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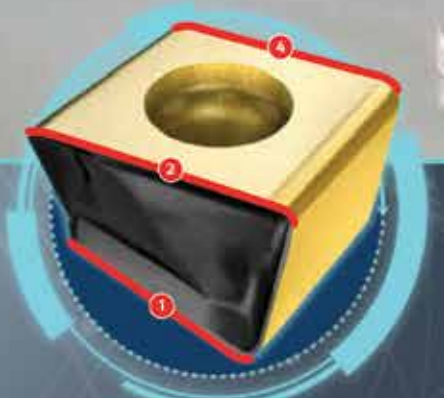

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HEY, SLOW DOWN!

Okay, before you jump to any wrong conclusions after reading the title, please read the complete note! Let's first take a stock of the situation. We have had a stable political situation for the last five years and definitely also for the next five years. There has been a budget favouring the industry. Moreover, the government has been regularly bringing out economic reforms. And to top it all, the monsoon has been good too – so far. The PMI data for the month of July shows a positive rise in the aggregate manufacturing production in India. Now, before you remind me, let me also note that the last nine months or so haven't been really good for the overall industry and economy, particularly for the automotive industry. Decline in sales and job cuts are being reported on a daily basis! And that's what is further pulling down the sentiments of the market and of the people.

"I THINK RATHER THAN GIVING KNEE-JERK REACTIONS TO THE CURRENT SCENARIOS AND ADDING TO THE PANIC, THE INDUSTRY MUST START FOCUSSING ON THE BRIGHT SIDE."

That is exactly why I said: Hey, slow down! Nobody is denying that things are bad. However, only the bad things are being highlighted. And while almost everyone knows about the good things, all are afraid to talk about them. Strange! Everyone agrees that the fundamentals of our economy are strong and healthy. Everyone agrees that this current 'slow down' (if we can even call it that) is just a blip. The long-term perspective remains positively robust. I think rather than giving knee-jerk reactions to the current scenarios and adding to the panic, the industry must start focussing on the bright side. And by the way, there are a few industries that are still doing well. So, let's just slow down a bit.

Editor & Chief Community Officer

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Worldwide Media Pvt. Ltd.

Chief Executive Officer **Deepak Lamba**

Chief Financial Officer **Subramaniam S**

Publisher, Print & Production Controller **Joji Varghese**

Brand Publisher **Rishi Sutrave**
rishi.sutrave@wwm.co.in
+91 9820580009

Editor & Chief Community Officer **Niranjan Mudholkar**
niranjan.mudholkar@wwm.co.in
+91 9819531819

Associate Editor **Swati Deshpande**
swati.deshpande1@wwm.co.in
+91 99204 00833

Assistant Art Director **Sanjay Dalvi**
sanjay.dalvi@wwm.co.in

Project Coordinator **Fiona Fernandes**
fiona.fernandes@wwm.co.in

ADVERTISING

South **Mahadev B**
mahadev.b@wwm.co.in
+91 9448483475

Prabhugoud Patil
prabhugoud.patil@wwm.co.in
+91 9980432663

West & North **Ranjan Haldar**
ranjan.haldar@wwm.co.in
+91 9167267474

Jangam G.
jangam.gangaram@wwm.co.in
+91 9820053063

SUBSCRIPTIONS
subscriptions.rmd@timesgroup.com
022 67427209 / 67427206

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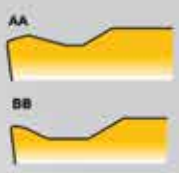

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Chandrayaan-2 spacecraft successfully launched

INDIA'S GEO-SYNCHRONOUS SATELLITE Launch Vehicle GSLV MkIII-M1, successfully launched the 3840 kg Chandrayaan-2 spacecraft into an earth orbit today. The spacecraft is now revolving round the earth with a perigee (nearest point to Earth) of 169.7 km and an apogee (farthest point to Earth) of 45,475 km. Today's flight marks the first operational flight of the GSLV Mk III.

After a smooth countdown lasting 20 hours, GSLV MkIII-M1 vehicle majestically lifted off from the Second Launch Pad at the Satish Dhawan Space Centre SHAR (SDSC SHAR), Sriharikota in Andhra Pradesh at the scheduled launch time of 1443 Hrs (2:43 pm) Indian Standard Time (IST) with the ignition of its two S200 solid strap-on motors. All the subsequent flight events occurred as scheduled.

About 16 minutes 14 seconds after lift-off, the vehicle injected Chandrayaan-2 spacecraft into an elliptical earth orbit. Immediately after spacecraft separation from the vehicle, the solar array of the spacecraft automatically got deployed and ISRO Telemetry, Tracking and Command Network (ISTRAC), Bengaluru successfully took control of the spacecraft.

ISRO Chairman Dr K Sivan congratulated the launch vehicle and satellite teams involved in this challenging mission. "Today is a historical day for Space Science and Technology in India. I am extremely happy to announce that GSLV MkIII-M1 successfully injected Chandrayaan-2 into an orbit of 6000 Km more than the intended orbit and is better."

Indian Railways to invest Rs.50 lakh cr., Aims at developing infrastructure

SURESH ANGADI, MINISTER OF STATE RAILWAYS RECENTLY spoke of several interesting developments aimed at modernization of Railways. "With growing consumerism and a large workforce, Indian Railways needs further investment, private participation and focus on freight transportation," said the Minister addressing the industry. "The Government is focusing on market-friendly mechanisms and ease of doing business," he added.

Echoing the same vision for growth, Vinod Kumar Yadav, Chairman, Railway Board said, "Indian Railways is now gearing up for quantum jump in infrastructure development." He said that freight transportation has been cross-subsidizing passenger transport. There is no lack of demand, but capacity is a constraint due to lack of land clearance and delayed forest clearances. Under digitalization of railways, one of the many recent initiatives is the introduction of the real-time information system. A pilot project of GPS installation has been run on 4,000 locomotives, and automated chartering of trains have been started.

N Sivasailam, Special Secretary, Logistics, Department of Commerce, Ministry of Commerce and Industry also spoke at the inaugural session. "The logistics' contribution to GDP stands at 13 per cent, comparable to that of developed nations of 7-9 per cent. The cause of concern is the declining trend of the contribution made by Railways. Therefore, we need to prioritise freight in rail transportation". He emphasized that digitization, appropriate utilization of assets, encouraging PPPs, and proper dispute resolution mechanisms will go a long way in streamlining railways and attracting private investors.

Lockheed Martin signs MoUs with three Indian start-ups

LOCKHEED MARTIN has recently announced the establishment of Memorandums of Understanding (MOU) with three Indian Start-ups. The MOUs pave the way for Terero Mobility, Sastra Robotics, and NoPo Nanotechnologies, graduates of the India Innovation Growth Programme (IIGP), to integrate with Lockheed Martin's supply chain, and contribute to the evolution of both the Indian and global aerospace & defence industry. According to Vivek Lall, Vice President for Strategy and Business Development at Lockheed Martin Aeronautics, "The agreements entered into today attest to the commitment of Lockheed Martin to cultivate and integrate indigenous content into global systems and platforms. Through these agreements, we look to provide engineering support, mentoring, and assistance in the qualification of some of the technologies proposed, all of which contribute to our mission of making in India," said Phil Shaw, Chief Executive of Lockheed Martin in India. "We are delighted to have identified, through the IIGP, three inspiring start-ups that we perceive potential to collaborate with on a global scale. We envision our intended partnership with them to enhance the platforms and programs we're developing, especially the solutions we wish to offer India."

Lockheed Martin expects to provide Terero Mobility with a scope of work for design development, test and qualification of the Cargo Ground Buildup System (CGBS) for Fixed and Rotary wing aircraft. The company expects to provide NoPo Nanotechnologies with a Scope of Work for qualification of As-Produced, Purified and Metallic Sorted HiPCO® Carbon Nanotubes to provide electromagnetic interference and lightning protection. Sastra Robotics's scope of work includes qualification of robots for Avionics testing. Successful qualification would enable Sastra Robotics to be a supplier to Lockheed Martin and other Tier-1 OEMs.

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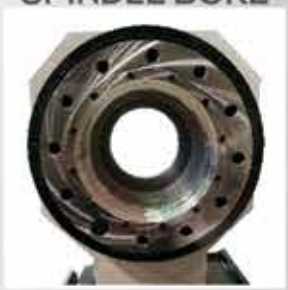

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Jaquar Group expands its Bhiwadi plant

JAQUAR GROUP announced the expansion of its manufacturing plant in Bhiwadi, Rajasthan on the eve of its 60th anniversary making it the world's largest faucet manufacturing plant in a single unit. The plant has a production capacity of manufacturing 1,25,000 faucets in a single day.

As a true market leader, Jaquar Group plans to make this plant as one of the shining success stories of government's ambitious 'Make in India' program where a company with origins in India has set up benchmark in manufacturing excellence. The Group has invested INR 150 Crores in expansion of the faucet manufacturing plant and another INR 150 Crores in setting up a new lighting manufacturing plant. The expansion has also led to the increase in employment opportunities and expansion of workforce.

On the occasion, Rajesh Mehra, Director & Promoter, Jaquar Group said "We are proud to announce the landmark expansion of our Bhiwadi plant. From a modest start of a small manufacturing unit in Old Delhi to the largest faucet manufacturing plant in the world under one unit is a successful journey for the Group over the last six decades. This expansion reflects our commitment to India and signifies the success of the Make in India program."

Step up production of indigenous defence equipment: says Vice President M. Venkaiah Naidu

THE VICE PRESIDENT OF INDIA M. VENKAIAH NAIDU had called for stepping up indigenous production of defence equipment under the 'Make in India' programme. Delivering the Valedictory Address at the First-Ever Foundation Course for Military Engineer Services Probationers, in Hyderabad recently, aidu stressed the need for reducing import of defence equipment.

Urging the probationers to constantly upgrade their skills and knowledge, the Vice President emphasized the importance of regular training for officers & professionals at various levels to keep abreast of the latest developments.

Naidu told the probationers to learn the best practices within & outside India, from both the private & public sector, &strive to reform the procedures and systems for producing outstanding results.

Saying that providing cost-effective and time-bound development of infrastructure was the need of the hour, the Vice President advised the probationers to spend time in villages and understand the problems and aspirations of people in rural areas. He told them understand the needs of the marginalized sections of the society and get a firsthand experience of service delivery in remote areas.

Naidu said that Military Engineer Service has been playing a crucial role in enabling the Indian Armed Forces, Indian Ordnance Factories, DRDO and the Indian Coast Guard in achieving their cherished goals. He asked them to work together in unison, complementing and supporting each other to attain higher levels of productivity.

GST of ₹ 1,02,083 collected in July 2019

THE TOTAL GROSS GST revenue collected in the month of July, 2019 is ₹ 1,02,083 crore of which CGST is ₹ 17,912 crore, SGST is ₹ 25,008 crore, IGST is ₹ 50,612 crore (including ₹ 24,246 crore collected on imports) and Cess is ₹ 8,551 crore (including ₹797 crore collected on imports). The total number of GSTR 3B Returns filed for the month of June up to 31st July, 2019 is 75.79 lakh.

The revenue in July, 2018 was ₹ 96,483 crore and the revenue during July, 2019 is a growth of 5.80% over the revenue in the same month last year. During April-July 2019 vis-à-vis 2018, the domestic component has grown by 9.2% while the GST on imports has come down by 0.2% and the total collection has grown by 6.83%. Rs. 17,789 crore has been released to the states as GST compensation for the months of April-May, 2019.

Quick Reaction Surface-to-Air Missiles flight-tested

DEFENCE RESEARCH DEVELOPMENT ORGANISATION (DRDO) successfully flight-tested its state-of-the-art Quick Reaction Surface-to-Air Missiles (QRSAM) against live aerial targets from Integrated Test Range (ITR), Chandipur.

Two missiles, developed by DRDO, were tested against two live targets meeting complete mission objectives of engaging the targets. QRSAM, with many state-of-the-art technologies, engaged the targets at different ranges and altitudes. The systems have been tested in final configuration with RADAR mounted on a vehicle & missiles on the launcher.

The systems are equipped with indigenously-developed Phased array radar, Inertial Navigation System, Data Link & RF seeker.

The entire mission was captured by various Electro Optical Tracking Systems, Radar Systems and Telemetry Systems.

The system is being developed for Indian Army with search and track on move capability with very short reaction time.

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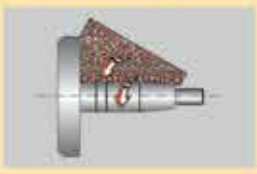

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• MARK YOUR DIARY •

A list of key events happening between August 2019 to September 2020, both nationally and internationally.

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AUGUST 30 –SEPTEMBER 1, 2019

AgriTech India 2019
Bangalore, India
www.agritechindia.com

SEPTEMBER 5–7, 2019

Material Handling Technology Expo
New Delhi
www.materialhandlingtechexpo.com/

SEPTEMBER 16–21, 2019

EMO Hannover 2019
Hannover, Germany
www.emo-hannover.de

SEPTEMBER 20–22, 2019

TechIndia
Mumbai, India
www.techindiaexpo.com

SEPTEMBER 25–28, 2019

Automation Expo 2019
Mumbai, India
www.automationindiaexpo.com

OCTOBER 7–10, 2019

Motek
Stuttgart, Germany
www.motek-messe.de/en/

DECEMBER 10–14, 2019

Excon
Bengaluru, India
www.excon.in

JANUARY 23–28, 2020

IMTEX Forming 2020
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FEBRUARY 26–28, 2020

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MARCH 31 –APRIL 4, 2020

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Seoul, South Korea
www.simtos.org

APRIL 22–25, 2020

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Mumbai, India
https://www.diemouldindia.org/

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OUR INHOUSE UPCOMING EVENTS

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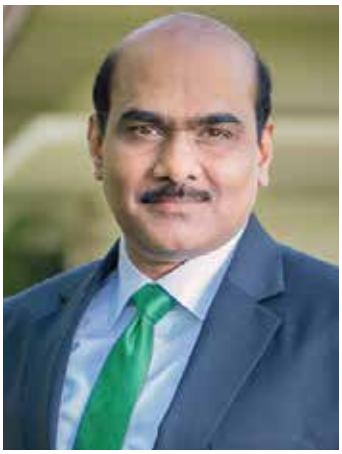
Schaeffler India appoints Harsha Kadam as Managing Director



Schaeffler India Limited has announced that the Board of Directors approved the appointment of Harsha Kadam as Managing Director for a period of five years. Kadam will assume office effective October 01, 2019 succeeding Dharmesh Arora who will take over as Regional CEO - Asia Pacific and Executive Board Member, Schaeffler AG. Kadam joined the company in March 2018 as President, Industrial business, a role that he will continue to hold in addition to the MD role. Arora will remain a Director on the Board of Schaeffler India Ltd.

"We are very pleased to welcome Harsha Kadam as the new Managing Director. He brings with him strong knowledge and distinguished experience which will be vital as we continue our ambitious plans to grow in India and seize the opportunities this market has to offer. We also thank Mr. Arora for his exemplary leadership that culminated in successful merger of all Schaeffler entities in India and strategic development of Schaeffler India Ltd. We wish them both very best for their new and exciting roles," said Avinash Gandhi, Chairman of the Board of Directors, Schaeffler India Ltd.

In his previous assignments, Kadam was the CEO of AGI Glaspac (India) and held several positions of increasing responsibilities at SKF India. In a career spanning more than 25 years, he has led several businesses including functions like Sales, Manufacturing, Product Design and Development. He is holder of several patents and has won global awards for innovation excellence. Kadam is a Mechanical Engineer with additional qualifications in business management.

Hindustan Aeronautics Limited appoints new Director - Operations

M.S Velpari, has taken the charge as Director (Operations)-HAL from Sunil Kumar who superannuated on July 31, 2019. Earlier, he was holding the post of Chief of Project (LCA Tejas) at LCA-Tejas Division.

Velpari holds a Bachelor's degree in mechanical engineering from College of Engineering, Guindy, Chennai and did his Masters from IIT Madras in Aircraft Production Engineering. He joined HAL in 1984 as Management Trainee (20th batch). He gained experience in the areas of manufacturing, assembly, design, product support, customer support, indigenisation and other management functions while serving at LCA-Tejas, Aircraft, Foundry & Forge Divisions in Bengaluru and Aircraft Division at Nashik.

Velpari was instrumental in sustained growth of LCA production from initial two in FY 2015-16 to eight in FY 2018-19. He took path breaking steps with the strategic outsourcing of structural assemblies of LCA-Tejas, which is poised to grow further. He played a key role in implementing the task of indigenisation of 1850 types of castings, forgings, rolled rings and rubber products at F&F Division.

R. Gopalakrishnan to be new Chairperson of Castrol India

Castrol India Limited announced the decision of Susim Datta to step down from his role as the Chairperson and Independent Director of Castrol India (CIL) Board of Directors after serving for 23 years. The CIL Board passed a resolution with respect to Datta's decision at the Board Meeting held.

In his long and illustrious career, Datta is known as a senior corporate statesman having served as Chairman of Hindustan Lever Limited as well as of Unilever Group of Companies in India and Nepal. He has also served on the Board of several reputed Indian corporates.

R Gopalakrishnan, who has been an Independent Director on CIL's Board, will succeed Datta as the new Chairperson effective October 1, 2019.

Gopalakrishnan has over fifty years of management experience having lived and worked in India, the UK and Saudi Arabia. He began his career in 1967 as a computer analyst with Hindustan Lever after studying physics in Kolkata and electronic engineering at IIT Kharagpur. He has attended the Advanced Management Programme at Harvard Business School.

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By Swati Deshpande

PARTNERS IN SUCCESS

Women employees' contribution in the success of the company is huge, says **Jayesh Shah**, Managing Director of Sonam Clock Limited.

Few months ago, we featured an interview of a woman plant head who leads an all women plant. As our search for women in manufacturing moved ahead, we came across a clock manufacturing company whose more than 90 per cent workforce comprise of women. Sonam Clock Limited, which is led by Jayesh Shah, Managing Director of the company speaks about the role that these women play in the success of the company.

Please tell us about the women workforce in your company.

Our workforce mainly includes women. In fact, out of our employee strength of around 650 people, more than 90 per cent are women. Qualities such as their sincerity and focus set them apart. Most of the women who work at the plant are not well educated. However what is important is that they are skilled to do the job that they are doing. We do provide them initial on-job training. Moreover, they are also positive towards acquiring new skills. With these qualities, they have been important part of the company's success.

Our plant is located at Morbi, Gujarat, which is a small village. These women daily commute from surrounding villages. To ensure their safety and convenience, we provide them transport facility.

Please tell us about the company's manufacturing facility.

In 1996, we began our journey with manufacturing and assembling 250 pieces a day. In the year 1997, we moved from a rented place to our own premise. By 1998 our operations and production had expanded reaching the capacity of 5,000 pieces of wall clock, and 10,000 pieces of alarm clocks with a strong distribution spread over India. Today, the production capacity is 10,000 wall clocks and 50,000 clock movements a day. We export to more than 25 countries.

Over the years, the company has manufactured various wall clocks as per the tastes and choices of end users and have updated designs, looks time and again.

"Most of the women who work at the plant are not well educated. However what is important is that they are skilled to do the job that they are doing."

