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THE MACHINIST

ULTIMATE GUIDE TO PROFITABLE MANUFACTURING

RNI No 71129/98

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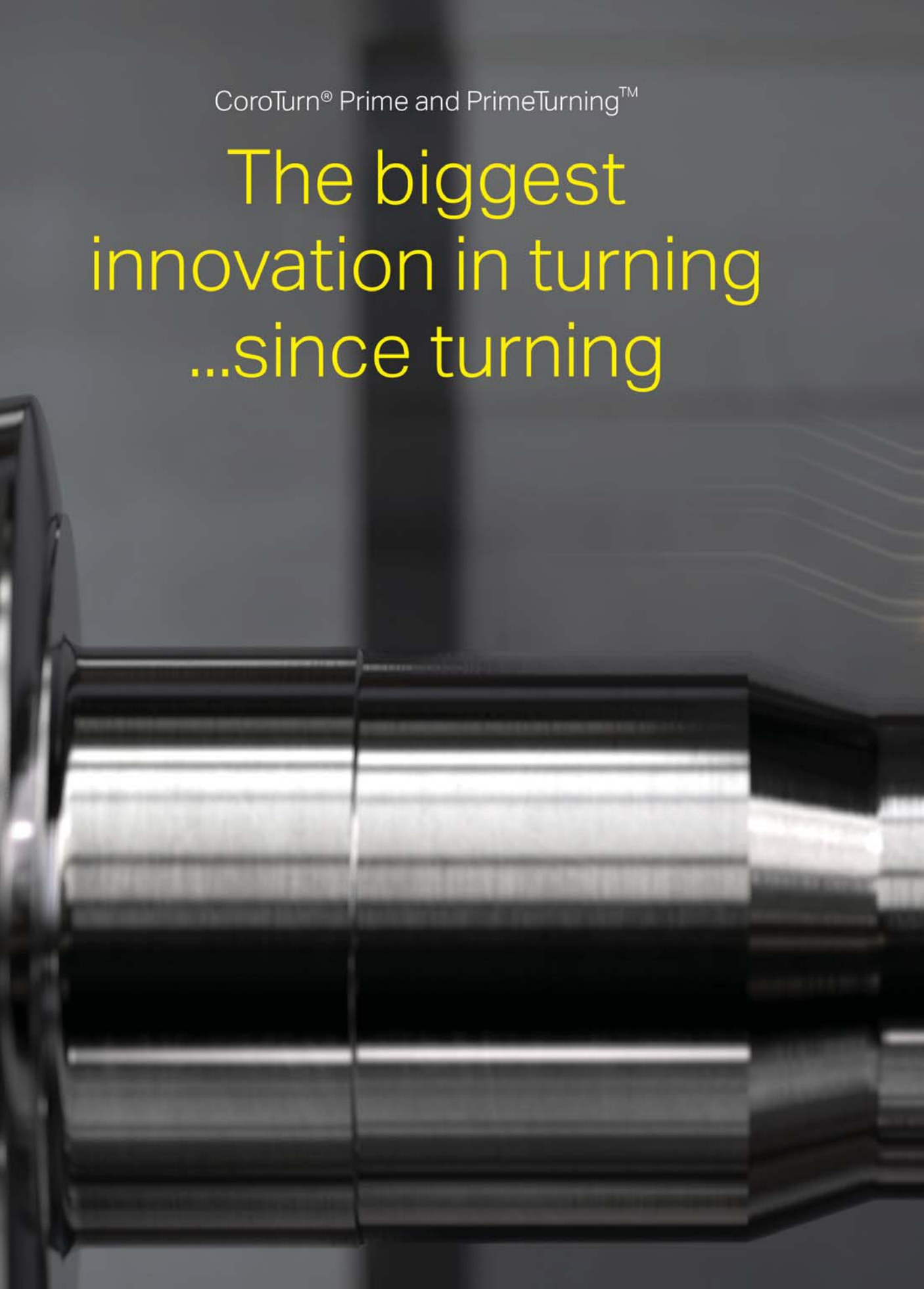

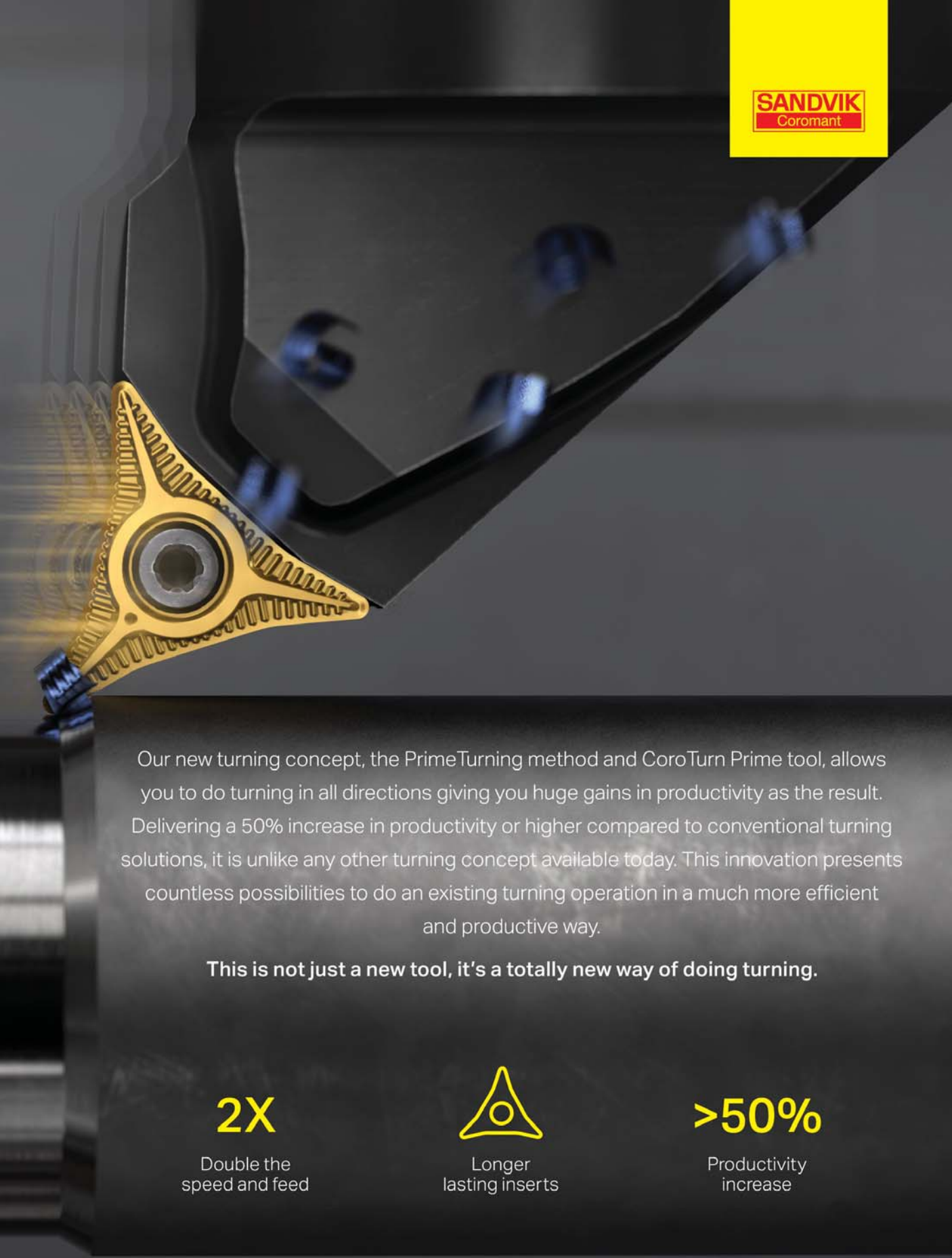

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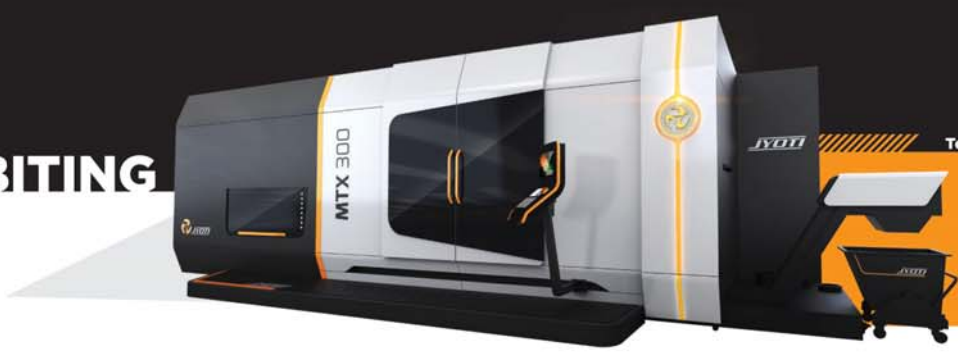

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The Ultimate Platform!

Well, if you thought that I was referring to 'The Machinist' magazine as the ultimate platform for the manufacturing industry then you are certainly right. However, the title of this note actually pertains to another platform created and developed by The Machinist magazine. I am talking about The Machinist 'Global Manufacturing Summit' (GMS).

GMS was originally launched in 2015 in the name of 'Manufacturing Excellence Summit' in Bengaluru. However, last year, we renamed it as 'Global Manufacturing Summit' for three reasons. One, the Indian manufacturing industry itself is acquiring a global stature in terms of its capabilities, capacities and reach. Secondly, the Summit focusses on issues that are global in nature and also have absolute relevance for the Indian industry. And thirdly, the Summit sees participation of many delegates, speakers and partners who have worked not just in India but also globally.

After doing the event in the metros (Bengaluru and New Delhi) in the previous two editions, we are now taking GMS to Indore. While Indore can be described as a Tier II city, it is in no way less important than Bengaluru or New Delhi when it comes to manufacturing clout. Home to many large and SME manufacturing players, Indore has the largest economy in central India and is the business and trading capital of the state of Madhya Pradesh. The city has emerged as a significant industrial hub in Central India with the nearby towns of Pithampur and Dewas adding to the region's growing industrial prowess. We are ineed very happy to bring GMS to Indore this year!

And besides changing the location, we are also looking to bring some refreshing changes to the format and content of GMS in 2017. The objective is to make GMS 2017 more engaging and more relevant for all its participants. While our team is already brainstorming on the same, I will also be happy to receive ideas and suggestions from my readers. So feel free to write directly to me at *niranjan.mudholkar@wwm.co.in,* and see you at Indore.

Editor & Chief Community Officer

THE MACHINIST
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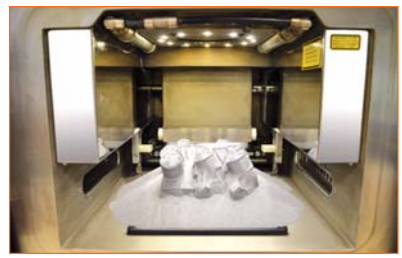

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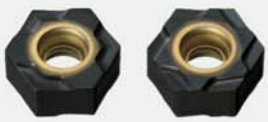

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STRONGER FASTER SUPERIOR

India's manufacturing sector must grow 14-15 percent: ASSOCHAM-EY Study

IF INDIA has to maintain a sustained GDP growth of 9-10 per cent per annum, it is crucial that the manufacturing sector grows steadily at 14–15 per cent per annum over the next three decades, noted a recent ASSOCHAM-EY joint study.

The joint report stated that while the Goods and Services Tax (GST) has to a large extent addressed prevailing regulatory issues, states across India must individually look into bureaucratic obstacles along with other obstructive regulations and policies on priority, based on their own manufacturing goals. "Manufacturing sector in each Indian state and union territory (UT) has the potential to grow either directly — by setting up new industries — or by creating ancillary facilities, infrastructure and necessary forward-backward linkages to existing ones," noted the ASSOCHAM-EY study titled "Sustaining India's growth by accelerating manufacturing."

It also noted that for states, the best way to grow is to focus on industries where a particular state has competitive edge over others in terms of raw material availability, demand, user industries, logistics and availability of skilled manpower, besides geographical location. "Robust domestic demand, improved FDI (foreign direct investment), increase in exports, higher infrastructure spending and capital formation, supportive fiscal and monetary policies suggest India's manufacturing sector is headed for a robust growth," said the report.

Highlighting that optimism in India's economy is largely stemming from launch of GST, apart from macro-economic and financial market stability, the study said that the government seems committed on providing conducive environment for growth of manufacturing. Highlighting that optimism in India's economy is largely stemming from launch of GST, apart from macro-economic and financial market stability, the study said that the government seems committed on providing conducive environment for growth of manufacturing.

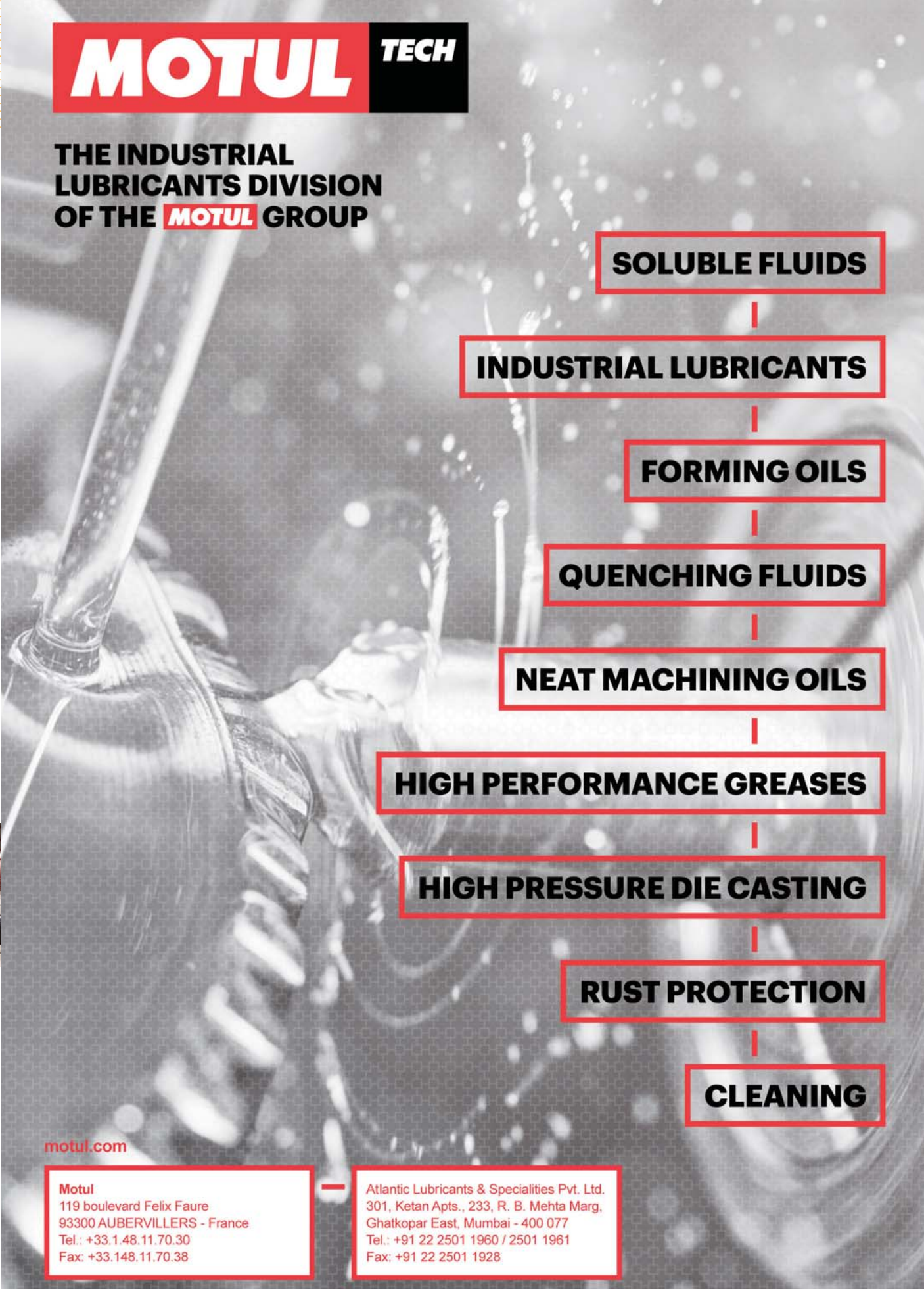
A foundation stone for bullet train project laid

PM NARENDRA MODI and Japanese PM Shinzo Abe jointly laid the foundation stone for India's first high speed rail project between Mumbai and Ahmedabad. Speaking on the occasion, the PM spoke of the high ambition and willpower of 'New India.' He said that the bullet train project will provide speed and progress, and deliver results quickly. He said the Government's focus is on increasing productivity through high speed connectivity. The PM thanked Japan for the technical and financial help given to India, for this project. He praised PM Abe for the fact that this project is being launched within such a short time. Modi said that this high speed railway would not only bring two cities closer, but also bring the people living hundreds of kilometers away, closer to each other. He said a new economic system is being developed along the Mumbai-Ahmedabad corridor, and the entire area would become a single economic zone. He further added that technology is useful only if it provides benefit to the common man. He said the technology transfer envisaged in this project will benefit Indian Railways, and boost the 'Make in India' initiative. He said the project would be eco-friendly as well as human-friendly. Further he mentioned, 'high-speed corridors' would be regions for rapid growth in the future.

