

TAGMA TIMES

NEWSLETTER

(Technical Info. on Die, Moulds & Toolroom)

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October 2022

DEFENCE MANUFACTURING:

SPOT

THE
OPPORTUNITIES

FACILITY VISIT:
A Sneak Peek Into
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TIPS & TRICKS:
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CONTENT



22 IN FOCUS

Defence Manufacturing: Spot the Opportunities



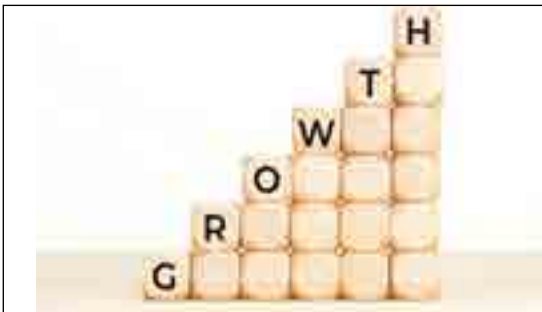
28 TECH FOCUS

Advancement of CAD/CAM Technology



36 FACILITY VISIT

Micro Plastics Pvt. Ltd.: Playing it right



40 REPORT

India's FDI could touch US\$475 bln: CII-EY



60 MANAGEMENT MANTRA

Boeing and Jaivel Aerospace announce second skills programme

EDITORIAL.....	6
TECH UPDATE	8
INDUSTRY UPDATE.....	14
INDUSTRY-ACADEMIA	42
TIPS AND TRICKS	46
TECHNO FOCUS.....	52
FACTORY INSIGHT.....	56
EVENT LIST	61
INDEX	62



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Fax : + 91 44 2434 1181
Email : info@pck-buderus.com

**Pune Stock Holding Center
Machining Division**
New Gat 754, Pune Nagar Road
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Fax : + 91 20 2705 0700
Email : punewh@pck-buderus.com

Ludhiana Stock Holding Center
C-1, Industrial Area C, Jaspal Main Road,
Kanganwal, Ludhiana - 141 120, Punjab
Tel : + 91 161 6532016 / 2017 / 2510073
Fax : +91 161 2510072
Email : ludwh@pck-buderus.com

Kolkatta Office
Flat No. 403, Vishal Apartments,
4th Floor, No. 18,
Prince Anwar Shah Road,
Kolkatta - 700 033
Tel : + 91 33 2417 1078
Email : info@pck-buderus.com

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C/o. NTTF
23/24, Peenya Industrial Area,
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Tel.: 080-28397196 • Fax : 080-64509966
Email: tagma.bangalore@tagmaindia.org
Contact: Mr. Ashok Shetty - Secretary
Cell.: +91 98453 97780

CENTRAL OFFICE

A-33, NandJyot Indl. Estate,
Safed Pool, Mumbai - 400 072.
Cell.: +91 96534 27396 / 97694 07809
Email: tagma.mumbai@tagmaindia.org

PUNE OFFICE

Plot A-22/2, Chakan Industrial Area,
Phase II, M.I.D.C, Village Khalumbre
410501
Tal. Khed, Dist. Pune.
Cell.: +91-95276 89700
Email: tagma.pune@tagmaindia.org

COIMBATORE CHAPTER

C/o. S & T Engineers (P) Ltd.
22, Vasanth Nagar, Trichy Road,
Singanallur, Coimbatore - 641 005.
Tel.: 0422-2590810 • Fax : 0422-2573629
Email: tagma.coimbatore@tagmaindia.org

PRESIDENT

Mr. D. M. Sheregar
Devu Tools Pvt. Ltd., Mumbai – 400 072
Email: president@tagmaindia.org; sheregar@devutools.com

VICE PRESIDENT

Mr. D. Shanmugasundaram
S & T Engineers (P) Ltd., Coimbatore – 641 005
Email: shan@stengineers.co.in

MEMBERS

Mr. Akshay Kalyanpur
Sridevi Tool Engineers Pvt. Ltd., Vasai – 401 208
Email: akshay@sridevitools.com

Mr. Amit Kumar Parashar
Subros Tool Engineering Center (STEC), Noida – 201 301
Email: aparashar@subros.com

Mr. D. Ravi
CMD Precision Products Pvt. Ltd., Chennai – 600 058
Email: ravi@classicmoulds.com

Mr. Gopalakrishnan T. S.
Multiple Special Steel Pvt. Ltd., Bangalore – 560 099
Email: gopalakrishnants@gmail.com

Mr. Paresh Panchal
Cam Tools, Mumbai – 400 072
Email: paresh@digitaltoolroom.com

Mr. Parveen Satija
Stitch Overseas Pvt. Ltd., Gurgaon – 122 004
Email: parveen@stitchtools.com

SECRETARIAT

Mr. Bhaskar Kanchan - Director
Mrs. Deepali Pandav - Deputy Director

Editorial Team

Nishant Kashyap, *Editor* | Kimberley D'Mello, *Associate Editor*



Edited & Published By: DM Sheregar for TAGMA INDIA at
A/33, Nand Jyot Indl Estate, Safed Pool, Mumbai - 400 072
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NISHANT KASHYAP

Editor

tt.edit@tagmaindia.org

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In January 2022, India bagged the biggest defence export order for BrahMos missiles. The Philippines Defence Ministry signed a \$374-million contract with BrahMos Aerospace Pvt. Ltd. to supply an undisclosed number of missiles, various news reports stated. India achieved exports of defence items and technology worth INR13,000 crore in 2021-22, Defence Secretary Ajay Kumar had recently said while adding that this figure is likely to increase to INR17,000 crore in 2022-23.

The government has been introducing various measures and undertaking initiatives to promote defence manufacturing in India. The recently concluded DefExpo 2022 is proof. It highlighted India's ambitious plans – namely, to indigenize defence manufacturing and to increase defence exports. Besides, the Centre has made a budgetary allocation of INR1.5 lakh crore for capital expenditure in the defence sector. The 'Make in India' initiative pushed for self-reliance, aiming for indigenous production of 70% of India's defence needs, and with the kind of defence budget we have, it's going to create huge business opportunities for the Indian companies, toolmakers and MSMEs. Our 'In Focus' section tells you all about the current status of the Indian defence industry, how it will impact component makers and what opportunities are in store for toolmakers.

Speaking of opportunities, we also explored another sector in our 'Facility Visit' section – toy manufacturing. We visited the state-of-the-art Micro Plastics Pvt. Ltd. facility in Bengaluru to get you some interesting information on how this commercial tool room grew to become India's largest toy manufacturing facility.

We hope that this issue of TAGMA Times is the dose of information and inspiration you are looking for.

Happy Reading!



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MAKING TECHNOLOGY AFFORDABLE

NUM launches linear electric motors designed specifically for machine tools



CNC specialist NUM has launched a series of brushless linear servo motors designed specifically for continuous duty cycle applications in machine tools.

Until now, most linear motors on the market have been designed for general-purpose automation involving fast A-B positioning capabilities but relatively low duty cycles. NUM has taken a more conservative design approach, waiting until the market matured before creating a linear motor expressly intended for continuous operation in the harsh environment of modern machine tools.

NUM's new LMX series linear motors incorporate a number of features to help mitigate the effect of arduous operating conditions. Their moving coil primary section is fully encapsulated in a robust stainless steel housing, with an integrated cooling circuit designed to maximise the flow rate, which also allows the use of low specific heat capacity cooling liquids. The motors have a short pole pitch to increase force density, minimise cogging forces and reduce thermal losses.

LMX linear motors comprise a metal track with multiple embedded rare earth magnets, and a coil assembly supported by a customer-supplied guideway. A key feature of the motors is that they are designed to operate with a comparatively large air gap of 1 mm, to reduce the impact of mounting tolerances on performance characteristics. For most machine tool applications, the track is held stationary and the coil

assembly is free to move – but converse mounting arrangements are also practicable, with similar performance attributes.

Suitable for use with standard 3-phase sinusoidal brushless servo drives, NUM's LMX series linear motors are especially cost-effective when teamed with the company's NUMDrive X or new NUM DrivePro drives. Both these families of high performance drives feature a high degree of functional integration, making them some of the smallest on the market, and offer extensive safe motion monitoring and control options to help simplify design-in.

The new NUM DrivePro drives are likely to be of particular interest to OEMs seeking maximum performance from NUM's new LMX series linear motors. Implemented using advanced system-on-chip (SoC) technology and based on a multi-core ARM processor, the drives employ bare metal programming to eliminate operating system latency.

NUM produces a wide range of electric motors, including spindle, servo, torque, synchronous and asynchronous, and now linear. According to Massimiliano Menegotto, Managing Director and CTO of NUM Group, "Choosing the best kinematic solution for any machine often involves a tradeoff between various technical factors. NUM can support machine designers, during the machine's development phase, with the selection of the most appropriate solution." ♦

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Gain versatility and reduce costs with Seco X-Head quick-change milling head system

To provide manufacturers versatility and high value, Seco has launched its new X-Head quick-change replaceable milling head system. With the system, users can quickly and easily change between various solid-carbide milling geometries and types to optimize milling operations while reducing manufacturing costs and tooling inventories.

Fast and easy tool changes with the turn of a wrench

Milling heads mount to a variety of available shank lengths for even greater versatility, with short and long-reach capability for a variety of overhang lengths. Head changes only require a simple turn of a wrench, eliminating the need to remove the holder from the machine to change the cutter. Users also eliminate the need to reset tool lengths thanks to a secure and reliable connection that provides exchange accuracies within 50 microns.

One tool mills it all

According to Gary Meyers, Seco Product Manager Solid Milling, shops must often purchase many different end mills and holders to machine different features on a



workpiece, which adds higher cost to a project. “The Seco X-Head quick-change replaceable milling head system adapts to various machining needs with a range of geometries and types but without additional holders,” he said.

With 194 types of available cutting heads, users can choose between different cutters for multiple operations as well as between specific high-performance, versatile high-performance and universal type geometries. Seco also offers metric and inch products for heads and shanks. ♦

No chance for corrosion

When it comes to process-reliable workpiece clamping in machining of raw and finished parts, the KONTEC KSC centric clamping vise has established itself as a highly efficient all-rounder. Now clamping device expert SCHUNK presents a successor that is in no way inferior in terms of reliability and precision. The new product also offers optimum corrosion protection due to its nickel-plated base body. This means that it can now be used even in demanding environments, for example with high humidity. Its extremely flat design and improved interfering contour ensures optimum accessibility, especially for 5-axis machining. This optimizes the use of the machine room. Another plus for process reliability is its encapsulated spindle. Its enclosed design with better chip discharge via lateral grooves protects from dirt



and reduces maintenance costs. Since its bearing is free from play, the vise has an excellent repeat accuracy of up to ± 0.01 mm, thus enabling highly precise machining of the first and second sides with only one clamping device.