Please tell us about Sonam Clock's journey since inception & also future plans.

Before establishing Sonam Clock, I used to be a trader in Mumbai. It is 1996, things changed I moved towards manufacturing and assembling. We started in modest way and it has been a satisfactory journey so far.

Today, the market for clocks is faring well. We are expecting the market size to reach Rs. 1500 crores. In these conditions, we are also expanding our wings. We are aiming at doubling our capacity by end of this year.

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AMH MARKET IS POISED TO GROW

Automation is playing a big role in the material handling equipment market. Read more about how the demand for AMH is growing

Manufacturers prefer automated packaging equipment for quick delivery to the consumer. The use of AMH equipment in the packaging process enhances the quality of packaging.

According to the new market research report "Automated Material Handling (AMH) Equipment Market by Product (Robots, ASRS, Conveyor and Sortation Systems, Cranes, AGV), System Type (Unit Load, Bulk Load), Software & Services, Function, Industry, and Region - Global Forecast to 2024", the AMH equipment market is estimated to reach USD 53.6 billion by 2024 from USD 33.5 billion in 2018, at a CAGR of 8.2% between 2018 and 2024.

The AMH equipment products include automated guided vehicles (AGV), automated storage and retrieval systems (ASRS), cranes, robots, and conveyors and sortation systems. The growth of the market is propelled by growing presence of start-up companies offering robotic solutions for warehouse automation, increasing popularity of AMH equipment among leading industries, significant recovery in global manufacturing, and rising labour cost and safety concerns.

USE OF ROBOTS

Robots are used to automate the manufacturing of goods. The robots are further classified on the basis of type into fixed and mobile robots. Robots are used for the applications such as assembly, machine loading, material removal, order picking, packaging, and waste handling in the manufacturing industries. The use of robots aids in reducing labor cost, protecting personnel or employees from injuries, and providing a high return on investment. Implementing robots greatly increases the efficiency and productivity of manufacturing and warehouse operating companies. These factors are fueling the demand for robots in manufacturing units and warehousing facilities.

UNIT LOAD MATERIAL HANDLING SYSTEMS EXPECTED TO GROW

Unit load material handling systems involve appropriately sized items organized into a single unit that can be moved easily. Unit loads make handling, storage, and distribution more efficient. The types of AMH equipment used to handle unit load include AGV, ASRS, and robots. They can identify the unit load to pick up and determine its appropriate destination.

The unit load material handling systems are widely used in various industries as they are cost effective and have many advantages such as the ability to handle several items simultaneously, thereby reducing the number of trips, the time required for loading and unloading, and the cost of handling.

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"

The rising awareness related to warehouse automation, increased emphasis of the leading developing economies such as China and India on robotics and automation, and growing e-commerce industry are some of the primary factors contributing to the larger share of APAC in the AMH equipment market.

ROLE OF PACKAGING

The role of packaging has become significant in the industries such as e-commerce, food & beverages, chemicals, and pharmaceuticals. The primary purpose of packaging is to provide protection to the item or product as it is handled numerous times during the order fulfillment process. Manufacturers prefer automated packaging equipment for quick delivery to the consumer. The use of AMH equipment in the packaging process enhances the quality of packaging. The equipment is capable of working with various packaging designs and multiple pack sizes for different products. They can optimize the packaging of both small and large, and fragile products with optimum speed, along with eliminating the human errors.

IMPACT OF E-COMMERCE

The e-commerce industry has evolved tremendously over the past few years. Moreover, the industry has been one of the major contributors to the growth of the AMH equipment market. Rapidly changing customer demands, increasing preference for online shopping, growing demand for shorter delivery times, and fierce competition among online retailing companies have raised the demand for automated fulfillment centers. With the increasing adoption of AMH equipment, the online and multichannel retailers can meet the increasing consumer demand to shop anywhere and at any time with fast, accurate shipments, and outstanding customer service. The growing demand accelerated order processing and delivery of product to customers in an accurate and undamaged form; rising competition in the e-commerce industry; and rapid rise in the online shoppers are propelling the e-commerce companies to invest in AMH equipment to improve their material handling efficiency.

APAC: FASTEST-GROWING MARKET

APAC constitutes some of the largest and fastest-growing economies - such as China, Japan, and India—in the world. Huge domestic demand for products and services, and significant business growth opportunities have led to the establishment of the manufacturing and warehousing units of various industries, such as automotive, metals & heavy machinery, and semiconductor & electronics, in the region. This offers an attractive growth opportunity for the AMH equipment market in APAC. The rising awareness related to warehouse automation, increased emphasis of the leading developing economies such as China and India on robotics and automation, and growing e-commerce industry are some of the primary factors contributing to the larger share of APAC in the AMH equipment market.

Source: MarketsAndMarkets

UPDATE

CONTINENTAL EXPANDS POWERTRAIN PLANT IN CHINA

Continental has announced the official opening of its new Powertrain plant in Wuhu, China. Representing an investment of almost EUR 28 million for land and building, phase I involves a total built area of more than 24,000 square meters, housing 22 production lines. The shop floor is also equipped with a quality analysis room, a spare parts room and a sample room. In the course of the ramp-up, more than 600 new jobs will be created at the location.

"China is the world's largest automotive market and I am delighted to witness the opening of the new Powertrain facility in Wuhu," said Andreas Wolf, CEO of Powertrain. "Our new plant in Wuhu is not only a reaction to the growing demand for Powertrain technologies in China, driven by local and global emission targets, but also demonstrates our strong confidence in and commitment to our local customers and business partners."

"With the fast development of China's urbanization, air pollution in China's key urban areas is a significant issue, and with 1.4 billion Chinese people there is a huge demand for clean mobility," said Enno Tang, President and CEO of Continental China. "The opening of our new facility in Wuhu enhances our capability to meet customer requirements in terms of both combustion and electric technologies." With its strong production footprint in China, Powertrain is pursuing its 'local for local' strategy to better serve the customers in the region. "The extended facility will further enlarge our product portfolio in China," commented Gregoire Cuny, Head of Powertrain China. "Going forward we will further enhance our local competence in electrification and low-emission drivetrain technologies, helping to build clean mobility for local customers."

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ACES OF THE GAME

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The ACE list

Bertrand Figueras

Managing Director- Faurecia Clean Mobility India & ASEAN

By Niranjan Mudholkar

Tell us about the overall Presence of Faurecia Clean Mobility India.

FCM started operating in India in 1998. We have now four plants in Chakan, Pirangut, Bangalore, Chennai and two Tech Centers in Bangalore and Pune. We employ a total of 1,400 people of which 800 engineers. We are serving Tata, Mahindra, Toyota, FCA, Renault, Nissan, Ford, Hyundai, Kia, Cummins, and soon, we will also be serving PSA. We have around 20 percent market share in India.

Tell us about the business of FCM India for the last Financial Year.

Last year was contrasted with two strong quarters at the beginning, followed by two weak quarters, which gave us a signal of the crisis to come. In this difficult environment, we have been able to achieve all of objectives in term of manufacturing excellence, customer satisfaction, and business development. we won several customers awards on quality, delivery with Hyundai, Toyota and Cummins. We were very happy to receive the Top Employer Award for the second time. On the technology side, we are working with leading universities and institutes in Bangalore, like the Indian Institute of Science. We have also participated to the BAJA SAE to join forces with the young college talents.

> "Our new plant is located at the heart of the Pune Automotive hub. This plant will be the biggest FCM plant in India with 170,000 sq. ft. We have invested EUR 20+ million in the latest Faurecia innovative technology to deliver the same level of quality in India, that can be compared with what we are doing in Europe and US."

Tell us something about FCM'S new plant in Chakan, Pune.

Our new plant is located at the heart of the Pune Automotive hub. It is in proximity to manufacturing facilities of OEMs like Tata, Mahindra and Volkswagen. This plant will be India's biggest FCM plant with 170,000 sq. ft. We have invested EUR 20+ million in the latest Faurecia innovative technology to deliver the same level of quality in India, that can be compared with what we are doing in Europe and US. By 2023, the plant will employ more than 600 people, and will be India biggest manufacturing center of BS6 after treatment systems.

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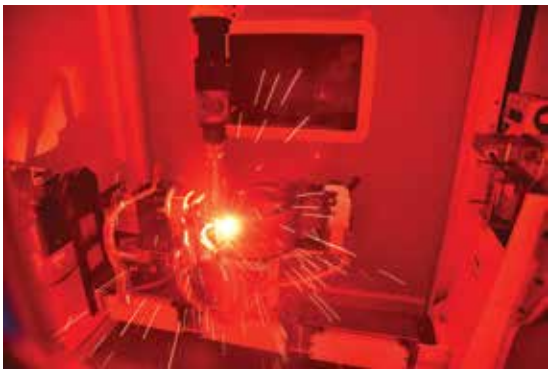

> "We are transforming our operations very fast by investing in the new technologies required for BS6, mainly on welding, canning and tube forming. In fact, we will be fully ready six months ahead of target date from the government fixed on April 1, 2020."

The Indian automotive industry is now transforming to Bharat VI. How well prepared is FCM to serve the needs of its customer in this regard?

As part of the Make in India initiative of the government, we are transforming our operations very fast by investing in the new technologies required for BS6, mainly on welding, canning and tube forming. In fact, we will be fully ready six months ahead of target date from the government fixed on April 1, 2020.

From autonomous vehicles to E-mobility and connected cars the auto industry is going through a huge disruption world over. How is FCM gearing up for the same?

We have aligned our strategy with the new mega trends and new mobilities. Our Clean Mobility offer is segmented around zero emission solutions, Electric cars, and Fuel Cells. For the zero emission solutions, we are increasing the efficiency of the aftertreatment system of Internal Combustion Engine to bring the emission down to almost zero. For Electric vehicles, we are proposing solutions around the battery pack along with thermal management. Finally, we are developing several solutions for Fuel cell, with our Fuel Cell ecosystem. Our other Business group is working on innovations like Smart Life on Board, with our Cockpit of the Future initiative. Finally, our recently acquired Clarion Business is developing solutions on Autonomous Driving. We are proud to be a strong player in technology offerings in the automotive market.

What is FCM is doing to promote and encourage gender diversity as well as inclusivity at various level?

To address all these emerging disruptive needs, we need to develop an environment where our teams will be able to deliver their full potential. We are working on different initiatives to engage our teams from the operator working on the shopfloor up to the PH.D in our Tech Center. Gender diversity is one of the key initiative we have launched across the operations with a target to reach a minimum of 30 percent across India. CSR is another way to engage our people in our community: we are contributing to the renovation of schools in Bangalore and Chennai, as well as various environment projects like river cleaning and tree planting.

UPDATE

GROUPE PSA LAUNCHES INDIA TECHNICAL CENTER

Continuing its commitment for Indian market, PCA Motors India Private Ltd, part of Groupe PSA, opened its new India Technical Center [ITC] in Chennai. The new ITC will play a key role in smoother & more efficient working of the employees of PSA India. Working together as one single team, in a large open space, will boost the capacity of the group to accelerate further in India. Eric APODE, Senior Vice President, PCA Motors India, was present at the launch.

The ITC is located in a specific building area, Chennai One, which is part of one of the Chennai Special Economic Zones [SEZ]. The new center will house departments of Research & Development, Programs and Projects, Global Purchasing Hub, Supply Chain, Process and Manufacturing Engineering, Quality, KD Excellence Center and Product. The co-location of the technical partner of Groupe PSA - TCS [Tata Consultancy Services], located in the same zone, will help to enhance the synergies and the efficiency of the work.

Commenting on the launch, Emmanuel Delay, Executive Vice President & Head of India-Pacific, Groupe PSA, said, "The new India Technical Center [ITC] is an important step for the development of Groupe PSA in India, and is definitely an asset to grow the Group's business in the India & Pacific region. This is part of our strategy to develop a global network of state-of-the-art technical center, strategically positioned in India, to support a customer-oriented agenda. With the new center, we're focusing our investment in creating a cohesive work environment to accelerate our growth. This unified approach will improve speed, efficiency and effectiveness of our employees, while enabling us to address evolving consumer needs more quickly in the future. Our investment in ITC further emphasizes the importance of India to our global business."

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The ACE list

Nishant Arya

Executive Director, JBM Group

By Swati Deshpande

The Indian Automotive industry have been working for a long time to improve vehicle efficiency & safety and reduce emissions with an aim to consequently lower ownership cost, adhere to emission & crash standards and conserve natural resources.

How is the automotive market faring in India? How do you look at the BS VI regulations that are to be implemented from next year?

Presently, the Indian automotive industry is at an inflection point where both opportunities and challenges abound in equal measure. The industry is trying hard to evolve and focus on new technologies, including transitioning to BS-VI. The auto industry is up to the challenge in view of the rising concerns on vehicular pollution, especially in urban metros. The Indian Automotive industry have been working for a long time to improve vehicle efficiency & safety and reduce emissions with an aim to consequently lower ownership cost, adhere to emission & crash standards and conserve natural resources.

Globally, the trend of light-weighting is seen in the industry for few years now. What impact does it have on auto component manufacturers? How have you been helping OEMs achieve success in this area?

The industry has been relentlessly working towards light-weighting with an aim to enhance vehicle efficiency without compromising on the quality. We have been pioneers in introducing TWBs (Tailored Welded Blanks) into the market that effectively aid in reducing the weight of the component or the assembly keeping the quality and strength intact. JBM has been working on this technology for over a decade now and has been assisting OEMs significantly to this effect. Apart from this, we are also working towards incorporating usage of alternate materials like aluminium, carbon fibre, etc. by virtue of our various global alliances.

Also, there is an increasing trend towards going green in the automotive industry. How do you look at it?

JBM is consciously working towards providing 'Well to Wheel' solutions, wherein, we have developed in-house, end to end capabilities in the e-mobility domain right from generation to consumption of green energy in powering e-vehicles. With strong focus on R&D, we have brought about a paradigm shift from the way JBM is perceived – from a product company to a solution giving company. JBM, a one-stop solution provider in the Electric Vehicles segment by offering complete ecosystem solution for E-mobility i.e. Electric Bus, Battery Technology, Charging Infrastructure and Operating Pattern. This has enabled JBM to offer seamless customer experience. JBM ECO-LIFE, a Zero Emission

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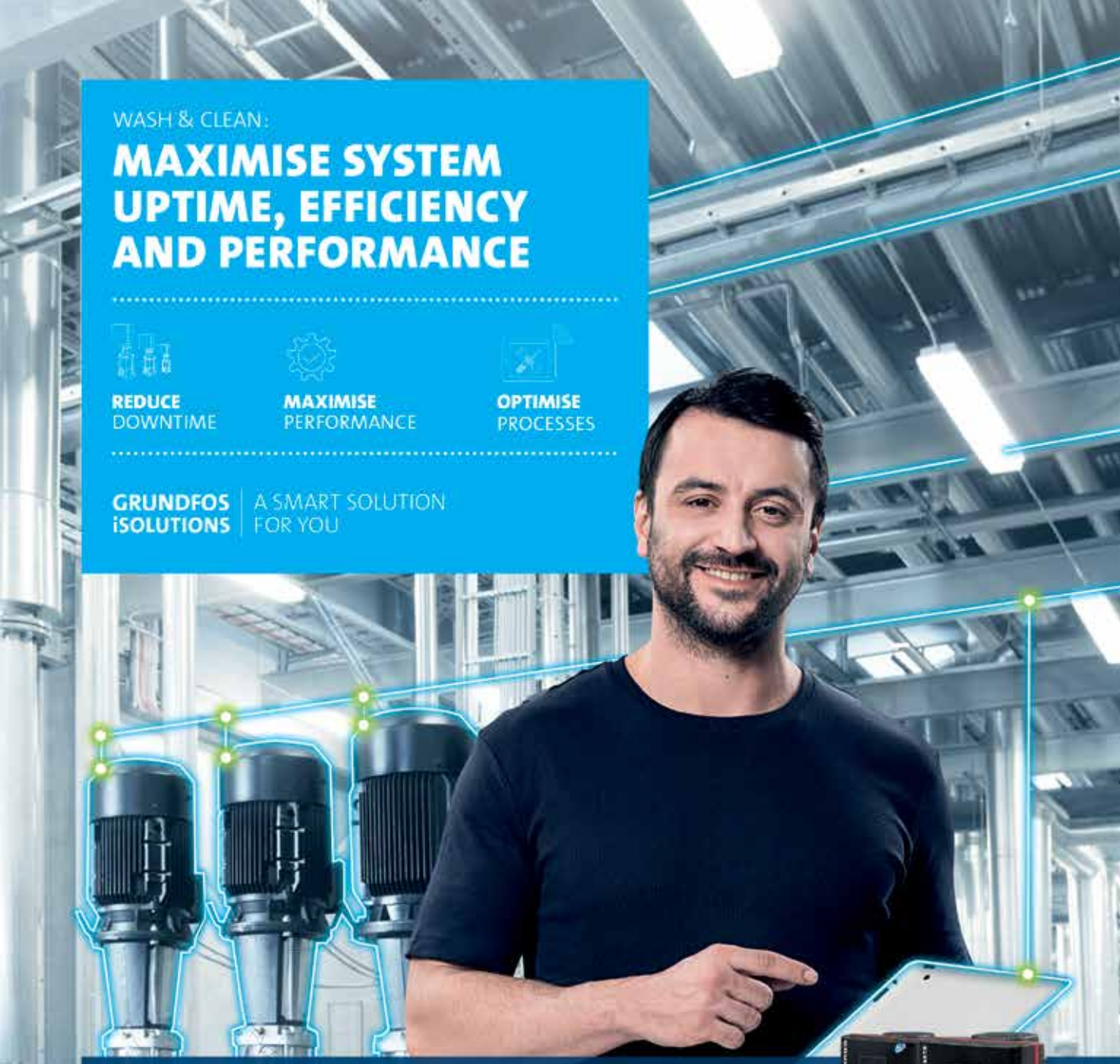

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The industry has been relentlessly working towards light-weighting with an aim to enhance vehicle efficiency without compromising on the quality.

Vehicle (ZEV), will save around 1000 equivalent tons of carbon dioxide and 350,000 liters of diesel over 10 years of operation. This is a huge evolution from how public transportation operates in India.

Now that e-vehicles are penetrating globally, how has been the response for JBM's electric buses?

JBM has been a frontrunner when it comes to the e-vehicle domain, with a strong focus on providing an end to end solution for EVs in India. We have added segments and verticals that highlight our focus on electric vehicle adoption. We introduced India's first 100% electric buses, 'ECO-LIFE' in association with our European partner Solaris Bus. These buses have been manufactured, tested and homologated completely in India under the 'Make in India' programme.

In fact, our electric bus 'ECO-LIFE' has successfully completed a trial runs recently conducted by multiple cities across India including metros like New Delhi and Mumbai. As part of this path-breaking product innovation, our focus was not limited to making a 100-electric bus; but we focused on building the entire ecosystem for adoption of EV by also building EV charging stations. In addition to our product line, our decision to emphasize on projects in the renewable energy space, puts us in a unique position to both benefit and support the new technologies market. Thus, JBM is positioned to provide complete green ecosystem solution.

How has been the last year for JBM Group? How do you look at this year?