Lucknow Metro inaugurated

ALSTOM RECENTLY inaugurated Lucknow Metro - the first project for the company in Uttar Pradesh. The Alstom-built metros are designed in Bengaluru and manufactured at Sri City and Coimbatore, supporting the Government's 'Make in India' campaign. The event was held in the presence of honourable Union Home Minister, Rajnath Singh and Uttar Pradesh Chief Minister, Yogi Adityanath.

Alstom was awarded the €150 million contract in September 2015 by Lucknow Metro Rail Corporation (LMRC) to provide 20 metro trainsets, each of four cars. The Metropolis trainset for Lucknow has 186 seats arranged longitudinally, and includes two dedicated zones for passengers with reduced mobility. These trainsets will circulate on the city's new metro line, which will be around 23 km long and will include 22 stations, of which 19 are elevated and three underground.



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Force Motors joins hands with Rolls Royce Power Systems to produce engines

PUNE based auto major Force Motors announced that it has tied up with Rolls Royce Power Systems for setting up a Joint Venture to produce engines for multiple applications like rail and power generation. A dedicated manufacturing facility meeting the standards and specifications laid down by Rolls Royce will be built by Force Motors at its site in Chakan near Pune. This joint venture will produce complete power generation systems including associated spare parts for Indian as well as global markets.

Rolls Royce Power Systems portfolio includes high speed engines and propulsion systems for ships, power generation, heavy land, rail and defense vehicles. Rolls Royce has customers in more than 150 countries. Its customers

include 400 airlines, 160 armed forces, 70 navies and more than 4000 power and nuclear customers.

Force Motors is also the only company in the world that produces engines for two of the leading European premium car makers Mercedes and BMW. This new joint venture with Rolls Royce opens up a complete new business opportunity with great potential for growth.

Speaking on the occasion, Prasan Firodia, Managing Director, Force Motors said, "It is a matter of great pride and satisfaction that Rolls Royce Power Systems has decided to partner with Force Motors for manufacture of engines for their rail and power generation systems. We look forward to a long and mutually beneficial association."

Cyient takes over B&F Design Inc.

CYIENT LTD has acquired B&F Design Inc, which is based in New Britain, Connecticut, USA. B&F Design initially offered design services to local manufacturing companies and later expanded the business to include the manufacturing of tools, and has built a reputation for its high quality design and tooling capability. Today, their area of expertise includes design and manufacturing of precision engine assembly equipment, repair tooling, machining of fixtures and gauges, and engine factory modernization services. B&F Design employs a team of around 47 people, with a revenue between $8 million to $9 million, with low double-digit EBITDA margins. They also bring-in a strong team of technical and domain experts in Aerospace Tooling along with a common anchor customer, led by Darius Szczepankowski, who will join as General Manager to run the delivery operations.

With new programs going into manufacturing the demand for precision tooling is significantly increasing. This market is forecasted to increase at a faster rate than that of design. This is Cyient's sixth acquisition in the last three years as part of its 'Design-Build-Maintain' strategy.

Cyient holds a strong cash position of $155 million and will continue to look for acquisitions that will enable the company to realize its strategy and the goal of industry-leading growth.

Anand Parameswaran, Senior Vice President for Aerospace and Defense said, "Cyient holds a leadership position in providing engineering services to the Aerospace and Defense market. This acquisition is a step towards enhancing our Build and Maintain offerings. Through this acquisition, we are better positioned to provide increased value to our customers by undertaking more comprehensive work. We are confident that this acquisition will aid us in achieving our vision."

Sigma Electric opens Innovation and Engineering Center in Pune

SIGMA ELECTRIC has announced the opening of the new global Sigma Innovation and Engineering Center in Pune. The center will

enhance Sigma's engineering innovation capabilities and facilitate new product and manufacturing process development. It will leverage India's large engineering talent pool to provide design and consulting services for our customers across the globe. Dr. Suresh Naik, Ex Group Director, ISRO inaugurated the new facility in the presence of the Sigma team. The Engineering Center will boost innovation and direct our strategic R&D, to develop synergies between technologies, enhance our competencies, new product development and attract highly-qualified professionals. This facility has a world-class UL certified test lab. The center will develop to efficiently support our business growth.

Viren Joshi, CEO and President, Sigma said, "The Sigma Innovation and Engineering center gives a new momentum to our program to reinforce our product leadership and differentiate ourselves through innovation. The center has been designed in alignment with Sigma's R&D strategy, which focuses on connecting megatrends, customer requirements, sustainability, innovation and cost efficiency."

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A list of key events happening between November 2017 to July 2018, both nationally and internationally.

CeBIT India November 30–December 02, 2017 Bengaluru *www.cebit-india.com*	**ArabiaMold Sharjah** December 11–14, 2017 Sharjah, UAE *http://www.arabiamold.com/*	**ExCon** December 12–16, 2017 BIEC, Bengaluru *http://excon.in*	**IMTEX 2018** January 25–30, 2018 BIEC, Bengaluru *http://imtex.in*
Auto Expo Components February 8–11, 2018 New Delhi *www.autoexpo.in*	**ELECRAMA** March 10–14, 2018 India Expo mart, Noida *http://elecrama.com/*	**SIMTOS** April 03–07, 2018 Seoul, South Korea *http://www.simtos.org*	**Die & Mould India International Exhibition** April 11–14, 2018 Mumbai, India *www.diemouldindia.org*
Hannover Messe April 23–27, 2018 Hannover, Germany *www.hannovermesse.de/home*	**CeMAT** April 23–27, 2018 Hannover, Germany *http://www.cemat.de/*	**ACMEE** June 21–25, 2018 Chennai Trade Centre, Chennai *http://www.acmee.in/*	**AMTEX 2018** July 06–08, 2018 New Delhi, *http://www.amtex-expo.com/amtex_delhi*

OUR INHOUSE UPCOMING EVENTS

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ACG APPOINTS RICHARD STEDMAN AS GROUP CEO

ACG has appointed Richard Stedman as Group CEO for its Engineering business units. In his role as Group CEO, Stedman will manage the entire Engineering business that includes products and solutions for granulation, capsule filling, tablet press, tablet coating, blister packing and cartoning.

While speaking on the occasion, Karan Singh, Managing Director, ACG, "I am extremely pleased to have Richard as part of my leadership team at ACG. Richard has invaluable experience in managing Engineering businesses, and has significantly contributed to the success and profitability of the companies he has been associated with. I welcome Richard to ACG and look forward to his guidance and counsel."

"ACG is a global supplier for pharmaceutical solutions and products, with a loyal customer base and superior quality engineering solutions. The opportunity is to leverage the breadth and capability of the ACG Engineering companies to provide enhanced solutions for our customers," said Richard Stedman on his appointment.

PER LINDBERG APPOINTED AS CEO OF EPIROC

Atlas Copco AB has appointed Per Lindberg as the first President and CEO of Epiroc AB, a subsidiary of Atlas Copco AB. He will start in this position latest in the first quarter of 2018. Per Lindberg is currently the President and CEO of BillerudKorsnäs AB, a leading supplier of renewable packaging materials and solutions.

"Per is a strong leader with a solid industrial experience and a long track record of successfully developing companies in a competitive international environment," said Hans Stråberg, Chair of Atlas Copco's Board of Directors. "The Board is pleased to have found a CEO that can position Epiroc in a professional way and further develop the business. "

Atlas Copco in January 2017 announced plans to propose a split of the Group into two companies, Atlas Copco and Epiroc.

NEERAJ SHARMA IS WÄRTSILÄ INDIA'S PRESIDENT & MD

Wärtsilä India, a subsidiary of the technology company Wärtsilä Corporation, has appointed Neeraj Sharma as the new President & Managing Director. Sharma comes with over 30 years of experience in the Energy and Industrial sectors. He has significant experience in leading and developing emerging markets.

Prior to this appointment, he was Executive Vice President, Asia Pacific and Member of the Executive Board for KONE Corporation, Finland. Earlier to this, he was Managing Director, KONE India. Sharma has also held management positions with global organizations like General Electric and Alstom.

Commenting on the appointment, Kari Hietanen, Chairman, Wärtsilä India Pvt Ltd said, "Neeraj has an outstanding career spanning over 30 years in the industry, and has shown strong results in the demanding posts he has held in India and globally."

LOUIS BERGER APPOINTS HEAD FOR INTERNATIONAL DIVISION

James G. Bach has been appointed as the international division president of Louis Berger, reporting to the chief executive officer. In this role, Bach oversees strategic and operational performance for the company's International division, which provides a broad range of engineering, planning, architecture, development, construction management and program management services to national, state, local and private clients outside of the United States. Bach will operate from the Richmond, London office, where the company's International division is headquartered.

"As a skilled and seasoned executive with decades of leadership overseeing domestic and international operations at Louis Berger, Jim was a natural choice to assume the helm of our International division," said Jim Stamatis, chief executive officer.

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ALSTOM APPOINTS ALAIN SPOHR AS MD FOR INDIA & SOUTH ASIA

Alstom has appointed Alain Spohr as the Managing Director for India & South Asia cluster based in Bengaluru, India. He joins Alstom from GE Energy India where he was the MD & CEO of the GE/Bharat Forge Join Venture and also the India Country Leader for Steam Power Systems. Spohr brings with him over 35 years of experience in various roles in Country Business Leadership, Unit Management, Project Management, Engineering, Construction and Commissioning coupled with strong exposure to Industrial/factory operations. His rich career in India spans over 14 years which not only gives him a keen understanding on the country's business environment but also its culture and growth trajectory.

No stranger to the business, Spohr said, "Strengthening our existing portfolio and timely execution of all our current contracts are of utmost importance to me. India stands at the cusp of modernisation in the mobility space, an exciting time for all the players in this field. I look forward to my tenure at Alstom."

BANMALI AGRAWALA APPOINTED AS PRESIDENT, TATA SONS

Tata Sons has announced the appointment of Banmali Agrawala as President, Infrastructure, Defence and Aerospace. He will report to the Executive Chairman, N Chandrasekaran, in his new role. "The Tata group has a significant footprint in the infrastructure, defence and aerospace sectors. Banmali's global experience in these industries will be very beneficial as we build scale and aspire for the next phase of growth. As part of the Tata Sons leadership team, his knowledge in several areas, including leadership development, digital infrastructure, innovation and technology, will be very beneficial to the Tata group," Chandrasekaran said.

"I am delighted to be back as part of the Tata group and contribute towards the phenomenal opportunities that the Tata group has in the core infrastructure-related sectors, in India as well as globally. I was privileged to be part of GE for close to six years and have learnt a lot at GE. I look forward to taking all my learnings and experience from GE onto my new role at Tata Sons," Agrawala said.

VISHAL WANCHOO - NEW PRESIDENT & CEO OF GE SOUTH ASIA

GE has appointed Vishal Wanchoo as President & CEO of GE South Asia effective October 1, 2017. Vishal succeeds Banmali Agrawala, who is moving on from GE to join Tata Sons as President of its infrastructure, defence and aerospace business.

Speaking about this announcement, John Rice, Vice Chairman, GE Said "GE has been in this region for over 100 years, impacting lives of people through its various businesses. We have succeeded in building a robust team under Banmali's leadership and have achieved key business milestones in the region. We would like to congratulate Vishal on his new role and are confident that Vishal will bring his experience as a senior leader in strengthening GE's growth in the region. We would also like to take this opportunity to thank Banmali and wish him luck for his new role."

GM NAMES JEFFREY MASSIMILLA AS NEW VEHICLE SAFETY CHIEF

General Motors Co. has announced that Jeffrey Massimilla will soon become the company's new leader for global vehicle safety, following the retirement of Jeffrey Boyer, who departs the company effective Sept. 1, 2017, following 43 years of dedicated service.

Massimilla is currently GM's chief cyber security officer, where he leads the global organization that develops and implements protocols and strategies to reduce the risks associated with cyber security threats related to the vehicle and vehicle connected services.

In this newly expanded role, he becomes the vice president for Global Vehicle Safety and Cyber security, where he adds global responsibility for the safety development of GM vehicle systems, confirmation and validation of safety performance, as well as post-sale safety activities, including recalls.

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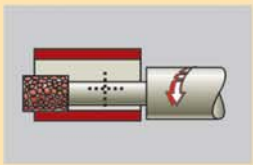

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FIGT-300 CNC
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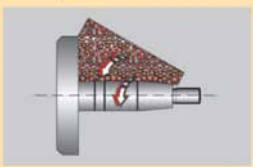
ID / OD GRINDER

CNC Cylindrical Grinding



AWH-1500 CNC
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AWH-2000 CNC
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SG-63
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Automats

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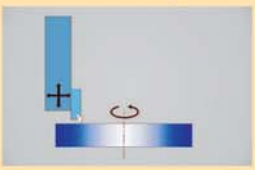

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Printing **metal components**

Mercedes-Benz Trucks has 3D printed the first spare part for trucks made of metal directly from digital data records saves expensive special tools, storage and transport costs.

Mercedes-Benz Trucks has taken 3D printing a stage further: the first printed spare part made of metal, a thermostat cover for truck and Unimog models from older model series, has passed all the stages of the stringent quality assurance process at Mercedes-Benz smoothly, and is now celebrating its premiere. This means that Mercedes-Benz Trucks is now the technological leader in the challenging segment of cutting-edge 3D printing processes for metal components.

"With the introduction of 3D metal printing technology, Mercedes-Benz Trucks is reasserting its pioneering role among global commercial vehicle manufacturers," says Andreas Deuschle, Head of Marketing & Operations in Customer Services & Parts at Mercedes-Benz Trucks. "We ensure the same functionality, reliability, durability and cost-effectiveness with 3D metal parts as we do with conventionally produced parts."

In the Customer Services & Parts division of Mercedes-Benz Trucks, automotive 3D printing began its increasing success in the production departments for the after-sales and replacement parts business a year ago. Since then, Customer Services & Parts has worked together with the researchers and pre-developers at Daimler AG to constantly improve and expand the use of the latest 3D printing processes for plastic parts. 3D printing of high-quality plastic components has now successfully established itself as an additional production method, and is particularly suitable for the production of smaller batches.

Metal parts in the 3D technology open up new possibilities

Metal parts from the 3D printer excel with their very high strength and thermal resistance, and the process is therefore particularly suitable for the production of mechanically and thermally stressed components required in small numbers. Metallic components can be produced "at the touch of a button" with any geometry and in any numbers. 3D replacement parts production began with rarely ordered aluminium parts. These excel with almost 100 percent density and greater purity than conventional die-cast aluminium parts. Apart from their high strength and hardness, as well as high dynamic resistance, their production requires no cost-intensive development work or procurement of special tools. Conceivable areas of use are

"In contrast to the Selective Laser Sintering (SLS) used in the plastics sector, 3D printing of metallic components uses Selective Laser Melting (SLM)."

Mercedes-Benz Trucks produces complex metallic spare and special parts in top quality using a new 3D printing process. The photo shows the working cavity of the laser printer at whose centre a metallic thermostat cover has been produced for the first time using selective laser melting (SLM). When the work platform is raised, the powdered aluminium/silicon material moves to the side and the contours of the component become visible.

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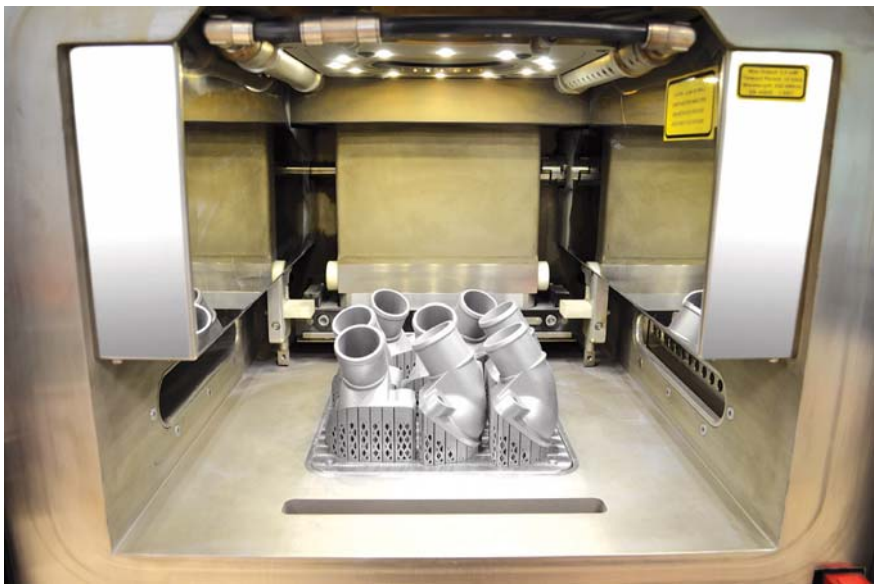

Mercedes-Benz Trucks is the worldwide technological leader in the use of 3D printed components, and will in future also produce complex metallic spare and special parts in first-class quality. The view into the interior of the 3D printer shows the first printed thermostat covers, which are still connected to the work platform. After removal of the platform and support structure, the aluminium/silicon metallic powder is removed by suction, sieved, cleaned and ecologically fed back into the recycling system.

peripheral engine parts made of metal, in-engine parts and also parts in cooling systems, transmissions, axles or chassis. Especially when they have complex structures, 3D-printed metal parts in small numbers can be produced cost-effectively as infrequently requested replacement parts, special parts and for small and classic model series.

"The availability of spare parts during a workshop visit is essential for our customers – no matter how old the truck is, or where it is located. The particular added value of 3D printing technology is that it considerably increases speed and flexibility, especially when producing spare and special parts. This gives us completely new possibilities for offering our customers spare parts rapidly and at attractive prices, even long after series production has ceased," Deuschle concludes. In the future, 3D metal printing might allow decentralised and therefore much faster, local production directly in the worldwide Mercedes-Benz production locations. This would further improve parts availability: expensive warehousing and the associated, complex transport processes would be unnecessary, with delivery times made shorter for customers.

