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THE MACHINIST

ULTIMATE GUIDE TO PROFITABLE MANUFACTURING

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CELEBRATING A COLLECTIVE APPROACH WITH AMAZING RESULTS

CASE STUDY

DESIGNING AND BUILDING SOPHISTICATED HEAT-COOL SOLUTIONS

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‘Make in India’ – Phase 2

It was during his Independence Day speech last year that Prime Minister Modi first gave the clarion call of ‘Make in India’. While the actual campaign was officially launched in September, these three words have certainly taken the Indian manufacturing industry by a storm over the last one year. And considering the response it has received from several multinational companies, it can be safely said that PM Modi has been fairly successful in reviving the interest in Indian manufacturing. Good news: Instead of following or replicating an American or Chinese or German or Japanese model, Modi and his government are focusing on creating a truly Indian model; perhaps by borrowing the relevant elements from these aforementioned models.

And although the Modi Government has also been endeavouring to create a conducive atmosphere by making all the right noises both in India and overseas, the real test for ‘Make in India’ will start only now. The Government will have to ensure that it sustains and builds on the confidence of the international investors by implementing the much needed policy reforms in a timely manner. While despite the current parliamentary hiccups, the GST is likely to roll out in April 2016, there are several other fronts where Team Modi needs to work diligently. Yes, they are definitely talking about power, water, infrastructure, labour reforms and technology as well as skill upgradation. But the aspirations and vision must start translating into ground realities soon. It is time for phase 2 of ‘Make in India’.

GOOD NEWS: INSTEAD OF FOLLOWING OR REPLICATING AN AMERICAN OR CHINESE OR GERMAN OR JAPANESE MODEL, THEY ARE FOCUSING ON CREATING A TRULY INDIAN MODEL.

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THE MACHINIST — ULTIMATE GUIDE TO PROFITABLE MANUFACTURING

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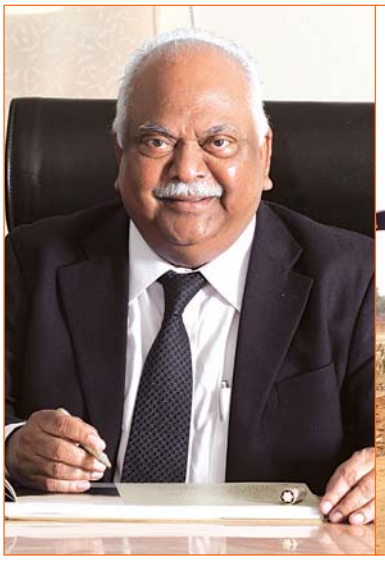

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Corrigendum: In the July 2015 issue on pg 64, Kirloskarvadi was spelled Kirloskarwadi by mistake. The error is regretted.

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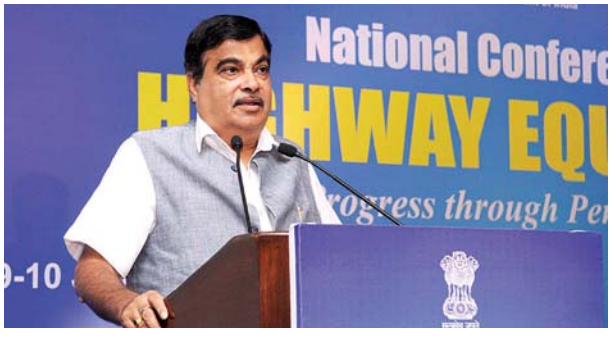
Prime Minister Modi launches SKILL INDIA on the occasion of World Youth Skills Day

The Government has recently launched SKILL INDIA on the occasion of the first-ever World Youth Skills Day. During the event, Prime Minister Narendra Modi unveiled the Skill India logo and launched four landmark initiatives of the Ministry of Skill Development and Entrepreneurship: National Skill Development Mission, National Policy for Skill Development and Entrepreneurship 2015, Pradhan Mantri Kaushal Vikas Yojana (PMKVY) scheme and the Skill Loan scheme. The PMKVY, the Ministry's flagship, demand-driven, reward-based skill training scheme will incentivise skill training by providing financial rewards to candidates who successfully complete approved skill training programmes. Over the next year, PMKVY will skill 24 lakh youth, across India. For the first time, the skills of young people who lack formal certification, such as workers in India's vast unorganised sector, will be recognised. Through an initiative known as 'Recognition of Prior Learning' (RPL), 10 lakh youth will be assessed and certified for the skills that they already possess. Prime Minister also launched the Skill Loan scheme. Loans ranging from Rs 5,000-1.5 lakhs will be made available to 34 lakh youth of India seeking to attend skill development programmes over the next five years.

Equipment manufactured in India will reduce construction cost: Nitin Gadkari



Construction & infrastructure equipment should be manufactured in India itself so that the cost of construction can be reduced, according to Union Minister of Road Transport & Highways and Shipping Nitin Gadkari. Speaking at the inauguration of the National Conference on Highway Equipment in Delhi, Gadkari said that it will also fulfil the Prime Minister's vision of 'Make in India'. The joint venture can also be taken up with the foreign partners wherever feasible, he added. Gadkari said that the Ministry's target is to expedite the construction of National Highways in India. He said that all steps should be taken to develop new technologies and equipment so as to bring down the cost of construction and improving the quality of road infrastructure. He emphasised upon innovation, entrepreneurship and technology in order to develop modern infrastructure. The Minister also said that the use of bio-diesel, ethanol and bio-gas should be promoted in transportation sector so as to reduce the harmful effects on the environment.

Titagarh Group enters metro coach manufacturing through acquisition

Titagarh Wagons Limited (TWL) has forayed in the metro coach and high-speed train manufacturing with the acquisition of the business of Firema Trasporti S.p.A. based in Italy. The transaction entails transfer of technology, all tangible and intangible assets and some liabilities relating to ongoing orders. The business has been acquired through a SPV Titagarh Firema Adler S.p.A. registered in Milan, Italy (TFA) in which TWL holds 90 percent stake and balance 10 percent

by Adler Plastics S.p.A a part of a leading Italian group with revenue of above a billion Euro. Umesh Chowdhary, VC and MD, Titagarh Wagons Ltd. said, "While we have been making conventional EMUs for the Indian Railways, Firema has state of the art trains with IGBT based 3 phase technology. Moreover, they have both Stainless steel and Aluminium car body technology which is going to open the world markets for the Group. We were a global player in goods wagons, and with this acquisition, we will be a global player in passenger trains as well."

Mario Wolf, Product Manager Milling

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7 projects worth Rs3,981 crore cleared by Rajasthan cabinet leading to 17,000 new jobs

As the date for Resurgent Rajasthan comes nearer, the environment for investment becomes increasingly more conducive in the State. The State Cabinet chaired by the Chief Minister Vasundhara Raje recently cleared seven projects worth Rs3,981 crore for being set up in Rajasthan. They will generate an employment for 17,000 persons approximately. They will also be given benefits of customised package under Rajasthan Investment Promotion Scheme-2014. Two projects worth Rs2150 crore have been cleared for the manufacturing of mobile phones, LED TV and allied products. Both these projects will be located at Karoli Industrial Area in Bhiwadi. Intex Technology (India) Ltd. will set up a project at a cost of Rs1,000 crore, generating an employment for 7,500 persons. Similarly, Micromax will set up a unit at a cost of Rs500 crore. In Bhilwara, the Jindal Saw Ltd. will set up a project for mining of iron ore and manufacturing of pellets, sponge iron, steel, etc. This project will be set up at a cost of Rs1,150 crore and will provide employment to 500 persons. Daikin Air Conditioning India Pvt. Ltd. will be setting up the manufacturing facility at a new location in the Japanese Zone of Neemrana with an investment of Rs500 crore.

Isgec & TITAN create manufacturing joint venture

Isgec Heavy Engineering Ltd., of Yamunanagar, Haryana, India, and TITAN Metal Fabricators, Camarillo, CA USA have recently announced the establishment of a new joint venture manufacturing operation: ISGEC TITAN Metal Fabricators Pvt. Ltd. The new ISGEC TITAN addresses the increasing need for the manufacture of corrosion-resistant process equipment to serve the specialised needs of the Chemical, Petro Chemical, Oil & Gas, Fertilizer, Mining, Power Generation, Pharmaceutical, and Steel Manufacturing industries. Aditya Puri, MD of Isgec Heavy Engineering Ltd. and Steven Muscarella, President of TITAN Metal Fabricators, Inc. said, "We will provide the next generation of reactive alloy equipment to our global customers."

Two ministries sign MoU to further skill development

The Ministry of Skill Development and Entrepreneurship and Ministries of Steel and Mines here today signed MoUs on Skill Development. The MoUs were signed with an understanding to collectively address the incremental human resource requirement in the two sectors. MSDE will implement this partnership through Directorate General of Training (DGT) and National Skill Development Corporation (NSDC).

Speaking on the occasion, the Minister of State (Independent Charge) for Skill Development and Entrepreneurship Rajiv Pratap Rudy said that the cabinet has recently approved the National Policy for Skill Development and Entrepreneurship and this will help the Ministry to bring uniformity across the skill initiatives it plans with all the Central Ministries.

Government sanctions 15 PSLV launchers worth Rs3090 crore

The Government has sanctioned 15 PSLV launchers worth Rs 3090 crore, which would be built during 2017-20. The launchers proposed by Indian Space Research Organisation (ISRO) in the coming years i.e. till March 2017 include Ten Polar Satellite Launch Vehicles (PSLV), Two Geosynchronous Satellite Launch Vehicles (GSLV) and one developmental flight of GSLV Mk III. Indigenous GSLV will launch 2 ton class of communication satellites in space. ISRO has been utilising the Indian industry for the manufacturing and production of the various components and sub-assemblies required for the development of space technology since 1976. In order to ensure the smooth supply chain of hardware, components and subsystems, ISRO is planning to magnify the role of industry partners by increasing the scope of work from sub-system/hardware level to system level in a phased manner. The entire gamut of activities that goes into the realization of the launch vehicles or satellites could be performed by the industry, except mission critical activities and launch operations.

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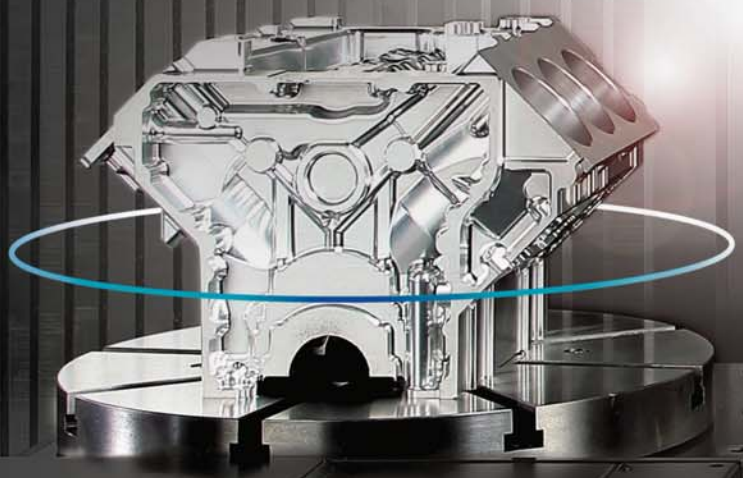

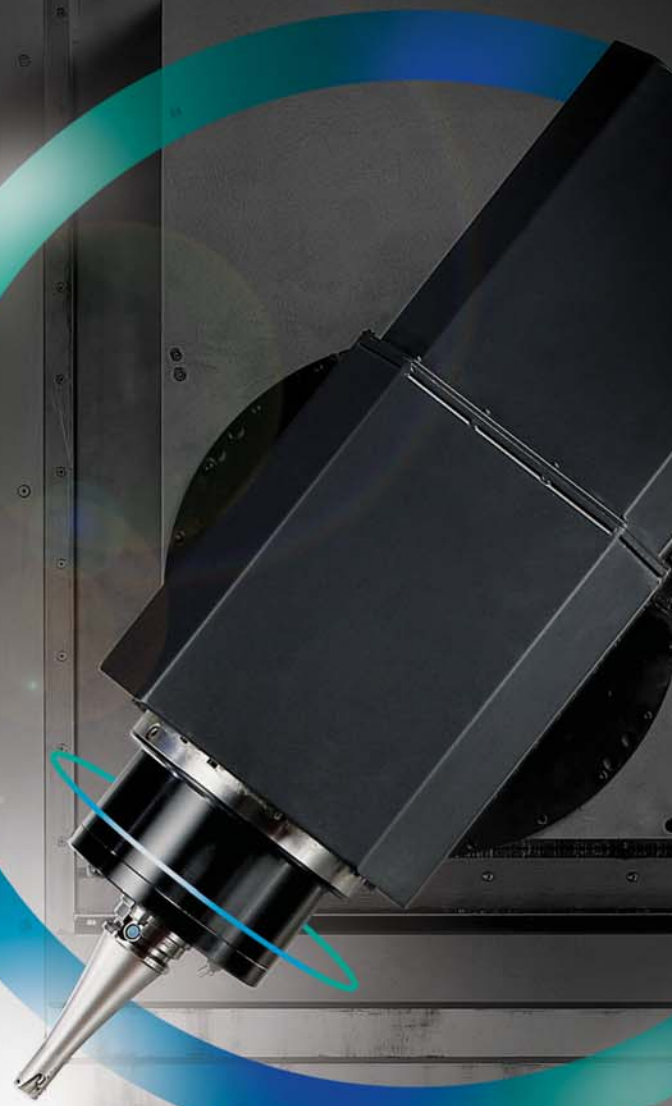

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Mark your diary

A list of key events happening between August 2015 to September 2016, both nationally and internationally

Automation 2015
August 24-27, 2015, Mumbai
www.iedcommunications.com/index.php

Aluminium India 2015
September 7-9, 2015, Mumbai
http://www.aluminium-india.com/

Laser World of Photonics
September 9-11, 2015, New Delhi
www.world-of-photonics-india.com/

Global Additive Manufacturing Summit - 2015
September 24 - 25, 2015, Bangalore
http://www.amsi.org.in/Conference.htm

EMO MILANO 2015
October 5-10, 2015, Milan
www.emo-milano.com/en/home

FABTECH 2015
November 9-12, 2015, Chicago, USA
www.fabtechexpo.com

Global SME Business Summit 2014
December 07-08, 2015, New Delhi
http://ciisme.in/

IMTEX FORMING 2016 & Tooltech 2016
January 21-26, 2016, Bengaluru (BIEC)
www.imtex.in

Auto Expo 2016 - Components
February 4-7, 2016, New Delhi
http://www.autoexpo.in/components-show/index.aspx

Auto Expo 2016 - The Motor Show
February 5-9, 2016, Greater Noida
http://autoexpo-themotorshow.in/

Grindex International 2016
March 3-5, 2016, Mumbai
www.grindexpo.in

IMTS 2016
September 12 - 17, 2016, Chicago (US)
www.imts.com

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GM's Chevrolet to invest US$1 billion in India; focus on Talegaon plant

As part of Chevrolet's global growth strategy to ensure long-term profitable growth in the markets where we operate, the company has recently confirmed that it will make US $1 billion (Rs6,400 crore) in new investment in India. The announcement was made in Delhi during GM CEO Mary Barra's second visit to the country in 12 months.

The new investment is expected to create approximately 12,000 new jobs for GM India and its suppliers. The majority of the new investment will support the strengthening of Chevrolet's Talegaon manufacturing base in the state of Maharashtra. It will enable the facility to localize, industrialize and optimise its footprint to accommodate additional products for the domestic and export markets. GM India is expected to roll out 10 new locally produced Chevrolet models within the space of five years. They include the Trailblazer SUV, which will go on sale in October of this year, and the Spin MPV, which will reach the market in early 2017.

Talegaon, which currently has a production capacity of 130,000 vehicles, will increase its base capacity to 220,000 vehicles by 2025. It will also become a global export hub for GM, with more than 30 percent of its annual production planned for markets outside India. To rationalize its domestic manufacturing operations, Chevrolet will cease production at its Halol facility in the state of Gujarat by the second half of 2016.

Stanadyne launches EcoForce in India

Stanadyne, a global leader in the design and manufacture of diesel and gasoline fuel systems has launched EcoForce; a next generation diesel fuel system developed for the below 50 horsepower engine market. EcoForce is designed for farming, construction and industrial sectors focused on improved fuel economy, increased engine performance and reduced particulate emissions. Stanadyne plans to launch the new product in 2016 with an investment of Rs100 crore over the course of the program. Sanjay Chadda, MD, Stanadyne India said, "With investment plans in place, we are expanding our plant production capacity to accommodate the increasing demand. As a result of strong market interest, we anticipate sales to more than double by 2018." "To start with, EcoForce will have 90 percent local contents. We are also looking for some local partners in this context. Production and commercial sale of the technology will happen in 2016," Chadda told The Machinist. Dr. John Pinson, Stanadyne President and CTO said, "EcoForce is based on an innovative design concept for the below 50 horsepower market that offers superior engine performance and fuel economy with a lower total cost of ownership." Pinson also shared with The Machinist that Stanadyne has a strong focus on innovation and has been spending close to ten percent of its turnover for R&D activities.

Magna to acquire Getrag, a global supplier of automotive transmissions

Magna International Inc. has signed an agreement to acquire the Getrag Group of Companies ('Getrag'), one of the world's largest suppliers of automotive transmissions. In addition to its wholly-owned operations, Getrag has significant joint-venture relationships with Ford, as well as Chinese auto makers Jiangling and Dongfeng. Other Getrag customers include BMW, Daimler, Renault, Volvo and Great Wall. Including joint-venture locations, Getrag has approximately 13,500 employees and operates 13 manufacturing and 10 engineering centres in nine countries in Europe, Asia and North America. Getrag's 2014 consolidated sales were approximately €1.7 billion, which excludes approximately €1.6 billion in sales generated in its non-consolidated joint-ventures. Don Walker, Magna's CEO, commented: "As part of our ongoing product portfolio review, we have identified the expansion of our powertrain business as a strategic priority. Getrag is an excellent fit with this strategy."

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Volvo to export 'Made in India' buses to developed markets like Europe

With the objective to leverage its manufacturing presence in Asia, Volvo Buses has announced its plans to use India as an export hub for developed markets like Europe. A key milestone of this initiative is that the first bus made in the Indian facility will be unveiled later this year in Europe.

Volvo is among the leading players in the global bus market. The company's Asia Leverage strategy aims to utilise its manufacturing presence in India and China to cater to demands also from other global markets. At present, intercity coaches and city buses from the Indian facility are being exported to countries in the South Asia region and to South Africa.

Håkan Agnevall, President, Volvo Buses said, "At Volvo Buses, we are constantly looking at providing maximum value and high quality to our customers across all markets. This was a driving thought in starting the Asia Leverage programme; to utilise the efficient engineering and manufacturing expertise in India to meet the demands of other global markets. The commencement of exports to Europe from India is a proof point of these capabilities. We are confident that going forward we will leverage the skills and strengths in India to meet the European market requirements."

Volkswagen Pune plant saves energy with Heat Recovery System

The major Think Blue. Factory. project at the Volkswagen Pune Plant of 2015 is the new Heat Recovery Unit (heat exchanger). This unit has been installed at the exhaust end of the Top Coat Oven in Paint Shop. The sustainable results of this project were achieved by generating hot water using the exhaust flue gases which are vented out at 320 degree centigrade. This hot water is then used for heating application in Pre-treatment process in the Paint Shop itself. As a result, 80 percent reduction for hot water generation for this purpose was achieved that saved 492,483 SCM of Natural Gas consumption and 37 MWh/a of electricity as well as reduced CO_2 emissions by 1013 tons/a. The savings in consumption of Natural Gas are equivalent to 4916 MWh/a. On an average this translates to the energy consumed by nearly 1300 Indian households in a year.* Commenting on the achievement from the new project, Andreas Lauenroth, Executive Director – Technical, Volkswagen India Pvt. Ltd., said "The Heat Recovery from our oven in Paint Shop is major breakthrough in our efforts for achieving cleaner manufacturing. Volkswagen Pune Plant is moving with the right pace to achieve and surpass the targets set for 2018 under Think Blue. Factory. programme. This year, we will come closer to our target of contributing to the 25 percent global reduction in this respect."

Honda begins automobile production in Nigeria; its first plant in Africa

Honda Motor Co., Ltd. has announced that it began local production of the Accord sedan on July 10, 2015 in Nigeria, West Africa, where the automobile market is expected to expand in the future. Honda Automobile Western Africa Ltd., a wholly-owned subsidiary of Honda in Nigeria, established a new plant by installing automobile production facilities and equipment within the property of the existing Honda motorcycle production plant and began Accord production with annual production capacity of 1,000 units. This new plant is Honda's first automobile production plant in Africa. Honda began motorcycle production and sales in Nigeria in 1980. Since then, Honda has been evolving its businesses in order that they take root in this region. In 2013, Honda established a local automobile business subsidiary and began the import and sales of Honda automobiles. Based on its longstanding commitment to "build products close to the customer" and by leveraging its knowledge and technique amassed through motorcycle business, Honda begins local production of automobiles for the customers of Nigeria.

