

TAGMA TIMES

NEWSLETTER

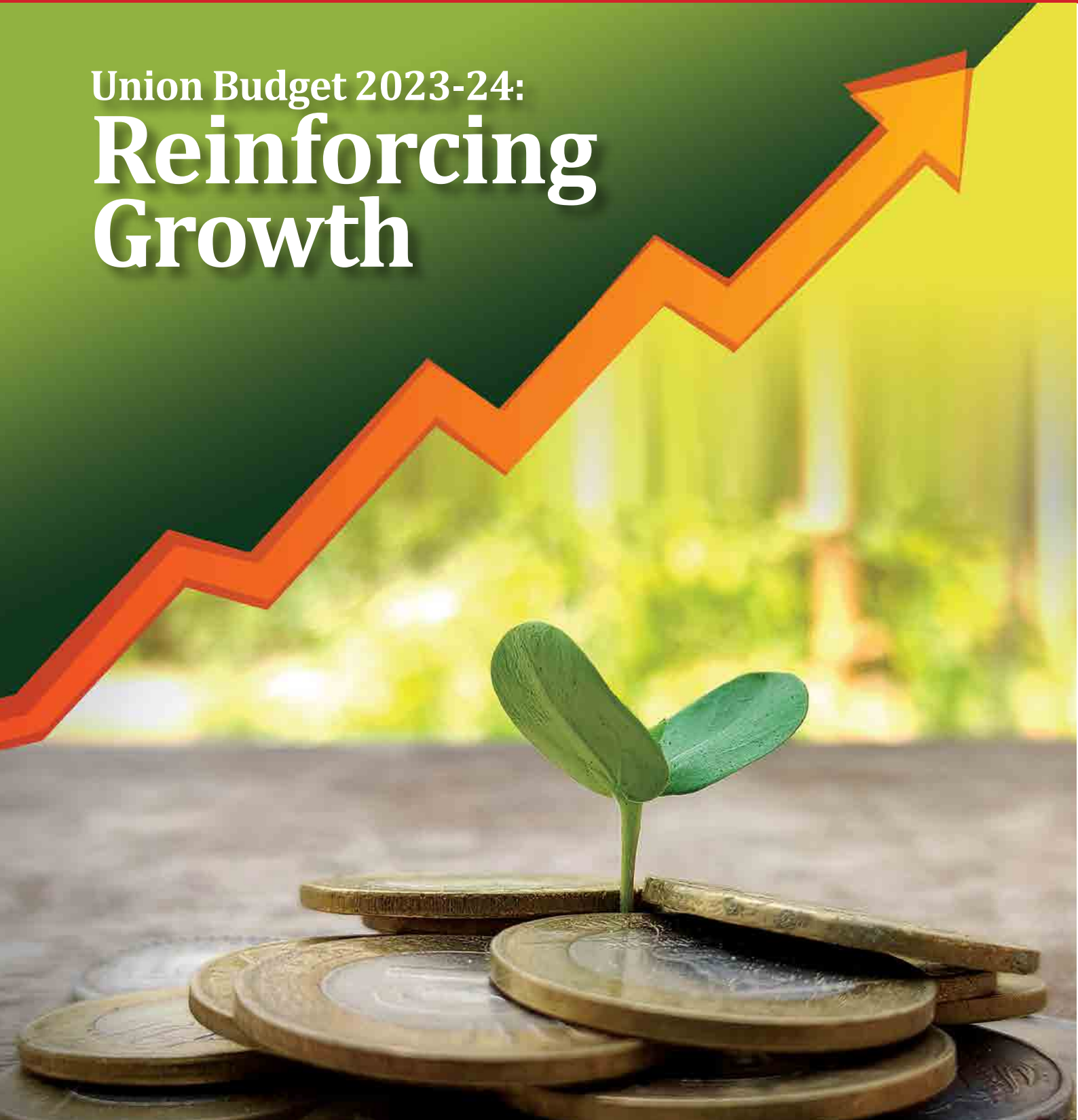
(Technical Info. on Die, Moulds & Toolroom)

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February 2023

Union Budget 2023-24: Reinforcing Growth





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◀ **THRUHARD SUPREME HH** ▶

"When designers at BMW-Germany are working on the new design for the 7 series, they also know what is the best mold steel that will meet their high quality requirements-THRUHARD SUPREME HH"



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The recently announced Union Budget 2023-24 has received mixed reactions from various industries. But the manufacturing MSMEs, including those from the die & mould industry, have reasons to be pleased with the Budget announcements. And, why not? After all, the Budget not only focusses on infrastructure development, but has also increased spending on research and development, and promotes ease of doing business.

One of the most significant announcements in the Budget was the allocation of INR 10 lakh crore for infrastructure development. This move is expected to create a conducive environment for the manufacturing sector, especially the MSMEs, as it will provide them with better connectivity, logistics, and access to markets. Additionally, the government's push towards the development of industrial parks and smart cities will help MSMEs in the die & mould industry to expand their businesses and reach new markets.

Unlocking the ease of doing business and enabling access to affordable capital have been the key demands of the MSME sector in recent years. Budget 2023-24 brought forth a few positive reforms around the ease of doing business by proposing to reduce more than 39,000 compliances and decriminalizing over 3,400 legal provisions. The Budget also includes several other announcements, such as the extension of the Credit Guarantee Scheme, DigiLocker, and the strengthening of the digital ecosystem. However, it remains to be seen how effectively these measures will be implemented and their impact on the ground.

The February issue of TAGMA Times tells you all you need to know about Union Budget 2023-24. The 'In Focus' section highlights what the Budget has in store for MSMEs and also features the views and expectations of those from the tooling fraternity, the large business executives, and the industry associations. Speaking of expectations, what does the industry expect from the tooling industry? An expert from Tata AutoComp explains it all in our 'Tool Talk' section.

Happy Reading!

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NUM launches next-generation CNC platform

CNC specialist NUM has launched a radically new CNC platform that sets fresh performance benchmarks in machine control. NUM's new FlexiumPro CNC platform makes significant advancements on the calculation power, speed, connectivity and reliability of the company's previous-generation Flexium+ CNC system.

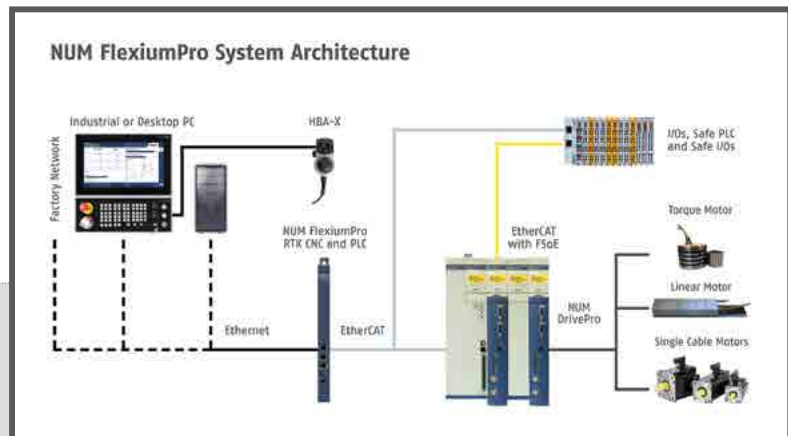
FlexiumPro's Real-Time Kernel (RTK) hosts an embedded Codesys V3 PLC and a CNC unit. Based on a multi-core ARM processor, the RTK is implemented using advanced system-on-chip (SoC) technology. The tightly integrated nature of this technology helps to significantly reduce the component count, resulting in improved system reliability and compactness. The single-board and fan-less design of the RTK unit is only 25 mm wide.

The speed advantages of NUM's FlexiumPro CNC system are considerable. Its hard real-time operating system reduces latency and obviates the time overheads of complex 'soft' operating systems; every aspect of the hardware and firmware is optimized to maximize machine precision and performance, while delivering secure connectivity.

Compared to its Flexium+ predecessor, the new system is more than 10 times faster – from boot time and block-per-second execution, to axis control, PLC/CNC data exchange, robot and peripheral I/O interfaces.

The PLC application, part programs, machine configuration, calibration data, etc., are all safely saved on a removable microSD card – and to secure shutdown processes, the FlexiumPro RTK incorporates super-capacitors, which keep the system alive for the time needed to save all data in the case of hard power off.

Machine users and OEMs familiar with NUM's Flexium+ CNC system will find it very easy to migrate to FlexiumPro. Its PLC programming languages and environment are identical to Flexium+, part programs remain compatible with both systems, software interfaces to custom HMIs (Human Machine



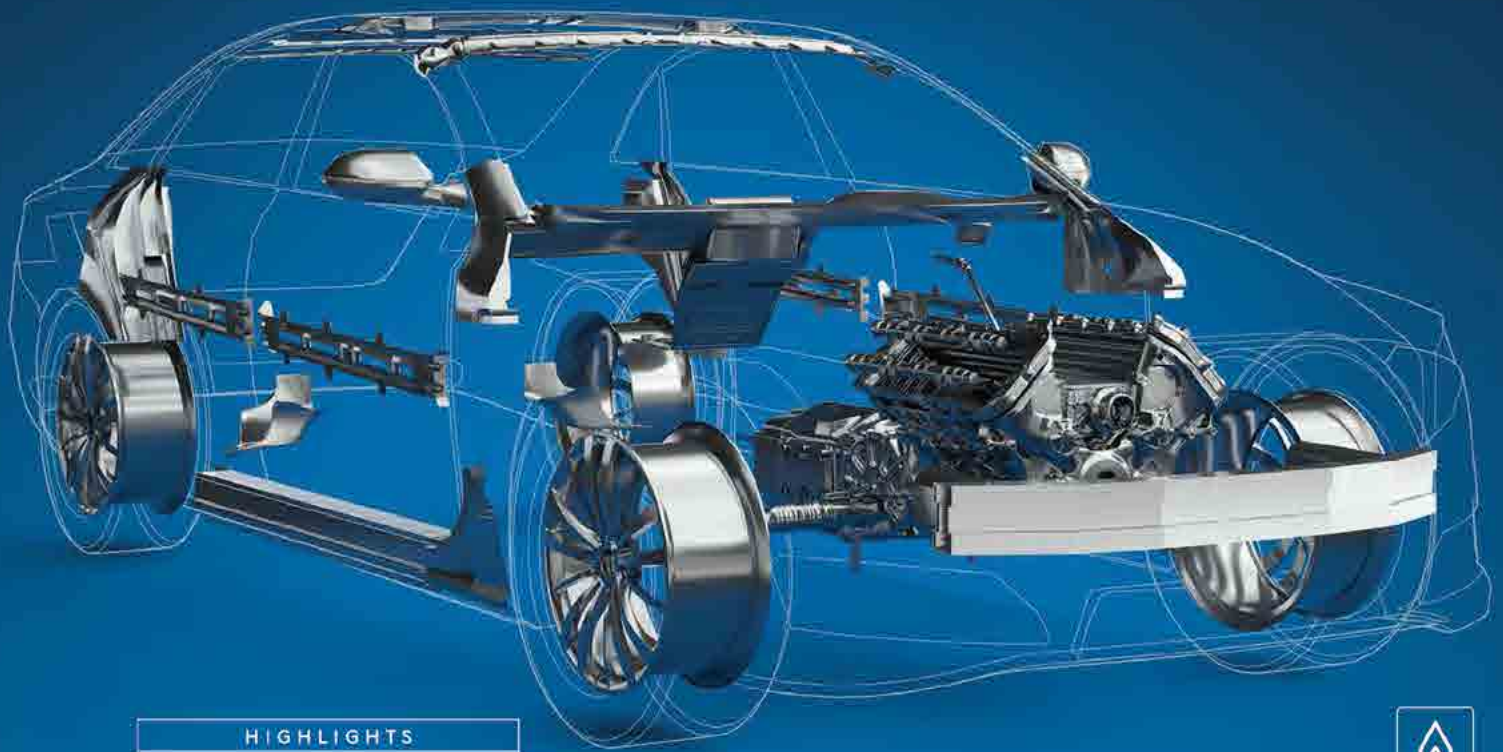
Interfaces) remain very similar, and all EtherCAT terminals and safety devices are unchanged.

FlexiumPro retains and extends all behavioural and functional aspects of NUM's Flexium+ system. These include control of up to 32 axes and/or spindles, up to 32 machining channels, and sub-nanometer interpolation capabilities. The system still supports RTCP (Rotation Tool Center Point) and HSC (High Speed Cutting) functions, as well as a number of technology-specific functions and machining cycles.

NUM has also developed an innovative user interface (UI) architecture for FlexiumPro that can incorporate individual OEM-defined modules with integrated features related to the technology. Until now, OEMs often had to develop dedicated HMIs for specific technology in their products, which could be an expensive, time-consuming task.

NUM's new FlexiumPro dual-layer HMI architecture significantly simplifies this aspect of machine tool design. The functionality of the underlying user interface modules (UIMs) can easily be defined, modified and saved by OEMs, facilitating the creation of highly ergonomic application-specific HMIs. This new approach to user/machine interaction utilizes the latest software technologies – WPF for the UIMs and C# for the software development kit (SDK) – to maximize performance in terms of speed and resource management.