Rapid global availability even after many years

The new thermostat cover is an example of cost-effective spare and special parts production in top quality, made possible by use of the 3D printing process for highly resistant metal parts made of die-cast aluminium alloy. This replacement part is only ordered in small numbers, and is used in older truck and Unimog models whose production ceased around 15 years ago. This example shows that Customer Services & Parts is able to produce and offer components that are no longer installed in current series production vehicles, or are only produced in very small batches as special customer requests, at a reasonable cost. Thanks to advancing digitisation, even highly specific metal components can be ordered from Mercedes-Benz Trucks and delivered anywhere in the world on request, even after many years: quickly, cost-effectively, in requisite numbers and in consistently high OEM quality.

"The new thermostat cover is an example of cost-effective spare and special parts production in top quality, made possible by use of the 3D printing process for highly resistant metal parts made of die-cast aluminium alloy."

"In the future, 3D metal printing might allow decentralised and therefore much faster, local production directly in the worldwide Mercedes-Benz production locations. This would further improve parts availability."

Andreas Deuschle,
Head of Marketing & Operations in Customer Services & Parts at Mercedes-Benz Trucks.

In contrast to the Selective Laser Sintering (SLS) used in the plastics sector, 3D printing of metallic components uses Selective Laser Melting (SLM). In the case of the thermostat cover, for example, the powdered aluminium/silicon material (ALSi10Mg) is applied in individual layers and melted by an energy source — usually one or more lasers. When one layer is completed, a new layer of powder is applied automatically and the melting process is repeated. The process is repeated until a high-strength, three-dimensional aluminium component suitable for use in areas of high temperature has been produced. Thanks to the layered structure, the process also offers a level of geometrical freedom that cannot be matched by any other production method.

Source: Daimler AG

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Journey of **excellence!**

The key to market leadership is sticking to basics and always remaining ahead of the curve, says **Abhijit Gupta**, Brand Leader& Managing Director, CASE India

By Niranjan Mudholkar

Congratulations to you and your team for your plant's success in achieving the bronze level designation in World Class Manufacturing. When did the plant embark on the WCM journey and how has this journey benefitted the plant as well as the overall business?

CASE Constructions has started its journey of Excellence in 2013, when we benchmarked ourselves with World Class Organizations and felt an urgent need to deploy the World Class Practices to compete with Market Leaders in Global arena. Over past 4 years we set the target, created a route map, formed a dedicated team, learned the WCM Concepts, visited world class plants of CNHI, Deployed the WCM Practices at Model Area and further expanded them across all the business processes, rigorous follow-up & through involvement of entire team from Top to Bottom. In May'2017 WCM Audit our plant succeeded in achieving this prestigious BRONZE Level Certification.

The WCM Tools and guidelines not only challenged and pushed us towards continuous improvement, they also widened our knowledge through Global Exposure. We have seen a drastic change in the way people look at Safety which created a world class Safety Culture and reaching our Goal of Zero Injury for last four Years.

The plant also made notable improvement in Energy & Environment Pillar via. Identification of related Waste & Losses and initiation of various projects ensuring Optimum Utilisation of Energy & Several Resource Conservation Projects.

WCM has helped us in inculcating a culture of Structured Problem Solving in every business processes which has helped us in Improving upon Built in Quality & Product Reliability. Thus, improving customer confidence in our brand.

WCM helped us in establishing a Lean Manufacturing Process, well integrated processes assuring first time right product and various cost saving initiatives led to maintaining our Profit Margins.

Has the plant undertaken any technological upgradation and training programmes to achieve the WCM competitiveness?

The Plant has undertaken many technological upgradations as a part of WCM. By introduction of state-of-the-art technologies viz. Laser Cutting Machine, Robotic Welding Machines, New Paint Shop, Ferro Arm, SST Machine, Testing Facilities, Various Poka-Yokes, IT enabled systems to ensure capturing of Real time data from Field as well as from Internal manufacturing processes etc.

Weekly, fortnightly and monthly training programmes on various WCM Concepts have been organized followed by linked projects and benchmarking visits to other WCM Bronze, Silver & Gold plants has helped in improving upon our WCM Competency.

> "The export volumes of CASE India also have a correlation with the WCM efficiency of the Pithampur plant and this has had a positive outlook so far."

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What is the next target in this journey?

WCM is a philosophy of eliminating waste as a perpetual journey and so is our continuous focus on improvement to drive excellence in our operations.

For CASE India, achieving Bronze has marked the beginning of the journey towards SILVER which we would target to achieve within a couple of years at max.

How many models and variants are manufactured at this plant and what is its total capacity?

There are mainly two platforms (Loader Backhoe & Vibratory Compactors).

Across these two product categories we manufacture 10 Models having more than 63 variants manufactured to cater to varied customer needs.

With an annual capacity of more than 7500 units on a single shift basis we have enough flexibility built in to cater all market requirements and demand surges.

In addition to these we are also trading three more product lines - Skid Steer Loaders, Motor Graders and Crawler Dozers - with seven models between them and a high level of configuration flexibility for different variants. These are manufactured at CNHI Construction Equipment plants in Brazil and USA.

What kind of R&D activities do you have at Case Construction Equipment India? Tell us about your efforts to develop and manufacture India specific products.

The company's R&D team constantly endeavours to develop clever innovations to make equipment more fuel efficient for reducing emissions on the environment. There are two platforms based out of India for construction equipment - loader backhoes and vibratory compactors. The team is equipped with a well-structured and well-equipped design team, validation team, specialist designers and manufacturing engineering team.

This team is catering to products manufactured in the Pithampur plant and exported in more than 30 countries in addition to the India market. Since the team is closer to Indian market, they regularly reach out to the Indian customers to access their identified and unidentified needs and also to take regular feedback from them.

"The WCM Tools and guidelines not only challenged and pushed us towards continuous improvement, they also widened our knowledge through Global Exposure."

Certain unique systems such as voice of customer recording through systematic and process driven interventions further helps make this information robust and representative

For a technological intervention, we have also introduced Eagle Eye Telematics System, a real-time vehicle tracking and communication based on GPS technology, on our machines coupled with several mobile applications which helps make the interaction with the customers seamless.

You have been a market leader in India in the vibratory compactors segment for more than two decades. This is a long time by any standard. What has been the key to this leadership and what are you doing to further consolidate this position?

To be a market leader in certain segment for more than two decades is a humbling experience which is achieved with a lot of hard work and appreciation from our valued customers.

The key to such a performance is sticking to basics with a good and reliable product, good customer after sales support through on time parts and service availability and of course always remaining ahead of the curve in terms of product upgradations to keep pace with the ever-changing demand of the customers.

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To give a recent example through which CASE India further consolidated its leadership position in Soil Compactors is with the launch of CASE 1107EX which boasts of a powerful yet fuel-efficient performance. It features a new FPT Industrial S8000 3.9 litre engine that delivers 100 hp at 2200 rpm and torque of 435 Nm at 1300 rpm. The turbo after cooled engine with internal Exhaust Gas Recirculation ensures best-in-class fuel economy. The more than 2 million S8000 engines at work across the world are testament to the reliability of this proven power plant.

The maximum applied force by this compactor under vibration is in the range of 34 tonnes which is among the best in the industry. The hydrostatic variable speed control ensures the CASE 1107EX travels at the perfect speed for every type of soil, resulting in a uniform compaction. This high productivity comes with high reliability and serviceability. The operator station provides excellent comfort and safety. The outstanding all-round visibility, together with the 90-degree rotating seat, makes it easy for the operator to control the rear wheel and front drum, operating productively and safely.

"Owing to our strategic positioning we could leverage the growth in demand to our advantage by achieving a higher as percentage growth than the industry at large."

Q How's been the market for Case India in 2016-17 in terms of business numbers? What are your projections for 2017-18?

The market has been great for CASE in this year. In the journey of more than 25 years in India we have seen the difficult years as well as the growth years of Indian construction equipment. After a recent 4-year slowdown, we experienced a good growth last year in line with the industry. We were actually preparing ourselves for it with a lot of product upgradations and launches in the last couple of years. Owing to our strategic positioning we could leverage the growth in demand to our advantage by achieving a higher as percentage growth than the industry at large.

The long-term outlook for the Indian market is very promising with huge potential. We expect significant growth and are positive in terms of increase in volume for the next year.

The Indian customer is becoming increasingly discerning and demands products with higher efficiency and performance, especially in applications where the project needs to be delivered within a certain timeframe. We have a complete family of construction equipment products. And, with the market evolving, we offer our support by using our skills and expertise at their best.

Q What are your domestic sales to exports ratio?

CASE India sells and supports a full line of quality construction equipment around the world to more than 30 countries. This is achieved by making the most advanced technological products which are suited not only to the export market but also to the Indian customer requirements of high fuel efficiency and productivity.

In essence, we make products which are of a truly global outlook with a quality matching the best in the world. The export volumes of CASE India also have a correlation with the WCM efficiency of the Pithampur plant and this has had a positive outlook so far. An exact share will be difficult to arrive at as there is a varying degree of export penetration across different product platforms. However, it is reasonable to assume that the export sales are catching up and are on a growing trajectory.

Q Which are your key exports markets and how do you see the exports business growing in the years to come?

CASE India is part of the highly industrialised world of CNH Industrial. Across its 12 brands, 64 manufacturing plants, 50 research and development centers and a workforce of more than 64,000 people, CNH Industrial is present in 190 countries giving it a unique competitive position.

CASE India plays its role in this overall worldview of plants and markets and is distributing the products made in India to more than 30 countries in addition to India which are at a similar level of emission level regulation as India.

Q While it is too early to assess the overall impact of GST implementation, what is your opinion about it?

GST aims to bring one uniform tax across the country, eliminating several layers of tax incidence. Any massive change such as this is bound to have some hiccups in the beginning due to different levels of understanding among the customers from different segments that are impacted differently with the change in tax. However, on a macroscopic scale this will result in a much more business friendly environment with the enlargement of a homogenous market across India. Summarily we have a positive outlook towards this reform and its consequent impact on Indian Infrastructure Development.

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Embracing **new beginnings**

Transition from BS IV to BS VI is not an easy task for the automotive industry. It requires immense efforts from industry. Let's see how the industry is gearing up for this big change.

By Swati Deshpande

The Indian auto industry is one of the largest in the world. "The industry accounts for 7.1 per cent of the country's Gross Domestic Product (GDP). Moreover, the growing interest of the companies in exploring the rural markets further aided the growth of the sector. India is also a prominent auto exporter and has strong export growth expectations for the near future," says Sudhir Mehta, Chairman & Managing Director, Pinnacle Industries Ltd.

In the midst of growing demand in the market, the automotive industry is transforming due to various reasons. Emphasis on new technologies such as smart vehicles concept is talked about. On the other hand, an e-revolution is set to take place globally. At the same time, the Indian auto makers are challenged by the announcement of skipping Bharat Stage V. Instead, Bharat Stage VI is proposed to be come into effect by 2020. Speaking on the transformation, Nishant Arya, Executive Director, JBM Group mentions, "There is a lot happening in the automobile sector in terms of transitioning from BS III to BS IV and to BS VI norms in a short span. And now, the government has already set its eyes on going 100 percent electric by 2030. With all that's happening in the space, there will be a sea change that the automotive industry will witness in the near future."

Agreeing to Arya, Deepak Chopra, CEO, Anand Group says, "This jump from BS IV to BS VI is certainly a challenge. Although the automotive industry was keen to go through BS V, the only way to cut short the time of catching up with the developed world is jumping on to BS VI."

Distinguishing BS VI norms from BS IV, Rashmi Urdhwareshe, Director, The Automotive Research Association of India (ARAI) explains, "There is a philosophical difference between BS IV and BS VI. BS IV is more or less confined to the laboratory level approvals. In addition to this, what is required to be done in BS VI is manufacturers must comply in-service checks. That's a big change. Moreover, what is new for us is compliance of these norms for commercial vehicles segment. It's a huge uphill task to shift from mechanical control systems

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"This jump from BS IV to BS VI is certainly a challenge. Although the automotive industry was keen to go through BS V, the only way to cut short the time of catching up with the developed world is jumping on to BS VI."

Deepak Chopra, CEO, Anand Group

"There is a philosophical difference between BS IV and BS VI. BS IV is more or less confined to the laboratory level approvals. In addition to this, what is required to be done in BS VI is manufacturers must comply with in-service checks."

Rashmi Urdhwareshe, Director, The Automotive Research Association of India (ARAI)

"When you look at the Indian automotive components industry, it is a mature one geared to cater to the global market and keep up with constantly-changing demands. We are not the same industry that used to be just focussed on Indian technology or markets alone."

Sunjay Kapur, CEO, Sona Group mentions

"We will be a seeing a lot of technology getting changed on the fuel intake systems, emissions and the exhaust systems."

Abhishek Jain, Chief Executive Officer and Managing Director, PPAP Automotive Ltd

to electronic control systems in the commercial vehicles segment. Passenger cars even at BS IV level are equipped with electronic control systems. Another challenging area is two and three vehicles. We are gearing ourselves for it so that we can help the government as well as the industry in a better manner."

Elaborating further, Sunjay Kapur, CEO, Sona Group mentions, "These norms, especially fuel, are really affecting engine manufacturers. Look at some engine components like steel pistons; this is also a result of fuel requiring such strength. Therefore, we are moving from aluminium to steel pistons in engines. This will not affect the components industry as, in totality, for instance, a steering maker or differential maker is not affected by the change in fuel. But engine components would be affected."

So what us the industry doing to gear itself for the upcoming change? "To enable quick transition from BS IV to BS VI, lot of efforts are needed by the whole industry including OEMs, Tier 1, Tier 2 and Tier 3. There is a huge investment that is involved in this. These efforts will also involve investment to be made and we have planned it as per the deadline." Further he explained that the group works on a joint venture model. "The advantage of this model is our joint venture partners already have know-how of BS VI as they have dealt with Euro VI recently in other parts of the world such as Europe and US Japan & Korea."

JBM Group has also started its journey towards adoption new norms. Speaking on the same, Arya mentioned, "To address the demands of the future, JBM Group started early in getting ourselves aligned with the changing demands of our customers. We have a dedicated and a very strong vertical for R&D and design which enables us to evolve fast."

Speaking about the Indian auto industry's groundwork towards BS VI, Kapur says, "We are absolutely ready to accept BS VI norms by 2020. When you look at the Indian automotive components industry, it is a mature one and it is geared up to cater to the global market and keep up with constantly-changing demands. We are not the same industry that used to be just focussed on Indian technology or markets alone."

"Today, the Indian automotive components industry is well established. Many companies are investing in R&D as well as design and development of products, indigenisation of tool rooms, and localisation of products. Therefore, I am confident that the Indian automotive components industry is absolutely ready to accept BS VI norms by 2020," he believes.

Summing up, Abhishek Jain, Chief Executive Officer and Managing Director, PPAP Automotive Ltd. says, "We will be a seeing a lot of technology getting changed on the fuel intake systems, emissions and the exhaust systems. Many component suppliers are ready with the technology to cater to BS VI requirements. The biggest foreseeable change will happen when India decides to adopt Hybrid and Electric vehicle technology in a big way.

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Rising above the ordinary

The present times call for us to have unprecedented visibility, tracking and control over the entire production process while at the same time creating cost efficiencies, says **Nachiket Kodkani,** Plant Head & Vice President – Manufacturing, Mahindra Vehicle Manufacturers Ltd. (MVML)

By Niranjan Mudholkar

How do you benchmark yourself?

The Mahindra Automotive Division has seven major plants in India and one in Korea (SsangYong motors). We have a similar set up for tractors. In a way, we have more than enough plants internally to benchmark -- as every plant has one or two areas of excellence.

Benchmarking for us works in two ways, internal and external. When we say internal, we mean within our plants we compare similar shops and processes with respect to various efficiency parameters and we do the same with our other plants in the Group. For example, a vehicle rolling plant will have all its parameters compared and benchmarked with all our plants across the Group in India and globally. This builds a healthy internal competition. We also have synergy groups consisting of members from all plants who continuously interact and visit to keep this process strong, leading to continuous improvements.

On the external front we benchmark other OEMs and many a times visit the "best practice" companies.

We also work and partner with suppliers on latest technologies and processes that can be implemented in the near future. We not only learn from auto industries but also learn a lot from other industries remotely connected to us. Our teams are on the move across the world attending different technology seminars /shows scouting for something new to make us more efficient and effective. We work with industry experts on specialized areas, also we interact with various institutes like IITs and other research institutes.

Skilled workforce is a challenge before the industry. What initiatives are being undertaken by your company for the skill building and craftsmanship, which is a requisite in present times?

Hiring the right talent coupled with right training soon after on boarding is the key for skill development.

We have taken the "First time right" mantra to schools, we believe we must teach them the right skills from the very beginning to reduce the unlearning time. Therefore, we have partnered with couple of ITI's from our neighbourhood, we work with them proactively, help them on the right curriculum, the right equipments so as to develop the right skills and talent even before they leave the school. This model has helped in addressing the needs of our Industry and is focused on making students work ready.

Once in the factory our focus shifts to training them for skill and finesse or craftsmanship, for which the employee undergoes an elaborate hands-on training program in our domain wise dexterity schools aptly called "GURUKUL" where expert trainers hone their skills before they are deployed to work in production. We are able to simulate the actual

"We have gone beyond the traditional 'problem-solving' approach; customers expect everything first time right."

working condition in production in these Gurukuls.

