career opportunities. The Markforged Metal XTM 3D printer can print complex metal parts in the widest variety of

advanced metals and is non-hazardous to nature.

"We have always fostered learning, discovery, innovation, and expression, at our Institute. Our reforms aim to inculcate scientific temper, efficiency, integrity, and values amongst the students

and transform them into good citizens and valued employees, entrepreneurs, and academicians. Our students have always academically

performed exceptionally well at global competitions in all the technological domains. Our Centre of Excellence will benefit our students enormously. Partnering with Phillips and Markforged in implementing the Metal X 3D printer will be an added advantage for our Gurugulam, as it allows the students to experiment with various materials in a classroom environment and help them in preparing for the global competitions in the future," says the Management of Bannari Amman Institute of Technology. ♦



We are excited to partner with BIT to drive the Industry 4.0 and Digital Manufacturing skills on their campus. With this collaboration, we look forward to bringing our best in-class technology to the students and preparing them for their professional journey with the skills required for today and tomorrow in the world of additive manufacturing.

**Anuj Budhiraja,
Country Manager –
India, Markforged**



We are extremely happy to partner with BIT as the Additive Manufacturing Technology partner for their new center of excellence – Gurugulam. This collaboration will surely help students to get hands-on experience with the most robust and reliable additive manufacturing technology and prepare them for the future of manufacturing.

**Sumeet Bengeri,
Business Head,
Phillips Additive**

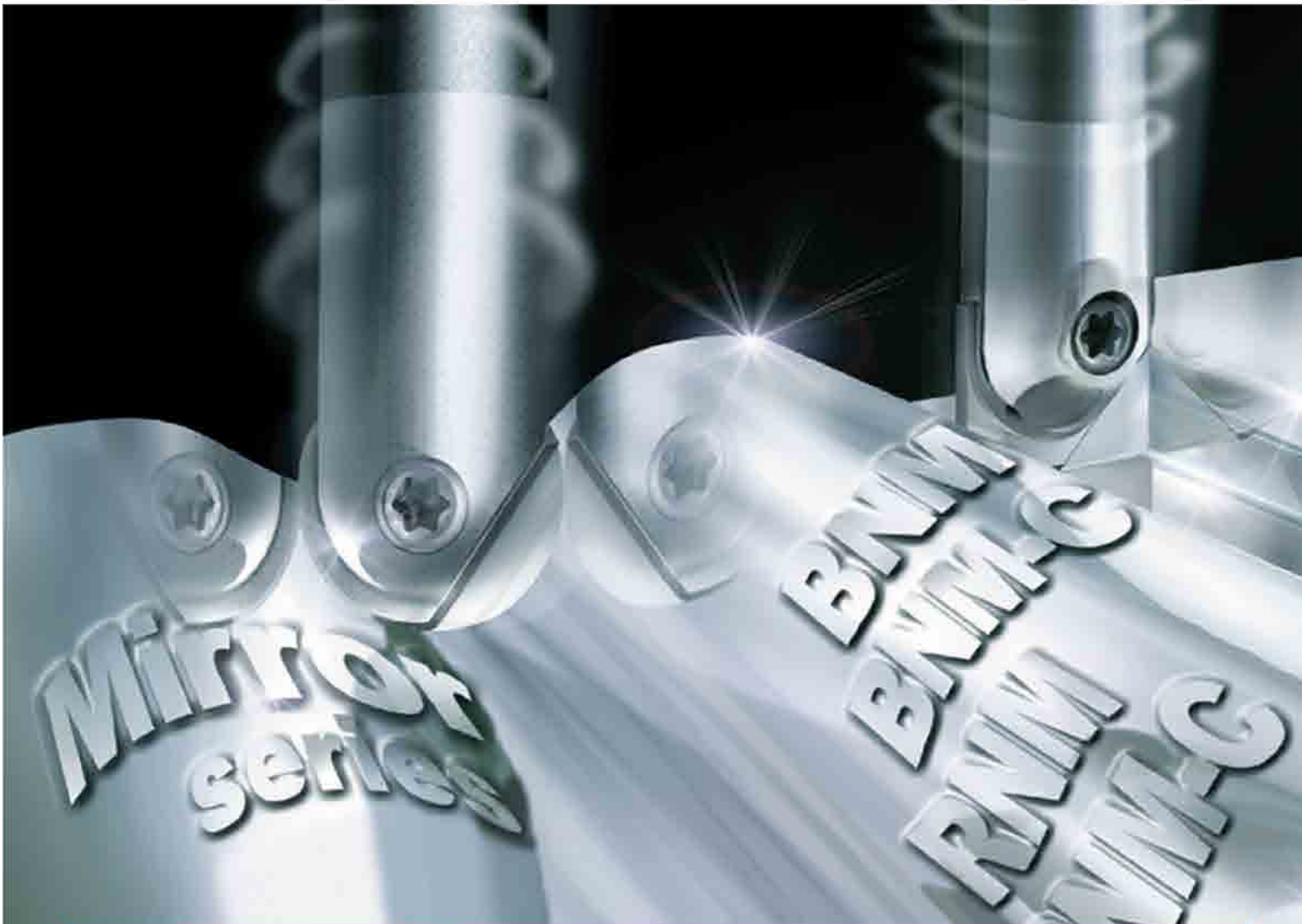
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National

PLASTINDIA 2023

10 exhibitions old, today, Plastindia has grown into a global experience, covering the entire gamut of plastics producers, processors and users of plastics, and it witnesses intense participation by both Indian and International Plastics Fraternity.