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A glimpse from one of the Aero India show. Courtesy: PIB

Widening the **horizon**

Aerospace and defense firms looking for untapped growth opportunities need to move quickly to appease investor/shareholders, says a new report from KPMG

While the mature aerospace and defense (A&D) markets continuing to stagnate, A&D organisations are under extreme pressure to make good on promises made to investors and shareholders to deliver growth in new areas and emerging markets.

In response, survey results released in KPMG International's Global Aerospace and Defense Outlook (KPMG A&D Outlook) shows that A&D organisations are looking for any opportunity to sustainably reduce costs and create new platforms for growth through more efficient research and development (R&D), through more responsive supply chains and through targeted divestments and portfolio adjustments.

For the next 12 to 24 months, keeping the business model competitive is the biggest challenge for A&D organisations (38 percent). To build strength and support growth agendas, 53 percent of respondents to the KPMG A&D Outlook cite sales growth as their top strategic priority for the next one to two years. This is followed by reducing cost structures (47 percent) and increasing cash flow from operations and improving risk controls (equal at 28 percent).

"With growth remaining slow and prices under continued pressure, A&D organisations are looking ahead for untapped opportunities and are preparing the groundwork for a positive future," said Doug Gates, KPMG's Global Head of Aerospace and Defense. "But with investors and shareholders becoming increasingly impatient for results, A&D organisations will need to move quickly to deliver on their promises."

> "With growth remaining slow and prices under continued pressure, A&D organisations are looking ahead for untapped opportunities and are preparing the groundwork for a positive future."
>
> **Doug Gates,** KPMG's Global Head of Aerospace and Defense

Many are looking to foreign markets for their next round of growth. More than a quarter of respondents to the KPMG A&D Outlook say they will enter into new geographic markets. A further 13 percent say they consider rebalancing their global footprint a top priority. And, while just 7 percent say they will exit unprofitable business lines, recent actions demonstrate that divestitures

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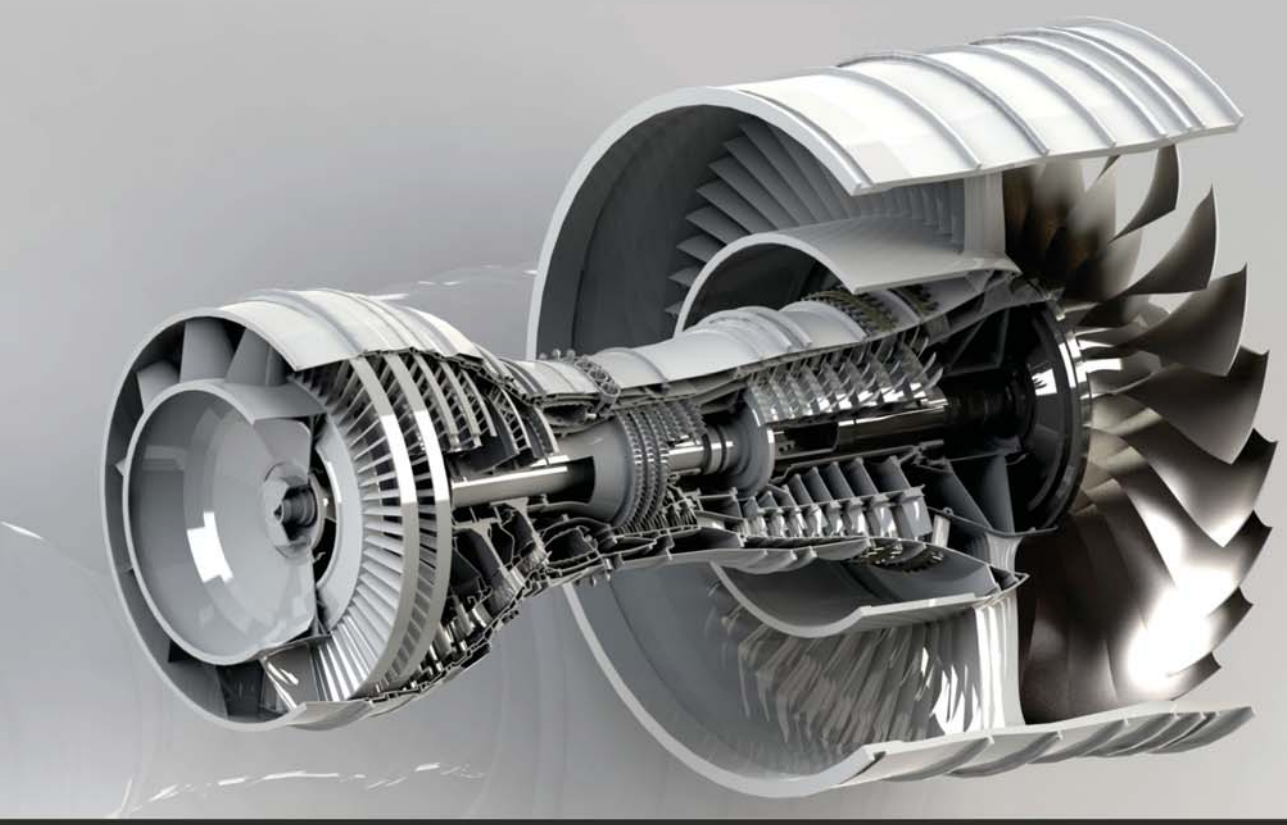

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A glimpse from one of the Aero India show. Courtesy: PIB

With growth remaining slow and prices under continued pressure, A&D organisations are looking ahead for untapped opportunities.

and consolidation will be much more prevalent than the data suggests.

Speaking about the report, Amber Dubey, Head of Aerospace and Defense, KPMG in India said, "With defense being one of the focus sectors for 'Make in India' campaign and an assertive India building up its military muscle, India provides both the opportunity for boosting sales and realising frugal engineering for cost management for the global A&D organisations." Speaking about the trend, Gates said, "Over the coming year, we expect to see significant consolidation in the sector. In part, this trend will be driven by necessity, particularly for any small-to-medium sized organisations and suppliers that are not able to win major contracts. But it will also be driven by organisations looking to reshape their portfolios with new products, services and technologies."

Exactly half of all respondents say they are focusing on adopting new manufacturing technologies and have breakthrough innovation as their primary strategy for advancement. In tandem, 46 percent say that the substance behind their technological advancements will come via placing more dollars into R&D. Indeed, the proportion of respondents who say they will spend in excess of 6 percent of revenues on R&D over the next year will increase by 13 percentage points to 41 percent.

But many recognise that some of their innovation will require working very closely with suppliers to identify, develop and commercialise good ideas. Reflecting this reality, around three quarters of all respondents say they are already adopting more collaborative business models with their suppliers and customers. In addition, 72 percent say that they expect partnerships – rather than in-house efforts – to characterise their future of innovation.

"Those hoping to enter into new geographic markets or adapt existing products into adjacent markets should work closely with both traditional and new partners to take advantage of their local or functional expertise," says Gates. "But, new relationships often tend to turn supply chains into increasingly complex operations and can become a drag on agility and competitiveness."

Recognising this, results of the KPMG A&D Outlook suggest many of the respondents are tweaking and adjusting their supply chain models and processes. In fact, a third of the respondents say that restructuring the supply chain to support growth is a top priority this year. An equal number say they are segmenting and tailoring their supply chain assets and processes in response to specific product needs and demand profiles. Furthermore, the majority of A&D respondents (54 percent) say they are focusing on lowering costs and working capital levels across the supply chain.

"In today's disruptive and fast-changing A&D environment, new threats and competitors are emerging every day. Yet, for the A&D industry in general, the challenge has less to do with spotting new threats and more to do with how individual organisations react and respond to them," said Doug Gates summarising the report.

> "India provides both the opportunity for boosting sales and realising frugal engineering for cost management for the global A&D organisations."
>
> **Amber Dubey,**
> Head of Aerospace and Defense, KPMG in India

5 key take-aways for Aerospace & Defense manufacturers

1. A&D organisations are highly focused on two overriding priorities: driving growth and managing costs. Growth will not come easily. New markets will need to be penetrated, new innovations will need to be commercialised, and new business models will need to be established.
2. R&D spend is on the rise as organisations focus on driving incremental innovation as a way to gain a competitive edge and adapt their existing products to adjacent markets.
3. To achieve growth objectives, companies have recognised that partnering will continue to increase in importance as they work to innovate products and services, execute on market entry strategies and adapt and develop new business models.
4. A&D organisations are continuing to look for opportunities to sustainably reduce costs. This includes rightsizing the product and business portfolio in order to prepare their organisations to take advantage of future growth opportunities.
5. Supply chain reorganisation is high on the agenda as A&D organisations look to drive future growth and reduce working capital. Particular importance should be placed on improved supply chain visibility, more reliable delivery performance and available capacity to meet current and emerging demands globally.

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Birla Spunshades™ - A shade better!

Birla Spunshades

The research conducted in 2010-11 by the Textile Research and Application Development Centre (TRADC) Surat, the Research and Development arm of Birla Cellulose, has resulted in a new application of viscose dyed knitted fabric, which does not harm the environment.

'Think About Tomorrow, Today!' This is the motto of the Aditya Birla Group. Sustainability is a crucial part of its manufacturing process and the entire Group is working towards achieving the 2017 mission of becoming the leading Indian conglomerate for sustainable business practices across its global operations. Every business within the Aditya Birla Group is doing its best to achieve the sustainability target and it is driven through innovative ways.

> "This process improvement is fully aligned with and adds to our new Forestry Policy. It brings renewable fabrics to the market as a part of our strategy to Future Proof our businesses."
>
> **Tony Henshaw,**
> Chief Sustainability Officer, Aditya Birla Group

Birla SpunShades™, the registered brand name for Spun dyed viscose fibre manufactured by Birla Cellulose has a technology to make fibre that is environment-friendly. "This process improvement is fully aligned with and adds to our new Forestry Policy. It brings renewable fabrics to the market as a part of our strategy to Future Proof our businesses," says Tony Henshaw, Aditya Birla Group's Chief Sustainability Officer.

Dyeing of fibre is a water-intensive process, apart from it being harmful for the environment due to the chemicals used and the effluents discharged. In traditional textile dyeing processes, the yarn/fabric once produced is dyed further. The dyed chemicals attach themselves to the surface of the yarn/fabric as they are unable to penetrate to the core of the fibres. Hence, with repeated washing, abrasion and exposure to light, the colours fade, which result in excessive water consumption, as repeated washing is required to remove the unfixed or faded colour.

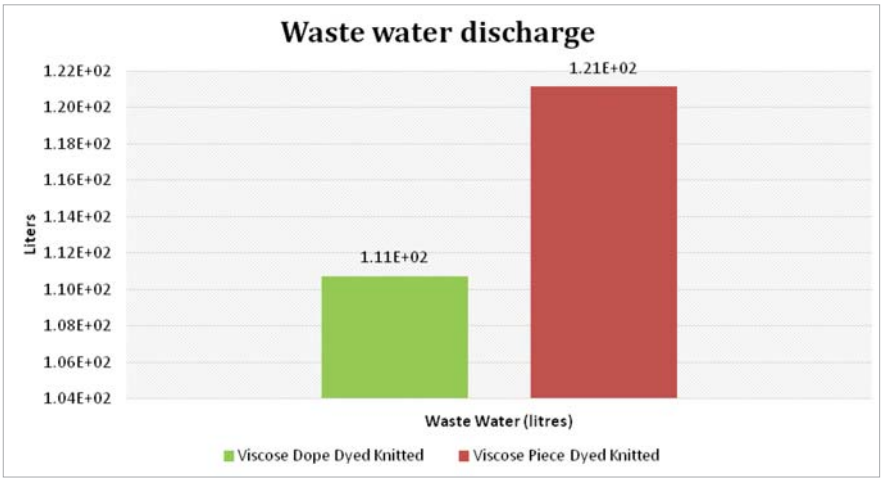
Through a research study conducted in 2010-11, sustainable and operational issues that were affecting the entire value chain were brought to the fore. This has resulted in a new application of viscose dyed knitted fabric, which does not harm the environment. Textile Research and Application Development Centre (TRADC) Surat, the Research and Development arm of Birla Cellulose conducted the research and sought modification of the current fibre. TRADC is a one-stop total solution provider that frequently works with the textile value chain for various projects on innovation and quality management.

Solution

"Pigment dyes are injected into the mix before the fibre is finally made …

… eliminates the need for conventional piece dyeing & saves ~30 litres/metre of fabric processed"

Spunshades are vibrant shades of dope dyed viscose fibre. In contrast to the traditional dyeing processes, Spunshades are manufactured with a technique that places colour pigments in the fibre itself when it is being made/spun – Spundyed. This eliminates the need for conventional piece dyeing and saves about 30 litres of water per meter of fabric processed. Hence Spundyed VSF is a great product for water conservation in the downstream processes. Life Cycle Assessment analysis conducted between viscose spun-dyed versus viscose piece-dyed knitted fabric supported the textile sustainability solution.



"In contrast to the traditional dyeing processes, Spunshades are manufactured with a technique that places colour pigments in the fibre itself when it is being made/spun – Spundyed. This eliminates the need for conventional piece dyeing and saves about 30 litres of water per meter of fabric processed."

In case of Spun dyed VSF, processes like bleaching, mercerization and dyeing are not required which so reducing the washing cycles to wash the product.

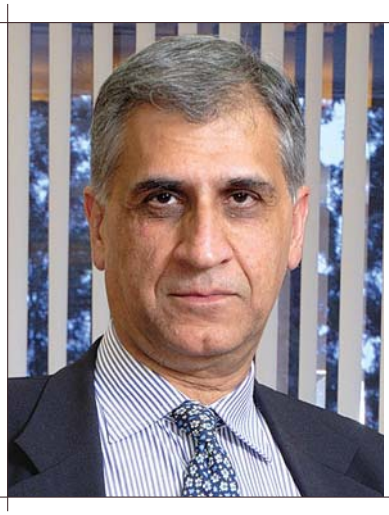
50 percent effluent reduction

"As the dyeing operation is not required for spun dyed VSF products … 50% of the effluent load is also reduced"

Spundyed VSF has industry leading levels of colour fastness (rating of nearly 5 on 5 for wash/rub fastness) and light fastness (nearly a rating of 7 on 8). Spun-dyed VSF has met with an incredible response. Birla SpunShades is available in 29 standard shades. It is being exported to countries all across the world. With the awareness building, the product is taking the market by storm. Bigger brands are approaching the company and it has truly revolutionized the fibre business in India globally.

The Greenhouse emissions and gaseous emissions are significantly lesser in spun-dyed VSF as compared to piece dyed products. Hence it can be safely said that Birla Spunshades are the solution to environmental issues like industrial pollutions, waste problems and global warming.

SKF INDIA LIMITED APPOINTS RAKESH MAKHIJA AS CHAIRMAN OF BOARD



SKF India Limited has announced the retirement of K C Mehra as the Chairman and from the board of SKF India Limited. Subsequently, the board approved and appointed Rakesh Makhija as the Chairman with effect from July 22, 2015. K C Mehra was the Chairman of the company from 2003. Makhija has been associated with SKF India for more than 12 years. He served as the MD of the company from 2002 to 2009 and has been a Member of the Board of SKF India Limited ever since. His most recent assignment was as President of Industrial Markets – Strategic Industries for the SKF Group. Prior to that, Makhija was the President of Asia Pacific – SKF Group. He brings more than 41 years of rich business experience. Prior to joining SKF, Rakesh served as the CEO and MD of Tata Honeywell. Before Honeywell, Makhija worked with Kinetics Technology International BV, a process engineering company in Netherlands, for over eight years. Makhija, aged 64 years, is a Chemical Engineer from the Indian Institute of Technology, New Delhi. He currently serves on the board of Tata Technologies Ltd, TML Drivelines Ltd.

RENAULT-NISSAN ALLIANCE GETS NEW MANUFACTURING ENGINEERING HEAD; IN CHARGE OF FURTHER ACCELERATING INTEGRATION

The Renault-Nissan Alliance has announced that Jérôme Olive has been appointed Alliance Executive Vice President, Alliance Manufacturing Engineering & Supply Chain Management, effective August 1. Olive, currently Senior Vice President, Manufacturing and Logistics Europe, Renault s.a.s., replaces Shohei Kimura who will move to a new leadership position in manufacturing within the Nissan group. His new position will be announced at a later date. Kimura has been head of the converged Alliance Manufacturing Engineering & Supply Chain Management function since its creation on April 1, 2014.

In his new position, Olive, 57, will be in charge of further accelerating integration within the function. The Alliance Manufacturing Engineering & Supply Chain Management function is one of four key converged Renault and Nissan units. The others are Purchasing, Engineering and Human Resources, which were also set up on April 1, 2014. Purchasing is led by Yasuhiro Yamauchi, Engineering by Tsuyoshi Yamaguchi and Human Resources by Marie-Francoise Damesin. Jose-Vicente de los Mozos will add Olive's current responsibilities to his duties as Executive Vice President for Manufacturing & Supply Chain at Renault. Olive joined Renault in 1982. He held various manufacturing-related positions at the Sandouville, Fonderie de Bretagne and Douai plants in France before he was promoted to General Manager of the Douai plant in 2004. In 2010, he joined Renault's subsidiary Dacia - maker of the popular Logan model - as Managing Director of the Renault Group in Romania and Managing Director of Dacia.

ROHIT AGGARWAL IS HUNTSMAN INDIA'S NEW VICE PRESIDENT & MANAGING DIRECTOR

Huntsman International (India) Pvt Ltd has appointed Rohit Aggarwal as the VP & MD of Huntsman India subcontinent with effect from July 1, 2015. Rohit will be succeeding Steve Stilliard who will be returning to Singapore. Aggarwal will rejoin Huntsman after two years with Louis Dreyfus Commodities B.V where he was CEO for the Asia Region. Aggarwal will continue Steve's leadership in helping grow the business, drive strategic partnerships and third party investment in India and the subcontinent. Speaking on the appointment, Paul Hulme, Huntsman Senior Corporate Officer, India Subcontinent said, "I would first like to thank Steve Stilliard for his valuable contribution throughout his stint at Huntsman India. He has displayed commendable leadership and keen sense of business insights in India which has positioned us for growth in India." "Rohit's appointment recognises our focus in accelerating our growth in a market that is exciting and filled with opportunities. He brings over 20 years of experience in the Chemical Industry, having led businesses across multiple chemical specialties, including additives, coatings, advanced materials and textiles. Rohit's experience in Huntsman from 2003 to 2012 augments a deep understanding of Huntsman's business and culture and will augur strategic growth in India," Hulme added.

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Manufacturing by **Digitisation**

Digitisation of manufacturing can help companies cut their operational costs by 30 percent and can have a very powerful impact in the key areas of operations, supply chain management and customer service.

By Ramesh Chandra

Information is accelerating at an unprecedented pace. The reason why data science, till now an obscure function, is suddenly becoming mainstream is because companies are beginning to realise that competitive edge is more or less derived from the ability to harness their tidal wave of enterprise data. The factory floor was often a black hole in the past. Adoption of technology has removed some of the operational blind spots and offered a clearer line of sight into the enterprise's operations and in turn, improved decision making. It provides for operational insights enough to ensure flawless manufacturing and, by extension, a more refined product?

The accelerated flow of information has impacted customers significantly, so much so that they have become more exacting in their demands from manufacturers. It is simply not enough anymore to come up with a slew of new features. Customers want clarity around what benefits are available to them and in the shortest span of time.

Most organisations have adopted contemporary technologies but in silos creating a connectivity gap in their operations. Digital technologies will play a major role in eliminating this gap. Manufacturing industry, for its part, must deal with sweeping changes in technology. Key among them is digital manufacturing in which cross-functional teams work in parallel to engineer and validate designs, before committing to physical prototypes, resulting in better productivity and cost savings.

Moving to digital manufacturing is the hardest part

As the market strives to be more and more customer-centric, manufacturers feel compelled to adopt the "pull" strategy in product operations, where goods are made to meet demand, not in anticipation of demand as is the case in the traditional "push" approach to production. To make a successful transition to just-in-time manufacturing of this kind, manufacturers must bring more discipline into their supply chain and use applications and web-based portals. Tight integration with business partners systems will bring visibility of their supply networks and stay in charge.

"Adoption of technology has removed some of the operational blind spots and offered a clearer line of sight into the enterprise's operations and in turn, improved decision making."

Contemporary ERP systems can certainly help the industry schedule its production better. And yet the challenges are far from over. The pressures range from the need for constant product innovation and faster product launches to agile operations to accommodate last-minute market flux or consumer whims. All this needs to be carried out without sacrificing on the cost and quality front. Ensuring quality of products and product design is a given in this industry and to make sure there are only pleasant surprises for the customer, it's time analog quality indicators made way for digital ones. Customers also expect complete after-sales support from manufacturers. The consumer behaviour in this digital era is characterised

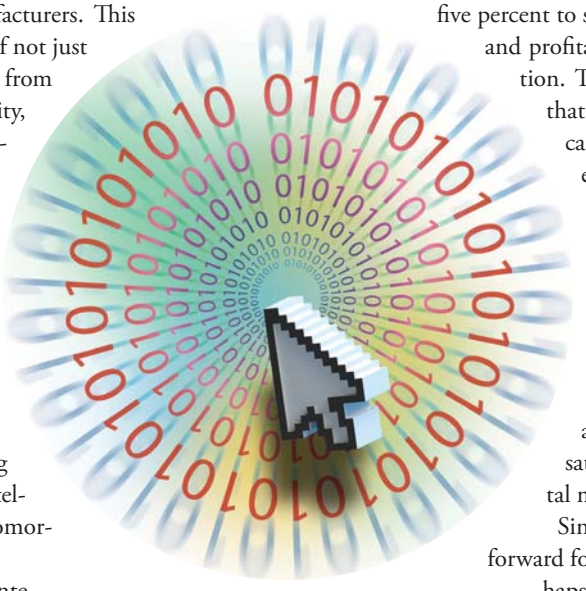
by 'simply tap, buy, use and throw'; so speed is of the essence in bringing new products to market.