Internally with an objective to further enhance the manufacturing skill standards at Mahindra to a Global level the program on Mahindra Skill Excellence was initiated. The program aids the skill building process, by exposing our workforce to the most stringent skills standards and subsequently equipping them with best-in-class training.

This initiative has brought lots of laurels in India and abroad. Results of these rigorous trainings and skill building programmes can be clearly seen from the fact that for last three consecutive competitions, our welder's have been selected at National Level and have represented India for the World Skill Competition at Germany, Brazil and the upcoming World Skill Competition at Abu Dhabi due in Oct 2017.

In addition, we also do many behavioural and motivational programs with our associates. Apart from this, we also work on capability development of our associates by conducting internal & external competitions. The idea is "Right skills need to be complimented with the Right will to deliver excellence".

Dr. Goenka has mentioned about the implementation of 'Delivering Customer Delight' and 'First Time Right' initiatives. How you are pursuing that in the facility?

Well, we have now gone beyond the traditional 'problem-solving' approach; customers expect everything first time right.

To get everything first time right we have automated most of the critical processes, to a large extent, like robotic painting, wind shield glass sealing and fitment, AC, Brake, Power Steering oil filling machines. Where ever we don't have automation, we ensure we have hundreds of POKAYOKE (mistake proofing mechanisms) to avoid any kind human errors even by chance.

Beyond this we have a stringent three tier fire wall/check system to ensure zero slippages to customer. Further on the plant side we have moved from "adherence to specification", to rising up to customer need, meeting specifications is now hygiene. We have benchmarked global standards and now follow the Global New Overall Audit for Customer (GNOVA C). These daily audits look at every vehicle from today's customer expectations and keep revising the standard and raising the bar.

The aim is avoiding occurrence of any defect in first place through automation, robotics and Pokayoke. Secondly, establishing strong detection systems by way of automated checks at end of the line as well as manual checks. Finally, the most important step, through regular in-sighting into customer expectations and realigning our quality standards. These are the three main elements which help us deliver FTR and ETR products.

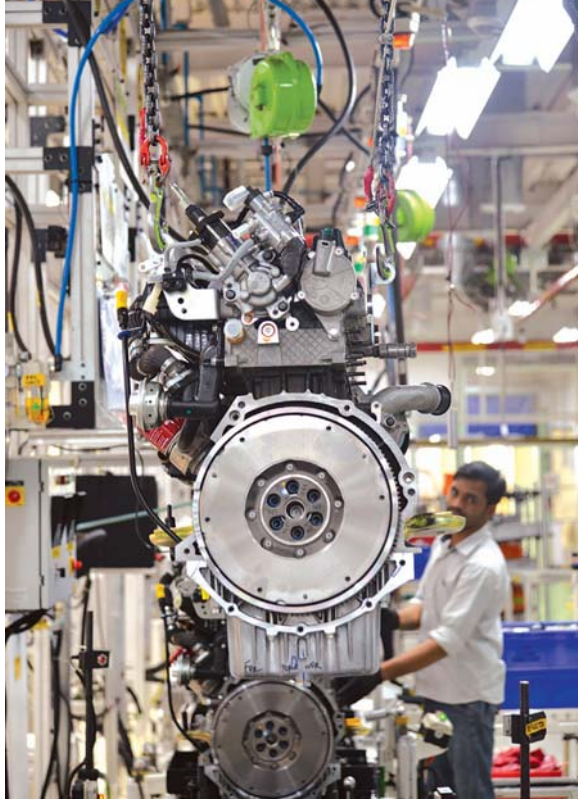
We at MVML, take pride in being able to deliver products that delight our customers.

The 'Design for Assembly' (DFA) - how it is put to practice here in MVML? Please elaborate a little more on it.

Unlike earlier days where we launched one or max 2 products a year, we have moved to an average of 4 to 5 launches a year in recent past, this has necessitated that we crunch time to market from concept to reality.

Most new products have been coming in brown field projects for which their seamless integration into existing

"We have a concept of "Connected Factory" which is primarily to ensure seamless operation of such large-scale industry to deliver vehicle of choice to customer at their expected time."



production lines and processes is the need of the hour for which this DFA is critical.

There is no time for errors and redos and this calls for early involvement of manufacturing teams right at design stage to ensure smooth implementation. This is where simultaneous engineering and DFA i.e. design for assembly plays a vital role.

Biggest challenge to run a factory is managing costs. What are the measures you undertake for efficient cost management?

As you rightly said, there is increased pressure on us to be cost efficient for maintaining the competitive edge.

The present times call for us to have unprecedented visibility, tracking and control over the entire production process while at the same time creating cost efficiencies.

We have dedicated CFTs in place for every major cost element that builds our cost structure. Idea is to challenge every expenditure and find alternative ways.

We also have central teams across plants who work on power and fuel and look at reduction and alternate source of energy. We presently use wind energy, solar energy and other forms of energy, we also use bio gas which we generate from canteen food waste. We have intershop and interplant working groups on consumables and spare cost synergy. We have centralized buying where it helps take benefits of scale. We also use a lot of technology to aid in cost savings, motion sensors, cameras, robots, cobot, etc.

We regularly do "value stream mapping" to reduce waste and work strongly on "footprint reductions". Both these initiatives have benefitted us tremendously in the recent past. For us "Every rupee matters" so while we have big projects, we also have this ideation forum where every associate contributes. On an average, we get 5 to 6 cost ideas per person /year which add to thousands of new ideas flowing into our kitty every month.

What is the role of the plant operations in the 'New Product Development' process?

In New Product Development (NPD) process, cross-functional development teams work to project fit with manufacturing resources and skills to ensure three critical areas - to achieve lower cost, high quality and short time to market in NPD.

We have a launch manager concept for every product, he and his whole team works with new product development team right from the start to the end, participating in DFMEAS, PFMEAS and DFA (design for assembly) continuously sharing learnings and giving inputs related to their domains to ensure no errors and rework.

This ensures seamless transfer of products from drawing boards to manufacturing and helps deliver first time right products and processes.

Here in Chakan plant we get to see good blend of automation and manual? Your thoughts on Industry 4.0 evolving in India?

Yes. rightly said we do have a balanced blend of technology and manual work. We do not believe in use of technology for the sake of it. We use technology very judiciously, and where found most apt to use, key areas where we like to use technology is quality, ergonomics, and safety.

> "In New Product Development (NPD) process, cross-functional development teams work to project fit with manufacturing resources and skills to ensure three critical areas - to achieve lower cost, high quality and short time to market in NPD."

We have a concept of "Connected Factory" which is primarily to ensure seamless operation of such large-scale industry to deliver vehicle of choice to customer at their expected time. We have extended the connected factory concept even to our suppliers who are in sync with our schedules and deliver on line not just in time but "just in sequence". The talks these days are revolving around Industry 4.0 and about the edge it is offering to drive new levels of efficiency on the shopfloor processes. We are not averse to digital 4.0, you can see many elements of this in our factory up and running Viz MES, Robots, cobots, connected machines. If the question is will we blindly copy every element of Industry 4.0 to the same scale answer may not be "yes". We will ideally be chalking our own path in this digital journey, we will do what best suits our business and the Indian context at large.

How do you see the role of SCM in your operations?

Building 'strategic alliances' with our key supply chain partners is what we believe in. MVML's strategy is to have an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agile supply chain wherein key suppliers operate in a firm's zone by ensuring that their manufacturing lead times are lower than MVML's ordering times. These suppliers are either housed in adjoining supplier-park or are encouraged to have their plants in close proximity of MVML.

Supplier domain is completely synchronised with MVML's state of the art MES and in some cases also have a B2B connectivity with their own MES. This enables them to supply components on a Just in Sequence (JIS) basis. This flexible back end strategy gives M&M a competitive Edge in the market place when it comes to dealer committing dates to customer. In terms of our expectations from our suppliers: MVML believes in partnering with suppliers to get excellence in areas such as - reliability of supplies, responsiveness, flexibility, supply chain costs and supply chain asset management.

Q How is MVML attracting and retaining new generation talent particularly when you operate in automobile hotbed of India?

The attractiveness of software industry is receding and there is a growing urge among Gen Y workforce to work in the core disciplines of engineering. There are equally good career avenues available now in manufacturing.

Hiring the right talent and carving right path of capability Building for Employees has always been the focus area in Mahindra. Employee Engagement Philosophy & Employee Value Proposition focuses on managing Career Aspiration, Alignment with Business Goals, Recognition of Outperformance & Abundant Learning Opportunities for Employees. This delivers & drives Employee Retention at M&M.

What is unique to Mahindra is probably the culture of empowerment, freedom to experiment, freedom to choose your place of work, supported by a culture of a reward and recognition.

An employee at Mahindra can apply for Job Rotation across any function, department, even across Business and if found suitable is supported by HR Policy for smooth transition across roles.

At Mahindra, all senior leadership follow open door policy. One can just walk in and share his thoughts and ideas, it helps build a strong bonding.

Added to this we have a very robust and fair transparent performance appraisal system which identifies high performers who are then groomed to become future leaders.

All this culminates to the fact that M&M AFS as an organisation has been featured among the top 25 companies in Great Place to Work 2017 survey report third time in a row and among the top three in manufacturing sector.

Q What are the sustainability practices at MVML?

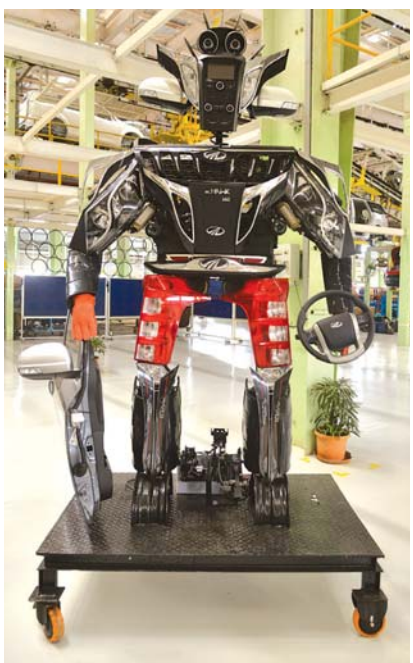
We have our efforts directed towards sustainability to reduce resource use in the plant and reduce the environmental impact of our manufacturing footprints. In our mission to achieve water neutrality, water harvesting facility is developed inside plant premises which stores One lakh Cu M of rainwater, which is sufficient to cater annual domestic water requirement of 1700 families. We have been able to reduce load on MIDC fresh water intake to a large extent.

We also have complete eco-friendly, high rate transpiration system (HRTS), as a tertiary treatment for the effluent treatment and disposal process. With this, we have been able to reduce GHG emissions and eliminate hazardous wastes generated out of conventional process. The efforts are also being taken to become a Zero land fill company.

With initiatives for Solar PV setup and solar dish for generating energy for different applications and Wind mill for feeding green power we have been able to reduce our CO2 emissions considerably. In our endeavour of green SCM, environmental impact of packaging has been reduced to half in last 5 years and target is to reach zero in next 3 years.

Going forward, we pledge to generate 5 MW power through roof top solar. With this, a majority portion of plant's today's energy requirement will be met by renewable energy sources which is equivalent reduction of 10000 tons of CO2 emissions.

Looking ahead, the journey from constraints to abundance will be long and complex. Nevertheless, it is the only long-term solution and I am sure that with our heightened awareness, enthusiasm and dedication, we will rise to the sustainability challenge as well.



An innovative 'training robot' created inhouse by MVML employees for understanding the complexities of electronics systems in the car. The robot has been built using actual parts of the XUV500.

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Bosch and Daimler to demonstrate Automated Valet Parking

Daimler and Bosch have teamed up to realise driverless parking (Automated Valet Parking) in the multi-storey car park at the Mercedes-Benz Museum in Stuttgart. Cars now proceed without a driver to their assigned parking space in response to a command issued by smartphone, without any need for the driver to supervise the manoeuvre. Automated valet parking marks an important milestone on the way to autonomous driving. The pilot solution at the multi-storey car park of the Mercedes-Benz Museum represents the world's first infrastructure-supported solution for an automated drive-up and parking service in real-life dual operating mode. From the beginning of 2018, visitors to the museum's multi-storey car park will be able to experience the convenient service at first hand and avoid spending time parking their cars.

Ashok Leyland bags Rs. 650 crore order from KSRTC

Ashok Leyland has bagged an order from KSRTC for 3019 buses. This order, one of the largest from a State Transport Undertaking for a single OEM, would be executed in the current financial year which would help Ashok Leyland in furthering its leadership position in buses. The order size is about Rs. 650 crore.

Speaking about the order, Vinod K. Dasari, Managing Director, Ashok Leyland, said, "We are very happy to receive the confirmation of this order from KSRTC. Our ability to bring value to customers like KSRTC, is a testament to our superior technology and innovation, combined with low costs."

Toyoda Gosei develops new headlamp

Toyoda Gosei Co., Ltd. has developed its first automotive headlamp LED as a new LED product. According to in-house tests, these LEDs achieve world-class luminance with low energy consumption. Toyoda Gosei has applied the blue LED crystal growth technology it developed over many years to improve the structure of gallium nitride (GaN) crystals in this new LED light source, with flip-chip technology adopted for good heat dissipation. These headlamp LEDs can achieve high luminance of 2,300 lm and can be used in bi-functional systems that produce both low and high beams from a single light source. Headlamps employing these LEDs will help reduce energy consumption in electric vehicles, fuel cell vehicles and other next-generation vehicles, and are expected to come into widespread use in the future as an environmentally-friendly product. Toyoda Gosei will continue to develop various types of headlamp LED light sources to meet customer needs.

JLR opens its new plant in China

Jaguar Land Rover has opened its Chinese engine plant as part of its RMB10.9 billion joint venture with Chery Automobile Ltd. The state-of-the-art facility will manufacture the all-new Ingenium 2.0-litre four-cylinder petrol engine for future Chery Jaguar Land Rover vehicles.

During the first six months of the year, Jaguar Land Rover sales have increased by 26 per cent in China. The new engine plant demonstrates Jaguar Land Rover's long-term commitment to the Chinese market, providing customers with an exciting range of vehicles and powertrain options, as well as to its joint venture. Operations began at Chery Jaguar Land Rover's plant less than three years ago and since then it has manufactured more than 100,000 vehicles. It produces the Range Rover Evoque, Land Rover Discovery Sport and, exclusively for the Chinese market, the Jaguar XFL. In addition, it has confirmed that the all-new Jaguar E-PACE will be produced in Changshu from 2018. Globally, Jaguar Land Rover has made significant investments in new technology and environmental innovation in recent years.

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Tata Motors develops Bio-Methane Bus

Tata Motors showcased country's first Bio-CNG (bio-methane) Bus at the Bio-energy programme, called 'Urja Utsav'. This programme was organised by the Ministry of Petroleum & Natural Gas. Tata Motors has designed and developed bio-methane engines (5.7 SGI & 3.8 SGI) for LCV, ICV & MCV buses.

Displayed at the event were three engines, along with the lead model; Tata LPO 1613 with 5.7 SGI NA BS-IV IOBD-II compliant bus. The Tata LPO 1613, already in operation by PMPML (Pune Mahanagar Parivahan Mahamandal Limited) was showcased with bio-methane fuel at the event.

According to Girish Waugh, Head, Commercial Vehicles Business, Tata Motors, "Tata Motors has been at the fore front in pioneering latest technologies and providing smart city solutions in the commercial vehicle industry. We are delighted to present yet another product with innovation in alternate fuel technologies, to cater to the need for a greener country. The use of Bio-CNG will contribute in a positive manner to the Smart Cities proposition of keeping them clean and is a good option for wet garbage management."

Continental pushes automated vehicles with CUbE

Continental is using its corporate expertise in automation, new mobility concepts, and electrification to develop solutions for the urban transport of the future and for a better quality of life in cities.

"The future of individual mobility in cities is autonomous and electric, and it will become part of the shared economy," says Frank Jourdan, member of the Executive Board of Continental AG and Chairman of the Chassis & Safety Division Management Board.

"This is why we're developing cross-divisional solutions for driverless robo-taxis – and we will be starting with practical testing this year. Continental has therefore access to an almost complete product portfolio of its own sensors, actuators, control units and communication and networking technology."

Henkel opens its Composite Lab in Japan

Henkel has opened a state-of-the-art test facility for composites in Japan. The new Composite Lab in Isogo-ku, Yokohama, will allow automotive customers from across Asia to team up with Henkel experts to develop and test composite parts, and to establish the best process conditions to make their ideas ready for market.

Interest in the use of composites to reduce vehicle weight and increase performance is rising rapidly among automotive OEMs and Tier 1 suppliers. But their demands are strict: they require cost-effective processes suitable for production of more than 10,000 parts per year. In practical terms, this means they often want custom-formulated, fast-curing resins for use in short production cycles.

This magnifies the importance of having reliable partners with in-house test capabilities. This is why Henke has opened the new Composite Lab, where automotive customers can work with Henkel experts to develop and test composite parts, and also optimize series production process conditions.

They can carry out trials with different test molds on Henkel's own High Pressure Resin Transfer Molding (HP-RTM) equipment. The HP-RTM machine includes a 380 tons press for trials close to series production conditions.

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Bringing efficiency in the **supply chain**

Efficient supply chain is directly related to success of the business. Here is how some organisations are attempting to make it robust.