Flexibly combinable

The centric clamping vise is 100% compatible with the predecessor KSC model and can be exchanged without any alterations to the program. Its unique, extensive range of system and top jaws and the easy jaw exchange via just two screws enables this multi-talent to be flexibly adapted to new clamping tasks in just a few steps. In addition, its VERO-S interface, which comes as standard, enables the KSC3 to be combined with the flexible SCHUNK stationary toolholding and workholding modular system, resulting in a wide range of clamping options. The KONTEC KSC3 is available in sizes 80, 125 and 160. Due to the efficient force transmission, the workpieces are held securely with clamping forces of up to 35 kN. ♦



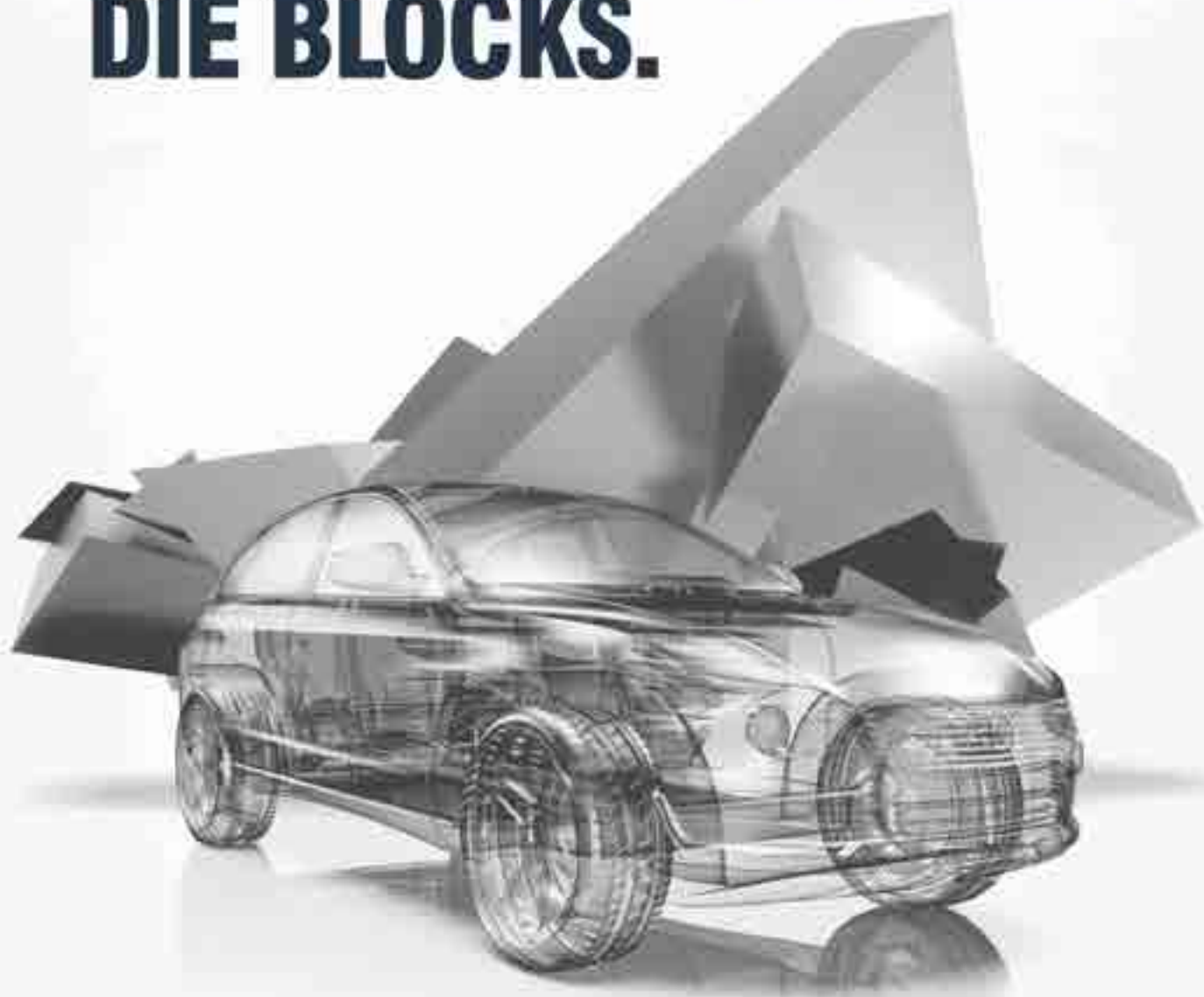
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CNC Machine Connect module achieves new level of accuracy to digital twins



CGTech has announced a new VERICUT module developed in partnership with Scytec: CNC Machine Connect. This new VERICUT module allows users to connect with CNC machines on their shop floor using Scytec's DataXchange software. This data can be used to create and maintain more accurate digital twins through VERICUT Machine Configurations (VMCs), as well as confirm that CNC machines and VERICUT simulations match as closely as possible, to eliminate unexpected surprises on the shop floor during machining.

The current version of CNC Machine Connect available with the launch of VERICUT 9.3 comes with a pre-check capability. Pre-check allows users and machine operators to verify that key aspects of CNC machine and setup information match what was previously verified in VERICUT prior to running the part on the machine. This feature validates critical control parameters that impact machine motion and behaviour, main NC program, subprograms, work offsets, cutting tools, and more. Significant differences are clearly identified and can be investigated prior to machining or updated to rerun the VERICUT simulation with data retrieved from the machine to ensure no new problems or unexpected errors are introduced by the current machine setup.

Future releases will add a post-machining capability to provide valuable insight about how NC programs ran on the machine. Users can connect to machines to retrieve current resident data, or access data archived when the machine ran, turning VERICUT into a powerful forensic investigative tool to improve machining processes. Users can identify modifications made to NC programs, overrides used on the machine, and where these occurred during the machining process. This historical data can also be used investigate potential issues that may have caused

poor machining conditions leading to poor part quality or parts out of specification.

CGTech has worked closely with Scytec, an independent machine monitoring software company, to create the initial release of this connective capability. DataXchange is currently sold in the U.S. and across the globe. The initial release of the CNC Machine Connect module utilizes Scytec's DataXchange software to connect with CNC machines having modern FANUC controls such as 0i and 31i models. Future plans include connecting with other popular controls such as Siemens, Heidenhain, and more.

"Even after using the best verification software, we recognize that there can still be 'gaps' between what was simulated, and the actual CNC machine environment. Such differences have resulted in unpleasant surprises, or damage to the part or machine," says Gene Granata, CGTech Director of Project Management. "That's why we're excited to release a new CNC Machine Connect module in 9.3 that enables VERICUT to connect directly to CNC machines. Through this connection, users can enhance their VERICUT digital twins with parameters from the machine, and verify that key setup information match what was previously verified by VERICUT. Any differences are clearly identified, enabling users to investigate further, or update VERICUT with the machine-resident information and re-perform the simulation to ensure that no significant problems will be introduced."

"We see huge gains companies make with machine monitoring," says Josh Davids, President and CEO of Scytec Consulting Incorporated. "Incorporating VERICUT in the digital transformation journey takes those gains to another level and highlights the value of the digital twin concept and the importance of smart factory technology in the Industry 4.0 era." ♦

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Apple asks suppliers to shift some AirPods, Beats production to India – Nikkei

Apple Inc. is asking its suppliers to move some AirPods and Beats headphone production to India for the first time, Nikkei reported recently, in what could be another win for New Delhi in its push for local manufacturing. Apple iPhone assembler Foxconn is preparing to make Beats headphones in India and hopes to eventually produce AirPods in the country as well, the report said, citing sources.

Luxshare Precision Industry, a Chinese supplier to the iPhone maker, and its units, also plan to help Apple make AirPods in India, according to the report. However, Luxshare is focusing more on its Vietnamese AirPods operations for now and could be slower than its competitors in starting meaningful production of Apple products in India, the Nikkei newspaper said.

Apple did not immediately respond to a Reuters' request for comment.

The tech giant has been shifting some areas of iPhone production from China to other markets, including India, where it started manufacturing iPhone 13 earlier this year, and is also planning to assemble iPad tablets. The company recently announced its plans to manufacture the latest iPhone 14 in India.



Image used for representation only. Courtesy Envato Elements

A Bloomberg News report has said iPhone exports from India crossed \$1 billion in five months since April and are set to reach \$2.5 billion in the 12 months through March 2023.

Apple's latest move is part of its gradual diversification from China, the Nikkei report said. India and other countries such as Mexico and Vietnam are increasingly turning important to contract manufacturers supplying to American brands amid COVID-related lockdowns in China and simmering tensions between Washington and Beijing. ♦

Courtesy Reuters

Purohit Steel expands South India operations; inaugurates new facility in Bengaluru

Purohit Steels, a leading stockist of tool & alloy steels and allied products & services, recently inaugurated a new facility in Dabaspet Industrial Area, near Bengaluru. The inauguration ceremony was held on October 15, 2022, and attended by toolmakers, Tier-1s and OEMs from across India. Dr. N. Reguraj, Managing Director, NTTF & Founding President, TAGMA India; Luca Fonto, Specialties Sales Director NLMK Verona, Italy; Pramod Raj Purohit, Chairman, Purohit Steel India Pvt. Ltd.; and Arun Gupta, Director, Riddhi Siddhi Steels Pvt. Ltd. were also present.

The new facility has the capacity to stock 2200 tons of steel with 30 tons max. crane capacity and 3.5 mtr high-end band saw machine.

"Cities like Bengaluru, Chennai, and Coimbatore to small industrial towns such as Hosur, Cochin and Belgaum are growing rapidly in South India and will be future growth drivers in the Indian manufacturing space. Rightly called the mother industry, the tooling industry needs to be very strong in order to support all the manufacturing activities. Supporting these tool rooms with the best quality steel and services is the need of the hour. Their demand was to get close to



their workspaces to serve them faster and better. The new facility will help us enhance our delivery and enable toolmakers to meet the industry's demands," said Vishal Purohit, Director, Purohit Steels Pvt. Ltd.

The inauguration was followed by a technical session and networking dinner, which was arranged at Taj Yeshwantpur in Bengaluru. ♦



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Garuda Aerospace partners with Lockheed Martin for new drone deal



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Chennai-based Garuda Aerospace has signed a deal with Lockheed Martin Canada CDL Systems to integrate its locally made drones with Canada bases company's advanced Uncrewed Aerial Systems (UAS) software solutions, reported The Economic Times.

As part of the partnership, the companies will closely work to investigate prospects to create drone-based service applications in industries like industrial inspection, mining, large-scale mapping, agriculture and defence.

Vehicles that can carry out data-collection missions without a human on board are referred to as "Uncrewed Systems". These vehicles can be aerial, terrestrial, or marine. They may also include related components like sensors and communications software. Drones fall under the aerial category, hence UAS software solutions are required.

Enabling connection in semi-urban and rural areas is one of the primary applications that Garuda wants to introduce through this collaboration. The drones deployed to spray pesticides will also serve as repeaters for network signals, similar to routers hovering over enormous areas.

Agnishwar Jayaprakash, the founder of Garuda Aerospace, said in a statement, "The drones will continue to serve the agricultural sector and help farmers reduce cost. With 5G connectivity introduced, this is one step towards creating a byproduct with huge disruption. The vision is to launch 25,000 such drones this year and 1,00,000 drones next year, and by 2024-2025, the goal is to deploy at least one drone in every village."

The drones that are expected to be made under the collaboration using UAS software will be able to deliver better and high-speed connectivity in villages for a few hours a day or whenever deployed. This would enable high-speed internet use for transactions and education/training purposes by organisations like banks and schools and universities in the villages with access to electricity for a limited number of hours a day. ♦

Courtesy Business Standard

Motherson inaugurates new facility in Morocco



Mr. V. C. Sehgal, Chairman of Motherson, inaugurated Motherson's new facility in Tanger Med Industrial Platform, Morocco. The inauguration ceremony was attended by representatives from the Moroccan Government and Administration, Tanger Med Group, and the key players from the automotive industry.

This new facility is a part of Motherson's Modules and Polymer Products division and will produce interior modules and components like instrument panels and door panels for passenger vehicles and light commercial vehicles. This is Motherson's latest facility in Morocco, replacing the existing Tétouan site, which was established in 2010.

The new 15,000 m² facility (which is double the size of the existing facility) will employ 300 people at peak production, whose highly skilled capabilities will focus on plastic injection moulding and further state-of-the-art processes such as high-precision robot-aided milling, plastic welding, and airbag integration solutions. The improved proximity to the customer will help in saving transportation costs and the expanded capacity will allow Motherson to provide more employment and growth opportunities in Tangier.