In manufacturing, the problem is further compounded by the gap between the business and product development teams. Such miscommunication, along with patchy understanding of changing market sentiments, can lead to underperformance. Since the operational complexities are diverse and evolving, the solutions need to not only address current business and consumer needs but be able to pre-empt issues in the future.

Manufacturing companies should assess their maturity in terms of the processes and readiness for Digitisation in order to understand the opportunities for improvement and to pick up the strategy of operational excellence from the start. It is then that the organisations will be able to lay clear objectives of their operational excellence strategy and what value they foresee to derive in the future.

Advanced ERP systems can ease the transition

In the days ahead, doing the new is no longer a possibility but an inevitability for manufacturers. This includes harnessing the potential of not just big data analytics but everything from Internet of Everything, mobility, cloud, 3D visualisation, simulation and printing. The key idea is to smooth the entire process of manufacturing, connecting customers and decision makers in real time to collaborate around standardizing product designs and production methods. This will reduce wasteful spend in effort, among other things. Cloud-based Enterprise resource planning (ERP) tools are crucial for the intelligent manufacturing facilities of tomorrow.



The consumer behaviour in this digital era is characterised by 'simply tap, buy, use and throw'; so speed is of the essence in bringing new products to market."

Contemporary ERP will help integrate resource allocation, project management and enable the enterprise to "see" the entire supply chain in clearer light. It also takes care of nitty-gritties like time tracking and document management and ensures a smooth and continuous workflow, all the way from product visualisation to realisation. It also puts in place a seamless system of communication across departments and practices with instant messaging, chat, automated mail, and broadcast capabilities at individual, general and targeted tiers. This, coupled with the ability to automatically allocate resources (e.g., employees, tools) on demand from a central pool so as to distribute heavy workloads, makes ERP systems an invaluable part of the smart manufacturing organisation.

Adding predictive analytical capabilities to ERP systems will help manufacturers extract deep and accurate inferences from their store of enterprise data. This will lift the fog and help enterprises get their hands on enterprise data and make better decisions. Above all, they can get a handle on the kind of rich experience end customers are looking for.

A few challenges and the way forward

ERP systems maximise resource utilisation and provide for efficient handling of present and future workloads. At the same time, ERP is a framework that proves challenging to implement, more so in places like India, where most businesses are still stuck fast to traditional factory systems. A few players have either bucked the trend or are making efforts in this direction. Working closely with our experts, some of our clients, for instance, have streamlined their spaghetti mess of analog setups and brought them to speed with contemporary digital infrastructure, so they "talk" to each other.

In a recent study, MIT Professors Andrew McAfee and Erik Brynjofsson found that businesses that made use of big data and analytics in day-to-day operations rated at least five percent to six percent higher in productivity and profitability compared to the competition. Trusted Research reports also say that Digitisation of manufacturing can help companies cut their operational costs by 30 percent and can have a very powerful impact in the key areas of operations, supply chain management and customer service. Manufacturing companies can certainly reap significant cost savings while steering world class standard delivery, quality and customer satisfaction by implementing digital manufacturing.

Since Digitisation is the only way forward for manufacturing, the time is perhaps ripe for companies to consider implementing advanced ERP systems early on before these become de facto in industry. Manufacturing organisations should realise that digital technologies offer them a potent chance to efficiently connect processes and people, and use information effectively without any loop holes in the operational process.

They should also consider lessons learnt from the earlier generation of technology deployments and stay away from taking a silo-based approach towards digital technologies. Instead, the focus needs to be on leveraging digital technologies to make information flow fluid and drive operational excellence.

The author is Ramesh Chandra - VP Global Enterprise Solution Tata Technologies.

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A decade of **transformation**

The Tata Group started the process of capturing and celebrating innovations of its companies through Tata Innovista in 2006. It has recorded a whopping 15-fold increase in innovations in the last ten years.

The Tata Group has recorded a 15-fold increase in innovations by Tata companies over 10 years of Tata Innovista. The Tata Innovista is a group-wide programme, held annually by the Tata Group Innovation Forum (TGIF) to encourage, recognise and showcase outstanding innovations done by Tata companies. Started in 2006, Tata Innovista has become an indicator of the success of the innovation drive in the Tata group — and of the inherent capabilities of its people.

Tata Innovista 2015 received 1580 projects under the Promising Innovations category as compared to 101 in 2006, signifying a 15-fold increase. The Promising Innovations category recognises innovations that have been successfully implemented during the year. Out of these 1580 projects received, the top 60 innovations are expected to deliver an estimated financial benefit of $1.1bn annually and are likely to touch the lives of 35 million people, globally, over a 5-year period. The Promising Innovations category has six sub-categories: New Products, New Services, Core Processes, Support Processes, Services Enabling Customer and Social.

From a total of 75 Tata companies from across 18 countries who submitted their projects in Tata Innovista 2015, 38 Tata companies reached the regional rounds. The projects at the regional rounds, held in Delhi, Mumbai, Bengaluru, Jamshedpur, London, Washington DC, and Singapore, were judged by eminent external experts. 78 teams from 26 Tata companies were shortlisted for the final global round that took place in Mumbai on April 23-24, 2015.

S. Padmanabhan, Executive Chairman, Tata Quality Management Services (TQMS), Tata Sons, said, "Over the past decade, Tata Innovista has visibly enabled a culture of innovation and risk-taking in the group. The fact that across its four categories, – Promising, Leading Edge-Proven Technologies, Dare To Try and Design Honour – Tata Innovista 2015 saw over 2700 projects coming from 75 Tata companies spread across 18 countries bears testimony to this growing culture, and greatly enthuses us at the Tata Group Innovation Forum to further strengthen our efforts to encourage and celebrate the spirit of innovation in the Tata group. Also, this year, over 130 projects were collaborative, indicating that Tata companies are increasingly able to come together to leverage the synergies a diverse group like ours offers."

According to Dr. Mukund Rajan, Member – Group Executive Council and Brand Custodian, Tata Sons, "Innovation, which has always been a part of the Tata DNA, has in recent years taken on a fresh impetus with the Tata group's effort to democratise it and make it a continuous and ongoing process. As we look ahead, the focus on technology and innovation will continue to play a key role in helping us achieve our global ambitions."

Apart from Promising innovations, awards were also given under three other categories:

The Leading Edge – Proven Technologies: 620 projects were received under this category, which recognises and rewards the most innovative technology that is being developed and piloted, but is yet to be commercialised. This year, The Leading Edge awards went to:

- Jaguar Land Rover for 'Polar 3 Ultra Wide Ratio Transmission Demonstrator'
- Tata Steel for 'Graphene from natural source'

Dare To Try: Showcasing a growing culture of risk-taking and perseverance across Tata companies, this category saw 314 projects. It recognises and rewards most novel, daring and seriously attempted ideas that did not achieve the desired results. The awards went to:

- Tata Technologies for 'Seats with changeable orientation'
- Tata Consultancy Services for 'TCS Insurance Fraud Detection Solution (IFDS)'

Design Honour: It seeks to promote the focus of Tata companies on design thinking. More than 250 projects were received in this category. The awards went to:

- Titan Company for 'Zyra'
- Tata Technologies for 'Tata IRIS Design Mark'

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Deccan Odyssey

Deccan Auto Ltd. has forayed into bus manufacturing with its newly inaugurated plant in Telangana. The Machinist caught up with **MSRV Prasad**, Chairman, Deccan Auto Ltd., and M Balaji Rao, Director & Principal Advisor, Deccan Auto, to know more.

By Niranjan Mudholkar

He is a kind of an adventurer; perhaps even a bit of a maverick. But M S R V Prasad definitely is an entrepreneur with the 'Midas' touch. With a penchant for acquiring sick companies and then turning them around, Prasad started his entrepreneurial journey in 1985. Since then, across a variety of industry sectors like steel, cement, foundry and railways, he has proved that with vision, hard work, determination and a strong focus on quality as well as delivery schedules, any business can be transformed successfully.

With three decades of robust experience resulting in a business empire worth a global turnover of US$ 1.5 billion, Prasad – who is primarily based in Africa – is now seeking newer entrepreneurial frontiers. And this time, he is looking to make a mark in India's dynamic bus industry. The logic behind

Deccan Auto's manufacturing facility

Located in 75 acres area, the plant has come up on 18 acres with a covered area of two lakh sq feet. It has modern testing facilities and paint booth that can handle more than 3000 buses annually. The manufacturing unit is accredited by ARAI (Automotive Research Association of India) and conforms to the New Bus Code. It has leakage testing facility, modern painting booths with ovens, Bus Transfer platform, 100% power backup, jigs & fixtures with hydraulic/pneumatic controls, ETP (Effluent Treatment Plant), diesel filling station, weigh bridge and four lakh litre water storage capacity among others.

"Today, India needs good buses; it is like the time when Maruti brought in the 800cc car and set the tone for the revolution in the car market. It is time this happens for the bus segment!"

entering this segment? He believes the market is ready for the next generation buses and he wants to build these buses! Prasad points out that more than 90 percent of the buses on road in India are based on the chassis based platform, which is commonly understood by the passengers as a truck chassis modified for bus application. Of course, there is no denying that chassis based buses have been very essential in the development of the bus market in India, where the passengers are price sensitive. (*After all, chassis based buses are cost effective both in production as well as maintenance.*)

"If you look at the middle class passengers, they have mostly moved away from using the city buses and avoid bus travel due to the discomfort associated with the chassis based buses. I have travelled world over and have seen how comfortable road travel is in good buses. Volvo buses have given a good opening to the market and have redefined the travel norms in our country. But even though they have played an important role, their share in the overall Indian bus market is just about one percent. Today, India needs good buses; it is like the time when Maruti brought in the 800cc car and set the tone for the revolution in the car market. It is time this happens for the bus segment! Now people are ready and are looking out for comfort and safety. This is the reason for the birth of Deccan Auto," Prasad explains.

The Chief Minister of Telangana Chandrasekhar Rao inaugurated Deccan Auto's first integrated bus manufacturing plant at Kodakachani Village in Medak District last month (July 2015). Located about 40 km away from Hyderabad, the facility has a capacity to manufacture 3,000 units per year. (*Besides the Deccan brand of buses, the Corona brand buses will also be manufactured at this plant. Corona is a Pune-based company in which Prasad has a majority stake.*) Prasad has invested more than Rs250 crore in the Hyderabad facility. Being a native of the region, he felt it appropriate to start off here. "I am a graduate from the Warangal REC - (Now National Institute of Technology). What better than having our Indian flagship start from here," he explains, without denying the emotional angle. Initially, Deccan will employ about 600

M S R V Prasad – The Entrepreneur

Prasad started his entrepreneurial journey way back in 1985. Having worked with a couple of foundries in Gujarat, Prasad decided to acquire a sick foundry unit at Pattancheru, Hyderabad, called Martopearl Alloys Pvt Ltd. Using his experience, he turned around Martopearl transforming it into one of the most successful foundries in Andhra Pradesh. Today, this unit supplies to big names like BHEL, L&T and so on. Riding high on this success, Prasad then took over Duccan Alloy Castings, another unit to supplement the increasing demand for castings. This dual stint in the castings business inspired Prasad to venture out into Africa. In 1991, he took over Tema Steel Company Ltd., a sick steel plant from GIHOC Steel Works Ltd. (owned by Government of Ghana) in partnership with M J Patel, an Indian industrialist based in Kenya.

After successfully turning around this steel company, Prasad then acquired a clinker manufacturing company in Togo, and forayed into the cement industry. Impressed by the commendable performance of Prasad's Group, the Government of Togo invited him to take care of the operations and maintenance of the entire railway network of Togo! Since then, the Group has been successfully operating the railway under the name of Togo Rail SA. It is worth noting that Togo Rail imported discarded meter gauge diesel locos from Indian Railways. These old locos were then thoroughly overhauled and used for operations in Togo successfully. Prasad has also setup Greenfield cement plants in Ethiopia, Ghana, Nigeria and Mali. His Group, now clocking US$ 1.5 billion annually, is also building Greenfield cement plants in Congo, Niger, and Madagascar.

people and in the next few years it will move to about 1000. "We have also taken up the cause to support the nearby areas and are engaged in training the people at the entry level. Our experience has shown that manpower is not a major issue in this region," Prasad adds.

Deccan Auto's Hyderabad plant will be producing buses based on two designs: the integral chassis design (like the Volvo buses) and the Monocoque Design - the only offer in the Indian market today. "Our buses are with a rear engine and space frame based design which will give the best of ride comfort. The Corona brand of buses will have independent suspension in the front just as you have in a car. The buses are available from 8m to 18m in length. It is the largest offer in the rear engine segment," Prasad shares. Importantly, customers have been identified and Corona already has an order book of 320 buses from Amritsar, Chandigarh, Goa and Karnataka. The Deccan brand of buses will be also seen on road from November 2015.

"Our buses are with a rear engine and space frame based design which will give the best of ride comfort. The Corona brand of Buses will have independent suspension in the front just as you have in a car. The buses are available from 8m to 18m in length. It is the largest offer in the rear engine segment."

Two new regulations aimed at imparting greater safety and comfort for bus passengers came into effect from April 1, 2015 in India. These are the Bus Body Code and the mandate to make ABS standard for commercial vehicles. So where do these buses – Deccan and Corona – stand on these two regulations? Prasad is quick to answer: "In fact, our buses are homologated based on these codes. We have already received the certificate for the 12m bus. The 14m and the 8m bus certificates are awaited and will, fully confirm to the new code."

M Balaji Rao, Director & Principal Advisor for Corona Bus and Deccan Auto, now joins the conversation to share more technical infor-

Importantly, customers have been identified and Corona already has an order book of 320 buses from Amritsar, Chandigarh, Goa and Karnataka. The Deccan brand of buses will be also seen on road from November 2015.

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Prasad taking the Telangana CM for the plant tour after the formal inauguration

mation on the new buses. The Corona brand of buses for the city operations – Balaji points out – are based on the monocoque design. These are the only buses in the Indian market with a monocoque design, he claims. "These buses have independent front axle just as in a car. The ride comfort due to these two reasons is unbeatable. The monocoque also helps in the reduction of the weight and hence adds to the fuel efficiency. The safety of the passengers is enhanced due to the transmission of the forces in case of an accident across the bus structure and the shock absorption is far superior to other designs. The Corona City buses also offer an end to end single floor plate unlike the other similar buses with steps at the rear portion."

The Deccan brand of buses will compete in the premium luxury segment and will have toilets, individual audio/video consoles, pantry and covered hack tracks. "These buses will come in 330 and 375 Hp engines. We also give a combination of 2x2 and 2x1 seating to enhance the earning with a business class luxury for the business traveller. We would want the companies to move from air travel to bus travel with these conveniences," Balaji shares.

While the Hyderabad plant's current capacity is 3000 units per year, this year the plant has an order book of 320 buses in hand. Deccan Auto plans to take the order book to 1000 by the end of this year. It also plans to export buses to Africa where the Group has presence in more than a dozen countries having 12 operational cement plants and six more are in construction. So it makes sense. "We are looking at doubling our production capability in the next six years. The requirement of buses for India is going to increase dramatically if the smart city concept is put in place. We don't see a reason on why we should not be looking at a volume of 6,000 buses by the end of the 8th year," Balaji adds.

Prasad also wants to ensure that the buses coming out of Deccan Auto's Hyderabad manufacturing plant are truly 'Indian' in the making. For example, 95 percent of the components of Corona are Indian. "The engines are from Cummins, the axles from Meritor, the A/C is based on the customer choice while most other components are all Indian. The Auto transmission is the only major item imported as of now from Allison USA," Balaji shares. Coming to the Deccan brand, all the components of the bus body are from Indian vendors while the chassis and the power train are imported as of now. "The Engine and Gear box is from WeChai and they are putting up a plant in Pune for engine manufacturing. WeChai also makes axles and various other under-chassis components. In the next few years we would be able to get all these components from them in India, if our volumes grow the way we have planned. We will make sure that the import content is drastically reduced," Balaji says.

Aware that buses manufactured by Deccan Auto will be competing with some of the well established Indian and international brands, Prasad has also paid good attention to the R&D aspect of his buses. Currently, R&D is happening at three centers. "For Corona at Pune, we have an exclusive team working continuously on the product development and customer feedback. Deccan has an R&D team working round the clock to put the design and development in sync with the Zhongtong team which is based out of the Zhongtong Technology Centre in Jinan (China). We have seen that the teams are able to co-ordinate and support the manufacturing with the right inputs. The R&D teams in Hyderabad and Pune will be expanded and we propose to have a single R&D based out of Hyderabad in the future," Balaji states.

According to Prasad, Deccan Auto's vision is to manufacture 'world class' buses in India. That's the reason he and his team have visited more than a dozen bus manufacturers round the world to get a feel of the global scenario with regards to the trends and technology. "We have studied the manufacturing systems and the layouts of various top class plants. The plant layout at Hyderabad and its facilities are at par with world class companies having similar production capacities.

Deccan Auto's technical association with the Zhongtong Bus Holding Company

Prasad and his team visited many companies globally looking for a partner who would understand the Indian requirement and be flexible enough to change the product to suit the Indian requirement. A product that is successful in one country may not necessarily work in another. According to Balaji, China has enough manufacturing capabilities beyond its requirement and it has various quality levels. One needs to choose the right level. "For the same quality level, it is cheaper to manufacture in India since we have superior workmanship. China has better processes. The strengths and weakness are complimentary as of today. So we make a good pair. It is only that we need to understand and communicate better to get out the best. We are just doing that," Balaji says. Not surprisingly, Prasad feels that China is the best bet for the Indian bus scenario. "We only need to touch the right codes and take it forward," he adds.

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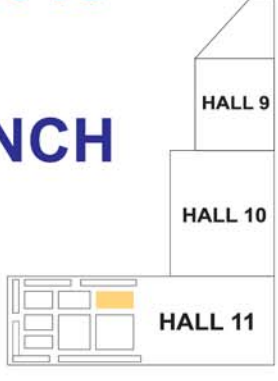

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"We are the only manufacturer in India today making the entire bus from chassis to finish in one unit - at one end of the factory you see square tubes lined up and at the other extreme end you see the buses being rolled out!"

M Balaji Rao,
Director & Principal Advisor for Corona Bus and Deccan Auto

We are the only manufacturer in India today making the entire bus from chassis to finish in one unit - at one end of the factory you see square tubes lined up and at the other extreme end you see the buses being rolled out! Our strength is visible in the design of the entire jigs and fixtures internally. We even have designed a roof stretch panelling machine. This is only the beginning. We will not compromise on the quality of manufacturing process or the equipment required. We will always be 'world class'," Balaji adds.

Prasad's Deccan Auto has also given sufficient attention to the 'Green' aspects at the Hyderabad plant. For example, the overall facility is designed such that the work area does not require fans during production. For example, last summer when the temperatures in the region were as high as 42 degree Celsius, the employees making the prototypes were going about their work without any discomfort. "The roof day lighting is good to run the show almost up to 6 pm in the evening without the artificial lights on. We have the mandated ETP and a huge water storage capacity. The area is about 75 acres out of which we have used only 18 acres," Balaji shares. In fact, about 2,500 saplings were planted in the open land at the Hyderabad facility on the day of the inauguration.

With every possible aspect taken care of Prasad wants Deccan Auto to be known as a manufacturer 'world class' buses for the masses and be a front-runner in the introduction of appropriate technology. He is obviously excited about his entrepreneurial foray into the bus manufacturing sector and continues to seek inspiration from his other successful ventures. "As an entrepreneur I have made success of businesses which others had written off. We have built cement plants under tough conditions. We have had to even build roads to reach out sites and then put up power plants to start the construction of the plants. And importantly, we have brought in prosperity to the areas we have reached. We continue this work with Deccan Auto," says the elderly entrepreneur with a certain pride.

The Deccan brand of buses will compete in the premium luxury segment and will have toilets, individual audio/video consoles, pantry and covered hack tracks. These buses will come in 330 and 375 Hp engines.

Considering his propensity to venture into associated territories, does he see Deccan Auto also diversifying into other commercial vehicle segments like trucks, for example? Well, it is definitely on the distant horizon but he wants to focus on buses at the present. "As of now we need to concentrate on Buses. This is our first entry into the automobile sector and hence need to consolidate before we jump into other areas. Of course, if opportunity strikes we are open to entering into the other commercial vehicle areas," he says with an entrepreneurial smile.