By Swati Deshpande

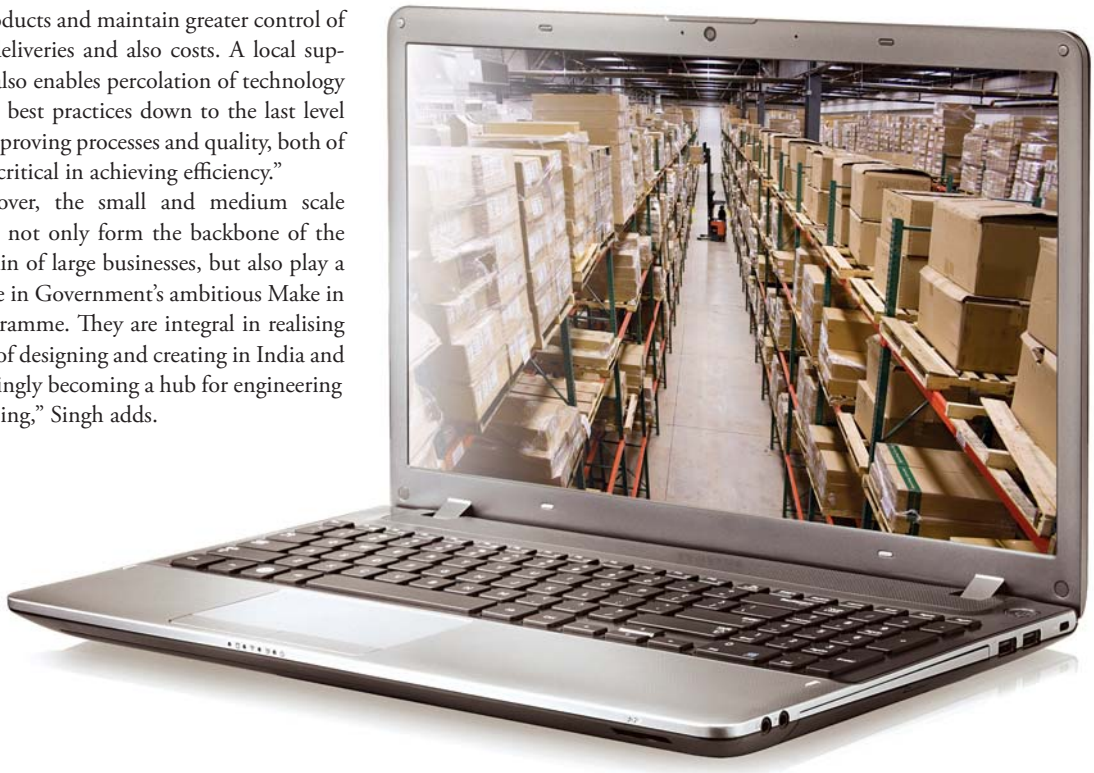
Supply chain management is one of crucial areas for any organisation. It has a major role to play in the success and hence growth of the company. Speaking on the same, Abhishek Jain, Chief Executive Officer and Managing Director, PPAP Automotive Ltd. says, "An efficient supply chain is one of the basic foundations to ensure competitiveness of an organisation. Our company supplies over 500 different products and over 150,000 pieces every day to our various customers spread across the country. We have to ensure that each of these pieces are defect free."

Additionally, robust supply chain can help addressing the customer demand. Commenting on it, Jasmeet Singh, Head - Corporate Communications and External Relations, JCB India Ltd. says, "With the ever changing dynamics of the market, it is essential for manufacturers to establish a robust and localised supply chain base. Today, customers are looking for products that offer value for money without compromising on the quality. A strong local supply chain base enables the manufacturer to offer world class quality products and maintain greater control of supplies, deliveries and also costs. A local supply chain also enables percolation of technology and global best practices down to the last level thereby improving processes and quality, both of which are critical in achieving efficiency."

"Moreover, the small and medium scale enterprises not only form the backbone of the supply chain of large businesses, but also play a pivotal role in Government's ambitious Make in India programme. They are integral in realising the vision of designing and creating in India and are increasingly becoming a hub for engineering and designing," Singh adds.

Describing efficient supply chain management, Hansraj Budhiraja, CEO, AB Sea Container explains, "Supply chain management is very important, not only to ensure maximised profits but also to gain edge over the competition. Supply chain is a systematic approach towards proper planning and execution of manufacturing of any product."

One of the ways to make the supply chain efficient is digitalisation. Speaking on the same, Budhiraja continues, "Our organisation has taken the biggest and the most important step, which most of the clever and smart companies has taken as well, to ensure efficient supply chain management. Digitalising of the supply chain. Now why do I say smart and clever is only on the basis of current trend, everything is moving online. While we have digitalised the supply chain management and operations, we have surly gained a lot, like now procurement and sourcing is now being done online, our quality supervisors go and inspect. All vehicles onto which material is loaded, real-time tracking of the positioning of vehicle is now



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An efficient Supply Chain is one of the basic foundations to ensure competitiveness of an organisation. Our company supplies over 500 different products and over 150,000 pieces every day to our various customers spread across the country. We have to ensure that each of these pieces are defect free.

Abhishek Jain, Chief Executive Officer and Managing Director, PPAP Automotive Ltd

being done. This ensures complete transparency between logistics department and operations. Online status of inventory and such other examples has made supply chain management more efficient."

JCB's emphasis on the quality urges it to make its suppliers partners in the success. Elaborating on the same Singh asserts, "At JCB, we believe in the concept of One Global Quality, products manufactured in India are not only sold in the Indian market but are also exported to over 80 countries. Therefore, it becomes imperative for our suppliers to align themselves with JCB Group's objective which is done by regular upscaling of systems and processes and training of people. JCB also shares the best practices it has accrued in its journey of four decades towards manufacturing excellence. Our suppliers have also built their world class facilities on JCB's lean manufacturing principles. We have remained committed to the concept of local supply chain through regular OEM Supplier initiatives such as Supplier Development Programmes, and hand holding to achieve JCB's Global Standards, etc."

Speaking on their strategy, Jain mentions, "Our customers follow Just in Time (JIT) strategy. Therefore, it is imperative for us to ensure that we are able to supply our products to them on everyday basis. This is not possible unless the entire supply chain from procurement of raw materials to delivery to the customer is efficient. In order to improve the efficiency of the entire supply chain, our company maps the entire process using a tool called PIF (Parts and Information Flow), which we have learnt from one of our esteemed customers. Using this tool, the lead time to procure, transit timings, inventory levels, WIP levels, Lot size for manufacturing, etc. is tracked and improved upon. As a result, we are able to improve our overall cost competitiveness by efficiently managing the inventory levels as well as the cash flow."

Green wave

The entire manufacturing industry is focusing on going green and reducing carbon footprint. How that is affecting supply chain? Elaborating on it, Singh informs about their efforts saying, "JCB has been at the forefront of social and environment initiatives through its multiple programmes aimed at reducing the overall carbon footprint. Our sustainability programme, 'Sustainable Innovation', reflects JCB's fundamental belief of conducting business in a responsible manner. We are committed to using our sustainable innovation programme as a complete approach to managing the impact of our business. So while we are aligning our own operations and products to our sustainability ambitions, we are also looking at our suppliers and their operations. This inclusive approach has helped in reducing the overall carbon footprint of JCB products."

"There is also a significant drive on re-suable packing like trolleys and bins across our facilities instead of using wooden boxes. Our Jaipur facility is a zero discharge green facility. Also, in our other facilities in Delhi-NCR and Pune, we have solar panels to harness solar energy which help contribute in our drive towards clean energy," Singh continues.

Elaborating PPAP Automotive's efforts, Jain says, "In our supply chain, we ensure that the deliveries are coming or being made in full truck loads only. Also, we periodically check health of the trucks that are used for the same and in case they have a problem, we immediately take countermeasure."

PPAP Automotive Ltd. is conscious about reducing carbon footprint and emission of greenhouse gases. "We have been able to reduce our energy consumption as well as reduce our diesel consumption by taking numerous initiatives," he adds.

Whereas Budhiraja talks about steps to be taken for going green, "First and foremost, is the step of observing and recording and establishing a benchmark for oneself and other

Taxation at a national level, rather than by each state, has made inter-state transportation efficient, paperwork for transporters seamless, and turnaround of materials much quicker thereby enhancing the overall operation efficiency and bringing down the logistics costs.

Jasmeet Singh, Head - Corporate Communications and External Relations, JCB India Ltd

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stakeholder or suppliers. Once we start just recoding our carbon emission and energy utilised in the production of a single product, we can use it as a benchmark for future that we do not have to cross this limit. Every product which has to be manufactured has to be under this limitation only. Then comes the process of integrating of digital means to prepare proper audits of energy consumed in a complete year. Now over the time you will have data collected which can be shared with the stakeholders as well as one's suppliers, which will aid in motivating them and as well as promote them to take such initiatives or others to minimise the utilisation of energy. Now secondly set targets for the energy consumption and carbon emission, and proceed to always maintain these targets. Most importantly, meet with your suppliers, supply chain experts and executioners, and share this information also acknowledge them with these factors. As energy spent can be minimised and has a direct result to reduced carbon footprints."

First and foremost is the step of observing and recording and establishing a benchmark for oneself and other stakeholder or suppliers.

Impact of GST

GST has been a tax reform and hence has affected each section of the operations. Commenting on the it, Jain mentions, "It is still early to account for the benefits of GST on the complete supply chain. But we are sure that it will improve our cost competitiveness as we will be able to reduce the incidence of additional tax on interstate movement as well as the efficiencies that will come up in transit of goods. In our endeavour to optimise our Parts and Information Flow, GST will play a significant role in reducing the lead times. Another benefit that we are seeing is the rise in input tax credit as some items in the previous tax regime were not under the purview of claiming the input credit. After the introduction of GST, the gamut of claiming credit on input items has increased barring a few items which appear in the exception list."

Agreeing to him, Budhiraja opines, "The biggest impact is now, is the availment input tax credit, whereas earlier some of the vendors in market would not even provide a bill and tax receipts. Now the situations have changed everyone in the market is either providing taxed invoices or is complete losing business. With the aid of GST the cost of production and procurement has been further minimized. With the credit period of 30 days only as GST returns has to be filled has further pushed the economy forward."

Supply chain management is very important, not only to ensure maximized profits but also to gain edge over the competition. Supply chain is a systematic approach towards proper planning and execution of manufacturing of any product.

Hansraj Budhiraja, CEO, AB Sea Container

On his concluding remarks, Singh mentions, "The introduction of the Goods and Service Tax in India is a landmark tax reform since Independence. Over the past four decades, JCB has created an ecosystem of local suppliers and all of these have ensured a seamless transition to the new tax regime. JCB conducted various sessions with its supplier partners to ensure this transition. The new unified taxation system which aims at improving the overall ease of doing business in the country has had a significant impact on the logistics sector. Taxation at a national level, rather than by each state, has made inter-state transportation efficient, paperwork for transporters seamless, and turnaround of materials much quicker thereby enhancing the overall operation efficiency and bringing down the logistics costs."

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INTERVIEW

Focus on **quality** and **delivery**

While safety and quality culture is taking priority, businesses are also striving to integrate sustainability at its core, demonstrating an emphasis on better environmental practices, says **Niranjan Nadkarni,** Chief Executive Officer, TÜV SÜD, South Asia, South-East Asia, Middle East & Africa

By Niranjan Mudholkar

First of all, congratulations on your role elevation wherein you will now oversee additional markets beside the South Asia region. How do you analyse your personal progress vis-a-vis the organisation's growth as well as the overall industrial evolution?

My journey at TÜV SÜD has indeed been exhilarating. In 1995, I made an unconventional move to join a five-member team at TÜV SÜD and qualified to become a Lead Auditor for management system certification ISO 9001, QS 9000, VDA 6.1 and TS 16949.

In 1994, a key objective for the five-member team at TÜV SÜD was to educate businesses about the need for auditing, testing, inspection and certification in manufacturing. The biggest hurdle in those times used to gauge the willingness of businesses to invest in a concept that was aimed to future proof. Initially we started by providing management system certifications to companies.

> "The success of Indian manufacturing strongly hinges on prioritising longevity over profitability."

In sharp contrast with two decades ago, India, today, has sector wise government institutions that focus on product and service safety. The rapid technological advancement has created many opportunities and upscaled the overall standard of life. This has evolved the way commerce, society and various sectors interact and shape the ecosystem. Sustainable development, consumer protection, digital transformation and urbanisation are the key drivers that will continue to define the trends in TIC sector. For example: Use of technology (IoT) for better backward traceability in food sector or use of IoT for predictive maintenance in a Conventional Power Plant.

What are the different measures that Indian manufacturers need to adopt to make the 'Make in India' campaign a huge success?

For a program as large as 'Make in India', the impact of it will only be visible if there is seamless collaboration between the government, industry and consumer. A key objective of this program is to accelerate the culture of high quality manufacturing that is at par with global standards. Such a culture renders scalability to businesses which can help India gain the status of a global manufacturing hub.

Whenever a nation intends to make for the world, one of the pre-requites is compliance with the regulations in different markets with an unsaid requirement of consistency in delivering quality product. Indian firms manufacturing for the world or domestic markets, need to develop a culture of quality and safety and invest in integrating quality standards across processes and systems, while simultaneously ramping up their capabilities.

While safety and quality culture is taking priority, businesses are also striving to integrate sustainability at its core, demonstrating an emphasis on better environmental practices, a pivotal element of the ZED program. Businesses that partner with third-party testing firms for environmental testing and monitoring services benefit by infusing symbiosis between operational and ecological activities that ensure sustained and long-term business growth. Services provided in our laboratories include a wide range of services like air, soil and water testing, waste water testing and effluent testing. These services empower businesses to upgrade sustainability efforts by en-

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The entire ecosystem of products and services has evolved owing to internal and external forces. Given the existing landscape, the scope of high-end quality, safety and cost efficiencies, a myopic approach to business growth sans TIC could be an impediment to growth of individual businesses and the economy at large.The ZED program has given the right kind of thrust to industries to innovate and self-mandate high standards of quality and safety. Businesses can benefit immensely if they partner with the government, industry bodies and international third-party testing agencies to collaborate and bring about a paradigm shift in their approach towards high quality and consistency of products.

Manufacturing firms in the developed world are implementing Industry 4.0 solutions and quite a few of them also have presence in India. How do you see the overall Indian manufacturing sector aligning itself to stay apace with its global counter parts?

Indian businesses have been very quick to adopt global best practices in the implementation of Industry 4.0 solutions. These solutions are broadly time, expertise and capital intensive. A key parameter for implementation is the intent of businesses. We have witnessed a noticeable surge in manufacturing companies that partner with us in their motivation to align themselves to global quality standards.

The alignment with global manufacturing practices in India, differs among sub sectors. The automotive sector in India is among the more mature ones owing to its initial exposure to global markets. It is my strong belief that any business that is built on the pillars of scalability and efficiency, has the potential to transform into a successful firm with a global footprint. Globalisation as we all see has turned the entire business environment on its head. It is no longer about global companies setting their businesses in India. Local players are foraying into other parts of the world but while doing so, the key distinguisher is going to be quality of the product. Adoption of industry 4.0 is proving to be an empowering catalyst for local players who are expanding their footprint and operational volumes. It is now time for India to be a global trend setter in manufacturing. This is possible if Indian manufacturers continue to be laser focused on driving scalability through high end quality and efficiency. The success of Indian manufacturing strongly hinges on prioritising longevity over profitability.

What do you think are the key advanced manufacturing trends that are driving new wave of manufacturing?

Consistent improvisation is essential for any sector to stay relevant in such a dynamic environment. A clear example of improvisation is of Industrial Internet of Things (IIoT). It enables machines to communicate with each other and thereby take dispersed decisions in a highly globalised economy.

In line with IIoT are the concepts of Artificial Intelligence (AI), Machine Learning (ML) and Pattern Recognition (PR).

"For a program as large as 'Make in India', the impact of it will only be visible if there is seamless collaboration between the government, industry and consumer."

AI, has the potential to immensely cut down production time. High intensity AI can help interpret data and speed in a cost-effective way.

Machine Learning can help companies transition from their sole dependence on traditional equipment maintenance methods to a high-end mix of data driven solutions and operational behaviour. The concept of pattern recognition can be a helpful in predicting production demand and anticipating maintenance issues too. Advance technologies have a vast potential. However, it is also important that an ecosystem of partnership comprising companies, the government, industrial bodies is created to encourage a suitable business environment in which technology-driven growth can flourish.

How does TÜV SÜD help companies drive operational efficiency through these advancements?

Globalisation has led to fragmentation of business operations. Every aspect of a business today might not necessarily be centralised. The concept has also given rise to a large amount cross border trade. In such a highly globalised platform, the biggest challenge that businesses face is to ensure consistency in quality and delivery while adhering to mandatory standards. These can be achieved through a range of factors that have operational efficiency forming the foundation of companies.

Third party testing, inspection and certification firms, with presence across the globe, provide access to a global pool of resources that help these firms to drive businesses with the highest level of precision. Manufacturers from any country making products for any market in the world can today partner with such firms to ensure the quality of their products through the production and distribution value chain.