Like its Flexium+ predecessor, NUM's FlexiumPro HMI runs under the Windows operating system; it can either be directly connected to a FlexiumPro RTK or it can run remotely on any PC connected to the same LAN as the FlexiumPro RTK. For additional flexibility, the system also supports multi-HMI configurations (for use when a single machine tool has more than one HMI), PLC-based visualization pages, and NUM's renowned Flexium 3D graphical simulation software. ♦



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DMG MORI is positioning the new CTX 350 universal turning machine as the successor model to both the CLX 350 and the CTX alpha 500. The world premiere consistently combines the best of both series – the price level of the CLX series and the performance and equipment diversity of the CTX alpha machines. These include a dynamic, precise C-axis, a VDI30 turret and a main spindle with energy-efficient synchronous motor that achieves a speed of 5,500 min⁻¹. Optional equipment variants include a Y-axis with +/- 50 mm, a tailstock, a counter spindle with 6,000 min⁻¹ speed and a chip conveyor. On the control side, DMG MORI installs either SIEMENS or FANUC. Intelligent automation solutions for autonomous loading and unloading complete the modular system around the CTX 350.

Its versatility makes the CTX 350 a valuable universal turning center in any production environment. Compared to the previous models, DMG MORI has been able to increase the working area while maintaining the same footprint of around 8 m². A bar passage with ø 65 mm, a chuck with ø 120 mm diameter and a turning length of up to 540 mm depending on the equipment variant allow machining of a wide range of components. The turning diameter is ø 320 mm. The turret provides space for twelve driven VDI30

tools. Their speed is 6,000 min⁻¹, optionally up to 12,000 min⁻¹. For the main spindle, DMG MORI uses an internal synchronous motor that is ten percent more efficient. The accuracy of the C-axis is due to a measuring system that is mounted on the front bearings and is therefore independent of small spindle deformations.

Automation solutions from a single source

DMG MORI has also taken the importance of automated production into account for the CTX 350. An integrated robot for loading and unloading chuck parts is available for the universal turning center, or a likewise integrated unloading unit for shafts up to 500 mm long and ø 40 mm in diameter. Alternatively, the CTX 350 is also compatible with Robo2Go Turning, which brings additional flexibility to production automation.



TD 110: Break detection without breaking the bank

Specially designed for quickly sensing tool breakage during use within a machine tool, HEIDENHAIN CORPORATION introduces the new TD 110 Tool Breakage Detector. Providing contact-free inspection of drill bits and end mills, it can determine whether a tool is broken off by more than 2mm as it passes within a machine tool, yielding significant time and money savings.

The TD 110 tool breakage sensor can be placed in the work envelope so that it is fast and easy to reach during the tool change. The inductive sensor can detect tools as they pass by while they are spinning at their operational speed.

Thanks to its rapid scanning technology, even very small tools made of HSS steel and carbide are detected.

The breakage sensor can then generate either a floating or an HTL switching signal and the machine control can evaluate it via standard instruction sets. These signals/ outputs can be used to connect to a HEIDENHAIN TNC control or a PLC or to any other IOs of nearly every CNC control manufacturer. In addition, an LED signals whether a tool has been flagged.

Overall benefits of the HEIDENHAIN's new TD 110 tool breakage detector include:

- Maintenance-free sensor for reducing non-productive time for breakage inspection.
- Cooling lubricant and lightly contaminated tools are tolerated.
- Universally retrofittable thanks to standard interfaces for tool touch probes.

Electric vehicle manufacturer EKA Mobility bags order of 310 electric buses

Electric vehicle (EV) and technology company EKA Mobility recently said it has received a letter of allotment (LoA) for the procurement, operation, and maintenance of 310 electric buses on gross cost contracting, from Convergence Energy Services Ltd.'s recently concluded tender for 6,465 electric buses. The tender was rolled out by state-owned Convergence Energy Services Ltd., a wholly-owned Energy Efficiency Services Ltd. (EESL) subsidiary under the National e-Bus program Phase 1.

According to EKA, the e-buses will be deployed in the Transport Department Haryana, Department of Transport, Arunachal Pradesh, Kerala State Road Transport Corporation for intra-city operations as part of the government's efforts to provide clean, sustainable, and efficient transportation options. With this order, EKA Mobility's order book has grown significantly, with more than 500 electric buses and over 5,000 electric light commercial vehicle orders in the pipeline.

Speaking on the occasion, Sudhir Mehta, Founder & Chairman of EKA, said: "We are thrilled to have been



Image used for representation only. Courtesy Envato Elements.

selected by multiple state transport authorities to operate electric buses as part of the National e-Bus program Phase 1. This order is a testament to the fact that design and making in India is now a reality and is a viable alternative that can replace the Chinese products that are coming into the market. With EKA, we are confident to build an ecosystem for sustainable transportation, that is efficient, reliable, and profitable."

EKA Mobility has also developed a nine-metre city bus on a hydrogen fuel cell platform. Going forward, the company plans to introduce multiple variants of electric and hydrogen fuel-cell buses, along with an e-light commercial vehicle range. ♦

Courtesy: IANS

Emmvee gets into a contract with Fraunhofer ISE as technology partner for its new mega cell line

Emmvee Group, a global manufacturer and supplier of PV Modules, has signed a contract with Fraunhofer ISE, the largest solar research institute in Europe. The MoU appoints Fraunhofer ISE as Emmvee's solar technology partner for its upcoming solar cell manufacturing facility near Bangalore. The collaboration aims to set up a 1.50 GW integrated Mono PERC/TOPCon cell production facility.

"Partnering with Fraunhofer ISE will help us to improve our skill, quality and efficiency and allow us to produce high quality cells and modules in the industry. This association will help us to enhance our product portfolio to develop and build new cell configurations and module sizes," said Mr. Manjunatha, Managing Director, Emmvee.

"Fraunhofer ISE's expertise in advanced cell manufacturing technologies, complex process interactions, and profound engineering approach is as unique as Emmvee practices. We are proud to be the first Indian solar company to associate with Fraunhofer ISE. We strongly believe that this collaboration allows us to deliver the industry leading efficiency within the timelines," said Mr. Suhas Donthi, Director, Emmvee.

"Emmvee and Fraunhofer ISE have mutually signed



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the agreement for the entire project timeline which spans over more than 36 months," said Dr. Jochen Rentsch, Head of Department Production Technologies – Surfaces and Interfaces at Fraunhofer ISE. "The project stages include technical evaluation of process equipment and consumables, training of employees in cell production, ramping up and optimization of production lines as well as a TOPCon upgrade with cell line optimization." ♦

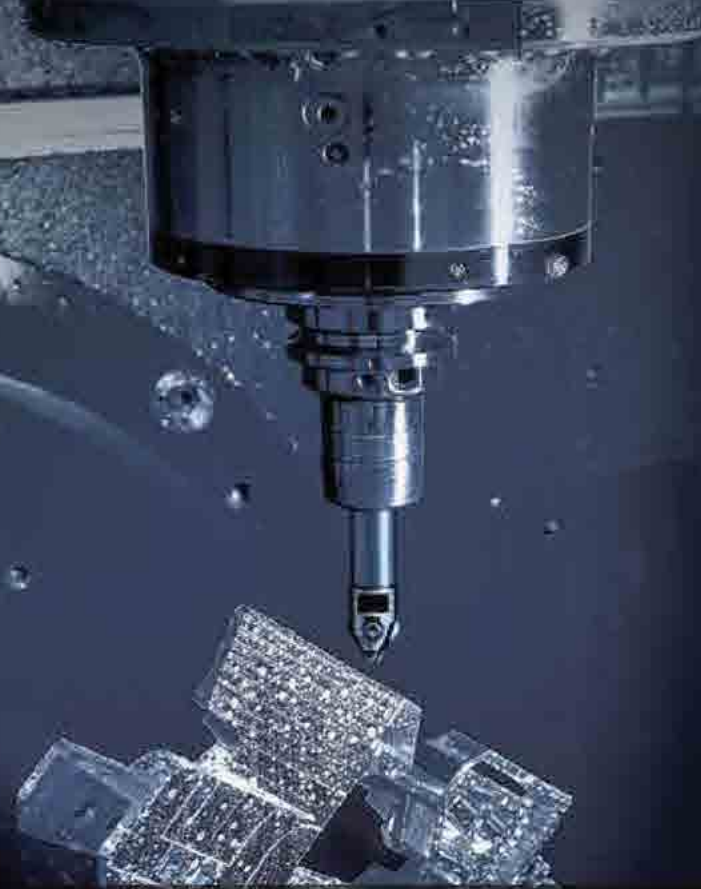
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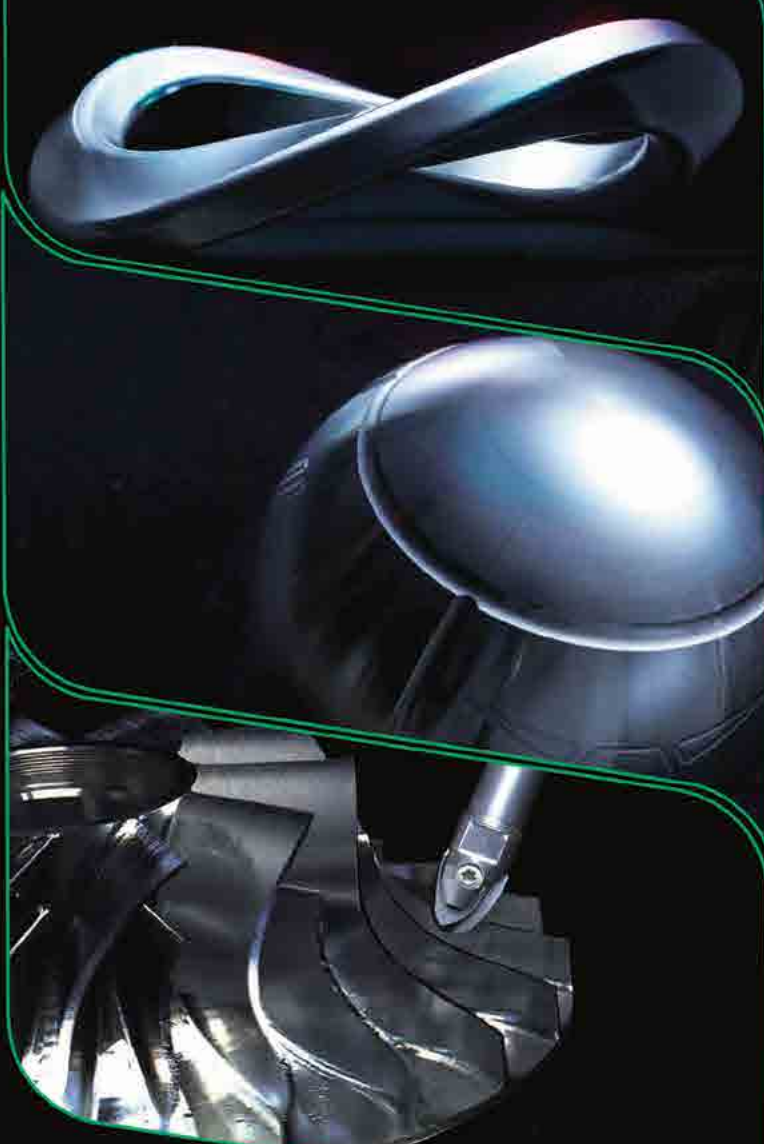
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Maini Precision Products and L3Harris ink deal for aircraft ejector release units

US-based L3Harris Technologies and Maini Precision Products Limited (MPP), Bengaluru, have signed a teaming agreement for manufacture of aircraft ejector release units (ERUs), at Aero India 2023. Under the terms of the agreement, L3Harris and MPP will localise the ERUs in a phased manner, as well as set up an MRO facility in India. The definitive objective of the partnership is to jointly offer 'life of type' support with maximum localisation.

A 'Make in India' project, the ERUs will be suitable for various prestigious Indian aircraft programmes, including the Light Combat Aircraft Mark 2 and the Advanced Medium Combat Aircraft. Approved by the US government for safety features and crew interface even when pressurised, the ERUs feature advanced technology compared to other contemporary ERUs. This partnership is expected to give a boost to the 'Aatmanirbhar Bharat' programme.

Gautam Maini, Managing Director, MPP, said, "The signing of the teaming agreement between L3Harris and the Aerospace Division of MPP stands testament to the 19 years of our focus on ensuring quality and working to provide high-tech solutions for our partners and customers in the aerospace industry. Working with a global organisation like L3Harris to localise manufacturing, repair and overhaul high technology products will facilitate MPP's principle of 'Make in India and for the World' and provide life of type support to the Indian aircraft programmes."

The ERUs offered by L3Harris and MPP will be designed with integral bottles, offering several advantages over



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the external bottle concept, including being designed as fit-and-forget ERUs with a zero-maintenance requirement on the part of operators, resulting in significant savings in lifecycle costs as well as substantial ease in day to day and combat operations. Additionally, integral bottle management has no requirement for logistics, unlike an external bottle approach. Pylon integration is also simplified since access doors or brackets are not required in the pylon design, and pneumatic tubes do not need to be routed from ERUs to pylons. These design features enable faster and safer re-arming operations for loading crews and the ability to carry a wider array of weapons. ♦

Courtesy: IANS

Omega Seiki to invest \$98.1 million in India EV parts plants

Omega Seiki Mobility Pvt. will invest 8 billion rupees (\$98.1 million) to build two facilities in India to manufacture electric vehicle components such as batteries and power trains. The New Delhi-based company has tied up with startup iM3NY, which manufactures lithium-ion cells in New York, to produce batteries in the South Asian nation, it said in a statement. Omega, founded in 2018, has also entered a joint venture with Jae Sung Tech Korea to make electric vehicle power trains locally, it said.