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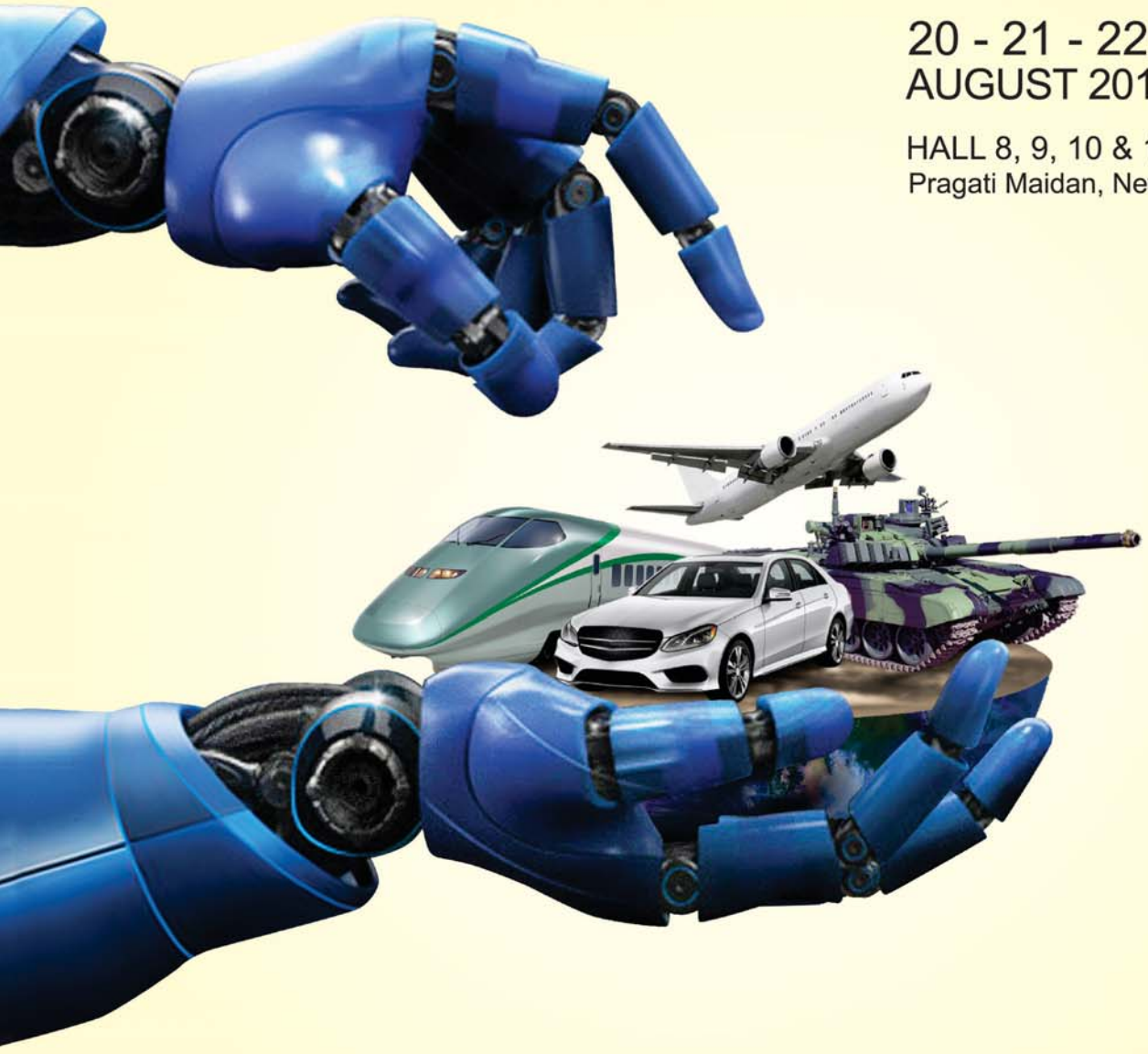

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Blisk **Machining**

The efficient machining of Blisk (bladed disk) often made from exotic alloy materials is becoming a focal point for project planning with a wide range of potential methods and combinations thereof available.

Blisk (bladed disk) volumes in aircraft production are increasing massively. Large engines now have several of these high pressure compressors which are manufactured from a single piece of high performance, often exotic alloy materials. The efficient machining of these materials is therefore becoming a focal point for project planning with a wide range of potential methods and combinations thereof available, from mechanical cutting to water jet cutting. A recent study by the Fraunhofer Institute for Production Technology (IPT) and the Laboratory of Machine Tools and Production Engineering (WZL) at RWTH Aachen (Germany) has now shown that Precise Electro-Chemical Machining (PECM) from EMAG drastically cuts costs for users, particularly for dressing the component surface.

Components inside an aircraft engine are exposed to extreme stresses, high temperatures and long service lives. Developers, therefore, use very hard, heat-resistant materials such as nickel-based super alloys for the construction of blisks and disks with single blades. This development presents a range of problems to manufacturing engineers, since conventional cutting methods become uneconomical as the material hardness increases and the service life of expensive tools drops, therefore causing unit costs to rise.

A recent study by the specialists at Fraunhofer IPT, together with WZL and EMAG ECM GmbH, compared a total of seven different blisk machining strategies, from multi-axis milling, combined with polishing to high pressure water jet cutting combined with PECM dressing. The results are impressive: for an assumed production volume of 800 nickel-based HPC blisks, the unit costs can be reduced by more than 50 percent compared to mechanical cutting if users adopt the correct machining strategy.

Machining area of an EMAG PO 900 BF for blisk machining using PECM (precise electro-chemical machining) technology

"PECM technology can significantly reduce the costs of blisk machining. EMAG can supply a wide range of machines for this purpose which can be tailored individually to the machining requirement."

Richard Keller,
member of the Board of Directors at EMAG ECM GmbH

PECM dressing proves to be the essential final process to make radical improvements to the efficiency of the production process. *(See info graphic)*

Gentle material removal – fast processes

In view of this, the PECM technology supplied by EMAG ECM based in Germany is currently being studied very closely by many OEMs and their suppliers. The electro-chemical process removes material without contact and causes minimal tool wear while being fast and reliable. The basic principle is simple to explain: during the process, the workpiece becomes the positive anode and the tool the negative cathode. An electrolyte solution flows between them, removing metal ions from the workpiece. The form of the cathode (tool), with its active, conductive zones results in material removal from the workpiece at the required component contours. Ring ducts, grooves, bell hollows and other contours can be produced without contact, but with very high precision and excellent surface quality.

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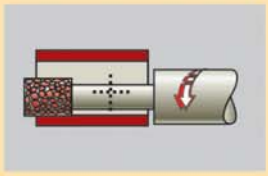
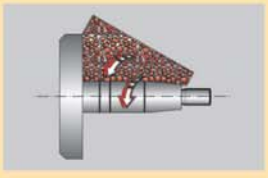


FIG-200 SPL CNC
BIG BORE GRINDER

FIGT-300 CNC
FOUR STATION TURRET

FIGE-150 CNC
ID / OD GRINDER

CNC Cylindrical Grinding



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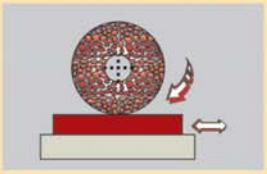

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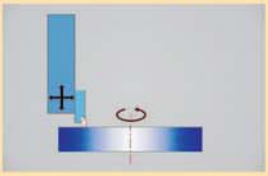

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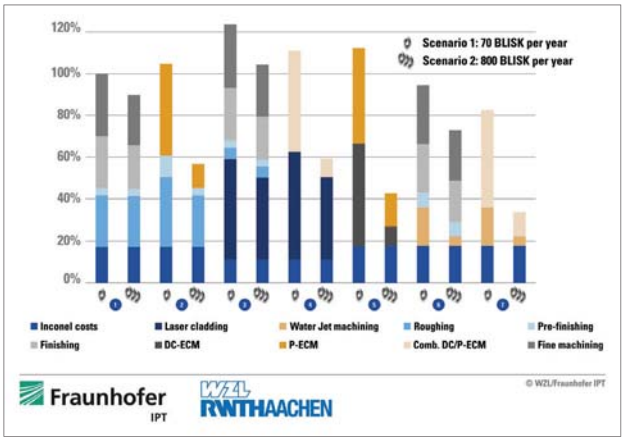

Seven different machining combinations were used in the study conducted by Fraunhofer IPT and WZL from RWTH Aachen. Complete mechanical machining (number 1) was used as the benchmark. The costs for an assumed volume of 70 BLISKs per year were 100 percent, falling to around 90 percent for 800 units (far left). In machining combination number 2 (rough milling and PECM), the costs falls to less than 60 percent. *Source: Fraunhofer IPT/WZL*

perts from EMAG ECM have developed this process in a targeted manner and tuned it to perfection. Two factors play a major role in this: firstly, the gap between the workpiece and tool, through which the electrolyte solution flows, is particularly narrow. And secondly, the supply of electrolyte solution is enhanced by a mechanical oscillation motion. Both factors together ensure that that material removal is even more effective and precise.

From single turbine blades to the blisk

EMAG ECM has two machine types for the different machining tasks of engine production: while the small model PO 100 SF is designed for machining single turbine blades, the larger PO 900 BF is for machining the complete, and therefore much larger, blisk. The systems differ in machining area size, footprints, generator capacity and the number of machining axes with precise PECM technology and EMAG high performance components available in both. "We launched the PO 900 BF in 2011 for blisk machining. The PO 100 SF development was the second stage in 2013 when an ever increasing number of customers demanded an electro-chemical machine solution for single blades. We now have an ideal basis for the development of precise, cost-efficient production solutions for small and large engine components," says Richard Keller, member of the Board of Directors at EMAG ECM GmbH. Both these machines also provide the user with central EMAG innovations such as a Mineralit® polymer concrete machine base, intelligent software and hardware interfaces and efficient automation solutions.

PO 900 BF blisk machining unit

Components certified for practice

This method has already been implemented into actual production with top results. For example, a well-known engine manufacturer has already certified single blades made on the PO 100 SF for use in aircraft in 2014 – unusually quickly after the start of production of the machine at a supplier's plant. A similar stage is currently pending for blisk production. Components from a whole host of engine companies are currently in the qualification phase for use in practice. "The technology is currently in the validation phase in a number of test programs" states Keller to sum up the current work of EMAG ECM. "The long-term strategic focus on these components and application technology is proving successful and each additional certification of components manufactured with PECM will only boost our sales success."

The geometric machining precision is one of the main factors behind the technology's success. In addition, it produces high surface quality with low peak-to-valley heights. Subsequent finishing processes on the blades, such as slide grinding, are therefore no longer required or can be completed much quicker – both of which result in a further reduction in unit costs. This is a massive plus point for a component which is becoming ever more important and whose volumes are rising massively.

Source: EMAG

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LASER World of PHOTONICS INDIA to be held during September 9-11, 2015 is an important gateway for the use of lasers and photonics in different industries in India.

The use of lasers in automotive manufacturing has increased dramatically over recent years to a position where about 15 percent of all industrial processing lasers are installed in production. Traditionally, the adoption of lasers by the automotive industry has been linked to new applications. Today, new solid-state laser technologies are evolving at an unprecedented pace. Although, the lasers are devoted mainly to cutting applications, a significant and growing proportion of lasers are being applied to welding. In industrial production, the advantages of the laser welding process have been established compared to alternatives such as electron beam welding. This is due mainly to the high productivity and small amount of down-time compared to vacuum based systems and the subsequent reduced manufacturing costs.

Automotive manufacturers utilise the advantages of laser cutting, such as the high quality of cutting edges, the low heat input into the material as well as the high processing speeds when working with a variety of work pieces around the car. Thereby, a variety of materials is processed. Besides a multitude of metals also materials such as airbag cloth and composites for interior room parts are cut with the laser. Owing to the good possibility of automation, also complex work piece geometries and various cutting edges can be easily generated.

"Laser technology is becoming the need of the day in manufacturing industries due to its several advantages. The main advantage of laser process is that, it offers faster and better results compared to existing conventional processes, thereby reducing the cost per part. Hence, conventional applications are being replaced with lasers in various industries like automotive, electronics, precision engineering, tool and mold making, medical technology, furniture and more. The show provides for an opportunity for pioneers like TRUMPF who will present to its customers our wide spectrum of well defined lasers that suit different processes – whether it is 2D or 3D laser cutting / Laser welding / Laser marking / Laser metal deposition" said Mohammed Hidayath - National Sales Manager – Laser Division, TRUMPF India.

Besides this other companies like Han's Laser, IPG Photonics, Sahajanand Laser Technology, Scantech Laser, HuaGong Laser, Amada Miyachi to name a few to offer solutions across automotive and other industries.

Laser techniques have several advantages over traditional metal-joining technologies like increased process speed, resulting in higher productivity, shorter cycle times and minimized heat distortion of the joined parts, Compact manufacturing lines with reduced floor-space requirements, Enhanced strength of the joints, compared with most alternative joining methods by continuous welds, Reduced width of — or elimination of — the flange, resulting in reduced vehicle weight, Greater tooling flexibility. The same laser can weld, braze and cut. Additionally, one laser can service multiple work cells by means of fibre optic cables.

"Today, lasers and photonics impact almost every aspect of our life. Lasers presumably will continue to play a major role in all the technologies. As it is the only show in its segment, we strive to match up to the expectations of our visitors coming from all across the user industries. It serves as an excellent platform to witness new technologies, connect with the industry experts, gain knowledge and benefit from them" said Bhupinder Singh, CMO and Member of the Management Board, MMI India.

LASER World of PHOTONICS INDIA, will also witness many accompanying programs held concurrently like International Conference on "Application of Lasers in Manufacturing 2015" organised by International Advanced Research Centre for Powder Metallurgy and New Materials, Short courses offered by The Optical Society (OSA) and Conference on "Smart Automation for SMEs" with Automation Industry Association.

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The ACE LIST

Leadership is playing a huge role in the Indian auto components industry's rise to the next level. Therefore, we at ***The Machinist*** thought it pertinent to understand the vision and aspirations of a set of top management representatives from this dynamic industry. While this list is far from comprehensive, it certainly reflects a very interesting and insightful cross section of this sector. We started the ACE List last year featuring some of the leading entrepreneurs from this industry. This year we have extended the scope of the list beyond entrepreneurs (people who started their own organisations) to include other top management guys. This is in recognition of the fact that while some of them may not have established the company, their role is equally entrepreneurial in growing it.

By Niranjan Mudholkar

Why they are on 'The ACE List'

- ✓ They are all big on manufacturing.
- ✓ They are expanding.
- ✓ They are either Tier 1 suppliers or are single source suppliers.
- ✓ They are focused on innovation and excellence.
- ✓ They are either diversifying or acquiring new businesses.
- ✓ They are big on exports.


Viraj G Kalyani


Asheet Pasricha


SK Behera


Thimmaiah NP


Gaurav Motwane

**The term 'ACE List' is an exclusive editorial property of The Machinist magazine. We do not claim this to be an exhaustive list and are well aware that we may have missed out on many names. But this is a beginning and we will be building this into a strong editorial platform in the times to come. - Editor*


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Harish K. Sheth

**Founder Chairman & Managing Director,
Setco Automotive Ltd**

It has been about 33 years since Harish K. Sheth started building Setco Automotive Ltd. And it has been time invested quite well because Setco has emerged to be the largest manufacturer of clutches for Medium and Heavy commercial vehicles in India. "Yes, nine out of ten clutches sold in India (in the OEM segment) come from Setco," he tells us with pride. In fact, his guesstimate is that even in the aftermarket segment, Setco could have a healthy market leading share of about 40 percent.

Now the aim is to be the preferred clutch of choice in the international market as well. "Our aim is to sell at least one out of every three clutches sold in the commercial vehicles segment and one out of five clutches sold in the farm tractor segment globally," Sheth says. Indeed, Setco is an excellent example of what a focussed Indian auto component manufacturer is capable of doing.

Established in May 1982, Setco today employs more than 1,200 people globally. It is a Tier I supplier of clutches to all the prominent Indian commercial vehicle manufacturers such as Tata Motors, Bharat Benz, Ashok Leyland, Man India, Mahindra & Mahindra, Volvo – Eicher Commercial Vehicles and Asia Motor Works amongst others. Setco has all the required global quality certifications such as TS 16949, ISO 14001, OSHAS 18001 and VDA 6.3.

While it has four manufacturing facilities – two in India and one each in UK and US – almost 90 percent of actual production happens in India. Its key manufacturing base is in Kalol, Gujarat, and the other Indian facility in Sitarganj, Uttarakhand, is also growing rapidly.

One of the key reasons why Setco has reached its current stature is the Company's strong focus on innovation based on market understanding. "Today, we have even developed products for international markets. Our advanced R&D centre at Kalol built with an investment of Rs25 crore is certified by the Indian Government's Department of Scientific and Industrial Research to design, develop and validate full clutch systems," Sheth shares. Setco also has a research and development centre in UK. "In fact, our two R&D units work on a collaborative platform developing products that address our customers' demands and requirements. At present, we are spending about one to one and half percent of our sales on R&D and are planning to take it to about four percent in the next two to three years. Our R&D provides us a competitive edge in terms of quality, cost, testing, design & technology of the company's products – and time cycles for each," he adds.

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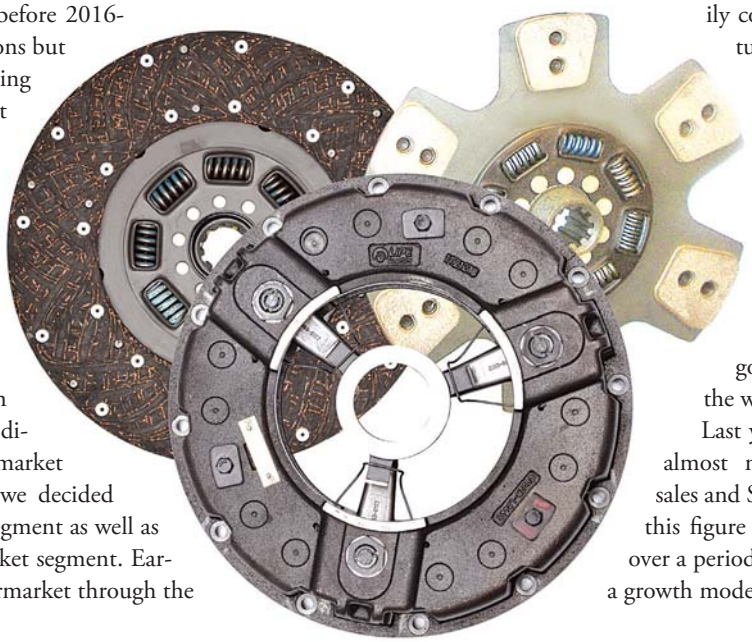
Setco manufactures and markets proprietary LIPE clutch solutions for the medium and heavy commercial vehicles worldwide. LIPE has emerged to be an undisputed leader with an imposing market share. Today, SETCO is one of the five largest manufacturers of clutches for Medium and Heavy commercial vehicles in the world. Its diversified portfolio includes non automotive areas such as Hydraulics for off-highway construction equipment and marine products through its overseas subsidiaries.

In the last five years or so, Sheth has been driving Setco in the top gear clocking excellent growth figures. For example, in 2009-10, Setco crossed the Rs.200 crore turnover mark, while in 2010-11, it crossed the Rs.300 crore turnover mark. And in 2011-12, Setco crossed the Rs. 400 crore turnover mark. "In fact, 2011-12 was the best year for us in terms of year on year growth. Of course, we cannot reach the same volumes again before 2016-17 due to market conditions but we are confident of growing in a healthy manner. Last year, we clocked about Rs460 crore (growing at 39 percent) and we are looking at touching the Rs1000 crore mark in the next few years," Sheth explains.

A key strategy behind Setco's robust growth also has been the timely diversification in different market segments. "In 2011-12, we decided to diversify in the LCV segment as well as the independent aftermarket segment. Earlier we did sell in the aftermarket through the OEMs but going directly has certainly helped us."

Setco is looking to add the tractor segment by next year. In the meanwhile it has also ventured into the castings sector by starting a joint venture called Lava Cast. "We will soon be starting trial production at Lava Cast. About 36 percent of its production will consumed for in-house demand while the rest will be sold in the market," Sheth says confidently. The reason for this confidence? "There is a shortage of good quality castings in India, US and Europe. In fact, all our current customers want good quality castings. Of course, it will take some time but eventually it will happen," he says.

Sheth foresees good growth for the Indian auto components industry both in the domestic as well as exports markets. He agrees that the Indian auto components sector is now a global phenomenon but believes that the Indian industry's strength primarily comes from the manufacturing side. "We (Indian companies) may not have much of chance in some areas like electronics and safety but as far as manufacturing is concerned – particularly in terms of forgings and castings - we are as good as anybody else in the world," he says.



Last year, exports contributed almost nine percent to Setco's sales and Sheth is looking at taking this figure to a healthy 15 percent over a period of two to three years on a growth model.

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Farrokh Cooper

Chairman and Managing Director, Cooper Corporation. Pvt. Ltd

Although he was honoured with 'The Machinist Lifetime Achievement Award in May 2015, Farrokh Cooper, Chairman and Managing Director, Cooper Corporation Pvt. Ltd., is quite young at heart. Belonging to Satara (where his organisation is the largest employer and tax payer), this third generation entrepreneur merges his decades of experience with youthful zest to run one of India's few indigenous engine manufacturing companies.

> "Despite the overall recessionary trends in the country, Cooper Corporation has witnessed consistent and aggressive growth for the past five years across sectors because of our reputation for technology, after market support and commitment to quality and service."

