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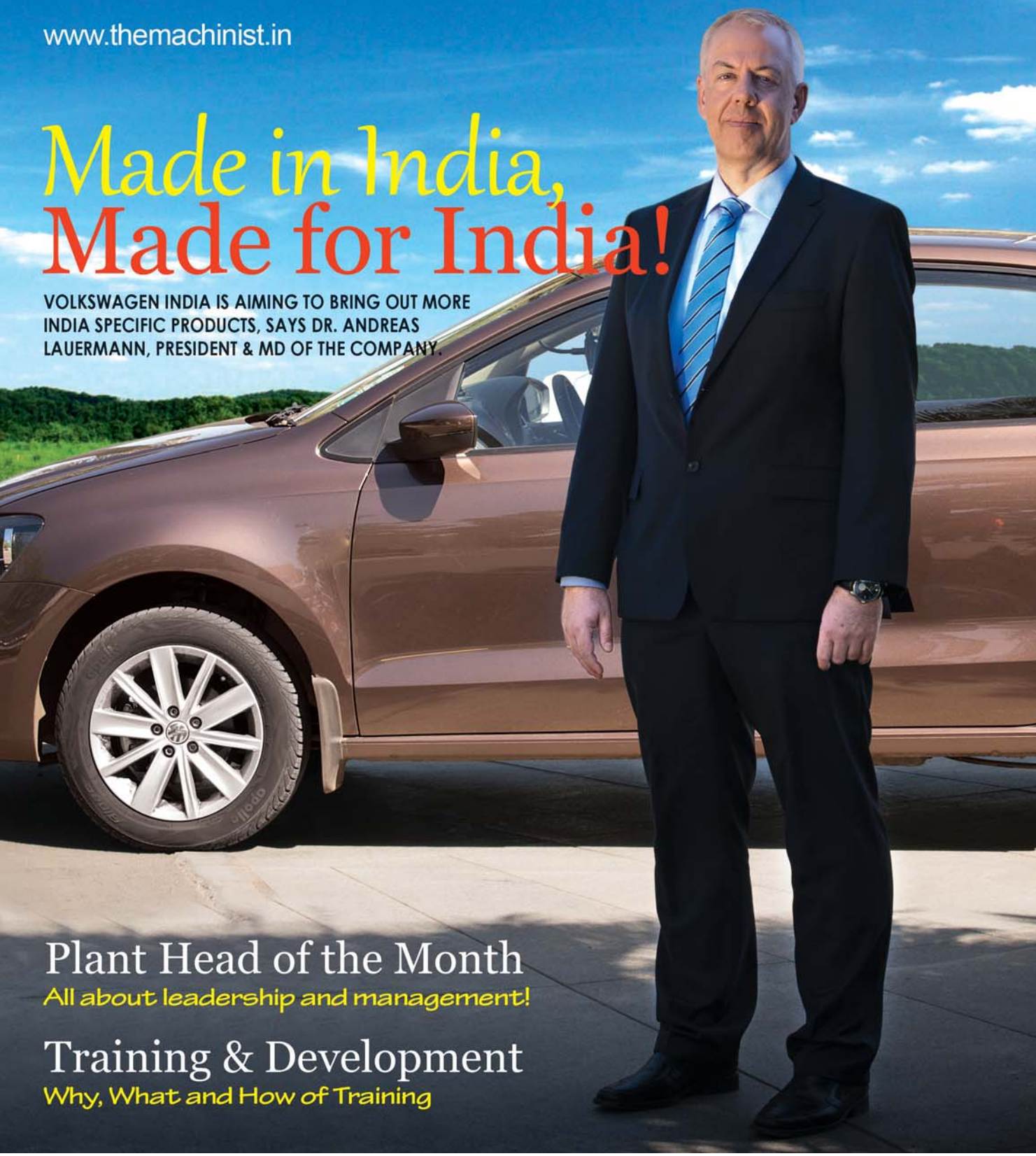

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To Know, To Learn, To Engage!

"Once this is over, I will never have to study or learn anything anymore." That's what I thought after almost every exam post my graduation. Fortunately, I was always wrong. I study and learn till date and will continue to do so. Of course, it may not be pursuing a course in some institute or academy but the objective should be to keep learning. It is important to have an open mind and keep seeking knowledge from every possible avenue. Obviously, all professionals think likewise and continue to evolve both professionally and personally.

One of the key avenues for professionals to learn about the best practices in their businesses is to attend relevant conferences and summits. With the aim of creating meaningful platforms for its readers and the manufacturing

"ONE OF THE KEY AVENUES FOR PROFESSIONALS TO LEARN ABOUT THE BEST PRACTICES IN THEIR BUSINESSES IS TO ATTEND RELEVANT CONFERENCES AND SUMMITS."

industry in general, The Machinist magazine started its journey of creating knowledge based networking forums. With the Super Shopfloor Awards and the Manufacturing Excellence Summit, we have built robust platforms that are meaningful from the knowledge point of view and are also immensely helpful in terms of connecting with the right people.

The Machinist Manufacturing Excellence Summit (or MES, as we call it fondly) was a great success in its maiden edition last year. Now, we are all set to take it to the next level this year in December. Well - those who participated would know - we created history with our Awards platform this year and we plan to replicate this success with MES as well. We are also changing the venue from Bangalore to New Delhi. So if you are keen to know, to learn and to engage then do join us at the MES 2016. Keep watching this space for more info.

P.S. The first edition of the 'Global Conference on Plastics in Automotive' organised by our sister publication 'The Economic Times Polymers' is shaping up pretty well. Hope to catch up with some of you there on September 22.

Editor & Chief Community Officer

THE MACHINIST
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India's rank improves in Logistics Performance Index

INDIA has now been ranked 35 amongst 160 countries in the World Bank's recently released 'Logistics Performance Index' (LPI) 2016 report titled "Connecting to Complete 2016". This is a jump of 19 places compared to the 2014 ranking. Further, in terms of the six-components of the LPI i.e. Customs, Infrastructure, International Shipments, Logistics Quality and Competence, Tracking and Tracing, and Timeliness, India's ranking is 38, 36, 39, 32, 33 and 42 respectively. Published by World Bank every two years, the Logistics Performance Index Report is an interactive benchmarking tool created to help countries identify the challenges and opportunities they face in their performance on trade logistics and what they can do to improve their performance.

Toshiba JSW ships first large-scale turbine generator

TOSHIBA JSW POWER SYSTEMS PVT LTD. (Toshiba JSW) marked a significant milestone in its endeavour to offer customers state-of-the-art power generations solutions with shipment of its first 'Made-in-India' steam turbine generator. The 800-megawatt steam turbine and generator (STG) for Unit 2 of the Kudgi Super-critical Thermal Power Station in Karnataka state is Toshiba's first large-scale generation system to be manufactured and assembled with locally procured parts and systems, and tested in India. On this occasion, Yoshiaki Inayama, MD of the company said, "Our extensive experience in equipment designing and manufacturing for thermal power applications puts us in a leading position to enhance efficiency and offer cleaner power-generation solutions to customers in India. With this shipment we embark on our local manufacturing – from procurement to testing and shipping, for customers in India and the neighbouring countries."

Bengaluru most hospitable to tech start-ups

BENGALURU is host to the largest share of technology driven start-ups, followed by the Delhi NCR and Mumbai while Hyderabad and Chennai are also quite popular among the techies who are budding entrepreneurs, according to an ASSOCHAM study. The study done in association with the 'Thought Arbitrage' found that in the technology driven start-ups, India has moved up to third position with the US occupying the top position with more than 47,000 and UK with over 4,500. India's tech start – ups number around 4,200 up to 2015. In terms of total number of start-ups, comprising tech and non-tech areas, India again figured among the five largest hosts in the world along with China. The number of start-ups in both India and China was 10,000 each. The US is at the number one position among the overall list of 83,000 budding entrepreneurs. Of the Indian start-ups, riding on the technology, the IT hub Bengaluru was host of 26 per cent, followed by NCR with 23 per cent and Mumbai 17 per cent. "The disruptive innovation in technology and process is creating newer Indian start-ups and foreign investors including some of the well-known venture capial funds are showing immense interest in these start-ups," ASSOCHAM President, Sunil Kanoria said.

KabelSchlepp India celebrates 10th anniversary

KABELSCHLEPP INDIA, Bengaluru, recently completed 10 years of operations in the country. The company is selling Cable Carriers and Guide way protection systems from last 10 years and has been growing steadily by stamping its name in Indian market. Most of the components were being imported from our principal company Tsubaki Kabelschlepp GmbH, Germany and are being assembled and sold from Bengaluru.

The company has now started manufacturing Telescopic covers from January 2015, the quality has been excellent and the demand has been increasing. Keeping in mind the future prospects of the company in the Telescopic cover business, the company has also opened a separate unit for Cable Carriers and Telescopic covers and hence the new unit is opened on the occasion of 10th anniversary.

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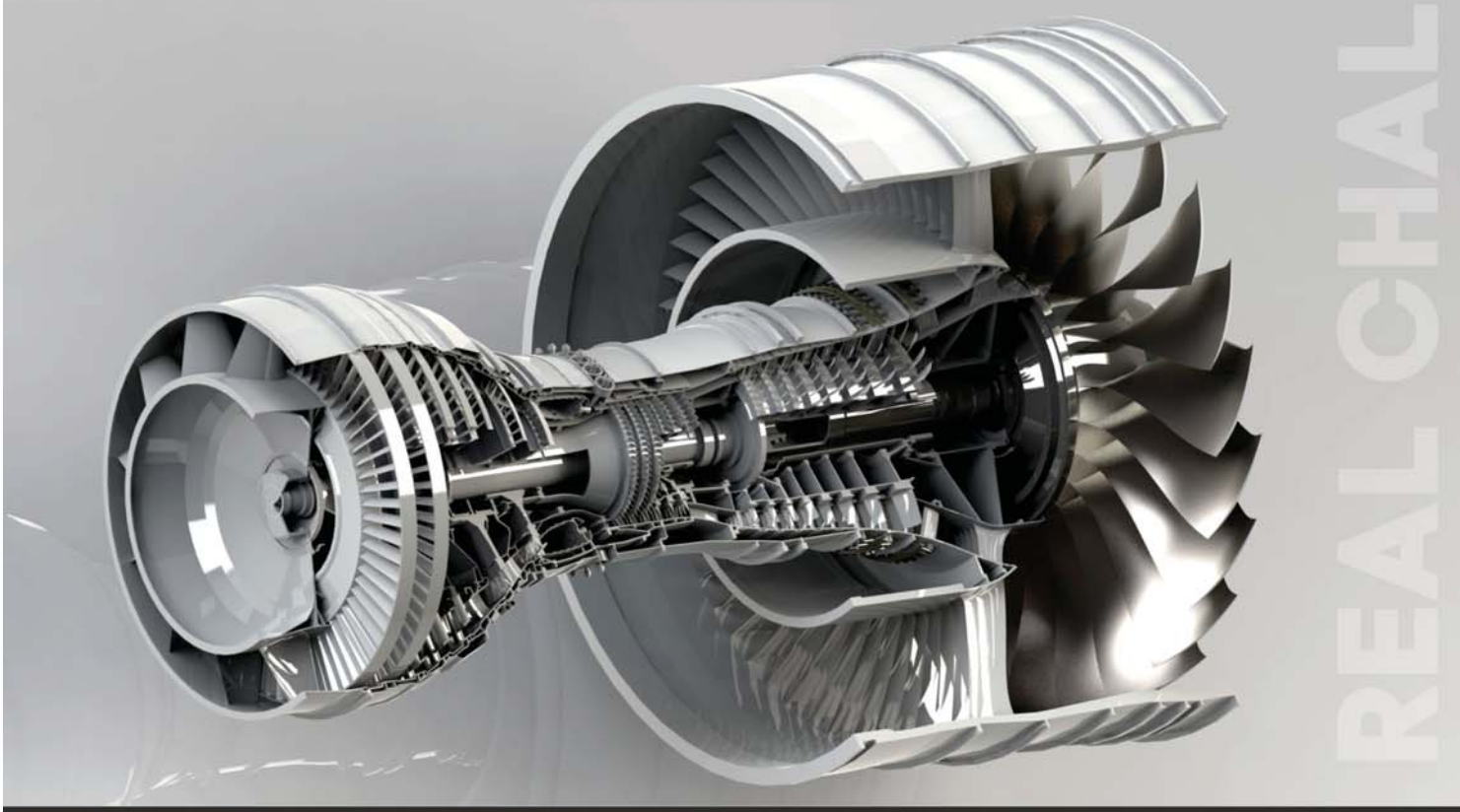

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ABB India doubles solar inverter manufacturing capacity

ABB INDIA has inaugurated a new solar inverter manufacturing facility in the city. The facility is set to double the solar inverter manufacturing capacity of the company. The factory was inaugurated by Sanjeev Sharma, CEO and MD, ABB India and Robert Itschner, Global MD for Power Conversion, ABB Group.

The expansion follows earlier milestones achieved by ABB India last year – the first company to double the solar inverter installed base to 2GW in a span of five months. ABB inverters manufactured at Nelamanagala, Bengaluru help power 40% of the utility scale solar power generated in the country.

"ABB, a global leader in solar inverter technology, has also been powering solar projects across the country spanning the entire solar photovoltaic (PV) value chain, a key component of which has been our solar inverter technology, made in India," said Sanjeev Sharma, CEO and MD, ABB India. "The government's vision has provided the required catalyst and focus for clean energy and ABB is proud to partner this journey. This expansion reaffirms our commitment, innovation to cater to country-specific solutions and enhances our manufacturing presence of sixty years."

Henkel India expands capabilities of its Innovation Centre at Pune

HENKEL ADHESIVES TECHNOLOGIES INDIA PVT LTD has expanded the capabilities of its Pune Innovation Center with two dedicated laboratories, one for Maintenance Repair and Overhaul (MRO) and the other for Acoustic and NVH. These laboratories will facilitate development of products that can meet the unique needs of customers to save costs, reduce downtime and improve performance; test products in simulated conditions in-house before they are used in actual conditions; and train customers on product selection, application, and best practices. Jerry Perkins, Global Head of General Industry Adhesives, Henkel Group said, "We are committed to further deepen our partnership with our customers in India, Middle East and Africa with the new investments in Innovation Center at Pune."

LeEco India opens its first local manufacturing plant

WITHIN just eight months of operations in India, LeEco India has announced the launch of its first state-of-the-art smartphone manufacturing facility in Greater Noida, India. This

swift alignment with the Government's 'Make in India' initiative is a reaffirmation of LeEco's commitment to India and its long-term plans for the country. The facility has been set up at a significant investment of US$ 5 million and a further US$ 2 million has been earmarked for the automation process.

The technology giant has collaborated with leading electronics manufacturer, Compal Electronics to set up this facility. The ceremonial lamp-lighting was commenced by Union Minister for Electronics & Information Technology and Law & Justice, Ravi Shankar Prasad in the presence of Atul Jain, COO of Smart Electronics Business for LeEco India. Tin Mok, VP of Le Holdings and CEO of LeEco Asia Pacific said, "India is top priority in LeEco's global expansion roadmap. Our investments here - be it our manufacturing plant or our R&D centre that will train hundreds of local talents - all demonstrate that we are here for the long haul."

C.R.I. enters high-end specialised wires & cables

C.R.I. has entered into the high end specialized wires and cables market. This diversification and expansion is part of an aggressive plan that targets turnover of Rs.5,000 crore in 2021. In the high end specialized wires and cables offering for the 1st time in India, C.R.I.'s Research Centre has developed a high temperature application XLPE (cross linked poly ethylene) submersible winding wire with higher dielectric strength. C.R.I. has also developed high efficient DC solar cables for the fast growing solar industry. The manufacturing plant is situated in close proximity to the city of Coimbatore.