The demand for lithium-ion batteries in India will increase from 3 gigawatt-hour currently to 20 gigawatt-hour by 2030, consultancy Arthur D. Little estimates, making it crucial to ramp up local cell manufacturing capacity. India imports 70% of its lithium-ion cell requirement from China and Hong Kong due to lack of local production.

Omega's battery facility in the western state of



Maharashtra will have a capacity of 0.5 gigawatt initially and scale up to 2 gigawatt, the company said. Its power train plant in Haryana will produce 10,000 units in 2024 and 100,000 by the fourth year, it said.

Cleaning up transport will help the world's third-biggest emitter of greenhouse gases meet its target of becoming net carbon zero by 2070. ♦

Courtesy: Bloomberg

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Renault and Nissan renew commitment to Indian operations through new investment and vehicles

Renault and Nissan have announced a new long-term vision for India, increasing production and R&D activities, introducing electric vehicles, and transitioning to carbon-neutral manufacturing. From their base in Chennai, the companies will collaborate on six new production vehicles for domestic and international customers, including two new fully electric vehicles, uplifting the Renault-Nissan centre into an international export hub.

An initial investment of around \$600m USD / INR 5300 crores is planned to support the new projects, which will see an up to 2,000 additional new jobs created at the Renault Nissan Technology & Business Centre in Chennai. At the same time, the RNAIPL factory will become carbon-neutral with a significant increase in renewable energy generation.

Following the recent announcement of new high-value-creation operational projects for the Renault-Nissan-Mitsubishi Alliance, the future for Renault and Nissan's Indian operations was outlined at an official ceremony in Chennai by Nissan's Director, Chief Operating Officer, Representative Executive Officer and member of Alliance Board Ashwani Gupta, in the presence of Thiru M.K. Stalin, the Honourable Chief Minister of Tamil Nadu, and alongside officials from the Tamil Nadu Government.

Guillaume Cartier, Chairperson for Nissan's Africa, Middle East, India, Europe and Oceania region, said: "Renault and Nissan are fully committed to the Indian market, committed to electrifying the Indian market and committed to minimising our impact on the environment. India was the first Alliance plant and India will be at the centre of this new chapter of the Alliance, with new vehicles, new R&D activities and new export markets taking our joint operations to the next level. For the first time,



Image used for representation only. Courtesy Envato Elements.

the Nissan line-up in India will reflect our global power in high-quality SUVs and EVs, bringing greater value to our employees, customers and communities."

François Provost, International Development & Partnerships Renault Group and Managing Director of Alliance Purchasing Organization, said: "India is a key market for Renault Group. Over the past 14 years, we have been developing the Renault Brand with our teams and dealers, up to reaching 100 thousand vehicles sold per year. India has also a key role in our R&D worldwide footprint. This project together with Nissan is a first concrete output of the new Alliance ambition."

Mr. S. Krishnan, Additional Chief Secretary, Industries, Government of Tamil Nadu, said: "The Renault-Nissan Alliance in Tamil Nadu has had manufacturing and design facilities operating in the State for more than 15 years now. This is a very valuable and important relationship for the Government of Tamil Nadu and the Alliance. It employs about 15,000 people directly in the State and has been one of the mainstays in ensuring that Tamil Nadu remains the automotive capital of India and an important hub for the manufacture of automobiles and auto components and automobile design as well. We are very excited about this new proposal of modernization and fresh investment by the Renault-Nissan Alliance in Tamil Nadu. This genuinely brings to life 'Make in Tamil Nadu and Make in India for the World!'" ♦

India's Mahindra to invest \$121 mln to set up EV facility in Telangana state

Indian automaker Mahindra and Mahindra Ltd. recently said it will invest 10 billion rupees (\$121 million) to set up a manufacturing facility in the southern state of Telangana to make electric three- and four-wheelers.

The investment will be made over eight years at the company's Zaheerabad plant to develop its last mile mobility business, such as cargo and passenger vehicles, Mahindra said in a regulatory filing.

The company has signed an agreement with the Telangana government for approvals to expand the plant.

Mahindra has stepped up investments to bolster its



EV capacity as the Indian government aims to increase the share of electric vehicles by the end of this decade.

In December, the company unveiled plans to invest 100 billion rupees to set up an EV manufacturing plant near the western city of Pune. ♦

Courtesy: Reuters

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Govt to spend 75% defence outlay for procurement from Indian firms: Rajnath

In a significant announcement, Defence Minister Rajnath Singh has said that the government will spend 75 per cent of the total defence capital outlay for procurement from domestic defence manufacturers from 2023-24. The decision will mean setting aside of around INR 100,000 crore for procurement of military platforms and equipment from the Indian manufacturers, he said.

Singh made the announcement at an event where several agreements and technology transfer agreements were firmed up among large number of defence companies which participated in Aero India 2023. "It is a very significant decision, which will further strengthen the domestic defence manufacturing sector," Singh said.

He also said that Aero India 2023 has shown that the Indian defence sector is ready to march ahead along with top global defence companies. The MoUs and technology



Image Courtesy: Press Information Bureau

transfer agreements signed during Aero India will facilitate a new beginning for defence manufacturing in India, he said. A new chapter in India's aerospace sector has begun today, he said referring to the agreements. ♦

Courtesy: PTI News

Tata Motors to operationalise Ford's Sanand unit in Gujarat in 12-18 months

Tata Motors is looking to commence operations at the Gujarat-based manufacturing plant it acquired from Ford, over the next 12-18 months to scale up its production capacity, according to its head of passenger vehicle business. The automaker recently completed the acquisition of Ford India's manufacturing plant at Sanand through a subsidiary. In August last year, the company had announced that its arm Tata Passenger Electric Mobility Ltd. (TPEML) would acquire Ford India Pvt. Ltd.'s (FIPL) Sanand plant, Gujarat, for INR 726 crore.

In an analyst call, Tata Motors Managing Director - Passenger Vehicle and Electric Vehicles Shailesh Chandra said the company also has the ability to debottleneck capacities at its two existing facilities at Pune and Sanand by an additional 10-15%. "We are targeting to operationalise the Ford plant in 12 to 18 months," he noted when asked about the production capacity at the company's disposal. Chandra noted that the company's production capacity currently stands at around 50,000 units a month.



Commenting on the sales outlook, he said with lean inventory and improved supplies, the fourth quarter should be strong in terms of wholesales when compared to the third quarter.

On the company's expected model mix by 2030, Chandra said: "If we have to take a view by the end of this decade, the mix will be around 25-30 per cent for CNG, 25-30 per cent for EV and the rest would be gasoline, but with a high mix of flex-fuel because that is the direction where things are going."

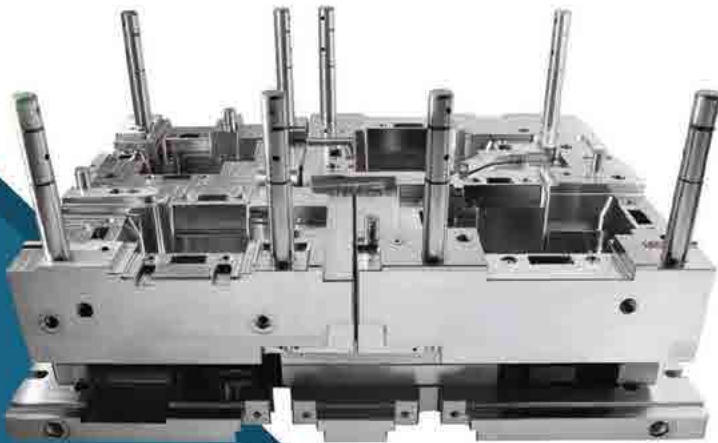
Diesel vehicle share would significantly come down below 5 per cent, he said. ♦

Courtesy: PTI News

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Union Budget 2023-24: Reinforcing Growth

Union Minister for Finance and Corporate Affairs Smt. Nirmala Sitharaman departs from North Block to Rashtrapati Bhavan and Parliament House, along with the Ministers of State for Finance, Shri Pankaj Chaudhary and Dr. Bhagwat Kishanrao Karad and other senior officials to present the Union Budget 2023-24, in New Delhi on February 01, 2023.

Union Minister of Finance and Corporate Affairs Smt. Nirmala Sitharaman presented the Union Budget 2023-24 in Parliament on February 1, 2023. “This Budget hopes to build on the foundation laid in the previous Budget, and the blueprint drawn for India@100. We envision a prosperous and inclusive India, in which the fruits of development reach all regions and citizens... In the 75th year of our Independence, the world has recognised the Indian economy as a ‘bright star’. Our current year’s economic growth is estimated to be at 7 per cent. It is notable that this is the highest among all the major economies. This is in spite of the massive slowdown globally caused by COVID-19 and a war. The Indian economy is therefore on the right track, and despite a time of challenges, heading towards a bright future,” she said.

“With India’s economic growth in the current year estimated at 6.8%, Budget 2023 focuses on creating an empowered technology-driven and knowledge-based economy with sustained focus on infrastructure and green energy, strong public finances, and a robust financial sector,” highlighted a PwC report on Union Budget 2023-24.

Nishant Kashyap and Kimberley D’Mello take a look at what the Budget has in store for MSMEs and what the tooling fraternity, the manufacturing industry, and associations have to say.

Budget 2023-24 will boost fund-starved sectors:

MSME Secretary



Image used for representation only. Courtesy Envato Elements

The Centre has acknowledged MSMEs' contribution to the country's economic growth, and Budget 2023-24 has given a boost to the fund-starved sector with higher credit flow and by simplifying compliances, an official has said. Availability, accessibility and affordability of credit/funds are the main challenges of the sector, said B. B. Swain, Secretary to the Union Ministry for Micro, Small and Medium Enterprises (MSMEs).

He was addressing a session at the launch of the three-day Indian Foundry Congress (IFC) and India Foundry Equipment Exhibition (IFEX),

being organised by the Institute of Indian Foundrymen (IIF) at the India Expo Centre in Greater Noida. "The government has acknowledged the contribution of MSMEs to the economic growth of the country. Union Budget 2023-24 has given a boost to the fund-starved sector with higher credit flow and by simplifying compliances," Swain said.

He said the launch of a revamped credit guarantee scheme worth INR 9,000 crore for MSMEs would enable collateral-free credit of INR 2 lakh crore loans to small businesses. "Moreover, by reducing the guarantee fee to 1.3 per cent,

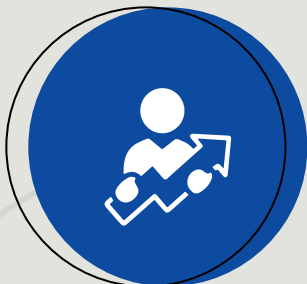
the government has eased collateral credit/funding for MSMEs. This will go a long way to support the sector. These measures can be game changers," he said.

Swain said the MSMEs catering to the foundry industry stand benefitted from several measures the government has taken up. "Over 15,000 MSMEs (out of 5 crore from all sectors) from the foundry industry play the role of a powerful catalyst in making India one of the largest producers and exporters of casting products in the world," he added.

Courtesy: PTI News



The Ministry of MSME shared the following key highlights of Union Budget 2023-24 on Twitter:



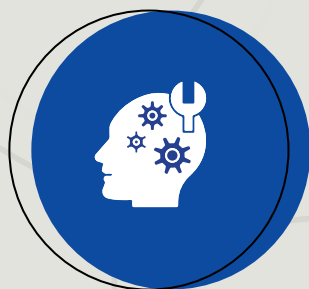
Promoting timely payments to Micro and Small Enterprises

In order to promote timely payments to micro and small enterprises, it is proposed to include payments made to such enterprises within the ambit of section 43B of the Act. Thus, deduction for such payments would be allowed only when actually paid. It will be allowed on an accrual basis only if the payment is within the time mandated under the Micro, Small and Medium Enterprises Development Act.



Credit Guarantee for MSMEs

The revamped scheme for MSMEs will take effect from April 1, 2023, through the infusion of INR 9000 crore in the corpus. This will enable an additional collateral-free guaranteed credit of INR 2 lakh crore. Further, the cost of the credit will be reduced by about 1 per cent.



Skill India Digital Platform

The digital ecosystem for skilling will be further expanded with the launch of a unified Skill India Digital Platform for:

- Enabling demand-based formal skilling,
- Linking with employers, including MSMEs, and
- Facilitating access to entrepreneurship schemes.



Vivad se Vishwas 1 – Relief for MSMEs

In cases of failure by MSMEs to execute contracts during the COVID period, 95 per cent of the forfeited amount relating to the bid or performance security, will be returned to them by the government and government undertakings. This will provide relief to MSMEs.