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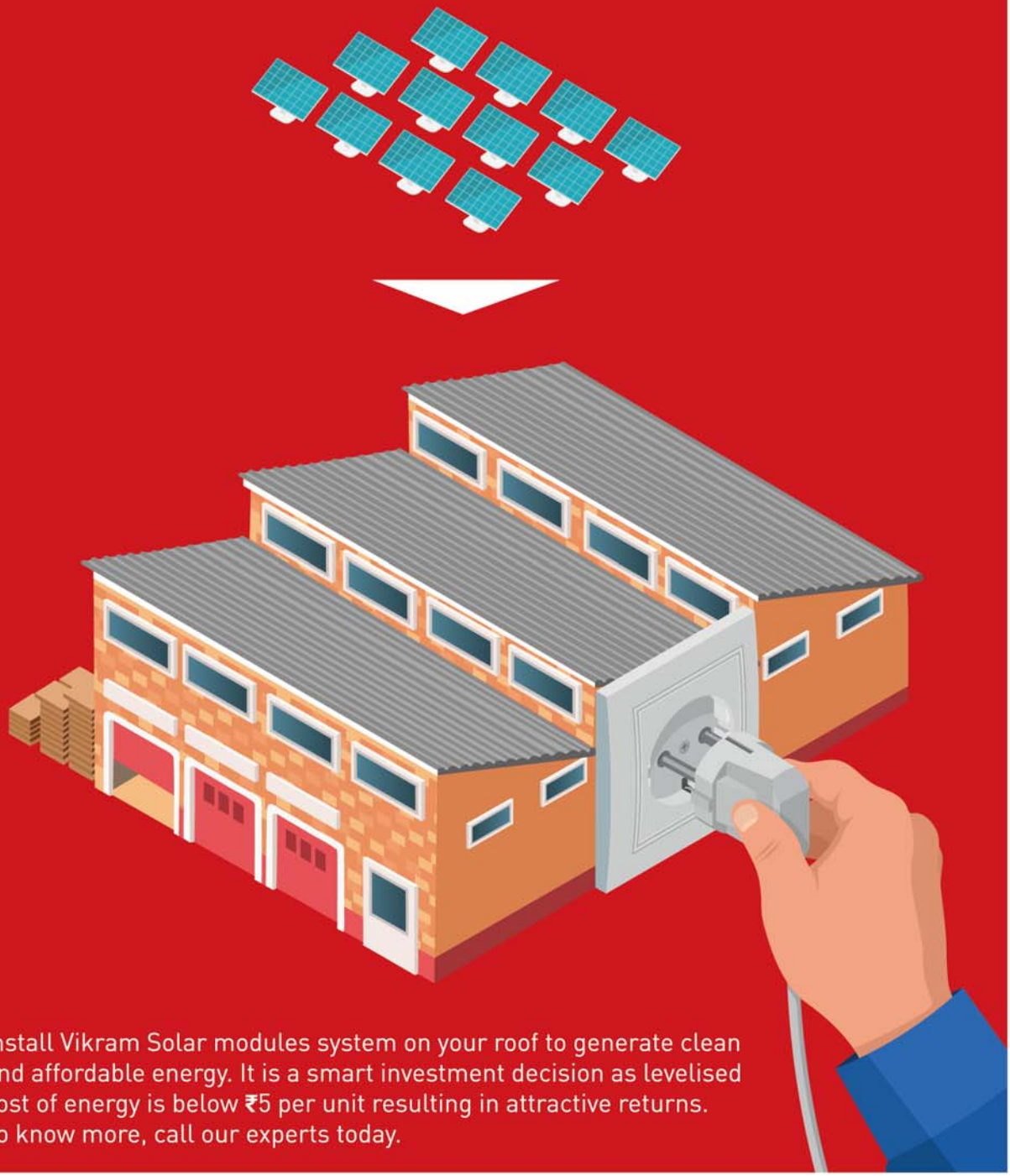

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Making **Materials Matter**

Ananthaseshan Narayanan, President Abrasives, Carborundum Universal Ltd (CUMI) gives insights on the company's business and current trends in the industry

By Niranjan Mudholkar

Production is supported by a sophisticated R&D infrastructure.

Can you give us an overview of Carborundum Universal Ltd (also known as CUMI) in terms of its legacy, business activities and market standing?

CUMI is an integral part of the Murugappa Group. It was incorporated in 1954 as a tripartite joint venture between Carborundum Co., USA, Universal Grinding Wheel Co. Ltd., U.K. and the Murugappa Group. Since its inception, the company stays committed to serve the manufacturing industry by building capabilities in the material science space to address a diverse range of engineering products – emerging as a key player in India's growth story.

The company pioneered the manufacture of Coated Abrasives and Bonded Abrasives in India in addition to developing capabilities in the fields of Super Refractories, Electro Minerals, Industrial Ceramics and Ceramic Fibres. Today the company's range of over 20,000 different varieties of abrasives, refractory products and electro-minerals are manufactured in over 25 locations across various parts of India and other parts of the world. CUMI has a leadership position in the Abrasives and Electro Minerals business – having fully integrated operations – from mines to end product. In the Ceramics and Super Refractories business, the company has been producing niche, customised products, as per market trends, with a dominant portion of its sales coming from exports.

Today, the company believes and works towards sustainable development. In line with CUMI's sharpened purpose of Making Materials Matter we make and offer products to improve productivity, quality and sustainability in the industry.

We understand that CUMI is one of the few manufacturers in the world with fully integrated operations. How does this help (having fully integrated operations) in addressing the demands of your customers?

CUMI's position as a fully integrated engineering materials company gives a distinct competitive advantage that allows it to provide customised and comprehensive solutions across surface engineering, thermal protection, wear protection and electrical insulation among others, to our customers in diverse industries. The company's Electro Minerals division, which manufactures a product line of fused alumina, silicon carbide, sol-gel ceramic grains and zirconia grains along with micro grit specialties, support the Abrasives and Ceramics business in innovation and development of specialised new products to meet the growing diverse needs of our customers.

The addition of our wholly owned entity - Volzhsky Abrasive Works, Russia has positioned CUMI among the largest producers of silicon carbide in the world, ensuring raw material security and a favorable cost position, driving profitability in the abrasives and refractories business.

The specialty grains – sol-gel ceramic grains, alumina-zirconia, stabilised zirconia and semi-friable aluminas – many of them developed in-house and patented products offer a capability to address high performance and high precision grinding applications, that few companies can match.

Tell us about your overall manufacturing capabilities.

CUMI has 25 manufacturing locations across India, Russia, South Africa, Australia and Thailand across its various divisions. In Abrasives CUMI has a capacity to produce 20000 MT of Bonded Abrasives spread across it's manufacturing plants in Chennai –custom built, Hosur – standard vitrified bonded abrasives and in Roorkie –Thin Wheels for the distribution market. The Coated Abrasives plant in Sriperumpudur has a capacity of 16 mn sq mtr producing a broad range of Alumina, Silicon Carbide and Zirconia based Paper, Cloth and Fibre backed products in various forms - Sheets, Rolls, Belts, Discs, Flap Discs and Mops. The raw material plant in MM Nagar produces the processed cotton, poly-cotton and

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polyester cloth and phenol formaldehyde resins and that are used in the production of abrasive products.

Production is supported by a sophisticated Research & Development infrastructure, with machines that simulate application scenarios very similar to customer locations. Grinding optimisation sensors and algorithms help in creating products which can be readily ported to the customers needs.

CUMI has also developed capabilities to produce a number of important adjacencies for the market, such as the Non-Woven products – industrial and home care, Power Tools for a variety of applications and Metal Working Fluids for grinding as well as for machining applications.

The Electro-Minerals Division, based in the state of Kerala produces the abrasive grains that are used to manufacture abrasive products as well as a range of other applications. It has a total capacity to manufacture 20,000 TPA of Brown Fused Alumina, 10,000 TPA of White Fused Alumina, 11,000 TPA of Zirconia and 80,000 TPA of Silicon Carbide – majority of which comes from Volzhsky Abrasive Works in Russia. CUMI has also invested in facilities to produce a wide range of High Performance friable, semi-friable and ceramic grains for specialised applications.

The Ceramics division has its footfall in Hosur and Ranipet. The Hosur facility has the capability to produce a range of customised wear resistant products for coal washeries, mining and power industries and metallised ceramics product for the high voltage electrical transmission with advanced manufacturing facilities including robots in the manufacturing and inspection lines. Other advanced applications include ceramics for solid oxide fuel cells and critical components for electric vehicles. The Ranipet facility houses the Super Refractories and Prodorite businesses – providing thermal, wear and corrosion lining solutions to the power, steel, cement and a host of other industries as well as producing complex, pre-cast composite products for industrial applications.

Q. What are the key trends in abrasive technology and how is CUMI placed in this regard?

The abrasives business has been witnessing a change in application of its products in the industry - moving from heavy material removal operation of grinding to finishing; manual to machine operations. Higher operating surface speeds, faster feed rates, better fluid delivery systems, and cutting edge dressing mechanisms have been some of the highlights of the new age machine tooling systems. Additionally, the material surfaces have evolved from Mild Steel to High Speed Steel, Metal Alloys, Glass, Ceramics and Composite Materials, which has opened up new opportunities for CUMI to improvise and develop a whole new range of abrasive products.

Keeping with the trends, CUMI has invested prudently on facilities producing High Performance Grains – Semi Friables, Microgrits and Ceramic Grains (being one of the only three companies in the world that produce ceramic grains), which have been used to develop products that provide superior precision and finish, as demanded by the market.

With the rapid growth of sophisticated machine tool systems, the understanding of grinding has improved in the last few decades. From merely the number of parts ground, the performance of today's grinding wheels are evaluated in terms of the total system productivity. To address the high speed and high productivity requirements of our customers, CUMI has designed a range of fiber-reinforced lightweight wheels that are capable of being operated comfortably at very high speeds (125 mps) with better stability and reduced power consumption for better metal removal rates.

Leveraging it's people's technical bandwidth along with it's six DSIR approved R&D labs, CUMI is also building IOT capabilities to support the Industry 4.0 revolution by venturing into the digital space with significant progress in designing sensor and microchip embedded products that communicates with systems and smart algorithms to control the process real time.

Q. You also have diversified presence in other segments. Please briefly tell us about the same.

Over the years, CUMI has emerged as trusted brand providing comprehensive surface engineering solutions, by adding state-of-the art manufacturing facilities serving products in the Industrial Ceramics, Ceramic Fibres and Super Refractories space. The Ceramics business offers products which harness the heat resistance, wear resistance and insulation properties of ceramics, with technology being niche and key entry barrier. These products cater to critical and demanding applications in thermal power plants, material handling, coal washeries, cement, steel, food processing, mineral processing, electrical and electronic industries among other industries.

CUMI is also a significant player of Super Refractory products in India, serving the upper segment of the refractory market. The Super refractory Division manufactures two different forms of the product (fired refractories and monolithics). The business caters to the sanitaryware, carbon black, iron and steel, power, HT insulators, ceramic tiles, ferrous and non-ferrous industries, primarily in heat resistant applications.

CUMI's Electro Minerals business itself has built capabilities of producing a wide range of specialised grains that find use in diverse applications, emerging as a global player in the

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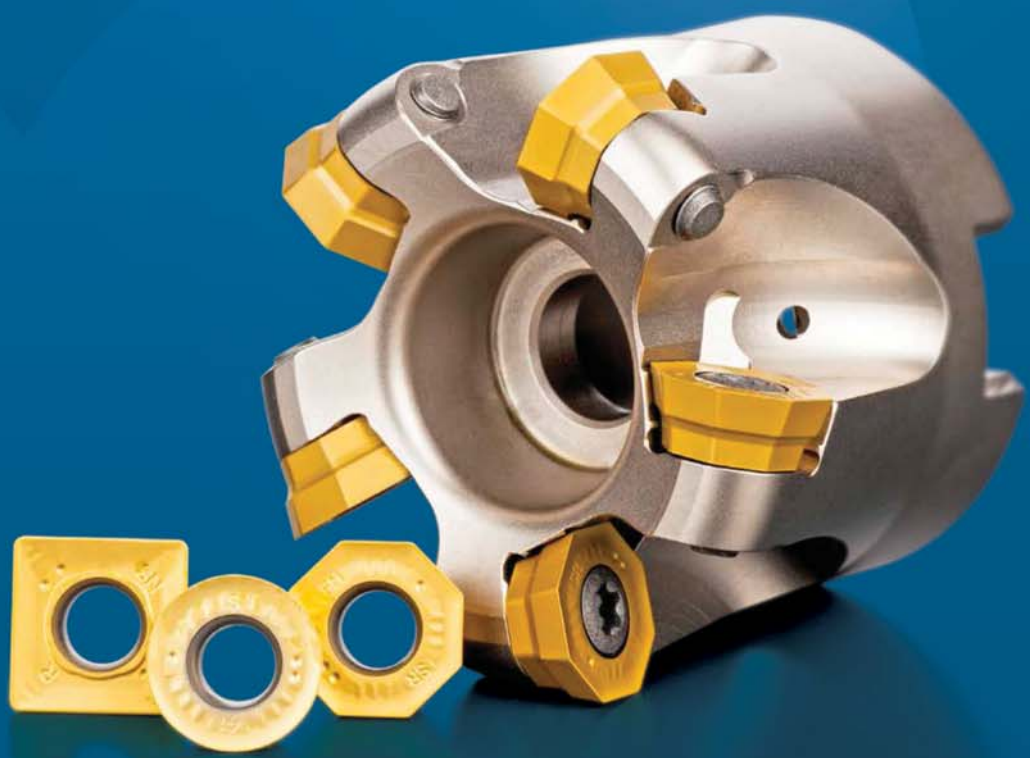

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segment, rather than just supporting its Abrasives business. Additionally, CUMI has actively partnered with firms that have added value to their core offerings – JVs with Sterling Abrasives which specialises in abrasives for food processing, Wendt GmbH of Germany for Diamond and Cubic Boron Nitride bonded Super Abrasives and Morgan Thermal Ceramics UK for ceramic fibres and modules for thermal insulation.

Which are the key industry sectors that you address with more than 20,000 SKUs in your portfolio?

CUMI's products find application in almost all industries that require materials and surface engineering solutions. The abrasives business is a key supplier to the auto OEM, auto components, bearings, steel, tools and general engineering applications among others. The Electro Minerals division, other than being a key supplier to the abrasives and refractories businesses, caters to a wide range of photovoltaic, metallurgical, investment castings, defence, coatings, brake lining, lapping and blasting applications. Iron and steel, power, sanitary wares, tiles, electric components, cement, foundries etc are the major sectors that are served by heat resistant products produced by the Super Refractories division.

Tell us briefly about your overseas presence. Do you also export from India? If yes, then to which markets?

CUMI has strategic presence in important overseas locations, either as a manufacturing partner or as a trading entity – whichever adds value to the firm's operations.

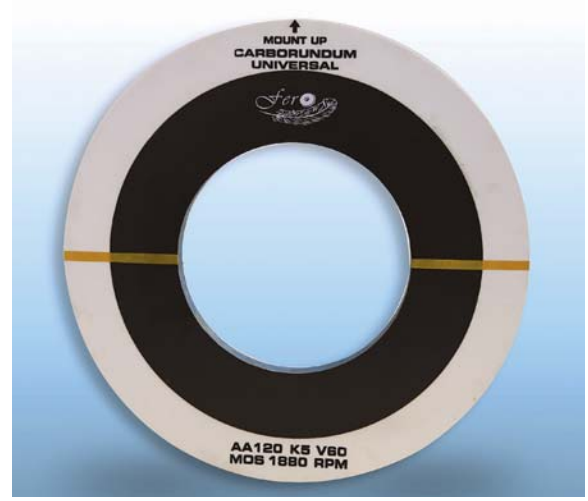
As a global manufacturer, CUMI is present in Russia and South Africa, leveraging significant cost arbitrage in producing Silicon Carbide and Zirconia, due to easy access to raw materials and low cost power at these countries. The high quality grains produced in these facilities, gives a significant competitive advantage to our abrasives and refractories business.

CUMI also has pure trading entities spread across the world in regions such as USA, China, Middle East, Europe, Australia and SE Asia.

How has been the last financial year for the company?

CUMI has reported an increase in consolidated gross sales by 9 percent to Rs. 2,200 cr. in FY 2016-17 compared to Rs. 2,024 cr. in the previous year. Full year consolidated segmental profitability improved for Abrasives and Ceramics businesses, supported by higher sales volume.

Abrasives division at consolidated level registered a growth of 10 percent. The sales for FY 2016-17 were Rs. 1,016 cr. Both Indian and overseas entities had a good growth. Electro minerals division at consolidated level registered a growth of 3 percent. The consolidated sales for FY 2016-17 were Rs. 769 cr. Indian operations registered a growth; however, sales were marginally lower for the Russian entity. Ceramics division registered a growth of 15 percent. For FY 2016-17 the sales were at Rs. 472 cr. The standalone industrial ceramics and refractories businesses delivered a good growth.



How is the GST implementation impacting your business and the overall industry scenario in the country?

GST is a major economic reform. The single tax regime is expected to bring in much needed uniformity and transparency. It also addresses the issue of cascading of taxes (hidden costs of doing inter-state business – primarily the erstwhile CST) through a system of seamless tax-credits.

From CUMI's perspective, GST would certainly help to optimise our distribution through dealers and sub-dealers, as standard tax rate would imply standard prices of our products through-out the country. Movement of trucks carrying our products has improved and is expected to reduce the lead time and cost of logistics to a significant extent, leading to overall cost of transaction going down. GST should also provide an impetus to domestic manufacturers of mass market products by reducing the arbitrage that imports had on local suppliers due to a complex system of cascading taxes, which has now been streamlined.

Automotive is one of the key focus areas for you. How do you see this industry evolving in terms of its manufacturing processes?

The Automotive industry is indeed an important customer segment, as it is one of the fastest growing sectors in the country and in the present context, is seen as a key manufacturer of automobiles and components for domestic consumption as well as exports. As the automobile industry has matured, it has challenged us to keep learning and developing products that support the trends – precision, evolving component surfaces, productivity and lower costs. The industry demands high grinding speeds with reliable finish for components that require to be produced in mass and be precise. Through our long collaboration with the leaders in the automotive and auto ancillary sectors, we have been continuously involved in identifying the changing needs of the market and designing products created using a wide range of technical, raw material and application engineering capabilities.