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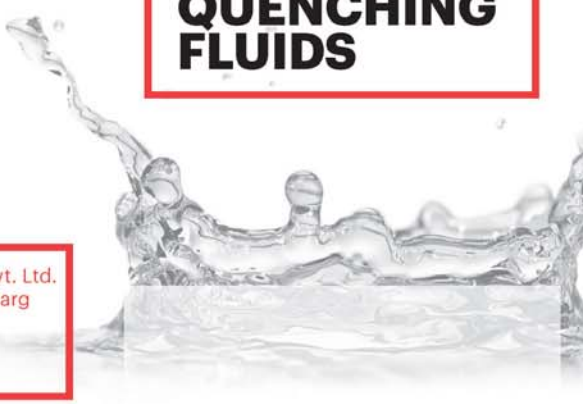

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• MARK YOUR DIARY •

A list of key events happening between September 2016 to June 2017, both nationally and internationally.

MINExpo International
September 26-28, 2016,
Las Vegas (US)
www.minexpo.com

Pune Machine Tool Expo 2016
September 29-October 2, 2016
Auto Cluster Exhibition Center, Pune
www.mtx.co.in

India International Textile Machinery Exhibition 2016
December 3-8, 2016,
Mumbai
http://itme2016.india-itme.com/

BAUMA CONEXPO India 2016
December 12-15, 2016,
New Delhi
www.bcindia.com

IMTEX 2017
January 26-February 1, 2017,
Bangalore
www.imtex.in

CONEXPO-CON/ AGG
March 7-11, 2017
Las Vegas, NV (US)
www.conexpoconagg.com

TIMTOS
March7–12, 2017
Taipei (Taiwan)
www.timtos.com.tw

Automotive Engineering Show
March 21-23,2017
New Delhi
www.aes-show.com

ACMA Automechanika New Delhi 2017
March 21-24, 2017
New Delhi
http://acma-automechanika-newdelhi.in.messefrankfurt.com/newdelhi/en/exhibitors/welcome.html

ProMat 2017
April 3-6, 2017
Chicago, (US)
www.promatshow.com

Hannover Messe
April 24–28, 2017
Hannover (Germany)
www.hannovermesse.de

INTEC 2017
June 1-5, 2017
Codissia Trade Fair Complex, Coimbatore
www.intec.codissia.com

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TAKEHIKO NAKAO RE-ELECTED AS ADB PRESIDENT FOR SECOND TERM

The Asian Development Bank (ADB) Board of Governors has unanimously re-elected Takehiko Nakao as President of ADB for a further 5 years beginning on 24 November 2016. Nakao was first elected as President by the Board of Governors on 28 April 2013 to serve the 3 and a half years remaining of the term of his predecessor, Haruhiko Kuroda. Nakao is the ninth President of ADB. He was the sole nominee after ADB's Governors were invited from 31 May to 30 June 2016 to make nominations for the organization's presidency. "I will devote myself to continuing to lead ADB to an even more elevated standing as the primary development institution in the region that helps achieve inclusive and sustainable development in Asia and the Pacific," said Nakao. During Nakao's first term, ADB has realigned its strategic priorities through the Midterm Review of Strategy 2020 and increased its lending capacity from $13 billion in 2014 to $20 billion by 2020 through the merger of Asian Development Fund operations with the Ordinary Capital Resources balance sheet.

SAMSON KHAOU IS INDIA MD FOR DASSAULT SYSTÈMES

Dassault Systèmes (Euronext Paris: #13065, DSY.PA), has announced the appointment of Samson Khaou as the Managing Director of its India Geo. Samson Khaou will develop Dassault Systèmes' India business strategy in line with the country's opportunities.

Samson Khaou joined Dassault Systèmes in 1989 and has spent more than 15 years in Asia. For the last 10 years, he has launched Dassault Systèmes' business in Korea and then he took the responsibility of Industry Services for Europe before leading the Asia Pacific South geo in 2011. Under his leadership, the revenue doubled, with several innovative projects such as "Virtual Singapore" being initiated. On his appointment as MD for India, Samson Khaou said, "I am delighted to take on the responsibility to spearhead Dassault Systèmes India's strong focus to leverage the opportunities which the country offers."

SHILIP KUMAR SUCCEEDS JEREMY HUNTER AS PRESIDENT - HENKEL INDIA

Henkel has appointed Shilip Kumar as the President of its India business, effective June 1, 2016. Besides, steering the Adhesives and Beauty care businesses of Henkel Adhesives Technologies India Private Limited (Henkel India), he will continue in his existing role of Business Director for Transportation & Metal Adhesives SBU in the India,Middle East, Africa (IMEA) region. Shilip succeeds Jeremy Hunter, who led the India business for over five years, and has now moved to Shanghai as President – Henkel China. Based out of Henkel India's head office at Navi Mumbai, Shilip will be responsible for leading Henkel's businesses in India through its next growth phase. Shilip started his journey with Henkel in 2011 as Business Director of the Transportation and Metal SBU in India. He was at that point in time responsible for integrating the SBU's operations across three legal entities, including two Joint Ventures, to leverage the scale of its business in the country.

ASHISH GAIKWAD IS MD OF HONEYWELL AUTOMATION INDIA

Honeywell Automation India Limited has announced that Ashish Gaikwad has been appointed as its MD effective October 1, 2016. Gaikwad succeeds Vikas Chadha, who was recently named president, Honeywell India. Speaking about the appointment, Suresh Senapaty, Chairman, HAIL, said, "HAIL has a 25-year legacy in India, in developing and manufacturing technologies that serve a diverse and extensive customer base across verticals including oil and gas, power, metals, pharmaceuticals, chemicals, mining, infrastructure, IT/ITeS, telecom, banking, healthcare, hospitality, automobiles, defense, aerospace, transportation, and the residential sector. With more than 25 years of experience in automation, control, and advanced software applications in the process industry, Ashish will strategically lead HAIL to continued growth in the region, and strengthen the brand and its equity with customers and other key stakeholders." Vikas Chadha, President, Honeywell India, said, "I am confident Ashish will take HAIL to new heights."

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Mercedes-Benz India completes its petrol portfolio in India

Mercedes-Benz completed its petrol portfolio with the launch of the 'S-Class of the SUVs', the GLS 400 4MATIC. The GLS 400 4MATIC makes it way to the Indian shores in just three months of the introduction of the diesel variant, underlining Mercedes-Benz India's strategy of introducing the best products from the global portfolio in the shortest possible time. Roland Folger, Managing Director and CEO, Mercedes-Benz India commented, "With the launch of the GLS 400 4MATIC, we have now completed our petrol portfolio for the Indian market. The introduction of the GLS 400 4MATIC is a strategic move as it gives the customers the flexibility to choose between the petrol and the diesel variants of their popular SUV. The GLS offers its occupants class leading luxury experience that no other full-size luxury SUV can match in this segment. This is also the fifth SUV variant we introduced this year, further bolstering our SUV portfolio which remains the most comprehensive in the luxury car segment. Our SUV segment has seen the maximum growth for the past two years and we are confident that this trend will continue."

JLR's Castle Bromwich plant starts production of Jaguar XE

Following the huge customer demand for Jaguar's two latest models, the F-PACE and XE, Jaguar Land Rover today revealed that the mid-sized premium sport sedan, the Jaguar XE, is to be built at Castle Bromwich - marking the return of all Jaguar sports and saloon car manufacturing to the Birmingham plant.

The XE will gradually transfer from its current home at Solihull, demonstrating the inherent flexibility of Jaguar Land Rover's West Midlands manufacturing operations - the result of more than £1bn of infrastructure investment at Solihull and Castle Bromwich. This investment in new press lines, body shops and final assembly halls supports production of the three Jaguar models built on the company's technically advanced aluminium architecture*.

Wolfgang Stadler, Jaguar Land Rover's Executive Director of Manufacturing, said: "The significant investment to create two centres of excellence in aluminium vehicle manufacturing, utilising shared technologies, was deliberate. It gives us the flexibility to quickly respond to consumer demand for our growing range of products."

Nissan & Ashok Leyland to restructure partnership; Nissan to sell its shares

Nissan Motor Co. Ltd. and Ashok Leyland Ltd. announced a restructuring agreement that will enable both companies to enter into a new phase in their business interaction. Nissan has agreed to sell to Ashok Leyland all of Nissan's shares in three joint venture companies that were formed in 2008. These joint ventures focus on technology development, and manufacturing of powertrains and vehicles. Under the agreement signed on September 7, 2016 by senior executives of Nissan and Ashok Leyland, these joint ventures will become wholly-owned Ashok Leyland subsidiaries, upon receipt of all necessary approvals from the regulatory authorities in India. The process is expected to be concluded later this year. The new phase of business interaction will begin immediately.

Toyota builds zero emissions building at Honsha Plant

Toyota Motor Corporation has installed stationary pure hydrogen fuel cells at the energy management facility which was completed at its Honsha Plant in Toyota City, Aichi Prefecture, in August 2016. Toyota is progressing with initiatives toward the fulfillment of the Plant Zero CO2 Emissions Challenge that was announced at the 2015 Toyota Environmental Forum. It aims to completely eliminate CO2 emissions at the recently constructed new energy management facility through energy-saving measures, and the use of renewable and hydrogen-based energy. The measures include, promoting conservation by allowing each employee to switch the air-conditioning and lighting on and off, as well as maximizing the use of natural lighting and natural ventilation.

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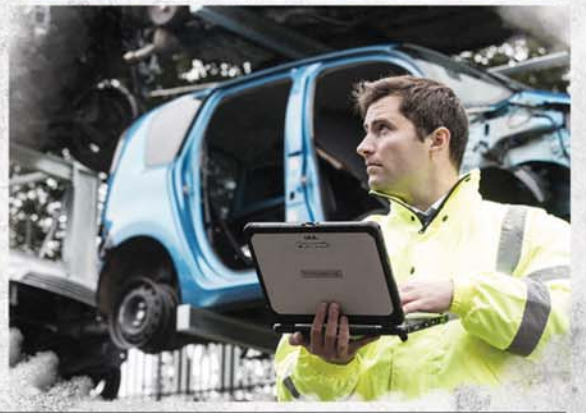

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Mercedes-Benz Vans launches new Vito in China

Mercedes-Benz Vans launched its new mid-size van – the Vito – at the Chengdu Motor Show in China on Friday. This marks another important stage of Mercedes-Benz Vans expanding its business in China, the world's largest automobile market. In March this year Mercedes-Benz Vans already successfully launched its mid-size multi-purpose vehicle (MPV) V-Class in China. The first batch of the new Vito rolled off the production line at Daimler's local joint venture Fujian Benz Automotive Co., Ltd. (FBAC) in Fuzhou in August. The new Vito will be ready for delivery to dealers at the end of September. Volker Mornhinweg, Head of Mercedes-Benz Vans: "With the launch of the new Vito in China, we completed the roll-out of our highly successful mid-size segment in this growing market. This is another milestone of our 'Mercedes-Benz Vans goes global' growth strategy. We have successfully entered numerous markets with the new Vito since its launch in 2014 – over 65 in total – and we have significantly increased unit sales ever since. We are convinced it will be as compelling to customers in China, too."

Toyota RAV4 production starts at Saint Petersburg plant

Production of the current generation Toyota RAV4 has started at the Toyota plant in Saint Petersburg. The best-seller Toyota RAV4 became the second model to be produced at the Saint Petersburg plant together with the Toyota Camry, which has been made here since 2007. The Russian-made Toyota RAV4 will be produced for Russian, Kazakh and Belarus markets.

The decision to start Toyota RAV4 production at the Toyota plant in Saint Petersburg was made in 2013 following the strong sales of this vehicle in Russia. As a pioneer creating a brand new segment when first launched in 1994, the Toyota RAV4 has established a solid reputation with Russian customers since its launch in Russia in 2002. For several years, it has been not only the market leader in the C-SUV segment, but the vehicle has become one of Toyota's best-seller across all segments in Russia.

Tata Motors launches two new CVs in Indonesia

PT Tata Motors Distribusi Indonesia (TMDI), a unit of Tata Motors Ltd., has launched two new-generation commercial vehicles in Indonesia, the Tata ULTRA 1012 light truck and the Tata Xenon XT D-Cab 4×4 pick-up, at the 24th Gaikindo Indonesia International Auto Show (GIIAS) 2016. Having been developed keeping in mind the Indonesian customer, both vehicles have been subjected to rigorous trials of over 25,000 kilometers, over different terrains and various operating conditions and are officially backed by PT Tata Motors Distribusi Indonesia's robust customer care. With best-in-class warranty, guaranteed parts supply and 24×7 on-road assistance, Tata Motors operates through 119 touch points across Java, Sumatra, Bali and Sulawesi.

Mahindra Reva rebranded as Mahindra Electric

M&M Ltd. has recently rebranded its electric mobility portfolio as Mahindra Electric. Under the umbrella brand, Mahindra Electric, the company will manufacture electric cars, license out its electric vehicle technologies, electrify its new and existing platforms and help deliver integrated zero emissions mobility solutions. Further to the introduction of its electric car, the Mahindra e2o, the company has continued its electric ambitions with the launch of the eVerito, India's first zero-emission, all-electric sedan. It also showcased the soon to be launched e-Supro, an electric version of the Supro passenger van. The company is expected to power some of its new and existing vehicles with the latest electric drivetrain technology from Mahindra Electric. It is a clear embodiment of Mahindra's vision of the 'Future of Mobility' which includes the framework of Green, Connected, Convenient and Cost Effective vehicle technology.


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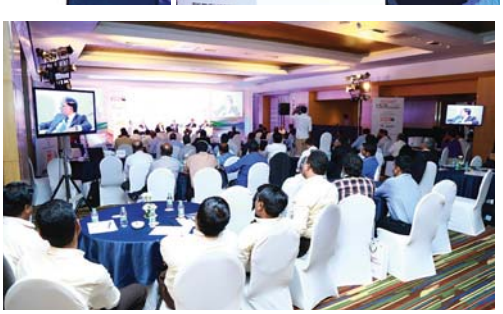

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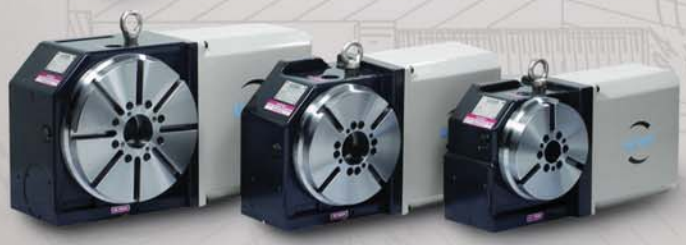

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A robust strategy

Puneet Chandhok, Group Chief Supply Chain Officer, Varroc Group, says his organisation has developed a robust strategy to streamline the supply chain process for sustainable improvement by removing all the foundation blocks.

By Niranjan Mudholkar

"We re-structured our Corporate SCM team into Category focus, and now each category head is majorly linked to one of our Business Units (based on spend)."

What measures is your organisation taking to ensure that your SCM strategy is in alignment with your overall business goals?

According to me supply chain management (SCM) needs to be efficient for any manufacturing organisation. It plays an important role in the success of manufacturing organisation. At Varroc, we have developed a robust Supply Chain strategy to streamline the supply chain process for sustainable improvement by removing all the foundation blocks.

We re-structured our Corporate SCM team into Category focus, and now each category head is majorly linked to one of our Business Units (based on spend). We further increased quality weightage from 60 percent to 75 percent in our new vendor ratings to align SCM with our business goals. Currently specific performance objectives of SCM are helping us in achieving both top-line and bottom line results.

For smoothness and efficiency we have made strategic tie-ups with our main suppliers, which have ensured us timely delivery of input materials to our plants in cost effective ways. Currently we have started system upgradation of our suppliers and the process of creating adequate outsourcing capacities to ensure best and first time right products for plants and customers. We are also giving special focus on first time right and on time component development. We are also implementing various IT initiatives through our ERP (SAP) across our plants for seamless and critical information sharing. In nutshell we are working towards a lean, responsive and flexible supply chain which is in alignment with our overall business goals.