Motherson's expansion plans in Tangier include the establishment of in-house capabilities for high quality soft-touch surfaces for automotive interior parts based on modern polymer-based finishes. Motherson's ongoing successful operations in the region strengthens the company's global position as a leading automotive solutions provider and a trusted long-time partner to its customers by contributing to their future production needs and growth.

Mr. Sehgal states, "Morocco is a very strategic location for Motherson due its proximity to Europe and the Middle East. This new facility will help us in serving our existing as well new customers better in these regions. We highly appreciate the continuous support of the Moroccan government and Tanger Med teams to accelerate investment in Tangier. We are committed to continuing our efforts to support the automotive sector in this region to enable it to reach its full potential." ♦

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India-Russia JV hopes for \$5 bn in supersonic missile exports by 2025

An India-Russia joint venture that makes nuclear capable supersonic cruise missiles hopes to bag orders worth \$5 billion by 2025, its chairman has said, having signed its first export deal of \$375 million this year with the Philippines.

BrahMos Aerospace is in discussions with Indonesia, Malaysia and Vietnam for new orders, Chairman Atul D. Rane recently told Reuters partner ANI. The joint venture, with a 50.5% Indian and 49.5% Russian partnership, fits into Prime Minister Narendra Modi's flagship 'Make in India' programme.

India has made Russian MiG fighter planes and Su-30 jets under licence and the two have collaborated to make BrahMos missiles in India. Russia has also traditionally been India's main arms supplier.



BrahMos supersonic cruise missile, with enhanced capability, was successfully test-fired off Odisha coast earlier this year.

Image Courtesy: Press Information Bureau

In April last year, Russia's Foreign Minister Sergei Lavrov had said the two countries were discussing "additional" production of Russian military equipment in India.

India, which has not explicitly condemned Russia's invasion of Ukraine, has also emerged as Moscow's second-largest oil customer after China, as Indian refiners snap up discounted Russian oil shunned by some Western buyers.

"Prime Minister Narendra Modi has given a target of achieving \$5 billion (in defence exports) by 2025. I hope BrahMos themselves will be able to reach the \$5 billion target by 2025," Rane said.

India's defence forces currently uses the BrahMos surface-to-surface supersonic missile, which can be launched from land, sea and sub-sea platforms. ♦

Courtesy Reuters

HANNOVER MESSE shows the way to a climate-neutral industry

The big challenges facing the world today – such as climate change, energy shortages and disrupted supply chains – all have one thing in common: they demand innovative, high-tech solutions. At HANNOVER MESSE, the world's leading trade show for industrial technology, leading companies from the mechanical engineering, electrical engineering, energy, and software and IT sectors demonstrate an industrial ecosystem that enables changes in the way we manufacture, collaborate and do business.

"With the lead theme 'Industrial Transformation – Making the Difference', HANNOVER MESSE 2023 shows the difference that exhibiting companies can make, which changes they can carry out and which innovations they develop on the road to a climate-neutral industry," said Dr. Jochen Köckler, Chairman of the Managing Board, Deutsche Messe AG. "This is a call to action for corporations, SMEs and startups as well as science,



politics and society. They must work together to secure our industrial production, prosperity and future as well as to protect our environment – HANNOVER MESSE shows the way to a climate-neutral industry."

HANNOVER MESSE 2023 hosts more than 4,000 exhibiting companies from all over the world, including global enterprises such as Autodesk, Bosch, Capgemini, Dassault Systemes, Microsoft, NOKIA, Salzgitter, ServiceNow, Schneider Electric, and Siemens as well as leading SMEs like Aerzener Maschinenfabrik, Beckhoff, Block Transformatoren, Boge, GP Joule, Festo, Formlabs, gbo Datacomp, GFOS, Harting, ifm, Kaeser, LAPP, Pepperl+Fuchs, Phoenix Contact, Rittal, SEW, Wago, WIBU, and Ziehl-Abegg. Well-known research institutes such as Fraunhofer and Karlsruhe Institute for Technology (KIT) sketch industrial solutions for the future and more than 300 startups from various technology fields show innovations with disruptive potential.

HANNOVER MESSE 2023 features seven display sectors: Automation, Motion & Drives, Digital Ecosystems, Energy Solutions, Engineered Parts & Solutions, Future Hub, Compressed Air & Vacuum, and Global Business & Markets. Exhibitor show solutions in areas such as CO2-neutral production, Industrie 4.0, artificial intelligence, IT security, Logistics 4.0, circular economy, and hydrogen and fuel cells.

Whether digitalizing complex production processes, using hydrogen to operate entire production facilities or employing software to analyze and reduce the CO2 footprint, exhibitors at HANNOVER MESSE provide a complete picture of the technological possibilities for the industry of today and tomorrow. ♦

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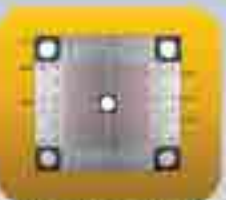
Trimming Machine



Hydraulic Quick Die
Change System



Mould Flipper



Magnetic Quick Die
Change System

Tech Mahindra Partners with Foxconn-initiated MIH Consortium to offer sustainable automotive engineering solutions

Tech Mahindra, a leading provider of digital transformation, consulting, and business re-engineering services and solutions, recently announced that it has partnered with Foxconn-initiated MIH (Mobility in Harmony) Consortium, an open EV alliance that promotes collaboration in the mobility industry. The partnership will focus on developing sustainable mobility solutions and building the next generation of Electric Vehicles (EVs), autonomous driving solutions, and mobility service applications that can deliver value for stakeholders in the mobility industry.



As part of the partnership, Tech Mahindra will help MIH build the software-defined car architecture and platforms and will provide its software, design development, and consulting expertise to deliver value to customers and stakeholders. The partnership will also focus on leveraging key technologies and developing reference designs and standards to bridge the gap for alliance members, enabling accelerated innovation and shorter development cycles.

Narasimham R. V., Global Head – Integrated Engineering Services, Tech Mahindra, said, “The Indian

Electric Vehicle market size is estimated to grow at a CAGR of 65.1% (2022-2029). At Tech Mahindra, we aim to contribute to this growth and our partnership with MIH Consortium is a step forward in this direction.

Together with MIH Consortium, we will focus on making EV cars a reality by 2025 by creating intelligent, innovative, and sustainable mobility solutions and infrastructure. We are confident that our technical prowess in the automotive sector and decades of experience in the field of engineering coupled with MIH Consortium’s strong expertise in mobility will help generate groundbreaking results in the EV market.”

Jack Cheng, Chief Executive Officer, MIH Consortium, said, “We, at MIH, are very pleased to have Tech Mahindra onboard with our Consortium, as they bring close to 26 years of deep automotive domain expertise to the alliance. Their lead into the EV vehicle technologies would very well add immense value to the alliance and its members in furthering the vision of creating an open EV ecosystem that promotes collaboration in the mobility industry. I look forward to welcoming Tech Mahindra into the Alliance and foresee them to be a very critical player in this consortium.” ♦

Triton EV issues INR 8,060 crore LoI to BEL for purchase of battery packs

Electric vehicle maker Triton Electric India has issued a letter of intent (LoI) to defence public sector unit Bharat Electronics Ltd. (BEL) for the procurement of battery packs for its semi-truck project in India at an estimated value of INR 8,060 crore, according to a regulatory filing. The 300-kilowatt lithium-ion battery packs are to be delivered by BEL to Triton Electric in 24 months commencing from January 2023, the filing stated.



“Triton Electric Vehicle India Pvt. Ltd., a part of Triton Electric Vehicle LLC, USA, issued a letter of intent to Navaratna Defence PSU Bharat Electronics for procurement of 300 KW Li-Ion battery packs for its semi-truck project in India at an estimated value of INR 8,060 crore,” the filing said.

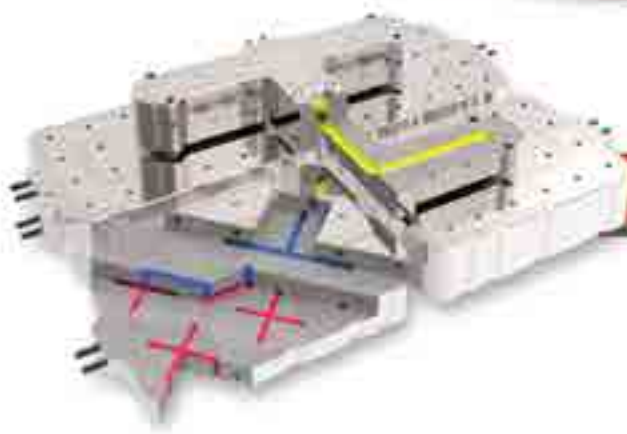
BEL Chairman and Managing Director Dinesh Kumar Batra received the LoI from Triton Electric Vehicle LLC CEO and Founder Himanshu B. Patel at DefExpo 2022 in Gandhinagar. “The purchase order for first-off quantity with 100 per cent advance payment has been handed over to BEL by Triton. BEL will deliver the first-off quantity by November 2022. The battery packs will be manufactured at the Pune unit of BEL,” the filing said.

BEL has also signed a memorandum of understanding (MoU) with Triton Electric Vehicle (TEV) for manufacture of Hydrogen Fuel Cells by BEL with technology transfer from TEV to meet the requirements of the Indian market and mutually agreed export markets. “The MoU aims at tapping the demand for clean energy solutions for various applications including E-Mobility by leveraging Government of India’s thrust for adoption of clean energy fuels for applications in transport, energy storage etc.,” the filing said. ♦

Courtesy PTI News

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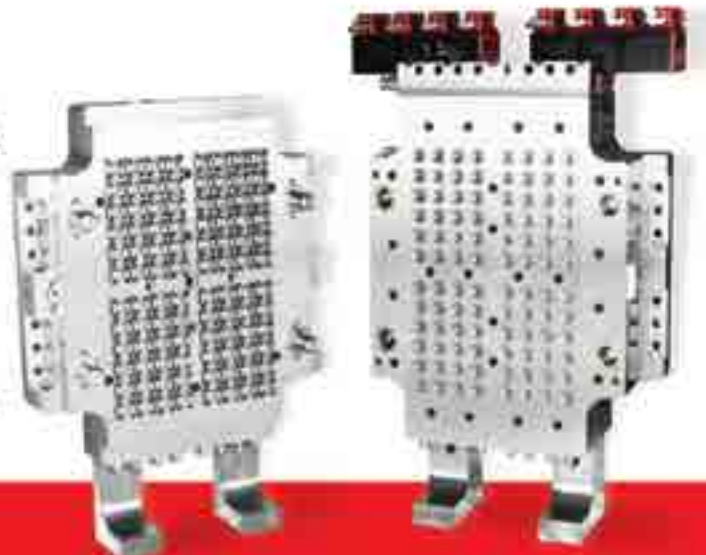
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Defence Manufacturing: Spot the Opportunities

Light combat helicopters inducted into IAF, commissioning of INS Vikrant, HAL & BEL sign contract for indigenous IRST... these and several more opportunities are opening up for manufacturers in the Indian defence industry. News reports highlight that India is extensively focusing on indigenous production and is attracting investments from companies across the globe. This manufacturing growth story could possibly open up several prospects for toolmakers. However, toolmakers need to equip themselves with the necessary infrastructure and skills before they look to explore what this industry has to offer.

Kimberley D'Mello

Over the years, India has grown to become one of the mightiest military forces in the world. Military fixed wing, naval vessels and surface combatants, missiles and missile defence systems, military rotorcraft, submarines, artillery, tactical communications, electronic warfare, and military land vehicles are

some of the well-known segments of the Indian defence sector.

