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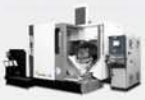

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A 'Super' Time

EDITORIAL

Another year is coming to its end. But this one surely has been a different one than most in the recent times. There is a wave of positivity in the atmosphere as the industry gears up for a revival. Things are surely looking up.

Manufacturing operating conditions in India have seen improvement for the thirteenth month in a row in November, supported by stronger growth of output and new work intakes, according to HSBC India Manufacturing PMI. In fact, rising from 51.6 to 53.3, the Index reached a 21-month peak in November. The November data reinforced reports of stronger-than expected demand, as new order growth accelerated to the quickest in 21 months. Input buying at Indian manufacturers increased in November, reflecting stronger order books and higher production requirements. These are obviously good signs. The Government has already made its intent clear with announcements; now is the time for implementation.

At the same, the industry needs to gear up. We know that all the manufacturing action takes place at the shopfloor and hence we are making an attempt to understand from experts as to what goes into the making of a Super Shopfloor. Find out more in this issue. *(And look out for the exciting announcement on pg. 71)*.

By the way, the next issue will be our Tenth Anniversary issue overall and First Anniversary since we re-launched the all new Machinist. Well, the celebrations have already started and so have the efforts to make it a special one. Do tell us how you have found the journey. We have just started enjoying it.

"WE KNOW THAT ALL THE MANUFACTURING ACTION TAKES PLACE AT THE SHOPFLOOR AND HENCE WE ARE MAKING AN ATTEMPT TO UNDERSTAND WHAT GOES INTO THE MAKING OF A SUPER SHOPFLOOR."

Editor

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THE MACHINIST — ULTIMATE GUIDE TO PROFITABLE MANUFACTURING

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10am. - 6pm.

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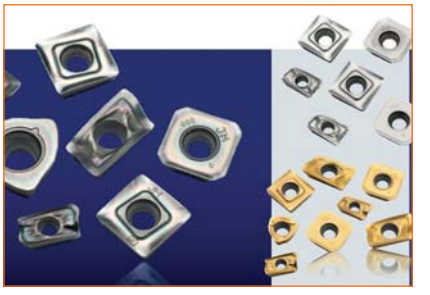

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NEWS

Lapp India to expand its production unit at Jigani, Bangalore

Lapp India, a 100% subsidiary of the Lapp Group and the leading manufacturer of Cables, Connectors, Cable Glands, Conduits and Accessories in India has announced the expansion of its Bangalore manufacturing facility. The project will increase the Company's production area from the existing 5,227 sq m to 10,803 sq m. The facility has the capacity to manufacture 60,000 km of Multi Core cables and 78,000 km of Single Core Wires per annum. The company has invested approximately Rs165 million (2.1 Million Euro) for this project. With this new expansion Lapp India aims at tapping into the increased demand for quality control cables in the market. This expansion with state of the art safety and environmental features will enhance the facility layout, ensure better flow for effective lean management and also help generating more space for the new machines to sustain company's long term growth plans and establish leadership in the control cable market.

Gamesa inaugurates a new production line at Nacelles plant

Gamesa India strengthened its operations in the country by announcing the launch of its new production line in its Nacelles plant in Mamandur, near Chennai. The new production line will manufacture larger G114-2.0 MW machines to be launched in 2015. For the first time in the Indian Wind Turbines industry, the Mamandur plant will feature an Automated Conveyor system in its production line which will considerably reduce the manufacturing time and ensures faster delivery. Ignacio Martín, Executive Chairman, Gamesa Group, said, "We plan to invest over 100 million euros in India in the next five years. Our primary focus in India is to increase our manufacturing capability, developing our supply-chain and to increase our land bank to promote and develop wind farms."

Toshiba reinforces T&D equipment manufacturing in India

Toshiba Corporation will reinforce its transmission & distribution (T&D) business in India with a 3-billion yen (approximately US$30-million) investment in new production capacity at Toshiba Transmission & Distribution Systems (India) Pvt. Ltd. (TTDI) in

Hyderabad. A new line for large power transformers will come on line in spring 2015, at the same time as the full scale launch of a new line for switchgears. According to Dr. Katsutoshi Toda, Chairman & Managing Director, TTDI, "India is a high growth market that Toshiba has positioned as a strategic base for its power-related businesses. In the period to FY2016, Toshiba plans to invest a cumulative 10-billion yen (approx. US$100-million) in its T&D business there, including this current round of investment." Alongside its existing production line of small- and medium-capacity transformers and low- and medium-voltage switchgears, the new power transformer line will support production of 765kV transformers with a capacity of 500MVA, while the new switchgear line will produce high voltage products.

HAL's Light Combat Helicopter's maiden flight successful; IOC expected by September 2015

The Light Combat Helicopter (LCH) Technology Demonstrator TD-3 made the successful maiden flight on November 12, 2014. "Escorted by a Dhruv helicopter, the entyre flight was flawless. It will be an effective weapon platform to deliver precision strikes at high altitude and we are confident it will meet the requirements of the IAF," said Dr. RK Tyagi, Chairman HAL. "We are making all efforts to achieve IOC by September next year," he adds. In all HAL is expected to produce/manufacture 179 LCH for the Indian Defence forces.

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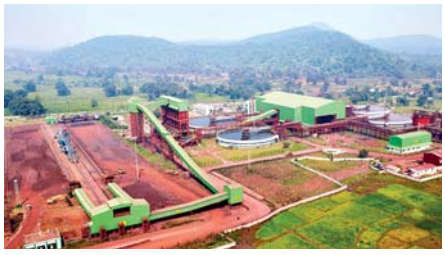
Danfoss India opens new manufacturing facility in Chennai

Danfoss India has inaugurated its new manufacturing, Research and Development (R&D) and administrative campus in Oragadam, Chennai. The plant also includes a solar power plant which will generate 1MW of electricity, sufficient to power 10 percent of electricity requirements of the campus.

Danfoss, through its focus on local manufacturing and R&D in the new campus, plans on making India a manufacturing cum export hub for its regional subsidiaries. Danfoss will also be sourcing products from local suppliers, thereby creating ancillary jobs. "India being a high-growth market for us, we kick started our Make in India initiative two years ago. We are pleased to commence our manufacturing at the right place and at the right time and believe this will enable Danfoss India operations to become the export hub for Asia-Pacific markets," said Niels B Christiansen, President and CEO, Danfoss Global.

Essar Steel commissions 6 MTPA integrated pellet complex



Essar Steel has commissioned an integrated Pellet Complex in Odisha. The Complex comprises of iron ore beneficiation facility at Dabuna (Keonjhar), 6 MTPA Pellet plant at Paradeep (Jagatsinghpur) and 253 km long slurry pipe line with 12 MTPA carrying capacity connecting the beneficiation facility and Pellet Plant. Essar has invested around Rs6,000 crore in setting up this integrated complex. The beneficiation facility is designed to use low grade iron ore fines. The Slurry pipeline is the most cost effective and fastest mode of transportation that eases significant pressure on rail and road network, with reduced carbon foot print and minimal environmental impact. With this integrated complex, Essar Steel has become the largest Pellet producer in India.

Harman unveils manufacturing facility in Pune

Harman International (India) Pvt. Ltd., the premium audio and infotainment group, has recently inaugurated its first manufacturing plant in India. The plant is located in the Chakan Industrial area in Pune. With a production capacity of 400,000 car sets per annum, this state-of-the-art facility will deliver cutting edge infotainment and audio solutions for its OEM partners in the country and will work closely with them to bring the 'connected car' experience to more people.

Omron Automation to strengthen its business in Tamil Nadu and Kerala

Omron Automation India endeavours to consolidate its business in Tamil Nadu as one of the important regional expansion plans to be followed in this FY. Speaking at the company's Affinity Seminar at Coimbatore recently, Sameer Gandhi, MD, Omron Automation India said, "Being the manufacturing hub for Tamil Nadu, Coimbatore has always been a crucial log in Omron Automation's business strategy for the state. This year we are taking our efforts to the next level by further exploiting the automation needs across its huge manufacturing industry base, especially, in the textile, automotive and engineering sector through channel expansion in our focused product categories of Vision, Safety and Sysmac.

MoU between Indian Railways and South Korea

An MoU has been signed in Seoul between the Ministry of Railways, Govt. of India and the Ministry of Land Infrastructure and Transport (MOLIT) of the Government of Republic of Korea (South Korea). It would enable technical assistance and cooperation between the Railways of the two countries on areas such as High Speed Rail, Modernisation of Rolling Stock, Railway Operations, Modernisation of Signalling, Construction & Maintenance technologies and in development of Logistics Parks/Terminals.

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A list of key events happening between January to November 2015, both nationally and internationally

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January 15-17, 2015, New Delhi
www.indiarubberexpo.in

Imtex 2015

January 22-28, 2015, Bangalore
www.imtex.in

SPS Automation India 2015

February 5-7, 2015, Ahmedabad
www.spsautomation-india.in

PLASTINDIA 2014

February 5-10, 2015, Gandhinagar, Gujarat
www.plastindia.org

India Automation Technology Fair

February 26-28, 2015, Mumbai
www.iatf.in

ACMA automechanika

February 26-March 1, 2015, New Delhi
www.acma-automechanika.in

ProMat 2015

March 23-26, 2015, Chicago
www.promatshow.com

Hannover Messe 2015

April 13-17, 2015, Hannover
www.hannovermesse.de/home

RAPID – 3D Event

May 18-21, 2015, Long Beach, California, USA
www.rapid3devent.com

Automotive Manufacturing 2015

June 24-27, 2015, Bangkok, Thailand
www.automanexpo.com

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

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www.mtx.co.in

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Industry academia collaboration

With its technical training program, Toyota Kirloskar Motor intends to enhance the technical abilities and employability of Industrial Training Institute (ITI) students.

With the view of addressing the growing need for technical training across different regions in the country, Toyota Kirloskar Motor Pvt. Ltd. (TKM) has recently launched its distinctive training model at the Government ITI, Paramakudi in Tamil Nadu. The General Technician and Body & Paint Technician Toyota-Technical Education Program (T-TEP) is a special training module in which Toyota has tie up with industrial training institutes. Launched in 2006 in India, TTEP is now associated with 37 training institutes under the program.

With this program, Toyota Kirloskar Motor intends to enhance the technical abilities and employability of Industrial Training Institute (ITI) students in the age group of 16 to 18 years. The program will benefit ITIs in building skilful technicians for the Indian automotive repair industry. The current automobile repair industry is characterised by inadequately skilled manpower and lack of professional training for repair and diagnostics. TTEP is a unique initiative undertaken by TKM, in partnership with ITIs and its dealers across India to address this issue.

The GT T-TEP training syllabus imparts training on basic automotive fundamentals, Toyota Way of Service and technologies in Toyota Cars help the students to get jobs in the Automotive General Repair industry.

The BP T-TEP training syllabus imparts training on basic body and paint repair skills in addition to dealer specific requirements to students, thereby improving their knowledge of repair techniques and facilitating the adoption of latest technology in Body & Paint. Currently Body & Paint technicians have limited information and hands on experience in the usage of correct repair operations and techniques, forcing dealers to recruit manpower from local garages. Toyota along with its supplier partners, PPG Asian Paints and 3M, will provide all necessary support to the institute i.e. training consumables, visiting faculty, training material, tools, equipments etc. Introduced in the year 2009, Automotive Body & Paint repair training has been provided to more than 500 students till now.