MSMEs and Professionals

MSMEs are the growth engines of our economy. Micro enterprises with a turnover of up to INR 2 crore and certain professionals with a turnover of up to INR 50 lakh can avail the benefit of presumptive taxation. It is proposed to provide enhanced limits of INR 3 crore and INR 75 lakh respectively, to the tax payers, whose cash receipts are no more than 5 per cent. Moreover, to support MSMEs in timely receipt of payments, it is proposed to allow deduction for expenditure incurred on payments made to them only when the payment is actually made.

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TOOLING fraternity lauds balanced Budget



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Courtesy Envato Elements.



“The state-wise Budget allocation for the first tranche under the ‘Aatmanirbhar Bharat’ scheme will help industrialists, especially small-scale entrepreneurs, avail of the allocated loan to develop their businesses. Some of the benefits here include: free collateral loans to MSME units worth INR 3 lakh crore, MSME fund of funds with an aggregate amount of INR 10,000 crore for small-scale business, subordinate debts for stressed MSMEs worth INR 20,000 crore, and partial credit guarantee of INR 4,000 crore for stressed MSMEs, among others. However, there is a need for more awareness among industrialists across India, especially the southern states. Besides, MSME membership should be given special recognition, and the process to obtain a loan should be simplified.”

**Bharani M., Managing Director,
Uni Modern Tooling Solution Chennai Pvt. Ltd.**



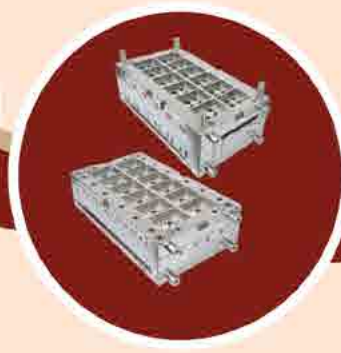
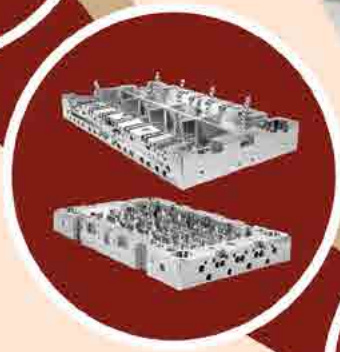
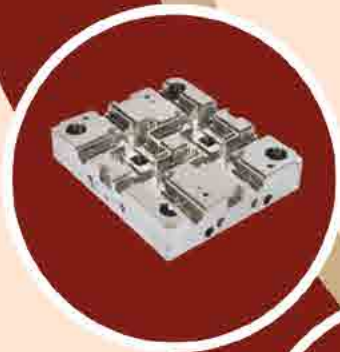
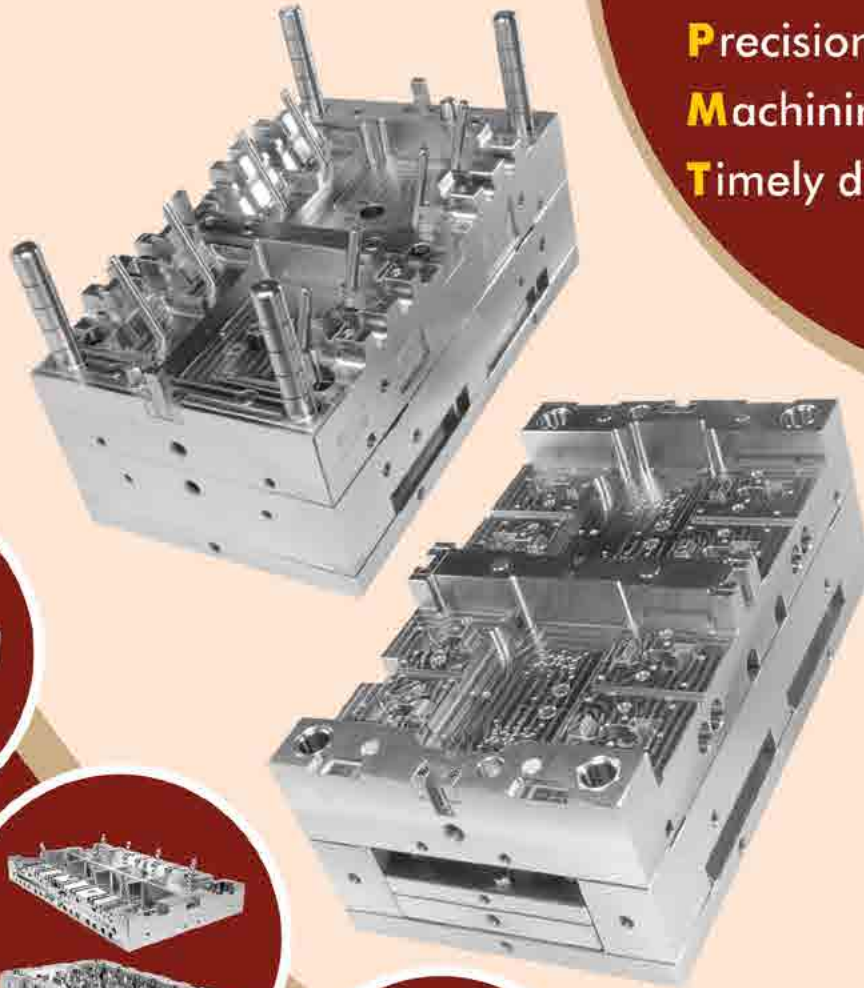
“We, as an MSME, believe that Union Budget 2023-24 will help the manufacturing sector boom. The Indian manufacturing sector anticipates promoting R&D and providing incentives to local manufacturers. Additionally, companies in the manufacturing space should be rewarded for bringing up new technologies and adopting sustainable business practices. In the aftermath of the pandemic, which impacted both the supply and demand, the manufacturing industry seeks support from the government. The Budget will impact our manufacturing sector. And, in the coming days, it will affect the market. Overall, I believe that Union Budget 2023-24 will be critical for the re-emergence of India’s manufacturing industry, which is currently recovering from the pandemic’s impact.”

Thomas George, Director, Accad Solutions Pvt. Ltd.

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"Overall, Union Budget 2023-24 is certainly a progressive one. The capital outlay for defence and infrastructure will drive the economy and create more job opportunities in the manufacturing sector, including the tool & die sector. This Budget would facilitate the journey towards India becoming a global manufacturing hub. It encourages start-ups and MSMEs – the backbone of the manufacturing industry. All OEMs have been instructed to increase the share of locally manufactured components, which would certainly boost the toolmaking industry as well. All banks have been instructed to fund MSMEs with liberal consideration. However, I think the income tax exemption for income from exports could have been re-introduced."

**Vivek Nanivadekar, Executive Director,
FIBRO India Precision Products Pvt. Ltd.**



"The first 'Amrit Kal' Budget with the seven key areas of focus are indeed definite indicators that we are on the right course. Inclusive development, impetus for capital expenditure in infrastructure development and manufacturing, strengthening the financial system, focusing on youth skill and education - all while encouraging environment sustainability. I find this Budget, as well as the recent ones, to be steady and with an achievable goal of unified growth across key sectors. We shouldn't forget that we are laying sound foundations on which we will build tomorrow's structures and to this effect, I give full credit to the Honourable PM for his vision, the Honourable FM and her team for keeping the momentum going, despite external volatility. The reduction in customs duty on machine tools for manufacturing EVs, the credit guarantee scheme and the PLI schemes being extended to 14 sectors including to support manufacturing new AAT products, amongst others, are due to help MSMEs involved in manufacturing. Budgeting is always an act of balancing, and I believe that a disciplined finance decision maker weighs the pros and cons of everything listed or proposed. When one assigns priorities against each, the decision is really more mathematical then. Certainly, this Budget has many positives for the toolmaking and manufacturing segments per se, and any expectations can be further discussed or implemented in the next Budget."

Vineet Seth, Managing Director, Mastercam India



"Union Budget 2023-24 is a balanced budget aimed at accelerating growth, while keeping inflation under control. Reduction in income tax rates will help increase demand and boost the consumption and GDP. The Budget is progressive and will help manufacturing MSMEs, such as toolmakers, to some extent. The announcement of an extended and refreshed ECGLS will help SMEs get loans from banks on favourable terms without collateral. The stipulation of expenditure not being allowed if a customer does not pay MSMEs in time will also act as a deterrent for customers, who delay payments routinely. They will be compelled to pay on time, thus improving the working capital cycle for toolmakers. The design-to-delivery cycle of toolmakers is quite long and a lot of working capital is required. This gets worsened by delayed payments. The Budget has tried to ease the delayed payments problem to some extent. Some incentives on export of tools manufactured by MSME toolmakers could have been added to the Budget. In fact, fiscal incentives for MSME manufacturer-exporters in all sectors should have been announced to assist them grow their exports. MSMEs contribute about 50% of exports from the country and hence, any assistance to them would have benefitted the country at the macro level in terms of generating employment and increasing the GDP. Toolmaking is a manpower intense and skilled activity. So, addition of good quality jobs could have been accelerated."

**Lalit Kumar Pahwa,
MD, Pahwa MetalTech Pvt. Ltd.**



INDUSTRY gives Budget a thumbs up



“Before commenting, I always wait a day to absorb the details. First, the context is that India’s the only major economy in good shape & the budget’s task was to preserve that status. So I was gratified to see the higher capex. That’s all about investing for higher growth. Second, the DNA of our finance ministry has embedded in it a strong sense of fiscal discipline & an aversion to profligacy & bankruptcy. (Unlike a rather fragile neighbour of ours) This budget lived up to that conservative tradition. In line with our conservatism, it was good to see us back on a trajectory towards a lower fiscal deficit. It will be a stretch to achieve, but I believe the Govt. can speed up disinvestment in order to provide the necessary resources.”

Anand Mahindra, Chairman & Team Member, Mahindra Group, on Twitter

“The budget 2023 is oriented to economic growth of the country. I am sure that 33% growth in capital expenditure will result in balanced development. This is a smart move since it will help the country achieve its goal of becoming a 5 trillion-dollar economy and a global powerhouse. I believe that the announcement of setting up 100 labs to effectively develop 5G services and the vision to promote Artificial Intelligence in overall industries is a strong step by the government. This will further lead to automation in the industries, which will help in propelling India’s growth and promoting smart cities. The union budget 2023 has come up with positive announcements for different sectors to support the ‘Make In India’ initiative and can result in balanced growth in the near future.”

Rajeev Sharma, Chief Strategy Officer, Mitsubishi Electric India Pvt. Ltd.

“The Hon’ble Finance Minister Smt. Nirmala Sitharaman has presented an exceptional budget by balancing the need for sustaining rapid growth, while maintaining an eye on fiscal prudence. Given the fact that there is an outlay of INR 10 trillion towards Capex, which represents 3.3% of the GDP, and a 33% Y-o-Y increase, this will definitely contribute to a robust economic growth. While doing so, the government has aimed at a fiscal deficit target of 5.9% for the upcoming year with a clear glide path to bring the fiscal deficit below 4.5 per cent of GDP by 2025-26... Priorities of this year’s budget clearly resonate with the government’s vision for overall development of our country in an inclusive, environmentally responsible manner towards a technology-driven and knowledge-based economy. The added reforms announced towards the ease of doing business, as well as simplifying the direct tax administration, as well as introducing new tax slabs, are bound to lead to greater disposable income, which will generate demand and are supportive for the growth of the economy.”

Vikram Gulati, EVP, Toyota Kirloskar

“The Finance Minister has presented a Budget for 2023-24 that is pro-growth and pro-development, with a focus on sustainable development, energy transition for a cleaner tomorrow, and inclusive growth through a tech-enabled economy.”

Shenu Agarwal, MD & CEO, Ashok Leyland



"The FY 2023-24 Union Budget shows consistency and an intent for growth. The 33% increase in CAPEX outlay underlines the fact that the Budget is pro-growth and the increase is to step up on the 7% growth achieved in the previous fiscal. Main highlights which stood out for us as a commercial vehicles manufacturer was the eye on digitalization by leveraging 5G, which can help optimize costs and improve efficiency in the sectors it is implemented; the INR 19,500 crore outlay for green hydrogen development is a step in the right direction for the future of heavy-duty trucks and largely, the logistics industry; INR 35,000 crore for renewable energy transition projects is also an interesting initiative but how this pans out in the medium term will mark its significance; the PM Awas Yojana that is planned for boosting rural housing would create more jobs and bring more projects for the CV industry. We also feel that the concept of the Green Credit program can be beneficial if thought through and implemented well. Our overall view of the FY 2024 budget is that it is expansive and pragmatic. The budget clearly indicates a penchant for sustainable growth with a potential of aligning with long-term objectives. While the infrastructure push is a fiscal multiplier, it also gives the CV industry plenty of projects to look out for in the medium term... The FY 2023-24 Budget shows consistency but the near-term capital inflow is worth monitoring and improvising on in order to transform consistency into healthy momentum."

Satyakam Arya, Managing Director & CEO, Daimler India Commercial Vehicles

"India's economic growth rate is the result of a resilient economy and prudent fiscal policies of the government. The Union Budget for 2023-2024 continues its focus on this path and the commitment to 'green growth' approach, will further boost the economy. Infrastructure is the most critical aspect of any economy and the highest ever capital investment outlay of 10 lakh crore is most commendable. Combined with the enhanced capital outlay of INR 2.40 lakh crore provided for railways, these steps will go a long way in upgrading infrastructure, assets, systems, and facilities by leveraging technology and promoting a sustainable approach."