JBM has been adopting the blue ocean strategy to ensure that we are ahead of competition. We evolve and constantly innovate which is what makes us agile. We started with a focus on auto components, which shifted to auto systems and assemblies. And, as we started moving ahead, we began adding new verticals and segments to our business, which is what has made us what we are today. We focus on the TCO (Total Cost of Ownership) principle for driving optimum value and cost optimization from our products & solutions thereby improving on its lifecycle cost. All our business verticals work in sync that provides us a sustainable and scalable ecosystem. Simplifying the hi-tech approach and making it user friendly and affordable is what we strive for. This year, we wish to expand our market by upgrading our capabilities and delivery mechanism, besides inducting technology and driving innovation to ensure value creation for self, business and the society at large.

UPDATE

BMW'S SPARTANBURG PLANT DOUBLES BATTERY PRODUCTION CAPACITY

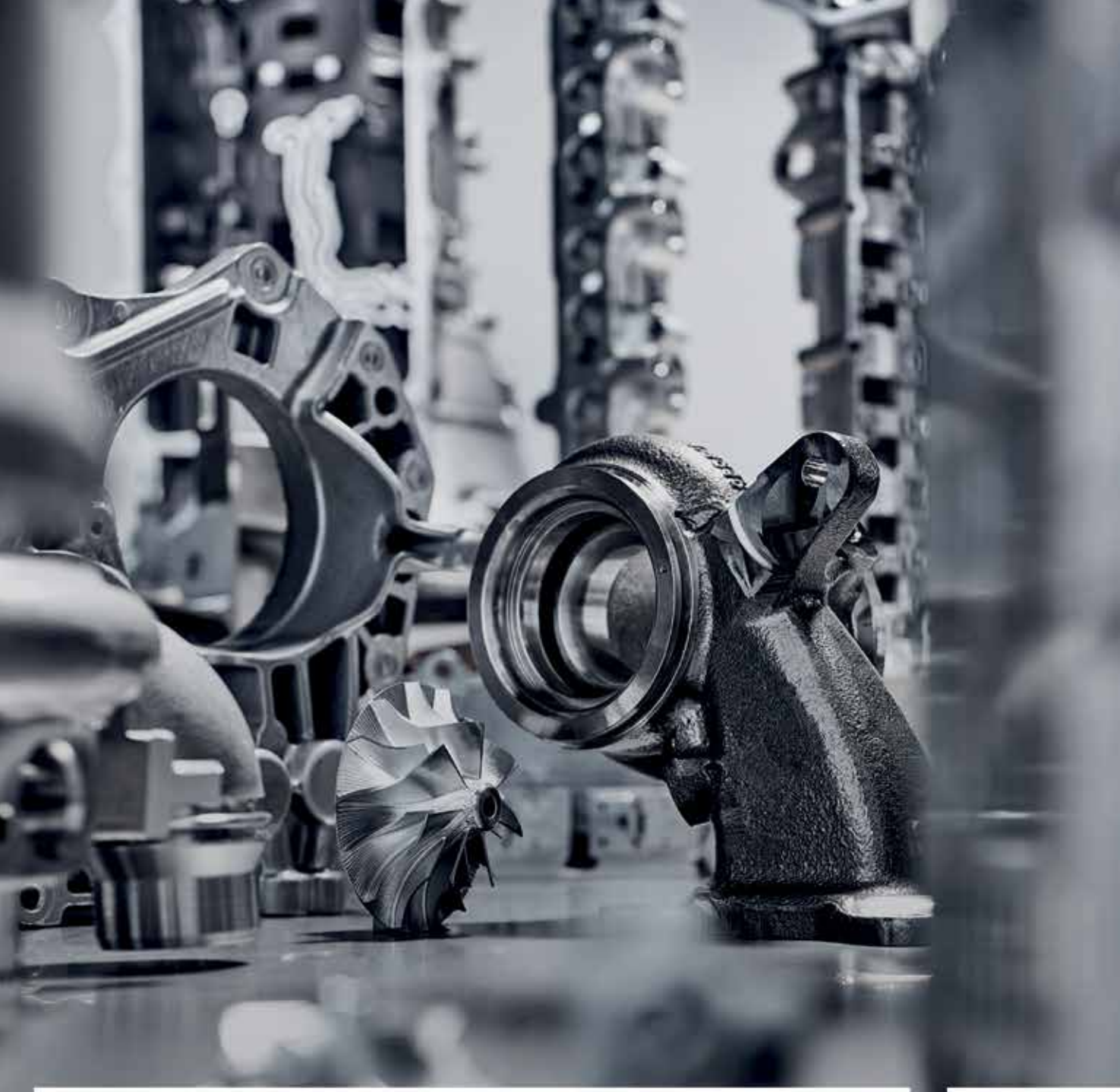
BMW Group Plant Spartanburg in the US state of South Carolina has doubled its capacity for production of high-voltage batteries. The plant's own battery facility now produces the new fourth-generation batteries. These are intended for the plug-in hybrid models of the new BMW X5 and the future BMW X3, also produced in Spartanburg.

"We have invested around ten million US dollars in a new battery assembly line and expanded the area to more than 8,000 square metres. This means we could double the number of batteries produced if needed to meet market demand," explains Michael Nikolaides, Senior Vice President Engines and Electrified Drivetrains, BMW Group.

The new assembly line will be able to produce different types of fourth-generation batteries to serve the growing range of electrified vehicles locally. These batteries are based on a new technology concept that further enhances their performance.

More than 120 people will be employed in battery production at Plant Spartanburg by the end of the year, having completed a comprehensive training programme to acquire the technological know-how needed for battery production.

"We have produced batteries on site at Plant Spartanburg since 2015 – making the BMW Group a pioneer for electromobility in the US," says Knudt Flor, President and CEO, BMW Manufacturing, Co., LLC. In the past four years, the plant's battery assembly team has produced a total of more than 45,000 batteries.



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The ACE list

Madhav Kulkarni

India MD, Nexteer Automotive

By Niranjan Mudholkar

Nexteer Automotive opened the India Software Center in Bengaluru in January 2019. How are you leveraging on this center to serve different markets?

The Software Center in Bangalore is going to serve Nexteer's three Engineering Development locations including Saginaw (USA), Suzhou (China) & Tychy (Poland) for all EPS software development work with Global Customers. Software plays an increasingly important role in the safety and performance of Nexteer's advanced steering systems. We view our software & electronic capabilities as key differentiators – especially as the market demand & steering function complexity grows with driver assist features & varying levels of automated driving. Nexteer is committed to deploying a best-in-class global team that delivers innovative solutions with speed, flexibility and seamless vehicle integration. The India Software Center expands Nexteer's software development by focusing on downstream software production and validation – ensuring quality & compliance with regulations and enables us to offer our global customers fast and flexible support.

> "The opening of Nexteer's facility in Chennai and our expanded production capacity in India are important pieces in our global strategy and represent our confidence in the growth potential of the automotive market in India."

With the inauguration of its third India plant in Chennai, Nexteer Automotive is also steadily increasing its manufacturing footprint in this market. What is driving this growth?

With Chennai plant we had launched our core product EPS (Electric Power Steering) for Indian market. The Chennai plant is going to focus mainly on EPS product. We are also putting state-of-the-art Drive Line (HS) manufacturing foot print in Chennai & that will cater mostly for export of HS products to Global customers. With Chennai Plant, we had launched Nexteer's core product - the high quality & safety-critical Electric Power Steering (EPS) products to India, as well as fast, responsive service to better serve our customers.

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Nexteer's EPS systems enhance driver comfort, control & feel-of-the-road, while also enabling ADAS features, like lane keeping, park assist, lane departure warning, traffic jam assist & more. EPS systems also offer automakers increased fuel efficiency and reduced emissions. At the same time, they help give your vehicle personality and performance. The opening of Nexteer's facility in Chennai & our expanded production capacity in India are important pieces in our global strategy & represent our confidence in the growth potential of the automotive market in India.

How is the Chennai plant enhancing Nexteer's manufacturing capabilities and capacities?

Chennai plant will have installed capacity of about 550K EPS systems & 1.2 million HS per year. This is state of art facility for both EPS & HS products with latest technology and controls.

Tell us about your customers in India.

We supply to most of the major OEMs in India. They include Maruti Suzuki, Renault & Nissan, Tata Motors, Mahindra, etc. We offer them the systems integration & cost optimized solution, which is suitable to meet the Indian market. We get involved with customers from design stage so that we can also work jointly on optimum solution.

What are some of the key trends that we can expect in the segments of Steering and Driveline? Tell us what Nexteer is doing in this context.

As you aware with BS VI change, safety & economy of drive, the EPS transition will happen fast in passenger vehicle segment up to SUV. We are here to support all customers with most suitable solution in this regard. On drive line with EV transition, we will have challenges for Indian market. We will use our global product experience to support our customers in India.

The field of mobility is going through disruptive transformations constantly. How is Nexteer Automotive is responding vis-a-vis these dynamics?

Relentless innovation is part of our culture. Everyday around the globe, we pursue new ways to enhance safety & performance for today's world & an automated future. EPS is a key ADAS enabler for features on the road today such as park assist, lane keeping assist, lane departure warning & traffic jam assist. Besides, our Steer-by-Wire technology unlocks new benefits for both drivers and OEMs in future mobility, and enables further functions, like Nexteer Steering on Demand™ System (Safe, transitions b/w manual & automated driving) & Nexteer Quiet Wheel™ Steering (Steering wheel remains still during automated driving) for automated driving. We work with most of Global Customers (almost 60 nos) including three Major USA OEMs. We are making sure that we are on track to meet / exceed the customer expectations in terms of technological innovations. In many cases we are partnering with Customers for innovations.

Having started its India operations in 1995, Nexteer Automotive is now heading towards its 25th year. How would you analyse the journey so far?

Last 25 years journey was challenging as we did transform through many challenges including Limited Bankruptcy by Delhi, where we got separated with independent company under Name Nexteer. Our major growth came after separate entity Under Nexteer brand & we are striving for US$ 200 million revenue by 2025.

Tell us about your exports business from India.

Our almost 40 per cent revenue is from exports & 50 per cent of this comes from direct export to Global Customers. We export Hyd Power Steering Pumps to PSA in France & Fiat in Turkey, Manual Steering Columns to Suzuki Japan. Also, we export HS through Renault and Nissan in India to their operations in Brazil, France & Japan.

How do you see the India market evolving in the next two years?

We will have many challenges with BS VI transition & EV drive from Central Government. Safety will become a major focus in coming years. Currently, the automotive industry is going through tough time & I am sure that we will come out of this soon y.

What is your vision for Nexteer Automotive India?

We are ready to support all customers in India & abroad in coming years with technologically advanced, quality products. We are looking forward for a quantum jump in revenue with customer experience management. Our vision is to have US$ 200 million revenue by 2025.

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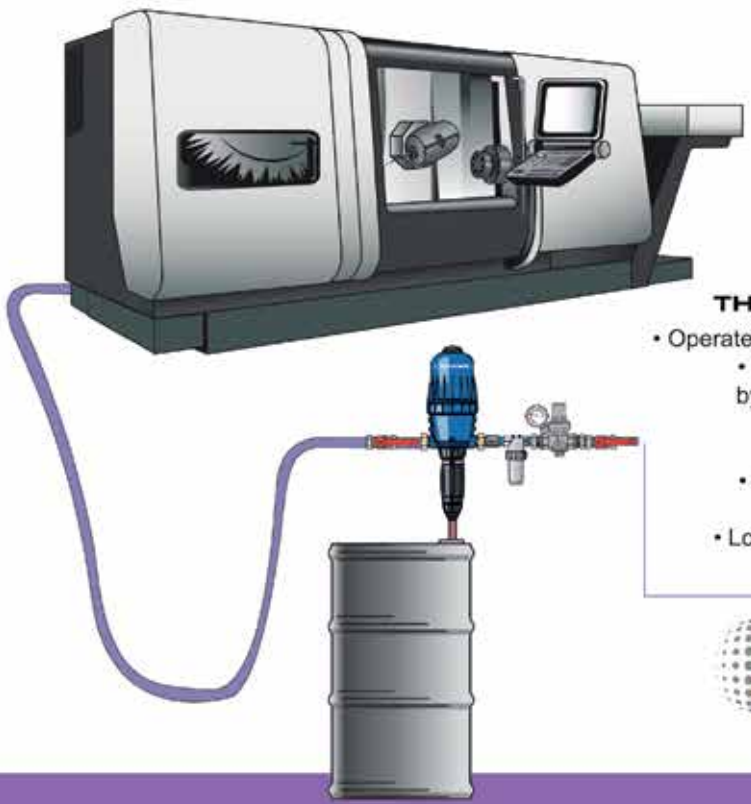

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The ACE list

Abhishek Jain

Chief Executive Officer and Managing Director,
PPAP Automotive Limited

By Swati Deshpande

How has been the last year for PPAP Automotive? How do you look at this year?

The previous year looked very promising in the beginning. In the first half, the market conditions were favorable which resulted in an increase in demand of vehicles. However, the weakening of demand started from the second half of the previous year and is continuing till date. The tapering demand started with the floods in Kerala last year and post that, there have been innumerable factors which have affected the growth of the industry. During the end of the year, general elections were round the corner, the fuel prices were shooting up and interest costs were rising. The start of this year also has not been smooth at all. There is an acute liquidity crisis which is leading to postponement of purchases of vehicles. During the end of the year, we will see the implementation of BS VI norms. There is uncertainty regarding policy matters. The Government is focusing only on promotion of EV vehicles but there is no incentive for ICE Engine vehicles. Overall, the sentiments remain negative and until & unless the liquidity improves and the Government supports the industry by reducing GST, this year is also going to be tough one, for the entire industry.

> Implementation of BS VI norms have brought about a tremendous disruption in the industry. The potential increase in cost of vehicles has forced many manufacturers to change their product portfolio including complete stoppage of Diesel engines.

BS VI regulations are to be implemented from next year. How are the Indian automotive and auto components industries getting ready for it?

BS VI regulation will be implemented with effect from April 1, 2020. The industry had to leapfrog from BS IV to BS VI in a very short time. All the companies embraced this challenge and invested in upgrading their technologies and are ready with their strategies for

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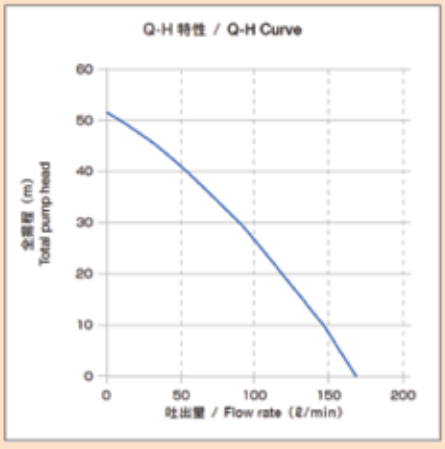
Suction Strainer	3mm (Solids larger than this must be removed from the tank)
Cyclone Filter	Water-soluble coolant fluid 100 µm: 99.9% (Silica sand Specific weight 2.7) Straight oil 100 µm: 80% (Silica sand Specific weight 2.7)

TOP -YTH①② -③CG

Motor capacity	1500: 1.5 kW
Motortype	R1: 415 V· 50 Hz R2: 230 V· 60 Hz R3: 200 V· 50/60 Hz R4: 400 V· 50 Hz R5: 380 V· 50 Hz R6: 440 V· 60 Hz 3 phase electric induction motor (IE3) with CE marking *Please contact us for other standard

③ Flow rate	50 Hz	I135CG: Impeller pump (5 stages / 135 LPM)
	60 Hz	I132CG: Impeller pump (2 stages / 135 LPM)
Filtering method		C : Cyclone type



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implementing these norms across their product range. Implementation of these norms have brought about a tremendous disruption in the industry.

The potential increase in cost of vehicles has forced many manufacturers to change their product portfolio including complete stoppage of Diesel engines. The shift from Diesel engines to Petrol engines will bring a lot of disruption in the Auto Component industry as well. Dedicated suppliers for diesel engines will face a tough time in finding customers for their products. However, we will also see some new component makers emerging in the emission product space. Till these norms are implemented, there is a lot of confusion in the consumer's mind regarding purchase of BS IV vehicles. This is also another factor for the reduction in demand of vehicles.

> "While adoption of EVs looks favorable in the public transportation space and point to point services, their adoption for private use may still be a few years away. Various companies are working tirelessly to develop technologies that will make EVs more affordable going forward.

For us, it is not much of a change as our products are used in any vehicle, be it a Petrol engine, Diesel engine or even an Electric Vehicle.

Globally, the trend of light weighting is seen in the industry for few years now. What impact does it have on auto component manufacturers? How has PPAP responded to this trend?

The prime focus on reduction of fuel consumption has led all automakers to focus on reducing the weight of their cars by using light weight components. Use of Engineering Plastic has been playing a major role in replacing traditionally used steel in many components.

PPAP has been consistently supporting this initiative by efforts towards reducing the cross section of its profiles as well as wall thickness of Injection Molding parts, thereby reducing the weight of the components manufactured by it.

Also, there is an increasing trend towards going green in the automotive industry. How do you look at it?

In today's world, everyone is aware about the concerns of the deteriorating Environment conditions and everyone is doing their bit to maintain the ecology and minimize their impact over the Environment. The vehicular emission is reducing with the implementation of new emission norms. As an industry, the OEM's as well as the component suppliers are doing their bit to reduce the impact of their respective operations on the Environment. The reduction of carbon footprint by reducing the energy consumption as well as use of alternate green power is one of the major focus of the entire industry.

Apart from that, there are many initiatives like zero water discharge outside the plant and use of recyclable packaging. Many companies are focusing on reduction of single use plastics like water bottles from their operations.

The industry also focuses on minimizing the use of conflict minerals. The focus for the industry is to ensure a sustainable environment around the activities done using a 3R approach (Reduce, Reuse and Recycle).

How do you look at the emergence of e-vehicles? How do you look at e-vehicles' future in India?

Electric vehicles (EVs) is the latest buzz word which is doing the rounds in the entire country. EV's comprise of a host of vehicles including CVs, Buses, PVs as well as Two and Three wheelers.

The government has shown its eagerness in early adoption of EV's and have launched promotional schemes like FAME II. They have reduced the GST to 5 per cent. However, the infrastructure for adoption of EV's remain a challenge in India. We still have to wait and watch the evolution of technology in order for EV's adoption across all product segments. As of now, it seems fragmented. While adoption of EV's looks favorable in the public transportation space and point to point services, their adoption for private use may still be a few years away. Various companies are working tirelessly to develop technologies that will make EV's more affordable going forward.