And come to think of it, he entered this business only by accident. It was in fact the biggest challenge of his professional (and perhaps even personal) journey. "One day there was a complete change in my daily routine from farming, dairy cattle, grapes and running country liquor shop (toddy shop) to machine shops without any notice, no training and mentors. I was left to deal with it on my own," he recalls. At that time, he went out and met all the key customers of Cooper and said that 'I know nothing but I am ready to learn, so give me a chance'. "I was fortunate enough to have clients like Kirloskar, Cummins, Walchand and other

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stakeholders who allowed me to grow Cooper Corporation to a level where it is today," he says with pride and gratitude.

He is inspired by 'excellence', a fact that clearly reflects in the Cooper products. "And my biggest strength has always been transparency, communication, integrity, honesty, sincerity and fidelity," he shares. He believes that it is only because of his inspiration and strengths that he has been able to guide Cooper successfully even during the difficult of times. "Despite the overall recessionary trends in the country, Cooper Corporation has witnessed consistent and aggressive growth for the past five years across sectors because of our reputation for technology, after market support and commitment to quality and service."

> "The Indian auto component sector should know how to exploit its own uniqueness in its DNA instead of blindly following what other countries are doing."

Earlier this year Cooper entered into a technical collaboration with Ricardo UK which will enable Cooper Corp to expand its range of engines from 3.5 KVA to 1000 KVA and cover almost 75 percent of the range of products available in the market putting the company in the same league as the biggest players in the industry in a relatively short period of time.

Cooper has a longstanding relationship with Ricardo, UK since 2008 for designing its state-of-the-art family of engines in 2, 3, 4 and 6 cylinder configurations. These Engines are designed to meet all future emission norms while delivering the best in class fuel efficiency. "This technical collaboration along with the nearly century long experience in India has allowed us to bring market competitive products that comply with regulations and norms in India," Cooper says.

At the same time, he intends to expand the Company's capacities in the cast iron foundry, aluminium foundry, engine lines etc. and achieve a turnover of Rs3000 crore in the next five years. By the way, Cooper Corporation's turnover a few years back (2012-13) was just Rs320 crore with an investment of Rs300 crore! In 2013-14, it was Rs390 crore with an investment of Rs325 crore. In FY14-15, it was Rs460 crore with an investment of Rs44 crore. For the current FY, Cooper's projection is Rs750 crore with an investment of Rs560 crore. "In the next three year we are confident of crossing Rs2200 crore with an investment around Rs600 crore. By 2020 we would like to achieve an annual turnover of Rs3000 crore," he says confidently.

Cooper's mantra for taking Indian auto components sector to the next level is quite simple: *'Understand the market and understand the customers'*. "It is important to remember to 'Understand before you are Understood'. Transparency is the key to build confidence. You have to have the ability to see what others don't see and then do what you have to do to get there; which means intuition, leadership and a very steady nerve. This is what will set you apart from the rest. The Indian auto component sector should know how to exploit its own uniqueness in its DNA instead of blindly following what other countries are doing or set them as benchmark,"

Cooper's personal vision for his organisation is that it should attract various stakeholders for its uniqueness in the Cooper culture, which has an amalgam of transparency, integrity, sincerity honesty and fidelity. "We aspire to be trail blazers in whatever we do, whenever we do and wherever we go. There is beautiful quote by Benjamin Franklin which says that *'if you wish to be remembered after your life, either write something worth reading or do something worth for people to write about'*. At Cooper it is our desire to do something worthy for people to write about us," he says. Well, Mr Cooper, we are already writing about you!

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Dr. Ravi Damodaran

President - Technology & Strategy,
Varroc Group

Dr. Ravi Damodaran joined Varroc Group in 2012 and since then has been successfully spearheading the Group's foray into next generation technology. Besides having more than 18 years of diverse and dynamic experience in handling large scale projects and operations in technology and manufacturing, Dr. Ravi also has many industry-firsts to his credit in the areas of materials research to technology transfers and business turnarounds. This alumnus of IIT-Roorkee is also a Six Sigma Master Black Belt from (G.E).

Dr. Ravi strongly believes that while our potential as a nation has been recognised by the world may times over in the past two decades, we have continuously failed to live up to that potential. "On one side we boast of the best intellectual capital in all fields, but on the other hand we have not excelled in the global arena in most of these fields. Indian manufacturing, while being recognised as low cost has not resulted in world class infrastructure or products and our exports continue to lag imports both in terms of quality and quantity. The tremendous opportunities for correcting these anomalies and realising our potential is an inspiration to not only me, but also, I am sure to many committed individuals whose single minded dedication and devotion are the reason we continue to make positive but painful progress despite the challenges of corruption, poverty and illiteracy that plague our society even today," he says.

He feels that technology has the power to change many things including taking the Indian auto components sector to the next level. "And by technology I don't mean the quest for incremental solutions that will keep us abreast of our own competition. Indians need to institutionalise technology development both in processes (for improved productivity) and products (for improved differentiation and customisation to local needs).

"Why is it that we have world class talent but no world class products? Why is it that while we are called a manufacturing hub, yet we have to rely on 'German and Japanese' machines to manufacture products to world standards, even after decades of manufacturing experience in India?"

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Why is it that we have world class talent but no world class products? Why is it that while we are called a manufacturing hub, yet we have to rely on "German and Japanese" machines to manufacture products to world standards, even after decades of manufacturing experience in India? Because we have not scaled up individual brilliance to collective excellence in the area of technology development to get ahead of our competition in the global arena. This has a long gestation period, however, the journey which has started hesitantly, needs to be accelerated. The timeline can be shortened by collaborative R&D in this highly connected and globalised environment," Dr. Ravi states.

It is the focus on technology at the Varroc Group that has catapulted the organisation in the realms of significant growth for many years. Varroc has consistently outperformed the market over the last two decades. This is primarily due to the strategic choices it made whether it be with products and markets or customer pursuits. "Overall the Varroc group grew 14 percent last year also although the year for us was a mixed bag. Our international operations performed incredibly well on the back of sustained focus and great execution, despite challenges on the market fronts. Our domestic operations managed to buck the trend of flat industry growth, primarily riding on some strategic diversification of the customer base in previous years. However, our plan to enter new segments to further derisk ourselves and bolster our margins received a setback due to the continued sluggishness in the markets," Dr. Ravi shares.

Varroc Group's turnover last FY was Rs7800 crore and Dr. Ravi expects to maintain the current growth rates organically. "We maintain a cautious outlook for the domestic market this year despite the initial signs of recovery in the first quarter. Our international operations will however maintain their steady growth despite a general slowdown in the China market. We have an aspirational goal of Rs20,000 crore for FY2020 for which we will look to a mix of organic and inorganic routes to achieve it," he says.

Varroc is a rapidly growing organisation that has targeted tremendous growth in the domestic and global arena. "We aim to achieve these targets with a judicious mix of strategic investments and aggressively tapping the opportunities presented by the various customer and markets we service today. My personal vision is to make Varroc the No. 1 technology player in the products that we chose to be in. This requires aiming for the state of the art technologies in intelligent passenger car lighting systems in the global arena and skilling up our Indian organisations to deliver technological excellence in our diverse product lines for the two wheeler market," Dr. Ravi shares.

> "Strategic planning is the tool I use to ensure that the future is de-risked. My own personal values of Sincerity, Humility and Integrity are what stood me by in driving change persistently with diverse teams and amidst adverse sentiments."

Besides growing topline by 14 percent last year, Varroc also added three new plants – one each in Chennai and Rajasthan to support local customers and one in China for its passenger car lighting systems. "We have also added over a 100 engineers in our technical centres last year to back up our engineering capacities for existing products and also to enhance capabilities for new technology development. Our partnership with Scorpion Automotive for advanced security and telematics systems for varied automotive segments early this year has already evoked interest amongst customers as they search for more robust solutions in these domains," Dr. Ravi adds. Varroc is also planning to build a Technical Centre in Pune early next year that will house over 300 engineers in the near term designing products and building technologies for Indian and global markets.

On a personal level, Dr. Ravi thinks that his optimism and ability to inspire the workforce are his biggest strengths as he continues to work to bring together diverse opinions and create an atmosphere of enquiry and reform to provide solutions to every challenge the organisation faces.

It is these strengths that have enabled him to overcome all the challenges. Of course, he looks upon challenges as a stepping stone: "Each professional move in my career was inspired by the challenges it presented. My current role in Varroc is no different. The opportunity to be part of a think tank that drives Varroc to achieve excellence in whatever it does also came with the challenges of working in an environment that has delivered consistently in favourable market conditions but was never tested in the kind of slowdown that we are witnessing in the auto industry for the past few years. Strategic planning is the tool I use to ensure that the future is de-risked and my own personal values of Sincerity, Humility and Integrity are what stood me by in driving change persistently with diverse teams and amidst adverse sentiments. All my life I have derived hope and positive thoughts from those ordinary people who consider it their duty to silently contribute to build a peaceful tomorrow," he says.

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Suresh KV

Country Head, ZF in India
(And Head of ZF India Pvt. Ltd)

He has recently (June 1, 2015) taken charge as the Country Head of ZF in India and Head of ZF India Pvt. Ltd, with the objective of driving the performance and development of all lines of business for ZF in India. At the same time, he is also responsible for the operational function at ZF India Pvt. Ltd. Of course, he looks at this dual role of tackling the business aspects overall as well as taking care of the day to day operations as an opportunity. And it is opportunities that inspire him while he draws strength from his ability to adapt as well as from team work.

Turning around ZF's Coimbatore facility into a profitable one was Suresh's biggest professional challenge and the qualities that helped him successfully accomplish that assignment will also enable him to achieve the task at hand currently. Those qualities are: 'Being focused and harnessing the potential of the team'.

"We have signed up with some of the biggest domestic OEMs and are in talks with several others for possible partnerships in the near future. We will be closely monitoring the response to this product (newly launched passenger car clutch systems) and take next steps," Suresh informs.

The first half of the year has been good with myriad of activities at ZF, the major ones being the opening of the Chakan facility and the TRW acquisition. ZF Friedrichshafen AG also took over Industrial Gears and Wind Turbine Gearbox business from Bosch Rexroth which marked their entry into the business with industrial gears that are used in oil rigs, mine vehicles, tunnel drilling machines, or cableways, etc. This year also marks the 100 year of ZF providing the world with futuristic technology and high quality products.

ZF established its presence in Pune in 2010 with the objective to locally meet the market demand for products and services from the company. Since then, the business unit has strengthened its network and extended its product offerings in the automotive and the non-automotive segments. "We introduced high performance transmissions, followed by chassis components both for commercial vehicles and passenger cars. Today we have enhanced this product portfolio by launching passenger car clutch systems. These are specially designed to meet the demanding driving conditions. The business unit is now increasing its focus further on market and dealer development. One of the initiatives in this direction is the Dealer Development, wherein we have put a lot of focus on close collaborations with our authorised Dealers and Services Partners for better market penetration and customer support. Also,

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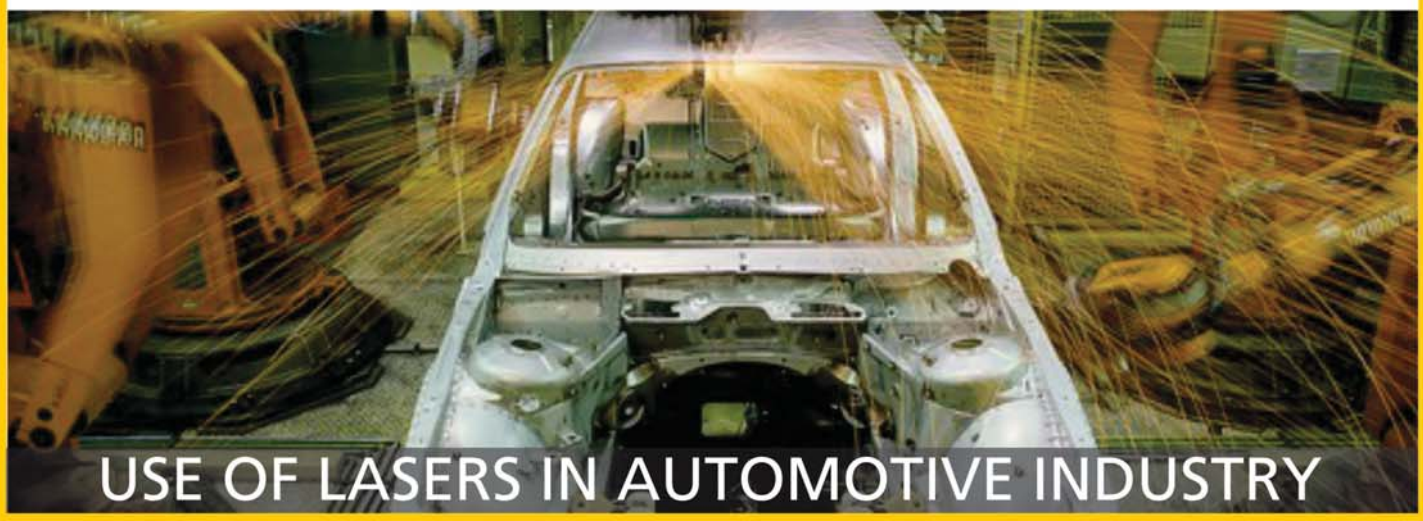

USE OF LASERS IN AUTOMOTIVE INDUSTRY

Laser has seen a fast development over the years and with it the use of lasers in the automotive industry is grown rapidly. The decision to use a laser over an alternative manufacturing method is now just an economic decision. Seeing the economical advantages almost all major car companies have now adapted the laser in their production. The need for **reducing the weight of cars, increase the safety and the efficiency is pushing the car industry** to adapt laser technology that is best suited and economical. In automobile components manufacture area, laser marking technology has already used in any areas that need to be marked, metal components, non-metal components, auto glass, tire etc. Lasers are now commonly used in applications like **hot forming, 3D laser cutting of ABC pillars, welding of power train components, roof brazing, plastic welding of headlights, marking of day/night switches and speedometers** and many more applications.

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LASER World of PHOTONICS INDIA 2015 is receiving overwhelming response, with more than **120 exhibitors** across the world as on date with country pavilions from **UK, China, Japan, Lithuania** and **Germany**. Like in past the trade fair is supported by Ministry of Communication and Information Technology and other important industry associations.

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in our aftermarket business we have seen a very positive growth," Suresh says.

Suresh believes that the main growth driver for the organisation was business with automatic passenger car transmissions and axle systems where ZF has witnessed better than expected growth. "The 8-speed automatic transmission, whose second generation we launched last year, has been especially popular among customers. The market for commercial vehicles and off-road machinery, however, turned out to be more difficult in 2014," he adds.

Post the acquisition of TRW Automotive on May 15, 2015, ZF is now represented at about 230 locations in some 40 countries. The combined company has a 100 year track record of customer benefit and value creation and a strong complementary product portfolio of leading technologies. "The portfolio combines the powertrain and chassis technologies including e-mobility solutions and electronics of ZF with the safety, steering, braking and autonomous driving technology of TRW. It diversifies across industries, spanning from passenger cars to utility vehicles such as trucks, buses and tractors and includes in addition construction machines, marine, railway, wind power and industrial technology. This very comprehensive portfolio is the right answer to the mega trends in an increasingly disruptive industry such as autonomous driving, safety and fuel efficiency," Suresh says.

Globally, ZF Friedrichshafen AG successfully completed the year 2014 with sales growth of nine percent which once again is above the industry average. The company generated sales of EUR 18.4 billion. At the same time, ZF has improved profitability, with earnings before interest and taxes (EBIT) rising more than one-third to about EUR 1.1 billion. The regions of North America (EUR 3.7 billion) and Asia-Pacific (EUR 3.6 billion) were top contributors to the company's record sales of EUR 18.4 billion, with each region increasing sales by 21 percent.

"The 8-speed automatic transmission, whose second generation we launched last year, has been especially popular among customers. The market for commercial vehicles and off-road machinery, however, turned out to be more difficult in 2014."

ZF has recently launched its passenger car clutch systems designed to meet demanding driving conditions in India. "We have signed up with some of the biggest domestic OEMs and are in talks with several others for possible partnerships in the near future. We will be closely monitoring the response to this product and take next steps," Suresh informs.

Government's increased safety norms have worked as a catalyst for companies to pay special attention to safety systems. Suresh believes that ZF has been ahead of its times with regards to safety of its products as the company understands that dense traffic and high speed characterizes everyday life on roads. "Additionally, not only road safety but ZF is particular about environmental norms in India. Compliance and enforcement programs by the Government of India aims to ensure that, even after a period of use, vehicle emissions of criteria pollutants are met. ZF's strategy is to grow from bringing advanced technology to India and develop products in India for India which would tackle these issues and provide sustainable products."

His mantra for taking Indian auto components sector to the next level is two-fold: 1. Performance on QC and D, and 2. Quickly adapting to changes – because change is constant in life. Suresh's personal vision for ZF in India is achieving multifold growth and at the same time become a preferred employer.

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Viraj G Kalyani

Executive Director,
Kalyani Forge

Viraj G Kalyani is probably the youngest in this list but very well deserves his place not just for driving his organisation's growth but also for bringing out a cultural change from within. And his education certainly did prepare him for this endeavour. "I think my biggest strength is connecting and synthesising disparate ideas. It's a strength I consciously cultivate by keeping my eyes and ears open to find patterns. I learned this a great deal from my alma mater, University of Pennsylvania, where we were encouraged to think in multidisciplinary ways," he says.

> "Quality must come first without compromise or cutting corners. The world still comes to India for cost advantages. But we should attract the world on the value of our products not just the price tag."

Viraj is inspired by work! He believes that work can be quite engaging if you approach it with the right perspective and develop a passion for it. "Interacting with a variety of people from colleagues, clients, friends and family and surrounding oneself with visionary people can be quite inspiring. There can be rough days at work, but the best days are when you learn something new at work. That excites me and opens up a world of new possibilities. Additionally I've been a firm believer in the tremendous potential of our country and making a difference here is a thrilling idea."

Viraj's biggest challenge has been change management. Of course, it takes a lot of perseverance to challenge and change the fundamentals of a business in order to transform for the future. "There have been times when I lost my patience with people. There were times where I'd hit the wall but I've never lost hope."

The learning curve is mandatory in any progressive journey and Viraj's experience has not been any different. "I've tried many small experiments of changing habits and processes and each experiment reveals what ticks with people and what doesn't. I've also made more effort in receiv-

ing feedback from various sources to validate my ideas and getting new ideas from others. It's been a humbling experience wherein I've learned the importance of empathy and involving multiple teams with a new initiative and not trying to steamroll it single handedly."

The last year was quite good for Kalyani Forge in terms of building on its customer satisfaction and making major interventions in its working culture. "Many of our customers have given positive and encouraging feedback on this front. We developed a number of new products thus expanding our offerings of forged and machined products for various engineering and automotive applications. We grew our topline by over 20 percent while also making substantial upgrades at our facilities. We also started creating a positive cash reserve for upcoming investments," Viraj shares.

> "There have been times when I lost my patience with people. There were times where I'd hit the wall but I've never lost hope."

The Company's last FY turnover was around Rs240 crore. "For the current FY, we are expecting good growth along with increased value addition. Five years is a long period to plan with certainty, but we are aiming for a growth over current levels of 4 to 5 times up to 2020," he adds.

Thanks to the transformation drive undertaken by Viraj, Kalyani Forge's plants are going through some facility upgrades as well as technological upgrades which are visible on the shop-floor. "We have a new machining shed which is getting booked with lines for new customer orders. We are in the process of commissioning two additional press lines this year thus building capacity for higher weight products," says Viraj.

Viraj feels that the Indian auto component sector should aim higher and look around the world for opportunities. "Quality must come first without compromise or cutting corners. The world still comes to India for cost advantages. But we should attract the world on the value of our products not just the price tag," he emphasizes.

Viraj believes that Kalyani Forge is on its way to becoming a strong engineering and design company, making the best high strength products. "The company is getting a vote of confidence from many marquees and leading OEMs around the world. I would like Kalyani Forge to be a benchmark organisation on customer centricity, employee engagement and technological leadership," he states.

Asheet Pasricha

Joint Managing Director, Trinity Engineers Pvt. Ltd
(And President, Association of Indian Forging Industry)

The diversity of challenges that forging industry is driven by provides the inspiration to Asheet Pasricha. "No two days are similar; it calls for innovative thinking and more often than not, unique solutions. Each day is a new learning experience giving me a firsthand opportunity to build upon my technical knowledge bearing in mind that I do not have a technical educational background," he says. His biggest strength: "To be able to adapt to the current situation, identify and break down the problem on hand and find solutions given the limited time frame."

Pasricha believes that the process of forging is both an art and a science. To do well in a sector as niche as this, one has to have the technical background and understanding as well as the passion to learn. "Besides, you need to have the willingness to do what it takes, understand the finer nuances of business, understand people management and be a team player while motivating your people to deliver their best," he says.

This industry being dominated by engineers, Pasricha's biggest challenge was the fact that he lacked the required technical background/expertise. "However I always believed in getting my hands dirty, working my way up and learning through hands on experience. That is how I made up for my lack of technical knowledge. From self education to working on the shopfloor I gained the required knowledge to survive in the industry," he shares.