Olivier Loison, Managing Director – India Cluster, Alstom, on Twitter



"The Union Budget for 2023 sets the stage for a growth-friendly strategy with a vision of a technology-driven and knowledge-based economy in the post-pandemic world. As the budget focuses on seven pillars of growth with a three-pronged approach to facilitating ample opportunity for citizens, especially the youth, providing a strong impetus to the development and job creation, and stabilizing the macroeconomic environment, we are well-positioned to tackle difficulties and prosper in the new normal. This year's budget provides us with a forward-looking blueprint for India's resilience, competence, and innovation... I am pleased with the Centre's measures for Make AI for India and Make AI Work for India, intended to encourage innovation in AI. The establishment of three Centres of Excellence for Artificial Intelligence at prestigious educational institutions coupled with leading industry players partnering to conduct research and develop cutting-edge applications would unleash the potential of the Indian economy... Innovation is at the core of this year's budget, as the government takes its digital India initiative to the next level with the deployment of 5G services and a new program to promote R&D in pharma. In addition, the Data Governance Policy will be launched this year to enhance startup and academic research and innovation. Thus, we are indeed on a highway to building an open, digital, and inclusive India in the coming years."

**Deepak Visweswaraiyah, Vice President
– Platform Engineering, and Site Managing Director, Pegasystems, India**

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Budget keeps India on the growth path: **ASSOCIATIONS**



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Sunjay J. Kapur, President, ACMA

"The Budget is a blueprint of a digitally enabled, 'Aatmanirbhar Bharat', coupled with measures that will drive sustainable yet inclusive growth at a rapid pace. Focus on exports, manufacturing, local value addition and encouraging green energy and mobility are indeed steps in the right direction. Further, the proposals for personal Income Tax will put more money in the hands of people, thus fuelling consumption leading to economic growth. ACMA is also delighted by the measures announced for skilling and research in hi-tech areas such as AI, Robotics, 5G, Mechatronics and 3D printing, among others. With increasing telematics and software content in vehicles, these measures will ensure that our industry continues to be relevant and globally competitive."



Deepak Sood, Secretary General, ASSOCHAM

"The Budget for 2023-24 is growth-oriented, as it navigates the global storm with a bold, focussed and people-centric approach, incentivising the middle class to spend more through income tax relief, private sector to crowd in investment along with the government's large spend and ease of doing business. The Budget delivers a perfect 10 upon 10 when it comes to maintaining prudence, keeping the path of fiscal prudence with a fiscal deficit of 5.9 per cent of the GDP in a trying global economic environment. The Budget continues with a thrust on 'Make in India', encouraging value addition through customs rationalization, while remaining committed to further improving ease of doing business."





Sanjiv Bajaj, President, CII

"CII welcomes the Budget for new India, which addresses the growth imperatives without compromising on the fiscal prudence path. Through a slew of measures in forward-looking areas encompassing green growth, digital infra, and urban rejuvenation, among others, we are happy to note that the Budget lays the roadmap for preparing India for the Amrit Kaal, the next 25 years upto India@100. It is encouraging to note that the Budget has made a bold attempt to invigorate the critical demand drivers of consumption and investment. The move to rationalise personal income tax rates will go a long way in increasing disposable incomes, thus giving consumption a leg-up, which will in turn have a salutary impact on India Inc.'s investments. The sharp 33% rise in capital spending budgeted for 2023-24 is in line with CII's suggestion and lends credence to the government's vision of improving the economy's growth potential through a push to overall productivity of the economy and creation of jobs. Even as a boost was given to demand drivers, the FM did a fine balancing act of maintaining fiscal discipline by containing the fiscal deficit at 6.4% of GDP for the current fiscal and bringing it down along a steady glide path to 5.9% next year."



Manish Raj Singhania, President, FADA

"The Modi Government's last full budget has been populist in all aspects as it will help boost auto sales all around. While the capital outlay of INR 10 lakh crore in infra spending will definitely aid CV sales, the aim to scrap all old government vehicles by aiding State Governments will boost all segment sales. Apart from this, the reduction in individual tax slabs will benefit the ailing entry level 2W and PV segment. Reduction in highest tax surcharge from 37% to 25% will also benefit luxury vehicle sales. With focus on Electrification, relaxation on import duties of Lithium ion batteries will help in price reduction of EVs, thus make it affordable for the masses. On the business front, being part of the MSME universe, cost of credit guarantee will reduce by 1% thus helping Auto Dealers in raising funds. The budget has also focussed on ease of doing business by reducing more than 39K compliances and enabling entity level DigiLocker for storing and sharing documents."



Vinod Aggarwal, President, SIAM and MD & CEO, VECV

"The 33% increase in capital outlay with an effective provision of INR 13.7 lakh crore will spur growth in the economy, resulting in a positive impact on the auto sector. The auto industry is fully aligned with the initiatives on sustainability and decarbonisation and increased focus on hydrogen, ethanol blending, biogas, electric vehicles and battery storage. The announcement for funding various government departments for the replacement of old vehicles is also commended. Another appreciable feature of the Budget is putting more money in the hands of individuals by some lowering of effective personal Income Tax rates that should increase consumption and consequently lead to more demand. All in all, this is a growth-oriented Budget with positive impact on the auto sector."

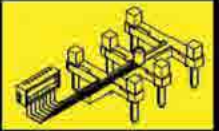


Subhrakant Panda, President, FICCI

"FICCI congratulates the Hon'ble Finance Minister for delivering a balanced and progressive Union Budget, which gives primacy to inclusive growth. The announcements capture the pulse of the economy, while retaining credibility both in terms of projections as well as committing to the fiscal consolidation glide path. Most importantly, a historic outlay for public capex is a continuation of the heavy lifting since the time of the pandemic and will have a multiplier effect across myriad sectors of the economy besides crowding in private investment... The support contained in the Budget for the MSME sector is welcome. The revamped credit guarantee scheme for MSMEs will benefit from an infusion of INR 9000 crore, enabling credit flow of INR 2 lakh crore with a 1% lower cost. In addition, the move from an accrual-based payment system to a cash-based one has been a long-standing demand from FICCI and will ensure MSMEs don't suffer as a result of delayed payments... Even as India offers a ray of hope in the current global context, we are not decoupled from the rest of the world. We laud the government's promise to make India exports competitive given that a slowdown in growth globally could have an impact. In this context, some incentive to support exports would have been timely."



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Union Budget 2023-24: Offering MSMEs a platform to grow

The Micro, Small & Medium Enterprises (MSMEs) sector is a major contributor to the socio-economic development of the country. The sector has also contributed immensely with respect to entrepreneurship development, especially in semi-urban and rural areas of India. At present, MSMEs contribute about 30 percent to the country's GDP, and create over 100 million jobs. Their contribution is going to be even more significant if India targets to become a \$5-trillion economy over the next few years. MSMEs also contribute to over one-fourth of India's gross value and are amongst the biggest employers in the country.

Union Budget 2023-24 is a progressive one and provides the required impetus to ensure overall development of the economy. The Budget has proposed key initiatives that facilitate the growth of MSMEs in the economy. Hon'ble Finance

Minister Smt. Nirmala Sitharaman has proposed to spend a whopping amount on various allocations that are aimed at providing a pathway for growth and creating a level playing field for MSMEs in India. Here are some of the major changes proposed in the Budget:

► **Claim as you pay**

MSMEs are the growth drivers. In order to enable working capital availability to MSMEs, ensure that funds are not blocked for a longer period and to promote timely payments, the Budget proposes to amend provisions of the Income Tax Act. Accordingly, the payments to MSMEs can be claimed as expenditure only if it is actually paid. The same will be allowed on an accrual basis if it is within the due dates specified under the MSME Act.

The amended provisions of the



Income Tax Act are a welcome move and could enable adequate and timely working capital in the hands of MSMEs. In the long term, it could result in reducing the finance cost for MSMEs. However, these provisions could also work counterproductively. The large enterprises may stop working with MSMEs considering the restrictions imposed both on account of payment period and claiming the expense.

In view of the above, it is recommended that MSMEs should tread carefully while contracting with larger entities and also ensure that the terms accepted are not harming their business.

► **Extension of the Credit Guarantee Scheme for MSMEs**



Credit guarantee trust for small micro-enterprises scheme will be

revamped with the required infusion of INR 9,000 crore, effective April 1, 2023, facilitating an additional credit of INR 2 lakh crore for MSMEs.

The biggest challenge for an MSME is working capital. Enhancement of the funds outlay for finance under the Credit Guarantee Fund Trust for Micro and Small Enterprises would mean availability of more funds to MSMEs. Collateral-free loans would help many start-ups and manufacturing entities as it would mean easily accessible loans at a lesser cost.

► **Digitalized MSMEs**

A DigiLocker would be set up for MSMEs for storing and securely sharing documents online, whenever needed, with various regulators, banks, authorities, and other business entities.



The next challenge, which is critical for the survival of MSMEs, is the availability of skilled labour. The DigiLocker database should come in handy here by getting skilled labour for various industries based on the requirements.



► **Refunds for MSME**

In cases of failure by MSMEs

About the author
Mr. Varun Subbaraj, the youngest of the partners, leads the Direct Taxation practice of T. Sriram Mehta & Tadimalla, a firm of Chartered Accountants. An Associate Member of the Institute of Chartered Accountants of India, Mr. Varun started his journey in the field of Chartered Accountancy with TSMT, having joined the firm as an Article Assistant way back in 2011. Upon qualifying as a Chartered Accountant, he was entrusted with handling the Direct Taxation department in the role of Manager. Soon thereafter, in 2018, he was promoted to Partner. As an expert in the field of Income Tax and International Taxation, he has assisted numerous clients in successfully overcoming their strategic business predicaments and in representing them across various Appellate Authorities.



to execute contracts during the COVID-19 period, 95% of the forfeited amount relating to bids or performance security will be returned to them by the government and government undertakings.

Conclusion

The MSME sector has been supporting the national economy and is acting as a defence against the global economic crisis, which we are facing in recent years. It is safe to say that India is moving

towards a bold and robust global economy through a revolution powered by MSMEs.

India has lot of talent and entrepreneurial potential to drive the growth of MSMEs. The technology adoption initiatives and supportive government policies will be pivotal in the MSME sector's growth and will place India on the global map. Also, for India to achieve its target of becoming a \$5-trillion economy, unlocking MSMEs' growth is imperative. ♦

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Activities: Mould Manufacturing

'The potential for growth in the toolmaking industry is unlimited'

“Toolmakers receive numerous RFQs, both domestically and globally, as many companies are looking for alternatives to Chinese suppliers. Moreover, India’s growing industries and increasing buying power of consumers has led to growth in sectors such as automotive, toy making, lighting, packaging, consumer goods, and home appliances,” says Ravindra Gugale, Sr. GM – Purchase (Interior & Plastic Division), Tata AutoComp System Ltd.



Nishant Kashyap

Q What is TATA AutoComp all about? Can you describe its tooling-related activities?

TATA AutoComp was started in 1995 to cater to the automotive industry. With 51 plants in India and abroad, we are the Tier-I suppliers to the automobile industry. Tata AutoComp has nine joint ventures in partnership with leading companies from the global auto component industry through which it manufactures and markets automotive components and systems like engine cooling solutions, automotive batteries, rearview mirrors, command systems, HVAC, exhaust, and emission control systems, seating systems, battery packs, battery cooling systems, battery management systems, motors, controllers, integrated drivetrain (Integrated Motor, Inverter, and Reducer), EV chargers and electronic solutions for passenger and commercial vehicles as well as suspensions for heavy commercial vehicles. We have over 15,000

employees and expect our revenue to cross INR 15,000 crore this year.

Q What are your views on the emerging trends in the global automotive industry vs the Indian automotive industry?

Currently, there appears to be a slight slowdown in the global automotive industry, but the Indian market is still going strong. One of the major changes we are witnessing in the automotive industry is the rise of electric vehicles (EVs), which has led to the need for innovations such as lightweighting, noise reduction, and the use of engineering plastics. With EVs, many engine-related parts will be eliminated, while new parts will be introduced, bringing about significant changes.

Efficiency and noise reduction have become critical in the automotive industry, leading to various innovations. Cars today are becoming increasingly quiet and efficient, and there is a growing demand for fit and finish, as well as aesthetic requirements. Compared

to cars from five years ago, modern vehicles are highly sophisticated, with lots of features in infotainment systems. This requires meticulous attention to detail, especially in terms of finishing work. The use of materials such as fabric, vinyl, and leather has also expanded from a few interior parts to include D pillars, door trims, and side pillars.

Another trend in the industry is lightweighting. OEMs are increasingly transitioning from metal to aluminium and engineering plastics to reduce the weight of cars. Overall, there is little difference between the global and domestic markets, and any new technology introduced globally is likely to be adopted in India as well. The Indian automotive market is highly developed, presenting significant opportunities for Tier-I suppliers.

Q How will these trends impact component manufacturers and subsequently, toolmakers?