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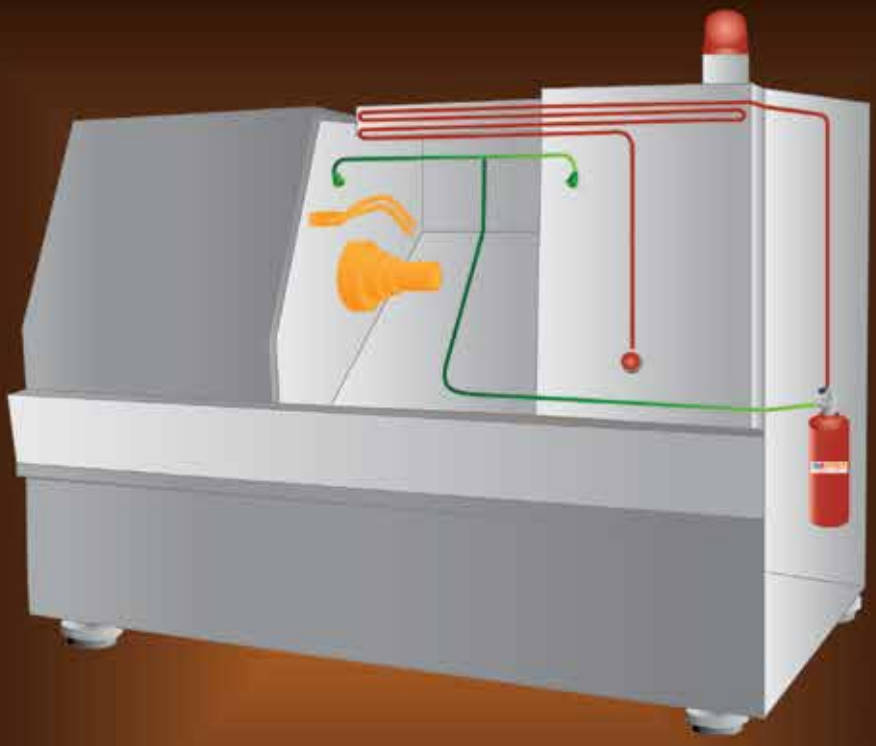

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APPLICATIONS

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Plastic Injection Molding Machines I Enclosed Automated Milling Machines I Wind Turbines I Server & Telephone Control Racks I Bus Engine Compartments
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The ACE list

Sunjay Kapur

Group CEO, Sona Group

By Swati Deshpande

The EV revolution will start with the 2 & 3 wheelers and then go to busses and trucks before it hits the passenger car market.

How has been the last one year for Sona Group and what are expectations from current financial year?

The last year has been exciting for us as we have been focusing on further developing our case differential business. We have migrated in the last 4 years from being a component player with bevel gear manufacturing to a system player which can design & manufacture the entire drive unit. Over the last year we have secured future orders for differential assemblies/drive units from global OEMs and Tier 1 suppliers in the EV as well as ICE space. We have also been expanding our capacities; & are in the process of building a new facility in Chakan in Maharashtra as well as an expansion project in Manesar, both of which will come online in Q3 2019.

In the current financial year, we have begun to see slowdown in volumes. I cannot predict when we will see a recovery, however I can confidently say that we will eventually see growth in a 5 year time frame; and that is what we are planning for. We have a strong balance sheet & a robust order book, so we will ride out this cycle comfortably.

The trade war between the United States & China will have an adverse impact on exports to the US & China, and this will be an opportunity for Indian companies. We should use this opportunity to see how we can increase business.

How do you see penetration of EVs in the Indian market?

The EV revolution will come to India just like it will in Europe or the US. Companies are more cognizant of government regulations that will force vehicles to go electric. It will start with the 2 & 3 wheelers & then go to busses & trucks before it hits the passenger car market. It will be key for India to build the right infrastructure to support the growth. As consumers become more conscious of the environment, the need for EVs will increase & this will push OEMs to adapt their product offerings. We have been working towards this for last three years & are ready to embrace this wave as a large opportunity to grow our EV portfolio & emerge as one of the leaders in supplying EV specific solutions to all our Indian & global customers.

Light weighting is one of the buzz words today. How do you look at that?

Light weighting is absolutely essential for several reasons. When we started looking at light weighting, it was for better fuel efficiency, now it is for electrification. An EV is a lot heavier than the traditional vehicle because of the batteries. Therefore, all other components will have to be lighter to allow the vehicle to operate efficiently.

Our tag line is 'more torque per gram', which simply means more performance per gram of steel & this is mostly about lightweighting. We are doing a lot in this area. We are looking at different materials as well as designs to reduce the weight of our product.

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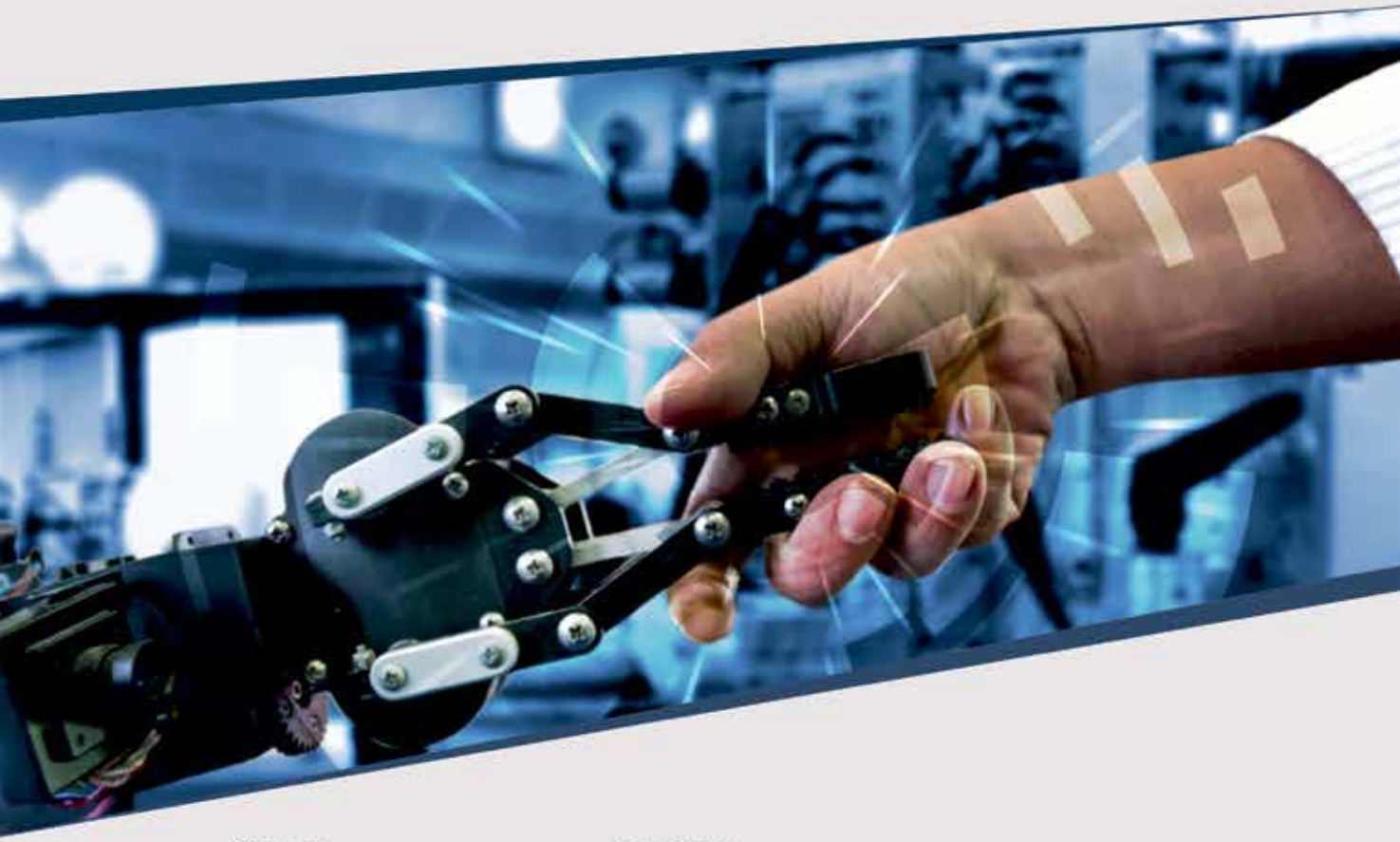

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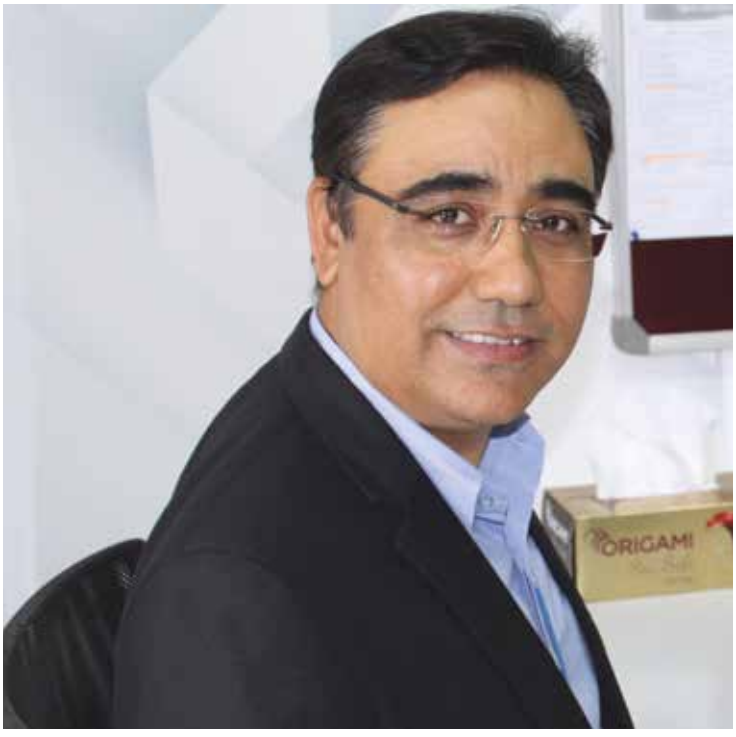
The ACE list

Bijay Krishna Shreshta

Chairman and Managing Director,
Toyoda Gosei South India Private Limited

By Swati Deshpande



As a part of eco manufacturing plant, we have initiated special activity to reduce waste with 'Mottai Nai approach' (Don't be wasteful) aiming to become Role Model Company in TG world by 2020.

How has been the last year for TGSIN?

Last year was good for us. We could expand our business to Renault which is one of the milestones. We would not only be contributing towards product manufacturing but also be playing a key role in product design and process development with the French major. The another feather in cap was that the company was recognised by Toyota Kirloskar for being one the best cost performer and Best Value Engineering (VE) company.

This year, demand in the market has weakened. We are utilising this opportunity to improve our systems and strengthen our operations, by more resource rationalisation, thereby improving our efficiency and become competitive to garner future business. Innovation in technology and products, strategic marketing and smart manufacturing will play a key in future business growth. We are focusing on human resources development with training program in India and overseas to improve their skills as part of Skill India. I strongly believe in supporting the cause of Make in India, by increasing our tool and product development locally.

BS VI regulations are to be implemented from next year. How are the Indian automotive and auto components industries getting ready for it?

The focus by the government towards a cleaner environment, by making BS VI compliant vehicles by 2020 is welcome.

Changes in the vehicles like on-board diagnostics, RDE (Real Driving Emission) monitoring systems will have a significant impact on the technology enhancement and cost increase. The vehicle cost is expected to increase by 15–20 per cent.

The concern point to automotive industry is about the possibility of inventory management of BS IV vehicles post April 2020 and the demand projections for BS VI vehicles.

In spite of such challenges, the automotive and automobile industry, have as been undertaking transformation in its process, facilities and other resources to comply with the BS VI requirements. This also has resulted in substantial capital investment in quite many industries, but keeping in mind the environment concerns the entire automotive and automobile industry is taking efforts to support the government initiative.

Also, there is an increasing trend towards going green in the automotive industry. Can you tell us about some of the initiatives that you have taken?

When we talk about 'Going Green', the primary indus-

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try in focus is the automotive industry. Every automobile maker and the related automotive industry is now giving more thrust to the research and development of more eco-friendly materials which are reliable and recyclable.

However, when we talk about going green, it promotes development of green concepts like the Green Supply chain and management, Green manufacturing, module assembly, ECO design, Reverse logistics, etc. contributing significantly in reducing the carbon footprint. That means it's an opportunity to enhance our knowledge by adopting new technologies, improvements, reduce wastages and contribute to the ecosystem.

Using renewable energy is one of our prime aims to reduce the CO2 emission in line with Toyoda Gosei's Environment Challenges 2050. This year we could run our operation 70 per cent on solar energy and aim to achieve 85 per cent by year end. As a part of eco manufacturing plant, we have initiated special activity to reduce a waste with 'Mottai Nai approach' (Don't be wasteful) aiming to become Role Model Company in TG world by 2020.

"

Changes in the vehicles like on-board diagnostics, RDE (Real Driving Emission) monitoring systems will have a significant impact on the technology enhancement and cost increase. The vehicle cost is expected to increase by 15–20 per cent.

Globally, the trend of light weighting is seen in the industry for few years now. What impact does it have on auto component manufacturers? How have you been helping OEMs achieve success in this area?

Weight reduction of about 10 per cent in the vehicle contributes to 6–20 per cent improvement in fuel efficiency, depending on the models.

Today, light weighting has opened up opportunities to plastics raw material makers, designers and component manufacturers to come out with products, which are more strong, reliable, durable and sustainable. Lot of metal replacement to plastics like fuel lids, front end module, shafts, engine components, powertrain parts, etc. have played a great role in weight reduction.

We have been acting as a bridge between the OEM and the raw material manufacturers in identifying, developing and promoting low weight materials, generation of new design ideas with support of Toyoda Gosei, Japan in this direction.

"

Today, light weighting has opened up opportunities to plastics raw material makers, designers and component manufacturers to come out with products, which are more strong, reliable, durable and sustainable.

Plastics Fuel Filler pipe, Lightweight integrated Grille supporting autonomous driving with sensors are pioneer products developed by TG.

How do you look at the emergence of e-vehicles? What challenges are being faced by the industry in this segment?

The promotion of e-vehicles in India looks promising, but comes along with challenges. Currently, India is emerging as one of the promising automobile markets, shall offer big opportunities to many OEMs to expand their market share. The changes needed in terms of the design, materials, etc. in the automobiles would give raise to many auto component industries. With e-vehicles contributing less than 10 percent of the total sales, it's not going to be a smooth road in India.

Biggest challenges lie in the infrastructure establishment in terms of the charging stations, the technology required and maintenance and sustenance of the same. Also, manufacturing cost of EV cars being very expensive, it is not affordable for the Indian market in present condition.

As we all know Battery is the most critical part of EV. Currently Lithium – ion Batteries (LIBS) is widely adopted. Affordability, distance coverage and of course the recyclability of battery are the serious issues to be tackled.

Clear long-term policy addressing above challenges, promoting research, development associated with EVs related car manufacturers and auto component industry is required to be formulated by the government.

Significant measures to build a strong infrastructure across the country will definitely boost the EV market in India. The main purpose of EVs is to have better emission control. Considering the challenges ahead we also need to explore the possibility for promoting hybrid technology as a front runner in this EV drive. However, we foresee a global trend of transformation from IC engine cars to EV primarily with hybrid electric vehicle, plug in hybrid electric vehicle, battery hybrid cars and fuel cell cars.

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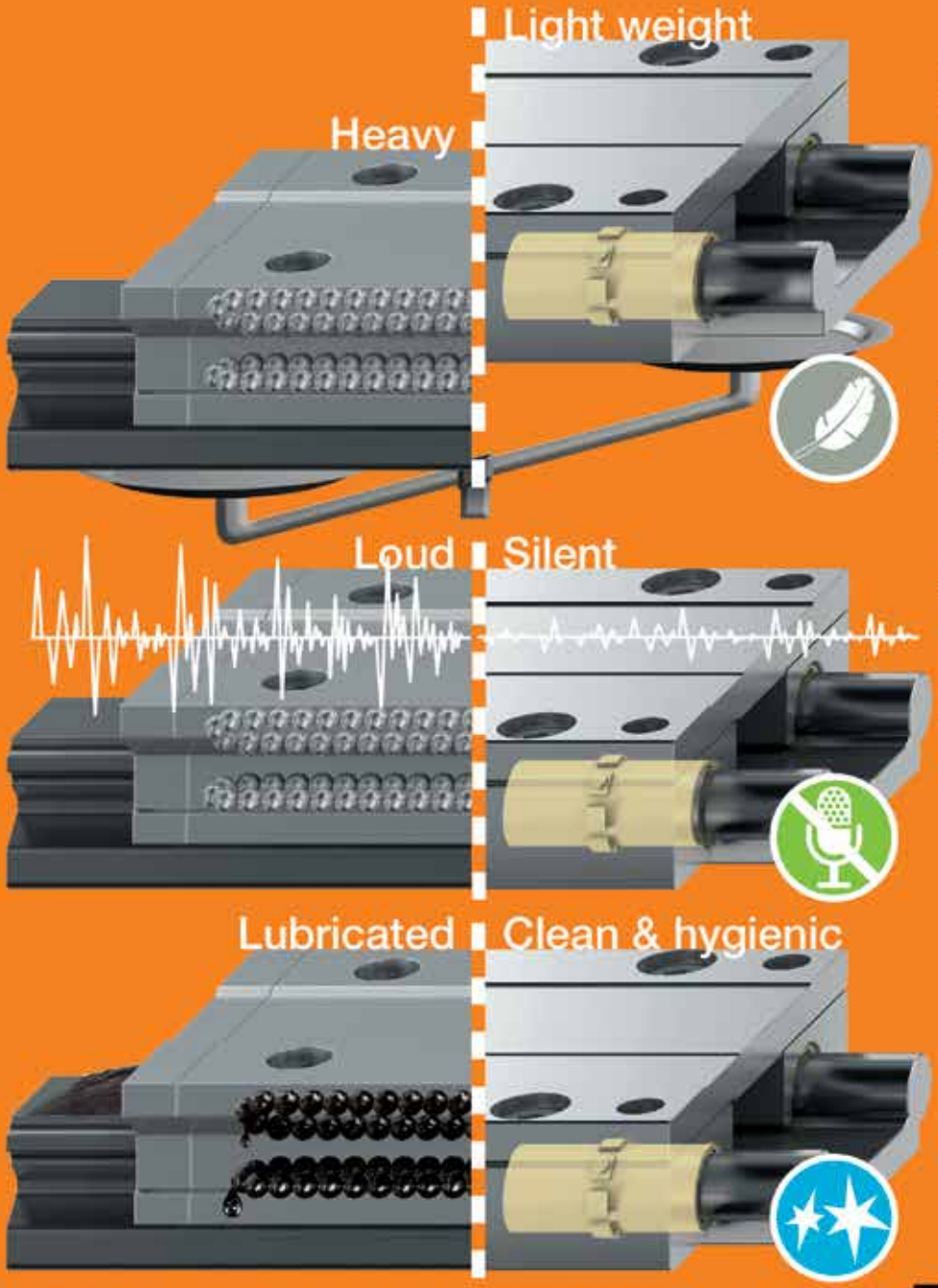

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The ACE list

Varadan Devanathan

President, Yanfeng India Automotive Interior Systems Pvt. Ltd

By Swati Deshpande

How has been the last year for YFAI India? How do you look at this financial year?

Indian market has been challenging in the last year and continuing the same trend this year as well. At YFAI, we use this challenge as an opportunity to focus on internal efficiencies and benchmarking and sharing best practices across our global footprints. We have an internal system that provides a platform to share best practices and focusing on this helps to improve synergies and enables to face tough situations. We continue to improve our competitiveness through these efforts.