"We introduced TTEP in India in 2006 and since then we have been successful in imparting technical training to ITI/Polytechnic students. This tie-up will cater to the requirement of skilled manpower in the Indian Automobile industry. The partnership with Government ITI, Paramakudi is one such step," said Mahesh N. Salkar, Vice President, Toyota Kirloskar Motor Pvt. Ltd.

> "We introduced TTEP in India in 2006 and since then we have been successful in imparting technical training to ITI/Polytechnic students. This tie-up will cater to the requirement of skilled manpower in the Indian Automobile industry. The partnership with Government ITI, Paramakudi is one such step."
>
> **Mahesh N. Salkar,**
> Vice President, Toyota Kirloskar Motor Pvt. Ltd.

"Our mission is to carve a career path for talented students in the rural market, and to provide job opportunities within the similar line of work in the automobile industry. The special course of General Technician and Body & Paint Technician is designed keeping in mind the advanced technology required for the Automobile Market. We thrive to give best to the students who will eventually contribute to the growing Automobile Market and Service Industry," he added.

The GT and BP T-TEP, a one year syllabus, introduces students to Toyota's advanced technology and service techniques. It also includes, on-the-job training, at Toyota's dealerships. As a part of this program, TKM will also train institute instructors in the latest technology, used at Toyota and the automobile industry.

TKM plans to introduce this program to technical institutes across the country in the coming years and reach out to over 1000 students per year.

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Corporate Governance Matters

Corporate governance is increasingly becoming important for India Inc. with the country climbing to the fourth position globally as per a ACCA – KPMG joint study

Adequate and effective corporate governance (CG) can be critical for supporting boards and management to navigate through uncertainty in the international business arena. Yet, a joint study by ACCA Singapore and KPMG in Singapore reveals a wide divergence in CG requirements across 25 markets, including; Singapore, Australia, Thailand, China and Brazil. Titled, 'Balancing Rules and Flexibility', the study also calls on governments to work towards meeting global CG standards, which are based on the Organisation for Economic Co-operation and Development (OECD) principles.

Said Irving Low, Head of Risk Consulting at KPMG in Singapore which spearheaded the study: "When implemented well, corporate governance builds confidence in capital markets. This is especially important in the context of high anticipated growth rates in many emerging economies such as those in the ASEAN region. "Given the disparity in corporate governance requirements across the markets we have studied, there is still a long journey ahead of us. We hope this study can contribute to raising the standard of corporate governance requirements globally."

> "This reflects the improving standard of corporate governance in India over the years. The results of the study are testimony that these are resonating well with key stakeholders and their perception of the governance standards in India."
>
> **Richard Rekhy,** CEO, KPMG in India

Commenting on the findings of the report, Richard Rekhy, CEO, KPMG in India said "This reflects the improving standard of corporate governance in India over the years. The results of the study are testimony that these are resonating well with key stakeholders and their perception of the governance standards in India is also improving." Further he added, "The Indian regulators have taken significant steps to raise the bar on governance in Indian companies by bringing in a paradigm shift in corporate governance requirements, both in the Companies Act 2013 and the recently revised clause 49 of SEBI's listing agreement. In particular, the changes relating to the role and responsibilities of the audit committee, the roles of independent directors, and the codified duties of directors as a whole, are leading to a shift in boardroom dynamics. There is also a mindset change in how key players in the governance framework engage with other stakeholders including minority shareholders. These, when implemented, can position India even higher in the ranking. It is now time for corporate India to follow corporate governance not only in form but in spirit."

The study analysed CG requirements in terms of clarity, degree of enforceability and number and type of instruments used by the 25 markets. The top three highest scoring markets with clear and extensive CG requirements are, in descending order, UK, US and Singapore. Australia, India and Malaysia jointly ranked fourth while Hong Kong and Russia tied for the next position. Brazil and Taiwan round up the top 10 highest scoring markets.

Mritunjay Kapur, Head of Risk Consulting and Strategy, KPMG in India said, "While the report identifies the need for raising corporate governance standards across nation, and the findings show a wide divergence in corporate governance requirements, it is encouraging to see that India has performed strongly on the back of the new regulations and holds a top spot among the BRICS nations."

Six of the ten highest scorers are developed markets, indicating that the maturity of the economy and capital markets influences, to some extent, generate the need for well-defined CG requirements. Commenting on the rankings, Low said: "The results are broadly in line with expectations, particularly at the top end and bottom end of the markets we examined."

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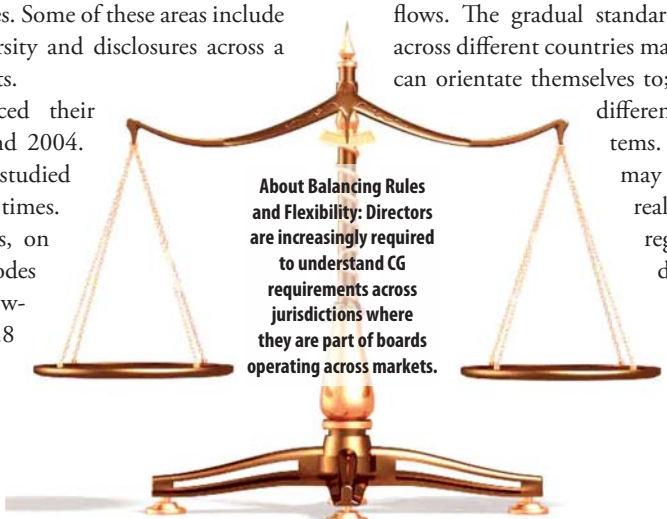
"There were some interesting insights: India and Russia performed strongly, and this could be in part due to recent revisions in their corporate governance codes and a desire to build confidence in their growing capital markets. Japan and Canada, on the other hand, received lower than expected scores." He clarified that low scores do not necessarily indicate the lack of CG requirements in these markets. "What low scores do reflect is that some of the CG requirements were not reflected in the actual corporate governance code of the market, although they might be present in other corporate governance instruments. This means that stakeholders who are unfamiliar with a specific market's corporate governance requirements may find it challenging to quickly and easily understand what the requirements are, and when, where, and how these requirements interact with one another," said Low.

The study found that the frequently mentioned CG requirements related to OECD principles, which highlights their significance in shaping a market's CG requirements. A majority, 16 out of the 25 markets studied have adopted more than 80 per cent of OECD-related principles. While this is encouraging, the study found that there were some markets such as Myanmar, Brunei and Laos that did not contain any requirements for more than half of the OECD principles.

> "The findings show a wide divergence in corporate governance requirements, it is encouraging to see that India has performed strongly on the back of the new regulations and holds a top spot among the BRICS nations."
>
> **Mritunjay Kapur,**
> Head of Risk Consulting and Strategy, KPMG in India

Sue Almond, ACCA, External Affairs Director said: "The OECD principles set out the basic tenets of corporate governance which market regulators should reflect upon at the very least. However, it is clear that many markets have gone beyond the principles so we welcome the OECD's current review of these principles and hope they will continue to be relevant and reflect good practice." The study also identified an additional 32 areas of better practice requirements that were not captured in the OECD principles. Some of these areas include risk governance, board diversity and disclosures across a number of governance aspects.

Most markets introduced their CG codes between 1992 and 2004. On average, the markets studied revised their CG codes 2.4 times. The highest scoring markets, on average, revised their CG codes 3.4 times, compared to the lowest scorers revising them 1.8 times.



About Balancing Rules and Flexibility: Directors are increasingly required to understand CG requirements across jurisdictions where they are part of boards operating across markets.

Other key findings

While CG codes provide clarity, they are not a 'one-stop shop' for CG requirements as additional requirements exist in other instruments.

At the same time, there is a risk of utilising multiple CG instruments to capture more details that can lead to inconsistencies and misalignment among different requirements.

More support is required for developing markets and emerging economies to raise CG standards.

Well-defined CG requirements on paper may lack enforceability in practice, 56 per cent of the 1,800 requirements reviewed were principles-based while the remaining were mandatory.

'Structural' CG requirements are better defined than 'behavourial' ones such as, performance evaluation and board diversity.

Most markets, 76 per cent, have revised their CG codes since the Global Financial Crisis in 2008. Some markets have not updated their CG codes. They are Indonesia (since 2006), Korea (since 2003) and China, which has not revised its CG code since 2001. Russia, India, Australia and the UK revised their codes in 2014. "Frequent and timely CG code revisions are an indication of active and engaged regulators and policy makers, a factor in driving enhanced CG requirements. Corporate governance is evolving and requirements should not remain static over time. This is particularly so as lessons learned from corporate failures and/or financial system collapses identify gaps and opportunities to improve," Said Almond.

In conclusion, Low said: "Just as boards set the 'tone at the top' for the companies they govern, market regulators and policy makers do the same with the corporate governance instruments and requirements they set." Regulators and policy makers must continue to review corporate governance requirements to help ensure they remain relevant, adequate and effective. Greater awareness and transparency of mandatory, principle-based and supporting guidelines and their interaction can be critical in improving corporate governance standards, he added.

Almond said: "We believe that the wide divergence of CG requirements introduces unnecessary complexity and generates a friction that hinders and impedes cross-border capital flows. The gradual standardisation of CG requirements across different countries may be an ideal that governments can orientate themselves to; despite challenges relating to different cultures and regulatory systems. The findings from this study may go some way to facilitate a realisation by governments and regulators about the enormous divergence in CG requirements and encourage them towards alignment for the greater economic good."

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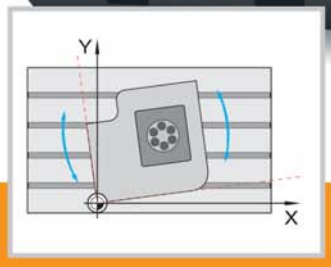

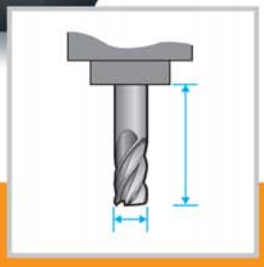

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A complete package!

A 'Super Shopfloor' is a one-stop location to produce the right parts, in the right numbers, in the right time and the right quality at the lowest possible costs.

By Harald Friedrich

A 'Super Shopfloor' is a one-stop location to produce the right parts, in the right numbers, in the right time and the right quality at the lowest possible costs. While it does seem very theoretical at first glance, the challenge is to bring efforts in a balance to the costs when it comes to actually doing it. All impacting contributors have to be known, constantly monitored and maintained as fast reaction on deviations is crucial for success.

We have to be aware that it is not enough to focus just on the shopfloor organisation and processes since all business processes and organisations are involved, directly or indirectly, in enabling the shopfloor to perform well. Self-accountability is a crucial element and everybody must be aware that his or her personal work or decision will have an impact in the performance of the shopfloor. The shopfloor has to earn money for the entire organisation and customers will pay only for the 'right' products. Considering that, the final goal is to continuously increase customer value and to reduce any kind of waste.

Powered by people

A 'Super Shopfloor' is clearly powered by people. Employees are the most valuable stakeholders of a company and thus the main contributors to the success of an organisation. Employees are continuously maintaining and improving our business processes, and having the right processes and the right flow in place, guarantees success.

Motivating people: We have to understand that every person is an individual with a personality of their own. There are differences like family background, education, culture, religion, society and not to forget day to day variations. Bearing these elements in mind, it is obvious that there is no single recipe to motivate people. Every individual has strengths and weaknesses. Based mainly on these strengths, we have to allocate the right people for the right work, while concurrently helping them overcome their weaknesses. But there are some aspects that we, as management, have to consider.