How will the implementation of GST impact the overall supply chain scenario in the country and how will your organisation leverage on this reform?

GST was a long awaited change for the automotive industry. In automotive industry, supply chain network design is dependent on indirect taxes. Implementation of GST with elimination of CST (Central Sales Tax) will reduce the necessity of having warehouses in each state and supply chain network design will become strong.

GST will simplify state border crossing and improve the transportation by reducing the delivery time. Due to complex tax regimes and poor infrastructure logistics is expensive in India and GST will eliminate multiple state taxes and encourage logistics companies to consolidate warehouses. GST's implementation will reduce overall logistics cost and idle time of trucks (30 percent total travel time) at various check posts for CST/Octroi to make supply chain network efficient and profitable.

Implementation of GST will provide a window of opportunity to Tier1-suppliers and logistics service providers to address the tax-driven incompetence in our supply chain. GST implementation will make larger impact on our supply chain re-engineering and redesigning and there will be alliance of supply and storage points followed by well-defined freight routes and investments in warehouses and stocking facilities.

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for supply chain partners (vendors) is extremely important for manufacturing companies. What are you doing in this regard?

This task seems to be difficult at starting of the improvement program but we have planned several steps to change the supplier's attitude and commitment towards continuous improvement.

We have a process called Vendor Quality Management System (VQMS) to improve the manufacturing processes and work place organisations of our suppliers. The successful implementation of VQMS will begin to reduce waste with improved efficiency and there will be consistency in the expected results.

Simplified manufacturing task is the heart of increased efficiency. You need to have an eye for finding an appropriate method of simplification for supplier's improvement. Otherwise improper ways can lead to inefficient manufacturing with inconsistent product quality and many more negative outcomes.

"The rise of smart machines will not see the demise of the knowledge worker rather, this increasing complexity will demand supply chain managers to expand their problem solving skills."

We are even organising supplier's shop floor to increase their efficiency and emphasizing on the importance of neat and orderly workplace. We are also helping them in identifying and minimising the common source of errors. We also aim at training supplier's workforce to increase their efficiency.

In continuation of the above questions, creating a 'Make in India' brand will need consistency and excellence of manufacturing as well as engineering across the supply chain ecosystem. What are the key challenges in achieving this and how can companies overcome these challenges?

I think India still lags behind the western world in most of the manufacturing areas but we have competencies and young talent which can create wonders for this country. We just need to learn from the mistakes of western world and adopt best technologies to change this situation.

Indian industries should insist on superior technologies to improve product quality and consistency in performance. We need to focus on value addition than being cost centric about technology.

Make in India has a lot of potential to enhance manufacturing sector and I think this Government is doing a sincere effort and trying to explore employment opportunities for our youth population. Looking at our abundant youth population we will remain young country for next 2-3 decades unlike other western countries and China who are aging rapidly and world will depend a lot on us. Therefore, I think Make in India needs to continue with the same thrust.

R&D restoration: We need to make huge investments in R&D to compete against global industries. Indian industries should also collaborate with government organisations like Council of Scientific and Industrial Research (CSIR) for robust R&D.

While it is still at very early stages in India, Industry 4.0 is inevitable if we are to compete and succeed at the global arena. How should companies re-align their supply chain strategies to be ready for Industry 4.0?

Industry 4.0 will create the smart Factory with technologies like Internet of Things (IoT) and the Internet of Services (IoS). Four key aspects will impact the supply chain:

1. *Smart factories* – Automated and flexible manufacturing processes that are integrated with customers in support of product lifecycle changes will impact current plant locations & layouts
2. *Internet of Services* – Connected production facilities across geographies and company boundaries to create virtual production capabilities will create new business models and disrupt current supply chain designs.
3. *Big Data & analytics* – Capitalising on big data and predictive analytics – to drive flexibility at the process level, not just production lines or factories – will put more pressure on organisations to use production data to its fullest.
4. *Talent scarcity* - The rise of smart machines will not see the demise of the knowledge worker rather, this increasing complexity will demand supply chain managers to expand their problem solving skills.

What should companies focus on for the same?

Companies need to re-align their supply chain strategies to be ready for Industry 4.0 and needs to focus on following thing:

1. *Supplier management* – The dynamic flexibility & re-configurability of supply networks that Industry 4.0 promises will require re-evaluating SLA for both upstream & downstream in the value chain.
2. *Supply chain visibility* – Supply chain needs to be transparent & nimble to adapt quickly with both scheduled & un-scheduled scenarios, which will in turn increase asset utilization & reduce risks.
3. *Lead-time & Demand planning* – Fluctuating demand patterns will need to be optimized in shorter lead-time and balance with inventories & specific plant utilization. Demand system will be driven by signal of Mass Customization and will require IT integration both horizontally & vertically.
4. *Product Lifecycles* – Product lifecycle will become shorter and hence development time as well. New technology products and Supply chain speed to execution will be key differentiator between early movers and laggards.

Q. Today, there is considerable awareness about going green and reducing carbon footprint. However, one aspect that companies might be overlooking is the energy spent in the various links of the supply chain. How can companies manage their supply chains energy efficiently to reduce their carbon footprints?

We have taken several steps in going green to reduce our carbon footprints and have achieved the benefits.

Out- bound Logistics: We are taking multiple steps to reduce number of trips or mileage, which will lead to less emissions. We are also working on higher utilization of truck space, movements, and optimizing pick-up points thru GPS tracked enablement. For long routes we tied up with TVS Logistics to do consolidation.

Packaging: Expendable packagings are replaced with returnable packaging solutions reducing the waste. This year we plan to achieve at least 20 percent increase in returnable/ reusable packaging across the plants.

Building/ Plants: Our all new machine procurement and building/plants are constructed considering electricity consumption in mind. At our new Viman Nagar, Pune office we have used highly efficient electric solutions, building materials, and optimized space which will help us reduce carbon.

Procurement Processes: We have changed our PO from paper to digital in SAP. It has eliminated printing of over 1 Lac copies and approximately 5,000 couriers. This makes us more efficient and environmental friendly.

Alternate Materials: Our category team including Consumables continue to explore and implement solutions which are more environmental friendly and can reduce the carbon footprint. This year we have taken three projects and currently under trial.

All about **leadership** and **management!**

The Plant Manager must work on the People Culture by focusing on competence management in all areas of work and also on diversity, says **Rajesh Khosla,** Plant Head – Manesar, Continental Automotive Components India

By Niranjan Mudholkar

The Plant Head's job is possibly one of the most challenging jobs in the manufacturing sector. It is where the board room meets the shopfloor! And when the market is going through a tough time, the job becomes tougher. It's true that the automotive industry has started to come back on track with the last two quarters clocking good numbers. But let us not forget that the time prior to that (many, many months, in fact) was really a tough one. And Rajesh Khosla, the Location Head & Plant Manager with Continental Automotive India's Manesar plant, surely knows how to deal with challenges. With the volatility in the Indian automotive market, his key challenge has been to keep costs optimal despite fluctuating sales. "We have witnessed a surge in demand for some platforms which demanded that we boost our capacities in a very short time. We have cost management programs to dive deep into projects for areas of opportunity for cost avoidance and reduction," he shares.

> "A collaborative approach works best in my opinion with Centralized Functions. Plant Managers need to actively collaborate in the networks and communities of these functions to support the continuous improvement of standards."

Another big challenge in the last year has been the drive to implement standards and to live by them. "It has been a very eventful and satisfying journey so far in terms of the evolution of 5S in the plant. We introduced a drive for 5S in all areas of the plant. A strong focus on quality and the goal to achieve top market position are also strategic areas which can be achieved

About the Plant Head

Rajesh Khosla has over 23 years of experience across leading automotive companies. He is currently the Location Head & Plant Manager with Continental Automotive India's Manesar plant, in Gurgaon. Prior to his joining Continental Automotive in 2005, Rajesh was the Head of Manufacturing & Manufacturing Engineering Operations at Delphi Automotive, where he was responsible for the LEAN Manufacturing processes.

A mechanical engineer by qualification and an alumnus of Thapar Institute Patiala, Rajesh is actively involved in operations activities for defining and implementing plant strategy, managing operational performance, quality and costs. Rajesh is focused on implementing standards for processes, tools & technologies and on promoting cultural development.

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Plant Info

Name: **Continental Automotive India's Manesar plant**
Date when manufacturing started: **January 2005**
Total land area: **7875 sq m.**
Key products manufactured: **Electronic clusters for two and four wheelers, sensors for Powertrain & Chassis.**
Number of employees: **450 (approximately)**
Catering to: **Both exports and domestic markets**
Key customers: **All leading international and domestic OEMs are the plant's customers.**

by initiatives like 5S, Read Across and Technical Cleanliness," Khosla adds.

Qualities for success

And what qualities must Plant Manager possess to be successful in today's world? "The most important quality or capability in my opinion is leadership and management," says Khosla. He believes that a plant manager must be a good communicator. He / she, as the local representative, should be able to effectively transfer the parent organisation's policies/ strategies/ messages to the people and augment the image and influence of the parent company. He / she must also be a strategist, always focusing on future strategy in terms of Cost, Quality, People Culture. "The most important stakeholders for a plant manager are the employees. The Plant Manager must work on the People Culture by focusing on competence management in all areas of work and also on diversity," Khosla adds.

Collaborative approach

Today's manufacturing plants are all about centralisation of functional areas such as IT, procurement, warehousing, and even HR and accounting. In this scenario, how is the role of the 'Plant Manager' evolving? Khosla believes that

"A strong focus on quality and the goal to achieve top market position are also strategic areas which can be achieved by initiatives like 5S, Read Across and Technical Cleanliness."

Plant Managers need to evolve with the changing times. "A collaborative approach works best in my opinion with Centralized Functions. Plant Managers need to actively collaborate in the networks and communities of these functions to support the continuous improvement of standards. A plant manager has the responsibility of all plant specific topics (e.g. legal requirements or employee related topics, union or government related matters as well). Collaboration is also a form of Leadership," he says.

Reducing costs

While the market has started turning positively, it still remains very price sensitive. In fact, there is an increasing pressure on tier 1 manufacturers to keep their prices competitive. How is

Plant's remarkable feature

"If I had to highlight one standout feature in my plant, it would be Leader Standard Work. This is an important drive under our strategic focus area of building a "Great People Culture". From team leaders to supervisors, managers to myself - we have all documented our daily, weekly, monthly routines. These form our working guidelines. Today every responsible employee knows what his or her daily routine is, and we perform a Gemba (workplace walkthrough) to assess the effectiveness. While initially this has been rolled out in Production areas only, over the next two years it will cover Administration areas as well."

Rajesh Khosla

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Our manufacturing deals extensively with component suppliers and plastic suppliers. The supplier base available locally needs to evolve in terms of sensitization to product quality and sustainability of specifications. This is a challenge today, but we are working with our value chain partners to help them build this capability. To a large extent, our tooling requirements are met by our local supplier base and here we see a steady improvement in the capabilities of the suppliers.

Continental's Manesar plant reducing costs at the shopfloor level? "As mentioned earlier, we conduct monthly reviews of cost reduction programs. All functions prepare project charters for the projects they would be working on for reducing costs in their fields. Before commencement of a new project we conduct Lean concept workshops," Khosla says. He adds that labour productivity is a continuous process, whereby Production, Industrial Engineering and Continental Business Systems teams come together to identify, and control waste.

Supply chain partners

How does Khosla perceive the role of his supply chain partners? What are his expectations from them? "Our supply chain partners are an integral part of the value we create. In fact, many of our initiatives are extended to our supply chain partners so as to have a robust value chain. My expectations from our supply chain partners are that they share our vision and work together with us to achieve our goals. A continuous focus on quality is imperative to our success."

Safety first

"Safety is our overriding priority," Khosla says. "This is not just a statement but our plant lives and breathes this principle. We have had zero accidents in the last three years. We comply with all safety regulations and fare very well in safety audits carried out by the corporation as well as our customers," he adds. At Continental's Manesar plant, regular safety drills are carried out and all new lines set up in our plant undergo a mandatory ESH audit.

Quality management

Quality is what separates the best from the good. So what is the Manesar plant doing to build quality management within the manufacturing system? "Quality First is Continental's mantra and every employee in our plant, I believe, tries to emulate it. 5S implementation, Read Across and Technical Cleanliness are the strategic areas our plant is working on to focus on quality in order to achieve top market position. Quality is everybody's business. Daily Gemba walkthroughs are carried out and employees are encouraged to note their observations and correct them. Quality is a top down approach and it my responsibility to drive this," he shares.

"The fluctuation rate for our workmen is almost zero and this is possible by sharing with them our goals, targets and engaging them in our daily practices on the shopfloor. We also chart roadmaps for the workmen to grow and fulfil their ambitions in the workplace."

Going green

Continental's Manesar plant started its 'Green Plant' journey in 2015. This was initiated with the swapping of normal lights with LED lights in the entire plant. "We have now introduced Variable Frequency Drives for our facility equipment. We are also working on renewable energy and there is a boost from the Indian Government on this aspect. The plant has a strategy in place to achieve "Green Label Certification" in the next two years .We are committed towards the betterment of our environment and supply environment friendly products to our customers," shares Khosla.

Attracting and retaining skilled workers has been a major challenge for Indian manufacturing. How has Continental's Manesar plant been dealing with this issue? Khosla believes that automotive manufacturing has changed rapidly during the last five years and disruptive manufacturing will be the norm for the future. Attracting and retaining talent will be a challenge for all players in the industry. "We focus on "on-the-job training" for our blue collared employees. As I mentioned, Leader Standard Work is an important strategic area under People Culture whereby we encourage our workmen to follow standards (like Jidoka, TPM, 5S, policy, culture). The fluctuation rate for our workmen is almost zero and this is possible by sharing with them our goals, targets and engaging them in our daily practices on the shopfloor. We also chart roadmaps for the workmen to grow and fulfil their ambitions in the workplace."

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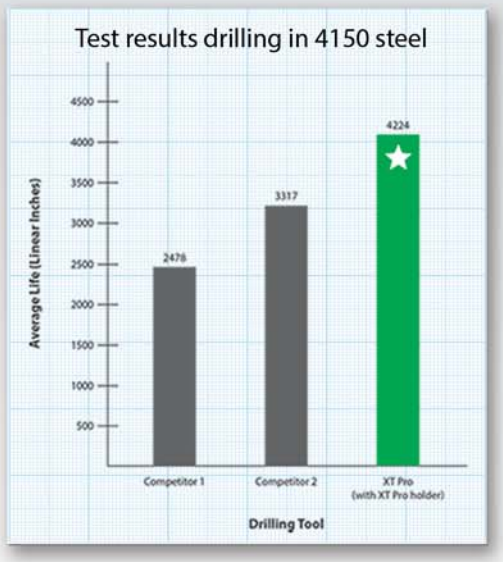

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Using the 'cluster approach'

Pankaj V. Abhyankar, Associate Vice President & Head – Commercial, Godrej & Boyce Mfg. Co. Ltd. shares how his company is leveraging on a series of partnership programs with suppliers to upgrade the quality on the lines of lean thinking and business excellence model

By Niranjan Mudholkar

Q. Efficient supply chain management (SCM) is critical for the success of a manufacturing organisation. What measures is your organisation taking to ensure that your SCM strategy is in alignment with your overall business goals?

We have a central commercial organisation that drives consolidation for logistics and optimises order processing and logistics execution, common procurement management for imports to gain on volume-related benefits, a TOC (Theory of constraints) model for business - GFA (guaranteed for availability)/ COE (complete order execution) initiatives for products and spares.

The location of our manufacturing units and evaluation of new manufacturing sites include logistics perspective. We have a central warehouse and mother hubs. The supplier base/ supplier clusters leverage JIT and inbound logistics cost; the company has an IT backbone with ERP distribution model for Supply Chain Management for all verticals. We use large body containers for movement of voluminous products and judicious use of railways for far-flung eastern locations.