CUMI is also working with the automotive industry to address automation of processes through designing ultra-lightweight and sensor embedded smart products that are compatible with advanced robots and machines.

Global Conference on Plastics in Automotive

Glimpses of The Econominc Times Polymers Global Conference on Plastics in Automotive (GCPA) 2017 that was held recently at Pune.

Plastic is a magical material that has transformed many industries. In case of automotive, it has changed more than the look and feel of the vehicle. On this backdrop, The Economic Times Polymers, a sister magazine of The Machinist, recently held a daylong conference – Global Conference on Plastics in Automotive (GCPA) 2017. The conference program in its second edition, received grand response from the industry.

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After the first successful edition in Mumbai, GCPA was organised in Pune – an automotive hub of India. The mere reason to shift the venue was to being closer to the industry to know what exactly it's looking at. And the CEO Panel Discussion at the event was held on the same topic – What Auto Industry Wants?

In this panel, Gajanan V. Gandhe, VP South Asia/Africa & MD, IAC Asia Ltd; Sonam Kumar Sinha, CEO - Interior Plastics Division, Tata AutoComp Systems Ltd; BP Shiv, Chief Marketing & Programs Officer, Plastic Omnium Auto Exteriors India and RK Sharma, Co-Founder & Managing Director, Daejung India threw light on needs and requirements of the industry with regard to use of plastics. Here, it was discussed that going forward the collaboration of OEMs with Tier I and Tier II suppliers will offer innovative solutions.

Similarly, Varun Gupta, Director, Calco Poly Technik made a presentation from a material perspective. He mentioned that selection of material should happen at early stage of product development, taking material supplier into confidence.

Plastic is a magical material that has transformed many industries. In case of automotive, it has changed more than the look and feel of the vehicle.

In the process of product development in the automotive industry, consideration of safety of the vehicle and passengers is of paramount importance. Discussing on the same, Sonam Kumar Sinha, CEO - Interior Plastics Division, Tata Auto-

Esteemed CEO Panellists discussed on 'What Auto Industry Wants?'

A panel discussion on Use of plastics in the context of Safety

The panel discussed 'Impact of plastics on design & aesthetics'

Panel Discussion on Plastics in light-weighting brainstormed on how components can be made lighter without compromising on quality and safety features

Comp Systems Ltd; Prashant Rashinkar, Product simulation Manager and Safety Specialist, Faurecia Interior Systems and Asmita Sathaye, Deputy General Manager, Polymer Engineering and Environmental management, R&D, Tata Motors talked about various aspects related to safety. They presented their point of views on changing norms & regulations, customers' perspective towards safety and cost efficient solutions.

On the other hand, Sandeep Raina, Vice President – Engineering, Maruti Suzuki India Ltd. presented on Future Challenges & Way Forward. He touched upon how plastics has been playing an important role in the new cars development and increasing use of the material in the automotive industry.

In the process of product development in the automotive industry, consideration of safety of the vehicle and passengers is of paramount importance.

Vishal Agarwal, President, Yudo Hot Runner India Pvt. Ltd. and Yudo Suns Pvt. Ltd. put forward New developments in hot runners and automation. During his presentation, he mentioned that hot runner systems have considerable impact on the auto components and their quality.

Dr. Pradeep Bakshi, Technical Consultant, Calco Poly Technik; Sandeep Waykole, Program Director India, Faurecia Interior Systems India Pvt. Ltd.; Dr. Mohammad R Parvez, Lead Material Specialist (Product Development), Varroc Lighting Systems has an interesting discussion on Impact of plastics on design & aesthetics.

During this discussion, panellists agreed upon the point that designers and material suppliers should work hand in hand. Aesthetics of the car is directly related to first impression of the car, and hence is a critical area. On the other hand, Panel Discussion on Plastics in light-weighting brainstormed on how components can be made lighter without compromising on quality and safety features.

A presentation on Moulding Solutions for Plastics in Automotive by Avadhesh Manjanwal, General Manager – Sales, Haitian International updated the audience on the latest developments in the moulding solutions.

PRODUCT UPDATE

A new generation of **water soluble cutting fluid**

Image Courtesy: Zavenir Daubert India

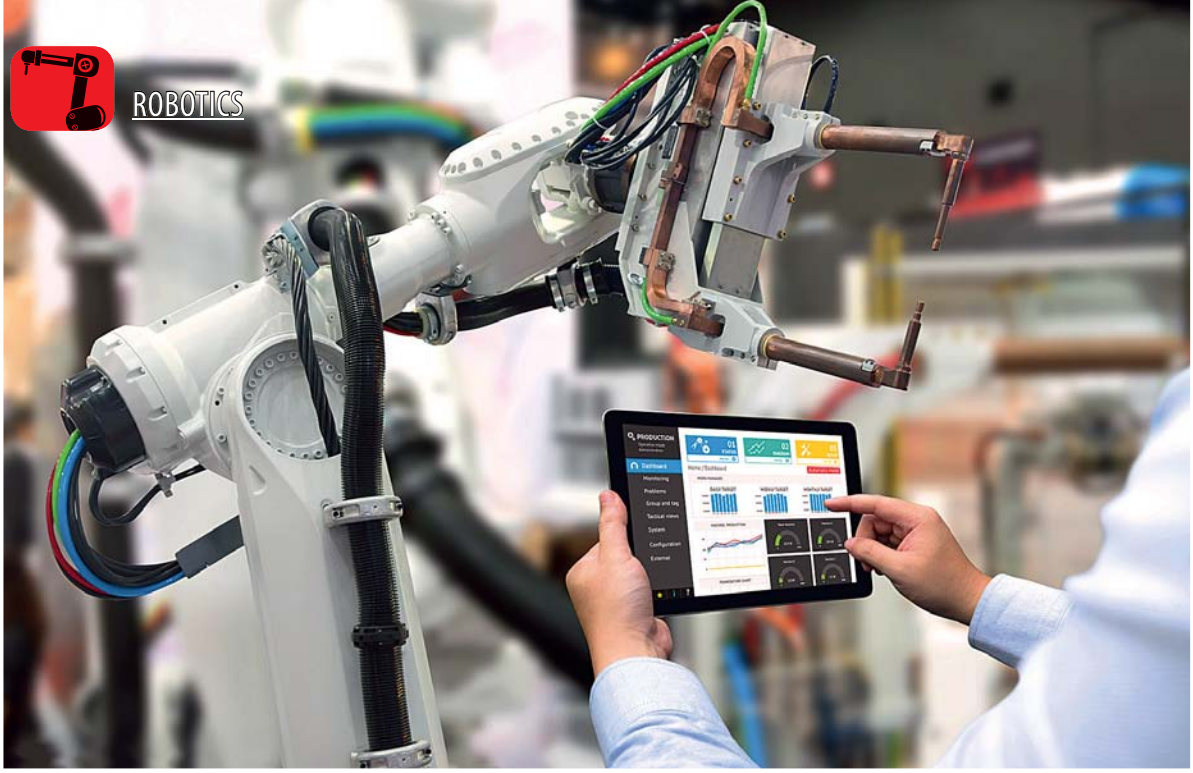
Zavenir Daubert India has recently introduced HAKUFLUID the new generation of cooling lubricants in the Indian market, which combines the benefits of neat oils with those of water soluble cutting fluids. HAKUFLUID products are water-based fully synthetic (oil free) viscous metalworking fluids in which the viscosity is variable to get optimised process conditions for wide variety of applications (grinding to broaching) & metallurgies. Key features of this product include better lubrication and tool life than neat oils, water based – 100 percent oil free, no- flammable, no oil dust or mists, clean parts & machines, extremely low consumption

IMTMA APPOINTS P. RAMADAS AS THE NEW PRESIDENT

Indian Machine Tool Manufacturers' Association (IMTMA) held its 71st Annual General Meeting (AGM) at Bangalore International Exhibition Centre (BIEC). At the Executive Committee meeting following the AGM, P. Ramadas, Managing Director, Ace Manufacturing Systems Ltd. was elected as the President of IMTMA and Indradev Babu, Managing Director, UCAM Pvt Ltd was elected as the Vice President of the Association.

P. Ramadas graduated as a Mechanical Engineer from Karnataka Regional Engineering College, Surathkal and got his M.Tech in Machine Tools from Indian Institute of Technology (IIT) - Madras, Chennai in 1970.

Babu completed his BE in Mechanical Engineering in 1977 from BIET College, Davangere. He began his career at Bharat Electronics Ltd before venturing into entrepreneurship by setting up a CNC job shop in 1986.



Rotating and turning

Robots are getting more compact and agile. Cable manufacturers have to design cables that meet the growing requirements.

By Frank Rothermund

It's a time of revolution in industry - automation, digitalisation, Industry 4.0 are just some of the current buzzwords. Robotics is an area that is developing rapidly. Worldwide, growth in the installation of industrial robots has been 16 percent per year on average since 2010, with annual growth forecast to be 13 percent by 2019. The automotive industry continues to dominate, but other sectors are definitely catching up, with use in consumer electronics increasing particularly sharply. As part of this trend, small and medium-sized producers are increasingly investing.

Manufacturers of robots are responding with new models that are more compact, more versatile and last longer. In the past, robots would be replaced when a product generation was phased out, but today they are taking on new tasks - and these change more frequently than before. The variety of movements means that the loads on certain components are increasing, particularly the cables. They perform torsion and kinking movements, frequently a mixture of the two, and with different bending radii and torsion angles as well.

Standard cables often unsuitable

Lapp has numerous robust cable types in its standard range, which have performed for years without failing on many robots. However, these standard cables are not necessarily suitable for special applications such as those outlined above - and these applications are on the increase. This is where cables uncompromisingly tailored for the specific use come into play. For cable manufacturers, robotics can be seen as the supreme discipline.

The most important difference between robot cables and conventional moving cables is that the former have to withstand both bending and torsion over their entire service life, and in development they are designed fundamentally differently to a power chain cable, for example. There are three key parameters:

Relocated to class 6

Braided conductor class: Robot cables should have at least class 6 conductors, which are designed for continuous movement in line with the standard. Lower classes are less suitable, or totally unsuitable. However, sometimes even braided conductor class 6 is not sufficient. For cables that need to be highly bendable and twistable, Lapp uses braids outside the standard in which the individual wires are just 0.05 millimetres thick, considerably thinner than the thinnest braided wires covered by the standard.

Torsion angle: A typical value is +/- 360°/m, which means that a cable can be twisted one full revolution to the left and once to the right about its axis per metre of cable length. This

In the past, robots would be replaced when a product generation was phased out, but today they are taking on new tasks - and these change more frequently than before.

applies to cables without shielding. With shielding the value is typically +/- 180° or half a turn per metre.

Bending radius: Ideally, this is between four and 7.5 times the outer diameter and thus in some cases lower than for cables that are only subjected to occasional movement. This allows the cables to be coiled in tight radii and in tightly packed hose assemblies.

Three times about its own axis

For some applications, even these properties are not sufficient. For these, Lapp supplies special cables qualified for even higher torsion angles, including a cable for 3D laser welding robot that allows torsion of over +/-1,000°/m. This means that the cable can be twisted almost three times about its own axis – this is unique worldwide. For the robot concerned this is definitely not overkill, as the robot arm moves completely freely in three dimensions, twisting several times about its own axis.

The amazing thing is not the sheer extent of the torsion angle, but the fact that this movement is possible over many years with no deterioration in properties. This particular cable is qualified for a minimum of seven million cycles, proved by tests at the Lapp testing centre, which is currently being extended for even more dynamic movement tests. Another special robot cable is certified for over 15 million cycles and, with +/-720°/m, allows two turns about its own axis per metre.

To create cables capable of handling such extreme loads, the Lapp engineers have to dig deep into their box of tricks. For the cable discussed above with a +/- 1,000°/m torsion angle, for example, braids made of a special copper alloy were used. They retain their minimum electrical resistance even when bent or twisted and after a large number of movement cycles.

Sophisticated construction

These properties can only be achieved with a sophisticated and complex cable construction. There are several factors that can be influenced:

Stranding types: Bundle stranding is usual for robot cables, with the individual conductors combined in one or more bundles. These cables withstand both bending and torsion. If the electrical properties demand it, for example for data or servo cables, cables suitable for use on robots are stranded in pairs.

Core insulation: The insulation of the cores has to be able to withstand several million movement cycles. The best solution is a thermoplastic elastomer, or TPE.

Sliding support: Elements help the components in the cable to move against each other with as little friction as possible. They also act as filler to make the cable circular. Sliding supports can be stranded plastic fibres that fit into the gaps or voids between the cores. Correct placement of these filler fibres requires a high degree of know-how. Thicker cores are often wrapped in a polytetrafluoroethylene or polyester film fleece wrapping to make it easier for them to slide against one another, particularly under torsion.

Shielding: Tests have shown that under torsion the gaps in the braided shield increase in size over time, because the small wires that make up the braid are pulled apart by the torsion and break over time. This pushes up the contact resistance, which has a detrimental impact on the desired shielding effect. Above around half a million torsion cycles, spinning with copper wires is superior to braiding. All the wires point in the same direction and the contact resistance hardly changes over the service life.

Outer sheath: Here, as in many industrial applications, the material of choice here is the very robust polyurethane (PUR).

Thinner is better

Customers are increasingly expressing a demand for the cables to be as space-saving as possible because robots are getting smaller all the time. Increasingly, hybrid cables are being used, containing all kinds of cables such as power, data and signals, in some cases also hoses for pneumatics or the air or protective gas supply. For example, Lapp has developed cables for a welding robot that contains dozens of cores for power, signals and Industrial Ethernet in a single sheath. Without this hybrid

The most important difference between robot cables and conventional moving cables is that the former have to withstand both bending and torsion over their entire service life.

cable, the customer would not have been able to realise this application. Although some of these hybrid cables are 30 millimetres thick or even more, they take up 30 percent less space than laying individual cables.

As the requirements for robot cables are so diverse, extensive tests are unavoidable for the manufacturers. However, many cable suppliers also have high minimum order quantities, in some cases several kilometres. In the case of Lapp, sample lengths starting at 100 metres are possible. This enables manufacturers to carry out tests without having to spend a lot of money on the cables.

The author is Market Manager Robotics at U.I. Lapp GmbH

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Quickly openable but tightly sealed

New chip-repellent e-tubes from igus

At EMO 2017, igus is presenting its R2.1 series energy-tubes, which are available immediately in new sizes and with even more accessories. In a test in the igus laboratory, it was shown that the tubes of the R2.1 series are among the best sealed energy-tubes for use in moving applications – In permanent movement with continuous exposure to metal chips weighing 2 kilograms in total, only 0.5 grams penetrated into the tubes after 100,000 cycles. In spite of being sealed, the tubes of the R2.1 series can be opened very easily, which makes assembly work even easier.

Doubly easy – This is the slogan for the R2.1 series energy-tubes from the motion plastics specialist igus. Easy because the tubes, which keep chips out, only consist of two parts: a link and a crossbar that functions as a form-fit lid. Easy because these lids can be opened very easily from both sides – now, this can be done along either the inner or outer radius. Users can choose the type that is best for their needs, which makes assembly and maintenance work even easier.

> The chip-proof e-tubes from igus are primarily of interest in the area of machine tool making as a reliable energy supply in an environment where chips are often present.
>
> **Lukas Czaja,** Head of Industry Management Machine Tools, igus

"The chip-proof e-tubes from igus are primarily of interest in the area of machine tool making as a reliable energy supply in an environment where chips are often present," explains Lukas Czaja, Head of Industry Management Machine Tools at igus."This industry is faced with the enormous challenge of mastering the increasing pressure of prices combined with rapidly growing technical requirements. The R2.1 series provides outstanding chip protection, can be assembled efficiently and stands out due to its very good price/performance ratio.", During the chip test in the 2,750 square metre igus test laboratory, it was shown that the tubes of the R2.1 series are among the tightest sealed energy-tubes on the market. During this laboratory test, the tube is moved continuously in a chip drum filled with two kilograms of metal chips of very different sizes and shapes. After 100,000 cycles, the size 40 e-tube R2.1 only let 0.5 grams of chips accumulate inside.

Expansion of product range for extremely fast, individual assembly

At EMO 2017, igus is presenting the R2.1 in new sizes. A completely new size with an inner height of 48 millimetres is available as a version with lids that can be opened along the inner radius. The sizes with an inner height of 26 millimetres or

40 millimetres are also available as versions that can be opened along the outer radius. Due to this expansion of the igus product range, users can always determine the filling method that is the best for them. Assembly or later filling can therefore be carried out very quickly.

Technical features for quiet and cable-friendly energy supply

The lids of all the versions of the R2.1 series are openable and do not have to be removed completely in order to fill the tube. Their contours are smooth and the curvature and tight manufacturing tolerances guarantee that chips do not accumulate between the stops. In addition, the smooth inner contours of the R2.1 and the rounded latching separators made of identical material ensure that the cables on the inside are not damaged or abraded. The integrated grid design also ensures a firm hold of the interior separation, even in side-mounted applications. Due to a brake in the stop-dogs of the individual chain links, operation of the chain is considerably quieter. Less vibration means more precise work on the workpiece. And due to the double stop-dogs, the energy-tube can absorb high fill weights and can even master long unsupported lengths. With the universal connecting elements of the R2.1, the strain on the cables can be relieved either inside or outside the chain cross-section.