Any requirement we, as a Tier-I

supplier, get will automatically be transferred to toolmakers. Tooling forms the base of manufacturing and in any part manufacturing, the tooling industry has a role to play. So, all these trends will have a positive impact on toolmakers. Any new product development happening will need the support of the tooling fraternity.

Let's take the case of new cars. New cars introduce many new challenges for toolmakers, especially with interior and aesthetic parts. It is up to toolmakers to rise up to the challenge to produce such tools with a low wall thickness, even in the PP as well as engineering plastics. For instance, in battery packs, the wall thicknesses are quite low – barely 1.2 to 1.3 mm – even for engineering plastic. Besides this, there's insert moulding on all three sides, core cavity, and core slider, which means everywhere there are multiple inserts so that the wall thickness is quite low, which is very challenging. To share one example: the smallest tool we made for a battery had 500-plus ejectors. So, these are the technical challenges we face these days.

These kinds of complicated products are putting a lot of challenges on our own tooling industry. Also, at the same time, the delivery targets, and quality requirements are very high, and customers now want first-time-right products. So, definitely these global challenges have come down to our industry for the part making and they are now transferred to toolmakers.

Q To keep abreast with all these trends, how should toolmakers equip themselves and tackle these challenges?

Unlearning and relearning are key in today's rapidly evolving landscape. What was relevant yesterday may not be relevant today. That's why Indian toolmakers need to stay updated with the latest technologies and ways of working.

Previously, it was common for

companies to have all the equipment and required infrastructure under one roof and in their control. However, the right approach now could be to focus on a specific aspect of toolmaking and become an expert in that area. Companies can outsource some of the low-end jobs to dedicated sub-suppliers and focus on their strengths such as roughing, pre-machining, CNC machining, or EDM wire cut.

The goal should be to become so good that the real pressure falls on the design team to make a perfect drawing. As a toolmaker, you may not be aware of where the part is fitting and what the end purpose is, but you should be sure that the drawing given to you must be replicated accurately. This makes the process easier and can only happen when you apply your experience and the latest technologies.

Customer lead times are becoming shorter every day. For example, car launch times are significantly reduced. Once a car is launched, preparations for a facelift start immediately. As a toolmaker, you need to have a fast turnaround time and deliver the tool accurately. It's essential to stay in constant touch with the customer, understand their requirements, and communicate effectively. It's also crucial to maintain a good relationship with your suppliers such as tool steel providers and heat treatment service providers.

Toolmakers should partner with various educational institutes, such as ITIs, polytechnic institutes, and OEMs, to work on skill development collaboratively. There is no readymade solution to this challenge, but it is crucial for everyone to work together to develop the necessary skills and expertise in the industry.

Teamwork is the need of the hour, and a cluster-type of working could be the way forward.

Q You have worked with overseas toolmakers from countries like China, Taiwan, and Korea. How has been your experience of working with overseas toolmakers vs Indian toolmakers?

In my personal opinion, overseas toolmakers are very responsive and good communicators. Once we send an RFQ, we receive a response within a couple of hours saying they have received it and will get back to us by the next day. The following day, they come back with a well-prepared query or quotation. They study the requirements in detail and come back with relevant questions, suggestions, or flag any potential problems. They share their expertise and sometimes make excellent design suggestions. In this area of communication, I find Indian toolmakers falling short.

Furthermore, once we place an order, overseas toolmakers keep updating us on the project's progress, which is very helpful. We don't have to ask for anything; they give us minute details of the project on their own. We have to understand here that in a car, there are thousands of parts. If one part is delayed, the whole car production will be delayed. Therefore, continuous reporting from the toolmaker helps us plan our corresponding activities.

In India, we use the same kinds of machines, software, and other technologies, but are lacking when it comes to communication. Apart from that, there are other areas such as tool design, delivery time, etc. But I have seen great improvement in these areas in the last few years.

I'm also delighted to share that we recently placed an order for six large bumper tools in India, and the project was successful. We used to procure these types of tools from China or Korea, but now we're confident that they can be made in India too. This

Q What key evaluation factors do automotive OEMs consider before finalising on a tool room for a project?

As both vendors and customers, we have a relatively straightforward set of requirements when selecting a toolmaking company. They are:

- ▶ **Track record:** We thoroughly investigate a company's track record, including their previous projects, the types of work they have undertaken, and their growth trajectory. If they have experience with similar projects to ours, this is a definite plus point.
- ▶ **Design capability:** In toolmaking, design is a critical component. So, we place great importance on the capability and experience of a company's design team. We also take into account how long a designer has been working with a particular tool room. For example, if a designer has 10 years of experience but has only been with Company A for six months, while another designer also has 10 years of experience but has spent eight years with Company B, we may prefer to work with the latter.
- ▶ **Infrastructure:** It is essential that the tool room has the required infrastructure to carry out our project successfully. To ascertain this, we send our team for an audit to evaluate the company, their infrastructure, and their sub-suppliers.
- ▶ **Financial stability:** It is vital that the toolmaking company has a good balance sheet before we begin a project. This ensures that in the event of any unforeseen issues, the project will not get stuck, and the company will have the financial backing to pay sub-suppliers on time and procure raw materials without any delay.

boosts the sentiment of the entire ecosystem. The vendor told us that they received similar orders from other OEMs as well. Therefore, I see the gap bridging rapidly, and our Indian toolmakers are improving in all departments.

Q The tooling industry is primarily owner-driven and mostly consists of MSMEs. In such a small setup, at times, it is difficult to integrate the corporate culture. How important is it for tool rooms to do so?

It can be challenging for these businesses to establish a corporate culture similar to larger organizations. However, in my opinion, a corporate culture for MSMEs means having specific leaders responsible for particular activities. For instance, large organizations have production heads, quality heads, design heads, procurement heads, etc. But in tool rooms, having so many heads is not sustainable for small companies due to added costs. Instead, it is essential to clearly define the roles of individuals and give them responsibility for specific departments or areas so that they become experts in those domains, and communication becomes seamless within the company. Owners cannot do everything on their own, but developing leaders within the organization can be beneficial.

Another crucial factor is that larger corporations periodically train their employees from machine operators to top management. Toolmakers need to adopt this approach and invest in skill development.

Q How would you rate the skills of Indian toolmakers? What could tooling companies do to enhance the skill set?

Toolmaking is a unique blend of art and science. To create the perfect tool, one must be passionate about the craft. Most tool room owners I have met share this passion. But it is

essential that they impart this same passion to their employees. While we have access to all the necessary machines, software, and the latest technologies, what truly makes a difference is the skill and expertise of the people behind the machines.

The tool rooms I have observed abroad impress me with their in-house training facilities. There, senior and retired toolmakers pass on their knowledge to the younger generation. This approach helps to facilitate overall skill development. I believe that Indian toolmakers could also benefit from a similar initiative. Toolmakers should partner with various educational institutes, such as ITIs, polytechnic institutes, and OEMs, to work on skill development collaboratively. There is no readymade solution to this challenge, but it is crucial for everyone to work together to develop the necessary skills and expertise in the industry.

What kind of growth do you foresee for Indian tooling companies in the coming years?

The potential for growth in the toolmaking industry is unlimited. Toolmakers receive numerous RFQs, both domestically and globally, as many companies are looking for alternatives to Chinese suppliers. Moreover, India's growing industries and increasing buying power of consumers has led to growth in sectors such as automotive, toy making, lighting, packaging, consumer goods, and home appliances. These industries use significant amounts of plastics, driving demand for tooling.

However, the key to success is how quickly companies can catch up to this growth and scale their operations. For example, Tata AutoComp has grown by 70% this year and expects to continue at this rate in the coming years. We purchase a minimum of 350 to 400 tools per year, ranging from 80 to 3200 tons, with plans to double our purchases in the near future. The opportunities for growth are substantial. ♦



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Electric Vehicles and CNC Machining: What you need to know



The push for electric vehicles (EVs) is nothing new, but few expected the arms race Tesla would spark in the automotive world with their aggressive development. Recently, IHS Markit predicted that 25 percent of all passenger vehicles sold worldwide will be electric by 2030. Others predict that even more will be sold by then. Currently, the inventory of automobiles, in general, is less than demand because of the supply chain issues of 2020 and 2021, leaving the market wide open for accelerated growth.

The automotive manufacturers that learned from the pandemic reassessed their production processes to maximize cost containment. Often that meant optimizing their CNC machining

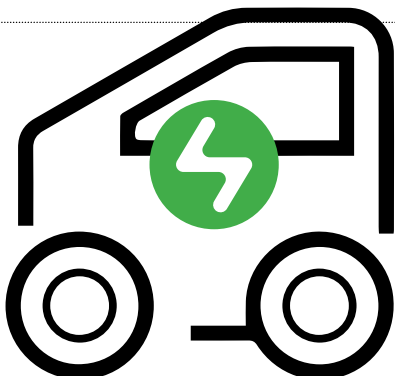
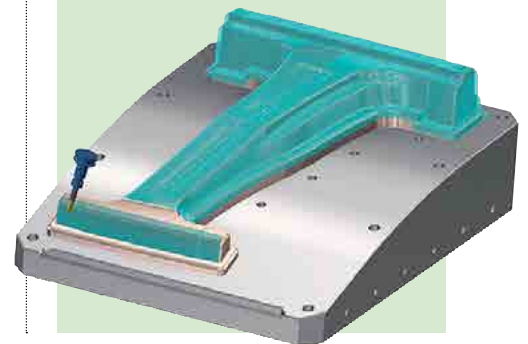
approach. Luckily, that exact choice will make it easy to switch from manufacturing mainly internal combustion engine (ICE) vehicles to EVs. That switch will be more difficult for shops that have overly specialized equipment, but investing in the right software in the coming years could put them back on the right path.

The most obvious concerns when producing EVs rather than ICE vehicles are reducing weight, achieving the precision necessary for making battery packs, and producing internal components with longer lifespans than their ICE counterparts. The right software and machining centers will help manufacturers move quickly from prototyping to mass production, in time to meet regulatory deadlines and even just to stay competitive.

The right tools

Automotive manufacturers should seriously consider reorganizing their shops and processes to make way for EVs. The best way to do that is to invest in the right equipment.

- ▶ Mastercam Multiaxis automatically generates optimized toolpaths for making automotive dies and for producing complex parts with deep pockets.
- ▶ Dynamic Motion Technology monitors the stock material during the entire cutting process, automatically adjusting feeds, speeds, and tool angle to keep machining safe and efficient.
- ▶ Verify and Backplot functions accurately simulate every stage of machining and highlight possible mistakes, gouges, and collisions.
- ▶ Extremely accurate toolpaths can meet even the tightest tolerances.



Machining batteries

The battery pack of an EV is essentially a Russian nesting doll of components: battery cells within battery modules within the battery pack attached to the vehicle frame.

- ▶ Parts like rotary shafts, linear ball bushings, and configurable plates can only be made with extremely precise machining.
- ▶ Batteries need to be protected from vibration and environmental factors (extreme temperatures, moisture, etc.). Their seals must perform even better than those in an ICE, because electric motors operate at greater speeds and temperatures.

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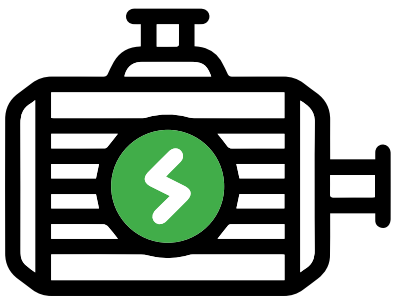
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Reducing weight

Any part of a modern EV has been designed, modified, and redesigned to eliminate weight, drag, and friction as much as possible.

- ▶ Body panels are made from innovative dies, which are machined by powerful 5-axis machining centers.
- ▶ Internal components are pocketed to reduce overall mass. Reaching these compartments without multiple setups would be impossible without multi-axis machining.
- ▶ Lightweight aerospace materials are used for many of an EV's parts, but often these are difficult to machine with traditional processes. Without CAM software that offers detailed simulations and continuously monitors the machining process, the risk of gouging or warping is high.



Meeting tight tolerances

Even though they perform at high speeds and temperatures, consumers expect less maintenance on EVs. There are fewer overall components in an electric motor, so each must be flawlessly manufactured for OEMs to meet this expectation.

- ▶ Parts must have perfect surface finishes that require little deburring.
- ▶ Any pocketing that is done must not alter the strength of the machined part, so each stepover and stepdown must be accurate to thousandths of an inch. ♦

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'CV sales volume to rise 9-11% next fiscal, third consecutive year of growth'

Image used for representation only. Courtesy Envato Elements.

Better operating leverage, lower commodity prices to support operating margin, says CRISIL.

Domestic commercial vehicle (CV) sales volume is set to rise 9-11% next fiscal, the third straight year of growth, driven by medium and heavy commercial vehicles (MHCVs) and expected economic growth of ~6%. Increased allocation to infrastructure spending in the Union Budget for next fiscal will also support demand.

This follows strong volume growth of 31% and ~27% in fiscals 2022 and 2023, respectively, as demand bounced back on increased activity in the roads, mining, real estate and construction sectors, as well as focus on last-mile connectivity.