Q. Having the right QA processes and implementing them for supply chain partners (vendors) is extremely important for manufacturing companies. What are you doing in this regard?

We have a series of partnership programs with our suppliers using the "cluster approach" to upgrade the quality on the lines of lean thinking and business excellence model. As part of the program, the set of suppliers go through a formal joint improvement learning and executing process supported by supplier improvement teams working jointly with vendors as part of the cluster programme. We have a system where vendor assessment and performance ratings are tracked and communicated and capable vendors acquire the ship-to-line status through self-certification of quality. Vendors performing well on the scores are recognized and given larger share of business. At Godrej & Boyce, we have also initiated vendor conference and Vendor awards, quality audit/inspection at vendor's end for critical shipments and B2B warranty system for all OE components.

"We have a system where vendor assessment and performance ratings are tracked and communicated and capable vendors acquire the ship-to-line status through self-certification of quality."

"With the data analytics tools, the process capabilities and cycle time data will be more accurate to estimate delivery timelines and hence make more accurate estimates for order fulfilment. This can be leveraged for better planning and gain on efficiencies across the supply chain."

Q. In continuation of the above question, creating a 'Make in India' brand will need consistency and excellence of manufacturing as well as engineering across the supply chain ecosystem. What are the key challenges in achieving this and how can companies overcome these challenges?

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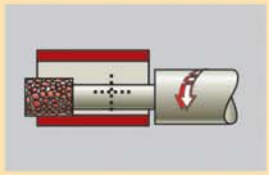

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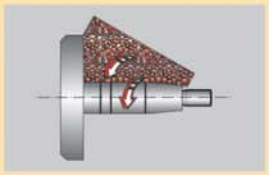

AWH-1500 CNC
LONG SHAFT GRINDER

AWH-2000 CNC
HEAVY DUTY GRINDER

SWH-400 CNC
AUTO LOADING

Surface Grinding

SG-106 CNC
CREEP FEED GRINDER

SGR-60
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SG-63
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TD36
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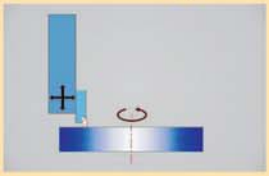
A42/60

Vertical Turning Lathe



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The major challenge in achieving this is the many clearances required for starting and maintaining businesses considering the volumes are still low scale. In addition the infrastructure required to prosper like roads, railways, consistent and stable power supply, progressive labour laws, skilled labour availability are yet significant challenges.

The companies can leverage CII bodies and representation for single window clearance. Partnership with Government to create an eco system which helps the industries to grow and benefit the consumer's is very important.

Q. While it is still at very early stages in India, Industry 4.0 is inevitable if we are to compete and succeed at the global arena. How should companies re-align their supply chain strategies to be ready for Industry 4.0?

Companies can re-align their supply chain strategies by automating their factories such as sensor based triggers for VMI for vendors, automated dispatches, process automation for order booking and execution, maps for locations leading to better planning, using GPS, RFID tags on products and seamless order flow and execution. With the data analytics tools, the process capabilities and cycle time data will be more accurate to estimate delivery timelines and hence make more accurate estimates for order fulfilment. This can be leveraged for better planning and gain on efficiencies across the supply chain.

Q. Today, there is considerable awareness about going green and reducing carbon footprint. However, one aspect that companies might be overlooking is the energy spent in the various links of the supply chain. How can companies manage their supply chains energy efficiently to reduce their carbon footprints?

Going Green is the need of the hour and at Godrej & Boyce we are every bit of concerned on being sustainable. Companies can manage their supply chains energy efficiently by use of railways, CNG fuel for secondary dispatches, use of large body vehicles, multi axle vehicles etc.

Another important aspect is power savings through natural lighting and turbo ventilators inside warehouse, green building warehouse construction, water harvesting, improve TLF utilization and network realignment.

Companies should regularly measure and report against Scope-3 of GHG emissions, measure transporters through rating system in their green conformance, consolidation across divisions. There should be strict rules at warehouse and docking points on no vehicle idling.

"Companies should regularly measure and report against Scope-3 of GHG emissions, measure transporters through rating system in their green conformance, consolidation across divisions. There should be strict rules at warehouse and docking points on no vehicle idling."

Impact of GST & way ahead

GST will enable reduction in stocking points – both on size and quantity fronts. This will further allow the setting up of large zonal hubs and encourage investments into big ultra-modern warehouses. It will allow direct dispatch to trade partners from manufacturing points and central warehouses therefore reducing the overall inventory in the system.

The reduction of transit time and delays at various barriers will improve customer satisfaction levels. Additionally, it will reduce handling/freight cost since we will serve from regional hubs rather than being located in all states to service customers.

Other than offering additional employment avenues, the move will also improve vehicle utilization and freight automation. Hence, encouraging new players to enter logistics business since inefficiencies will reduce making it more attractive.

Godrej & Boyce will revamp its supply chain network and further optimise freight costs. Better supply chain can lead to reduction in inventory across projects. Changes in modes of transport will lead to better options of supply. Further investment can be considered for strengthening of warehousing and automation. Multi tier racking will give us benefits of utilization of vertical space in the warehouse, coupled with use of Latest MHEs like BOPT, Stackers, Reach Trucks etc. other areas of investments in warehousing would be on IT, where we propose the Hubs and Mother warehouses would be fully RF connected and use Barcodes, RFID Tags for all our picks and storages. Other areas of investments in equipment's like Dock Levelers, Jib Cranes, would be also done. The move will throw open new opportunities for our Material Handling Equipment (MHE) & Storage Solutions Group (SSG) businesses to acquire new customers and grow. Further, there will be an opportunity to negotiate better with C&F/3PL partners using volume/consolidation approach.

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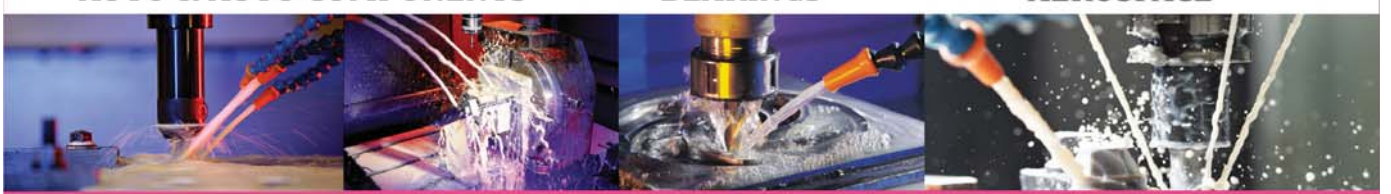

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By Niranjan Mudholkar

There was a certain positive energy that I could feel while entering the Volkswagen India headquarters at Pune (Chakan) recently. Probably, it had to do with the renewed confidence the VW team is experiencing post the launch of the Ameo. Or maybe it is because of the arrival of the festive season. Or perhaps, it is the good monsoon that has blessed almost the entire nation this year. Or it could be that the VW team is all geared up with the Ameo diesel version for the festive season. Well, in most likelihood, it is all of the above. But nevertheless, it did feel good.

Dr. Andreas Lauermann, President & Managing Director, Volkswagen India Pvt. Ltd. has taken charge about 14-15 months back and he's been a very busy man since then. The ups and downs of the market haven't given him much of a breather and yet he comes across with genuine excitement and enthusiasm. We first catch a quick glimpse of him while he is 'judging' the eco-friendly Ganesh makhars (*the decorative temples in which the Ganesh idols are installed at homes during the festival*) made by Volkswagen employees. The makhars on display were made primarily from the scrap from the plant and Dr. Lauermann is assessing them to select a winner. The characteristic German seriousness cannot be missed from his face but you can also see that he is enjoying the creativity while trying to understand the concepts.

Volkswagen India sales figure

Month	2015	2016
July	4,029	4,301
August	4,191	4,447

He selects his winner and then quickly joins us in his office. The VW Corporate Communication team informs me that he has to rush to Mumbai immediately after this interview and so we get on with the job quickly by asking about his journey in India so far. "It has been a very fast journey through this one year. India is really running fast and one year is simply nothing if you are to understand this country and market properly. You need some time to get the knowledge about the country, its behaviour and the culture. So it's been short time but overall it was a good year. Of course, there have been a lot of ups and also downs; downs for which we were not really prepared. But today, we are very optimistic. With the launch of the Ameo, we are really happy and this is running well. The Skoda Rapid GP is also coming out before the festival; so we can be very proud of the achievement in this year," he says and surely the pride shows in his smile.

Throughout his career, Dr. Lauermann has travelled all over the world and has worked in different markets like Germany, Argentina, Portugal and even China. I ask him to draw

Made in India, Made for India!

Riding high on the success of the recently launched Ameo, Volkswagen India is aiming to bring out more India specific products going ahead, says **Dr. Andreas Lauermann,** the Company's President & Managing Director.

a comparison between India and the other global auto markets where he has worked. His answer is quick. "You cannot compare India with other countries. One may feel that it is a little bit similar to the other countries because you are accustomed to certain schemes, behaviours and cultures. And you would think that you have the solution. But when you look at the Indian market and its customers, you realise that it is completely different. It is like no other market in the world. A country like this with such big diversity, it is unique in the world. You will never find a country like this. China is bigger in size but it is a lot more homogenous. Yes, there is a difference between the north and south in China but not like here in India. India is a mix of different cultures, languages and behaviours. And it is a very difficult to understand market for Europeans. But you have to be open and try to understand it. That's what I am doing."

Last couple of months have been relatively better for the overall automotive industry in India including for Volkswagen. So is Dr. Lauermann satisfied with the way things are now shaping up? "Yes," he says emphatically, adding that things are happening the way he and his team had planned. "In fact, even 2015 had a good start for us but we were stopped in between because of the diesel issue. The year 2016 has also started very well. Now, with the launch of the Ameo we have another momentum. This is really helping us. When we look at the sales of the Ameo, it is really fantastic. Ameo is available in the petrol version at present and the diesel version is coming out just before the festive season. We believe the diesel launch will further provide a boost. It will have a better engine with little bit more power. So we have something to offer," he shares.

Update on *Think Blue. Factory.

a. Total achievement till June 2016 from start of programme in 2012 stands at reduction of impact on environment due to manufacturing processes by 23.7%
b. Global target by 2018 was 25%; target specifically for Pune Plant was 21.9% considering we started the programme one year after global start
c. Over achieved results in the several areas. Exact results as follows: energy consumption (28.3% reduction), CO2 emissions (27.8% reduction), water consumption (27.8% reduction), waste generation (24.8% reduction) and VOC emissions (9.6% reduction). These reductions have been measured per car.

At the Volkswagen Pune plant

The Ameo has certainly brightened up things for VW and Dr. Lauermann believes that things will only get better from here on. The car is indeed special for Volkswagen India as it is the first car that the Company has built specially for this market. It is 'made in India' and 'made for India'. "The segment in which Ameo competes doesn't exist anywhere in the world except in India. And in India, unfortunately, we were the last one to enter it. But this is also a learning curve. We are fairly young in India as a company. And it is difficult to understand what is necessary for this market, in a very short span. It takes a little bit of time to develop the right solution. I believe that we are on the right track now that we have a better understanding of the market. We now have a car which is more fitting. We are offering the latest features at an aggressive price. There is absolutely no compromise on quality and safety; it is just like any other Volkswagen product when it comes to quality. This is a good mixture that we can offer to our customers. It should be a success and for the moment it looks like," he says with confidence.

So will we see more such 'Made for India' and 'Made in India' products from VW going ahead? Dr. Lauermann doesn't give a quick 'yes' or 'no' reply. His response is much more studied this time. "We are making a lot of investigations on how we can continue in India because when you look at the total

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market then obviously we are not the biggest one. This is not Volkswagen like and we want to have a bigger market share and be more successful. Therefore we have to investigate in the ways that we are doing business. Our overall portfolio is not so bad but we have to develop it further and we are looking at it. There are discussions happening with some partners and we are open to ideas. We are exploring the possibilities right now so it is difficult to share any concrete details. But yes, our aim is to bring out more India specific products. That, we will definitely do."

Volkswagen India is doing fairly well year on year when it comes to exports. And Dr. Lauermann is quite happy about it. "We are very successful with our exports because we have created it as our second leg. The Indian market is a little bit volatile so the Company has kind of de-risked its business by also focussing on the exports market. "In total, we are fairly successful when it comes to exports. Mexico is our biggest exports market. We also export to Argentina, which also gives us good volumes. These are the markets where you also have to focus on quality. You can be successful in those markets only if you are able to deliver quality. And I am happy that our plant is able to do this. At the moment our exports to domestic sales ratio is 55:45. Of course, we want it to be more balanced and with the Ameo we think we will be able to achieve that. While we are happy with the way our exports business is growing, we would surely want to increase our domestic sales and that is our main target."

Our overall portfolio is not so bad but we have to develop it further and we are looking at it. Our aim is to bring out more India specific products. That, we will definitely do."

The VW Group has recently announced the setting up of its IT delivery and support centre in Pune, Volkswagen IT Services India with an investment of Euro 3 million. Dr. Lauermann calls it an important step and Volkswagen's contribution to 'Make in India'. "Having an independent IT center allows us at the plant to focus on making and selling cars. Of course, the IT center also supports us with its activities but it is global in nature as it is also catering to other Volkswagen markets globally. Having this centre in Pune makes sense because Pune is also an IT hub and there is immense talent available in the region," he shares.

Then we turn to the controversy that rocked Volkswagen globally, the emission issue. Obviously, like everywhere else, it also impacted the India operations. Dr. Lauermann told us how much. "As I mentioned earlier, we started pretty well in 2015 and we were doing quite good till this issue struck us in September. As a result sales started dropping as much as 30 percent. Thankfully, we were able to recover from it to some extent with the final number at three percent in terms of the loss. This year, of course, we are and will be doing much better. We are winning back the trust of the customers also," he says with certain confidence.

Then I ask him about another emission related issue – although entirely different from the earlier one – about the jump that the Indian Government is planning from Bharat Stage (BS) IV to Bharat Stage (BS) VI by 2020 by skipping one stage completely. He says that as a Company, Volkswagen is well-prepared for this change because it has the cars. "Some people also ask us as to why are we downsizing our engines to BS IV. The reason is simple: because the fuel is not available. So the availability of BS VI fuel will also be a big challenge. We will need BS VI fuel at least one year before we bring in the cars but the problem with the oil companies is that they cannot bring the fuel so quickly. Well, all manufacturers are committed to the shift to BS VI and also to the timeline but under certain conditions.

"Of course, the discussion related to taxation in this context is still open therefore it will not be easy. We need a correct and reliable roadmap from the government in this regard that will assure us that we can invest because we need security to make investments," he says, adding that he is overall satisfied with the way the government is making efforts to bring reforms. "There is a lot of movement and the biggest step is the GST. It is a step forward as now India is a common market. There will be a lot of trouble in the beginning for sure but this is a big step ahead

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In 2015, the production capacity at the Volkswagen Pune plant was 130,000 in two-shifts with actual production at 123,456 cars. In 2016, a third shift has been added and the full year capacity with three shifts can go up to 200,000 cars.

in the right direction. The central Government is trying a lot to change the total circumstances for the industry in a positive way. They recognise that we need more growth. A GDP of 7 percent is nice but when you have to overcome the situation of poverty then you need more or less about 10 percent to 12 percent. And it is possible. Thankfully, we have also had a good monsoon this year so it will also help," he says.

Dr. Lauermann is also happy with the way the Maharashtra Government and the CM are actively taking steps to bring ease of doing business in the region. "But there is a lot of work to do. It's a long way but they are on the right way," he adds.