First and foremost, we have to prepare the organisation and give guidance to provide people the security to act within a known and safe range. To do that, we have to determine what is important and expected from a company's management perspective. What I am alluding to are the values and principles that make a company's expectation clear in terms of routine work behaviour. This can be accomplished with a focus on people involvement, continuous improvement, process simplification, commitment, trust, respect, fairness, and doing it right for the first time, among other things. Once a sustainable implementation is visible, a comfortable company culture will evolve.

Secondly, we have to identify the focus areas that we like

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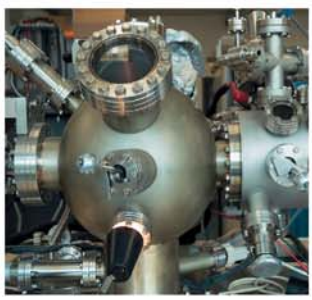

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to work on to support our values and principles. Focus areas could be, for instance, the stakeholder structure. Once the focus is defined, we have to work on our points of action for improving performance.

Finally, we have to empower our people with the right training and the appropriate toolsets. Once people are empowered, they will be motivated enough to help themselves. Once we have that in place, people will be able to work systematically and successfully on continuous improvement. Success will create personal growth, personal growth will create passion, and passion will create motivation.

Importance of technology

In my line of business, technology is always a strong focus. New technologies are, as a general rule, based on improvements in terms of precision, speed, energy consumption, productivity or simply new opportunities for production. To be cost competitive, we need stable processes with reproducible results so that the risk is predictable as much as possible. This can be achieved by reliable technologies.

The better the process or machine capabilities are, the more reproducible the results. This leads to a higher yield and lesser scrap. New technologies combined with capable processes, lean flows and standards have a favourable impact on production costs.

> "To be cost competitive, we need stable processes with reproducible results so that the risk is predictable as much as possible. This can be achieved by reliable technologies."

"Self-accountability is a crucial element and everybody must be aware that his or her personal work or decision will have an impact in the performance of the shopfloor."

Harald Friedrich

Beyond safety, quality and productivity

In a super shopfloor, all three categories are essential. Safety is important because we have to protect the health of our valuable employees. This can be done ergonomically, by means of safe and properly designed workplaces. Quality is crucial because we have to protect our customers from any negative impact and fulfil their expectations. We can ensure high quality standards with robust designs and processes. Productivity is critical to ensure sound financial health. This can be done by a lean manufacturing approach, standardisation, and well trained and motivated employees.

For everything we do, we need to have the right people in place. Productivity can only be improved by consistently working on optimisation and we must constantly ask ourselves whether what we are doing is state of the art and truly adding value.

Is a 'Super Shopfloor' Green?

Yes, it is; ISO14001 should be mandatory for every workshop, but it alone is not sufficient. Much more is required and 'Go Green' is an appropriate approach. We have a responsibility to preserve our environment for our children and generations to come. Being 'green' starts with the product design; the key phrase is design for manufacturability. Once the design is smart, the industrialisation can be done based on the lean principles. This leads to leaner production processes, lower power consumption, lesser usage of hazardous materials, less air pollution, less waste and greater value addition.

It is also innovative!

The contribution of employees is the main driver for innovation. The faster an organisation drives the continuous improvement process, the more innovation is possible. 'Speed' is the keyword in this case. Every little improvement is a very welcome contributor as the market is highly dynamic and competitive. Continuous innovation is more or less a requirement and not just a request.

It's a complete package!

No single aspect can alone be key for the success of a company. It is the complete package and we have to stay focused on the entire value chain. This connection is always based on the behaviour and actions of employees. Passion and motivation are the drivers for moving things forward. Having the right principles and values in place, combined with a value creation mindset and the right human relations are the prime drivers for a 'Super Shopfloor', in a convenient company culture.

The author is Plant Manager Bangalore, Head of Operations India, Continental India.

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Complemented by a support system

In a developing country like ours where the infrastructure needs a lot of beefing up, a standalone super shopfloor concept cannot derive maximum benefit without development of auxiliary services, say four spokespeople from the shopfloor of Trinity Engineers Pvt. Ltd, a leading automobile forging company

A 'Super Shopfloor' is normally determined by a high rate of productivity both from machines as well as manpower with consistent quality and comfortable man – machine interface. It would, at the minimum, include stream lined processes for smooth material flow, efficient material handling systems and reliable technological assistance for people on the shopfloor to achieve maximum output economically under a safe environment.

Focus on quality

At Trinity Engineers, all manufacturing processes conform to TS16949 Standards to ensure compliance of product quality to the customer's specifications. The centralised 'in-house' Standards Room takes care of the calibration needs of all the Measuring Instruments and Testing facilities used in the company. This facility is extended to Machining vendors as well.

Quality Assurance at all stages of manufacture is implemented through an experienced team of qualified engineers. A cross functional team (CFT) carefully chosen from the various operational disciplines conducts a thorough scrutiny of customer's requirements and undertakes an exhaustive Contract Review before preparing Process Flow Diagrams (PFD) and evolving Advance Product Quality Plans (APQP). This team also makes Control Plans (CP) and Technical Data Sheets (TDS) for purchase of input materials.

Likewise a dedicated team of experienced engineers is formed to address all the problem areas through:

- Threadbare analysis and evolution of effective Corrective and Preventive Action Plans (CPAP).
- Adopting '8-D' approach to conclusively resolve the issues.
- Engaging advanced problem solving tools like DOE (Design of Experiments).

Motivating people

The concept, design and infrastructure involved in putting up a shopfloor along with its maintenance are powered by people. Also, there are certain activities of the shopfloor which are controlled by humans from remote locations. Although shopfloors are predominantly run by man power, some super shopfloors are replacing operators with robots to handle the production system.

It is definitely a major challenge to keep people on the shopfloor motivated because when you are performing at such high levels, there may not be much scope for motivation through enhanced output target and challenge. Cost reduction and connected incentivisation could be one of the avenues to meet the challenge, serving to motivate people to excel.

Technology as a differentiator

With industrialisation growing at a fast pace, efficient technology could be the key differentiator to surviving in a highly competitive market. Shopfloor is the most important unit of any company and therefore competent technology becomes extremely critical as it plays a significant role in turning an ordinary shopfloor to a super shopfloor. Today the competition is at a global scale so the methods will also have to be of superior standards.

Technological advancement is of prime importance to enhance process execution while monitoring of the same and automation features too will increasingly become the order of the day.

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"It would, at the minimum, include stream lined processes for smooth material flow, efficient material handling systems and reliable technological assistance for people on the shopfloor to achieve maximum output economically under a safe environment."

VS Chandraseakar,
Head TQM,
Trinity Engineers Pvt. Ltd.

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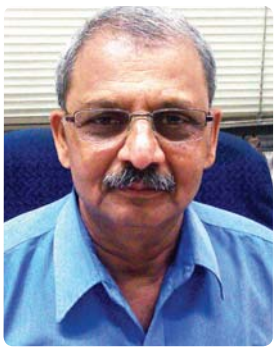
S Kanitkar, Head, Metalurgy and Heat treatment, Trinity Engineers Pvt. Ltd.



"Shopfloor is the most important unit of any company and therefore competent technology becomes extremely critical as it plays a significant role in turning an ordinary shopfloor to a super shopfloor. Today the competition is at a global scale so the methods will also have to be of superior standards."

MN Ugran,
Head, QA & MR,
Trinity Engineers Pvt. Ltd

"With issues like space crunch, multi-storey shop floors have also been conceptualised and implemented with supporting material handling systems. A super shopfloor may have to be complemented with proficient distribution services and good logistics."

VB Patil, Head, Finishing operations, Trinity Engineers Pvt. Ltd

High degree of adaptation

The Super Shopfloor concept involves a high degree of adaptation to improve the methods and use of advanced technology. Constant skill upgradation in maintenance and operational know-how will become a necessity through training and development. If the super shopfloor uses processes that involve scarce and depleting resources of the earth, the management of that super shopfloor needs to look at means of shouldering its social responsibility towards the same. It could throw up various complex issues relating to redeployment of people rendered redundant.

Adherence to green norms

The super shopfloor necessarily has to adopt green norms. One of the elements that go towards differentiating a super shopfloor from an ordinary one will be the ease with which it can adopt strict adherence to green norms.

Places of continuing change

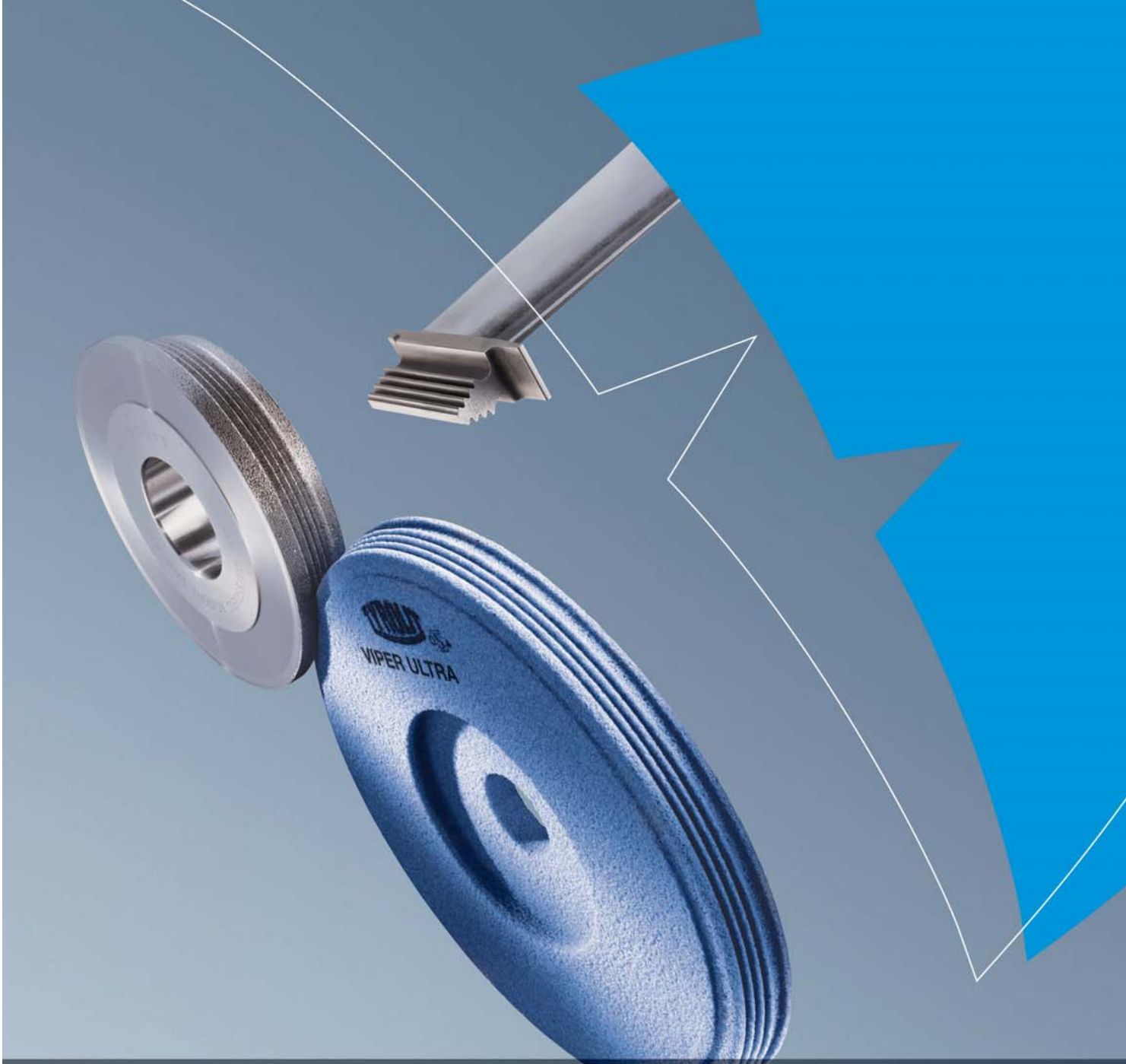
Innovation cannot be taken for granted by the advent of super shopfloors. Today's super shopfloor may be tomorrow's laggard, if continuous improvements do not take place.