India Brand Equity Foundation, an initiative of the Ministry of Commerce and Industry, Government of India, on its website stated: "The Indian defence manufacturing industry is a significant sector for the economy... Over the last five years, India has been ranked

among the top importers of defence equipment to gain technological advantages... To modernise its armed forces and reduce dependency over external dependence for defence procurement, several initiatives have been taken by the government to encourage 'Make in India' activities via policy support initiatives."

Saab to set up manufacturing facility in India for Carl-Gustaf

Saab will set up a manufacturing facility for the shoulder launched weapon system Carl-Gustaf® in India, further strengthening production in the country. Production in the new facility is planned to start in 2024. The facility will support the production of the Carl-Gustaf M4 for the Indian Armed Forces as well as components for users of the system around the world. The new company Saab FFV India, currently under registration, will make the latest generation of the state-of-the-art weapon in India. Saab will also be partnering with Indian sub-suppliers and the systems manufactured in the facility will fully meet the requirements of 'Make in India'.

Image courtesy: Saab



DID YOU KNOW?

India's defence production stood at INR 17, 885 crore (US\$ 2.24 billion) in FY 2022-23 (until 1 August, 2022)

Defence production by PSUs stood at INR 10,831 crore (US\$ 1.36 billion) in FY 2022-23 (until 1 August, 2022)

Source: ibef.org

developed Light Combat Helicopter (LCH) named 'Prachand' was inducted into the Indian Air Force in October 2022 in the presence of Defence Minister Rajnath Singh. The new chopper getting inducted into the force is capable of aerial combat and will help the force combat slow-moving aircraft, drones and armoured columns during conflicts. The light combat helicopter is a dedicated combat helicopter designed and developed indigenously in India. It has been manufactured by Hindustan Aeronautics Limited (HAL).

India signs deal with Armenia for export of missiles, weapon systems

According to a news report by The Economic Times, India plans to export missiles, rockets and ammunition, including indigenous Pinaka multi-barrel rocket launchers, to Armenia to help defend the nation against the neighbour Azerbaijan. Defence India has signed an order for the arms export through a government-to-government

route, through which the two nations inked contracts for the supply of arms and ammunition to Armenia in September 2022. The government has not revealed the value of the contracts, however, according to the report, India will supply weapons worth more than INR 2,000 crore over the coming months.

India's first indigenous aircraft carrier INS Vikrant in Kochi commissioned

Prime Minister Narendra Modi commissioned the country's first indigenous aircraft carrier Indian Naval Ship (INS) Vikrant at Cochin Shipyard Limited (CSL) on September 02, 2022, stated a press release issued by the Press Information Bureau. INS Vikrant is designed by Indian Navy's in-house Warship Design Bureau (WDB) and built by Cochin Shipyard Limited, a Public Sector Shipyard under the Ministry of Ports, Shipping & Waterways. Vikrant has been built with state-of-the-art automation features and is the largest ship ever built in the maritime history of India, added the press release.

Defence deals

The Indian defence manufacturing sector has witnessed some major investments and developments this year. Here are some of them:

Made-in-India light combat helicopters 'Prachand' inducted into IAF

According to an ANI News report, the first batch of indigenously-

Image used for representation only. Courtesy Envato Elements



Image used for representation only. Courtesy Envato Elements

MoD approves procurement of military equipment, platforms worth INR 76k cr

In a significant move to boost self-reliance in defence manufacturing, the government in June this year approved the procurement of military equipment and platforms worth INR 76,390 crore from domestic industries to enhance India's overall combat capabilities, stated a PTI News report. The Defence Acquisition Council (DAC), chaired by Defence Minister Rajnath Singh, cleared the procurement of next-generation corvettes (NGCs), the manufacture of Dornier aircraft and Su-30 MKI aero-engines, wheeled armoured fighting vehicles and weapon-locating radars among others, according to the defence ministry, added the news report.

Boost to 'Make in-India': HAL & BEL sign contract for indigenous IRST

In April 2022, HAL and BEL signed a contract for co-development and co-production of Long Range Dual Band Infra-Red Search and Track System (IRST) for Su-30 MKI in Bengaluru under the MAKE-II procedure of Defence Acquisition Procedure (DAP) 2020, as part of the 'Make in India' initiative. The proposed IRST system will be a high-end strategic technology product in the field of defence avionics and technically competitive to existing IRST system in the global market with features of

Television Day Camera, Infrared & LASER sensors in single window for air-to-air and air-to-ground target tracking and localization. The system will enhance the Indian Air Force's air superiority.

Time to gear up

India has built on its manufacturing proficiency, R&D abilities, IT and engineering services, and semi-skilled and skilled manpower over the years. However, manufacturing in the defence industry is far more complex, as it involves the manufacturing of difficult-to-manufacture, and intricate critical parts. These mandate that toolmakers furnish their tool rooms with highly advanced multi-axis CNC machines, and CNC tube bending machines, among other state-of-the-art equipment, to achieve high-precision machining and accuracy of components in aluminium, and other hard metals such as titanium. To be eligible to manufacture for the defence industry, the tooling industry will also have to obtain the necessary certifications to ensure the quality, conformity, safety, and reliability of

Image courtesy HAL



HAL and Safran sign strategic MoU during ground-breaking ceremony of HE-MRO at Goa

In March this year, the ground-breaking ceremony for a new facility of Helicopter Engines MRO Pvt. Ltd. (HE-MRO), a joint venture of HAL and Safran was held in Goa. Mr. R. Madhavan, CMD, HAL, Mr. Franck Saudo, CEO, Safran Helicopter Engines and senior officers from the Indian Armed Forces and HAL were present on the occasion. During the ceremony, both partners signed a 'Memorandum of Understanding' to extend their cooperation and explore opportunities for new helicopter engines in civil and military markets.



Image used for representation only. Courtesy Envato Elements.



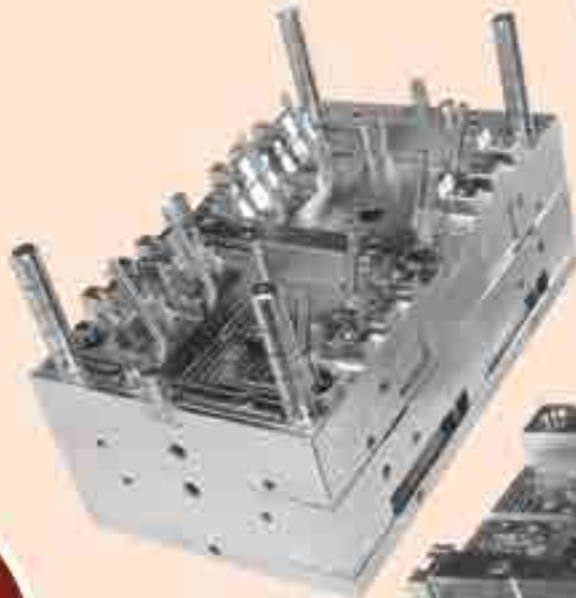
Image courtesy HAL

the manufactured product. Besides this, it is mandatory that the tooling industry equips itself with highly skilled machinists to ensure that the job is done right. The defence industry has put forth a possibility of opportunities for domestic as well as international companies. Opportunities await entrepreneurs looking to venture into this sector as well as those who are carving a niche for themselves here. ♦

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Indigenous India set to make a global mark at DefExpo22

The 12th and largest-ever defence exhibition, DefExpo 2022, was held in Gandhinagar, Gujarat, during October 18 to 22, 2022.

In line with its theme, 'Path to Pride', the exhibition marked the emergence of India's defence industry as a sunrise sector for investments on a global scale. Organised in the largest-ever total area of over one lakh sqm (previous edition being 76,000 sqm), the five-day event witnessed unparalleled participation of over 1,340 exhibitors, businesses, investors, start-ups, MSMEs, Armed Forces and delegates from several countries, with engagements spread over four venues.

Major attractions

- For the first time, 'Invest for Defence', the first ever marquee event of Ministry of Defence, targeted to promote investment in the defence sector in the country both by the Indian industry as well Foreign Original Equipment Manufacturers, was held. It was inaugurated by the Raksha Mantri on October 20. Shri Rajnath Singh stated that the event is an important platform for eminent industrialists as they can contribute to the government's efforts towards development of the defence industrial ecosystem in the country and become a part of the 'Make in India, Make for the World' resolve. He added that the event promotes the growth of MSMEs and start-ups in the country so that they can become participants in the global supply chain and generate new employment opportunities.
- Raksha Mantri Awards for Excellence in Defence Manufacturing was also organised for the first time during DefExpo.

Images Courtesy: Press Information Bureau

SPOTLIGHT

DRDO hands over 16 Licensing Agreements for Transfer of Technology for 10 indigenous technologies handed to 13 industries

Defence Research & Development Organisation (DRDO) handed over 16 Licensing Agreements for Transfer of Technology (LAToT) for 10 DRDO-developed technologies to 13 industries during the 'Bandhan' ceremony. Raksha Mantri Shri Rajnath Singh presided over the ceremony.

The technologies transferred by DRDO are from the area of electronics, laser technology, armaments, material science, combat vehicles, naval systems and sensors, etc. The products include Handheld Ground Penetrating Radar (GPR), Unexploded Ordnance Handling Robot (UXOR), Semi-Solid Metal (SSM) Processing Technology for Aluminum Alloys, High Oxidative and Thermal Stability Oil (DMS Hots Oil-I), Nuclear Shielding Pads for Combat Vehicles, 120mm Tandem Warhead System for Anti-Tank Application, High Energy Material (TNSTAD), Laser-Based End Game Fuze, Multi-kW Laser Beam Directing Optical Channel (BDOC), SHAKTI EW System. These high-technology products will provide impetus to 'Aatmanirbhar Bharat' drive of the Government and boost the defence manufacturing sector through self-reliance, besides enhancing the operational capabilities of the Armed Forces.

Manthan 2022: Calling start-ups and innovators

Raksha Mantri Shri Rajnath Singh exhorted start-ups and innovators to come up with new ideas to modernise the Armed Forces through research & innovation and contribute in making the nation strong, prosperous & 'aatmanirbhar'. Inaugurating Manthan 2022, an event organised by Innovations for Defence Excellence-Defence Innovation Organisation (iDEX-DIO), Ministry of Defence, he said that a large number of start-ups and innovators are venturing into the defence sector, as the government has created a robust ecosystem for their as well as the nation's growth.

"In the last 7-8 years, there has been a change in the consciousness of the nation, with greater focus on solutions and goals. Earlier, it was difficult for the youth to contribute in various fields, but initiatives such as iDEX have empowered our young entrepreneurs and given them wings to fly. iDEX, a major initiative

towards making India self-reliant, is a platform to provide economic support to entrepreneurs to develop state-of-the-art technologies," he said. ♦

Source: Press Information Bureau
Images Courtesy: Press Information Bureau



Image courtesy: Hindustan Aeronautics Limited

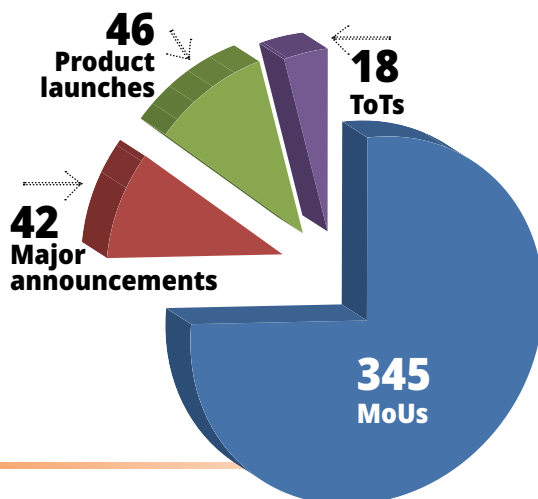
Prime Minister unveils HAL's HTT-40

Prime Minister Shri Narendra Modi unveiled HTT-40 the indigenous trainer aircraft designed and developed by Hindustan Aeronautics Limited (HAL) at the India Pavilion during DefExpo-2022. Shri Rajnath Singh, Union Minister of Defence and Shri Bhupendrabhai Patel, Chief Minister of Gujarat, were present on the occasion. The aircraft has state-of-the-art contemporary systems and has been designed with pilot-friendly features.