Volkswagen's 'Think Blue Factory' initiative launched in 2012 for manufacturing plants across the globe has achieved quite good results at the Pune plant in 2015 across different parameters. Dr. Lauermann is delighted about it. "It is the Volkswagen Group's global initiative in terms of its responsibility towards the environment. In India, we are actually ahead of the programme. We have reached the target of reducing 25 percent in power, waste and VOC little earlier then the schedule. But this does not mean that we are stopping the programme. We understand that this is our responsibility and commitment to the environment. So we will continue on our way and also find some new ideas."

So how's been Dr. Lauermann personal experience in India? He speaks with his signature smile. "I am here very optimistically like I have done in all the other countries. When I came here I thought it will be easy with my experience. But it was not. Of course, if you have an open mind then you can really experience a lot in this country. Unfortunately, I haven't had much time but I have travelled a little bit. This country is really very interesting. Going ahead, I will see more of India and try to understand it a little more. While I do not understand the local languages, I do make an effort to understand the culture." Like he was doing just before we started the interview – the Ganesh Makhars? "Yes, that was very interesting. There we see a lot of creativity. And this is something that we see all across the country. It's truly fantastic."

And Volkswagen India's long term plans? According Dr. Lauermann, it is very clear. "We have to define our products fitting exactly with this market. This is a huge market and it has the potential to be the biggest automotive market in the world. In our strategy, we need to consider a lot of changes and transformation that are happening right now. There will be big challenges. In Europe and North America we are talking about autonomous cars. This will obviously not be the first solution for India but there will be certain steps coming. We are talking about connectivity. So the business models itself are changing," he says.

Dr. Lauermann also believes that Volkswagen India will also have to take into consideration things like the growth of mobile services and rise of taxi companies like Ola. "Therefore, you have to understand what you are doing. You need the right products but you must prepare yourself for the future. You also need to think how you can create new business ideas here for India. Because they will come for sure. It's not the same development like we have seen in Europe. It will be faster. So you have to be prepared and this we are doing in our strategy as well," he says confidently as he signs off.

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Collaborative **team work**

Sandeep Baxla, Supply Chain – Head, Henkel Adhesives Technologies India Pvt. Ltd., says that for an organisation, both Supply Chain and Manufacturing have common goals.

By Niranjan Mudholkar

Q. What measures is your organisation taking to ensure that your SCM strategy is in alignment with your overall business goals?

For an organisation, both Supply Chain and Manufacturing have common goals. Performance measurement and incentives are determined on common KPIs. This results in collaborative team work which ultimately helps in achieving our overall business goals.

Q. Having the right QA processes and implementing them for supply chain partners (vendors) is extremely important for manufacturing companies. What are you doing in this regard?

We are working with some of our key vendors on self QA certification. This will allow us to directly take in the raw materials into our production floor. Moreover, it is one of the founding members of the Together for Sustainability (TfS) initiative. The purpose of this Initiative is to develop and implement a global audit program to assess and improve sustainability practices within the supply chains of the chemical industry. The objectives of the member companies of TfS are to join forces to create standards for sustainable supply chains, share supplier sustainability assessments and audit findings, raise awareness and initiate continuous improvements, and exchange and promote best practices.

Q. In continuation of the above questions, creating a 'Make in India' brand will need consistency and excellence of manufacturing across the supply chain ecosystem. What are the key challenges in achieving this?

Infrastructure and governance are the two big challenges today. Top level political will and determination is there but at ground level we still face bureaucratic hurdles. GST to a great extent should help in eliminating these hurdles.

Q. How should companies re-align their supply chain strategies to be ready for Industry 4.0?

The fourth Industrial revolution which is Industry 4.0 is already becoming a reality. We have not done enough to keep pace but works are underway to fully comprehend and then jump into this environment.

Q. How can companies manage their supply chains energy efficiently to reduce their carbon footprints?

"We are working with some of our key vendors on self QA certification. This will allow us to directly take in the raw materials into our production floor."

With business activities becoming more global and supply chains more complex, companies need to look beyond the sustainability impact of their own operations. Companies need to understand the environmental and social impacts associated with a product's entire value chain, from raw materials extraction to final consumption and recycling.

As the saying goes, "Every drop makes an ocean." All small Supply Chain endeavors, whether it's being located close to the customers, using rail and waterways network or ensuring full truck loads, it will go a long way in improving our sustainability journey.

Moreover, through the Together for Sustainability (TfS) initiative, Henkel fosters sustainable sourcing. Sustainable sourcing means to incorporate environmental, social and ethical aspects into spending decisions alongside the conventional procurement criteria of price and quality by selecting a supplier or evaluating a supplier relationship. The supplier engagement program of TfS covers the following areas: Management, Environment, Health & Safety, Labor & Human Rights, Ethics and Governance.

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Why, What and How of Training

Training is considered an investment for future of the business. As per their goals, missions and vision different companies have different approach towards it. Know more about various companies' perspective towards training and how do the conduct the same.

By Swati Deshpande

It is the people of the organisation who make or break the company. Therefore, it is extremely important to have right people with right skill sets on board. "People constitute the very core of an enterprise and for an organisation to succeed, its people have to be productive and here is where training plays a pivotal role. It enables them acquire the requisite skills, be it new skills or sharpening existing ones, to get better and better at their workplace," believes George Menezes, Chairperson, Godrej 'Disha', Godrej & Boyce Mfg. Co. Ltd. This also has the salutary effect on the motivation and morale of people. "With the help of right training, employees' confidence level increases and it further leads to benefits such as ability to carry out work assigned in a better manner and willingness to take on more responsibility," mentions Shobha Narayan, CEO, Lift Academy.

Such increased confidence level boosts self-esteem and and naturally increases employees' productivity. "Hence, an enterprise must invest in their people, building their skill and knowledge base as it directly contributes to the development of not only the individual and enterprise but also the community and nation at large," adds Menezes.

Why training?

SANY Heavy Industry has different approach towards training. According to Kundan Naikde, Training in Charge, SANY Heavy Industry Pvt Ltd, "Every employee is either a fresher whose idea about the industry is limited or employees who come from different backgrounds. There are only a handful of employees who have relevant experience, which can be immediately put to work. Well planned and customised training programmes can address employee skill gaps, improve performance, provides consistency to experience and knowledge and also increases employee satisfaction. All these elements put together makes an employee more productive helping an organisation make the most of an employee's potential. With proper training and development programmes an employee becomes a valued asset of the company."

Bridging the skills gap is extremely important. "This is usually done through refresher programmes, which are short duration programmes to upskill an employee. In the design of the programme, we take into account the skills gap in the

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"People constitute the very core of an enterprise and for an organisation to succeed, its people have to be productive and here is where training plays a pivotal role. It enables them acquire the requisite skills, be it new skills or sharpening existing ones, to get better and better at their workplace."

George Menezes, Chairperson, Godrej 'Disha', Godrej & Boyce Mfg. Co. Ltd

"We are also working on the concept of creating Automation Training Channel Partners in order to extend the training facilities. These interventions help in strengthening the technology connect between academia and industry people."

Sameer Gandhi, Managing Director, Omron Automation, India

employees so that through the refresher the gaps are addressed and employees are upskilled," shares Narayan.

Another aspect to the skill gap is adapting new skills to embrace advanced technologies. "The manufacturing sector in India is preparing to compete globally and is rapidly embracing the latest automation technologies. However, to take full advantage of this automation investment, it needs to have the right set of people to design, deploy and maintain this level of automation. Availability of the right skills is a big challenge that the manufacturing & automation industry is facing," expresses Sameer Gandhi, Managing Director, Omron Automation, India. Hence, acquiring new skills and sharpening existing ones is important from employees' as well as organisation's point of view. In achieving this every company has its own programmes and training modules.

JCB has designed multiple programmes for up-skilling. "We believe in regular up skilling and ensuring that equal opportunity for growth is provided to every single employee. Our aim is to enhance their skills and functional competence on key parameters like – Health and Safety, Productivity and Quality. Our commitment to skilling has helped us achieve the goal of 'One Global Quality', which has enabled us to export to over 65 countries," explains Jasmeet Singh, Head-Corporate Communications and External affairs, JCB India Ltd.

What training?

In the matter of undertaking training programmes, each company has its own approach and way. Speaking about his company, Abbas Ali, Talent Manager, Henkel Adhesives Technologies India Pvt. Ltd. says "Our endeavour is to encourage employees towards a journey of lifelong learning and provide them a bouquet of vocational and further education courses using diverse methodologies including on the job training, classroom learning, peer assist and online learning. In addition to developing their potential, we believe training has a direct impact on how engaged the employees feel with Henkel and constantly enhance our competitive edge to deliver more to our customers."

Similarly, SANY Heavy Industry believes

Something noteworthy

JCB's comprehensive skills developed through training programmes have helped young employees progress in their careers, especially Lady Engineers who are making their careers in the traditionally male dominated areas of welding and assembly. "Women in the manufacturing sector are conquering new frontiers with their inclusion on the shop floor to carry out demanding tasks which were previously handled by their male colleagues. Apart from other core areas of manufacturing, welding is one such operation where lady engineers at JCB have excelled. Today we have specialized 'lady welders' who are regularly trained by professionals to ensure their skill set is as per the requirements of the job. Many of these Lady Welders have excelled in their areas of work and making a name for themselves," said Jasmeet Singh, Head- Corporate Communications and External affairs, JCB India Ltd.

that enhancing employee's skills goes a long way in their contribution to the organisation and hence, the company takes steps to do so at regular intervals. "The company has a training facility at its Pune campus for the entire Middle East, Africa and South East Asian countries. Employees from all these locations come to SANY's state-of-the-art training facility and spend time with SANY officials and experienced in-house trainers who help employees understand the DNA of the company along with specific trainings for different departments," explains Naikde.

"Racold Thermo conducts training programmes for improvement in Blue Collared worker performance & efficiency, ensuring work satisfaction, increased productivity, improved quality of service and products, reduced cost and reduction in supervision," Gautam Karkal, HR Head, Racold Thermo.

Sharpening existing skills and acquiring new ones is extremely important from employees' as well as organisation's point of view. In achieving this every company has its own programs and training modules.

How of training?

As per their need and belief, companies have developed their own training programmes e.g. SANY Heavy Industry Pvt Ltd undertakes Repeat Training Sessions. "We believe that the human brain tends to forget details due to overload of information. Keeping that in mind after training completion for all levels in the organisation, we arrange the next level training which is called RPL (Refresher Previous Learning Course)," informs Naikde.

On the other hand, Racold Thermo follows the 70-20-10 principle of On the Job, Network learning & classroom training like many other organisations. "Our manufacturing follows the WCM (Fiat's World Class Manufacturing) as a standard and this comprises of continual improvements in process & the ways of working. This is addressed by continuous education. Our training programmes include Training of Newer Technologies, Targeted Soft skills training, Leadership & Team workshops," says Karkal.

Henkel organises training programmes for employees at various levels. "Talent entry programmes focus on building organisational and job related skills. For middle management the focus changes to development centers, which enable individualised approach to development. Coaching and mentoring is leveraged at more senior levels," states Ali.

Godrej has a multitude of initiatives to impart the relevant skill sets to budding incumbents. "Apart from running a Corporate Training Centre, which organises customised training programmes for employees including newly recruited shop floor workers, be it permanent or temporary, trainees or apprentices, everyone undergoes an Induction Training Programme and all are exposed to Lean Manufacturing concepts like, Kaizen, 5S, TOM, Quality Circle etc.," mentions Menezes.

Going beyond employees

Though employees have major contribution

"With the help of right training, employees' confidence level increases and it further leads to benefits such as ability to carry out work assigned in a better manner and willingness to take on more responsibility,"

Shobha Narayan, CEO, Lift Academy.

"In addition to developing their potential, we believe training has a direct impact on how engaged the employees feel with Henkel and constantly enhance our competitive edge to deliver more to our customers."

Abbas Ali, Talent Manager, Henkel Adhesives Technologies India Pvt. Ltd.

"We believe that the human brain tends to forget details due to overload of information. Keeping that in mind after training completion for all levels in the organisation, we arrange the next level training which is called RPL (Refresher Previous Learning Course)."

Kundan Naikde, Training in Charge, SANY Heavy Industry Pvt Ltd

"Racold Thermo follows the 70-20-10 principle of On the Job, Network learning & classroom training. Our manufacturing follows the WCM as a standard and this comprises of continual improvements in process & the ways of working."

Gautam Karkal, HR Head, Racold Thermo

in the success of a company, other factors such as dealers, channel partners, customers, etc., cannot be neglected. "At SANY, we have two types of training programmes for customers—Customer meet cum training and Customer on-site training. Our product trainers visit the customer site to update them about new features and benefit in our product," averrs Naikde.

Omron has developed dedicated training centres at the company where its customers, employees as well as channel partners are provided with trainings. "Additionally, we've also tied up with renowned industry bodies such as AIA to be a part of all key skill development activities related to the automation domain. We have conducted various seminars and knowledge sharing sessions in conjunction with AIA, keeping the brand neutrality concept alive to nurture skills on particular technologies," shares Gandhi

JCB organises training programmes for its dealers who employ over 4500 service engineers. "There are regular training programmes to ensure that they are abreast with latest technological innovations in our products. JCB has a full-fledged Parts and Training centre at Pune. We also have dealer engineer assessments. We had over 1000 training days in 2015 for 350 different courses," adds Singh.

Though employees have major contribution in the success of a company, other factors such as dealers, channel partners, customers, etc., cannot be neglected

Youth—Tomorrow's employees

Strengthening academia-industry partnership seems be another important factor for companies for the mere reason of today's students are employees of tomorrow. "Therefore, we reach out to external youth through our employability initiative, called Disha, wherein we have taken an ambitious growth target of skilling two lac Indian youth in vocational skills. Here, we have collaborated with various vocational training providers in the country and helped them set out the infrastructure, frame the curriculum and train the trainers, conduct assessment and certification and eventually, assist in the placement wherever possible, through our network of associates and service providers," discloses Menezes.

JCB also has been at the forefront with its skilling initiatives. "We train and develop talent across India to promote entrepreneurship and employability. Many of our initiatives are aligned with the government's initiative to build the right skill across industries. The company has 15 Operator Training Centres across India. Till date, we have trained around 25,000 operators who are now trained operators; many have also become proud owners of our machines," Singh adds. In addition to this, JCB also has an in-house welding training school at Jaipur where a 16 week detailed training program is organised for fresh diploma graduates. Omron also conducts training programs for students and faculty at various engineering institutes. "We are working on the concept of creating Automation Training Channel Partners in order to extend the training facilities. These interventions help in strengthening the technology connect between academia and industry people. Another notable initiative is our one-of-its kind Automation Centre at Mumbai, which showcases our complete technology prowess and also act as a learning centre for all key stakeholders in the automation industry," informs Gandhi.

Conclusion

Undertaking training is just not enough. "Clarity of ownership on talent development and timely reviews are as critical as training infrastructure to continually enhance employee skills. We, at Henkel, encourage development in a well-rounded manner leveraging a mix of e-learning, on the job learning and classroom training to achieve this. Regular development conversations are encouraged and documented. Development materials are constantly reviewed to assure contemporary relevance. In conclusion, we have adopted an integrated approach on development involving product technology, individual competencies and soft skills," concludes Ali.

Benchmarking the best practices

Vineet Baid, CEO, Falcon Autotech Pvt. Ltd., says his organisation is running various initiatives to improve upon the three pillars of SCM, namely velocity, accuracy and costs.

Q. What measures is your organisation taking to ensure that your SCM strategy is in alignment with your business goals?

We are running various initiatives to improve upon the three pillars of SCM, namely velocity, accuracy and costs. Some of the core themes behind these various initiatives include data driven decision making, early warning systems, focus on collaboration, building redundancies and fall back mechanisms, minimising ambiguity in processes and decision making.

"Unless we start becoming crazy about quality, performance and consistency, like the Germans or the Japanese, everything else is futile."