As a result, most shopfloors are places of continuing change. Existing production assets are upgraded, reconfigured and adjusted to improve efficiency, enhance flexibility and meet new manufacturing demands. In order to increase or change capacity and capabilities, new assets are acquired and commissioned. New relationships with suppliers, partners and customers also lead to new shopfloor procedures.

Part of an ecosystem

The quest for excellence has been a continuous process. From bullock carts to airplanes and supersonic planes, from manufacturing one car per week to one car every few seconds – these are some of the advancements in shopfloor practices that have been witnessed. With remarkable technological advancements, the world has witnessed mobile shopfloors too, manufacturing shopfloors on a ship.

With issues like space crunch, multi-storey shop floors have also been conceptualised and implemented with supporting material handling systems. A super shopfloor may have to be complemented with proficient distribution services and good logistics. In a developing country like ours where the infrastructure needs a lot of beefing up, a standalone super shopfloor concept cannot derive maximum benefit without development of auxiliary services.



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Workplace with a sense of ownership

The shopfloor has to communicate that this is a place where the employee can spend eight hours meaningfully, thus fostering ownership and possible attachment for the work space, says **Anil V. Pillai,** Director, Terragni Consulting

A super shopfloor would have to focus on creating the right conditions on three key dimensions, - world class quality, an engaged workforce that is motivated to provide best in class productivity and is environmentally sustainable. The Super shopfloor has to be one, where employee and customer alike would look forward to work on and visit. Safe, clean, gender neutral, naturally lit and designed to improve and respect the shopfloor employee and her work.

"Any decision on the introduction of technology on the shopfloor has to be seen within the frame work of safety, productivity, innovation and quality."

Anil V. Pillai, Director, Terragni Consulting

People power

There is no doubt that a Super shopfloor has to be powered by people. People will be motivated when such a shopfloor is designed keeping the employee in mind, keeping the employee at the center of things as opposed to being skewed entirely and obsessively on throughput and industrial engineering norms. The shopfloor has to communicate to the employee that this is a place where he / she can spend eight hours of his / her waking hours which are meaningful as opposed to being seen as eight hours of drudgery, thus fostering ownership and possible attachment for his work space.

The Super shopfloor necessarily has to be a 'green' one. This environmental consciousness has to come both from the usage of energy in its various forms and also from the disposal of waste and by products.

Technology as an enabler

No shopfloor can be a super one without technology. Technology has to be seen as an enabler - an enabler of safety, productivity, innovation and quality. This necessitates that any decision on the introduction of technology on the shopfloor has to be seen within the frame work of these key attributes and clear linkages to these attributes be established prior to the introduction or implementation of such technologies on the shopfloor. This also ensures that there is a buy-in from the employees on the shopfloor towards the adoption of cutting edge technology. Many times expensive technology is procured and abandoned due to poor usage or poor maintenance. This occurs due to poor buy-in from the shopfloor employees and thus lack of motivated participation from them.

'Hygiene' conditions

In management terms quality and safety are popularly known as 'hygiene' conditions, or should be seen as such. They have to be a given - super shopfloor or not. Productivity is an ever moving goal post and thus there is a constant quest to bring in enhancements on a continuous basis. However beyond these parameters, is how well designed and managed shopfloors can challenge employees to innovate? Can the super shopfloor foster creativity towards solving problems that make the lives of the customer easier, add revenue, and cut costs? The super shopfloor has to have a curtailed carbon foot print that reduces its environmental load.

Environmental consciousness

The Super shopfloor necessarily has to be a 'green' one. This environmental consciousness has to come both from the usage of energy in its various forms (steam, electricity, compressed air etc) and also from the disposal of waste and by products. Any shopfloor that does not pay adequate heed to both these aspects is not really a super shopfloor.

Innovation that works!

Innovation from a super shopfloor has two aspects. One is innovation that results in a tangible benefit to the organisation, in terms of increased through put, quality, reduced costs , lesser strain on manpower and similar such benefits. The other key aspect of innovation is one where there are tangible benefits to the environment. Innovations that result in lower usage of utilities, allows safer methods of waste disposal, changes in processes which eliminates harmful practices that have a direct impact on the health of the workers. For too long organisations have tried to focus only on innovations that result in reduced direct costs or increased productivity. This needs to re-orient.

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Factory of the future

There is an opportunity to 'leapfrog' other countries by embracing new technologies, and rethinking business processes to take advantage of those new technologies.

By S. Ramachandran

Industrial revolution was the transition to new manufacturing processes according to Wikipedia. This transition included a movement to machines, improved efficiency and new energy sources. It is a prolonged period of time in which there is manifold increase in productivity, impacting large sections of society by providing them employment and economic upliftment.

To realise the Prime Minister's vision of India's GDP constituting of agriculture, manufacturing and services in equal measure, the manufacturing sector needs something similar to significantly double its output from the current level of 15 percent to 30 percent of GDP. To achieve this far reaching goal, investment needs to happen in many areas. Just investing in factories and equipment will not be sufficient. The people aspect at all levels is a vital component. There is an opportunity to 'leapfrog' other countries by embracing new technologies, and rethinking business processes to take advantage of those new technologies. In order to move forward, IDC Manufacturing Insights suggests that India should adopt a 'factory of the future' approach*.

Indian manufacturing has seen some levels of maturity in traditional IT areas like ERP, CRM and PLM. In the 2014 IDC Manufacturing Insights survey among IT executives, factory automation and manufacturing intelligence or shop floor reporting were the top ranked areas for future investment. Focus on what IDC calls the 3rd Platform (mobility, cloud, social, Big Data/analytics) and IoT (Internet of Things) will be essential in the technology portfolio to achieve this. While delivering his key note address in a recent CII conference, Dr Stefen Berns, MD Bosch India spoke about a 'Connected Industry' in action. He gave an example from Bosch where huge volume of data generated from test beds is mined to get valuable insights on which operators need training and which sub-systems need to be re-calibrated.

> "For perfect order fulfilment, supply chain visibility or transparency to the status, location and condition of the product at all phases until final delivery and beyond will be required."
>
> **S. Ramachandran**

Traditional ways of using demand forecasts in a 'push' type of business model to make and stock products result in not only locked up cash until a sale but also have the risk of scrap and rework due to obsolescence or damages. Obsolescence is even more pronounced these days with the short life cycle of products and increasing competition. Organisations should start using technologies such as efficient and dynamic order placement applications, their real time propagation to the right teams, usage of analytics to proactively look at patterns and social media to listen to the voice of the customer.

These backed by a 'pull' model where any product is made only for a particular customer

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request will lead to gross reduction of finished goods inventory. This is a make-to-order model and can be extended to an assemble-to-order or an engineer-to-order where each product is not just manufactured but even designed as per a customer's requirement, needing closer follow up at all stages and IT applications such as product configurators. Infrastructure such as reliable, predictable transportation networks and a trusted supplier ecosystem will be vital for implementing a pull system to ensure timely delivery of raw materials, parts and sub-assemblies and reduction in volatility of the supply system.

Organisations should shift from a 'capacity' mode to 'capability' mode. Capacity in simple terms is the ability to product a certain number of products in a time period using available resources and can be a subset of capability. What is required is an external focus looking at perfect order fulfilment – manufacturing and delivering the exact product the customer wanted at the location and time required by the customer, at the appropriate price and incurring the right cost.

Capability also includes flexibility to shift from one model to another in the shop within allowable time limits. For perfect order fulfilment, supply chain visibility or transparency to the status, location and condition of the product at all phases until final delivery and beyond will be required. Technologies like IoT, RFID, NFC and mobility can help for traceability of parts.

> "The revolution starts with moving away from a 'my job' to 'my factory', 'my industry' and eventually 'my society or country' mind set."

Factories of the future in India will be people intensive and not totally automated with robots. Western economies went through cycles where entire factories were automated even leading to a term 'ghost shift' where no humans oversee the operations during night shifts. Robots can be used for repetitive or hazardous tasks such as assembly, material handling, welding or where precision is required. According to data from ABB, India has the lowest density of robot usage in manufacturing – 1 per 10,000 workers (compared to 28 in China, 273 in Germany), 80 percent of the usage in automobile industry, with 70 percent of the application for welding. Robots have a huge potential even though they may not be applicable for all tasks in a developing economy like India. As part of the shift from capacity to capability, employees should be empowered – to stop the production life if a defect is found, to spend time in preventive maintenance of their equipment instead of keeping the machine running just for capacity utilisation (the push model). Employees should have a sense of ownership towards their organisation and be authorised to take decisions based on data and insights.

According to data from ABB, India has the lowest density of robot usage in manufacturing – one per 10,000 workers (compared to 28 in China, 273 in Germany). *Image Courtesy: ABB*

A network of factories will be the future model and not one large factory which has a risk of supply disruption due to unforeseen situations. India is being planned as a manufacturing hub already by multi-national companies from chocolates to consumer electronics to automobiles. A network of factories talking to each other would mean standardisation of processes and well planned IT systems including the data models and EDI standards used for communication.

The metrics used to measure the health of organisations can undergo changes. External focus on customer satisfaction using scores such as NPS (net promoter score or the share of happy customers who would refer an organisation), on-time order fulfilment etc., would also get measured by senior management. Organisations cannot limit their focus within the four walls of their enterprise but go beyond to betterment of systems and processes in the overall ecosystem including their suppliers and vendors.

Doubling of the output of manufacturing as a sector in a decade or more is nothing short of a revolution. Only investment in infrastructure cannot make it happen. What is even more important is the evolution of the ecosystem starting from employees to senior management, vendors and suppliers – from education institutions to training centers and the factories. The revolution starts with moving away from a 'my job' to 'my factory', 'my industry' and eventually 'my society or country' mind set. The government and all stake holders should have a long term futuristic state in mind post a manufacturing revolution and plan a road map accordingly before starting any execution.

The author is Principal Research Manager, IDC Manufacturing Insights.

*Transitions for IDC's *'factory of the future'*

- From forecast based production to customer order based production
- From capacity to capability to fulfil customer orders
- People at the center of activity for flexibility and decision making to deal with increasing complexity
- Rise of contemporary metrics beyond just top line and bottom line
- IT becoming essential for real-time decision making.