Besides higher volume, increase of 2-5% in realisations as original equipment manufacturers (OEMs) comply with BS VI-Stage II¹ norms, and benefit of lower commodity prices, especially steel, will help improve operating profitability to a four-year high of 7-7.5% next fiscal from an estimated 5-6% this fiscal (~3.9% last fiscal).

A CRISIL Ratings study of four CV makers, accounting for over 70% of the sector's capacity, indicates as much.

For the record, light commercial vehicles (LCVs) accounted for nearly two-thirds of the sector's volume, while MHCVs account for the balance. Buses are included in both LCVs and MHCVs.

Says Anuj Sethi, Senior Director, CRISIL Ratings, "With strong demand prospects, we expect LCV sale volumes to grow 8-10% next fiscal, and cross pre-pandemic (fiscal 2019) sale volumes. MHCV sale volumes will continue to grow faster than LCVs at 13-15% next fiscal, but are expected to exceed pre-pandemic sale volumes in fiscal 2025."

LCV and MHCVs are expected to register volume growth of ~27% and ~40% respectively in fiscal 2023, albeit on lower base of fiscal 2022. While the strong infrastructure impetus in the country will continue to drive MHCV sales, LCV sales will be spurred by increased focus on last-mile connectivity and stricter restrictions on movement of MHCVs within city limits to curb traffic congestion. Demand for buses will continue to see good traction from educational institutions. Implementation of the mandatory scrappage policy from April 2023 onwards for government-owned vehicles older than 15 years will also aid CV volume growth.

Says Anil More, Associate Director, CRISIL Ratings, "Strong balance sheets and healthy liquidity helped offset profitability pressures ensuring 'Stable' credit profile of CV manufacturers in the recent past. The expected improvement in operating

profitability this and next fiscal, and only modest capital spending needs (given utilization rate at ~70%) will ensure improvement in the key debt metrics, and keep credit profiles stable; these debt metrics were impacted during the pandemic years."

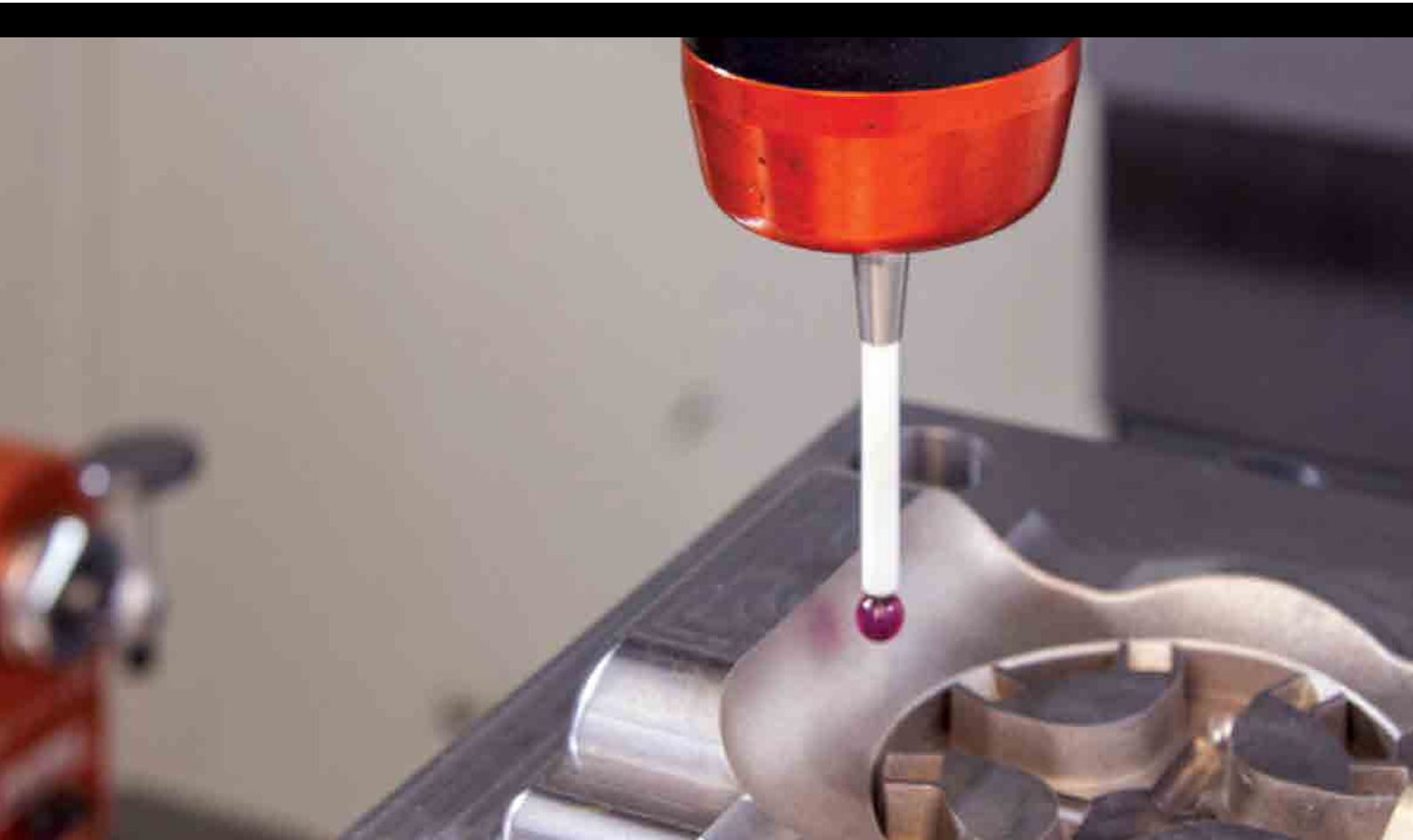
For the sample set, CRISIL expects interest coverage to improve to 2.5-3.0 times this fiscal and the next, from ~1.6 times last fiscal. Also, the ratio of net debt to earnings before interest, tax, depreciation and amortisation is expected to improve to ~2.5 times by next fiscal, from ~5 times in fiscal 2022.

That said, the fortunes of CV volumes are linked to the overall economic and industrial growth, and hence, the pace of economic recovery will bear watching. Besides, interest rate movements and inflation-related pressures could potentially dampen the growth momentum, and will remain monitorables. ♦

¹ The government has notified that the BS-VI Stage II norms will be implemented across India from April 1, 2023. With this, vehicles will need to meet the actual driving emission norms and will not be limited to tests in laboratories. To facilitate this, vehicles will need to have OBD2 (on-board diagnostics) as standard.

Article Courtesy: ©2022 CRISIL Ratings Limited – A subsidiary of CRISIL limited, an S&P Global Company

Renishaw probing simplifies set-up of complex mould tools for **BK Tooling**



Toolmaking has always been the preserve of craftsmen; even with the arrival of complex CNC machine tools, the skill of the toolmaker is still required. However, innovative technology such as Renishaw's Primo™ probing system is a proven timesaver for even the most experienced toolmakers.

BK Tooling, based in Bishop's Stortford (UK), is vastly experienced in the manufacture of injection mould tools and the associated electrodes for die sinking. Over the years, it has seen these tools become more and more complex, as designers push the boundaries of what is feasible. Managing Director Bob Tunks has been using Renishaw probing systems since he took delivery of his first CNC machining centre 20 years ago. That machine tool came equipped with a probe.

At the time, Bob Tunks didn't fully appreciate its value; "I didn't

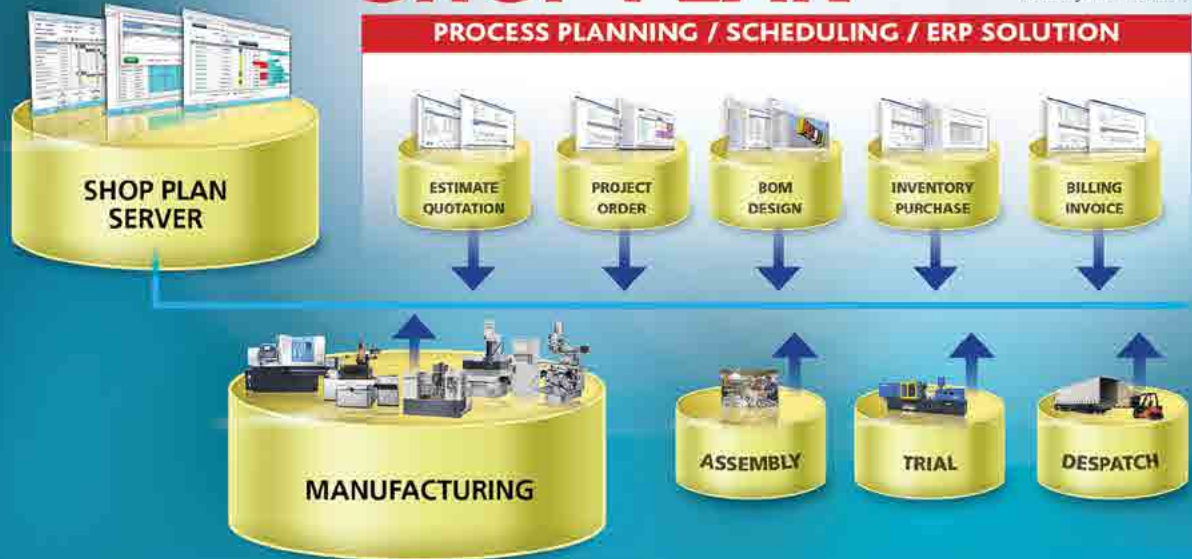
understand the importance of probing when I was first introduced to it. I now realise that it is vital. CNC machine tools have to have probing; to do without it would be a regressive step as far as I am concerned. It amazes me that there are still toolmakers that don't use probing. Many of them cite cost, without recognising the cost of the time they are losing as a result of not probing parts on the machine tool."

BK Tooling's most recent machine tool purchase – an XYZ 1060 HS high-speed vertical machining centre (VMC) – came equipped with the Renishaw Primo system, including a

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Primo Radio Part Setter and Primo Radio 3D Tool Setter.

The Primo system addresses the primary concerns that prevent companies from making the transition to probing; namely perceived cost, fragility and complexity. The Primo system offers an industry-first “pay-as-you-probe” approach with minimal upfront investment costs. Two types of Primo Credit Token are available, offering either six months usage, or unlimited lifetime usage for experienced users such as Bob Tunks.

The system also comes with a self-study training kit and GoProbe; Renishaw’s new, easy-to-use probing software. For peace of mind, the system is protected against accidental damage with Primo Total Protect cover. “Buying a machine like this without probing is something that I would not even contemplate. Yes, you can set parts manually, but you do that without any confidence in where the datum is. Probing is all about having the confidence of knowing where the part is on the table and not standing there hovering over the feedrate override,” explains Bob Tunks.

BK Tooling sees the benefits of using Renishaw probes primarily when setting up moulds; particularly when they are returned for additional finishing work. Without probing, Bob Tunks estimates that typically it would take 20 minutes to re-set a fairly simple mould tool. For more complex moulds with multiple 3D



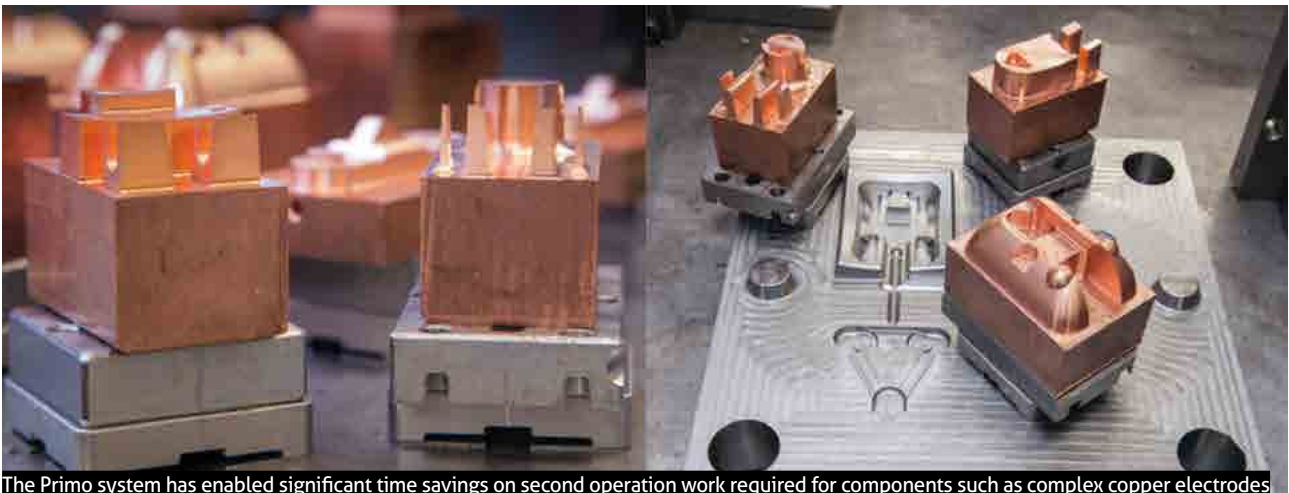
The Renishaw Primo™ system has enabled significant efficiency gains at BK Tooling through reduced set-up times

We didn’t understand the importance of probing when we were first introduced to it. We now realise that it is vital. We have had five machining centres, all of which have been equipped with Renishaw probing systems. We can’t see any logical reason now to buy a CNC machine tool without probing.