Q. Having the right QA processes and implementing them for supply chain partners (vendors) is extremely important for manufacturing companies. What are you doing in this regard?

Falcon builds and implements mission-critical solutions, hence, it is imperative for us to be spot-on with respect to quality. Our solutions undergo extensive QA processes at various stages, the parameters of which have been defined internally to suit the functional expectations from the machine. The entire process is supported by powerful software, with the core idea to collect as much data as possible in a structured manner and then run advanced analytics to take decisions. Last but not the least, each solution undergoes extensive functional testing at our own site, covering multiple scenarios and boundary cases before the solution is shipped out to the customers.

Q. Creating a 'Make in India' brand will need consistency and excellence of manufacturing as well as engineering across the supply chain ecosystem. What are the key challenges in achieving this?

It's absolutely correct that the government can only create a push towards investments in manufacturing in India. For this momentum to sustain, we will have to perform together as a country. I see only one challenge which we need to overcome – our mindsets needs to evolve. Unless we start becoming crazy about quality, performance and consistency, like the Germans or the Japanese, everything else is futile. I find all other factors on our side – skills, understanding, hard work, adapting, language etc. There is no direct formula for changing mindsets, hence requiring multiple interventions in organisations both, top-down and bottom-up. Once this happens though, everything else in terms of process, systems, controls etc will follow.

Q. How should companies re-align their supply chain to be ready for Industry 4.0?

Industry 4.0 is the latest wave in the field of industrial revolution and with the advent of advanced technologies and data analysis, supply chain players are required to deploy the same, in order to remain relevant and competitive in the present world. Opening doors to cloud-computing, big data and data analytics and social networking, along with revamping operational strategies, are some of the changes called for from companies. Since the customers are evolving in their needs and expectations, companies need to be more agile, whilst providing better visibility efficiently.

Q. How can companies manage their supply chains energy efficiently to reduce their carbon footprints?

Making the supply chain processes efficient help companies not only save the carbon footprints but also save finances. Hence, the top level leadership needs to be part of the paradigm shift, driving the company towards energy conservation and judicial utilization. Besides, overhauling the procurement process, perhaps getting into sector based collaborations with suppliers delivering higher carbon reductions would be of further value. Lastly, benchmarking the best practices and process capability analysis to enhance energy efficiency and competitiveness, following up with regular audits and making processes transparent and standardised, would further reinstate energy efficiencies.

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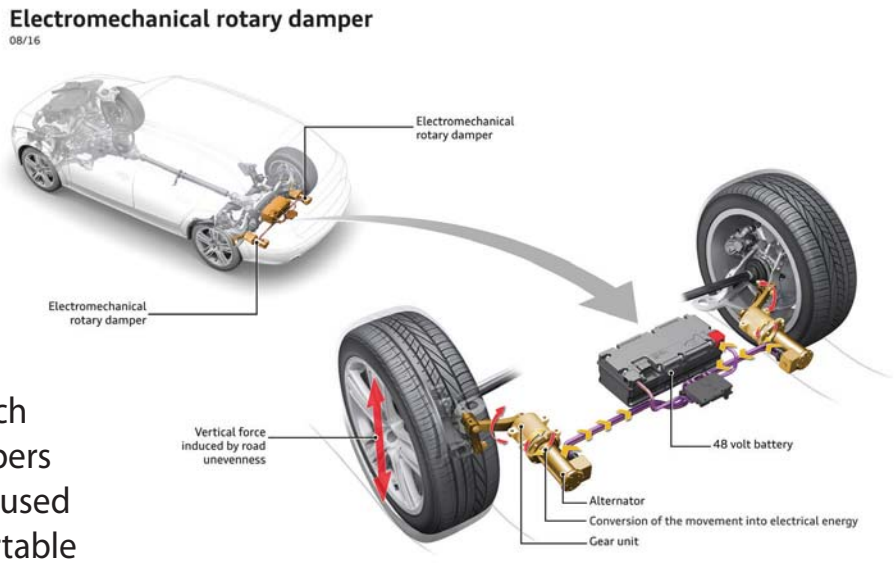
Future shock, now!

A German automotive giant is working on a prototype in which electromechanical rotary dampers replace the hydraulic dampers used today for an even more comfortable ride.



In the mobility of the future, the recuperation of energy plays an increasingly important role, including in a car's suspension. Audi is working on a prototype called "eROT," in which electromechanical rotary dampers replace the hydraulic dampers used today for an even more comfortable ride.

The principle behind eROT is easily explained: "Every pothole, every bump, every curve induces kinetic energy in the car. Today's dampers absorb this energy, which is lost in the form of heat," said Dr.-Ing. Stefan Knirsch, Board Member for Technical Development at AUDI AG. "With the new electromechanical damper system in the 48-volt electrical system, we put this energy to use. It also presents us and our customers with entirely new possibilities for adjusting the suspension."

The eROT system responds quickly and with minimal inertia. As an actively controlled suspension, it adapts ideally to irregularities in the road surface and the driver's driving style. A damper characteristic that is virtually freely definable via software increases the functional scope. It eliminates the mutual dependence of the rebound and compression strokes that limits conventional hydraulic dampers. With eROT, Audi configures the compression stroke to be comfortably soft without compromising the taut damping of the rebound stroke. Another advantage of the new damper system is its geometry. The horizontally arranged electric motors in the rear axle area replace the upright telescopic shock absorbers, which allows for additional space in the luggage compartment.

The eROT system enables a second function besides the freely programmable damper characteristic: It can convert the kinetic energy during compression and rebound into electricity. To do this, a lever arm absorbs the motion of the wheel carrier. The lever arm transmits this force via a series of gears to an electric motor, which converts it into electricity. The recuperation output is 100 to 150 watts on average during testing on German roads – from 3 watts on a freshly paved freeway to 613 watts on a rough secondary road. Under customer driving conditions, this corresponds to a CO2 savings of up to three grams per kilometer (4.8 g/mi).

> "Every pothole, every bump, every curve induces kinetic energy in the car. Today's dampers absorb this energy, which is lost in the form of heat. We put this energy to use. It also presents us and our customers with entirely new possibilities for adjusting the suspension."
>
> **Dr.-Ing. Stefan Knirsch,** Board Member for Technical Development at AUDI AG.

What does it do?

- Horizontally arranged electric motors replace telescopic shock absorbers
- Future system enables energy recuperation in the suspension
- Electromechanical rotary dampers increase ride comfort

The new eROT technology is based on a high-output 48-volt electrical system. As currently configured, its lithium-ion battery offers an energy capacity of 0.5 kilowatt hours and peak output of 13 kilowatts. A DC converter connects the 48-volt electrical subsystem to the 12-volt primary electrical system, which includes a high-efficiency, enhanced output generator.

Initial test results for the eROT technology are promising, thus its use in future Audi production models is certainly plausible. A prerequisite for this is the 48-volt electrical system, which is a central component of Audi's electrification strategy. In the next version planned for 2017, the 48-volt system will serve as the primary electrical system in a new Audi model and feed a high-performance mild hybrid drive. It will offer potential fuel savings of up to 0.7 liters per 100 kilometers.

Source: Audi

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Expanding **development activities**

Bosch has recently expanded its Adugodi development center with an investment of Rs. 350 crore.

Bosch has recently inaugurated the first phase of expansion of its development center in Adugodi, Bengaluru. The leading global supplier of technology and services started revamping its oldest facility in India into a technology and development center in 2014. Since then, the company has invested around Rs 350 crore (around EUR47 million). "Bosch sees immense growth potential in India. The inauguration underscores our commitment to the country," said, Peter Tyroller, member of the board of management of the Bosch Group responsible for the region Asia Pacific, during the inauguration. The envisioned development of the facility will take place in several phases. "For the second phase of expansion, we will further invest in the coming years to develop Bosch Adugodi into a state-of-the-art R&D facility," he commented further. In 2016, Bosch India will invest around Rs1,170 crore.

> "The two newly inaugurated buildings in Adugodi have state-of-the-art laboratory facilities and accommodates over 3,000 associates. Adugodi will house the majority of the local development – including R&D centers of Bosch Limited, Robert Bosch Engineering and Business Solutions and Bosch Home Appliances."
>
> **Dr. Steffen Berns,**
> MD of Bosch Limited and President Bosch Group India.

India: an important hub

"The two newly inaugurated buildings in Adugodi have state-of-the-art laboratory facilities and accommodates over 3,000 associates. Adugodi will house the majority of the local development – including R&D centers of Bosch Limited, Robert Bosch Engineering and Business Solutions and Bosch Home Appliances," mentioned Dr. Steffen Berns, MD of Bosch Limited and President Bosch Group India.

Engineers at the facility work on key topics such as driver assistance and passive safety, active safety, anti-lock braking system (ABS) and electronic stability program (ESP), and hardware development. Other areas of focus include big data and software solutions for the Internet of Things (IoT).

Bosch started its manufacturing operations in India at the Adugodi facility in 1953 – a time when industrialisation in the country was still at an early phase. Since then the company has continuously been expanding its operations in India, while the need for local development was increasing. Following a strong localization strategy, Bosch focuses on offering products and solutions that are tailored to the needs of the Indian market, including local development. From bringing the common rail systems to India, Bosch is now offering two-wheeler engine management systems developed in the country. "Bosch has been making conscious efforts to offer superior products that are environmentally friendly, cost-effective and above all possess the ability to connect with the youth," said Dr. Berns.

Today, India is home to the Bosch Group's largest development center outside of Germany. At the locations in Adugodi, Bangalore and in Coimbatore, the company employs over 14,000 research and development associates. This makes India an important hub for Bosch's global R&D network. This role will further increase with the expansion of the Adugodi facility – as increasingly Bosch's leading edge in technology is the result of a "local for global" exchange of findings and experience.

Inspiring working conditions for more innovation and creativity

Beyond having development and testing labs, the new facilities are designed to offer associates an inspiring working environment. The new facility has an open work space, more discussion rooms and a collaborative work space on each floor. "Today's youth thrive in a fun, dynamic and transparent work environment. Our current facility has incorporated such elements. We are providing our associates with resource and facilities that will aid them in improving the quality of innovation," said Vijay Ratnaparkhe, MD, Robert Bosch Engineering and Business Solutions. In August 2015, Bosch had relocated part of its manufacturing operations from Adugodi to Bidadi. Spread over 97 acres of land this state-of-the-art facility produces Diesel products.

The **Co-bots** are here!

A Danish robot manufacturer that pioneered collaborative robots discussed the future of co-bots in India and accessibility to such technology that could bring about a revolution in various industries in Mumbai recently

UR3

Co-bots are designed to work with humans and assist them with a variety of tasks which help to automate and streamline repetitive and potentially unsafe processes thus, ensuring safe work environment while increasing productivity and efficiency. With the small and medium-sized enterprises (SMEs) set to grow, they are eager to adopt this technology.

To ensure the success and adaptability of co-bots, a study was conducted by MIT researchers at a BMW factory, where it was seen and analyzed that teams made of humans and robots collaborating efficiently can be around 85 percent more productive than teams made of either humans or robots alone. Also, the cooperative process reduced human idle time by virtue of its pace-setting ability.

Since 2003 Universal Robots has grown over 13 years from introducing the idea of creating a light robot that would be user friendly for the industries. The company has seen the evolution of robot arms from the UR3, UR5 and UR10, which are built for respective payloads of 3kg, 5kg and 10kg.

The global collaborative robots market was valued at $128 Million in 2014 and is likely to reach $ 1 Billion by 2019, growing at a CAGR of 50.88 percent. 80 percent of the UR robots worldwide operate with no safety guarding (after risk assessment) right beside human operators. The safety system of our robots are approved and certified by TÜV (German Inspection Association).

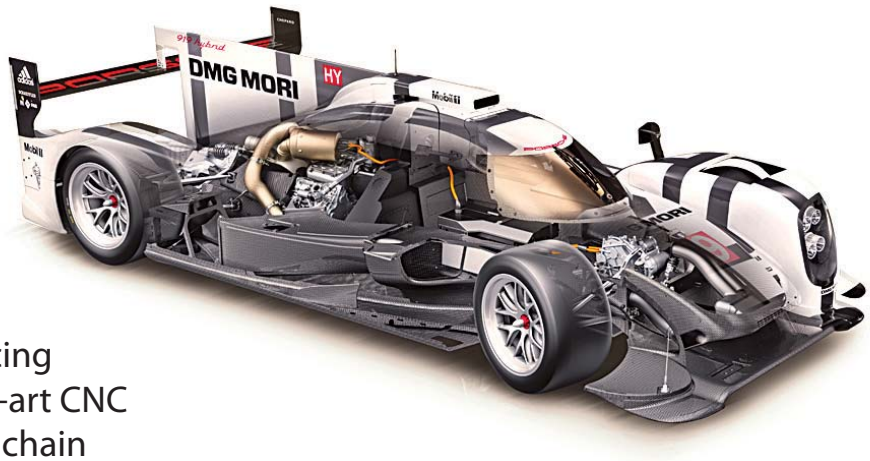
"Evolution has been evident in the past and we thrive to nurture it and take it to the next step with human robot collaboration. Collaborative robotic technology can be used to benefit all aspects of task-based businesses irrespective of their size. Our robot arms are advanced tools that can be used by all levels of production staff to help increase productivity, reduce injury and boost morale. With a Universal Robots robot arm, you can automate and streamline repetitive or potentially unsafe processes, so staff can be assigned to jobs that provide them with new challenges. We are delighted to be able to provide the platform required for the Indian market for increasing productivity, quality, and market competitiveness. Our collaborative robots will help to ease out processes in task driven industries like manufacturing, assembly and food processing," said Esben Østergaard, Chief Technology Officer, Universal Robots.

"Evolution has been evident in the past and we thrive to nurture it and take it to the next step with human robot collaboration. Collaborative robotic technology can be used to benefit all aspects of task-based businesses irrespective of their size."

Esben Østergaard, Chief Technology Officer, Universal Robots.

Universal Robots has been servicing clients in India such as Mahindra, TVS, TATA Consultancy Services, Siemens, Bajaj, BOSCH, Renault, Hindustan Unilever Limited, GE, Calvin Klein to name a few. The companies have readily adopted the technology and Universal Robots has sold close to 100 Units of Co-bots (collaborative robots) till date. Pradeep David, GM, Universal Robots (India) further added, "Our three different collaborative robots are easily integrated into existing production environments. With six articulation points, and a wide scope of flexibility, the collaborative robot arms are designed to mimic the range of motion of a human arm. The latest collaborative robot technology should be available to all businesses. "The nominal investment cost is quickly recovered as our robotic arms have an average payback period of just six months. The need of advanced robotics is required for accessibility to anybody who wants to increase productivity while maintaining high safety standards."

Fast and flexible



Porsche Motorsport is bringing sophisticated components to the racing track with state-of-the-art CNC machines and process chain

For Porsche a perfect season has come to an end: They took the overall victory at the 24 Hours in Le Mans, won the Manufacturers' World Championship title at the penultimate round in Shanghai – and have been crowned the drivers' World Champions too. This quick success is the result of long-standing experience and most of all consistent and continuous further development of the Porsche 919 Hybrid.