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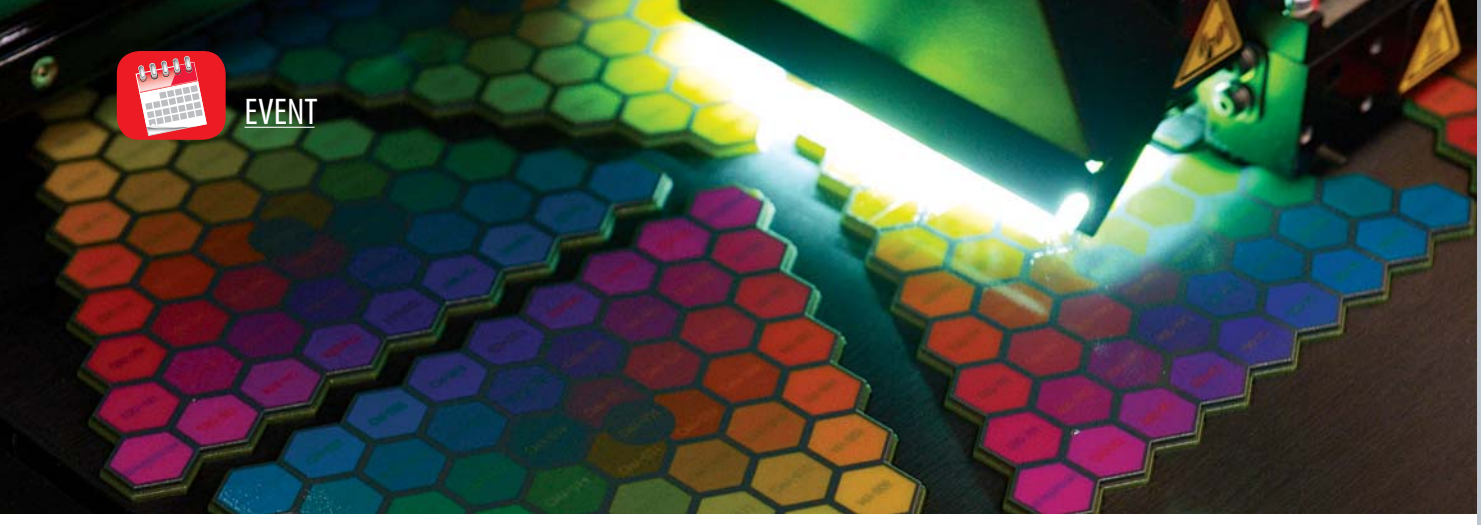

The Age of Networked Manufacturing

From digital factories that show how product development and manufacturing processes will be coordinated in the future to startups that use research and technology to win customers, Hannover Messe 2015 will have it all.

The overarching integration of industrial processes is entering the next round: Exhibitors at the Digital Factory trade fair (to be staged under the umbrella of Hannover Messe 2015 next April) will demonstrate what industry needs for this next evolutionary phase, how product development and manufacturing processes will be coordinated in the future, and what the integration of information technology and automation can look like in action. The lead theme of the world's most important trade fair for industrial technology is "Integrated Industry – Join the Network!", and it is in this spirit that the hot topic of Industry 4.0 will be addressed.

"Since its premiere in 2003, Digital Factory has successfully established itself as the world's leading trade fair for integrated processes and IT manufacturing solutions, covering everything from product development on up to actual manufacturing. It thus provides very fertile soil for the technology needed for Industry 4.0," said Oliver Frese, Deutsche Messe's Senior Vice President in charge of Hannover Messe.

> The world needs innovative technologies in order to make its energy systems more sustainable and to fully realise the efficiencies offered by the fourth industrial revolution. This calls for creativity and fresh thinking – qualities that startups have in abundance.

Digital Factory provides a comprehensive look at the IT solutions needed by manufacturing firms for each and every step, e.g. CAx for conceptualisation and design, MES and ERP for production planning and control, simulations and forecasts using virtual reality and 3D models of products and factories, as well as management of product and manufacturing data throughout the product lifecycle using PDM and PLM. All the major suppliers are represented, including Dassault Systèmes, Microsoft, PTC, SAP and Siemens PLM Software, as well as many smaller businesses. Young start-ups such as Bi Excellence are also exhibiting at Digital Factory. Bi Excellence is a company that provides business intelligence frameworks, dashboard systems and SAP export solutions. Many start-ups take form where the real and virtual worlds meet. They are more flexible, respond faster to trends and thus develop more individualised products – a huge advantage in this era of industrial transformation, and a significant asset for Digital Factory.

Today's manufacturing firms are looking to achieve full digitisation of their entire value chains, the only way to move towards products networked via the Internet, and even to fully networked self-controlling manufacturing facilities. Digital Factory at Hannover Messe shows the next steps along this path, which can already be taken today.

Additive Manufacturing Plaza

The new Additive Manufacturing Plaza gives additive manufacturing a dedicated showcase at Digital Factory. The Plaza will put the spotlight on digital prototypes as a prerequisite for automated production. The heart of this special display is being staged in exclusive collaboration with Arburg. A group pavilion and individual stands by key players are part of the display. The focus will be on industry-capable machines as well as standard industrial materials of representative hardness and other parameters. Among the leading suppliers to appear alongside Arburg are alphacam, ExOne, Kisters and voxeljet. Arburg is the only manufacturer to cover the entire spectrum of industrial production of high-quality plastic components, from additive manufacturing of one-off units all the way to injection molding for mass production.

"At this special display, we are not only presenting our Freefomer and Arburg Plastic Freeforming technology, but

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also promising ways of using Industry 4.0 technology to deploy additive manufacturing and injection molding throughout the entire process chain," explained Heinz Gaub, CTO, Arburg. "Along with the manufacture of functional components and small batches, we are presenting cutting-edge additive manufacturing using the Freeformer for user-specific customisation of mass-produced components made of plastic. Full integration throughout the value chain makes it possible to flexibly respond to customers' individual wishes."

MES Conference, CAE Forum and Technology Cinema 3D

The focus of the MES Conference, now in its seventh edition, is on valuable real-world expertise and new solutions for automated manufacturing. The CAE Forum has been the meeting place for simulation experts from shipbuilding, automobile manufacturing, wind power and aeronautics since 2013. Complex 3D manipulation is explored under the slogan SIMPLIFY 3D at Technology Cinema 3D, covering visualisation, virtual reality and process integration. To make all the right connections on the way to integrated industry – Join the Network in Hall 7!

Get new technology first!

Hannover Messe, the world's leading trade fair for industrial technology is staged annually in Hannover, Germany. The next Hannover Messe will run from April 13 to April 17 2015 and feature India as its official Partner Country. Hannover Messe 2015 will comprise ten flagship fairs: Industrial Automation • Motion, Drive & Automation (MDA) • Energy • Wind • MobiliTec • Digital Factory • ComVac • Industrial Supply • Surface Technology • Research & Technology. The upcoming event will place a strong emphasis on Industrial Automation and IT, Power Transmission and control, Energy and Environmental Technologies, Industrial Subcontracting, Production Engineering and Services, and Research & Development.

Startups at Research & Technology 2015

Take innovative thinking, pair it with lightning agility and add a generous portion of boldness in the face of risk. Then harness it all to a common vision and focus it on a new product while keeping a close eye on the costs. That's entrepreneurship – something that every company aspires to. But how to get from aspiration to realisation? Increasingly, the answer to this question is exemplified by startups, many of which weave their magic at the interface between the real and virtual worlds and win new customers with individualised products. The startup scene made a big splash at this year's Hannover Messe – particularly at the Research & Technology show – and will again feature strongly at Hannover Messe 2015.

"This year, we decided to showcase startups more prominently than ever before. As the world's leading trade fair for industrial technology, Hannover Messe is able to significantly boost the international profile of these innovative young companies and hence increase their chances of finding cooperation partners. At the same time, investors, who are naturally drawn to Hannover Messe from all around the world, are able to assess these young companies' innovative ideas for themselves and make investments," said Marc Siemering, Deutsche Messe's Senior Vice-President responsible for Hannover Messe.

The startups at Hannover Messe are important drivers of technology transfer in two ways. First, they exhibit pioneering products that are ready to make or have already made the transfer from R&D to manufacturing. And second, they are able to draw on their own experience to advise the next generation of entrepreneurs on the vital first steps towards starting up their own companies. This year (in 2014), startups presented innovations from a wide range of areas, including energy, environmental technology, mobility, industrial subcontracting and automation. "At this year's Hannover Messe, the group pavilion for innovation networks and their member startups at the Research & Technology show was very well attended. It was a winning format that we will be using again in 2015," said Siemering.

The world needs innovative technologies in order to make its energy systems more sustainable and to fully realise the efficiencies offered by the fourth industrial revolution. This calls for creativity and fresh thinking – qualities that startups have in abundance. And that is why, in 2015, Hannover Messe will again put a strong emphasis on startups. The main hub of the fair's startup activities will once again be the Research & Technology show in Hall 2, which will feature around eight networks. Startups and young, innovative companies will also be an important part of Hannover Messe's other trade shows.

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Driving new opportunities

Bosch Rexroth India is focusing even more on developing local variants based on its product platforms, says its Managing Director **Dr. Johannes Grobe**

By Niranjan Mudholkar

What is your analysis of the Indian manufacturing sector? In the wake of our PM's call of 'Make in India' what are the areas that we need to work on to transform India into a manufacturing hub?

India has grown in the last two decades on the shoulders of the services sector but with the new government pushing investment and reforms in manufacturing, the latter could play an important role in driving growth in the future. Over the years, India has become a promising investment destination for foreign companies looking to do business here and with a stable government in power will further strengthen the roots. Stabilising economic indicators are also giving cause for optimism. The Government's new initiatives such as the 'Make in India' campaign are gaining traction and bringing trust back in investors.

In India, automation is growing in proportion to general market growth. The expansion of the product portfolio in the last few years has opened many new opportunities especially in mid-sized automation. In the past, customers were looking mainly on cost of investment and simple automation. Now, due to the strong demands from the machine users, the OEMs understand the need for it. These demands request new solutions, clearly driving the market to new investments.

Bosch Rexroth India has recently started the Centre of Excellence in automation technologies at the Manipal Institute of Technology. Tell us about it.

As a part of industry institution partnership, Bosch Rexroth India has taken initiative and established a 'Centres of Excellence in Automation Technology' in collaboration with different engineering institutions. These centers offer well structured courses designed and supported by Bosch Rexroth in the field of automation technologies on skill development of engineering students with emphasis on hands-on approach for mastering skill and competencies. It is primarily intended to assist in the transfer of knowledge for students in the subject areas of automation and to bridge the gap between education and industrial demands. By doing so, the center is contributing to the strengthening of the industrial sector in India.

> "Bosch Rexroth in India plans to develop beyond market growth as well as need across India, and to achieve this it is imperative to design and manufacture locally while building up suppliers in the region."

About one and half years ago, you started a new facility in Sanand with an investment of around Rs280 crore. At that time, you had mentioned that going beyond production, the plant has been developed more as a technology center. How are you leveraging on this for the benefit of customers?

India is an attractive destination resembling growth and potential. Bosch Rexroth in India is on way to become the supplier of first choice for hydraulic, electrical, linear motion & assembly technology components and systems. In doing this, the major task for us is to lead and build up Bosch Rexroth (sales, R&D, manufacturing, service etc.) in India, develop new components and systems that address perfectly the needs of Indian customers which are not covered by the existing product portfo-

lio. Bosch Rexroth in India plans to develop beyond market growth as well as need across India, and to achieve this it is imperative to design and manufacture locally while building up suppliers in the region. We want to generate our revenues in line with the market sizes across India. We are focusing even more on developing local variants based on our product platforms. Put simply, we want to become a strong 'local hero' in all key markets that understands and implements regional requirements.