BK Tooling (UK)

reference points, it could be over an hour before he would be confident to begin cutting. With Renishaw probing systems, he can reduce the setting time to just three minutes, irrespective of the complexity of the workpiece.

“We can probe and datum the vast majority of our work within three minutes, but we are occasionally presented with special challenges,” he explains. “Recently, we needed to rework an existing mould tool using only a CAD model and the old tool, which didn’t have a single recognisable datum point on it. Eventually, by cross-checking, we evaluated 20 datum points. This took about an hour using the Primo Radio Part Setter. Without the probe, I estimate it would have taken at least half a day.”



The Primo system has enabled significant time savings on second operation work required for components such as complex copper electrodes

The Radio 3D Tool Setter is also a major benefit to BK Tooling, which rarely uses reground tooling; instead relying on 'virgin' new tools for most of its work. The diameters of these new tools can be relied on as the manufacturers work to tight tolerances, but length setting is crucial. BK Tooling needs to be able to match the Z-heights of all the tools used on a workpiece in order to achieve the blending it needs on 3D profiles. Like the Part Setter, the Tool Setter works to a repeatability of $1 \mu\text{m } 2\sigma$, which adds further to the consistency that BK Tooling is able to achieve.

"The time savings on second operation work is, for us, where probing really comes into its own and benefits our business. In combination with a CAD model we are able to quickly pick up multiple datum points and start cutting the part much quicker than we could ever do manually, without probing. The time we are saving more than offsets the cost of the Renishaw probing system."

The Renishaw Primo system provides much more than initial workpiece probing. At BK Tooling,



Complex mould tools are easily set up using the Renishaw touch-trigger part setting probe

the Radio Part Setter is used to update offsets throughout the day to compensate for any thermal variations in the working environment. Movement within the machine tool is inevitable, especially in the Y-axis. By probing the workpiece or other datums at regular intervals this variation can be compensated for quickly and easily, with new datums being transferred to the machine's CNC. Bob Tunks explains: "We know that there will be some movement in the machine tool over the course of a day and with the speed of probing we can check this

more frequently, which equates to greater accuracy in the finished parts and makes us as consistent as we possibly can be."

"We have had five machining centres, all of which have been equipped with Renishaw probing systems. I can't see any logical reason now to buy a CNC machine tool without probing. The time savings that can be generated by probing either the workpiece or the tool far outweigh any cost associated with purchasing the probes," concludes Bob Tunks. ♦

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Industrial solutions for connectivity and climate neutrality

The list of challenges facing industry is long: climate change, energy shortages, disrupted supply chains and a shortage of skilled labor. The solution to these challenges lies in the targeted use of technology. At the same time, governments need to get their economic policy right. HANNOVER MESSE 2023 covers not only technologies for connected, climate-neutral industry, but also provides a forum for a global policy discussion among industry, government, science and social representatives.

Hannover, Germany. "Carbon-neutral production, artificial intelligence, hydrogen technologies, energy management and Industrie 4.0 – those are the overarching themes of HANNOVER MESSE 2023," reports Dr. Jochen Köckler, Chairman of the Managing Board of the Deutsche Messe group of companies. "Only the interplay of these technologies will make it possible to sustainably safeguard our prosperity and at the same time drive climate protection forward," he says. At the world's leading trade fair for industry, some 4,000 companies from the mechanical engineering, electrical and digital industries as well as the energy sector will showcase solutions for production and the energy supply of the future.

From the digitalization and automation of complex production processes and the use of hydrogen to power factories and the use of software to register and reduce carbon footprints, HANNOVER MESSE offers a holistic picture. As Köckler assures: "Approaches to solutions for each of the current global challenges will be on display at HANNOVER MESSE."

The exhibiting companies include global tech corporations such as Amazon Web Services, Microsoft, Google, SAP, Siemens, Bosch, NOKIA, ServiceNow and Schneider Electric, as well as medium-sized technology leaders like Beckhoff, Festo, Harting,



ifm, Pepperl+Fuchs, Phoenix Contact, Rittal and SEW. Renowned research institutes such as Fraunhofer or the KIT (Karlsruhe Institute of Technology) as well as more than 300 startups promise cutting-edge technologies and completely new business models.

HANNOVER MESSE will be opened by German Chancellor Olaf Scholz and Indonesian President Joko Widodo. Indonesia is this year's Partner Country at the industrial fair.

Industrie 4.0 & Manufacturing X

Large amounts of data are needed to tap the full potential of Industrie 4.0 – data that can be accessed by all companies involved in the value creation chain. A new interconnected data ecosystem – Manufacturing X – is part of the solution.

This vision of a sovereign and secure data platform is being driven forward by the industry associations

BDI, VDMA and ZVEI, among others. The first steps towards implementing Manufacturing X will be presented at HANNOVER MESSE in close cooperation with the German Federal Ministry of Economic Affairs and Climate Action.

As Köckler puts it: "The aim is to preserve the independence of companies. They should not lose access to the customer interface, but they also need to tap the potential of the platform economy."

ChatGPT – good for industry as well?

Artificial intelligence (AI) is playing an increasingly important role in industry. In addition to optimizing processes, the manufacturing industry is increasingly relying on AI in simulation and product development.

So-called generative AI will also find its way into industry. Systems

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such as ChatGPT or DALL-E can already support text generation, programming and design today. "In the future, it is quite conceivable that AI will design a machine and the human will then check which adjustments are necessary for real operation. This saves time and offers considerable potential in view of the prevailing shortage of skilled workers," reports Köckler. On the subject of AI, HANNOVER MESSE offers a comprehensive range of visitor tours, forums and presentations of AI tools and use cases from exhibitors.

Making energy streams and consumption visible

The interaction between software and machines creates considerable energy-saving potential. Smart energy monitoring solutions from HANNOVER MESSE exhibitors help to identify and optimize energy consumption at the machine level, thereby reducing the carbon footprint.

"Most industrial users are still hardly aware of the numerous hidden forms of consumption," explains Köckler. Unregulated motors in pumps, fans, compressors or machines are still part of everyday life in many factories. Without intelligent control technology and the interaction of electrical engineering and IT, energy efficiency improvements are scarcely feasible.

According to Köckler: "Industry consumes around 45 percent of the electricity in Germany. The solutions presented by the exhibiting companies can make an important contribution to a significant increase in energy-efficiency in the production realm."

Hydrogen as a source of energy and future hope

Green hydrogen is all the rage right now. Industry wants to use it to free itself from dependence on fossil energy and reduce carbon emissions. Meanwhile, the German



Federal Office for Economic Affairs and Climate Protection describes hydrogen as a key energy carrier that is essential for the long-term success of the energy transition and climate protection.

Still, there are challenges. Producing hydrogen is a complex and expensive process. Questions of availability, transport and large-scale storage still need to be resolved.

"More than 500 companies at HANNOVER MESSE will be showcasing solutions for the use of hydrogen in industry," says Köckler. "This makes Hannover the world's most important and largest platform covering hydrogen themes."

Users from industry and political decision-makers can get a holistic picture of the potential of this energy carrier in Hannover and see the course that needs to be set on the road to hydrogen-based industry.

"Your Future" initiative promotes young talent

With the Your Future initiative, HANNOVER MESSE and its partners have developed a new concept aimed primarily at graduating classes, students and young professionals. HANNOVER MESSE offers them a central discussion platform as well as guided tours taking them to interested exhibitors.

WomenPower Career Congress

The WomenPower Career Congress is one of the most successful networking and discussion events for women when it comes to diversity,

career advancement, sustainability and new working environments. The congress is held annually as part of HANNOVER MESSE and is primarily aimed at participants from the STEM sector. This year's motto is "Celebrate Diversity".

In addition to the program of lectures, panel discussions and workshops, WomenPower offers companies, associations, networks, organizations and trainers the opportunity to find out about career prospects, studies, coaching and mentoring services, and other labor policy topics and trends in the accompanying exposition.

Partner Country Indonesia

Indonesia, the largest economic power in the ASEAN region, is appearing as the Partner Country at HANNOVER MESSE 2023. Their motto is: "Making Indonesia 4.0". Indonesia aims to be one of the ten largest economies in the world by the year 2030. Renewable energies are expected to account for some 51.6 percent of total electricity generation by then. At HANNOVER MESSE, this up-and-coming nation is presenting itself as a reliable partner for companies across the globe.

HANNOVER MESSE

HANNOVER MESSE is the world's premier trade fair for industry. Its lead theme, "Industrial Transformation – Making the Difference" unites the display sectors of Automation, Motion & Drives, Digital Ecosystems, Energy Solutions, Engineered Parts & Solutions, Future Hub, Compressed Air & Vacuum and Global Business & Markets. The key topics include CO₂-neutral production, energy management, Industrie 4.0, artificial intelligence and machine learning, and hydrogen and fuel cells. The exhibition program is complemented by a series of conferences and forums. The next edition will be hosted in Hannover from 17 to 21 April 2023. The Partner Country at HANNOVER MESSE 2023 is Indonesia. ♦

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Date: Jun, 15-19

Venue: Chennai Trade Centre, Chennai

Organiser: Ambattur Industrial Estate Manufacturers Association

Contact: +91 - 73052 82228
info@acmee.in

ITS 2023

International Tooling Summit - the FLAGSHIP event of the Tool and Gauge Manufacturers Association of India (TAGMA India), is a platform that brings together the tool-making fraternity and the user industry under one roof. The two-day event provides a unique platform for industry professionals to network with potential customers, learn from subject experts and update their technological know-how.

Date: August 23 & 24, 2023,

Venue: Hotel Sheraton Grand

Organiser: TAGMA India

Contact: 96534 27396 / tagma.mumbai@tagmaindia.org

Plastvision 2023

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

Date: Dec, 07-11

Venue: Bombay Exhibition Centre, Mumbai

Organiser: All India Plastics Manufacturers' Association

Contact: 022 6777 8842/46/48
marketing@plastivision.org

International

Intermold Korea 2023

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

Date: Mar, 14-18

Venue: KINTEX Exhibition Center, Seoul

Organiser: Korea Die & Mold Industry Cooperative (KODMIC)

Contact: +82 (2) 783-1711
koreamold@koreamold.com

Intermold Japan

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

Date: Apr, 12-15

Venue: Tokyo Big Sight, Tokyo

Organiser: Japan Die & Mold Industry Association

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

Hannover Messe 2023

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

Date: April 17 - 21

Organiser: Deutsche Messe AG

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

Moulding expo 2023

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

Date: Jun, 13-16

Venue: Messe Stuttgart

Organiser: Landesmesse Stuttgart GmbH

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Brinell hardness	HBW 10/3000	210	294	270-320
Rockwell hardness	HRB	95	106	103-107
Modulus of elasticity	GPa	131	135	127
Density ρ	g / cm ³	8.71	8.7	8.7
Coefficient of expansion α	10 ⁻⁶ / K	17.5	17.5	18.1
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Tel: +91 2135-610 810 | Fax: +91 2135-610-811
infoindia@ampcometal.com
An ISO 9001:2015 Certified Company

AMPCO METAL S.A

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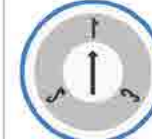
A/113 & 114 , Evershine Industrial Estate, Waliv Road, Chinchpada Junction, Vasai (E) - 401208, INDIA.

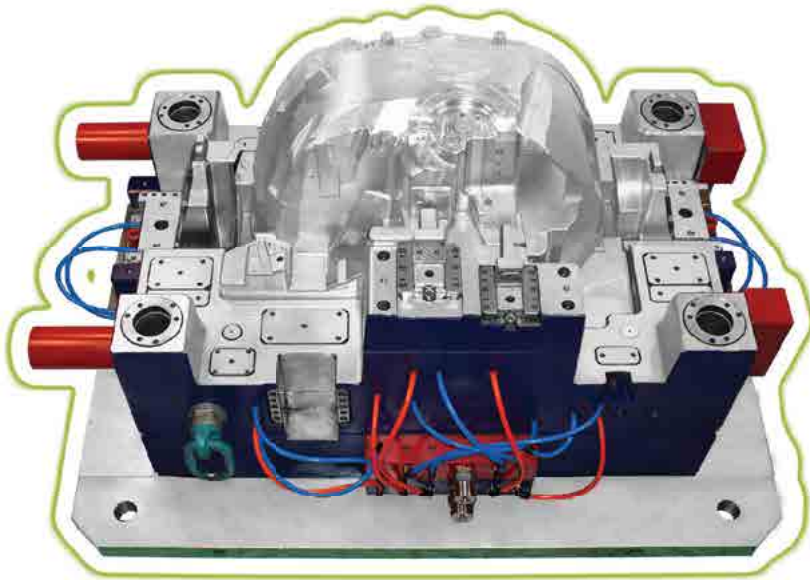
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DATE INDICATORS

FOR THE YEAR **2023** ARE AVAILABLE EX-STOCK

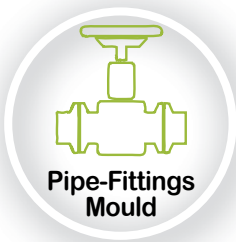
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- **Mould Name:** WHEEL LINER
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