We have also been utilising this opportunity to build our local capability and position YFAI to strategic success. We have developed a growth strategy for India aligned with our global customer and product strategies. Part of this requires widening our customer base and executional excellence through bringing in new technology, development of people and supply chain. We have installed a paint shop and invested in some specific technologies that were required for a new customer and doubled our footprint in Chennai

> The automotive industry is facing drastic changes in the form of Connected Car, Autonomous Driving, Shared Mobility and Electrification. YFAI's ambition is to drive, rather than react to, the significant shift in the automotive industry that is being shaped by these global megatrends, new market players and technologies.

This year, we are additionally focusing on hosting Technology shows at customer locations wherein we display our key innovations that are considered to be market trends. Some of the area of focus this year has been Smart Surface, Ambient Lighting, Light Weighting and Decorative technologies. We have completed two such shows and are planning to conduct similar shows across current and prospective customer base. The innovations that were displayed have been much appreciated by customers.

There is an increasing trend towards going green in the automotive industry. How do you look at it?

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How is YFAI working towards it?

Reducing weight is one of the avenues to help go green. At YFAI, we work towards bringing down the weight of the interiors where some of the light weighting technologies have helped to address this requirement.

The use of natural fibre-reinforced composite materials is currently gaining new impetus in the form of decoratively finished designs which retain a natural appearance. YFAI is developing such products.

Our innovative compressed fiber molding process makes it possible to reduce door panel substrate weight up to 40%. This as a lightweight solution can be beneficial to improve fuel economy to meet defined standards.

It also combines the advantages of natural fiber and thermoplastic so that either technology can be deployed where needed to maximize door trim panel performance.

Our streamlined, single-step process reduces production time and costs for delivering a high-quality mass-saving solution.

> "
>
> In the future, every surface inside the vehicle can become a smart surface. Various operating functions in the vehicle will be seamlessly and invisibly integrated into the design of the interior, and information will always be able to access flexibly.

Other weight saving materials and processes have been developed for our products to reduce the combined weight of the interiors with a different approach to suit customer functional requirements. These all offer the benefit for improved fuel economy.

How do you look at connected cars and autonomous driving?

The automotive industry is facing drastic changes in the form of Connected Car, Autonomous Driving, Shared Mobility and Electrification. YFAI's ambition is to drive, rather than react to, the significant shift in the automotive industry that is being shaped by these global megatrends, new market players and technologies.

One of YFAI's advantages is our focus on the futuristic interiors, starting with our understanding of end-consumer needs and wants, our insight in new technology and our ability to transform all this know-how into solutions for car interiors that create a better life on board.

One such innovation is Smart Interior Surface (SIS) that may gradually find its adaptation in Indian market. Innovations, combining adaptations of developing technology but suited to the demanding vehicle requirements, are very exciting. YFAI has several SIS products which are redefining the vehicle interiors.

Interiors is changing and the areas where consumers will concentrate for media and control functions are changing. In the future, every surface inside the vehicle can become a smart surface. Various operating functions in the vehicle will be seamlessly and invisibly integrated into the design of the interior, and information will always be able to access flexibly. This will be made possible by the seamless integration of HMI (human-machine interface) technologies, such as displays or capacitive switches. In the vehicle's interior, Smart surface particularly offers a wide latitude of design freedom.

We are particularly proud on our Multifunction Deco Panel (MFDP) products recently launched with one of our global customers. The interest in MFDP through our current series of India technology shows is overwhelming.

Understanding the trends, customer needs and changing interior requirements is the key and we are looking forward to introducing these products in the next generation local vehicles.

How do you look at the emergence of e-vehicles? How do you look at e-vehicles' future in India?

There is a great deal of information available on the prognosis for the e-vehicles on the India market which is following global trends to use hybrid and electric vehicles.

Also, there is the drive from the government to promote and develop the infrastructure along with innovation incentives to enable e-vehicles to be more suitable for the consumer.

Local development of electric 2 and 3 wheelers are being well publicized and the introduction of electric vehicles with higher distance range makes their acceptance more attractive. Public transport initiatives to use electric busses is already developing.

Consumers are becoming aware of the environmental benefits and the infrastructure considered to be provided by energy concerns and the automobile industry combined will gradually enable more consistent city performance and long-range use of electric vehicle.

This trend for all vehicle segments will continue to develop. The rate of this development is still being analysed. At global level, YFAI believes this is an opportunity and is working with new age vehicle manufacturers, who are focused on EV. This will provide a strategic advantage to YFAI in India as and when the migration to this technology happens.

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Fourth Edition

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Swati Deshpande | +91 9920400833

For Delegate Registration: **Fiona Fernandes** | +91 9930723498

(For automotive professionals only)

For Partnership Opportunities Contact:

West & North

Ranjan Haldar | +91 9167267474 | ranjan.haldar@wwm.co.in

Jangam Gangaram | +91 9820053063 | jangam.gangaram@wwm.co.in

South

Mahadev. B | +91 9448483475 | mahadev.b@wwm.co.in

Prabhugoud Patil | +91 9980432663 | prabhugoud.patil@wwm.co.in

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The ACE list

Suresh KV

Head of ZF, Region India

By Swati Deshpande

India is also growing as an important production location for ZF in supplying to their global customers. Today, we are already exporting Commercial Vehicle chassis components as well as occupant safety system components.

How has been the last year for ZF India? How do you look at this year?

In 2018, we brought about some changes that reflect the increasing importance of the Indian market, in the ZF world. India became a stand-alone region in the ZF organization with a direct representation by a dedicated responsible Member at the Board of Management.

Considering production, India benefits in two ways. On the one hand, ZF is continuing its successful local for local approach, by expanding capacities to assure that the growing local customer demands in the future can be fulfilled. However, India is also growing as an important production location for the company in supplying to its global customers. Today, we are already exporting Commercial Vehicle chassis components as well as occupant safety system components. We continued our investment for extending local production facilities such as the Plant expansion in Pune, the joint venture plant inauguration at TRW Rane in Trichy and the new axle assembly line in Coimbatore. Furthermore, the Indian Technology Center (ITC) in Hyderabad, an engineering hub for ZF group worldwide, has been steadily growing, outperforming the planned numbers

BS VI regulations are to be implemented from next year. How are the Indian automotive and auto components industries getting ready for it?

The new BS VI emission regulations and axle load requirements becoming effective for new vehicles delivered after April 1, 2020 foster truck manufacturer and fleet owner to shift up gear. The race is up for the most price competitive solutions to fulfil the new standards. ZF offers lightweight chassis components as well as transmissions to supports OEM customers in the development of more fuel-efficient vehicles. Systems and components with a reduced weight, such as dampers, tie rods or transmissions have a direct effect on the fuel efficiency. Other solutions such as clutches and automated manual transmissions help indirectly. All these support the fleet owner to keep the Total cost of ownership lower even though the initial costs are higher. Shifting a higher torque with more gears will increase driver fatigue. With an automated manual transmission such as ZF's 'EcoTronic mid' model, the rides will become much more comfortable and will also keep the running costs under check, as there will be reduced dependence on the skill and experience of the driver.

Globally, the trend of lightweighting is seen in the

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E-vehicles and electrified powertrains will play a vital role when it comes to reaching emission targets. However, electrification should not only be purely reduced to battery-electric drives. Putting all eggs in one technology basket will surely be a mistake.

industry for few years now. How have you been helping OEMs achieve success in this area?

Lightweight design is a key technology when it comes to reducing vehicle energy consumption. For the passenger car chassis, the company has opted in favour of several, mutually complementing solutions: Engineering focuses on the structural optimization of components and the integration of functions. In addition, alternative materials, such as aluminium, carbon fibre reinforced plastic (CRP) or glass-reinforced plastic (GRP) are used, and advanced production procedures are applied. These approaches help to reduce the weight of control arms, tie rods, suspension struts, dampers and entire axle systems.

Weight reduction in the passenger car chassis is not only an important aspect for electric vehicles where reduced weight results in an increased range and thus greater acceptance, saving weight on board, has advantages in all vehicles. Fuel consumption and, in parallel, CO2 emissions are consequently reduced in conventionally motorized passenger cars as well. At the same time, lower non-suspended masses lead to greater driving dynamics and more comfort and safety.

Also, there is an increasing trend towards going green in the automotive industry. How do you look at it?

As an innovative and sustainable technology provider, our company is working on solutions to support this trend. The Group is constantly extending its portfolio of products to reduce CO2 emissions, including solutions such as hybrid and electric drives for all kinds of vehicles. In addition, ZF is also addressing sustainability on a corporate level to meet its responsibility toward people and the environment by implementing a range of different environmental protection measures. This responsibility is anchored in the company's values and protects against entrepreneurial risks – in the areas of compliance, customer relations and reputation – while improving operating efficiency and benefiting the environment. Conserving natural resources is the fundamental principle of ZF's environmental strategy. A corresponding policy therefore includes essential areas of activity such as climate protection, the environmental impact of production, eco-friendly product design and environmental performance improvement. The "design for environment" principle puts particular focus on environmentally friendly product design. Relevant aspects must be proven by means of a checklist at various steps in the development process, taking into account environmentally friendly manufacturing and manufacturability, wear, serviceability and repairability, recyclability and environmentally sound materials.

How do you look at the emergence of e-vehicles? How do you look at e-vehicles' future in India?

E-vehicles and electrified powertrains will play a vital role when it comes to reaching emission targets. However, electrification should not only be purely reduced to battery-electric drives. Putting all eggs in one technology basket will surely be a mistake. ZF promotes a discussion that is open to all types of technology with a coexistence of hybrids and all-electric drives for a very long time.

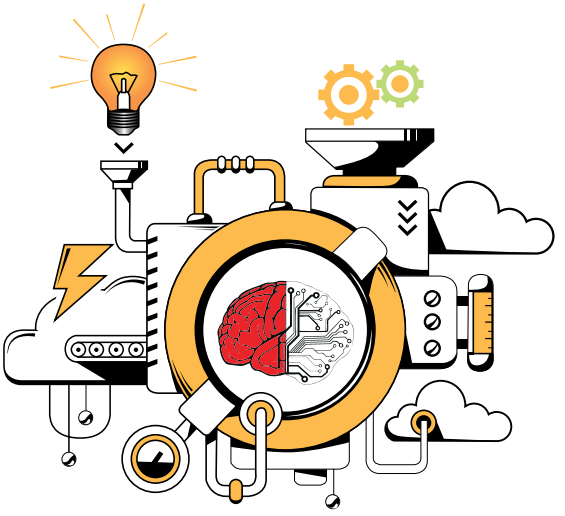
The hybrid's greatest strength is its flexibility. A modern plug-in hybrid is the all-round drive for family cars. In inner cities and environmental zones, on short and medium-range routes on the way to work and to buy groceries, they drive all-electrically and thus with zero emissions. Operated conventionally, the same vehicles can also run a long distance, for example when going on holiday by car.

With regard to the Indian market, plug-in hybrids can enable a fast market launch for electrification, as long as there is no viable overall concept, let alone implementation, when it comes to loading stations, network structure and payment systems. In this area, there is a need for action that will last for many years.

By Dr. Narendra Bhat

TAKING CARE OF ENERGY!

Operations of industrial buildings represent a huge potential for energy efficiency.



"The solutions for energy efficiency can be often adopted without disturbing the current electrical system."

Residential and commercial spaces are always the pursuing energy conservation measures, but industrial buildings and warehouses are often neglected in this area, often despite huge energy bills because what is inside them are considered more important than the operations of the buildings themselves. These represent a huge potential for energy efficiency and this article highlights some great opportunities for reducing the energy bills. Typical industrial or warehouse facilities can have some of the below elements that consume energy.

- High Mast Lighting,
- Interior lighting (in offices and aisles),
- Air Conditioning systems (serving office spaces and machine rooms),
- Lighting on conveyor belts or equipment,
- Motors and Pumps,
- Machinery used in direct production and equipment for material handling.

The last item on the list, i.e. machinery that is directly functional towards production and material handling is often used as per requirements of the business. It may be more difficult to conserve energy or take efficiency measures on it. However, the other load components mentioned can be controlled to achieve the best possible energy efficiency.

High mast lighting: If the industrial or warehouse space has high mast lighting then there is potential for savings if it currently uses metal halide lighting. Most high mast lighting typically use 12-15 light fixtures and by replacing metal halide with LED flood lighting, the electrical load can be reduced by nearly 50 percent. A centralized control can be integrated for to control (switched ON) as required from a remote location or via Smart Apps, alternatively scheduling can also be done based on operating shifts to reduce the usage. The solution can reduce the high mast energy consumption by further 10-20 percent with payback periods within 10 to 12 months.

Interior Lighting: Offices have lighting operating at most hours often even during the daytime, and even if the format is LED, a 10-15 percent of energy savings. Lighting energy is often wasted in an office space especially in the conference, meeting rooms, restrooms, aisles, lobbies and pantries. Motion Sensor based solution for controlling these loads provide the best returns without needing to change existing lights and often wireless motion sensors can be deployed within finished offices, to retain the aesthetics of the finished spaces, without adding wiring. The savings possible on these loads on adopting the solutions is around 15 – 20 percent, with payback often being under 12 months

Air conditioning: These are higher consumers of energy than power. They are present not only in office spaces of the facility but also in parts of substations. Variable Frequency Drives (VFDs) used to operate the various Motors in the facility and VFD controls are installed in separate rooms other than the panel rooms of the

substations as they require air conditioned space. These air conditioning units often operate 24x7 and also have standby air-conditioning units due to the criticality of the equipment. In many situations these "Drive Rooms" are overcooled beyond the required 24°C, thereby consuming more energy. A centralized AC control can be installed to encompass the control of all split units across the property. These centralized AC control systems which operate multiple split ACs can also monitor the room temperatures to turn them ON/OFF more effectively, allow for switching between the working and standby units as per schedules, allow centralized status monitoring and control, run the units as per schedule and control the set temperatures centrally. Around 15-20 per cent reduction in energy consumption with 12-14month payback is achievable in most situations.

Conveyer & equipment lighting: Lighting on conveyors and equipment is an opportunity because such lighting stays on even when not needed. Often conveyor lights are installed throughout the belt and can run several meters long. They can be operating throughout the night time (approx. 10 hours) and in an enclosed conveyor belt, operating 24 x 7. The same holds true for much of the production equipment which are well lit. These lighting can be efficiently controlled with wall mount occupancy/motion sensors, but multiple sensors would need to be placed as needed. There is a huge savings potential with energy savings often around 60–80 per cent and the payback within 10–12 months.

Motors & pumps: These are high capacity units whose consumption of energy and operating status can be monitored if their Panels allow for connectivity via Modbus protocols. This is beneficial if remote monitoring and centralized control of these can provide means of reducing energy consumption of such units. It is sometimes feasible to monitor the current consumption to even trace operating issues if it operates at levels beyond the specifications, which is an added bonus of safety.

The solutions for energy efficiency can be often adopted without disturbing the current electrical system. They can be overlaid in the facility to quickly provide the control and the monitoring required while delivering the energy efficiency.

The author is Founder & President of BuildTrack. He was formerly a consultant for McKinsey & Company, Inc.

By Swati Deshpande

SMART TECHNOLOGIES: POSITIVE DISRUPTION

Ravichandran Purushothaman, President, Danfoss India says that it is important to acknowledge the positive effects that technology upgradation will bring to the efficiency of the manufacturing process.

"With its investment in smart technologies across the campus, the employee productivity has gone up by 30 percent, scrap costs down by 20 percent, and customer complaints by 57 percent."

Can you please tell us about the implementation of Industry 4.0/Smart Factory in manufacturing facilities?

Digitization across industries has given rise to the phenomenon of smart manufacturing, paving the way to industry 4.0 that allows for the creation of flexible business models. In our opinion, this has contributed to reducing wastage of resources and the consumption of energy, promoting increased efficiency, faster turnaround, better quality, faster time-to-market, integrated supply chain and better security.

Earlier this year, Danfoss' compressor factory in Wuging, China was recognised among the 16 of the world's most advanced smart factories – as one of the so-called Fourth Industrial Revolution production sites. With its investment in smart technologies across the campus, the employee productivity has gone up by 30 percent, scrap costs down by 20 percent, and customer complaints by 57 percent.

By investing in smart technologies, companies are now able to produce customer-centric solutions which should ideally be the main architecture of our design principles. Industries should also look at incorporating design thinking in their products to ensure that we build them in a manner that helps our customers connect to various devices and gain maximum value from the products and solutions.

In simple terms, it also enables manufacturing facilities in achieving operational excellence. With emerging and advanced technologies like Internet of Things, 3D printing, big data & analytics, players like us are empowered to design, modify and create products & solutions that customers are looking for, thereby helping companies explore new revenue opportunities.

How does the technology make sense in Indian context where labour is available in abundance?

Productivity & Quality will increase with more smart manufacturing techniques. With right kind of skillsets being imparted to the new workforce, technology and labour can complement each other in tomorrow's production facilities, thereby leading to India becoming the manufacturing hub for the world.

Let us take the example of OLA or UBER where technology has improved customer experience but has also used the available labour force in an efficient manner.

We can see how the government is making use of

smart technologies through policies like the eNAM market.

The most integral role of technology is towards aiding the process of productivity and efficiency of the labour workforce, and not to replace it.

In a market like India, the government's vision towards 'Make in India' and the favourable demographic dividend makes it an attractive phenomenon for global manufacturers to set base in the country. Furthermore, it also makes the process of up-skilling an uncomplicated process and they are more receptive towards the innovation and usage of newer technology.

> With right kind of skillsets being imparted to the new workforce, technology and labour can complement each other in tomorrow's production facilities, thereby leading to India becoming the manufacturing hub for the world.

By enhancing our skillset and adopting 'smart manufacturing', India can surely be positioned as one of the top three manufacturing destinations by 2020.

Technology upgradation calls for disruption as well. What disruption do Smart Factory technologies cause at the operations level? How do you deal with such disruption?

It is important to keep in mind that digitization and any modern technology will certainly be disruptive. In such a scenario, companies need to ensure that the golden triangle of change is ready to make the transition i.e. people (who are at the crux), processes (which require human intervention) and technologies (that help perform processes).

Noting that the disruption will be positive, it is importance to acknowledge the positive effects that technology upgradation will bring to the efficiency of the manufacturing process. With AI and VR, there is scope for lesser errors, greater accountability and faster turnarounds that help in addressing customer requirements in an agile manner.

For e.g: Recently when a customer in US had an issue and their service engineers were challenged, our R&D experts were able to simulate the scenario in our labs and offer a resolution. Thanks to the advancement of 3D technology, down-time, travel time, costs and efficiency could be managed remotely from halfway across the globe.

Technology upgradation calls for new skills set. How to deal with the challenge of skill upgradation?

Currently, the Indian manufacturing sector has the potential to grow six-fold by 2025 up to $1 trillion, creating up to 90 million jobs. With the current Government's Make in India initiative, this sector is set to grow further. The fact that India is a developing country gives us an added advantage that we are at the 'start' line. This gives us the opportunity to apply knowledge that has been proved successful in similar societies and learn from their mistakes.

At Danfoss, we believe that the industry needs to engage more with universities to build a strong ecosystem for innovation and to enhance skill-sets of the future generation of decision makers. With the government's initiatives alongside the NSDC, we are confident of building a strong ecosystem for the future workforce of the country.