Tell us about Bosch Rexroth India's overall manufacturing capabilities and capacities.

Established in 1974, Bosch Rexroth in India as a part of Bosch Rexroth AG, is one of the leading specialists in the field of drive and control technologies. It serves customers through manufacturing facility and technology centres at Ahmedabad and Bangalore with wide spread sales and service offices and dealer network spread all over India. It develops, produces and distributes its components and systems in the technology field of hydraulics, electric drives & controls, linear motion and assembly technology. These products are used in all major industries such as plastics, steel, (bulk) materials handling, railway, construction machinery, agricultural & farm machineries, machine tools & presses, automotive, food & packaging, textile, and so on.

Our new plant in Sanand not only has a complete variety of hydraulic products, but also provides the design of the complete hydraulic equipment and the system, which are used across all sectors mentioned above.

"In India, automation is growing in proportion to general market growth. The expansion of the product portfolio in the last few years has opened many new opportunities especially in mid-sized automation."

Any plans of expansion in India?

We are market segment focused and we have specially developed our systems to work according to the specific sector demands. We provide integrated one stop solutions in drive and control technologies. The expansion of the product portfolio in the last few years has opened many new opportunities. We are continually working towards new segments with this portfolio thus offering our customers complete solutions. Our target is to establish Bosch Rexroth as leading solution provider in drive and control solutions.

With our new plant operational, we will focus on first addressing growing needs of our customers and adding new customers in our kitty, parallel. We will definitely go for expansion in future in line with the market conditions and requirements.

Improving energy efficiency is key challenge in machine engineering. In this context, as a supplier of the full range of drive and control technologies, Bosch Rexroth has developed the 4EE system. Tell us more about this?

Drive and control solutions from single source will always have an advantage by utilising synergies between technologies there by achieving efficiency. A machine manufacturer will always look for energy efficiency. This will ensure quality with productivity and reduces cost burden. We as a drive and control solution provider offer such concepts e.g. Rexroth 4EE (Energy system design, Efficient components, Energy recovery, Energy on demand) thus optimising energy efficiency in all phases of machine life cycle. Take components from Rexroth range like axial piston motors which have got low coefficient of friction or servo motors which are highly efficient these will ensure peak performance. Moreover, our energy efficient solutions ensure plants run smoothly, e.g. Rexroth solution 'Sytronix' combines the features and multiply the advantages of both the technologies i.e. hydraulics & electric drives and controls. This lowers energy consumption (up to 70 percent) and reduces noise considerably. We offer such and many more innovative solutions which support in getting higher efficiency and fast operations.

Safety is a priority for manufacturing businesses. How are you helping manufacturing plants to maximise their productivity and performance while being on top of the safety issue?

Machinery manufacturers and users require more engineering efficiency for a faster time to market and future-proof automation solutions in order to protect their investments. At the same time, they are looking for possibilities to customise their machines economically with new automation ideas for machine processes and functionalities to meet the needs of individual customers. This is how they can set themselves apart from the competition. As a result, the wish for more flexibility to implement these customised concepts rounds out the list of new requirements. And here machine safety plays an important role. Rexroth offers the universal competence for functional safety at all levels of automation, as well as technologies thus establishing Rexroth Safety on Board path to intelligent and economical machine safety.

Would you like to add anything else?

Bosch Rexroth India is Driven by Passion and it has helped us to serve past 40 years in India and we will continue to do so for years to come as a complete Drive and Control solution provider addressing all our customer's needs.

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Growth aspirations

Tata Technologies Limited wants to remain ahead of the curve and would like to grow at 18-20 percent per annum, says **Samir Yajnik,** its President Sales & COO Asia-Pacific

By Niranjan Mudholkar

What has been the biggest highlight of the calendar year 2014 for the Indian manufacturing industry?

Due to the significant opportunities generated by increasing trade between India and the global markets, 2014 has been an exciting year for the Indian manufacturing space. The highlight has been the empowerment of Indian manufacturing sector in achieving global benchmarks of quality, safety and regulatory compliance, through manufacturing excellence and the connected enterprise

Why do you think so?

Today's manufacturing environment is increasingly becoming more demanding. To upsurge competitiveness and meet expectations, manufacturers need to reduce time-to-market, increase process visibility and production flexibility, optimise scheduling and reduce waste, material inventory and downtimes. Adoption of standard manufacturing and quality management practices is now a prerequisite for industries where customer safety is at stake. Many of these requirements flow down from the end-customer to downstream in the supply chain.

To increase production efficiency while simultaneously improving quality management practices, organisations are turning to more sophisticated and integrated information systems for production management – Manufacturing Execution System (MES) and leaving the old paper-based processes behind.

"To upsurge competitiveness and meet expectations, manufacturers need to reduce time-to-market, increase process visibility and production flexibility, optimise scheduling and reduce waste, material inventory and downtimes."

What has been the most important achievement for your organisation this year?

Tata Technologies had a good run this year. The public debut of New Land Rover Discovery Sport (Latest SUV from Jaguar Land Rover) was a monumental achievement for us in 2014. This project involved the efforts, knowledge and vision of over 200 VPD (Vehicle Programs & Development Group) engineers, contractors, and designers from different corners of the globe, who worked relentlessly to deliver all body engineering for JLR Discovery Sport. Digital Manufacturing services played a vital role in ensuring smooth and timely launch of vehicle. Our Simultaneous Engineering services took care of all manufacturing aspects during product development phase. JLR Discovery Sport has been a learning and enthralling experience for everybody involved and we look ahead to create more such milestones in the future. Since product development is central to what we are as an organisation, this milestone is very important to us.

What are your expectations from 2015?

According to research agency IDC, IT spend in Indian manufacturing will double by 2016. IDC's Manufacturing Insight predicts the Indian manufacturing IT spending to grow to US$8,781.8 million by 2016, which doubles the manufacturing IT spending of 2011, representing a CAGR of 14.5 percent between 2012 and 2016. The overall ER&D market is expected to be in excess of US$32 billion by 2020.

At Tata Technologies, we want to remain ahead of this curve and would like to grow at 18-20 percent per annum. Tata Technologies would like to consolidate and grow in our verticals of focus – automotive, aerospace and industrial machinery, whilst diversifying into new verticals where our competencies are unique so as to reduce entry barriers and reach out to new customers segments for exponential growth.

Do you have any special plans set for 2015?

To fuel growth and to serve our key customers, Tata Technologies will expand in newer geographies, such as Japan, Brazil and China. Also, we would like to take advantage of the stable economy in the US to increase our share of business from North America and Europe. These growth aspirations are in line with our goal to become a billion dollar company by 2017.

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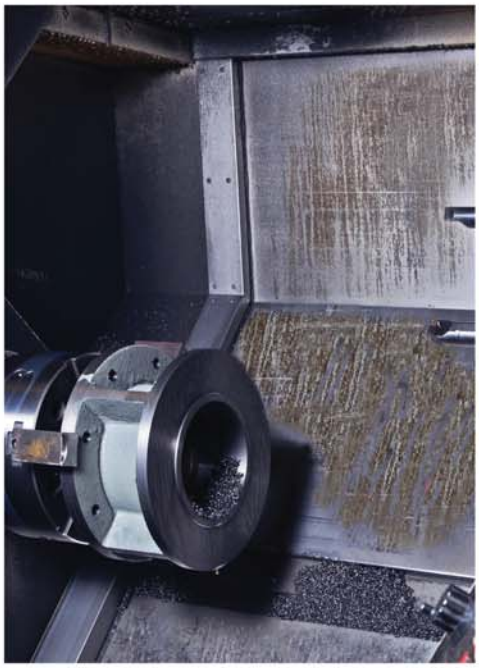
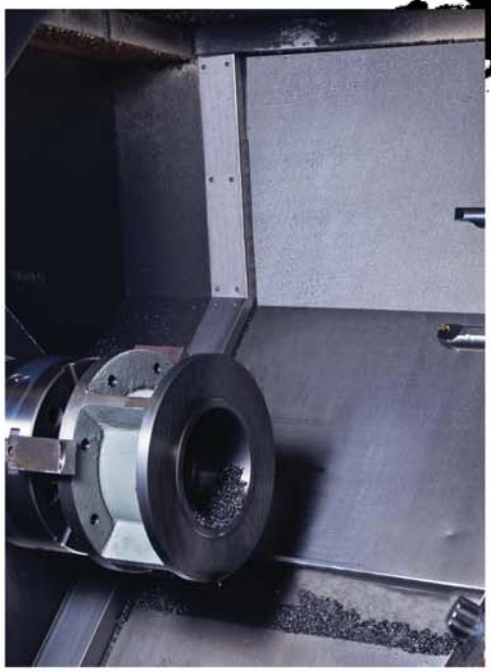
Dirty machines can affect your shop floor productivity and your morale

Machining of Cast Iron, is a tricky and demanding process. Inherent composition and properties of the metal pose stiff challenge to even the experienced machinist. The fine graphite residues generated during the machining process tend to stick on to the machine parts rendering it with an unenviable look.

If unattended, these impurities tend to form a thin oxidized film on surface of the machine parts. Chances of rust formation also cannot be ruled out. These can not only lead to choking of pipelines and nozzles but also significant reduction of machine lifetime. Dirt on the machines is not only a blot to your reputation but can also impede efficiencies. While chances of tool breakage and poor finish increase, the biggest impact is on the morale of the operator!



Scale formation with ordinary cutting fluid



Machine after switching over to Avantin

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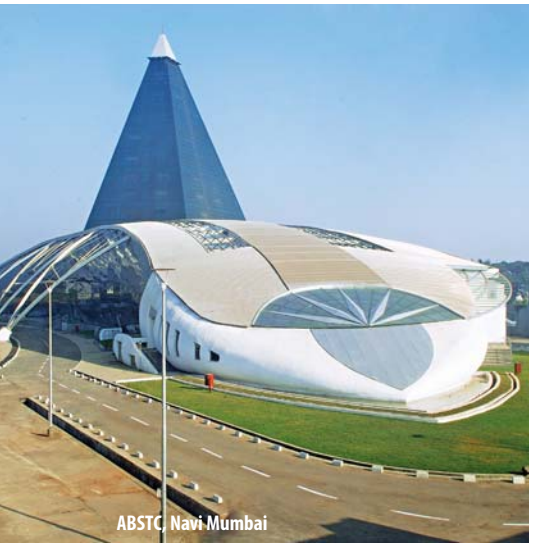

ABSTC, Navi Mumbai

Science and Technology for a Sustainable Future

The Aditya Birla Group's technology team from the Aditya Birla Science and Technology Company Limited (ABSTC), along with the Hindalco Muri Refinery and Hindalco Innovation Center, is building a strong scientific platform backed by science and technology to excel with safe and efficient manufacturing practices at its commercial production sites.