The Basic Trainer Aircraft (HTT-40) indigenously designed and developed by HAL would be used for basic flight training, aerobatics, instrument flying and close formation flights, whereas its secondary roles would include navigation and night flying. HTT-40 is an example of cutting-edge technology designed to meet primary training requirements of the Indian defence services. The HTT-40 is an indigenous triumph. With over 60% in-house parts and collaboration of private industry, the HTT-40 is a shining example of the vision of 'Aatmanirbhar Bharat'.

Source: Hindustan Aeronautics Limited

451
Total number of Memoranda of Understanding (MoUs), Transfer of Technology (ToT) agreements and product launches that took place



Advancement of CAD/CAM Technology

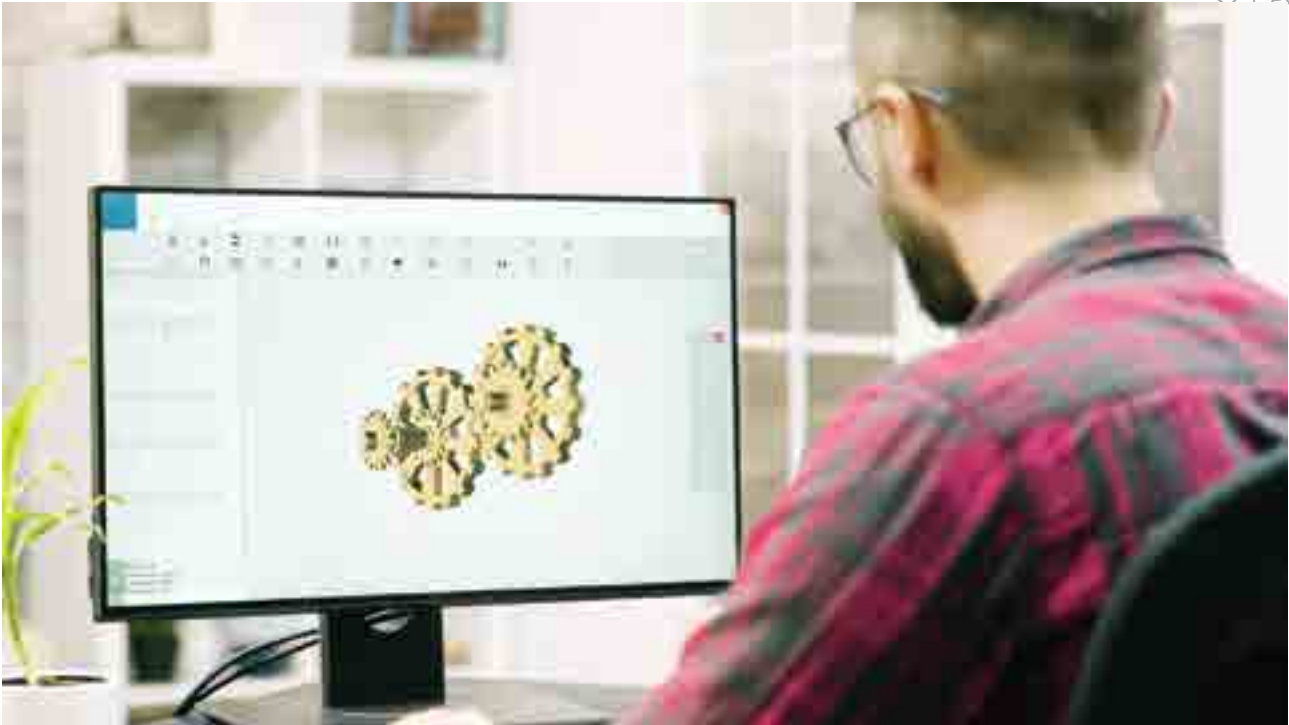


Image used for representation only. Courtesy Envato Elements.

NISHANT KASHYAP

Since the beginning of the Industrial Revolution, manufacturing processes have undergone several changes. One of the most significant changes was the introduction of computer-aided design and manufacturing (CAD/CAM) software. This system optimizes computer technology in product manufacture, planning, and control. Its usage began in the 1950s and steadily extended throughout numerous sectors by the early twenty-first century.

Over time, more and more features have been introduced to the fundamental CAD systems, such as the transition from 2D to 3D models, additional bill of materials modules, new design features to accommodate more complicated designs and tools to assist designers in creating designs faster.

In this article, we will talk more about the use of CAD/CAM software in the manufacturing industry, some latest development, and what the future looks like. Let's explore.

Use of CAD/CAM software in manufacturing

Manufacturing may be challenging since we must track inventories, keep track of orders, and create standardized lists for manufacturing procedures that are frequently completed with a single click on a computer equipped with CAD/CAM software.

One of the most significant advantages of CAD/CAM software is that it automates manufacturing processes through real-time control and robotics, saving time, labour, and money. Since each manufacturing step is computer-controlled, a high level of precision and uniformity is attained.

Another advantage of CAD/CAM is that it allows for flexibility and quick design modifications to meet the individual demands of consumers. CAM applications include numerical control (NC), computer numerical control (CNC), and industrial robot programming; tool and fixture design and EDM electrode design; die and mould design for casting; and quality control and inspection in manufacturing facilities.

In recent years, the CAD/CAM software sector has grown steadily. Much of this growth can be attributed to recent technological advancements, rising demand for sophisticated computer-aided manufacturing in industries such as automobiles, aerospace and defence, increased industrialization, increased use of CAM software in packaging machinery, and increased adoption of cloud technologies.

CAD/CAM and die & mould industry

Mould and die is a very efficient method of producing components using polymers, metal, and a variety of other materials.

To assure the quality of the finished item, whether utilising a mould or a die, proper design and fabrication of the tooling is required. To ensure effective production, toolmakers, die makers, and mould makers in every sector rely on specialised mould and die design and manufacturing solutions. Here are some of the ways CAD/CAM can save you time and effort:

- ▶ Automate more of the manufacturing authoring process. This could be done by:
 - (a) using design requirements (colour coding and Product Manufacturing Information (PMI)) directly on the 3-D model to automate NC and CMM programming, and
 - (b) Saving NC data within the standard part's 3-D model file. For instance, the NC data included inside a conventional slide model may be updated to its design dimensions.
- ▶ Maintain data organization so that you may work in teams, in parallel, and react to design changes more quickly.
- ▶ More than one designer can work on the same tool at the same time, and NC programming can begin before the tool design is finished. For instance, when the CAD model changes, you may update your die mould design, NC programs, electrodes, and setup sheets by using a master model with the associativity. Associativity speeds up design modifications, and basic adjustments may be updated automatically—they don't require reprogramming since they re-adjust themselves.
- ▶ Eliminate costly and redundant data translation steps across

One of the most significant advantages of CAD/CAM software is that it automates manufacturing processes through real-time control and robotics, saving time, labour, and money.

apps that use the same 3-D model.

- ▶ Some systems provide a completely integrated set of applications for the whole process, from component design to mould design, NC programming, electrode design, and CMM inspection programming.

Latest development of CAD/CAM technology

Computer-aided design and manufacturing technologies are constantly changing and growing like business demands. As technology advances, this evolution will continue. If you are unaware of some of the newest technological breakthroughs and trends in the manufacturing sector, this section is for you. Continue reading to learn more about the most recent CAD/CAM technology advancements in the die mould industry.

a. Automation and Artificial Intelligence

Automation is undoubtedly one of the most prominent trends in recent years. We can witness the progress of Artificial Intelligence (AI) in a variety of fields. It will become more popular in 3-D modeling software. Indeed, CAD/CAM software will be able to predict our actions and enhance our 3D modeling experience, allowing users to rectify or predict design flaws.

Automation will undoubtedly enhance manufacturing processes and enable the avoidance of 3D modeling issues. Some software businesses are already incorporating AI into their systems, which will become progressively more popular in the future, allowing design activities to be

automated. These programs will become increasingly sophisticated as a result of AI.

b. Cloud in the future

Some businesses have already adopted cloud-based CAD/CAM, with many more planning to do so in the near future. This trend increases the likelihood of never having to bother about software upgrades again. The program would be available in your browser using cloud-based CAD/CAM, eliminating the need for upgrades or downloads. Furthermore, concerns such as data management may become obsolete. When your cloud-based CAD software can track everything you do, there's no need to save several design versions or worry about erased data.

c. Generative Design

The idea of CAD technology being able to 'think'—predicting a designer's next move and making a reciprocal move—is a key impending development in CAD/CAM. Designers will soon be able to select the greatest design option by collaborating with computers to develop a perfect design. This is referred to as 'Generative Design'.

CAD/CAM technology's future

CAD has evolved and altered dramatically throughout the years and will continue to do so in the future. The utilization of CAD/CAM technology has grown throughout the years. In reality, almost no product is made today without the use of CAD software for design, simulation, and production.

The importance of CAD/CAM also resulted in the breach of CAD skills in employment. Many advertised jobs that need CAD expertise may be found in many industries. ♦

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Contact Person : Mr. D Shanmugasundaram - Managing Director
Email Id: info@stengineers.com
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Corrigendum

In the Patron Member section of TAGMA Times (September 2022 edition), there was an error in the details of S&T Engineers (P) Ltd. The error is regretted.

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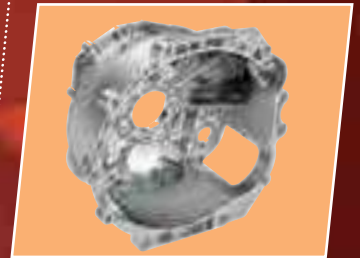
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FOR DETAILS:





Playing it right



From a commercial tool room to support the engineering sectors to venturing into toy manufacturing, the journey of Bengaluru-based Micro Plastics Pvt. Ltd. has been commendable. In this facility visit, **Mr. Vijendra Babu**, the company's owner, tells Nishant Kashyap how by toying with the idea of manufacturing toys, Micro Plastics has today become India's largest toy manufacturer.

From articles of amusement to instruments of learning, the role of toys has evolved over the years. In fact, toys have become even more popular as tools to develop holistic skills that are essential for the overall growth of a human being.

Toys have been a part of our childhood and they continue to be a part of our children's childhood even today.

Have you ever wondered what it takes to build such toys?

What infrastructure is needed? What kind of skill set is required? This article will try to answer all this and more, as I describe my experience of visiting Micro Plastics Pvt. Ltd., India's largest toy manufacturer.

Headquartered in Bengaluru, Micro Plastics has a total of 6 plants, including one in Hosur which is India's largest toy manufacturing facility. As you enter the plant, it is hard to miss the colourful toys (manufactured by Micro Plastics) displayed at the reception area. One glance at them is enough to tell you all about the variety of toys they manufacture.



How it all began?

Let's start from the start! Micro Plastics was established by Mr. Vijendra Babu in 2005 as a commercial tool room to support the automotive industry and other engineering sectors. Back then, the company served some of the largest industries in automotive, consumer goods, electrical & electronics, power tools, and telecom. "When you serve industries like automotive, you are at the Tier-II level or the component level. But you don't get the opportunity to manufacture the entire product," Mr. Babu explained.

He aspired to do much more. He wanted his company to get into product manufacturing and provide end-to-end solutions to OEMs. "At that time, one could rarely find Indian companies, which manufactured toys for OEMs. Most domestic companies were shying away because they found it difficult to meet the expectations of OEMs in terms of quality, materials, ethics, etc.," said Mr. Babu.