To foster the engineers of tomorrow, Danfoss has a comprehensive university engagement program that connects with student community in campuses across India. A unique partnership between industry and academia, the Danfoss university engagement initiative plays a key role in imparting industry-specific knowledge and the latest technology in climate and energy to engineering students, besides encouraging them to think innovatively.

While focus remains on building the skill-set of newer members of the workforce, it is also essential for the companies to invest in the periodic upskilling of their existing workforce in order to ensure continued efficiency that will translate to maximised productivity.

By Shyam Motwani

RUNNERS, REPEATERS, STRANGERS!

Lean Thinking focuses on streamlining the manufacturing process as a whole. This concept is not only applicable to the physical resources that the company uses to produce goods but also to the natural and technological resources like Men, Materials, Money and Methods.

"Lean is not just about removing Cost; but it is about reduction of waste by focusing on what adds value, and not just trying to identify the wasteful steps in an isolated process."

The world is getting more and more conscious about wastage. The Government, communities and individuals are constantly promoting elimination of waste and adoption of mindful disbursement. Optimization has been the core concern of the manufacturing businesses. Better management at all levels of production help the companies achieve high productivity and customer satisfaction. Lean manufacturing and its tools have transformed the manufacturing sector over decades and are now acting as catalysts in the speedy service of ecommerce. Lean Thinking focuses on streamlining the manufacturing process as a whole. This concept is not only applicable to the physical resources that the company uses to produce goods but also to the natural and technological resources like Men, Materials, Money and Methods. Reduction of resources used in manufacturing, handling and delivery of products can help e- commerce swiftly run its processes without causing a loss of 'value' to its customers.

One of the key tools in Lean Thinking is the Runners, Repeaters, Strangers (RRS) approach. RRS —'runners', 'repeaters' and 'strangers' form an excellent strategy for production scheduling and supply-chain management. It uses the philosophy of constraint management to reduce the loss in the manufacturing throughput and identify the critical drivers of sales. For instance, if we take products; organizations usually find that its just 20 or 30 percent of their portfolio of products that account for bulk of the sales. These are classified as Runners or the hero products. The market demands Runners on a regular basis, and hence the organization has to produce them consistently over the year. These products are cost – efficient and enjoy maximum supplier support.

Simply put, I would call runners, the heartbeat of an organization, as they account for a steady and predictable flow of work and resources. Repeaters are products that are in demand during a specific time of the year. There is usually a set pattern in the demand of these products, so the organization can plan which quarter of the year it will need to manufacture these variants. Repeaters are less rigid and may have different variants to suit the needs of the customers. Apart from the product design; delivery time and cost of these products stay constant throughout the year. The last category; Strangers, are highly customized and produced to meet specific demands of their customers. Identifying which products are runners, repeaters and strangers can help manufacturers understand how to better leverage budgets and resources. RRS helps establish a framework that empowers organizations on

> One of the key tools in Lean Thinking is the Runners, Repeaters, Strangers (RRS) approach. RRS —'runners', 'repeaters' and 'strangers' form an excellent strategy for production scheduling and supply-chain management.

multiple fronts, i.e. improve efficiencies in production, inventory management, supply chain management, distributions well as in customer facing processes, such as delivery management, after sales service, etc. The RRS approach holds a tremendous potential to make E-commerce more efficient. E-commerce organizations can adopt Lean Thinking to embed customer centric processes and thus increase the customer's perception of delivered value.

One of the biggest advantages that accrue from RRS is competitive pricing and speedy service. E-commerce customers are typically price conscious, thus adding pressure on e-tailer margins. Consumers expect faster delivery, which calls for a superior distribution network. This is where Lean Thinking can help, since Process improvement in Lean system focuses on the needs of the customer, and the wastes are defined by activities that don't support the generation of value to customers. Lean is not just about removing Cost; but it is about reduction of waste by focusing on what adds value and not just trying to identify the wasteful steps in an isolated process. In e-commerce, lean practices such as RRS can play a crucial role in warehouse management and logistics. For instance, fast moving Runner items can be prioritized for vendor manufacturing and supply chain, as well as optimizing warehouse storage. Repeater items, special items that are ordered during festivals, or seasonal items — can be produced as per the anticipated demand in the market. Lean Thinking plays a gigantic role in boosting brand reputation. Customers are increasingly moving towards waste reduction and prefer purchasing from sustainable companies. According to National Geographic's Green Index 2014 (a comprehensive measure of consumer behaviour), 61 per cent of global customers said they are concerned about environmental problems. Lean thinking ensures that the company scrutinizes all processes regardless of how seemingly minor or substantial they may be to the operations. It not only makes the company more productive and cost efficient but also creates a culture of sustainable consumption in the society.

The author is Executive Vice-President and Business Head, Godrej Locks & Architectural Fittings and Systems.

UPDATE

ONEWEB TO EMPLOY INDUSTRIAL-SCALE MASS PRODUCTION TECHNIQUES FOR SATELLITES

OneWeb Satellites – a joint venture of OneWeb and Airbus – recently opened its high-volume, high-speed advanced satellite production facility to bring transformative internet connectivity to everyone, everywhere.

Historically, satellites are custom built, costing tens of millions of dollars to build, and taking more than a year to produce a single one. The OneWeb Satellites facility is the first to employ industrial-scale mass production techniques for satellites, enabling dramatically reduced costs and production times that can deliver one satellite per production shift or two a day, while significantly expanding internet connectivity and making space technology far more accessible.

> By producing high quality satellites at a fraction of the cost and schedule of traditional manufacturers, we are not only enabling OneWeb to connect the planet, we are making space dramatically more accessible to everyone

"OneWeb Satellites and its partners are transforming the satellite and space industry. By producing high quality satellites at a fraction of the cost and schedule of traditional manufacturers, we are not only enabling OneWeb to connect the planet, we are making space dramatically more accessible to everyone," said Tony Gingiss, CEO of OneWeb Satellites.

By Niranjan Mudholkar

ROUNDED FOR PERFECTION!

The Pune unit has moved upward in global supply chain and is working closely as a master unit with R&D and product management, says **Ajrel Shepherd,** Vice President, Round Tools Production, Sandvik Coromant India.

How would you compare the Production Unit Pune Round Tools with Sandvik Coromant's similar units around the world?

This is first multi-storeyed manufacturing facility at Pune site. Pune Round Tools production unit is one of the best production units in the world having highly automated state-of-the-art manufacturing machines and equipment, benchmark processes and system as well as qualified staff and competent people. It is a global supply unit that manufactures and supplies standard, tailormade and special solid round tools with world class quality, on time delivery at high productivity and optimum costs by implementation of lean best practise.

What are the green initiatives and safety measures implemented in the plant?

Coromant has high commitment towards sustainable planet and there are many green initiatives implemented in the plant. The building is designed to illuminate using natural day light and LED lamps. It is ventilated with evaporative ventilation system than air conditioning.

It has 100,000 litters sump used to harvest rain water which is used in processes and recycled again. Same water sump is used to cool the heat treatment furnaces rather than using chillers thereby reducing electricity consumption and improving energy efficiency. It also helps to conserve scarce water resources.

The plant and machinery are protected against risk of fire using dry type transformers, smoke detectors, automatic fire extinguishers, and sprinklers. The site is certified as highly risk protected site by FM Global.

What are the various tools manufactured at this Unit and what is the overall capacity of this facility?

The plant has annual capacity to produce nearly 2.5 million solid round tools and is currently producing more than two million tools per annum. The plant manufactures high tech HSS Taps including those with powder metallurgy substrate, Solid carbide drills, endmills, reamers and provides reconditioning and recoating services for these tools. The tools are used in

"The plant manufactures high tech HSS Taps including those with powder metallurgy substrate, Solid carbide drills, endmills, reamers and provides reconditioning and recoating services for these tools."

"Cost competitiveness is vital to our business and we are wisely choosing and prioritising on those digital initiatives which would help us reduce waste, improve efficiency, productivity and increase utilization of our bottlenecks to be cost competitive."

different sectors such as automobile, aerospace, oil and gas, energy, die and mould and general engineering for drilling, milling, reaming and tapping operations on wide range of materials with optimised performance.

Tell us something about the development of Coro TapTM, the new product launched from the Pune Production Unit. Tell us about the overall new product development activities at this Unit.

Pune unit has moved upward in global supply chain and is working closely as a master unit with R&D and product management. It has engineering and manufacturing capabilities to introduce new products and processes, make prototypes and do extensive trail and testing for optimization of new products before introduction. Our Unit has so far launched various new products such as Corotap-XM, ISO-K, ISO-N taps and development of few more new taps is ongoing. These are application taps with optimised geometries, substrates and coatings to provide solution to varied machining applications

"Reconditioning is a green and sustainability initiative which helps to reuse expensive tool minimum three times, and scrapped tools are recollected and recycled by Coromant to conserve natural resources."

How do your engineers help your customer in choosing the right kind of tools for their requirements?

Our trained and competent design engineers support our customers via "Enquiry management system and CAPP" to provide solution for special applications.

Digitalisation of production is a major trend all over the world. How has your Unit adopted it? How easy or difficult is it to maintain balance with production costs?

Digitization is going to change how we design, manufacture and use our products in big way in days to come and Coromant has proactively started its journey to lead this change within its production. We have completed digital diagnostics of our manufacturing operations and will continue our journey of reducing waste and optimizing efficiency and productivity with digital tools and initiatives. We are focusing our efforts on key pillars such as cyber physical equipment, connected systems, data analytics and digitized visualization for better performance management. For example, we have already initiated IOT projects such as Coroplus process control on our machining centres to improve its safety and uptime and use of Cobots with pick and place automations in our production. We are also using CAPP for seamless planning and scheduling of tailormade and special orders.

We have initiated the process to build digital competencies and develop necessary mindset and behaviours among our employees to embrace this change and make maximum out of it for all stake holders.

Cost competitiveness is vital to our business and we are wisely choosing and prioritising on those digital initiatives which would help us reduce waste, improve efficiency, productivity and increase utilization of our bottlenecks to be cost competitive.

I understand the Production Unit at Pune also offers reconditioning service. What kind of equipment and infrastructure do you have in this regard and how are you helping your customers with the same?

Reconditioning service is key value-added service provided to our customers as it reduces the effective cost of expensive solid round tools to half over its useful life. We have state-of-the-art 7-axis ANCA MX5 and Walter Helitronic CNC tool and cutter grinders for geometry grinding and Walter helicheck CNC measuring equipment for quality control of precision tools. We have the complete technological knowhow and competencies required to recondition and recoat our tools to the same original quality assuring life of new tools. Reconditioning is green and sustainability initiative which helps to reuse expensive tool minimum three times and scrapped tools are recollected and recycled by Coromant to conserve natural resources.

By Phanindra Karody

KEEPING UP WITH SUSTAINABILITY

Today, the world of sustainable mobility is not just an aspirational value but also a goal for all the major automotive manufacturing players around the world. However, technology alone wouldn't be able to achieve it all.

"As the world is going gaga over green and sustainable energy, it's important to create a work environment that sustains a personnel's abilities and make optimal usage of his/her skills."

India is one of the fastest growing economies in the world. As per United Nations report, India's population houses 1.2 billion people and expected to raise its number by 300 million in the upcoming decades. To meet the needs of this booming influx of lives, planning of smart cities is essential for sustainable development.

Continental is a pioneer and a leading participant when it comes to sustainability. Sustainable management and social responsibility are among Continental's fundamental values. They are inculcated in our work culture, corporate strategies and envisioned to transform the future of mobility.

We are convinced that sustainable and responsible business increases our ability to innovate and meet the requirements of the future. It allows us to identify risks and opportunities early and opens the change processes we need. For these reasons, sustainability is an integral component of our corporate strategy and corporate development. By combining financial and non-financial performance indicators in a holistic approach, we make a positive contribution to our employees, to the environment, and to the society.

As one of the global leaders in the automotive sector, we believe that sustainability solutions are not beneficial for the business but also an integral part of how mobility is marketed, perceived, purchased innovated and driven.

SUSTAINABILITY IN PRODUCTS

A considerable amount of CO2 is produced from transportation of public and goods. Creating sustainable mobility solutions and products is a big challenge. Continental develops ground-breaking technologies and services for sustainable and connected mobility. When it comes to the CO2 emissions of cars, the clock is ticking ever louder. As emission regulations around the world are getting stricter, the focus right now is on reducing emissions gram by gram. Our MK C1 brake-by-wire brake system enables full utilization of the recuperation potential. This allows the vehicle to recover more electricity and achieve measurable CO2 savings. Our responsibility for our products covers their entire life cycle – from the raw materials used, product development, and production, to their use and subsequent recycling.

SUSTAINABLE WORK ENVIRONMENT

As the world is going gaga over green and sustainable

> When it comes to the CO2 emissions of cars, the clock is ticking ever louder. As emission regulations around the world are getting stricter, the focus right now is on reducing emissions gram by gram.

energy, it's important to create a work environment that sustains a personnel's abilities and make optimal usage of his/her skills. Creating a sustainable work place goes beyond controlling the thermostat. We can truly succeed in being sustainable when all parties involved - the corporates and the citizens, the management, the employees and other partners - work together to achieve the vision. Continental is committed to equal opportunities for all employees, regardless of age, gender, nationality, religion, skin color or sexual orientation. For us, it is the abilities and potential within people themselves that count. The onus of ensuring sustainable practices are followed begin at the management level.

SUSTAINABILITY ALONGSIDE INDUSTRY 4.0

We are at the cusp of what is commonly called the fourth industrial revolution - 'Industry 4.0', which is closely interlinked with sustainability. The use of new technologies under Industry 4.0 can be a great enabler for sustainable practices across domains. Manufacturing processes, regardless of the kind of industry, require enormous amounts of power and other resources. The electricity required can be generated via solar or wind, depending on the region.

Continental's Central Electronic Plant in Bengaluru, Karnataka uses solar power for nearly 80% of its requirement. The use of switching timers and occupancy sensors in other parts of the plant further help in energy saving - a clear illustration of the sustainability.

ROAD-AHEAD

Today, the world of sustainable mobility isn't just an aspirational value but also a goal for all the major automotive manufacturing players around the world. However, technology alone wouldn't be able to achieve it all. It is important to understand how interconnected challenges related to economical surge and environmental improvement should go hand in hand. We all have to play our part and create a collaborative model to create safe, clean and intelligent technologies.

The author is Plant Manager, Central Electronics Plant – Bangalore, Continental Automotive India

UPDATE

HONDA AIRCRAFT BREAKS GROUND FOR NEW FACILITY

Recently, Honda Aircraft Company celebrated its most recent expansion in a groundbreaking. The new facility will allow for more HondaJet Elite wings to be assembled concurrently, resulting in a major increase in production efficiency. This expansion will also add additional storage for service parts for the growing fleet of HondaJets around the globe.

Expected to be completed by July 2020, the latest expansion is a $15.5 million investment in an 83,000-square-foot facility on Honda Aircraft's 133+ acre campus in Greensboro. This will bring the company's total capital investment in its North Carolina facilities to more than $245 million.

> Expected to be completed by July 2020, the latest expansion is a $15.5 million investment in an 83,000-square-foot facility on Honda Aircraft's 133+ acre campus in Greensboro.

The ceremony's attendees included members of local, state and federal government officials, prominent community figures and leaders in the aviation industry. During the event, remarks were made by Governor Roy Cooper (D-NC), Executive Director of the Piedmont Triad Airport Authority Kevin Baker and Honda Aircraft Company president and CEO Michimasa Fujino. The celebration also featured a HondaJet Elite flyover in the skies above the company's future additional production site.

By Praful Gupta

THE BIG SHIFT!

In today's challenging economic times, auto plants across the globe are sometimes faced with the tough decisions to relocate their facilities due to several reasons.

"Relocating an auto plant requires a high-level of project management from initiating, planning, monitoring and control and finally the actual execution."

Around five years ago, Toyota's North American arm sprung a surprise on the auto industry when it decided to move its plant from Southern California to a place near Dallas. When asked why they chose Dallas for relocation, Jim Lentz, CEO of Toyota Motor North America, said the main factors in narrowing down on a palace included housing availability, logistics and quality of life.

Closer home, India's largest car maker Maruti Suzuki India announced last year the relocation of its first plant from Gurgaon to another site due to congestion and traffic hassles. With the rapid development in Gurgaon, the company was finding its plant in the middle of a bustling city which made it difficult for trucks carrying raw materials and finished products to move in and out of the plant.

In today's challenging economic times, auto plants across the globe are sometimes faced with the tough decisions to relocate their facilities due to several reasons. One of them may be a need to consolidate facilities to reduce operational costs. It could also be that the growing business or new product lines may be pressing companies to move their operations to larger facilities to keep up with increasing demand. Another reason could be a response to changing market pressures which calls for relocating closer to customers or supplier network.

Regardless of the many reasons, each relocation project comes with unique challenges and the process can seem especially overwhelming and frustrating. However, with an appropriate plan in place before the first crate gets packed, the auto company and everybody under its roof can be a part of a smooth transition and get back up to speed before long in the new facility.

Relocating an auto plant requires a different level of commitment and stakeholder engagement. There has to be a huge level of consultancy that involves immense planning, scheduling and taking risks into account. It requires a high-level of project management from initiating, planning, monitoring and control and finally the actual execution. The whole process of relocating an auto plant could take anywhere between four and six months.

The most important part of something as massive as relocating an auto plant is detailed planning and communication in the beginning which yields successful projects. This is mainly to ensure that when a running production operation is relocated, there must be no production stops due to an undersupply of parts. Therefore, it is necessary for a production relocation to be started within the planned timeline and with the planned yield of good parts.

Handling out the organization and implementation of such huge relocation projects is better off backed by a professional project organization who work on easing out the relocation process with efficient expert

planning. Such teams are adept at managing aspects right from coordinating approval processes with the local authorities to determining the requisite start-up inventories and ensuring their availability.

The biggest concern while relocating an auto plant is the safe moving of equipment. Equipment is, of course, the main strength of a plant and its movement is a major aspect in the whole process. A thorough audit before the relocation will help reveal which of the machinery is redundant and may have to be disposed off and which of it may have to be moved to the new plant. There is also a chance of losing something or incurring damage to equipment during a move. This means the project team has to ensure all the property, including the company's plus any clients' or vendors' onside property, is properly packed and tracked before, during and after the move.

It is also essential to have all goods and inventory covered under transit insurance even if the moving is within the same city. Accidents may happen due to human error but fortunately if the goods are insured, the company can seek compensation charges from the insurance provider in regard to the damaged goods. The relocation partner can assist in getting a good proposition for this to reduce the overall risk of the transition project.

> "The biggest concern while relocating an auto plant is the safe moving of equipment. Equipment is, of course, the main strength of a plant and its movement is a major aspect in the whole process."

When shifting inventory which can typically range in one Million SKUs (Stock Keeping Unit), it is imperative that the origin and destination tagging of these items are in sync and the ERP (Enterprise Resource Planning) systems have been updated and are ready to handle such a huge volume of record updation.

It is possible that some equipment and other assets won't be ready for the transition right away or at the same time. In cases like these, it is necessary to find a secondary location where these items can be stored safely. This means lowering their risk of being misplaced or even being stolen in what is probably going to be a complicated manoeuvre with several people and moving parts.