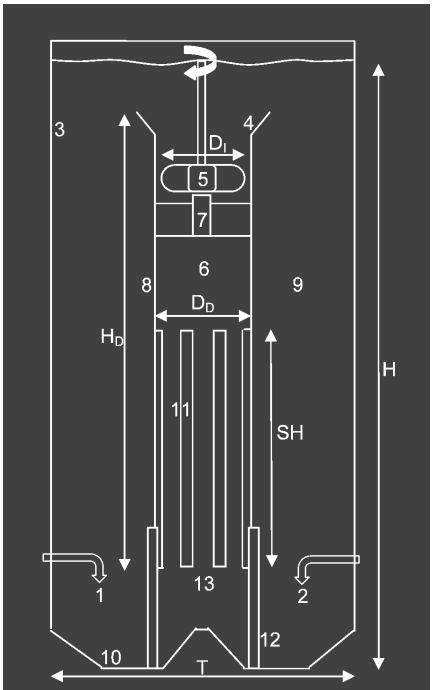
Implementing the best operating practice for efficient energy management in an alumina refinery

Air sparging is widely used in the process industries, in production of chemicals, pharmaceutical applications as well as in food, pulp, paper, minerals and hydrometallurgical industries. Typical mineral processing industries use as much as 30% of their total electricity requirements to make compressed air. The two most cost effective ways include reducing air leaks and/or optimizing the utilization of compressed air for the best performance of a unit process. In the Bayer alumina process, especially in the white side, precipitation process is the rate determining step in the production of aluminium hydrate crystal particles.

A successful commercial scale production especially depends on the smooth and continuous operation of the agglomeration and precipitation growth processes. Industry scale draft tube precipitator design in the Bayer alumina process has the task to uniformly suspend alumina hydrate particles with minimum power consumption. It is important to note that the overflow particle concentration from one stage to the other will be uniform if particles are uniformly suspended in the entire precipitator volume; else gradients in particle concentration will prevail in alumina precipitators. In operational practice, it is generally believed that the compressed air sparging assists and enhances the solid suspension in draft tube

"Managing a complex chemistry of precipitation circuit of Bayer's Alumina process through a precise control of air and pregnant liquor flow and controlled agitation to produce desired Granulometry is an engineering marvel. It makes it extremely critical when 10 giant tanks of 36 m height each having 4,500 m^3 volume are live in the circuit. Technical & Operations team of Hindalco Muri Refinery supported by engineering prowess of ABSTC made us proud by delivering world class results in precipitation productivity."

Sudip Bhattacharyya, Unit head – Hindalco Muri works



Draft tube precipitator (Details of H, H_D, SH, D_I, D_D and T are given in the below Table). (1&2) Air injection location (3) Precipitator wall (4) Draft tube bell-mouth suction (5) Hydrofoil impeller (6) Draft tube region (7) Flow straightening vanes (8) Draft tube wall (9) Annular region (10) Profiled precipitator bottom (11) Draft tube slots (12) Draft tube support (13) Draft tube outlet.

Design	Notation
Tank diameter	T
Draft tube diameter	D_D
Impeller diameter	D_I
Operating fluid height	H
Draft tube height	H_D
Total slot height	SH

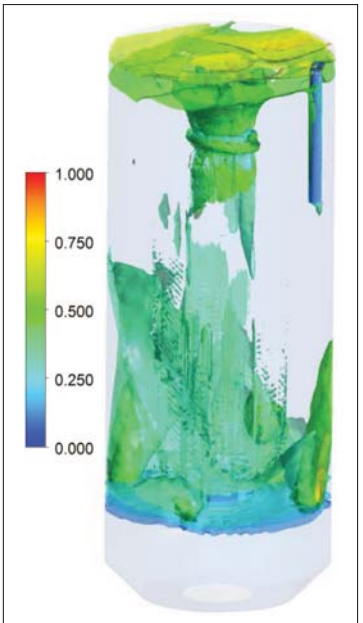
precipitators. A fundamental investigation has been made to characterize the flow and hydrate suspension phenomena in the draft tube precipitator design using computational fluid dynamics (CFD) modeling.

Objective: To reduce downtime in the white side of alumina refinery by improving hydrate suspension in the draft tube precipitators.

Challenges: Attempted several process and design modifications to improve hydrate suspension. None of them sustained with improved suspension. Finally excessive compressed air agitation prolonged the hydrate suspension, however, not sustained.

In-house R&D investigations: Initiated in-house R&D to critically figure out the root cause of the problem. The fundamental and scientific based critical investigation helped the entire team to understand the actual root cause problem in-depth.

The principal objective of the draft tube design along with an axial down pumping agitator is to pump the mass from the top portion (4) of the precipitator towards the tank bottom (13).



CFD modeling of compressed air holdup in the draft tube precipitator

The impeller rotation creates a tangential swirl and it results in the formation of low pressure region inside the draft tube. Depending upon the local pressure distribution, slots will have both inflow and outflow through draft tube wall section (11). In industrial processes, the process variability can disturb the smooth and consistent operation, which could be triggered by upstream and/or downstream operations. The disturbances in the process variables initiate the hydrate settling. In order to overcome the settling problem without affecting the productivity, the operational practice is to inject air from the bottom of the annular region of the tank (1 & 2).

In-depth CFD modeling investigations clearly showed the impeller region inside the draft tube is completely flooded by the air holdup. The moment air occupies the impeller region, the pumping capability of the impeller drastically reduces and initiates the solid settling in the precipitator.


Hindalco Muri engineering team at the shop floor continuously working to improve the productivity without compromising on the product quality

Parameter	UOM	Before	After
Precipitation Productivity	gpl	-	6 gpl improvement
+ 150 µm	%	> 20	10-12
Residence Time	hrs	23.5	27.1
Suspension	-	Non-uniform	Uniform
Air Flow/tank	Nm^3/hr	300	150


The Scientist Team from ABSTC continuously supports the alumina business to strengthen its long-term competencies and to develop proprietary technologies and intellectual property

Implementations and Benefits

Detailed investigation helped the team to understand the characteristic dynamic behavior of the draft tube precipitators. Hence instead of suspending the hydrate particles with excess air, the team focused on reducing the standard deviation in the process variability by excellent seed management and reducing the compressed air consumption of white side of the refinery by 50%. This practice resulted in improved solid suspension and equipment uptime.

Investigations are in progress to further reduce the level of compressed air agitation to excel the performance of alumina productivity efficiently and cost effectively.

Flying Higher!

Pratyush Kumar, President, Boeing India, and Vice President, Boeing International is working to bring the best of Boeing to India and the best of India to Boeing.

By Niranjan Mudholkar

It has been almost two years since Pratyush Kumar has been at the helm of affairs as President, Boeing India, and Vice President, Boeing International. As Boeing's most senior in-country leader, he is responsible for development and execution of the company's strategy in India.

When asked to describe the journey so far, he calls these two years as fabulous, fantastic and fast moving – the excitement and exhilaration in his voice cannot be missed. And almost as an after-thought, he adds that the two years have also been quite compelling, very challenging and at times even exhaustive. "But nonetheless, very engaging and meaningful," he says with a quick smile.

Prat, as he is popularly known, says that Boeing's India strategy is two pronged. "This involves bringing the best of Boeing to India and bringing the best of India to Boeing. And we have made great progress in the last two years in strengthening this partnership between India and Boeing." Of course, Boeing has had an enduring and vibrant relationship with Indian aerospace going back to more than seven decades – it all started when the then Tata airlines flew the DC-3 aircraft.

Down the line, that association has only become stronger with more than two hundred jets in service with its key customers like Air India, Jet Airways and SpiceJet. Today, Boeing continues to deliver what Prat calls 'Boeing's proven work horse 737' to SpiceJet and Jet Airways.

"And we have added the defence portfolio in the last two years delivering nine C17 aircrafts, which has reached unprecedented level of readiness which has helped India during a couple of natural disasters," he says. Then, there's the P-8I Maritime reconnaissance aircraft, which has done incredible missions not just during the search of the Malaysian aircraft but also during Cyclone Hudhud. "Really, it has been an amazing time for us in the country in terms of the activity level that has gone on and in terms of bringing the best of Boeing to India," he says.

On the second prong of the strategy - in bringing the best of India to Boeing – Prat believes a huge amount has happened. "We have had strong partnerships – from collaborating with leading institutions in the country like IIT Bombay and IISc to really kind of delivering the partnership we have with Tatas for manufacturing the 787s floor beams in Nagpur to

creating a world class MRO for Air India that is to be handed over soon. And that's not all; we are also creating an ecosystem for aerospace manufacturing in India through partnerships with Dynamatic Technologies, with HAL, with Mahindras and many others.

"We have been working with these organisations very closely. We have also been working with the National Skill Development Corporation (NSDC) to skill the frontline factory workers. So that is all in the spirit of bringing the best of India to Boeing. We know that we have incredible breadth of capabilities in the country and amazing cost structure. So we want to work with them to help develop the skillsets so we can harness that for our competitive advantage across the globe," he says, almost in a single breath.

Prime Minister Narendra Modi's 'Make in India' campaign seems to have galvanised the Indian manufacturing sector and has also raised confidence levels for overseas investors too. Earlier, the Budget opened up the defence segment further for foreign players. In this scenario, does Prat see Boeing playing a much enhanced role going ahead? And will Boeing make in India? "We are doing this today and we will only scale this up as we move ahead," pat comes the reply. Of course, there's a cap on the FDI in this sector so we may not have a 100 percent Boeing owned facility but Boeing will continue to manufacture and make in India with its partners.

"We have had significant investment in the supply chain in India. We have invested over a US$100 million over the last few years in the Indian supply chain in developing their capabilities. This investment has been made in processes, plans, equipment, machinery, training, oversight and all that goes into getting the capabilities up. We have done that and we will continue to do that," Prat shares – the thought of Boeing investing through equity still lingering in my mind. He answers as if he has read it: "Well, we will also look at selectively if there is an opportunity to put some equity in," but adds "Nothing on that as yet but yes, we are in it to support not just 'Make in India' but help Boeing become more competitive globally." Incidentally, the fact that everything that Boeing is currently doing in India is export oriented gives strong credibility to his statement.

> We will also look at selectively if there is an opportunity to put some equity in. Nothing on that as yet but yes, we are in it to support not just 'Make in India' but also to help Boeing become more competitive globally."

Boeing's C-17 Globemaster III for the Indian Air Force

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Prat is quite optimistic – in fact enthusiastic – about the future of Indian aerospace manufacturing. "This sector will accelerate dramatically in the next five years," he says. He has his reason to say so. Historically, the aerospace sector has been confined to the government. It was essentially the HALs and the BELs. "Now the private players are coming in – the Tatas, the Mahindras, the L&Ts and many more. You will see huge acceleration of aerospace manufacturing capabilities in the private sector and Boeing is actually actively enabling that. I see the sector growing rapidly in a very short time."

Prat also believes that the steps taken by the Government to allow the private entrepreneurship to bring their innovation to the sector in India is also a welcome step. "This will certainly help India get in the game in a globally competitive manner."

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Institute of Science, Boeing has created the joint Aerospace Network Research Consortium (ANRC). It is progressing well and Prat believes it is brining huge benefits to the Indian aerospace sector. "This is very high-end network consortium. If you look at the evolution of wireless networking technologies on board, it has all kinds of possibilities. For example, if you could have low energy wireless systems on board, then you could have telemetry on real time conditions of different equipment on the aircraft to monitor that and it changes the game completely.

"I know this sounds a bit futuristic but if you look at the aviation system it evolved from fly by rope to fly by wire to fly by light. So we are at a cutting edge of that sort of evolution with our consortium partners. It's a futuristic technology and will take some time to come by but between now and then we are doing some interesting innovations which we will look to put into the next generation platforms as well," he informs. By the way, about 100 research papers have been produced at IISc based on ANRC's research along with 25 theses created on the consortium's work. And nearly, hundred interns from various universities have been enrolled in the last six years. Boeing's Research and Technology Centre in Bangalore continues to play a key role for its global activities and also serves as the hub of ANRC.