In this scenario, what inspired Mr.

Babu to take the plunge into toy manufacturing? "I believe that the industry has huge potential. It is close to a \$120-billion industry globally of which China has 70% share. Even a 2-3% shift from China to India would be a huge opportunity for us. Considering all these aspects, I thought it would be the right time and I began manufacturing toys," he stated.

Opportunity arrives

The opportune moment arrived during 2014-15 when Hasbro, one of the world's largest toy brands, was looking for suppliers in India. Mr. Babu met with the company's officials and expressed his interest. "Hasbro made a very bold move when they turned to India to find suppliers. Back then, the Indian toy manufacturing industry was at a very nascent stage without an ecosystem. Initially, to qualify as their supplier, we had to work hard. But they gave us a lot of support in the early days, which helped us build on our

capabilities," said Mr. Babu.

"Ever since Hasbro successfully built their supplier base in India, it gave other brands the confidence as well. Now, many big brands source toys from India. I must say, Hasbro has played a major role in developing the Indian toy manufacturing ecosystem," he added.

But there were challenges too...

When you start a journey in an uncharted territory, it comes with its own set of challenges. The journey for Micro Plastics was not easy either. The Indian toy manufacturing industry is still in its nascent stage, but the situation in 2015 was different. "When we ventured into toy manufacturing, we realised that there was no ecosystem in India. Besides, raw materials and many key components were not available in the country. There were hardly any tool rooms that made tools for the toy industry. And, to top it all, finding skilled manpower was a daunting task. We wouldn't get any engineers or labourers, who have worked in the toy industry. These were some of the challenges we faced," Mr. Babu elaborated.

"But we have emerged stronger," he said, adding, "Now, there is a fairly good ecosystem in India with manpower. I am proud to say that Micro Plastics has played a major role here."

The infrastructure

The company operates from 6 manufacturing units





near Bangalore with a total manufacturing area comprised of 1.2 million sqft with state-of-the-art injection moulding, roto moulding, blow moulding machines, in-house tool-room, mould design, hair rooting, hair grooming, press shop, assembly lines, plush toys setup, testing and decoration facilities.

The company follows the highest quality and safety standards for toys and hobby model kits. All the materials comply with EN71 standards and are checked both internally and using external certified labs like SGS, TUV & Intertek. The in-house quality lab conducts rigorous checks from incoming to shipment, ensuring quality at every stage. The division is audited and approved by major international retailers like Walmart, Disney, Target, and Amazon. Direct



shipments are made to these stores in every part of the world.

"We never compromise on technology and always look for best-in-class machines. Our tool room is equipped with machines from Makino, Sodick, Doosan, 3D Systems and Hexagon CMMs. Same is the case with our injection moulding, blow moulding, roto moulding, and gun drilling machines. We recently invested in a highly automated PCB manufacturing machine," informed Mr. Babu.

Tool rooms capabilities

The in-house tool room is equipped with modern machinery to manufacture and maintain moulds up to 1mt in size to meet the requirements of both the engineering and toys divisions. The company has experience in building complex hot runners, hot sprue and hydraulic core moulds. Micro Plastics sources core and cavity materials from Stavax, Orvar Supreme, Nimax and other standard elements from Misumi. Both graphite and copper electrodes are used for better mould finish and dimensional accuracy. The tool room is ably supported by an in-house experienced team of designers with in-depth knowledge in both product and tool design.

Talking about the tool

room capabilities, Mr. Babu informed, "We have a fully equipped tool room with milling machines, a WEDM machine, a 3D-printing machine, the latest CMM, sophisticated design and manufacturing software. We also have reverse engineering capabilities. With our current set up, we can say that we are one of the largest tool rooms in India with the capacity to manufacture 500-600 tools a year."

Scope for toolmakers

Tooling plays a major role in the development of toys. One toy may need anywhere from 3-30 tools. Looking at the number of products the industry produces, toy manufacturing offers good business opportunities for the tooling industry. "The toy industry could be a good industry for toolmakers to venture into. The industry is growing and requires a lot of tools. Even though we have a large tool room, we still source tools from a couple of toolmakers because the amount of tools a toy manufacturer needs is difficult to manage in-house. It is a sunshine industry and will generate huge business opportunities for toolmakers in the coming days," asserted Mr. Babu.

Growth prospects

Micro Plastics is undoubtedly



Toolroom Capabilities of MPPL



the market leader when it comes to manufacturing toys in India for leading global brands. This year, the company aspires to cross a revenue of \$75 million. When the company started toy manufacturing in 2015, the first year revenue from the toy business was a mere \$0.5 million. Micro Plastics currently serves customers such as Hasbro, Casdon, Chicco, Spinmaster, Airfix, IMC Toys, Shifu, Hamleys, BYJUs, and Golden Bear, among others toymakers. In the engineering division, they cater to Toyota, Schneider, TCS, Komatsu, Bosch, Stanley and Nokia.

Owing to the Government of India's encouragement, there has been significant development in the Indian toy-making industry in recent years. Recently, it was reported that toy imports in India declined for the first time in three years. Also, a significant number of MSMEs registered for toy making. "With adequate support from the government, such as skill development initiatives, PLI schemes and other incentives to

encourage more players, we will be able to increase our share in the global toy industry and play a small part in the growth of the Indian economy and generate employment. There have been some great initiatives such as BIS standard and high import duty on toys that have given the much-needed boost to domestic players. However, we still have a long way to go," highlighted Mr. Babu.

The company currently manufactures all kinds of toys such as plastic and metal toys, fashion dolls, plush toys, creative art & craft toys, hobby model kits, AR & VR toys, board games and puzzles and

exports to developed markets such as Europe, US, UK, Japan, Australia, China and Russia.

"We currently make 25-30 million toys a year and export about 20 million to various countries. We have some spare capacity and once fully operational, we will be able to produce close to 50 million toys from our current setup. We will soon start manufacturing wooden toys to justify our company's motto 'One Stop Solutions'. I am confident about the growth of this industry and would definitely encourage more and more entrepreneurs to take the plunge into toy making," he concluded. ♦



'MNCs optimistic about India's growth prospects; India's FDI could touch US\$475 bln in next 5 years'



Image used for representation only. Courtesy Envato Elements.

71 % of Multi-National Companies (MNCs) working in India consider the country as an important destination for their global expansion. The optimism is driven by both short-term as well as long-term prospects. A majority of MNCs feel that the Indian economy will perform significantly better in 3-5 years backed by 96% of respondents being positive about overall India's potential, according to a report released by CII-EY titled 'Vision – Developed India:

Opportunities and Expectations of MNCs' at CII's National Conference on MNCs 2022, organized on October 14, 2022, in New Delhi.

The report underscores that India has optimistic growth prospects for foreign investments with a potential to attract FDI flows of US\$ 475 billion in just the next 5 years. FDI in India has seen a consistent rise in the last decade, with FY 2021-22 receiving an FDI inflow of US\$ 84.8 billion, despite the impact of the pandemic and geopolitical developments on investment sentiment.

"Against the backdrop of growth challenges being faced by major economies of the world and new geopolitical issues, it is heartening to note that MNCs consider India an attractive investment destination and are planning expansion. We are confident that the continuing reform momentum by the government will attract an increasing volume of investment from MNCs and facilitate their larger integration in the domestic supply chain," said Mr. Chandrajit Banerjee, Director General, CII.

According to the report,

the direction of India's growth is being determined by the strong momentum in domestic consumption, services, digital economy, and infrastructure. The estimated real growth in consumption is the 3rd highest behind only the US and China, while the fast-expanding digital economy is expected to reach US\$ 1 trillion by 2025.

Besides the fact that India is among the fastest-growing large economies in the world, the confidence in India's potential stems from strong consumption trends, digitization, and a growing services sector, along with the government's strong focus on infrastructure and manufacturing, the report mentions.

A large majority of MNCs laud the government's consistent efforts for improving the business environment in the country, which has been at the core of their growing interest in the Indian economy. Over 60% of MNCs in the report stated improvement in the business environment in the last three years. MNCs appreciate the impact of GST, the government's digital push in various spheres, and transparency in taxation, amongst other reforms.

As continuing improvement in the business environment, MNCs would like to see enhanced effectiveness of the national single

Against the backdrop of growth challenges being faced by major economies of the world and new geopolitical issues, it is heartening to note that MNCs consider India an attractive investment destination and are planning expansion.

**- Chandrajit Banerjee,
Director General, CII**

window for approval/ clearances; greater tax certainty, and stronger contract enforcement mechanism, among other measures.

What also makes India an attractive investment destination for MNCs, besides the consistent reform measures, is it being a large and stable democracy. Majority of the respondents also see India as an alternative for their 'China+1 Strategy'.

93% of the respondents feel that investment in Sustainable Development Goals (SDGs) and in climate change mitigation and adaptation is essential. Additionally, a large majority of the respondents (82%) agree that investing in Sustainable

Development Goals is essential.

The country's thrust on structuring modern Free Trade Agreements (FTAs) to boost trade and create cross-border investment opportunities also finds favour with MNCs with 82% supporting the trade initiatives, as they expect them to create new opportunities.

By way of ongoing reforms, MNCs expect momentum on faster execution of infrastructure projects, continuing improvement in ease of doing business, further tax reforms and more trade agreements. They further recommend that the government should focus on implementing the infrastructure projects and project preparation timelines, especially for the Public-Private Partnership (PPP) projects and development of competitive business clusters through the Development of Enterprise and Service Hubs (DESH) initiative.

The CII Director General also observed: "The confidence in India's potential stems from fast economic growth, from strong consumption trends, digitization and a growing services sector, along with the government's strong focus on infrastructure and manufacturing. The Indian government's consistent efforts to reduce regulatory barriers is also stoking the positive perception among MNCs." ♦

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Godrej & Boyce helps students design and build formula-style electric racing car



Image Courtesy: Godrej.com

Godrej & Boyce facilitates next-gen auto experts from K. J. Somaiya College of Engineering to design and build formula-style electric racing car – ‘Lemnos’. The Orion Racing India Team launched this electric racing car at the prestigious ‘Formula Student Germany 2022’ in August. Orion Racing India plans to launch driverless formula-style electric racing car by 2024.

Orion Racing Team from K. J. Somaiya College of Engineering, one of India’s only active formula student racing teams today, recently unveiled their formula-style electric racing car ‘Lemnos’. The name ‘Lemnos’ is derived from Greek mythology and it means ‘the city of technology’. The car was built under the mentorship of Godrej & Boyce, India’s leading engineering conglomerate and the flagship company of the Godrej Group. The car was officially launched by Anil G. Verma, Executive Director and President, Godrej & Boyce, in the presence of Formula 4 Racer, Mira Erda, Motorsports Racecar

Driver, CEO of IR eSports and driving coach to Team Orion Racing India, Saurav Bandyopadhyay, K. J. Somaiya College of Engineering Principal, Dr. Shubha Pandit and Team Orion Racing India.

The car made its debut at the ‘Formula Student Austria 2022’ hosted at Austria’s Redbull F1 Racetrack in July 2022 and ‘Formula Student Germany 2022’ hosted at Germany’s Hockenheimring F1 Racetrack in August 2022 by the Team Orion Racing India, the only active electric formula student team from India to be participating at these two prestigious competitions. They ranked first among all Asian teams on this platform at FSG ‘19. At the event,

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Orion Racing India also announced that the team plans to introduce a driverless formula-style electric racing car by 2024.

Godrej & Boyce has been associated with Orion Racing India since 2017. This year, too, the team was mentored by engineering experts from Godrej & Boyce throughout the development journey of 'Lemnos'. Along with technical guidance, the students were also provided with access to the company's advanced manufacturing units and resources to build this state-of-the-art electric formula student car.