The most important part of something as massive as relocating an auto plant is detailed planning and communication in the beginning which yields successful projects.

The next step which is another important phase in an auto relocation project is planning and installing the new plant layout. It is not easy to set everything up a second time in the new location. There are several factors to consider since auto plants can have complicated processes with several divisions and teams to worry about. Each one might have its own set of workflows, including physical workstation setups that they have perfected over time to facilitate smooth operations. Redesigning each facility separately and to achieve one-piece flow is not an easy task. This requires very solid teamwork between the project team and the stakeholders.

Besides these obvious aspects involved in the relocation, there are several other matters where the company needs counselling and consultation as well as actual help. There has to be enough communication given to the employees, suppliers, customers, and anyone else who may be affected by this move. Employees need to be kept updated so their morale isn't damaged. This calls for counselling for the employees to ease them into the whole moving process and make it better for them emotionally as well as logistically. There are some expert project teams that manage everything from providing housing for employees, orienting them into the new cities to even conducting group tours of the new city for them.

Relocating an auto plant and facility is no small endeavour. It is not easy to manage so many aspects involved in the massive scale movement.

Hence, it is imperative to plan everything appropriately with the help of experts and ensure that everything goes as per the plan.

The author works with Writer Relocations.

UNCOMPROMISING AND ECONOMICAL AUTOMATION

Markus Rehm, Managing Director of DMG MORI HEITEC and DECKEL MAHO Seebach, provides The Machinist an insight into current developments in the company's automation portfolio.

We are assuming that by 2022, 80 percent of all ordered machines will be delivered with automation. The new development of automation solutions is just as important as the development of new machine models at the moment.

DMG MORI will be presenting two-thirds of its exhibits as automation solutions at the EMO – a total of 29, including modular and robot-supported handling systems for workpieces and pallets through to stand-alone transport systems. In the future, the company will offer all machine tools in its portfolio with automation solutions in order to meet the increasing demand.

Almost all modern production processes rely on automated manufacturing facilities. How is this business area developing?

The business area continues to grow for us. This applies to the percentage of fully integrated automation solutions as well as the equipping of our machine tools with the corresponding interfaces. This means our customers are already prepared for automation of the machine at a later point in time. We are assuming that by 2022, 80 percent of all ordered machines will be delivered with automation. The new development of automation solutions is just as important as the development of new machine models at the moment.

What specific functions does DMG MORI HEITEC have in this context?

Our aim at DMG MORI HEITEC is to link all processing steps related to the topic of automation. Together with DMG MORI, we offer our customers a universal and reliable solution – from engineering through equipment, tooling, NC programs up to integrated automation and connection to the IoT world. From the concept through the offer to commissioning, our consultancy covers everything. Service, maintenance and spare parts are all also available from the one source. This integral approach allows DMG MORI HEITEC to ensure the highest availability and guarantees customers get the perfect solution for a sustainable investment and long-term high security for its manufacturing processes.

Can you distinguish between the two companies' roles & how do they complement each other?

DMG MORI HEITEC complements the product portfolio of DMG MORI with standardized automation solutions in the area of workpiece handling and flexible automation solutions. This includes the WH Cell for machining centers and turning machines as well as the WH Top and WH Front for the CTX beta series turning machines. The DMG MORI plant in Pfronten is responsibility for the development of pallet automation solutions, while the Robo2Go flexible robot automation system has its home in Bielefeld.

How many projects has the company already completed and what type of automation solutions were they?

We've been able to successfully complete several dozen projects since DMG MORI HEITEC was founded in December 2017. The main area of focus has been on the standardized WH Cell robot cells but we have also been able to implement convincing automation solutions in the area of turning with WH Top. This has

resulted in increasing autonomy and availability during production for our customers.

What proportion do workpiece handling, pallet handling systems and robot solutions each have?
Pallet handling makes up about 60 percent of the volume. The remaining 40 percent is then workpiece handling. Robot solutions are used in both areas.

What new automation developments will you be presenting at the EMO?
DMG MORI HEITEC is expanding the product portfolio to include the innovative automation concept WH Flex. This is a very flexible and modular automation solution for both workpiece and pallet handling. It allows us to react even better to the very individual and unique requirements of our customers. Starting with the basic configuration of the WH Flex, we can put together an optimal solution for the customer from a large range of standard options. Included in the modules are storage systems such as shelving, paternosters or pallet stations as well as various gripping and gripper change systems. Other options such as the SPC outward transfer, alignment and turning stations and a cleaning station round off the system. The additional connection of specific add-ons – for example laser labelling or measuring and testing applications – ensure that we are able to cover all customer requirements. Automation without compromises at attractive economic conditions is our benchmark.

> "We consider AGV to be the future concept for pallet automation based on its new flexibility and simple retrofitting capability. A similar degree of flexibility has already proven its worth in the area of turning machines with the Robo2Go 2nd Generation.

Are there any new developments in the area of pallet handling systems by DECKEL MAHO Pfronten?
Yes, the driverless pallet handling AGV (Automated Guided Vehicle) will be presented together with a DMU 65 monoBLOCK. The automation solution enables maximum flexibility through free accessibility to the machines and freely programmable travel paths for the handling unit. The configuration of the pallet rack and the set-up stations is modular. The number and positioning can be completely adapted to suit the specific requirements of the customers. The control and the management of the system is taken on by the DMG MORI LPS 4 master computer.

What importance is placed upon automation solutions such as the AGV?
We consider AGV to be the future concept for pallet automation based on its new flexibility and simple retrofitting capability. A similar degree of flexibility has already proven its worth in the area of turning machines with the Robo2Go 2nd Generation. The new Robo2Go Vision, a further development of flexible robot automation, enables direct loading of Euro pallets and thanks to the new 3D-camera achieves robust recognition without the need of any specific workpiece deposits. With the aid of the dialog-guided control via CELOS and the 3D-camera the teach-in of the Robo2Go Vision takes less than ten minutes.

How does the development of the automation portfolio fit in with the company's digital strategy?
The demands on manufacturing are undergoing dramatic change. Flexible batch manufacturing with high parts variation is increasingly coming into focus. The WH Flex not only allows the customer to automate their manufacturing but also elevates the digitalization of their production to a new level. Three modules play an important part in this: the DMG MORI Digital Twin, networking both at the horizontal as well as the vertical level and a system control system, which is not only intuitive to operate but also offers excellent features for flexible production. This makes an investment in automation with the WH Flex the right step for digital manufacturing.

What function does the digital twin play here?
The digital twin, a cybernetic, digital image of the real machine, allows the system to be put into operation on the PC virtually. The real-time capable, digital model enables the processes and procedures to be simulated prior to the machine being assembled at the customer's. This means time savings of up to 80 percent when it comes to the real commissioning procedure and a significantly higher quality in addition. With a digital twin, the customer is able to retool for new products parallel to primary machining also during ongoing production and thus continuously optimize the production process. This example demonstrates that we are increasingly linking our new automation developments with digital productions using open interfaces. This means we can create a unit with optimal connectivity for our customers as the basis for the factory of the future.

Source: DMG MORI India Pvt. Ltd.

LIGHT AS AIR

Composites play a crucial role in light weighting the aircraft and hence lead toward saving the cost on fuel

THE COMPOSITE BEARINGS ARE EASIER TO FIT THAN METAL ONES AND THEIR FLEXIBLE BASE MATERIAL SPREADS LOAD MORE EFFECTIVELY, ALLOWING A LARGER CONTACT AREA.

Light-weighting is a key objective for all aircraft manufacturers. Making a plane lighter reduces fuel use, lowering operator costs and the negative impact of flying on the environment. This is where composites are finding its place!

Fuel is the number one expense for airlines, so it's no surprise that they are continually looking for ways to lighten the load. A figure brought to the forefront by Norwegian economist Bharat P Bhatta's proposed pay-as-you-weigh pricing model for passenger fares, is his estimate that a reduction of one kilogram of weight could result in a fuel saving of 3,000 US dollars per year.

All of these measures add up to lower operator costs, less fuel and a reduction in CO2 emissions. As effective as these in-cabin changes may be, potentially greater savings can be made in the fundamental design of the plane. One option for this is a shift from metal components to composites.

Composite bearings

Trelleborg Sealing Solutions has a focus on composites at its facility in Albany New York in U.S. as well as in Rotherham, England, where the unique Orkot® material is manufactured.

"Traditionally, Orkot® has been used in bearings for ships and hydropower plants," says Brian Bowen, who is heading up a project to transfer this proven technology to aerospace applications. "Metal bearings feature in the landing gear shock absorbers of planes and if these can be successfully replaced with composite bearings instead, a huge potential saving can be made by operators through light-weighting."

Not just lighter in weight replacing a steel/ bronze bearing with a composite bearing saves weight due to the specific density of the materials used. The specific density of steel is eight grams per centimeter cubed and bronze is 8.75. Polymer bearings have a specific density of just 1.25 grams per centimeter cubed; a typical saving of 7.5 in volume per unit.

"Composite bearings have other advantages too," continues Brian. "Friction is low, running dry or lubricated, and constant. There's no surface coating to wear off, and when running dry, there's no maintenance.

"The composite bearings are easier to fit than metal ones and their flexible base material spreads load more effectively, allowing a larger contact area. They also have no edge loading, are impact resistant and oversized repair parts require no tooling. All in all, the composite bearing is a promising alternative to metal ones."

Eliminating metallic wear particles

A less obvious but important additional benefit of composite bearings, that has been identified by Trelleborg Sealing Solutions, is the exclusion of metallic particles from the hydraulic system.

Brian explains: "We've observed that customers who use metallic bearing shells have an increased risk of metallic wear particles in the shock absorber hydraulic fluid. Over time these metallic wear particles can scratch the counter surfaces of the shock absorber slider, and more critically, can damage the soft polymer seals. If the dynamic seal caps become scratched, then this can lead to a reduction in the service life of the shock absorber. Composite bearings do not generate such abrasive wear particles, extending the life of seals and the system itself."

However, despite all these benefits, the biggest advantage of the composite bearing remains its lighter weight. To prove this Trelleborg Sealing Solutions undertook tests to verify the potential weight saving from switching from metal to composite bearings.

Huge savings per year

"The total saving from just the replacement of the bearings in the landing gear shock absorbers is 20 kilograms per plane. If we go back to Bharat P Bhatta's estimated fuel saving of 3,000 US dollars per year per kilo that equates to 60,000 US dollars per year per plane.

"And the shock absorber bearings are not the only application we're looking at for Orkot®. There are also the LG pin bearings, landing gear actuation bushings, door hinges and cargo handling rollers and wear pads," concludes Brian.

For more info, contact:
Trelleborg India Pvt Ltd
tsindia@trelleborg.com

A NEW LOOK FOR GEAR MILLING?

New machines require appropriate tooling & cutting tools manufacturers should prepare their response accordingly, which is why producers of general-purpose rotating cutting tools are reconsidering the role of gear-milling cutters in their program for standard product lines.

Figure 1

TECHNOLOGICAL PROCESSES DEVELOPED FOR THESE MACHINES ARE ORIENTED TO MAXIMIZE MACHINING OPERATION FOR ONE-SETUP MANUFACTURING, CREATING A NEW SOURCE FOR MORE ACCURATE AND PRODUCTIVE MANUFACTURING. MILLING GEARS AND SPLINES IS ONE OF THE OPERATIONS SUITABLE FOR PERFORMING ON THE NEW MACHINES.

Technology and its products are often causative: a technology might be applied to develop more effective and intelligent products, which in turn can play an important role in advancing that technology.

This interrelationship may be observed in metalworking. Over the last few years, leading-edge technology has resulted in multitasking machine tools and machining centers with impressive working possibilities. At the same time, this progress in machine tool engineering is significantly changing metal cutting technology.

The advanced multifunctional machine tools increasingly widen the range of machining operations that can be performed. Technological processes developed for these machines are oriented to maximize machining operation for one-setup manufacturing, creating a new source for more accurate and productive manufacturing. Milling gears and splines is one of the operations suitable for performing on the new machines.

Traditionally, gear (and spline) making is a complicated process that involves milling, chamfering, grinding and other operations. With batch manufacturing, the majority is made on specific machines: gear hobbing, gear shaving, gear grinding and so on. Developments in technology have changed the limits of hardness for cutting and considerably increased operational accuracy. This in turn has reduced abrasive machining in gear making while decreasing rough cutting. The modern multifunctional machines, which meet the requirements of one-setup manufacturing, have proved to be perfect for various gear making operations.

These new machines require appropriate tooling and cutting tools manufacturers should prepare their response accordingly, which is why producers of general-purpose rotating cutting tools are reconsidering the role of gear-milling cutters in their program for standard product lines.

ISCAR, a leader in the cutting tool industry, is embodying this trend with a three-point program for form gear-making tools:

- Milling cutters carrying indexable inserts
- Milling cutters with replaceable cutting heads based on the T-SLOT concept
- Milling cutters with replaceable MULTI-MASTER cutting heads

MODUGEAR, the family of indexable gear-milling cutters (Fig. 1), reflects a conventional design approach, comprising disk-type tools with tangentially clamped LNET inserts. The tangential clamping principle provides an extremely rigid and durable cutter structure that results in stable and precise enough machining tooth or spline profiles. Its principal application is producing involute gears of relatively low accuracy and rough gear-milling operations that feature a 1-1.75 mm gear module range.

The cutters with replaceable heads have two significant advantages compared with gear milling tools carrying indexable inserts: they offer better precision and allow the design

T-SLOT, a family of modular milling cutters SD-SP, was originally developed for milling relatively narrow slots and grooves. A cutter comprises a shank and an interchangeable solid carbide head, mounted on the shank with the use of a specially designed SP-connection. The connection ensures a very durable assembly that withstands considerable cutting forces during slot milling, even in cases when a tool works with high overhang. The heads of the same diameter vary in their width. The cutting geometry of the heads is intended for efficient slot milling of different engineering materials.

The design features of the heads do not limit their field of application by milling slot and grooves. The subsequent development stage introduced T-GEAR – a family that uses a SP-connection but is intended for form milling gear teeth.

| Figure 2

THE INTRODUCTION OF MULTITASKING MACHINES IN GEAR MILLING AS A SERIOUS ALTERNATIVE TO A DEDICATED MACHINE REPRESENTS A NEW CHALLENGE TO THIS SECTOR AND PRODUCERS OF COMMONLY-USED CUTTING TOOLS SHOULD BE READY FOR THIS SIGNIFICANT CHANGE.

of gear-milling cutters that are small in diameter but feature quite a large number of teeth. The replaceable heads are mounted in bodies (shanks), which are standard-line products suitable not only for the gear-milling heads but also for other types of head (for milling slots and grooves, for example). This enables customers to increase operating efficiency of the versatile shanks and to reduce tool stock, providing added value.

The replaceable solid carbide heads of the T-GEAR SD D32-M-SP15 family are mounted in standard T-SLOT SD-SP15 cylindrical shanks and transform the latter into 32 mm diameter gear milling cutters (Fig. 2). The precise profile of the cutters' teeth and the accurate and reliable SP-connection between the shank and the head define its range of use: milling involute gears featuring a 1-2 mm module.

Both types of milling cutters (those with indexable inserts and those with replaceable heads) meet the requirements of standard DIN 3972, basic profile II.

There are two types of MULTI-MASTER spline and gear making solid carbide heads. The first type is represented by the MM SS heads that were specially designed for milling involute spline shafts, specified by DIN 5480 and ANSI B92.1 standards. These heads are intended for 1, 1.25, 1.5, 3 mm module (DIN 5480) and 8, 10, 12, 24 diametral pitch (ANSI B92.1).

The heads of the second type, MM SG, are used in milling spur gears in accordance with DIN 3972 (module 1-1.75 mm) and ANSI B6.1 (diametral pitch 15-24) standards.

The main application field for MULTI-MASTER heads is the efficient production of small to medium batches of spline and spur gears in various industrial branches.

The world of gears is very rich and multiform, embracing a wide variety of external and internal gears: spur, helical, bevel, hypoid, and more. Manufacturing these gears encompasses an entire, dynamic industrial sector with its own methods, equipment and tooling. The introduction of multitasking machines in gear milling as a serious alternative to a dedicated machine represents a new challenge to this sector and producers of commonly-used cutting tools should be ready for this significant change. ISCAR meets this challenge while maintaining the requisite high standards demanded by end users.

Source: ISCAR

A MULTI-MASTER end milling tool comprises a shank carrying interchangeable solid carbide cutting head with treaded rear area for quick-change connection with the shank. MULTI-MASTER benefits include minimum setup time and more than 15,000 possible configurations of tools assembled from the standard shanks and heads. If necessary, the assembly can be completed by extensions. The shanks have been developed in a variety of materials: steel for general-duty applications, tungsten carbide having higher rigidity, and heavy metal featuring increased vibration resistance, which considerably expands assembly options

THE WORLD OF GEARS IS VERY RICH AND MULTIFORM, EMBRACING A WIDE VARIETY OF EXTERNAL AND INTERNAL GEARS: SPUR, HELICAL, BEVEL, HYPOID, AND MORE. MANUFACTURING THESE GEARS ENCOMPASSES AN ENTIRE, DYNAMIC INDUSTRIAL SECTOR WITH ITS OWN METHODS, EQUIPMENT AND TOOLING.

SHOWCASING EXPERTISE AT EMO

The CHIRON Group is appearing at EMO with a lot of debuts: new machining centers, software and automation solutions

| Autonomous machining of complex workpieces – at the EMO, CHIRON is combining the new FZ 16 S five axis with VariocellPallet pallet automation for the first time.

CHIRON Group is attending EMO in Hanover from September 16 to September 21 with innovative must-sees relating to machining. Machining centers from CHIRON, STAMA and SCHERER, new automation solutions and an extended software program await visitors to the exhibition.

CHIRON: new variants of the 16 series and world premier of DZ 25 P five axis: At EMO, CHIRON is combining the new FZ 16 S five axis with VariocellPallet pallet automation for the first time. The new automation solution is aimed at machining small batch sizes and complex workpieces autonomously. Furthermore, the new DZ 16 W five axis will be presented live in action in Hanover. The highly-productive 5-axis double spindle machining center has already convinced those visiting the CHIRON OPEN HOUSE because of its unique combination of dynamics and precision.

The CHIRON DZ 25 P five axis is celebrating its world premier at EMO, designed for productive machining of large components in the automotive industry and aviation. With the 25 series, CHIRON is achieving a combination of productivity, precision and flexibility that has never been seen in this class before. With a spindle distance of 800 millimeters, the DZ 25 P five axis is predestined for double-spindle machining of aluminum structural components. It is operated and loaded on separate sides, which allows ideal access to the work area and a good insight into the process. The machine only requires a small amount of floor space thanks to its compact design. Furthermore, its optimal dynamics make it a compelling offering in this competitive environment. Visitors can experience the DZ 25 P five axis live in a new light in CHIRON's interactive showroom.