The last one year has been better than compared to the last few years for Trinity Engineers. "This is majorly attributed to the positive market sentiment primarily owing to the focused strategy to diversify our customer profile from automotive to non- automotive sectors like oil and gas, power, defence and general engineering," Pasricha informs.

Over the last three years, Trinity has been focusing on up-gradation of resources both equipment and manpower. "The main objective has been to improve the overall productivity and spruce up capacity utilisation while breaking down cost rather than expansion of capacities."

Pasricha is aware that as elsewhere in the world, the forging industry is still heavily dependent on the automobile industry with demand for forgings essentially originating from commercial vehicles and off road vehicle (Tractors) in terms of tonnage, and other four-wheelers. "The industry is still recovering from the impact of the global economic slowdown on the Indian automobile sector that led to decrease in demand on one hand and on the other, the cost of major inputs like power, steel, fuel and skilled manpower spiralled," she says.

The slowdown however highlighted an inherent shortcoming of the industry and that was the over-dependence on auto sector. "The need of the hour is aggressive diversification into non-auto verticals both at the level of individual companies and the industry on the whole. The current level of diversification stands at 39 percent and needs to be pushed significantly," he believes.

> "I always believed in getting my hands dirty, working my way up and learning through hands on experience. That is how I made up for my lack of technical knowledge. From self education to working on the shopfloor I gained the required knowledge to survive in the industry."

As a part of the Association of the Indian Forging Industry (AIFI), Pasricha strongly feels the need to reduce dependency on the automotive sector. "Conscious efforts are being made continuously by the industry towards upgrading technologies and diversifying product range to expand its customer base to emerging sectors including aerospace, energy, oil & gas, heavy engine parts, defense, construction equipment, power generation, transmission and distribution."

Trinity Engineers' current turnover is Rs210 crore. And Pasricha's target for 2020 given the current scenario should be about Rs300- 320 crore. His vision for Trinity Engineers is to see the company carve a niche for itself as one of the leading and trusted players in both auto and non auto forging space in domestic and international market. "By 2020, I hope to achieve a healthy mix of consumer profile spread across auto and non segments.

In the short term, this will translate into Trinity focusing its energies towards improving efficiencies / utilisation / productivity of existing resources; technologically, manpower and equipment wise. "Planned investments will go in to expansion as and when required to meet growing demand," he states.

SK Behera

Vice Chairman & Managing Director, RSB Group

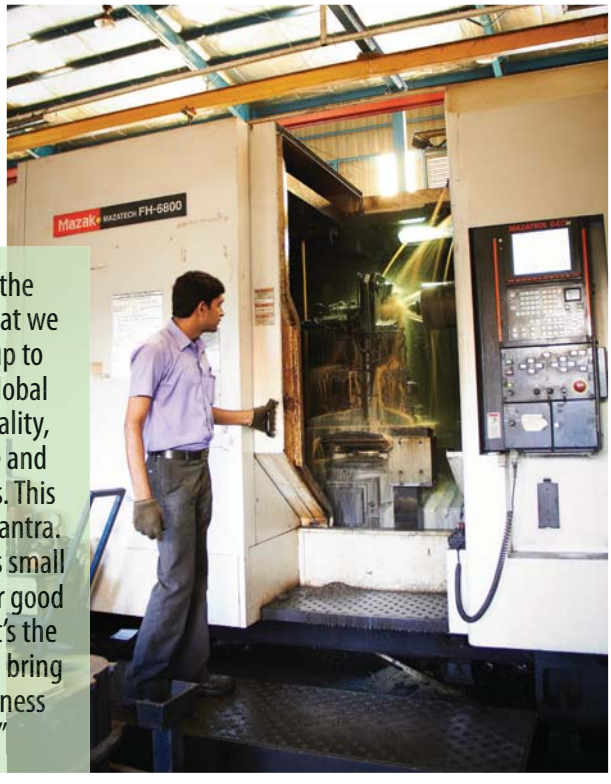
The RSB Group is helmed by two illustrious and brilliant entrepreneurial leaders and S K Behera is the younger of the two. Inspired by "Excellence", SKB – as he is popularly known – strives for excellence in every moment of his life, at place of work, with his customers, vendors, his RSBians and commitment to society in action with silent deeds. "Excellence is the beginning and end in my every endeavour," he says.

SKB does not believe in 'aiming'. "What I do is 'hit the bull's eye' straight, clear and concentrated. Life has two rules: (1) Never quit. (2) If difficulties surmount, I refer to Rule No.1," he says matter-of-factly.

Importantly, SKB believes in running the day and not the other way around. "I know there is no royal road to anything and the one that moves fast withers rapidly whereas I believe in taking one at a time with dedication and put my whole and sole, grow steady and endure in each of my initiatives," he adds.

So what has been the biggest challenge in his professional journey and how did he deal with it? "Looking back, our earlier years were most challenging when we took hits after hits and many of our friends closed their shops for good; that's where I and my elder brother, R K Behera, stood steadfast, learned to smile in depressed scenario, used our every acumen with patience. I remember in late 1970s I used to pedal in my bicycle around Jamshedpur to do everything which will keep us afloat," he recalls with humility and pride.

Of course, when he looks back today, he feels delighted that their (his brother's and his) efforts and ethical business while keeping quality as their top agenda (RSB is a world-renowned Deming Award Company for Business Excellence) has made the Group today a leading engineering institution. The Group has 13 manufacturing plants spread over seven locations in India; namely Jamshedpur (Jharkhand), Pune (Maharashtra), Dharwad (Karnataka), Chennai (Tamil Nadu), Pantnagar (Uttarakhand), Cuttack (Orissa) and Lucknow (Uttar Pradesh); and one each in Homer (USA), Silao (Mexi-



"Leverage the excellence that we have built up to challenge global norms in quality, cost, service and effectiveness. This is a simple mantra. No business is small or gigantic; or good or average. It's the approach you bring to your business process."

co) and partnered venture at Brazil.

While the last one year wasn't really great for RSB, SKB is confident about the coming times. With the thrust on Made in India and 'Make in India' promoted by our Honourable Prime Minister, we are confident of a better time ahead," he says. Last year RSB had a turnover of around Rs1046 crore and this year it is expected to clock around Rs1262 crore, SKB is targeting to cross Rs2750 crore by 2020. "After prolonged slump, there have been signs of recovery albeit not in line with expectations. But more than the numbers, SK Behera wants RSB 'to be amongst the most admired organisation with a significant global presence'.

RSB has recently signed an MoU with the Andhra Pradesh Government for setting up its state-of-art plant at Sri City for manufacturing latest generation of propeller shafts. "For these propeller shafts, we have an on-going collaboration with world-renowned Eugen Klein GmbH, Germany and Jidosha Buhin Kogyo Co. Ltd. (JBK), Japan. This plant will cater to Isuzu Motors and other global OEMs - Ashok Leyland, Daimler, etc in south besides catering to other clients pan India and overseas," he shares.

> "What I do is 'hit the bull's eye' straight, clear and concentrated. Life has two rules: (1) Never quit. (2) If difficulties surmount, I refer to Rule No.1."

SKB's mantra for taking Indian auto components sector to the next level is quite simple. "Leverage the excellence that we have built up to challenge global norms in quality, cost, service and effectiveness. This is a simple mantra. No business is small or gigantic; or good or average. It's the approach you bring to your business process," he states.

Thimmaiah NP

Managing Director & CEO,
Meritor India

Thimmaiah NP, MD & CEO, Meritor India, is responsible for Meritor and its joint venture activities in India including - Meritor Heavy Vehicle Systems, Automotive Axle Ltd, the India Technical Center and Global Sourcing Office. And he sees this opportunity to create an environment that inspires continuous improvement across all business areas, is what drives him.

"Being responsible for complete oversight of the businesses' different facets, driving the organisation towards growth and world class manufacturing capability, and delighting the customer excites me. My biggest strength is being able to span the often polar opposites of strategy and execution. I always look for the next level of performance and drive the organisation towards it. I love doing new things and I enjoy taking calculated risks. I believe that people make the difference and having the right people who understand what is good for the organisation and work towards organisational betterment are key factors for success. At the end of the day I want to look back and see what have I contributed. Have I created something lasting and of value for my people and the organisation and industry; am I leaving behind a strong legacy?" he says.

Meritor Heavy Vehicle Systems and Automotive Axles Ltd are joint ventures between Meritor Inc. USA and the Kalyani Group, Pune. It has been the largest independent rear axle drive manufacturer in India for close to 35 years. After more than two years of downturn the market is looking up since the last few quarters. "We continue to grow significantly faster than the market with our new product development and new business vertical strategies. The last one year was exciting for us as we continued to launch many new products and will continue to ramp up this year as well," Thimmaiah says. The company's annual turnover is approximately Rs1,000 crore. "We have an ambitious target to grow multifold by 2020, the strategy and execution plan are in place to grow the business exponentially," he adds.

> "At the end of the day I want to look back and see what have I contributed. Have I created something lasting and of value for my people and the organisation and industry; am I leaving behind a strong legacy?"

Meritor India has recently expanded its current facility at Mysore to produce high end specialty axles which are used in mining, off-highway and military axles. The new plant is a world class facility spread across 3,600 square meters and has the capacity to manufacture 9,000 axles per year. "The plant has the unique ability to manufacture a special axle weighing 10 tonnes used for a 100 tonne dump truck. We have also built a new factory at Jamshedpur for brakes and tag axles."

Thimmaiah's personal vision for his organisation is three-pronged. Firstly, he wants to grow

the business profitably faster than the market - through highest level of performance to the customer while continuing to invest in new products development, venture into new business lines, adjacencies related to its product line. Secondly, he wants to create world class manufacturing – this includes factory and organisation culture. And third, he wants to have highly motivated employees.

Thimmaiah says that aligning people towards a common goal is the biggest challenge. He believes that it is very important that leaders should support each other in the organisation to seamlessly execute upon one strategy and one vision, and that is the challenge. "You need to be constantly communicating and ensure they do not drift. I also want to say that I have been lucky throughout my career to have excellent teams in each organisation I have worked for. I want to emphasise that at my current organisation the team is excellent and among the best I have had, and that makes my job very easy. Market downturns are extremely challenging, identifying what should and should not be done during a downturn is very important," he says.

He also believes that a leader needs to keep both short term and long term objectives in mind and make decisions. "Making decisions about what should and should not be done to avoid hurting the long term objectives of the organisation is the most difficult thing to do. Also keeping up the motivation of the people is extremely challenging and important, communication is a very important factor, and I always ensure that I am transparent and over-communicate to make the organisation aware of the dynamics, requirements, performance needs," he sates.

> "Consistent quality and delivery performance are still going to be the main factors to take the Indian auto industry to the next level."

Thimmaiah feels that the Indian auto component sector needs to invest in upgrading manufacturing processes and capabilities to deliver high quality products and a reliable supply chain. "Most of the time it adds to capital investment, but the challenge is you do not get compensated for the same, we are caught in this vicious cycle. Everyone says that volatility is here to stay and we have to learn to deal with volatility. I agree that this is the fact but according to me it is impossible to deal with volatility in an effective manner – serving a volatile customer demand adds to cost in the supply chain. Many people may not agree to my point but when you have 100 suppliers spread across the country with a logistics lead time varying from 1 to 7 days and manufacturing throughput of many days, it is impossible to produce and ship per daily variation. I know it is very difficult because the ultimate volatility comes from the end customer and it's our endeavour to serve the customer in the best possible way. Consistent quality and delivery performance are still going to be the main factors to take the Indian auto industry to the next level," he shares.

Gaurav Motwane

Managing Director,
Mahindra Sona Limited

Associated with the Company since May 2004, Gaurav Motwane has gained considerable experience in auto components industry. An alumnus of The Wharton School at the University of Pennsylvania, Motwane is inspired by 'Organisations who continue to innovate and develop state of the art technology to help to meet rapidly changing customer and market demands. "We have all seen the kind of impact new innovations can have on an industry and economy as a whole. There is an advantage in using ones strong analytical skills with the ability to identify opportunities and risks based on which strategic decisions can be taken," he shares.

"We have all seen the kind of impact new innovations can have on an industry and economy as a whole. There is an advantage in using ones strong analytical skills with the ability to identify opportunities and risks based on which strategic decisions can be taken."

Over the years, Indian Auto component suppliers have had to establish Joint Ventures and Technical collaborations with International players to acquire product and process technology. "This was a huge challenge for Mahindra Sona Ltd. (MSL) given we did not have a Joint venture partner or a technical tie up with an overseas partner for the manufacturing of Propeller shafts. The question being asked was "what is MSL's technology pipeline"? We started this journey by identifying world class Companies who are leaders in supplying Propeller shafts. We needed to understand the technology they used and if it was applicable to the Indian context. Striking and maintaining a long standing partnership with large globally established players was a challenge which we have achieved," states Motwane.

Mahindra Sona Limited is an ISO/TS 16949 certified Tier 1 supplier of Propeller Shafts, Clutch Assemblies, Steering Column Components such as Steering

Universal Joints and Spindle & Sleeve Assemblies. The Company caters to the Utility Vehicle and Commercial Vehicle Segments. MSL exports about 20 percent of its production to OE customers in North America and Europe. The gross total income of Mahindra Sona Ltd. for the year 2014-15 (FY15) was Rs433.89 crore. It has been posting a strong double digit CAGR growth in last five years.

Of course, as Motwane rightly points out, the economic environment in India during the year gone by has been subdued which has caused a slowdown in the Automotive sector. "The GDP growth of the Country was at around 7 percent. The manufacturing sector also remained under pressure. In an economic environment, wherein growth in the automotive sector has slowed down, our Company has achieved a growth in sales. This growth has been achieved by winning additional business with existing customers, adding new customers in the domestic OEM market, developing products for the new segments and growing our export business," he informs.

> "Innovation and Quality with value for money is the only path forward for going to next level. While, the components industry has vast potential in and outside India, we need to understand customers' expectations, stated and implied."

MSL continues to invest aggressively into in-house R&D and testing which has resulted in creating a robust mechanism of generating and capturing IP within the Company. "Our customers appreciate the work we are doing to add various features to the products we supply which in contribute to making their vehicles more reliable and efficient. We are also in the midst of identifying new locations to set up additional capacity. We will have more clarity on this in the next few months," Motwane says.

Motwane believes that Indian automotive companies must invest aggressively in R&D and testing infrastructure. "Companies that have the capability to innovate will survive. Innovation and Quality with value for money is the only path forward for going to next level. While, the components industry has vast potential in and outside India, we need to understand customers' expectations, stated and implied. With the entrance of many MNCs in past 25 years, the vehicles manufactured in India have to be at par with global counterparts.

Motwane wants to build MSL into a Company that India is proud of. "We want to become a supplier of choice to domestic and global customers and align ourselves with the Government's 'Make in India' campaign to demonstrate that world class quality products can be made in our Country and used by the customers worldwide. We already have a significant export business and my target is to grow this overseas business and supply to Global OEMs by selling cost effective quality parts in and outside India," he says.

Automation for turning process of forgings

Globally as the automotive parts industry volumes are getting integrated and enlarged with fewer number of Tier 1 and 2 suppliers, there is increasing need for automation of workpiece handling even at the first operation stage after forging.

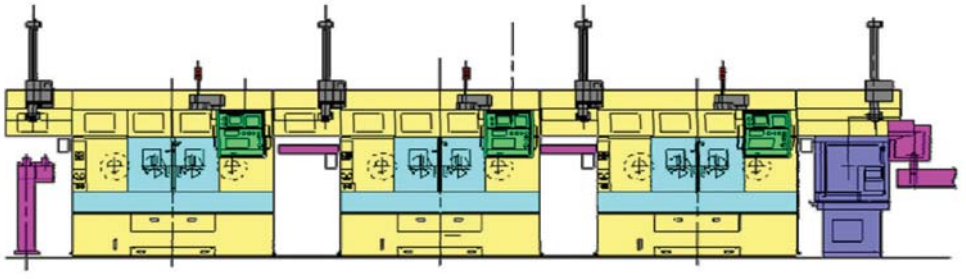
By K. Raghunandan, Marketing Advisor, Murata Machinery Ltd, Japan

This article describes the design aspects and practical factors relating to automatic handling of forgings for feeding into the first machining process of turning operation.

During the past two decades, there has been a revolutionary change in the design and production of forgings, especially for the high volume requirements industry worldwide. In the olden days, forging companies were only just that; forging manufacturers. With the evolution of modern supply chain management, especially in the high volume automotive parts industry, many forging companies have had to add value to their forgings to deliver to their clients globally.

No more is a forging company, just a forging supplier but in the modern industrial world, it is also a supplier of at least fully finish turned or semi-finish turned parts. In many cases they also go one step higher in value addition ladder by heat treatment and other finishing operations up to ready-to-assemble stage of components. Further up the ladder are the suppliers of unit assemblies as well. With this evolution, forging companies not only consider the economics of the forging technology to produce the raw forgings, but consider on a macro level including the value-adding first metal cutting operation process.

In this presentation, we focus on the link between raw forging as it comes out of the forging process and the feeding into the value-adding first operation of turning or turn-milling. Globally as the automotive parts industry volumes are getting integrated and enlarged with fewer number of tier 1 and 2 suppliers, there is increasing need for automation of workpiece handling even at this first operation stage after forging. This article will describe the various types of automatic feeding and handling devices of workpiece to load on the first operation chuck and highlight their designing factors relating to the forging quality and material.



Full Turnkey Solution for first process of Turning / Turn Mill for forgings:

- Feed-In device
- Poka-Yoke / Orientation units
- Loading / Unloading on First Chucking process
- Turnaround Unit
- Loading / Unloading on Second and / or further chucking processes
- Washing station
- Post-Process Gaging unit
- Feed-out device
- Interfacing to next process
- From Muratec

The presentation will be based on actual case studies of varieties of forgings with illustrations and the practical issues to consider for achieving the highest level of efficiency in a fully automated value adding first operation.

Complete handling of the forging to finish machined product is achieved, by Muratec's integrated Gantry Loader system and additional pick-and-place units if required, to meet the TACT time requirement of the complete production line.

Focus of this presentation is on the feed-In of raw forging to the first chucking process.

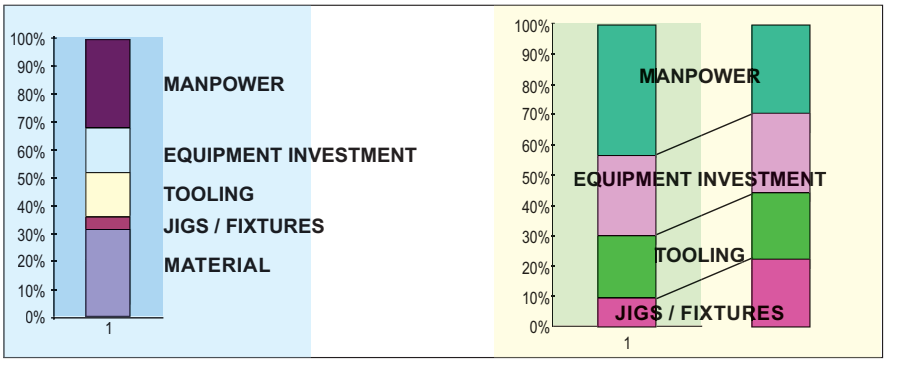
Automation in turning process is mainly considered for forgings from 0.5 to 25 Kg weight, 30 to 350 mm diameter and 10 to 400 mm lengths.

Turning process of forgings achieving high efficiency of productivity can be broadly classified into:

Automotive sector with high volumes and minimum part varieties

Non-automotive sector with medium to high volumes and medium part varieties

Distribution of per piece cost of machined product and life cycle balancing of the cost is as below:



Forging quality vs Cost

We now look into the effects of quality of forging on manufacturing costs.

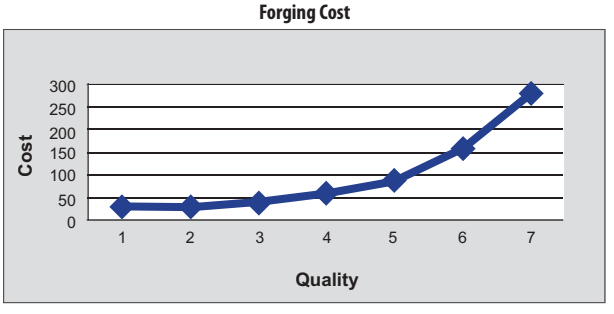
Classification of quality issues of forgings:

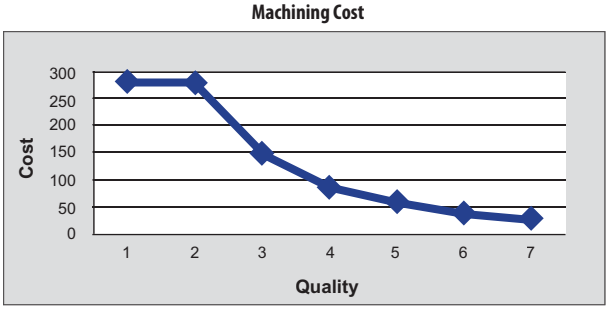
A. Dimensional variations (diameter, length / width)
   Too small or too large variations make control of the turning process more difficult.
B. Geometrical variations (Taper, step, burr)
   Small variations make easier control of turning process than large variations
C. Material issues (Hard spots, sand inclusions, pin holes)
   More of such abnormalities in forgings makes control of turning process more difficult.