Commenting on the occasion, Anil Verma, Executive Director & President, Godrej & Boyce, said, "At Godrej & Boyce, we have always been passionate about empowering our future generations. With 125 years of knowledge and expertise in technology, we believe it is our duty to motivate and support the next generation that bears the passion to dream big and pioneers progress, just as we do. The young engineering minds have been an inspiration to all of us given the passion, dedication, and originality that they showcased while designing and building Lemnos."

Aligned with the company's commitment to pioneering progress for our future

Lemnos' features

- ▶ 'Lemnos' features the Emrax 228 MV motor controlled by UNITEK Bamocar D3-700 and has a maximum motor power of 100kW.
- ▶ The powerful motor coupled with ergonomic body and a meticulously curated drivetrain provides a maximum motor rpm of 4600 and maximum vehicle velocity of 90 kmph during acceleration event.



generations, various businesses from Godrej & Boyce participated in empowering the students to pursue their passion of building and racing a globally recognised racing car. For instance, Godrej Aerospace was leveraged to build the bodyworks and aerodynamics package made from lightweight composite materials and special materials including composite prepregs. Other consumables required to fabricate the components were also provided to the students. Godrej Tooling also supported the students with

a workshop facility, which was equipped with the best-in-class precision tooling and an excellent surface finish for their wheel assemblies. The racing team was given access to the 3D-printing facilities at the company's Prototyping Lab, for cell holders required for the high-voltage battery pack used in the electric car.

Dr. Shubha Pandit, Principal, K. J. Somaiya College of Engineering, said, "We have always encouraged our students and believed in them. We are proud of Team Orion Racing India for representing India on a global stage. We are also grateful to Godrej & Boyce, for mentoring and empowering our students with the resources to build an electric formula racing car of their dreams."

Godrej & Boyce has been pioneering progress for generations since 1897 and has partnered with numerous colleges to empower the next generation to continue on the same path. From partnering with K.J. Somaiya College of Engineering to various IITs across the country and young start-ups, the company seeks to drive innovation that will help build the nation and drive business growth. ♦

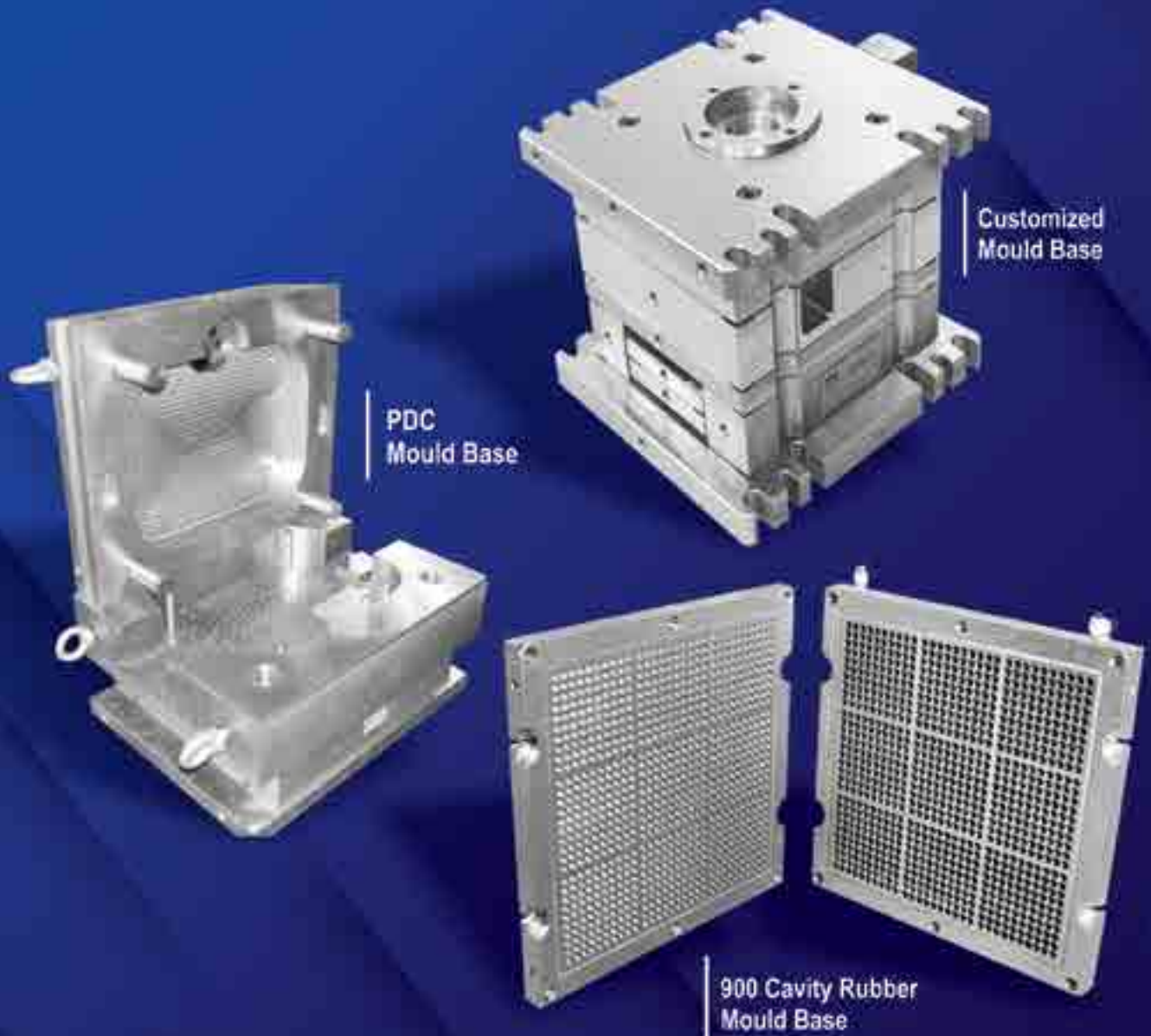
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6 Types of CNC Machines, a Complete Guide

When it comes to precision manufacturing, CNC machines are one of the most preferred and high-standard appliances. Because of the speed, accuracy, and ability to hold tight tolerances, it has become the most preferred choice. It's no surprise that this process is critical to producing many products we use every day.



What is a CNC machine?

CNC machining is when factory machinery and tools are moved according to pre-programmed computer software. In less time, manufacturers can produce parts, reduce waste, and eliminate the risk of human error with CNC machines.

CNC machine tool systems can be classified in 2 ways:

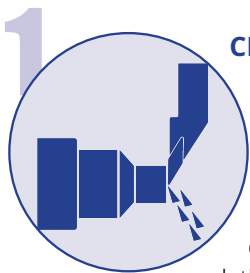
Open-loop

Closed-loop

It depends on the control system adopted for axis motion control.

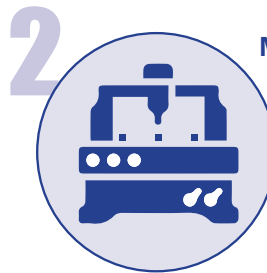
Now that you know about CNC machines, you need to understand how many types of CNC machines there are.

Types of CNC Machine tools



CNC Lathe Machine

Because of their fast and accurate operation, Lathe CNC machines are distinguished by their ability to turn materials during operation. CNC lathe machines have fewer axes than CNC milling machines, making them faster and more compact. CNC lathe machines are made up of a lathe in the centre that manages and transfers material to the computer programmatically.



Milling CNC Machine

The shaft of a traditional milling machine is endowed with a tool holder, which can replace various milling tools, and the fixed axis rotates. To improve the bed base, you can adjust the rotation speed and move the workpiece up and down. Cantilever milling machines are typically small for milling, drilling, and other tasks, whereas gantry milling machines are more significant. The CNC machine calculates the programming using G code and can control the milling machine's operational parameters using the XYZ three-axis.

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3 Grinding CNC machine

CNC stands for computerized numerical control. These CNC machines can cut metal precisely and give your product a detailed finish. With the help of the rotating grinding wheel, CNC grinding machines create fine cylindrical pieces.



4 Laser cutting CNC machine

The CNC machine with a laser helps in cutting hard materials effortlessly, as instead of a plasma torch, a laser beam is used to perform this chore. Lasers might offer high accuracy, but they are not as productive as plasma torches.

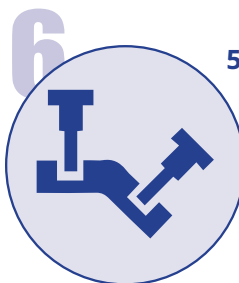
Are there any good CNC machine manufacturers in India?

There are many, but you need to pick one that's best for you. Phillips is one of the largest and best suppliers of state-of-the-art manufacturing equipment globally. They carry the most profound machines.



5 Electric discharge CNC machine

These are also called spark CNC machines, as they use electric sparks to shape materials. Electrical discharge has a transient effect, which means it can degrade the elements it is presented with.



6 5-axes CNC machine

As the name says, this CNC machine has a total of five axes. It has three axes (X, Y, and Z), and any tool's cutting operation is done in three directions, but two additional axes (A and B) were added, making five axes. CNC machines with rotary axes can produce sculptures.

Article courtesy Phillips Machine Tools India Pvt. Ltd.
Images courtesy: The Phillips Machinist



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Embracing the edge



According to Google Trends data, web searches for edge computing have increased by a colossal 473% in the last five years. Clearly, there's an appetite for understanding the edge — but the technology has yet to be widely deployed in industrial applications.

Here, **Nevzat Ertan**, Chief Architect & Global Manager for Digital Machining Architecture at Sandvik Coromant, explains the misconceptions and barriers of edge computing for manufacturers, and argues the case for embracing the edge.

First, let's start by defining edge computing. Edge computing and edge analytics describe data capture, processing and analysis that take place on a device — on the edge of the process — in real-time. Unlike traditional methods, which typically collate data from several machines at a centralized store, edge computing is a distributed computing that brings a single, or a group of machines computation and data storage closer to the sources of data. This can improve response times and save bandwidth.

In an industrial environment, conducting analytics at an individual device can provide significant cost and resource savings compared to data processing using a purely cloud-based method. For clarity, this cloud-based method refers to streaming data from multiple devices to one centralized store and conducting data analysis there.

Drowning in data

Using the centralised method, huge volumes of data must be collected and transferred to one place before they can be analysed. While there are advantages to having every

piece of machinery data in a central hub, it can be painfully difficult to manage. This complexity will be heightened in facilities with a large number of machines, especially if the communication protocols differ on each device. Unfortunately, not all data speaks the same language.

This method can also create a massive glut of operational data — and weeding out insightful knowledge from the monotonous can be a painstaking task. Let's face it, spotting inaccuracies in the metal cutting process of a large and expensive part is crucial knowledge, but the energy efficiency of a small conveyor at the end of the process, for instance, isn't quite as valuable.

With edge computing, operators can instead set parameters to decide which data is worth storing — either in the cloud or in an on-site server — and which isn't.

To be clear though, edge computing is not an alternative to cloud-based methods, or an Industrial Internet of Things (IIoT) process in which cloud-based technology and edge computing can work together. These technologies are not competing against each other. In fact, each

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is making the other's job easier. The computing environments associated with IIoT take a variety of forms, from an industrial PC (IPC) remote server to a gateway or back-office infrastructure. These tools are essential to support edge computing because they are distributed away from the core, or the cloud. They have the capacity to perform a variety of tasks — particularly tasks that don't necessitate analytics at the edge.

The benefit of this combined model is that it allows enterprises to have the best of both worlds: reducing latency by making decisions based on edge analytics for some devices, while also collating the data in a centralised source. The model also allows future analysis of data and other processes, and the capturing of data required for regulatory reasons.