Date: Feb, 01-05

Venue: Pragati Maidan, New Delhi

Organiser: PLASTINDIA FOUNDATION

Contact: +91 22 26832911/14

contact@plastindia.org

ACMEE 2023

ACMEE is India's premier International Machine Tool Show with exhibit range such as CNC Machines, CNC & PLC Controls, Cutting Tools and Accessories, Special Purpose Machines, Pneumatics, Hydraulics, Industrial Robotics & Automation, Instrumentation, Machinery & Machine Tools, Welding, Material Handling Systems, Sheet Metal Press, Laser Cutting, Cleaning Systems, among others.

Date: Jun, 15-19

Venue: Chennai Trade Centre, Chennai

Organiser: Ambattur Industrial Estate Manufacturers Association

Contact: +91 - 73052 82228

info@acmee.in

Plastivision 2023

The exhibition today has become the platform for companies to launch new products, grow their network within and outside the industry, learn new technologies and exchange ideas on a global level. Such is the influence of the show that today it is ranked amongst the top 10 plastic industry events globally.

Date: Dec, 07-11

Venue: Bombay Exhibition Centre, Mumbai

Organiser: All India Plastics Manufacturers' Association

Contact: 022 6777 8842/46/48

marketing@plastivision.org

International

Intermold Korea 2023

INTERMOLD KOREA is the only mold exhibition in Korea and is held every two years. It promote the development of dies, molds and related equipment and facilitate the exchange of cutting-edge technology and Know-how.

Date: Mar, 14-18

Venue: KINTEX Exhibition Center, Seoul

Organiser: Korea Die & Mold Industry Cooperative (KODMIC)

Contact: +82 (2) 783-1711

koreamold@koreamold.com

Intermold Japan

Largest exhibition for tooling industry in Japan with global participation. The exhibition showcases latest in the die mould industry and provide ideal opportunities for technology providers to showcase their capabilities.

Date: Apr, 12-15

Venue: Tokyo Big Sight, Tokyo

Organiser: Japan Die & Mold Industry Association

Contact: +81-6-6944-9911 / iminfo2023@tvcoe.co.jp

Hannover Messe 2023

HANNOVER MESSE is the most important international platform and hot spot for industrial transformation - with excellent innovations or unusual products.

Date: April 17 - 21

Organiser: Deutsche Messe AG

Contact: +91 022 41562727 / yash.panchal@hmf-india.com

Moulding expo 2023

Moulding Expo is one of the most important European events for tool, pattern and mould making.

Date: Jun, 13-16

Venue: Messe Stuttgart

Organiser: Landesmesse Stuttgart GmbH

Contact: +49 711 18560 0 / info(at)messe-stuttgart.de

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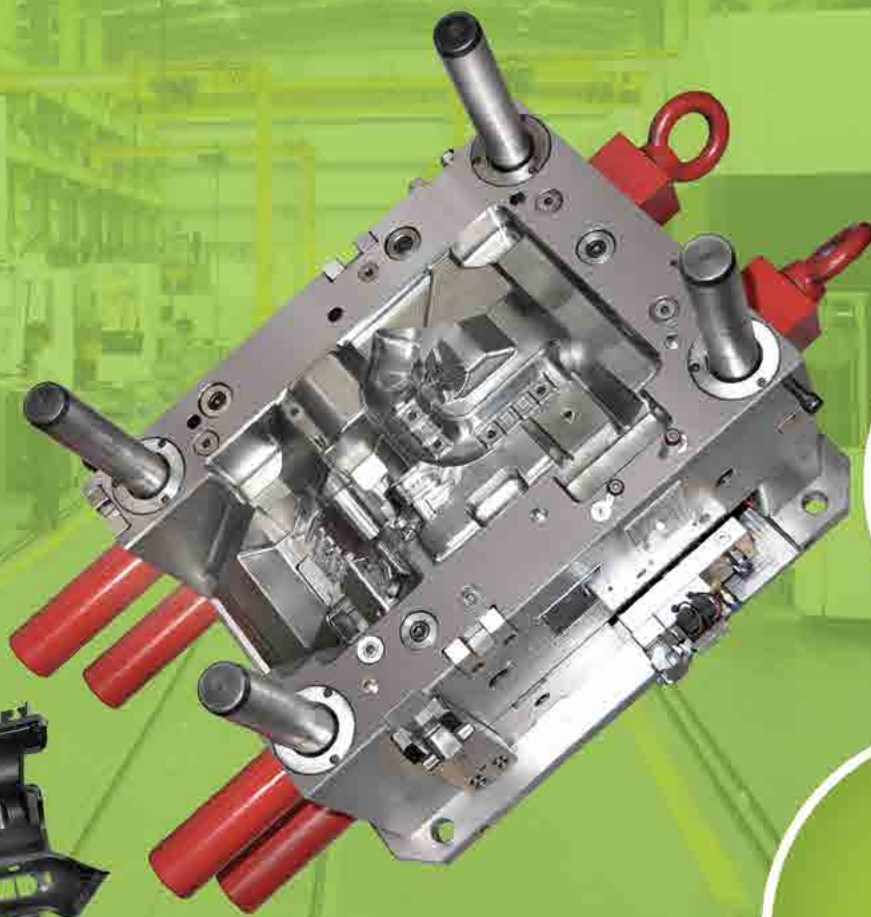




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