Conclusion on forging quality vs Cost per piece:

To achieve better quality of forging, higher cost is involved in the forging process.

On the contrary, better quality of the forgings, definitely reduces the cost of machining and automation.





Quality vs Problems vs Countermeasures

We now analyze the problems resulting out of forging quality issues, which we listed in the previous section.

Most obvious problems are directly in the machining process:

- More tool passes to remove excess material
- Unstable tool life resulting in productivity loss
- Longer cutting cycles due to above
- Unstable chucking resulting workpiece flying out
- Ultimately may lead to tool and machine damage

Simpler countermeasure is to sort out the forgings with excessive variations manually and pre-machine the excessive material by low-cost manual machines to bring the variation within controllable limits.

Though this countermeasure sounds simple, it involves additional management of machines, manpower and logistics.

More comprehensive countermeasure is sorting of forgings automatically and using suitable gaging system for just the critical dimension, which is directly related to chucking and tooling cycle. Objective is not to measure the actual dimension but to gage if the critical dimension of height to diameter is in allowable limit for efficient handling and chucking. It is also possible to check if the part is being loaded in to the chuck with the correct side in and out. To certain extent it can also be designed for Poka-Yoke.

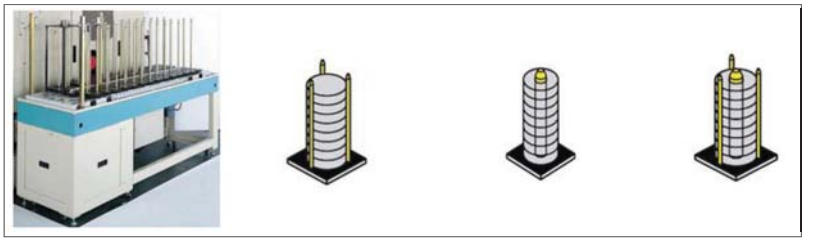
We look into the various countermeasures for automation of the feeding –In of forgings to the first machining process of turning.

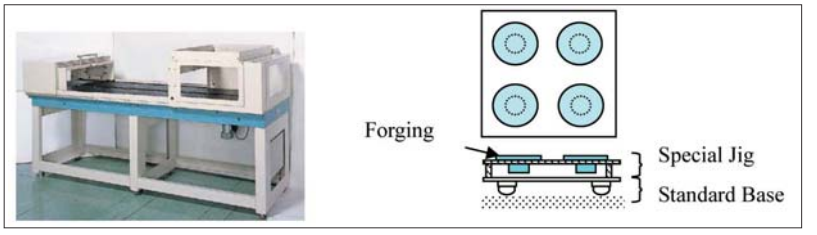
Gaging device	Sensitivity	Relative cost
Laser Sensor with suitable jigs	±1 mm	Medium
Proximity Sensor or Optical sensor with suitable jigs	±3 mm	Low
Scale cylinder with suitable jigs	±0.5 mm	High
Direct Sensing by loader	±3 mm	Low
Orientation device (for non-circular forging shapes of chucking surface)	Includes one of the above	Higher

Feed-In devices (Muratec solutions)

There is a variety of solutions possible based on following factors:

1. Stackability
2. Round or non-round external shapes
3. Volume of feed-in stock required: Typically to run unmanned even during lunch breaks of the operator, depends on the TACT time of the line and overall size of the forging





1. *Standard Work Feeders*

a. Stacking type

Suitable for fairly good quality uniform shaped forgings which can be stacked one above the other in the orientation as required for loading into the chuck.

i) 3-Pole centralizing pallet system – For round external shapes

ii) Center pole pallet system – For forgings with fairly smooth round or symmetrical punched bores

iii) Combination of above for uneven forgings

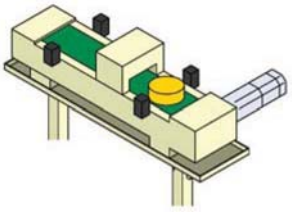
iv) Customized pole pallet system – For non-round and unsymmetrical shaped forgings where orientation is required to load the forging into the chuck

b. Flat non-stacking type

Suitable for forgings which cannot be stacked easily. One or more forgings are set into special jigs on square pallet for the loader to pick up by special palletized program.

2. *Feed-In Conveyors*

a. Flat belt or Mesh conveyor



b. Pitch-feed conveyor

3. *Parts Feeder – Vibratory bowl feeder*

4. *Magnetic picker type for direct setting of forging bin*

Feed-In Checking station and Orientation Station

In the earlier section we have explained the need for such devices.

Machining / Chucking Issues

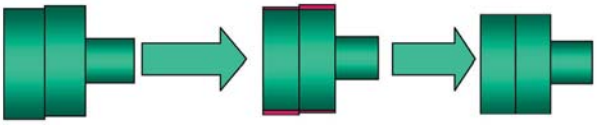
We now look into the effects of forging design on chucking and machining.

1. *Chucking surface*

Most common chucking surface is the outside diameter of the forging or in case of larger forgings, sometimes inside diameter. If this chucking diameter has a large draft angle or step due to forging die mismatch, etc., standard straight action wedge type jaw chucks are not suitable for safe chucking.

Effect on machining mainly would be interrupted cutting affecting tool life.

Most common chuck type is universal ball lock type chuck with centralizing action. Cylinder stroke is sensed by proximity switches to ensure that forging is clamped properly.

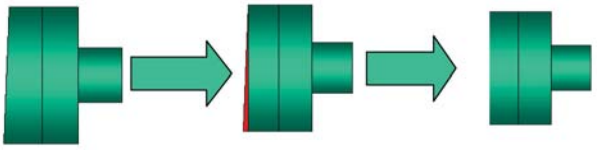


2. *Locating surface*

If locating surface has a large taper or burr, it results in uneven stock removal in first chucking process which in turn affects the subsequent chucking processes and may result in uncleaned surfaces.

Effect on machining is again interrupted cutting affecting tool life.

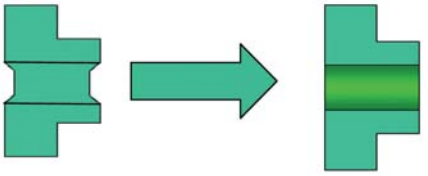
If locating surface is not too rough, location sensing system with air pin-hole check can be used.



3. *Bore with / without pre-punching*

Many designers want to reduce forging cost by avoiding punching out the bore. If the face is straight, drilling operation can be easier but most of the forgings are with a dimple in the center. In such cases special drilling tool may be required, which increases machining cost and cycle time as well.

On the other hand if punching is done with too much stock removal left or eccentric punching, can have adverse effect in rough boring operation. Especially if bore length to diameter ratio is high, stable rough boring may not be possible or special boring bar has to be used, again resulting in more cost and cycle time.



Types of chucks for forgings

Finally we look at a variety of chucks commonly used for the first operation chucking of forgings in turning process.

1. Standard wedge type chuck
   Even though this is low cost, it is suitable for only very good quality forgings where defects mentioned earlier are non-existent.
2. Long stroke chuck
   This is basically the standard chuak with longer jaw strokes. If chucking diameter surface is good but there is burr at the back which has to be avoided, this chuck can be useful.
3. Universal Ball Lock chuck (centralizing)
   This is probably most commonly used chuck for forgings, especially for automation to ensure proper chucking. It can take care of certain level of forging issues as mentioned above.
4. Swing Jaw chuck
   For forgings where face clamping is required, this chuck is useful in automation.
5. Universal Ball Chuck (compensating) with center location and tailstock
   For shaft forgings with pre-forged or pre-machined faces and centers, this type of chuck is required.
6. 2-Jaw, 4-Jaw or 6-Jaw chucks
   For odd shaped forgings and specialized applications, where automatic loading and unloading has to be coupled with automatic chucking, such options are available.

Conclusion

In the global perspective of raw materials, forgings, initial machining process, finish machining process, sub-assemblies and final assemblies, quality and cost are not any more independently controllable. Every one of the links in the chain or closely inter-related and so for the final assembled product to be a globally marketable output, all the chain of suppliers, machine tool suppliers and logistics suppliers have to work together in achieving the objective.

"Muratec as a leader in the manufacture and integration of turning technology and automation has accumulated the global know-how to provide full turnkey solutions to suit local needs and working environments. In India, Meiban is adding value to the turnkey solutions by adopting "Make in India" concept in localizing the feed-in and feed-out systems, chucks and toolings and various other elements of the system from Muratec, Japan."

This article was presented as a technical paper by the author at the International Forging Conference in Hyderabad in 2011.

Leicestershire-based Surface Generation designs and builds sophisticated heat-cool solutions for composite part manufacturing.

Production to **Functional Specification**

Leicestershire-based Surface Generation designs and builds sophisticated heat-cool solutions for composite part manufacturing. The company's innovative machines are used by blue chip customers in the aerospace, automotive and consumer electronics sectors, and are assembled with precision components.

If you're going to change the way things are made, you need very good ideas and pertinacious investors. When Ben Halford founded Surface Generation in 2000 as a spin-off from an engineering consultancy business, he had both. Which is just as well because a few years into its business plan, Surface Generation's future hung in the balance.

"The financial crisis of 2007/8 hit us hard," says Halford. "But, with the support of our shareholders we got our heads down and developed something in which we'd seen a nascent interest: a rapid heating and cooling technology for composites parts production. And that's what we have today." The technology found a market immediately and the company's operations grew dramatically. "We now have 30 people employed here and we are working hard to keep up with demand from some very well known firms around the world."

Surface Generation claims its patented Production to Functional Specification (PtFS) technology provides manufacturers in the aerospace, automotive and consumer electronics sectors with a significant improvement in cost, quality and delivery for precision moulded parts.

"Most composite parts are 'cooked' – heat cured, in an autoclave," says Halford. "But that's an isothermal process, where the temperature the part is exposed to is constant. If you want to make parts of varying sectional thickness, perhaps using a combination of different materials, it can't be done in an autoclave, as different areas of the part need to be heated to different temperatures and cooled at different rates."

The secret behind the success of PtFS is how it uses a custom designed chequer board configuration, where each square on a mould tool is heated and cooled individually, with pressurised air, controlled by a computer. All types of materials can be processed, up to 850°C, including thermosets, thermoplastics, metals and glass. Surface Generation has quickly

built a reputation for engineering solutions when, according to Halford, a customer reaches an impasse because no other processes appear to be working. 'Torture parts', as he calls challenging projects, are normal, everyday problems. "These are components where the general consensus is that they can't be manufactured.

"For example, last year we were given a part to make, which incorporated a logo that wasn't mouldable using typical processes. But, I'm happy to say we solved the problem with 100 percent yield. In another case, we've taken a cycle time down dramatically from two hours to just 20 minutes. Our process delivers that kind of very significant difference."

Surface Generation's success is also down to solid investment decisions such as, for example, the latest CAE technologies, including SolidWorks and PowerMill. The company has also acquired three US designed and built Haas VF CNC vertical machining centres from UK distributor, Haas Automation UK, Ltd. The VF-3 machining centre, with WIPS (Wireless Intuitive Programming System) arrived first, in 2012, followed by a Haas VF-2SS super speed around 18 months ago and, most recently, a Haas VF-4.

"Previously, we were subcontracting parts to job shops, which just didn't give us the necessary control, quality or flexibility," says Halford. "However, this was addressed immediately with the arrival of the VF-3. We looked carefully at two or three other brands of CNC machine tools, but liked what Haas were doing. Haas UK had an extremely good engineering and support team, which also gave us a great deal of confidence."

A normal mould base at Surface Generation comprises around 200 hours of machining, and among the main challenges is the production of deep pockets in confined spaces. Here, the through-coolant capability of the VF-4 helps enormously. Another challenge ably accommodated by the Haas machines is shear edge details on compression moulds. The company maintains a gap of between 25 and 50 µm on a compound surface while trying to follow what it describes as "a nasty contour".

Surface Generation selected the Haas VF-3 as it was the smallest model of Haas vertical machining centre available on that particular size of base casting, which Halford felt was a good indicator of rigidity. "We're cutting mostly hard metals," he says. "The VF-3 has proved to be a rock solid performer. The VF-2SS is quick, and the VF-4 has been a great all-round machine, as well.

"Another good thing is that pretty much anyone can use a Haas with a days' training. All the controls are the same, irrespective of machine size. Also, I should mention that availability from Haas UK is brilliant! We bought the VF-4 as we were behind on a big project. I made a phone call to Haas and the machine was installed within seven days – I can't imagine that would be possible anywhere else!"

As well as normal day shift, Surface Generation runs its Haas machines lights out through the night and at the weekends, making parts typically from steel, but also from materials such as Invar and titanium. "Our Haas machines are very reliable. We leave all three running on a Friday night, and they will probably still be running on Sunday. This is how we've geared up our business."

Ben Halford, who founded Surface Generation in 2000, now has 30 employees

"The secret behind the success of PtFS is how it uses a custom designed chequer board configuration, where each square on a mould tool is heated and cooled individually, with pressurised air, controlled by a computer."

From those difficult days in the aftermath of the global financial crisis, Surface Generation has successfully reinvented itself. The company has recently secured a further £3.1 million of investor funding to help maintain its rapid development – revenue in 2014-15 was £2 million, a staggering 233 percent rise on the previous year! "Nobody else is really doing what we do," says Halford. "We're attracting the attention of some big name manufacturers, so we're definitely going to need more space and, of course, as our overseas businesses in the US, Taiwan and Japan bring in more orders, we'll also need more Haas CNC machine tools."

Source: Haas Automation

High performance dressing/peprofiling Machines from Wendt – WDM Series

WDM 15V

Wendt offers latest state-of- the-art Wheel Profiling Machines – WDM 8, WDM 15 & WDM 25 models in both Profile Projector & Video Vision Versions.

Exclusive features:

- Operator friendly & Easy accessibility for operation.
- Available in Projector and Video Vision Version
- Hollow spindle design to accommodate any tool packs.
- Linear scale with Digital Read Out for work head axis for video vision version.
- Variable speed for work and wheel spindle as optional.
- Motorized arrangement for work head axis as optional.

WDM 8V

Application Areas:

Dressing & Profiling of Straight & Convex Diamond or CBN Grinding Wheels Mounted on a wheel pack

Key Specification:

Models		WDM 8	WDM 15	WDM 25
Max. wheel Dia. to dress	mm	160	350	480
Wheel Head Dressing Spindle	mm	Ø 60 X 250	Ø 70 X 210	Ø 80 X 285
Wheel Head Speed	Rpm	3000	1900	1900
Swivel Range		190°(+95°)	190°(+95°)	190°(+95°)
Wheel Head motor power	kW	0.37	0.75	1.1
Work Head Spindle	mm	Ø 60/80 X 250	Ø 80 X 250	Ø 120 X 250
Work Head speed	Rpm	950	240	245
Work Head motor power	kW	0.55	0.75	1.1
Work Head Cross Traverse	mm	150	110	130
Oscillation Motor	KW	0.09	0.09	0.11
Oscillation stroke	mm/sec	40	40	67
Magnification	Projector	10X, 20X	10X, 20X	10X, 20X
Magnification	Video Vision	9X TO 108X	9X TO 108X	-

For further details contact: Wendt (India) Ltd.: Ph: #91-4344 405500, 405501; Fax: +91-4344 405620.
Email: SajuAbraham@wendtindia.com Venkateshms@wendtindia.com Web: www.wendtindia.com

Note: Specifications are subject to change without notice as continual improvements being done.

3,200 assembled cables: configurable online and supplied from stock by igus

The Cologne cable specialist is expanding its range of drive cables for energy chains

igus has expanded its range of assembled drive cables to a total of 3,200 types. With the addition of Mitsubishi and Parker, two new manufacturer standards have now been added to the 22 standards in the 'readycable' range of assembled cables. igus supplies these to its customers from a single source, which can significantly reduce their process and assembly costs.

igus, the manufacturer of cables for motion, has once again expanded its range of assembled cables for use in energy chains; new items in the range include connectors for the production of assembled cables for Mitsubishi and Parker standards. "In order to offer design engineers even more freedom, our range now includes 3,200 different drive cables, which we fully assemble and deliver to our customers in a short time," explains Christian Stremlau, head of readychain and readycable division at igus. "Our assembled cables are specifically designed for use in energy chains, so that users can select from seven different quality levels according to their requirements." The various drive cables have different approvals and certifications and are assembled with connectors according to the 22 different manufacturer standards.

"The fully assembled cables are supplied by igus with centimetre accuracy to the desired length, and without any surcharge for small quantities," says Stremlau. "We guarantee a lifetime of 36 months for all our cables." This igus guarantee of reliability is based on extensive tests in the largest testing laboratory in the industry, where the cables are subjected to realistic tests for their suitability for use in energy chains.

The lowest priced solution at the touch of a button

To make the selection of the appropriate cables even easier, all 3,200 different drive cables are listed in the readycable product finder. Here users can easily select the appropriate cable with connector without registering. Then they can learn the delivery time and the price, even accounting for the daily copper surcharge rate. The comparable cables are also juxtaposed compared to identify the savings potentials versus differences of the cables quickly and easily. Next, the correct cable can be directly ordered online. The readycable product finder can be found at *www.igus.eu/readycable-finder*.

Contact for more info: Sreejith Menon, Product Manager, Chainflex®; igus (India) Private Limited; Phone: +91-80-45127852; Cell: +91-9342828642; sreejith@igus.in; Web: www.igus.in

With the inclusion of Mitsubishi and Parker, two new branded connectors have been added to the range of assembled 'readycable' cables from igus, which now comprises 22 standards.
(Source: igus GmbH)

Jyoti MX 8M - a multifunction machining centre with Universal Head

MX 8, a multifunction machining centre with Universal Head enables machining operation in 5-Axis and on 5-Sides from roughing to finishing in single set-up. Aside from high machine dynamics achieved through FEM optimized designed accommodates high and multiple clamping devices for machining of large and complex work-pieces. MX 8 is having a mobile column with high grade cast iron structure maximizes structural rigidity and allows optimum harmonic stability and maximum damping during demanding cutting conditions. Spindle Head, on 45⁰ plane allows tilting from 45⁰ to 180, is equipped with integrated torque motor and is with 2-working position: Vertical and Horizontal. The rotary table equipped with TRIM (Table with Integrated Motor) rotates at 500 rpm with Turn-Mill option which enables Turning and Milling operation in single set-up. The machine having rapid of 40 m/min, can also be offered with Fork Type, 2-Axis Milling Head for more flexibility in machining., can be offered with many alternatives in spindle, palletisation, etc. Machine is equipped with a twin pallet whose changing time is less than 1 minute.

Contact - Jyoti CNC;
Phone: +91-2827 - 287081/082;
Fax: +91-2827 - 306161 / 287 811;
Emails: info@jyoti.co.in / sales@jyoti.co.in; Website: www.jyoti.co.in

DMG MORI with 7 world premieres at EMO

The new NLX 6000|2000 manages the whole range of high-performance turning in the field of long parts with large diametres from 2-axes turning to 6-side complete machining

ecoTurn 450 with ECOLINE New Design

The EMO in Milan will provide DMG MORI with the perfect showcase for new advanced technologies and innovative products. From 5 to 10 October 2015, the technology partner will be presenting a total of 7 world premieres at its stand in Hall 4. In the field of turning technology, there are 4 world firsts: the production turning machine SPRINT 32|5 (including the equally new extension stage to SPRINT 32|8) built in Italy, the second generation of the turning & milling machines CTX gamma TC in two sizes and the NLX 6000|2000 turning/milling centre for large components. The three milling innovations all originate this time from the 4th generation of the duoBLOCK® series. Other highlights of DMG MORI's trade fair presentation are the introduction of the automatic lathes from DMG MORI WASINO that have been strengthening the DMG MORI product range since 1 April 2015.

The seven world premieres at the DMG MORI stand in Hall 4.

- **SPRINT 32|5 and SPRINT 32|8:** Extension of the successful SPRINT series for parts with diametres of up to 32 mm
- **CTX gamma TC 2nd Generation:** Complete machining with the new compactMASTER® turning/milling spindle
- **duoBLOCK® 4th generation:** Strong and precise: new duoBLOCK® machining centres of the 4th generation
- **NLX 6000|2000:** Powerful turn & mill machining with torque of up to 12,000 Nm, long parts and large diametres
- **DMG MORI WASINO:** Ultra precise production lathes with 0.2 µm roundness precision for production lines in the automotive industry
- **ECOLINE New Design:** Optimised ergonomics and greater stability

Production turning machine G07 from DMG MORI WASINO.

Thanks to two Italian production sites, the EMO in Milan will be something of a home match for DMG MORI. Since 1969, GILDEMEISTER Italiana S.p.A. from Bergamo has been synonymous with high performance lathe technology and within the Group has a special focus on production and automatic lathe machines. Now that its site has been modernised and extended last year, DMG MORI will be setting new standards in the manufacture of machine tools. A new 1,200 m2 assembly hall has been created – accompanied by a 1,000 m2 technology centre, in which customized solutions and innovative high-tech machines are developed and can be presented to customers under production conditions.

The EMO world premiere SPRINT 32|5 and its upgrade SPRINT 32|8 are "made in Italy" as well as the universal turning machines NLX 2500SY|700 and CTX alpha 500. The turning & milling machining centre CTX beta 1250 TC, the production turning machine SPRINT 50 and the automatic multi-spindle machine GMC 20 ISM are other EMO exhibits made in Italy.