Edge computing in practice

As with other industrial innovations, some manufacturers perceive edge computing as daunting, unobtainable or out-of-reach. However, that couldn't be further from the truth. The primary benefit of edge analytics is its scalability. Pushing analytics to sensors and network devices can significantly reduce the strain on enterprise data management (EDM) and analytics systems. Plus, there's the opportunity to start small.

Unlike the smart factory concepts hailed in the early 2010s,

With edge computing, operators can instead set parameters to decide which data is worth storing — either in the cloud or in an on-site server — and which isn't.

deploying edge computing does not require an entire systems overhaul or investment in several machines. Instead, manufacturers can opt for just one device that provides analytics at the edge.

For instance, with Sandvik Coromant's CoroPlus® edge computing offering, intelligent tools and sensors can be deployed on one piece of equipment. This has proven especially beneficial in the boring of large components, for example, where one small mistake can be incredibly costly.

To avoid mistakes, the newly-launched machine integrated version of Sandvik Coromant's Silent Tools™ Plus, with CoroPlus® Connected, uses data generated at the cutting zone to identify potential problems. Automated cutting actions can then be applied to avoid any costly mistakes.

Overcoming barriers

As with all industrial technologies, security concerns about edge computing are rife. In fact,

according to a Collective report, 66 percent of IT teams view the architecture as a genuine threat to their organization. The primary reason for this concern? Apprehension about edge security.

Naturally, the distributed nature of edge computing does require some changes to security methods — especially if the facility has relied previously on a traditional centralized or cloud-based infrastructure. With edge computing, data instead travels between different distributed nodes, which may require special encryption mechanisms that are independent of the cloud.

On the other hand, processing data at the edge minimizes the transmission of sensitive information to the cloud. Some could argue this is more secure but, in reality, it depends on your security protocols.

That being said, malicious, routing information and Distributed Denial of Service (DDoS) attacks are still possible — as they are with any internet-enabled device. The first and most important step is to seek confidence and reassurance from the manufacturer of your edge device.

At Sandvik Coromant, for instance, we've designed a new security principal to give our customers peace of mind. It's been developed to support the ANSI/ISA-95 standard, an international standard from the International Society of Automation for developing automated interfaces between enterprise and control systems.

Better understanding

Edge computing is widely hailed as a ground-breaking technology for the industrial realm, and wider IT applications. However, there are multiple misconceptions that must be dispelled before edge systems are deployed in industrial settings.

First, the technology doesn't replace IIoT, nor does it compete



with other cloud-based analytics methods. In fact, the technologies must work harmoniously for manufacturers to reap the true benefits of edge computing. Similarly, the technology doesn't pose any greater security risk than existing internet-enabled data collection methods. Security protocols may simply need updating.

It's clear that edge computing can provide significant benefits to manufacturers. They include reducing the latency involved in decision making, optimizing cloud-based data collection, and reducing the energy required to consistently

stream data from every device in a facility to a centralized hub.

What's more, deploying edge computing is more straightforward than many believe. Manufacturers needn't overhaul entire systems to reap the benefits of the edge. The proper deployment of edge nodes can provide several benefits including reduced latency for real-time applications, more efficient use of bandwidth and storage resources, enhanced scalability, reduced energy costs, improved environmental performance, as well as better opportunities for privacy control and data protection. ♦

About the Author



Nevzat Ertan is the Chief Architect & Global Manager at Sandvik Coromant. Nevzat has a broad background in applied mathematics, computational methods and more

than 35 years of working experience in the area of Information & Communication Technology (ICT), predictive science, and technical business development & strategy. He is also responsible for Sandvik Coromant's Digital Machining Architecture department, is the subject matter expert for Digital Business/Digital transformation and industrial Internet of Things (IIoT) and has broad international experience as an executive member of various boards.

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ABB India 'Smart Power portfolio' expands capacity with cobots



One of the first-of-its-kind factory with Industry 5.0 standards, with human and cobots collaboration, this factory supports urbanization with sustainable, reliable power installations, manufacturing digital circuit breakers, contactors, relays, etc. and has enhanced its productivity by 40%, energy productivity by more than 15%, test automation ratio by 50%.

ABB India has expanded and upgraded its Smart Power factory in Nelamangala, Bengaluru, to meet the strong demand growth for its Smart Power solutions and energy management technologies with one of the first Industry 5.0 production processes. The smart facility harnesses advanced collaborative robotics technology for better human-machine interface, artificial intelligence (AI) and advanced digitalization technologies to create a sophisticated, automated, and flexible future-ready factory.

This first-of-its-kind facility manufactures, tests, and supplies ABB Smart Power's complete range of low voltage power equipment and energy management technologies to meet demand from the industry for increased reliability and energy savings. It

caters to the increasing demand across sectors including commercial and residential buildings, infrastructure, utility and renewable energy systems of solar, wind and many others where electricity is consumed.

Spanning over 8,400 sqm, the ABB Smart Power factory, links equipment such as robots, motors, and drives to the Internet of Things (IoT). The connected factory software highlights process optimization opportunities and schedules predictive maintenance to maximize productivity and efficiency. This resulted in enhanced productivity of 40% in the same space, with an energy efficiency of 15%.

"The upgrades and expansion at the Bangalore factory make it one of our most advanced production facilities in the world. The adoption of exciting

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new Industry 5.0 technologies makes this an ideal home for the production, testing, and supply of ABB Smart Power's technologies. The Smart Power team are the ideal partners for customers pursuing higher standards of safety, reliability, and energy efficiency in their operations," said Giampiero Frisio, President, Smart Power Division, ABB Group.

"Through our own digital transformation at this facility, we will be able to demonstrate the benefits of adopting smart solutions directly to our customers. We believe that this will encourage the shift towards digital and sustainable manufacturing in India. Smart factories would be the cornerstone for the Indian manufacturing sector to leapfrog and manufacture quality electrification products and solutions to support the country's

Smart factories would be the cornerstone for the Indian manufacturing sector to leapfrog and manufacture quality electrification products and solutions to support the country's next level growth across sectors sustainably.

- Kiran Dutt, President, Electrification Business, ABB India Ltd.

next level growth across sectors sustainably," said Kiran Dutt, President, Electrification Business, ABB India Ltd.

This facility also houses numerous robot types with

combined autonomous test cells for different product variants. Enabling last-mile manufacturing competitiveness, a Metrology Lab ensures standardization in measurement, calibration, and inspection to match the highest standards of design specifications and product quality. A Test Lab in the facility performs rigorous endurance tests of products manufactured for conformance.

In line with ABB's 2030 sustainability strategy in achieving carbon neutrality, this Smart Power Factory is nested within ABB India's integrated Nelamangala Campus, which is certified by Indian Green Building Council (IGBC) with Platinum rating and by The Energy and Resources Institute (TERI) for water positivity. ♦

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Boeing and Jaivel Aerospace announce second skills programme for Gujarat aerospace sector

20 young women and men will receive classroom and on-the-job training in this unique skill-building programme, which aims to help create a skilled and employable workforce for the aerospace manufacturing sector.



In picture from left: Sudeep Dube – Partner, Learning Links Foundation, Anil Sankar – Supplier Program Manager, Boeing India, Gunjan Tilva – Function Leader – APQP, Jaivel Aerospace, Rekha Vachhani – CFO, Jaivel Aerospace, Pragnesh Patel – Business Leader – Systems, Jaivel Aerospace, Maria Laine-Vice President International Sales & Strategic Partnerships, Boeing Defence, Space & Security, Salil Gupte-President, Boeing India, Alain Garcia-Vice President of Business Development For Defence and Services Boeing India, Praveena Yagnambhat-Chief of Staff & CSR Lead, India & South Asia, Vipul Vachhani – Founder & CEO, Jaivel Aerospace, Anubhav Kumar-Director Strategy, Boeing India, Amrita Purkayastha – Executive Assistant, Boeing India, Pradeepkumar Chikkamath – Principal Consultant, Learning Links Foundation

Boeing, Jaivel Aerospace and Learning Links Foundation (LLF) announced the launch of a new chapter of 'Learn and Earn', a unique youth skilling programme aimed at creating skilled and employable workforce for the aerospace and manufacturing sector in Gujarat.

The second batch of 20 trainees in the programme will undergo classroom training, followed by on-the-job training at Jaivel Aerospace. The curriculum will focus on mechanical and fabric tooling in the aerospace manufacturing sector. The programme will aim to provide technical and soft skills, which the trainees can leverage to secure employment opportunities with various aerospace manufacturing Micro, Small & Medium Enterprises



(MSMEs) operating in Gujarat.

"Boeing has been supporting the growth of the Indian aerospace sector over the years by addressing the critical and growing need to skill frontline workers for the aerospace manufacturing sector. With the new chapter of the skills programme, we aim to inspire the next generation talent, and help them develop skills to strengthen the aerospace ecosystem in the state of Gujarat, in line with the vision of 'Aatmanirbhar Bharat' and Skill India," said Salil Gupte, President, Boeing India.

Since its inception, the 'Learn & Earn' Programme has already benefitted 188 individuals, of which 23% are girls and 14% PWDs, and helped them attain jobs in various industries. It is a unique programme that aims to

bridge the skill gap among the youth by curating an industry-need-aligned training curriculum that can help them readily obtain employment as a productive workforce. The programme aims to further strengthen the aerospace ecosystem in the country and is in line with the Government of India's 'Skill India' initiatives.

"Building on the success of the first skills programme in 2019, we are delighted to launch second skills programme in partnership with Boeing and Learning Links Foundation," said Founder & CEO—Jaivel Aerospace, Vipul Vachhani. "Our team at 'Inspire One' are on a journey to build a fully digital manufacturing ecosystem; this endeavour provides an excellent opportunity for young minds to learn and develop their creative thinking," he added. ♦

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National

Auto Expo 2023

The Auto Expo, over the years has grown tremendously in size and transformed itself into a global event. Owing to the tremendous growth of Auto Expo - Asia's largest Automotive expo is now seen at two different venues with clear focus on Automobiles (Auto Expo - Vehicles) and Components (Auto Expo - Components)

Date: Jan, 12-15

Venue: Pragati Maidan, New Delhi

Organiser: ACMA, CII, SIAM

Contact: +91 0124 4060
neelam.bhagat@cii.in

IMTEX 2023

IMTEX is a flagship event for the Indian metal cutting industry. It is South Asia's apex exhibition showcasing the latest trends as well as technological refinements from India and other global players. The mega event attracts visitors from a wide spectrum of manufacturing and ancillary industries including key decision and policy makers as well as industry captains who are keen to source latest technologies and manufacturing solutions for their product lines.

Date: Jan, 19-25

Venue: BIEC, Bengaluru

Organiser: IMTMA

Contact: +91 80 6624 6600 / info@imttx.in

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Venue: Pragati Maidan, New Delhi

Organiser: PLASTINDIA FOUNDATION

Contact: +91 22 26832911/14 / contact@plastindia.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

Moulding expo 2023

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

Date: Jun, 13-16

Venue: Messe Stuttgart

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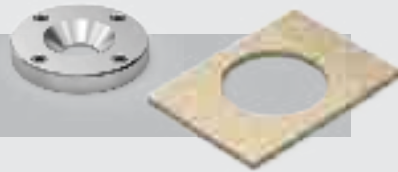
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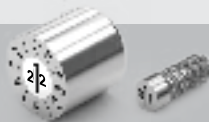
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Factory : Plot Survey No. 577, Atgaon Indl Estate, Mumbai Nasik Highway, Post Pundhe, Atgaon, Taluka Shahapur, Dist Thane-421601, Maharashtra, India
Phone : +91-22-6128 2626 (100 Lines) 2851 2635 / 6691 4412 Fax : +91-22-2851 8690 / 2859 0285
Mobile : +91-9820030764 Email : marketing@devutools.com, sheregar@devutools.com
Web : www.devutools.com