For more information, contact:
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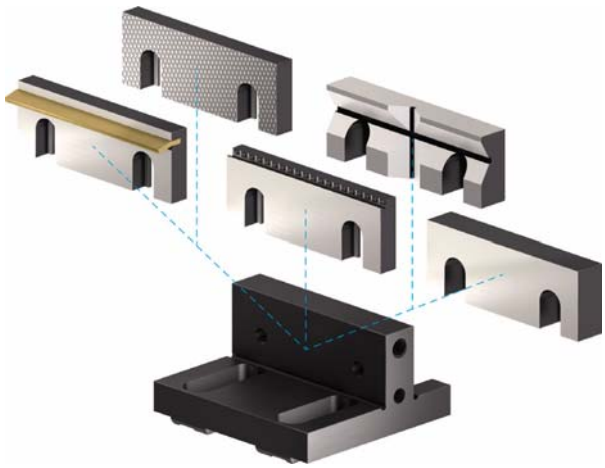
Maximum flexibility and efficiency on the clamping force blocks

Know more about SCHUNK's TANDEM plus clamping force blocks.



With the flexible supporting jaw system SCHUNK TANDEM TBA-D, a large variety of parts can be clamped on the SCHUNK TANDEM plus clamping force blocks without requiring special chuck jaws. This saves time and money.

The Schunk Tandem TBA-D supporting jaw system transforms the Schunk Tandem plus clamping force blocks into multi-purpose powerhouses. For the first time it is possible to cover the whole clamping areas with clamping inserts from the Schunk standard chuck jaw program for stationary workpiece clamping. Instead of several different special chuck jaws, with the TandemTBA-D supporting jaw system, the user just needs a few standard inserts, which can be quickly configured and are usually available from stock. This reduces both the investment volume and implementation time to a minimum.

With the fine serration, its position can be varied in just a few simple steps. The SCHUNK TANDEM TBA-D is available in three sizes for clamping ranges from 8 to 70 mm, 18 to 120 mm, or 30 to 200 mm.

Standard interfaces allow different variations for raw and finished parts as an option including gripper jaws, stepped jaws, prism jaws, soft jaws, jaws with pull-down, jaws with T-nut, and many more. The supporting jaws are assembled with four screws at the base jaw of the clamping force block, maximising rigidity. With the fine serration, its position can be varied in just a few simple steps. The SCHUNK TANDEM TBA-D is available in three sizes for clamping ranges from 8 to 70 mm, 18 to 120 mm, or 30 to 200 mm. It is suitable for ID and OD clamping on SCHUNK TANDEM plus clamping force blocks in sizes 100, 160, and 250.

High clamping force and repeat accuracy

Schunk Tandem plus clamping force blocks develop high forces in confined spaces. Its one-pieced rigid base body, the wedge hook kinematics, and the long, ground jaw guidance provide concentrated clamping forces of up to 55 kN. They also ensure a repeat accuracy of up to 0.01 mm. This means that the clamping force blocks are also suitable for challenging milling processes with a high metal removal rate, high cycle times, and minimum tolerances. The optimised outside contour and minimum clearance prevent the nesting of chips, and keeps chips and dirt out of the clamping module. Tight-fitting screws ensure that the clamping module can be changed at a high repeat accuracy.

The standardised powerhouse is available in several varieties: pneumatic; hydraulic; with spring or manually actuated in module sizes between 64 and 250 mm with a standard stroke or long stroke; or as a clamping force block with a fixed chuck jaw. They are suitable for top jaws with tongue and groove, but also for jaws with fine serration. To learn more about the many possibilities, SCHUNK offers a free quick finder on their website www.schunk.com, which makes the search for the best clamping force block much easier. Five clicks is all it takes to find the tool suggestion for the matching modules.

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Improved efficiency with hybrid tools

Walter Tools brings a wide range of tools to facilitate efficient machining of chassis components

Machining chassis components is not easy, as the process usually involves difficult-to-cut materials. Many chassis components also have a long, slim shape, which makes them even more difficult to machine. Walter AG, based in Tübingen, is a sought-after solution partner in this field. The company tackles these specialised challenges with efficient tool geometries and a range of ingenious hybrid tools unrivalled on the market.

Drag bearings for the front wheels of a car are 50 cm long or longer. They are usually made from materials with difficult cutting properties. Aluminium is generally used for cars, whereas commercial vehicle chassis components are generally produced from cast iron and their dimensions are even larger.

The length and often demanding shape of the work pieces makes machining these drag bearings and other chassis components a difficult exercise. Especially since the finished parts – whether bearings, suspension arms, longitudinal swinging arms or subframes – will have to withstand exceptionally high loads: They will have to support the steering motion, compress and decompress, ensure a secure connection to the vehicle body and do their job perfectly even in the worst road conditions (to mention just a few of the demands placed on them).

Simultaneous face milling of the upper and lower sides on the upper connection of a drag bearing. Then a stepped hole is drilled into the connection, without changing tool, and the rear side is deburred circularly. *Image: Walter AG*

Robust materials

The materials used to manufacture chassis components are suitably robust – and consequentiality difficult to machine. For example, the aluminium alloys, which predominate in the car sector, can produce chips that are often between 10 and 50 cm long. Removing these chips smoothly and cleanly is barely achievable.

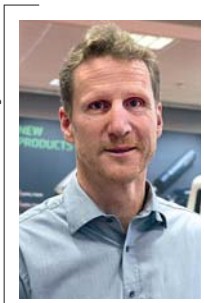


Image: Walter AG

"Our customers need solutions to improve their efficiency. We have been seeing this trend for many years now. We are therefore deploying our skills in metal machining not only to develop highly efficient tools, but also to offer our customers complete machining concepts."

Roland Hanischdörfer, the PCD Special Tools Product Manager at Walter AG.

The challenges begin much earlier, however at the clamping stage and in the spatial configuration of the machining situation. The work piece must be securely clamped and accessible for machining from all required sides. The tool must be long enough to do its job between the clamp and the component optimally. The time-honoured rule applies to clamping and tools here: As long as necessary but as short as possible. The most important thing is to get a handle on the cutting forces. The length of the pieces being machined and the tools may cause such substantial swinging movements during machining that clean and precise machining is no longer possible.

"This can be entirely or at least substantially prevented with a tool geometry specially developed for this purpose," explains Roland Hanischdörfer, PCD Special Tools Product Manager at Walter AG: "Our tools are specially designed for machining chassis components."

There are essentially two effects generated by using the correct microgeometry, which counter the undesirable swinging movements: Either the stability of the tool limits the swinging movements to a minimum or eliminates them, or the forces generated during machining cancel each other out. Which effect is produced, or whether a combination of both

is employed, depends on the actual machining situation. "Our tools are able to do either," says Roland Hanischdörfer.

Hybrid tools improve efficiency

This is not enough for the specialists at Walter, after all, their customers in the automotive sector are subject to constant competitive pressure and consequently pressure to optimise. The Tübingen-based company has therefore developed a wide range of tools to facilitate efficient machining of chassis components: Hybrid tools combining solid carbide indexable inserts with polycrystalline diamond inserts (PCD).

The carbide indexable inserts are used for roughing work to and achieve an extremely high machining volume. Their special tool geometry also produces short chips even when machining aluminium, thus solving the problem of chip removal.

In the following machining step, the hybrid tool's PCD indexable insert can be used for finishing. "The user therefore employs one and the same tool for two completely different machining stages. This reduces non-productive time as there is no need to change the tool."

According to Hanischdörfer, the PCD indexable inserts used to carry out finishing operations ensure an extremely high surface quality. Recently, Walter has also started offering PCD tools with chip breakers lasered into the diamond cutting edge. "These reduce metre-long chips to a few centimetres.

Many Walter hybrid tools can also be configured for use with minimum quantity lubrication (MQL). Instead of emulsion or oil, as is the case with conventional wet machining, an oil-air mixture cools and lubricates the machining surface and tool. This has several advantages. Firstly, using MQL brings the amount of coolant required per hour from around 500 litres down to only 10 to 20 ml. Secondly, using MQL does away with the expensive and environmentally harmful need to dispose of coolant and wet chips as special waste.

Complete machining concepts

Walter engineers have demonstrably achieved high tool life and cutting data for their hybrid tools in practical use. "Customers who are using these tools and can see the results in their workpieces, including cutting data and tool life, are absolutely delighted," Roland Hanischdörfer is pleased to report.

Moreover, customers are increasingly commissioning Walter to develop machining concepts based on these. "Our customers need solutions to improve their efficiency, but they do not want to have to put a lot of work into their development. We have been seeing this trend for many years now. We are therefore deploying our skills in metal machining not only to develop highly efficient tools, but also to offer our customers complete machining concepts."

There are usually two routes to this type of concept:

- The automotive customer invites the Walter experts to their own premises and shows them computer images and/or prototypes of the new component. Walter develops the complete machining concept based on these, including all tools.
- The user goes to their machinery manufacturer and purchases the complete machining process from them. The machinery manufacturer contacts Walter in order to define and purchase the tools required for this. Or (see above) the manufacturer develops the machining concept in collaboration with Walter.

No matter which route leads to the destination, the basis is always as detailed as possible knowledge of the existing machining processes and framework conditions at the customer's premises.

More and more users are also requiring an even more extensive service from Walter: The development of complete component cost concepts. The key point here is that the Tübingen firm can guarantee specific costs per component. This is a significant advantage in the automotive sector in particular, where the "Cost Per Part" (CPP) is the key calculation variable.

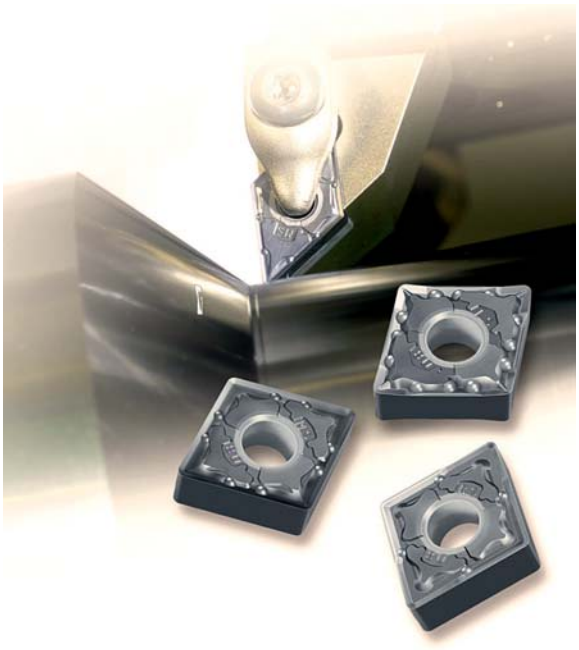
This requires extremely close collaboration between Walter and the respective user, however, as well as the extensive digitalisation and networking of all production processes. Roland Hanischdörfer explains: "If our digital manufacturing experts have sufficient data to make the processes transparent in detail, they can unlock previously unimaginable optimisation potential and achieve amazing efficiency gains."

For more information, visit www.walter-tools.com

Example drag bearing from the car sector, on which all the tools shown above are employed. *Image : Walter AG*

New turning grades for heat resistant alloys

The machining of difficult to cut materials such as heat resistant alloys, titanium alloys and Inconel has now been simplified with the introduction of the new MP9005, MP9015 and MT9015 turning grades from Mitsubishi.



For titanium alloys in the ISO-S15 parameters, Mitsubishi has developed its MT9015 line of uncoated cemented carbide inserts that have a sharp cutting edge but also have high fracture and wear resistance properties.

The latest MIRACLE SIGMA technology has been applied in the new (AlTi)N coated MP9005 and MP9015 series. This new Al rich, (AlTi)N coating surpasses conventional performance with a single layer that provides stabilisation of the high hardness phase to dramatically improve wear, crater and welding resistance. The grades have been developed for finish to medium turning processes and for medium to rough cutting on heat resistant alloys respectively. MP9005 is a high quality grade that surpasses the wear resistance of previous versions, making it most suitable for ISO-S05 type materials, whilst the MP9015 line is better suited to ISO-S15 materials and is highly recommended for more general purpose usage. For titanium alloys in the ISO-S15 parameters, Mitsubishi has developed its MT9015 line of uncoated cemented carbide inserts that have a sharp cutting edge but also have high fracture and wear resistance properties. This uncoated range is offered specifically for general turning of titanium alloys.

For more robust rough cutting, the RS chipbreaker incorporates a positive land that controls abrasion at the depth-of-cut line and eliminates chip welding that is commonplace when machining heat resistant materials.

Chip Breakers

Incorporating Mitsubishi's new chipbreaker designs for the negative inserts, the R&D team has developed the LS chipbreaker for light cutting, a newly designed MS breaker for medium and general use applications and the RS breaker for rough cutting. Primarily for small depths of cut, the LS chipbreaker has enhanced chip disposal geometry for depths of cut smaller than the insert corner radius. For more general applications, the MS chipbreaker has a large two-step rake angle that enables swarf removal without tangling around the tool and workpiece when cutting at lower feeds. For more robust rough cutting, the RS chipbreaker incorporates a positive land that controls abrasion at the depth-of-cut line and eliminates chip welding that is commonplace when machining heat resistant materials.

Easy Selection

This chipbreaker designation is simplified by Mitsubishi with its new 'Easy Selection Breaker System' that identifies each chipbreaker by L, M and R for Light, Medium and Rough cutting with the ISO material type following. In this case, S is the ISO designation for heat resistant alloys. The formula has now been introduced to all Mitsubishi insert grades to enhance insert identification and ease of use for the end user.

All the above mentioned insert grades are available in CNMG, DNMG, SNMG, TNMG, VNMG and WNMG designations to ensure that the new grades, MP9005, MP9015 and MT9015, can improve tool life, longevity, productivity and reduce costs regardless of the turning application.

High Al and conventional coating comparison

The new technology high Al-rich (Al,Ti)N single layer coating provides stabilisation of the high hardness phase and succeeds in dramatically improving wear, crater and welding resistance.

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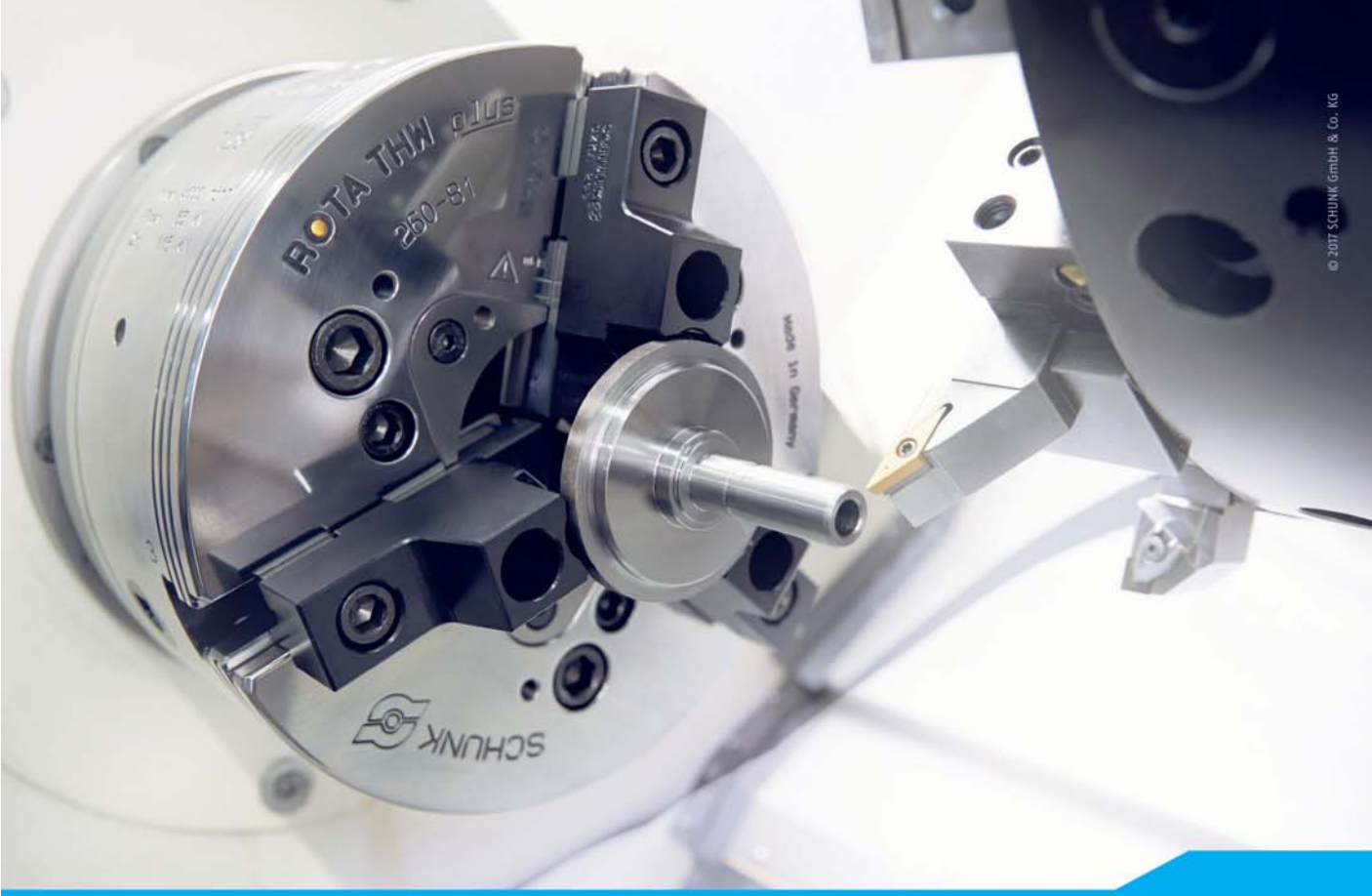

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