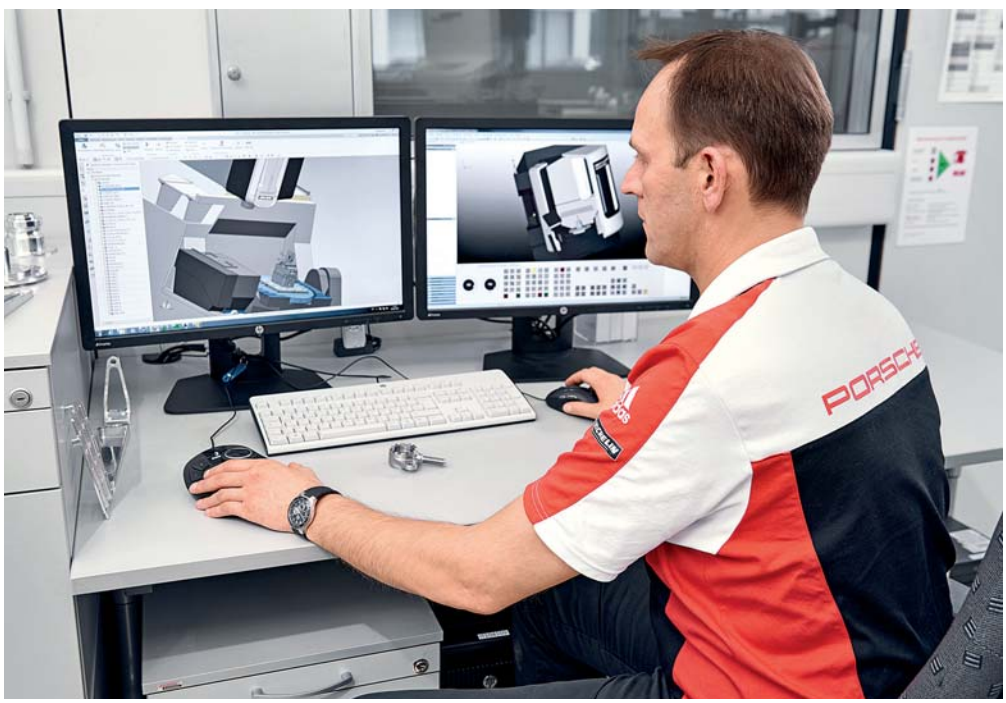
While the racing team largely cooperates with suppliers here, the technology partnership with DMG MORI has long and lastingly influenced the internal possibilities in production as well. Because in order to produce components for the racing cars more flexibly and quickly, Porsche Motorsport has built its own and ultra-modern component production as new core competence.

A DMU 65 monoBLOCK® and a CTX beta 800 form the machine basis. The production process is complemented by using the DMG MORI process chain: Constructing and programming with Siemens NX CAD/CAM, followed by a 1:1 simulation of the NC program in the DMG MORI Virtual Machine.

"Short response times and flexibility are deciding factors for success in the field of motor sports", says Frank Jahn, responsible for the Porsche team for component production. For this reason, in parallel to the numerous cooperations with first class suppliers, an in-house production has also been set up. The challenge for this project has been enormous: "We had to invest here with regard to technology as well as personnel."

> "Short response times and flexibility are deciding factors for success in the field of motor sports. We had to invest here with regard to technology as well as personnel."
>
> **Frank Jahn,** responsible for the Porsche team for component production.

The development of an in-house component production is of course also a direct result of the cooperation with DMG MORI. As premium sponsor and technology partner of the Porsche Team, the machine manufacturer provides comprehensive know-how in the field of CNC technology.



The DMG MORI Virtual Machine simulates the programs written by Dittmar Lienert in Siemens NX CAM 1:1.

Frank Jahn, responsible for component production, and Dittmar Lienert, responsible for programming and operation, record the work schedule in CELOS® and document the production.

As the machining centres and lathes have already been used for many years in sophisticated industries like automotive engineering, the aerospace industry as well as – not least – motor sports, DMG MORI is very familiar with the high expectations. Usually, it is highly complex components that need to be available within the shortest possible time and with the highest quality.

CTX beta 800, DMU 65 monoBLOCK® and DMG MORI process chain: Interaction of proven machine tool technology and innovative software solution

With a CTX beta 800 and a DMU 65 monoBLOCK®, Porsche Motorsport is optimally equipped to resolve any production tasks quickly and reliably. "The combination of the versatile CTX beta 800 – it is equipped amongst others with a Y-axis and an oil mist circuit breaker – and the 5-axis DMU 65 monoBLOCK® allows us complete freedom with regard to production", underlines the operator. The work areas are sufficiently big for the respective components and the performance of both machines impresses in the area of speed as well as on quality level.

One highlight of component production is the DMG MORI process chain. It includes constructing and programming with Siemens NX CAD/CAM, followed by a 1:1 simulation of the NC program in the DMG MORI Virtual Machine. "The Siemens NX CAM provides the required programming strategy for even the most complex machining operation. And we check feasibility and ensure 100 percent collision safety with the virtual machine", says Frank Jahn when explaining the investment in the software solution.

He sees an analogy to the 24 hour race of Le Mans, where Porsche could recently celebrate an impressive double victory: "We often need to deliver top results in the form of high-quality components within 24 hours as well." Which is why the complex components must be machined error-free at the first attempt.

Dittmar Lienert – he joined the team when component production was established and is responsible for programming and machining of the components – explains the advantage of the simulation software: "The DMG MORI Virtual Machine holds the same importance for us as the racing simulator for the pilots. It enables the 1:1 simulation of real machining on the PC – including machine kinematics and real control." He experienced getting familiar with the powerful and thus complex software as being straightforward: "We got to where we wanted a lot faster."

The demanding range of applications of the development department includes amongst others undercarriage parts and crankshaft housings, but also operational equipment which plays a big part in successful racing. Modifications of the numerous components always occur at short notice between the individual races.

> "This Virtual Machine holds the same importance for us as the racing simulator for the pilots. It enables the 1:1 simulation of real machining on the PC – including machine kinematics and real control. We got to where we wanted a lot faster."
>
> **Dittmar Lienert,** responsible for programming and machining of the components

"Programming in NX CAM and simultaneous simulation of the programs in the DMG MORI Virtual Machine saves a tremendous amount of time, as errors in my programming work or even possible collisions are displayed instantly", says Dittmar Lienert. This also renders the time-consuming running in of the programs on the machine superfluous.

Within the scope of complex component production, the CELOS® user interface on both machines also proves to be of great support. Frank Jahn refers to the work schedule here: "Based on photos, we record components as well as clamping devices in CELOS® and manage cut edges and tools."

This also facilitates the required seamless documentation in production. The conclusion is very clear: "With the DMG MORI process chain and CELOS®, we program, simulate and produce any complex parts for our racing cars – incredibly fast and error-free. This way we contribute to the head start our teams in Le Mans and elsewhere bring to the racing track."

Source: DMG MORI

Karnataka Govt. gives nod for Machine Tool Park

The Karnataka Cabinet has approved setting up of the country's first Integrated Machine Tool Industry Park in Tumkur district at a cost of Rs 447 crore. The project at Hosa Narsapur, a joint venture between the central and state governments, will come up on 500 acres with a central government grant of Rs 125 crore, state Law and Parliamentary Affairs Minister T B Jayachandra said. The park will be a cluster of machine tool builders, makers of accessories, components and foundry, among others, and will help small and medium scale enterprises to expand their manufacturing capacities, he said.

President of IMTMA (Indian machine Tool Manufacturers' Association) P.G. Jadeja has welcomed the nod from the Karnataka Government Cabinet towards development of Machine Tool Park. Jadeja said: "The long cherished desire of India's machine tool industry of setting up an integrated machine tool industrial park for development of the manufacturing technology industry in India is now becoming a reality with the Government of Karnataka giving a cabinet nod towards this. We are extremely happy with this decision." He added that this initiative would primarily help the development of supply chain by attracting investments in machine tool and mainly ancillary industries which in turn helps the overall development of MSMEs and large OEMs in the sector. "We thank both the Karnataka government and the Government of India for moving one step closer to fulfilling machine tool industry and 'Make in India' objective. IMTMA will extend all possible support to enable this project develop at a better pace," he said further.

Allied Machine announces purchase of majority interest in Wohlhaupter

Renowned German manufacturer offers wide range of precision boring tools and systems

Allied Machine & Engineering Corp, a leading manufacturer of holemaking and finishing tooling systems, announces it has purchased a majority of the shares of Wohlhaupter GmbH of Frickenhausen, Germany, Wohlhaupter USA and Wohlhaupter India.

Known all over the world as a manufacturer of innovative, modular tool systems, Wohlhaupter produces facing and boring heads, grooving heads, clamping tools and customized solutions for boring operations. The most significant product additions include Wohlhaupter's larger diameter boring tools and their line of digital boring tools. With one innovation after another, they have continually reinforced their reputation as the world leader in digital boring tools.

"Allied Machine is a perfect fit with Wohlhaupter," said Bill Stokey, President/CEO of Allied Machine & Engineering. "Both are family-owned companies whose foundations are built upon excellent quality, flexibility, and ability to customize products and services, as well as a preference for building strong partnerships with our customers. These commonalities will produce a seamless integration of our philosophies and services."

Customer sales and support will continue to be provided by both Allied and Wohlhaupter, reflecting the strong long-standing relationships established by both companies.

"By acquiring Wohlhaupter, Allied has added the world's widest range of precision boring tools to our already vast array of available products," adds Eric Tope, Vice President of Marketing & Sales. "Equally important is the fact that Allied now has a manufacturing presence in Europe and an additional 30 Field Sales Engineers throughout the USA, Germany and India."

VL 3 DUO: EMAG's highlight at AMB

EMAG has expanded its range of products at AMB exhibition. Know more about its latest range of products.

The modular machine concept, which was introduced by EMAG in 2011, has turned into a favourite within the market. Starting with a focus on the development of vertical turning machines, in recent years, we have witnessed the integration of the EMAG Group's full technology portfolio into this new machine model. Now, in addition to vertical pick-up turning centres for chucked and shaft parts, there are also machines for gear cutting, induction hardening, and hard machining. Combined with the TrackMotion automation solution, EMAG now offers these modular machines as building-blocks for entire production lines. The company has introduced two new modular standard machines to the EMAG product line this year at AMB in hall 3, booth D32.

The modular machines are already optimised for maximum productivity due to its fully automatic manufacturing system which includes EMAG's 'pick-up' technology, self-loading working spindle and integrated parts storage unit. In addition, there is a work turret with 12 tool positions, fully designed and manufactured by EMAG, and considered one of the best on the market. When combined with the machine base made out of Mineralit polymer concrete, the result is an extremely compact machine tool that ensures top quality results and maximum productivity. If these impressive features aren't enough for you, EMAG is now introducing the new VL 3 DUO, a dual-spindle machine that is redefining productivity.

Compact, fast, precise

The VL 3 DUO is compact in size. "Only 19 m^2 (204.5 ft^2) is required for the full setup of the VL 3 DUO," explained Andreas Frank, Product Manager for Modular Machines, EMAG. "For a dual-spindle vertical pick-up turning center that's an outstanding figure especially considering that the machine features a storage unit for up to 400 workpieces and is completely automatic. These features make the VL 3 DUO one of the most compact and high-performance systems for chucked components in production," Andreas Frank said.

With its range of parts up to 150 mm (5.9 in) in diameter, the VL 3 DUO is ideal for functions in transmission component manufacturing, for instance in the machining of blanks for gear production.

With its range of parts up to 150 mm (5.9 in) in diameter, the VL 3 DUO is ideal for functions in transmission component manufacturing, for instance in the machining of blanks for gear production. "Transmission components such as gears have to be produced in very high quantities. This is where the VL 3 DUO scores highly, especially with its short chip-to-chip times of about five seconds (depending on the workpiece geometry). It reduces idle times to a minimum and guarantees maximum productivity. The new dual-spindle machine also impresses with its machining capability. It features two 18 kW main spindles offering up to 142 Nm torque. The offer is complemented by options including driven turret tools and measuring stations located outside the machining area. The extremely robust machine design with recirculating roller guides offers an optimal basis for great surface finishes and minimal tool wear, and a direct measuring system that ensures a high degree of precision in all axes. .

A modular solution for the machining of gears

The VL 3 DUO forms part of the modular solutions, which distinguishes itself through its modular design. This design makes the configuration of complex manufacturing systems simple. The VL 3 DUO is easy to integrate, as shown in the

machining of gears, for example. The soft machining process of a gear covers 4 operations: turning OP 10 and OP 20, hobbing OP 30 and chamfering and deburring OP 40. "With the VL 3 DUO we are aiming, of course, at the first two operations, i.e. OP 10 and OP 20, in particular. These are ideal for the VL 3 DUO," explains Frank. The other operations can be carried out on gear-cutting machines, deburring machines and grinding machines for hard machining – all of these machines are also covered in the EMAG portfolio. The possibility and ease of configuring a production line with these machines is only one of the many advantages offered by this type of machine.

Vertical hard machining of transmission components

While the VL 3 DUO provides maximum productivity for the soft machining of blanks for transmission components, the new VLC 200 GT guarantees cost reductions in the hard machining of planetary gear carriers.

The VLC 200 GT allows for the use of a variety of technologies for hard machining on a single machine, such as hard turning and grinding. Flexibility was a top priority with the VLC 200 GT, and consequently the machine's work area can be setup perfectly to suit each component being machined. The user can rest assured that the best technology for machining the workpiece will be available every time, whether that is a turning turret or a block tool holder for hard turning or grinding spindles for external and internal machining. This means processes are optimised: For example, the bore of a gearwheel can be finish-ground with a CBN wheel, while the end faces are hard turned. In both cases optimal surface finishes and the most advantageous cycle times are guaranteed. The machining quality is monitored by a measuring probe located between the machining area and loading station. In short, the VLC 200 GT brings not only cost reductions on all levels but also optimal machining results – a win-win situation for the user..

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Andreas Frank,
Product Manager for Modular Machines, EMAG

From the raw part to the finished product

EMAG's promise of being able to construct complete manufacturing systems on a modular basis can be easily achieved with the products presented there. The simplicity with which the modular machines can be linked using the TrackMotion automation system, the wide range of technologies offered, and the high productivity and quality of the individual machines make EMAG one of the most innovative suppliers of turnkey manufacturing systems in the marketplace.

A compact quick-change pallet system

Learn more about SHUNK's new clamping technology

The SCHUNK miniature quick-change module VERO-S NSE mikro transfers the effect of fast component change with the SCHUNK VERO-S quick change pallet system to a new dimension. For the first time, it is now possible to change miniature components in confined spaces reliably and precisely at a repeat accuracy of <0.005 mm within seconds. The compact miniature module is an important piece of the puzzle for more efficiency in the production of small workpieces and components. It is suitable for fast workpiece, component and pallet change in light machining as well as in assembly cells and measuring machines.

Extremely small and compact

At a height of only 12 mm and an outer diameter of 49 mm, VERO-S NSE mikro is one of the most compact quick-change pallet systems in the world. The corresponding clamping pins have an outer diameter of just 10 mm. The miniature module also convinces with the superior features of the VERO-S series: its patented dual stroke actuation concept with the standard integrated turbo function guarantees a pull-in force of 500 N and holding forces of up to 6,000 N (M4). The clamping pin is positioned via short tapers and fixed with three slide assemblies. Locking is achieved mechanically by means of a spring assembly. The system is self-locking and designed for form-fit clamping. A system pressure of 6 bar is sufficient for pneumatic opening of the module. All functional components such as the base body, clamping pins, and clamping slides are made of stainless steel.

For more information, contact:
SCHUNK INTEC INDIA PRIVATE LIMITED
Email: info@in.schunk.com
Web: www.in.schunk.com

New solutions for composite materials machining

The PCD type indexable inserts are specially designed to prevent surface delamination of composite materials.

With the increasing application of composite materials in the market, TaeguTec offers new PCD milling inserts, diamond coated solid carbide end mills and drills for effective machining of composite materials.

In recent years, the demand for strong, lightweight materials from industries ranging from aerospace, motorsport to power generation, has led to the development and implementation of composite materials. Composites, such as CFRP (carbon fibre reinforced plastic) are 70 percent lighter than steel and 40 percent less than aluminium alloy. For aerospace, in particular, CFRP is a very popular material because of its reduced weight, which equates to higher fuel efficiency. These new tooling solutions satisfy the unique cutting conditions of difficult materials as they have been designed to combine the specific grade, required geometry and high technology diamond coating for processing composite materials.