STAMA MT – trend-setting in complete machining for complex workpieces that are difficult to machine: Whether from the bar or the chuck, STAMA keeps setting new milestones in complete machining with the MT 7 and MT 8 systems' milling and turning machines offering innovative machining solutions. Since September 2018, STAMA has been offering new machining centers for 6-side milling and turning in one set-up in the form of the MT 733 series, especially for complex components and materials that are difficult to machine. The MT 733 one plus will enjoy its world premier in Hanover. Like all models of the MT 733 series, it has a gantry design: this allows the machining process to gain a significant amount of stability on a thermal, mechanical and static level. The Galaxie® drive system in the B-axis bolsters this effect with its extreme power density, stiffness and positioning precision. The final result is highly dynamic and highly precise milling/turning and drilling operations, simultaneous 5-axis machining and integrated automation. These are the best conditions for a successful "first part good part" strategy. The MT 838 TWIN, presented by STAMA, is a HSK-A100 milling and turning machining center that is unique in double-spindle milling and turning of chuck components with a spindle distance of 600 mm.

| MT 733 one plus: Complete machining of complex components and difficult-to-cut materials.

Vertical turning from SCHERER for the customer's needs: Highly productive turning takes center stage again at SCHERER. The company is demonstrating its expertise with the VDZ 320 multi-functional vertical pickup turning machining center. The series can be precisely tailored to the customer's requirements thanks to numerous equipment options and variants. Options include another milling spindle and special modules for ball turning, bearing track milling and hobbing. An additional Y-axis in the main spindle ensures high productivity during complex machining.

CMS presents automation solutions that can be retrofitted: Automation is at the heart of retrofit specialist CMS's work as well. In Hanover, the company is showing how an out-dated machining center can be enhanced by a modern automation solution and how this can significantly improve productivity. Automation is gaining significant importance

across different industries. That's why retrofits are an attractive and cost-efficient way for many customers to remain future-proof.

SmartLine software portfolio extended: This year, the CHIRON Group is extending its SmartLine program with ConditionLine and ProtectLine. The software modules can be implemented individually or together. They support the user in taking even better advantage of the machining centers' capabilities. ConditionLine allows precise planning of maintenance work and repairs. The software is reliable at detecting abnormal operating behavior and wear in a timely manner. ProtectLine has a preventative function in protecting physical machining centers from collisions with help from a digital twin. The virtual machining center always runs ahead of the real one and shuts it down in good time if there are any collision risks.

Source: Chiron Group

THREADING WITH MAXIMUM PRODUCTIVITY AND PROCESS RELIABILITY

Walter AG is releasing the new TC620 Supreme thread milling cutter in diameters up to M20

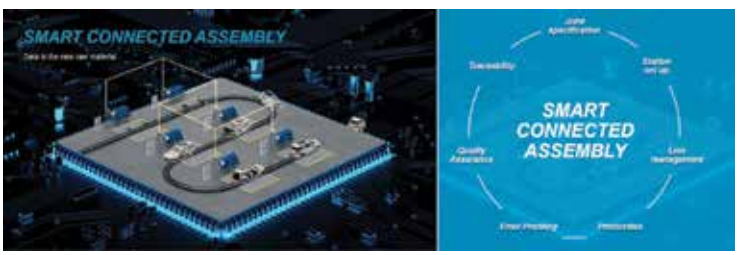
High cutting pressure and tool deflection are the greatest challenges when it comes to thread milling. This results in restricted cutting parameters, necessary cutting passes and short tool lives or even tool breakage. With the TC620 Supreme universal thread milling cutter, tool wear is drastically reduced thanks to minimal cutting forces and the resulting high feeds per tooth. The multi-row concept not only reduces the machining time and wear, but also improves process reliability and handling – even when used with more demanding materials such as stainless steels or Inconel 718.

Reliable chip evacuation, thanks to internal coolant, and simple handling of the TC620 Supreme guarantee maximum process reliability. Radius corrections are seldom necessary, and when they are required, it is often only once competitor tools have already reached the end of their tool life. Walter is launching the TC620 Supreme for thread depths of 2 and 2.5 × DN in the dimension range from M4 to M20 as well as UNC 8 to UNC ¾ .

Source: Walter Tools India Pvt Ltd

SMART CONNECTED ASSEMBLY

New benefits of smart factories are arising, to meet the new challenges that are emerging. This evolution of the assembly process is driven by the Industry 4.0 – The fourth industrial revolution: the digitalization of manufacturing and assembly. And Atlas Copcos' contribution, and answer to this revolution, is something we call Smart Connected Assembly.



"Smart Connected Assembly is about creating unique value by connecting together all the customer's assembly related processes along with error proofing and quality assurance techniques.

Our solutions are networked to each other and integrated into the production network. The data generated is the new raw material used when controlling and identifying improvements in and between the manufacturing assembly processes.

Bringing these thoughts to India, our approach is to partner with our customers for improving their productivity using improved error proofing practices for increased uptime and allowing flexible production," says Abhay Pande, Business Development Manager, Quality Assurance & Software Solutions

Source: Atlas Copco

THE DATA GENERATED IS THE NEW RAW MATERIAL USED WHEN CONTROLLING AND IDENTIFYING IMPROVEMENTS IN AND BETWEEN THE MANUFACTURING ASSEMBLY PROCESSES.

ABHAY PANDE, ATLAS COPCO

CIRCULAR MULTI-BUSHING WITH GEL TECHNOLOGY

Multi cable bushing systems are extremely convenient as they allow many cables to be inserted in a compact bushing. This saves a great deal of space, especially where installation dimensions are limited. However, when mounting cables and conductors in multiple entries a pre-pricking is usually necessary for the feed-through of cables and conductors. This means not only additional installation work but also a potential risk factor for the safe sealing of the cables.

However, this does not have to be the case. With the SKINTOP MULTI-M with metric connection thread developed by LAPP no such pre-pricking is necessary thanks to a highly elastic gel technology which makes it possible to insert cables with variable outside diameters of 2-6mm into entry point. This makes the SKINTOP MULTI-M a logical addition to LAPP's existing product portfolio which already includes various rectangular multi bushings and the classical round cable gland. The SKINTOP MULTI-M now offers the connection of both by enabling the insertion of a large number of cables in a round cable gland with metric connection thread. The gel is firmly connected to a plastic outer shell which defines the possible feed-through points. Thanks to the high elasticity of the gel the conductors can be routed directly without having to pierce the gel beforehand. The gel adapts optimally to the cable diameter and thus guarantees a high IP protection class (IP 68).

At the same time the innovative gel technology ensures that unused entry points remain securely sealed against the ingress of foreign bodies but they can also be used directly for insertion if cabling should subsequently required.This makes the round SKINTOP MULTI-M multiple entry system with metric connection thread particularly suitable for feeding through unassembled cables and conductors as well as media-conducting hoses. This ensures quick and easy installation of the cables even with the highest packing density.

More information at: www.lappkabel.com

IN-CYLINDER VOLUME PRODUCTION COMBUSTION SENSOR

Detroit Engineered Products (DEP), a US based company with specialized engine design and development capabilities, has recently launched their latest product- an advanced IC sensor that can help improve the efficiency and reduce emission of internal combustion engines. These IC sensors can be used in real-time for applications, functioning as a timing sensor, combustion sensor, performance sensor, emissions sensor and pressure sensor, delivering accurate and reliable results on a cylinder-to-cylinder, and a cycle-by-cycle basis.

These sensors are most suitable for on-board engine diagnostics, can predict combustion, performance and engine out emissions, and are superior to pressure transducers. They can easily be retro fitted in existing electronically controlled gasoline and diesel engines, by adapting the fuel injector or spark plug or glow plug as the sensor, without the need to drill another hole in the cylinder head. The product folio consists of both hardware and software- the multi sensor, a black box controller which processes the signal from the sensor, and a diagnostics kit which visualizes the data & performs diagnostics.

Announcing this, Radha Krishnan, President, DEP said, "There is a lot of pressure on vehicle manufacturers as combustion engines are required to meet stringent emissions standards in addition to targets for fuel economy and performance. The IC sensor is the next- generation of sensors for the next generation of smarter vehicles. We are very excited here at DEP, as this technology can help conventional as well as advanced engines."

The in-cylinder combustion sensor enables performing multiple sensing tasks and real time engine management by providing feedback to the electronic control of engine. The volume production system results in low initial and maintenance cost compared to pressure transducers. Remote monitoring and diagnostics are also possible which help reduce the cost of inspection and repair over the lifetime of the engine.

Source: Detroit Engineered Products

COMPLETE GRIPPING SYSTEM KIT FOR ROBOT ARMS

Specially coordinated interfaces and adapters make sure that all modules of the modular system are combinable

INSTEAD OF PLANNING AND IMPLEMENTING THE ELECTRIC OR PNEUMATIC ACTUATION AND THE SENSOR CONNECTIONS INDIVIDUALLY EACH TIME AT GREAT EXPENSE, THE INTERFACES OF THE GRIPPERS, QUICK-CHANGE MODULES, AND SENSORS ARE PERFECTLY ADJUSTED TO ANOTHER WITHIN THE MODULAR SYSTEM.

Automating fast, easy, and flexible – this is the aim of the SCHUNK gripping system kit, which is compatible with all Universal Robots robot arms. SCHUNK offers as the world's first manufacturer a comprehensive range of standardized components for the 6-axis lightweight UR robots, which comprises both fields of application, gripping and changing as well as measuring forces and torques. Specially coordinated interfaces and adapters make sure that all modules of the modular system are combinable with the UR robot arms and can be quickly exchanged. It will now be as easy to commission the peripheries as it is to program the robot. Instead of planning and implementing the electric or pneumatic actuation and the sensor connections individually each time at great expense, the interfaces of the grippers, quick-change modules, and sensors are perfectly adjusted to another within the modular system. All modules are easily connectable via Plug & Work to the robot arms. Neither mounting kits nor external valves are required for this. Furthermore, special plugins will facilitate commissioning in the future, meaning particularly newcomers will be able to benefit from a fast and uncomplicated entry into process automation. SCHUNK is consistently pursuing the idea of simple automation as represented by UR in the field of gripping systems.

WITH MAXIMUM GRIPPING FORCES RANGING FROM 140 TO 930 N AND STROKES FROM 6 TO 40 MM, IT COVERS A WIDE RANGE OF FIELDS OF APPLICATION, BOTH IN CONVENTIONAL AUTOMATION AND IN THE FIELD OF COLLABORATIVE APPLICATIONS.

Manual change systems for fast gripper change

In the first step the SCHUNK gripping system kit for Universal Robots robot arms will include: The multi-tooth guided and especially precise and powerful SCHUNK parallel grippers PGN-plus-P in the sizes 80 and 100, the multi-tooth guided centric grippers PZN-plus 64, the price-to-performance-optimized universal grippers JGP 80 and 100; the long-stroke grippers KGG 100-80 and PSH 22-1, the electric gripper for small components EGP, and the Co-act EGP-C, designed for collaborative applications. All micro valves for actuating the pneumatic modules are integrated in the SCHUNK adapters. Added to this is the manual change system SHS with integrated air feed-through, electrical feed-through, and optional locking monitoring for gripper change in a matter of seconds. The changing system facilitates a particularly flexible use of the UR arms, as complicated set-up processes are no more necessary, and both SCHUNK grippers and other actuators with ISO-50 flange can be precisely and reliably exchanged in just a few steps. Right from the beginning, an attractively priced force/torque sensor is also included in the SCHUNK modular system kit. The SCHUNK FT AXIA 80 facilitates the precise measuring of forces (resolution 1/10 N) and torques (resolution 1/200 Nm) in all six degrees of freedom. Altogether, the modular program currently enables 36 combination possibilities. With maximum gripping forces ranging from 140 to 930 N and strokes from 6 to 40 mm, it covers a wide range of fields of application, both in conventional automation and in the field of collaborative applications. It is therefore equally suitable for newcomers to automation as well as for professionals in the metal-cutting industry, the automotive industry, and the electronics industry, as well as many other sectors seeking to tap into the potential of automation using UR robots.

For more information, contact:
Satish Sadasivan
SCHUNK INTEC INDIA PRIVATE LIMITED
E: info@in.schunk.com
www.in.schunk.com

EVALUATE MACHINE DATA WITH NEW COMMUNICATION MODULE

Module enables predictive maintenance with flexible data integration for high IT security

THE NEW COMMUNICATION MODULE CAN BE OPERATED OFFLINE UPON CUSTOMER REQUEST, AFTER ONLINE INSTALLATION WITHOUT UPDATE FUNCTION. IN THIS 'SEMI-OFFLINE' CASE, DURING AN INITIAL 'LEARNING PHASE', THE DEVICE REQUIRES A TEMPORARY, SHORT-TERM SECURED IOT ACCESS TO THE IGUS SERVER TO MATCH THE CALCULATION ALGORITHMS TO THE ACTUAL MOTION AND ENVIRONMENTAL PROFILE OF THE CUSTOMER APPLICATION.

Being able to predict and plan maintenance is the goal pursued by igus with its smart plastics solutions. Intelligent sensors, for example, measure the wear of energy chains, slewing rings and linear guides. With the new communication module icom.plus, the customer can now decide in which form they would like to incorporate the acquired data from the sensors. From an offline version for restrictive environments up to the connection of the values to the igus server for automatic spare parts ordering, the user is free to integrate and read their data.

Under the name isense, igus carries sensors of various kinds that detect the condition of igus components such as cables or energy chains. They measure among other things the wear during the operation and alert the user early enough to plan repair or replacement. By networking with the icom communication module, the data is transmitted to an intelligent system. The module can be connected to all igus specific sensors. For example, with sensors for the measurement of abrasion, or the wear measurement of the pin-bore connection of the energy chain, as well as sensors for the detection of break and push-pull forces and for cable monitoring. Once the measured values from a sensor have been transferred to the icom module, they have to be "interpreted", i.e. understood in order to generate instructions from the same. So far, this has been possible via the connection to the igus cloud. Due to the increasing importance of IT security, however, many companies are increasingly relying on the development of their own SCADA systems, which is why igus has now advanced its data concentrator into icom.plus. With the new module, the customer can integrate the data in the way that best suits their equipment.

THE MOTION PROFILE REQUIRED FOR THE CALCULATION OF THE MAINTENANCE RECOMMENDATION IS READ DIRECTLY FROM THE CONTROL SYSTEM VIA THE BUS SYSTEM OF THE MACHINE.

Flexible data connection through new 3-in-1 module

The icom.plus is programmed via igus online configurations with initial service life algorithms. The special feature: the new communication module can be operated offline upon customer request, after online installation without update function. In this "semi-offline" case, during an initial "learning phase", the device requires a temporary, short-term secured IoT access to the igus server to match the calculation algorithms to the actual motion and environmental profile of the customer application. In very restrictive areas, the update can also be performed from the beginning via a storage medium completely offline. In this way, the user can flexibly design the connection of the module and their data and establish a balance between maximising the runtime and IT security. The motion profile required for the calculation of the maintenance recommendation is read directly from the control system via the bus system of the machine. In the same way, the information about the number of days until the next recommended maintenance and freely definable warning messages about unusual changes in the sensor data are transferred to the PLC control. The user information is provided directly via the system monitor or via customer-specific SCADA systems.

Predictive maintenance by connecting to the igus server

With the online connection of the icom.plus, a continuous matching of the service life statement with the igus cloud takes place in order to enable maximum system runtimes with minimal failure risk. The data in the cloud draws on the 10 billion test cycles of energy chains and cables performed in the company's own 2,750 square metre test laboratory, and thanks to machine learning and AI, igus can provide precise information on the durability of the solutions used and inform the user about a necessary replacement beforehand.

For more info, contact
Shery George
igus (India) Private Limited
sgeorge@igus.in

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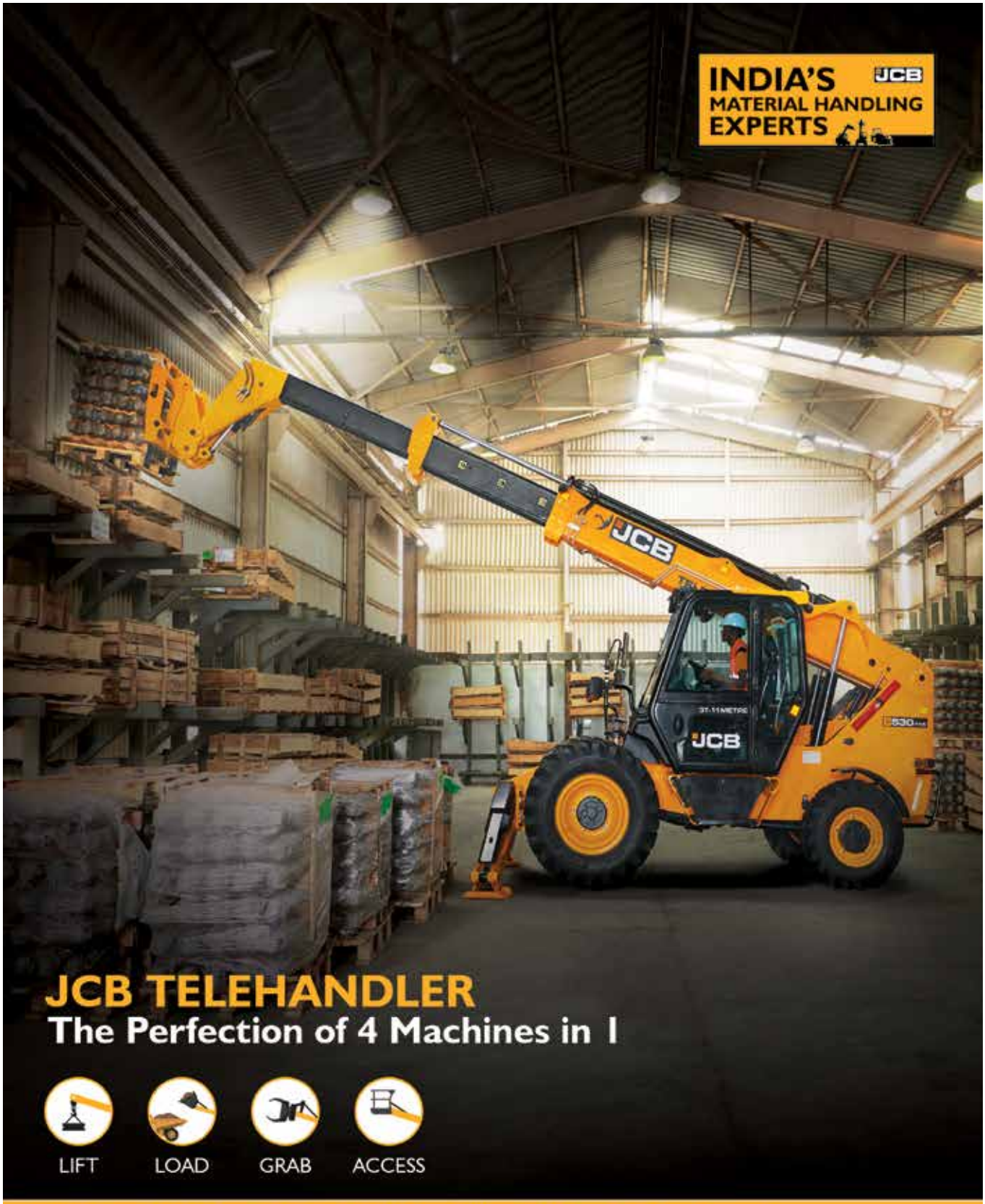

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