S33 – The reasonably priced grinding machine for individual requirements

The S33 brings important advantages for customers in toolmaking, job shops and the supply industry: Countless workpiece geometries can be ground in a single clamping! The wheelhead with three grinding wheels ensure that the workpiece can be machined even more individually and quickly - complete machining in a class of its own!

In addition to the familiar production wheelhead, which can be used at 0 deg and 30 deg, the universal head can be fitted with two external grinding spindles and one internal grinding spindle. Both external grinding wheels with Ø 500 x 63mm (80/110mm Form 5) are arranged on the right. The universal head can be manually positioned every 2.5 deg or is available with automatic B-axis with 1 deg Hirth serration. HF spindles are exclusively used for internal grinding.

The clever design of the S33 allows us to achieve an up to 1/3 extended grinding length, in comparison with the competitors. In conjunction with grinding wheel arrangement on the right with plunge angle 30 deg, reduction of the efficient grinding length should always be taken into account.

The S33 is available with a CNC control and integrated PC. This enables the use of the new StuderWIN operator interface. The StuderGRIND programming software modules can now be installed directly on the control system.

Proven S33 features: Unique arrangement of the motor spindles. Very simple changeover from grinding between centers to live spindle grinding. Swivelling machine table. Optional C-axis for form and thread grinding. Granitan® machine bed. Large selection of options and accessories.

For more information, contact United Grinding GmbH, India Branch Office & Technology Center (Bangalore),
Tel. +91 80 30257 611; Fax +91 80 30257 603;
Email: prabhakar@grinding.ch; Website: www.grinding.ch

pL Lehmann Rotary Table

pL Lehmann is a known Swiss pioneer in the manufacturing of precision Rotary Tables for the last 35 years. Their highly flexible system allows modular conversion at any time to adapt to the changing production and process requirements of the industry. The newly conceived "Series 500" with Gear Drive has new generation 4th and 5th axis Rotary Tables with 170 different combinations that offer distinct advantages. This "Series 500" has four basic models viz. 507, 510, 520 & 530 with peak heights from 110mm to 240mm.The most interesting thing is that that the module of the "Series 500" can be assembled into various combinations by machine retailers or customers themselves which saves cost and time.

- *Compactness and Energy Saving:* Lehmann Rotary Table is the most compact ever available in the category. Flexibility of more space on the machine table for the work piece and fixturing.
- *High Braking Torque:* Prevents vibration during cutting and helps reduce cycle time.
- *Less Weight:* The weight of the Rotary Table is less than half that of competitor.
- *Zero Break Down:* A Black Box that monitors critical 19 functions/parameters on a real time basis and avoids break down resulting in optimum utilization and productivity.
- *IP 67 Protection:* Protects the rotary table from coolant and dust particles entering into the rotary table.
- *High Load Carrying Capacity:* Equipped with four bearings - two radial and two axial to increase the load carrying capacity.
- *Low Wear:* Special alloy steel used for worm and wheel resulting in high wear resistance.
- Application in precision machining of parts related to Automotive, Defence, Aviation, Clock & Watch, Medical & Dental technology etc..

Contact: Stitch Overseas Private Limited; Tel: + 91-124-4755400;
Fax: + 91-124-4755430; Helpline No: +91-9313361202;
E-mail.: stitch@vsnl.com; Website: www.stitchtools.com

Gripping Modules: Mechatronic universal genius

With the multi-tooth guided SCHUNK EGN and EZN mechatronic grippers, SCHUNK, the competence leader for clamping technology and gripping systems, transfers the unique features of the original pneumatic SCHUNK PGN-plus and PZN-plus universal grippers to the world of mechatronic based gripping. The electrically driven and energy-efficient SCHUNK EGN and EZN 2-finger parallel or 3-finger centric grippers combine the range of options and robustness of their pneumatic model with the variability, intelligence, and sensitivity of mechatronic gripping modules.

The most unique exterior feature is the SCHUNK patented, multi-tooth guidance, which minimizes wear and guide play, and ensures high stability and loading capacity of the guideways. Brushless servo motor is used as a drive, and its rotation is translated into a stroke movement through a spindle nut. A resolver, which is directly connected to the motor, continuously queries the position of the servo motor, and allows exact positioning of the gripper fingers.

Control is carried out by a SCHUNK ECM controller, which is equipped with standard plug connector technology by Profibus or CAN bus. It allows simple commissioning and parametrization by a PC and rotary encoding switch. Finger position, gripping force, acceleration, and speed can be regulated and controlled during the ongoing handling process. Since the gripper fingers can be pre-positioned, short cycle times can be shortened or the impulse force during the gripping process can be reduced. Combined with the SCHUNK FMS force measuring system, sensitive parts can be gently handled.

Mechatronic universal gripper: A vast program of accessorires transforms the SCHUNK EGN and EZN to multi-purpose units for different environments and fields of application.

Numerous protection and safety features

A vast option program transforms the 24-V-DC modules into a multi-functional unit, which can be also used in demanding environments. This includes the direct attachable protection protection cover which guards against fluids and dust, compensation units for compensating angle errors, force-measuring jaws, and jaw quick-change systems. For tool-free wiring with the controller, pre-assembled drag or robot cable sets in various lengths up to 20 m are available.

The electrically driven and energy-efficient SCHUNK EGN and EZN 2-finger parallel or 3-finger centric grippers combine the range of options and robustness of their pneumatic model with the variability, intelligence, and sensitivity of mechatronic gripping modules.

A DNC coating ensures optimal conductivity, and reliable protection of the electronic components. With standard threads for protective conductors, personal safety is ensured. Combined with the SCHUNK ECM controller, and the SCHUNK ECS safety module, the EGN and EZN transform to a certified safety gripping system according to DIN EN ISO 13849 without any conversion. Equipped with the functions SLS, SOS, and STO they meet performance level d and SIL 3, providing safe human-machine collaboration in confined spaces. The mechatronic SCHUNK EGN 2-finger parallel gripper is available in three sizes with gripping forces of 400 N, 720 N, and 1,000 N, and a maximum stroke of 8 mm, 10 mm, and 16 mm. The SCHUNK EZN 3-finger centric gripper is offered in two sizes with gripping forces of 500 N and 800 N, and a maximum stroke of 6 mm or 10 mm.

For more information, contact:
Satish Sadasivan, Schunk Intec India Private Limited;
Ph: 080-40538999; Fax: 080-40538998;
Email: info@in.schunk.com; Web: www.in.schunk.com

Fresmak ARNOLD CLASSIC vice

High Pressure ARNOLD CLASSIC vices achieve a clamping force of up to 8 tons using the simple turn of the handle without any effort. This advantage makes them ideal for heavy duty clamping in milling machines, drilling machines and threading machines.

Its monoblock design avoids deformations with high pressure and offers great rigidity. Moreover, if the body is in two parts the High Pressure ARNOLD CLASSIC vices can achieve large openings reaching from 375 mm to 845 mm. Fitted with a high pressure intensifier, which does not require any external supply the ARNOLD CLASSIC vice can achieve 2.4/5/8 tons, depending on the size. The force is applied by the high pressure spindle and transmitted to the work-piece in the exact centre of the clamping jaw.

Thus, the permanent clamping force avoids repositioning the work-piece from one day to the next. These vices achieve -0.01 mm clamping repeatability, which makes it ideal for long term machining.

It can be supplied in 3 different versions:

1. *Standard vice:* It can be clamped to the machine table is carried out through the lengthwise orifices and slots of the vice.
2. *Straight vice:* The narrow figure enables one to be placed alongside another, making up a large clamping unit for large work-pieces.
3. *Two part straight vice:* It is able to clamp any work-piece however large it is. An inner tie-rod joins the two parts of the vice.

All these vices can be supplied with up to eleven different types of standard jaws. It can also be equipped with special jaws designed by the user.

For more customised solutions please contact: Fresmak ARNOLD Precision Engineering Pvt. Ltd. Tel No +91 (80) 6765 4250; Email info.india@fresmak.com; Website: www.fresmak.com

UPDATE

EOS enters into a strategic cooperation with GF Machining Solutions

EOS, the global technology and market leader for high-end Additive Manufacturing (AM) solutions, has entered into a strategic cooperation with GF Machining Solutions, the Swiss-based industrial company GF (Georg Fischer), Schaffhausen, to offer customers innovative solutions combining both companies' technologies.

The two companies have agreed to focus on the mold and die sector. They will develop exclusive solutions for mold makers, a market in which GF holds a leading position thanks to its EDM, high speed milling and automation technologies.

Pascal Boillat (left), Head of GF Machining Solutions with Dr. Hans J. Langer (right), Founder and CEO EOS Group in front of an EOS M 290 metal Additive Manufacturing system *(source: EOS)*

The additive manufacturing technology offers for such customers the possibility to generate metal inserts featuring cooling close to the surface, thus allowing for a shorter mold cooling sequence and therefore a much faster plastic injection cycle.

GF and EOS will undertake the integration of the additive manufacturing machines into the production process of mold inserts, including the necessary software and automation link with downstream machine-tools and measuring devices.

"The cooperation allows us to increase the value for customers by integrating conventional and additive technologies. This is a large step towards seamless production and we join forces with a strong and experienced partner." says EOS founder and CEO, Dr. Hans J. Langer.

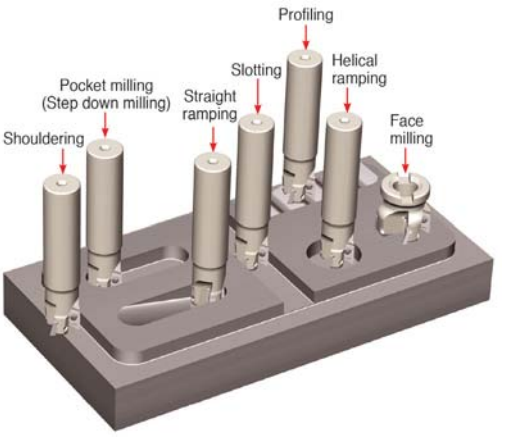
"We welcome very much this strategic partnership", says GF CEO Yves Serra. "GF and EOS complement each other very well to offer the large customer base of GF Machining Solutions a unique set of technologies."

ChaseAlu XEVT Line to chase away aluminum challenges

Every machinist that works on aluminum knows the headache this alloy offers but its high strength to weight ratio make it an imperative and a highly popular material in the automotive and aerospace fields. The main problem in machining aluminum is the formation of built-up edges due to the adhesion of the materials used.

The primary tooling concern when machining aluminum that is minimizing the tendency of aluminum to stick to the tool cutting edge can be tackled with TaeguTec's new ChaseAlu XEVT line. It ensures good chip evacuation from the cutting edge, making sure the core strength of the tool is sufficiently durable in order to withstand the cutting forces thrust +upon it without breaking.

ChaseAlu's two new offerings, the XEVT 16 – which is an upgraded version of the current XECT 16 – and the XEVT 22, come at a time when productivity, safety and cost needs to improve greatly for companies to be viable in today's increasingly competitive world. Both types are designed with a stable "V" shape bottom as well as a unique "stopper" for rigid clamping and stability. Both sizes guarantee high precision and excellent surface roughness in aluminum and non-ferrous machining due to their high positive helical cutting edges and polished insert surfaces.



Both XEVT 16 and XEVT 22 inserts deliver outstanding productivity in demanding high-speed milling applications such as shouldering, slotting, face milling, step down milling, profiling, straight ramping and helical ramping. Moreover, both XEVT types are available in several corner radii and the XEVT 16 inserts are interchangeable with the current TE90XE and TFM90XE cutters in order to enhance the productivity of current XECT 16 inserts currently being used.

The cutter's simple screw clamping design ensures for proper seating and rigidity during machining in order that the tool stays firmly in place when handling high feeds and speeds on aluminum and non-ferrous materials.

Cutters are available in end mills, modular types, face mills and HSK type face mills.

In extensive tests, TaeguTec's ChaseAlu XEVT 16 clobbered the leading competitor's similar offering by increasing productivity by an amazing 329 percent while also increasing tool life by a very respectable 33 percent on an aluminum workpiece.

Contact: TaeguTec India P Ltd.
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K3X8 FIVE - 5-Axis High performance Vertical Machining Centre

5-Axis High performance Vertical Machining Centre, JYOTI Huron KX Five series, enables machining operation in 5 simultaneous axis on 5 sides, These series is specially designed for injection moulds, complex aerospace components or high integrity mechanical parts. A combination of high dynamics and accuracy allows the KX Five to obtain very high surface quality. Its workpiece load carrying capacity is 500 kg. Powerful spindle with high torque allowing high metal removal rates with spindle vibration monitoring system. K3x8 five have table equipped with TRIM technology which is inclined at 55° plane allowing tilting from -30° to 180° which can be rotate up to 50 rpm with area of ϕ 500 m.m.

AX Series 300 - produce complete component in single set-up

Turn-Mill Centre Y-Axis gives the flexibility to produce complete component in single set-up maintaining the required accuracy. AX series is equipped with 12-station Servo Driven Tool Turret. Multitasking possible with combination of two spindle and two turrets with only one workpiece clamping, thanks to live tool, C & Y Axis. There is a standard live tool servo type upper turret with 3-axis movement in X/Y/Z plane.

Contact - Jyoti CNC; Phone: +91-2827 - 287081/082; Fax: +91-2827 - 306161 / 287 811;
Emails: info@jyoti.co.in / sales@jyoti.co.in; Website: www.jyoti.co.in

Precision at its Peak

The Chennai based well known Abrasive manufacturer "CUMI" offers new range of high performance products for Gear Grinding application with high level of profile accuracy. Carborundum Universal Ltd (popularly known as CUMI) is part of Rs269 billion Murugappa Group has been offering wide range of abrasives and metal working fluids for the various industries. CUMI is an integrated manufacturer of high performance grains and grinding wheels. The in-house capabilities built over 60 years across application engineering, product design, process and precision finishing enables it to address very demanding applications.

CUMI is one of the largest grinding wheel suppliers to the automotive OEMs as well as auto component manufacturers for various precision applications like crank shafts, cam shafts, valves, transmission shafts, gears and other automotive parts. Gear grinding is very high precision operation and generally executed on gear teeth after the heat treatment process to achieve the desired highly demanding dimensional tolerances like surface finish as well as surface texture, accuracy in profile.

CUMI's gear grinding wheels are manufactured at their Chennai plant with the state of the art facility. The product range includes hob sharpening, Gear honing, Single Rib and Multi Rib wheels for both conventional as well as new generation high speed machines. The high performance Ceramic and Micro Crystalline abrasive grain wheels deliver optimum results.

Understanding the criticality of the operation CUMI has invested on the high accuracy profile machine to ensure that the profiles are maintained to the very close tolerance levels. This helps the wheel deliver superior performance even at high operating speed like 60- 80 m/s.

CUMI's range of high quality gear grinding wheels has been well received by customers across India and in many countries across the globe. Its focus is to deliver products and solutions that enable its customers increase their productivity, quality and contribute to the improving their competitiveness.

CUMI also offers value added services of re profiling the wheels. This helps the customer to reduce their non moving inventory and effective usage of wheels. From making materials work for man CUMI is progressively moving towards "Making Materials Matter".

New 3D metrology software for increased productivity

FARO Technologies, Inc. has announced the release of FARO CAM2 Measure 10.5, its latest software for the FaroArm, FARO Laser ScanArm and FARO Laser Tracker. CAM2 Measure 10.5 comes with the capability to connect multiple 3D measurement devices, within the same coordinate system, and simultaneously scan into a single seat of software on one computer. This capability allows users to seamlessly scan large objects with higher speed and precise accuracy in order to complete 3D scanning jobs faster. "The new CAM2 Measure 10.5 provides significant advancements that support our customers' needs to measure faster and more efficiently with improved ease-of-use," stated Kathleen J. Hall, Senior VP & MD, Americas.

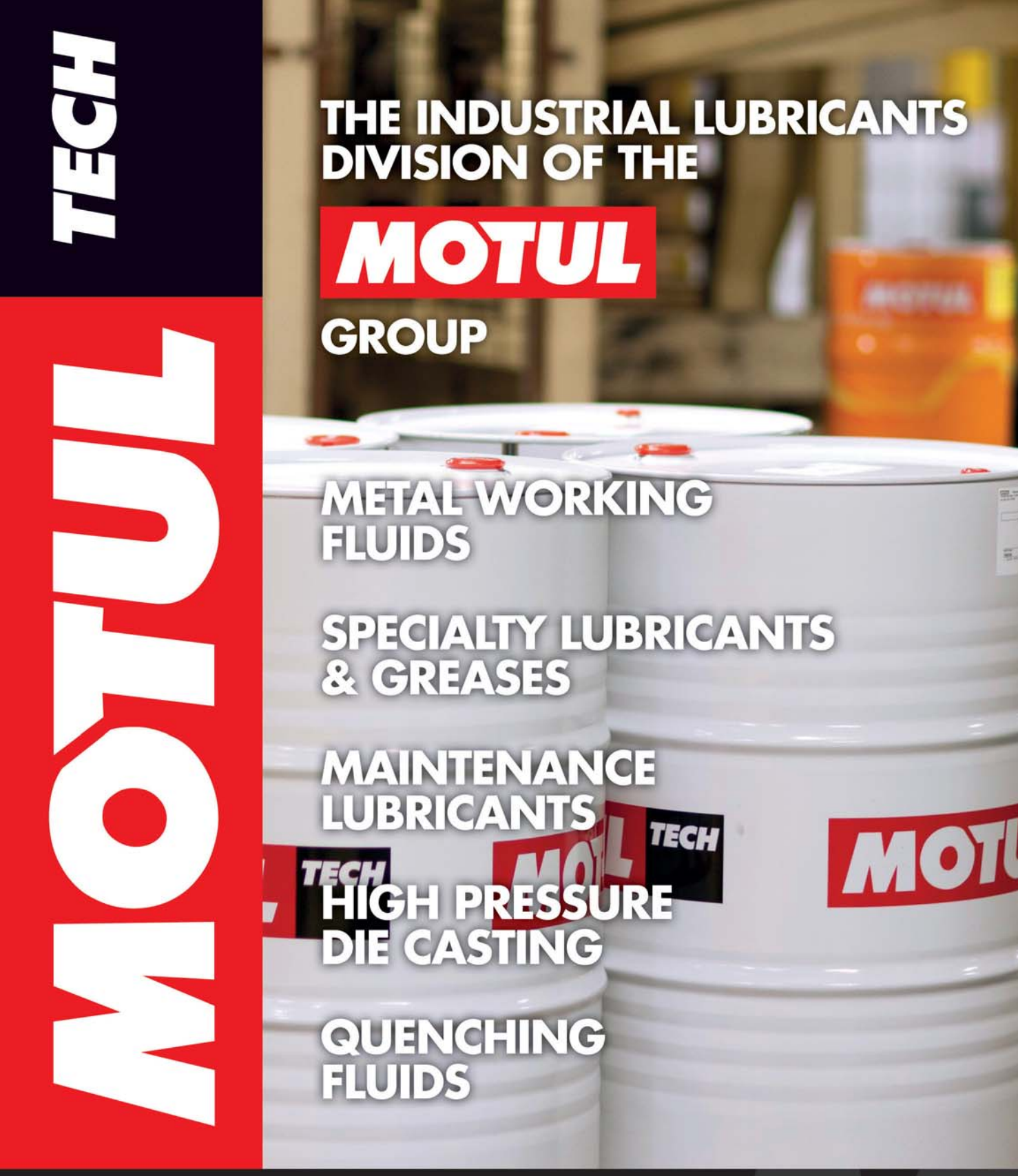
Significant advancements to Geometric Dimensioning and Tolerancing (GD&T) functionality provide users with streamlined analysis and visual reporting. A part inspection can now be displayed just like a print to easily visualise and determine part quality. This enhanced functionality eliminates the need to look at each feature in sequence to make the same determination.

Workflow efficiencies are maximised with the ability to automate repeat inspections by programming data analysis to automatically occur after the measurements are taken. This new capability reduces required training time, significantly reduces the risk of operator error, and accelerates job completion times.

Additional enhancements include expanded point cloud capacity and the ability to easily scan trimmed edges. Users are now able to collect over 20 times more data than our previous versions while maintaining accelerated processing speed. New capabilities also allow trimmed edges on materials such as sheet metal to be easily scanned, essentially eliminating the need to collect hard-probed measurements on part edges.

"The capability to connect multiple devices for simultaneous 3D scanning, automating repeat inspections, and enhanced GD&T functionality represent major advancements in our metrology software. We are excited to launch this new release, and further enable our customers to use our world-class products to drive productivity gains," Hall concluded.

For more information, you can also visit:
www.faro.com/cam2measure/in



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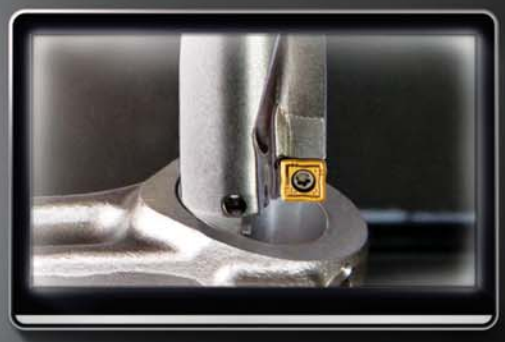
TOPDRILL



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