The PCD type indexable inserts are specially designed to prevent surface delamination of composite materials. Diamond coated solid carbide end mills come in the following types: RRFE type (Splitter router); RCFE type (multi-flute router); RCOM type (Left and right hand helix type); RDCF type (Low helix type). Grades TD 830 and TTD610 offer excellent wear and abrasion resistance along with superior edge quality and thermal stability.

Dry or Wet?

When milling, a major question is "Which is better: dry or wet machining?" Here is an answer to the question

Throughout the world of contentious machining, the issue of - 'with coolant supply' (wet) or without coolant supply' (dry) is a common subject of discussion.

To further complicate the decision, new-to-dry or minimum quantity lubrication (MQL) cutting techniques may represent a successful compromise, and therefore provide an efficient and effective answer to the troublesome question.

As in many areas of machining, making such choices is not easy, and therefore, this familiar question requires careful and informed consideration.

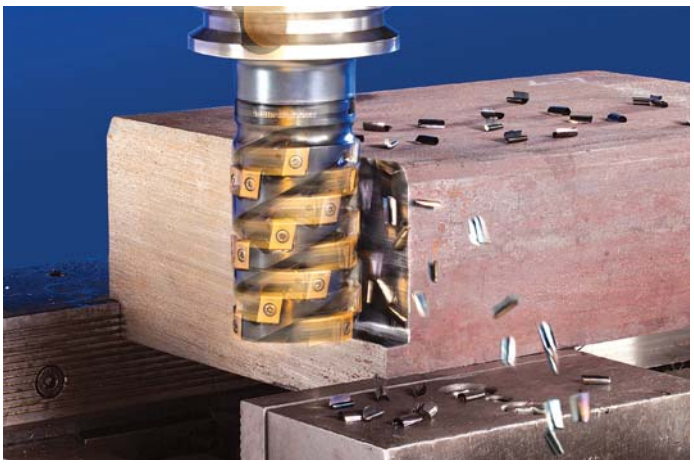


Fig.1 - Wet cooling is not recommended for rough milling steel with the use of a T490 extended flute cutter.

Fig.2 - Multi-Master ball-nose milling head, intended for machining hard-to-cut materials with inner channels for coolant supply in the appropriate area.

Wet Coolant

Wet coolant, cooling mixture, cutting lubricant, cutting fluid, and coolant are all commonplace shop-floor terms that are familiar to all involved in machining. Each expression refers to a fluid, which is used in across multiple processes for both cooling and lubrication purposes.

All cutting activities generate unwelcome friction between the surfaces of the tool being used and the workpiece it is in contact with. The presence of coolant ensures that the friction between the two surfaces is reduced and by doing so makes the removal of a metal layer by the tool, a great deal easier (lubrication).

During the machining process, the temperature in a cutting zone becomes extremely high. The application of coolant lowers the cutting zone temperature and reduces the thermal load on the tool (cooling). In addition, the use of coolant contributes to improved chip evacuation and also reduces the concentration of metal dust in the area of a manufacturing unit. Therefore, the coolant supply is directly connected with several important tasks:

- advancing process performance (machining accuracy and surface finish)
- increasing economic numbers (boosting productivity, enhancing tool life and reducing tool consumption)
- improving environment control

When performing an interrupted cutting, milling process, the cutting edge of the tool comes under a cyclic thermal load; also the ambient temperature is dramatically changed when the edge enters into, then leaves the workpiece. The tools cutting edge is exposed to severe heat stress comparable to repeatable thermal shock. Cemented carbide, today's main tool material, is a sintered product of powder metallurgy and is sensitivity to thermal shock load which destroys cutting edges. When using this type of tool, the application of a coolant supply may increase such 'shock treatment' and unintentionally contribute to the failure of the tools edge. Extreme temperatures result in plastic deformation of the cutting edge, whilst the presence of temperature differences leads to thermal cracks. This situation becomes even more exaggerated in high-heat generation milling situations, such as when machining difficult-to-cut materials or when making rough passes with significant machining allowance. As explained, although wet cooling delivers undoubted benefits, it also has the capacity to produce several major disadvantages within the milling process.

In many cases the use of an efficient coolant supply is not only reasonable but it is absolutely necessary, without coolant, in many cases productive milling would be impossible. For example, when machining materials such as titanium and high-temperature super alloys, austenitic and duplex (austenitic-ferritic) stainless steels or even special-purpose alloyed hard cast iron, when friction and heat generation are considerable. Also, the flushing effect of a coolant supply significantly

improves chip evacuation and reduces re-cutting, particularly when milling deep pockets or narrow slots.

Compared with traditional low-pressure coolant, normally delivered at around 20 bars, the relatively recent introduction of high-pressure cooling (HPC), in which the wet coolant is provided under approximately 80 bars pressure (normal) and even more (Ultra HPC), has been a welcome development.

Intensive heat generation, when using traditional wet cooling, produces a vapor film in the cutting zone that intensifies heat transfer. A HPC jet, directed exactly to the cutting zone, effectively penetrates this film and overcomes the unwelcome obstacle. It also improves the cutting action by changing the shear-plane angle and creating thin manageable chips. Taking advantage of HPC techniques is only possible only when using appropriate machine tools or by modernizing existed machines.

Dry machining and other options

Ignoring cases where the use of cutting fluid is essential, machine operators must appreciate that, if the use of wet cooling brings disadvantages, the eliminating of coolant will result in noticeable progress.

In these cases, dry machining offers promising opportunities. As previously explained, rough milling with significant stock removal results in extremely high-heat generation. In this case, a coolant supply may be destructive due to critical thermal stress. In contrast, when dry, rough milling, the temperature of the insert's cutting edge will remain high. Though, if the machining data is set correctly, the tool temperature will remain at an acceptable level. For example, the tool temperature will vary within a relatively narrow range that will not lead to thermal shock.

As for light cuts of high speed milling (HSM), especially for workpieces with hardness values of HRC 45 and above, cooling by air is strongly recommended. In the above examples, the absence of wet coolant also considerably increased tool life.

Other important factors to consider are cooling economy and work safety. If cutting tool investment in batch production is estimated at 3% of a part cost, the share connected with wet coolant (purchasing, maintaining, filtration, etc.) according to a variety of sources can reach16-17%.

Also, prolonged exposure to wet coolant by operating personnel may cause health problems and industrial illnesses. Many national and international standards and published advice, which relate to safety and environmental control, make increasingly tougher demands related to cutting fluids.

Where there is no cutting fluid, there is no need for a coolant pump, a coolant recycling system and other expensive machine tool accessories further reducing total costs. The above points ensure that informed manufacturers are constantly looking for alternatives to traditional cutting with coolant supply.

Another available option is milling with minimum quantity lubrication (MQL), sometimes called "near-to-dry". When using this technique, the tool's cutting edge works inside a mist formed from oil and compressed air that is spayed directly into the cutting zone. Depending on the design of a machine tool and milling cutter, the mist can be delivered externally or internally (via the cutter). The main function of MQL is to lubricate the edge during the cutting action, because of this, the machining process consumes only the necessary quantity of oil, and therefore the lubrication is more effective. In addition, the resulting machined workpiece and chips are almost dry ("near-to-dry"), making their cleaning much easier and quicker. MQL increases tool life. Moreover, the working area of the machine tool also remains relatively dry, enabling various parts of the machine tool to work under better conditions and improving their effective life.

Another coolant option is cryogenic machining. Using a coolant at extremely low, cryogenic temperatures drastically reduces the possibility of overheating and allows better performance and extended tool life. Combining this principle with MQL results in a more effective "minimum quantity" cryogenic machining method, as low-temperature coolant (such as liquid nitrogen) is supplied directly to the cutting zone via the tool. Alternatively, some processes propose applying carbon dioxide (CO2) that is delivered under pressure to the cutting zone. In each of these methods, the particles of cryogenic coolant vaporize from the tool edge, and in doing so, remove heat. However, it is obvious that despite the clear benefits, cryogenic cooling is not a cheap method and it also requires the use of specially designed machine tools.

Fig. 3 - A T490 extended flute cutter intended for HPC. The cutter design enables mounting nozzles in the outlets of the holes for coolant supply.

So - dry or wet? As we can see, the correct answer today continues to be dry and wet – it depends on the specific application (a workpiece material, operation, etc.) and available machining tools. Nevertheless, the manufacturers of cutting tools take into account customer requirements and provide them with tools that will ensure productive machining with the use of different cooling methods.

The vast majority of modern indexable mills have inter-

nal channels enabling the supply of coolant directly via the tool body. This allows more effective delivery of the coolant directly to the cutting zone. For face mills of previous generations, without coolant channels, ISCAR proposes a clamping screw with an adjustable nozzle – in many cases it not only improves coolant supply but also contributes to better chip evacuation.

When exploring milling cutters intended for HPC and cryogenic machining, the body of the cutter should be designed accordingly. The shape of the internal channels, their size and sealing elements (if necessary) should ensure the maximal free flow of coolant without any disturbance. The most important elements are the nozzles that are mounted in the outlets of the channels, as they optimise the effect of the high-velocity coolant jet and direct it exactly to the necessary area.

Fig.4 - A nozzle mounted in a hole for coolant supply near a face-cutting insert of the T490 extended flute cutter.

Last but not least – we must consider the indexable carbide insert itself.

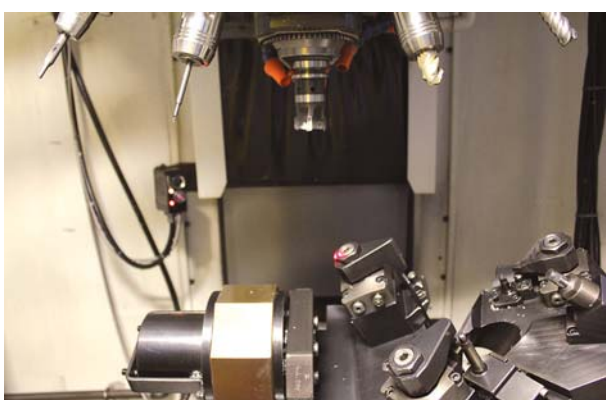
Although the insert's edge performs the cutting, how does it relate to the coolant method? The key to understanding this relationship is the insert's carbide grade and more specifically - its coating, which provides a barrier for heat penetration. The coating must be resistant to the thermal shock that causes the destructive effect. Understandably, there is no 'universal' coating, which is equally suitable for productive milling with coolant and without it. Some coatings are more effective for wet machining, whilst others provide dry machining advantages. Although indexable carbide inserts are available with coatings to suit all applications, the field of insert coating layers is so complex it is worth an entirely separate discussion.

Reducing rejections, increasing profit

Know how Mumnjal Castings overcame manufacturing challenges with the help of solutions provided by Renishaw.

Munjal Castings has emerged as one of the trusted names in the aluminium and zinc die casting industry, supplying 600 tonnes of castings each month, with a turnover of Rs. 1.5 billion. The company supplies components to various OEMs.

For Munjal Castings, a major challenge was frequent tool breakage, which caused delays in production and led to high levels of scrap and financial loss in terms of materials and time. The reputation of the company was at stake, as even a single substandard component could negatively affect goodwill towards Munjal Castings in the market.



The Solution

Renishaw TRS2 systems were installed at Munjal Castings to address this challenge. The TRS2 is an award-winning non-contact broken tool detection system for machining centres. It determines whether a tool is present by analysing reflective light patterns and ignores any that are created by coolant and swarf, thereby eliminating false indications of a broken tool.

P. L. Arora, Sr VP, Munjal Castings said, "The company was incurring huge financial losses due to high rejections. This prompted the management to pursue increased automated solutions and they purchased TRS2 from Renishaw. After installing 16 TRS2 systems, huge savings in costs and time have become a reality."

The company's vision is to increase exports from Rs. 400 million to Rs. 1,000 million in the next three years. To achieve this, it has decided to increase automation with the help of process control solutions. According to Munjal Castings, machines with TRS2 installed have had their overall equipment effectiveness (OEE) increased from 50–76 percent. The target is to increase the OEE to 85 percent. Previously, 250 finished components were produced daily on each machine. Following installation of the TRS2 systems, production increased to 270 components per day.

Arora concluded, "Maintaining quality, cost and delivery within stringent deadlines is our company's unique selling point, which has helped us to stand apart from others. Daily, we supply 200,000 castings with 150 different component types to the automobile industry. Renishaw's products are reliable and are of high quality. With faith in Renishaw's technology, the management is confident of achieving greater results and reaching its targets."

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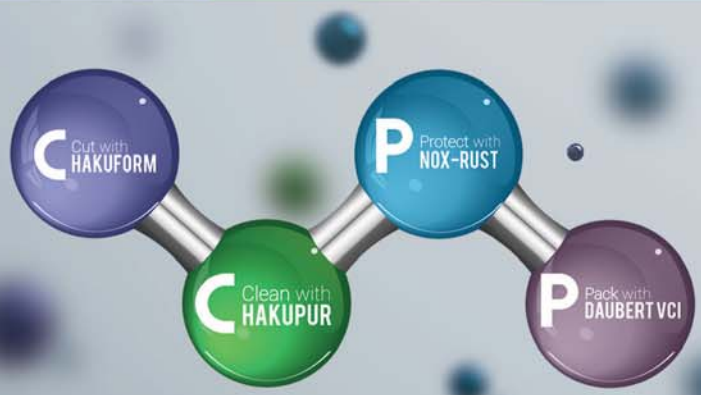

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Cable reel for energy chains proves its worth on the stage

Know more about igus e-spool that has achieved success in noise emission tests

The e-spool from igus, a cable reel for energy chains, has passed all the noise tests in the igus test laboratory. This means it has distinguished itself as an ideal solution for applications in noise-sensitive areas, such as in stage engineering. With the space-saving e-spool, energy, media or fibre optic data cables can be run together in a single system, as it requires no slip ring.

igus operates one of the largest testing laboratory in the industry with a floor area of 2,750 m^2, where all products have to pass various tests. It was here that the e-spool was subjected to an intensive test for its noise emissions during operation. e-spool is an alternative to conventional cable reels for very tight radii and installation spaces. In the tests, the cable-friendly energy, data and media supply system of the latest generation has been proved extremely quiet. In particular the absence of slip rings minimises the noise development significantly in this special reel. An e-spool equipped with 'anti-vibration matting' was able to reach levels below 46dB (A) in these tests.

The tests in the igus test lab also proved the performance of the e-spool with respect to its service life. In addition to the noise emissions, this special insulated option was tested for compliance with the service life expectancy for a customer. At full extension to 12 mtr, the integrated return spring held the required tension of the pull-out e-chain at all times, and a maximum rotational movement of the used igus twisterband the e-spool has surpassed the required 24,000 double strokes by far, completely trouble-free. The twisterband works as the rotating link through which the cables are routed smoothly for the chain and which allows the rotation of the reel. igus offers e-spools with one or two twisterbands, depending on the number of cables to be routed. The achievable life is dependent on the application and execution of up to about one million movements. For the model with spring reel, the spring must be replaced after 75,000 double strokes. In the e-spool power with motor drive, that is not necessary.

Suitable for noise-sensitive applications

The latest test results prove that the e-spool is ideal for use in noise-sensitive applications such as stage installations. Finally, moving stage elements must be moved as smoothly and quietly as possible, at the same time the energy supply system needs to be as compact as possible in order to manage with the limited space. Similarly, factories or logistics centres, where noise emission limits are increasingly becoming a norm, are suitable areas of its application. But there are even more features such as the strain relief of the cables, the variable guiding in all directions, as well as halogen-free components support the use of an e-spool. The latter is particularly important in order to achieve the required fire safety standards. For this purpose, igus offers the appropriate chainflex cables with TPE outer jacket for moving applications.

The e-spool energy supply system is available in standard catalogue sizes of four to 14 metres. For special projects which are either particularly compact or for very long extension lengths up to 50 metres, igus also offers customised special solutions. All components together according to customer requirements with completely pre-assembled cables and optional installation.

For more information, please contact:
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