> You will see huge acceleration of aerospace manufacturing capabilities in the private sector and Boeing is actually actively enabling that. I see the sector growing rapidly in a very short time."

Boeing is contributing further to bridge the gap between industry and academia with meaningful collaborations. It also has an ongoing partnership with IIT-Mumbai for the National Centre for Aerospace Innovation & Research (NCAIR) to promote aerospace manufacturing capability development.

"It goes all the way from training our suppliers for getting NADCAP (National Aerospace and Defense Contractors Accreditation Program) accreditation to really helping them solve real time problems. The ultimate goal is to create a globally competitive supply chain," Prat says.

According to Boeing's own estimates there will be a demand for more than 1,600 new airplanes in India over the next 20 years, valued at $205 billion. How much of this does Prat see coming Boeing's way? He doesn't really have to think when replying to this one. "We want more than our fair share," he says without hiding his smile. Then he explains: "If you look at this market, we have slightly more than 50 percent share; we do pretty well on the twin-aisle segment where we have disproportionate share of the market. But single aisle segment is very competitive. We have a very strong competition and we would want to out-compete them. We have a fantastic product to improve on – 737 NG. Overall, our aspiration is to get more than the fair share of the commercial aerospace market in India. And we are very confident given the proven economics of our products."

A Boeing subsidiary CDG operates from India as an engineering services company providing strategic solutions for development and maintenance of complex equipment. Does it play any role in adding to India's aerospace ecosystem in any way? "Absolutely, it does. It is a fairly unique company," Prat replies. From creating and maintaining documentation on complex equipment, CDG has now evolved into providing very sophisticated engineering services for aviation and design of airplanes. "We certainly want to develop those capabilities for our own good but it is also part of our strategy for creating a bigger footprint in India in the engineering services. It is really core engineering that is helping us to harness the full potential of India. It is growing and currently employs 200+ engineers."

Considering the overall demographics and the overall macro-economic scenario in India, Prat believes Boeing is really positioned well and at the cusp of faster growth in India. "We want to be a reliable and long-term partner with India. We want to harness the significant manufacturing and engineering potential that exists here to become more competitive globally. And I really think this whole 'Make in India' initiative implies productivity and growth for Boeing so it is a win-win situation," he signs off, continuing with his positivity.

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Next 'Gen' Engineering

Nagendra Singh, President, Sterling Generators (P) Ltd, invited The Machinist magazine for a visit to the Company's manufacturing facility in Silvassa to explain what goes into the making of what he calls the next generation generators.

By Niranjan Mudholkar

The Sterling Generator's manufacturing plant is located about a couple of hours drive from Mumbai in a small village in Silvassa, the Capital of the Union Territory of Dadra & Nagar Haveli. The rural surroundings offer a perfect contrast to the advanced industrial set-up inside the manufacturing facility. Considered as one of the largest generator producing plant in Asia, it has both DTA (domestic tariff area) and EOU (export oriented unit) factories. While the in-house facilities include the latest infrastructure and equipment in terms of fabrication, assembly, powder coating, acoustic enclosure manufacturing and control panel manufacturing, according to Nagendra Singh, President, Sterling Generators (P) Ltd, it is the vision that separates Sterling from its competitors.

"Sterling Generators is part of the Shapoorji Pallonji Group and when our Group decided to foray into this business, we wanted to create a product that is technically superior, represents the latest technology and makes customers feel that they have taken the right decision in buying this product. And, it should also be cost competitive as we are aware that India is a price sensitive market. So this is the basic premise with which we started this manufacturing facility," Singh explains.

> "Our aim is to create a product that is technically superior, represents the latest technology and makes customers feel that they have taken the right decision in buying this product. And, it should also be cost competitive as we are aware that India is a price sensitive market."
>
> **Nagendra Singh,**
> President, Sterling Generators (P) Ltd

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Being a seasoned campaigner in this industry, Singh very well understands that both technology as well as customer demands are changing regularly. And the Silvassa manufacturing facility has been created to address the demanding nature of this business. "People often talk about addressing the customer need but we need to understand that there are different aspects to this customer need; that it is multi-dimensional," he says.

"For example, the purchaser wants the lowest price. The project guy wants the product to meet his specifications and requirements. The operations guy's concern is that the product should perform in case of a power failure, while the maintenance guy doesn't want to have a mid night call. And the owner doesn't want to add to his existing capital expenditure. Blending all these requirements, we have designed our product. And that is how we have been able to penetrate the market, show a significant growth and become an established competitor in the market in a span of a short time compared to the other well established players."

Singh believes that while technology is upgrading every day, it is not just enough to upgrade the product. "We also need to upgrade the skill to maintain that product. We have got to be flexible and we have got to be adoptive. We have got to listen to what the customer wants and we have got to deliver. This is our concept of manufacturing and this is our concept of selling. And this is what drives our manufacturing

> "We have got to be flexible and we have got to be adoptive. We have got to listen to what the customer wants and we have got to deliver. This is our concept of manufacturing and this is our concept of selling. And this is what drives our manufacturing plant."

People focus

Training: The Silvassa plant conducts a training programme which trains 15 selected young people with basic qualifications preferably from the local area to enhance their job readiness. This includes one year of theory and practicals and two years of actual on-the-job training. Sterling Generators spends approximately Rs2 lakh per person for this programme and currently the 3rd batch is in progress.

Employee engagement: The Plant celebrates an annual function called Harshotsav that brings together family members of all the employees. The Silvassa plant boasts of an excellent cricket team that has won several tournaments at different levels. Such activities inculcate the spirit of team work amongst the people, says Singh. Recently when an employee was faced with a medical emergency, all staff members contributed a day's salary to take care of the employee's medical expenses.

CSR: The plant has adopted a nearby village and is helping raise the living standards of the villagers. The plant also regularly conducts blood donation camps.

Singh aspires to make the Silvassa Plant a great place to work at and is confident that no employee leaves the organisation because of disputes. "If at all people leave us, they leave for very personal reasons and without any bitterness for the organisation," he says.

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Fabrication and assembly

The Sterling Generators' Silvassa plant uses the latest CNC machines for all sheet metal processing like cutting, bending and punching. The sheet metals are carried to the point of processing on wheeled trolleys from point of stacking. All sheet metal is sourced directly from the manufacturer to ensure quality. After completion of the fabrication work, the processed sheet is transferred to the paint shop.

The plant uses high conductivity electrical grade Aluminium/Copper conductor (as specified) directly sourced from manufacturers. All bus bars are properly cleaned before being used in the panel assembly. All cutting and bending are done on hydraulic/electrical machines to achieve desired angle and smooth edges. After cutting and bending, bus bars are covered with heat-shrinkable PVC sleeves. They are then kept inside a baking oven with moving bed, to shrink fit the sleeves on the bus bars.

> "We believe that any organisation which is creating this product must have the ability to design, develop, measure and test the product to meet Indian conditions. That's the reason why we have created such comprehensive testing facilities. In fact, I would say that our test bench is nothing but a R&D center."

plant," he says emphatically. "The manufacturing is very well complemented by a strong service and spare parts network across the country; Sterling Generator's provides timely after sales support to all their customers."

A key feature of the plant is the sophisticated testing facility. Singh asserts that it is not some fancy equipment but a well thought out infrastructure created with long term perspective that takes care of requirements so far not addressed by the industry. The major component of the generator is its engine. According to Singh, international engines are tested to match the ISO standards set for 25 degrees of ambient temperature. "Incidentally, the average ambient conditions in India are in the range of 45 degrees to 50 degrees. One must understand and appreciate the fact that the ambient conditions have a direct impact on factors like fuel consumption, longevity, reliability and performance of the product.

"We believe that any organisation which is creating this product must have the ability to design, develop, measure and test the product to meet Indian conditions. That's the reason

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Pre-treatment

A Fourteen tank process is used for pre-treatment of metal surface followed by Powder Coating, which is baked in an oven. The key steps include:

Degreasing: Removal of grease, oil, soils, lubricants, oxide films, heat treatment scales etc. before protective coating. Rinsing: A rinsing process is carried out to completely wash out the degreasing chemical from the metal surface.

De-Rusting: This process is carried out to remove heavy rust and soil. It is carried out in the tank using mixed acid at room temperature for about 10-15 minutes. This solution is capable of arresting the fumes, while reducing the attack and removing the traces of oil. Once again rinsing is done.

Activation: After rinsing, the surface of the sheet metal is activated with proper Zn & Mn phosphate coating at ambient temperature.

Phosphating: This produces a smooth, compact, uniform zinc-nickel phosphate coating. It is a room temperature zinc phosphate process. The dip duration is around 20 minutes. Again rinsing is done.

Passivation: In order to obtain maximum corrosion resistance over phosphate coatings, it is necessary to apply a post treatment in order to seal the pores. This is a chromate rinse carried out at room temperature.

Water Drying: Components are dried in hot air chamber. After the final process, metal is powder painted within 24 hours.

The bath top up, solution concentration testing in each tank is done as per schedule specified by manufacturer.

> "We are getting our test results at 50 degrees verified by a third party to truly address the needs of Indian conditions and Indian customers. And in doing so, we are going to redefine the generator business in terms of engineering and performance."

why we have created such comprehensive testing facilities. In fact, I would say that our test bench is nothing but a R&D center." In short, Sterling Generators is measuring and creating everything at 50 degree centigrade which is exactly the Indian requirement. "It took two years for us to create this infrastructure but we are glad that we have built it. It allows us to measure and test the performance of our products at 50 degrees centigrade."

But Singh is not stopping at just creating the requisite facilities and testing the products. Sterling Generators is soon going to invite ARAI (Automotive Research Association of India) as a third party agency to measure and verify the test results. "We will publish our data and have it verified by ARAI." This – Singh says – will be an industry-first. "Yes, it has not happened in our industry before so we will actually be setting a new trend. Some may dismiss this as a marketing gimmick but it is not. We are doing this to address the needs of Indian conditions and Indian customers. And in doing so, we are going to redefine the generator business in terms of engineering and performance," he states.

On an exciting journey

Wohlhaupter India is helping its customers in achieving quicker and more precise results with its high quality tools and evolving technology, **Keshav Khurana**, Sales Director and Country Head of the Company

By Niranjan Mudholkar

Q. Wohlhaupter India Pvt Ltd was established as the 100 percent subsidiary of Wohlhaupter GmbH in 2011. How has been the journey since then in terms of challenges and opportunities?

India is a big market and has enough space for us to establish our foot steps in a big way. Market has given us a respectable space. The challenges and opportunities both have helped us to learn and work upon. It has been an exciting journey so far for us and we wish to build upon our experiences.

"Market has given us a respectable space. The challenges and opportunities both have helped us to learn and work upon."

Q. What is the latest technology offered by Wohlhaupter India and what are its benefits?

Our digital boring range solution starts from 0.4mm and goes up to 3255 mm. This really helps customer avoid any manual error of changing the size of boring diameter as compared to analogue setting. An unskilled labour also can handle these tools to set the size i.e. increase/decrease the boring dia for a least count setting of 0.002mm.

Q. Have you launched any new product recently? Please tell us about the same.

We have introduced a new tool, Primebore, which offers a wider boring range from 6mm to 128mm to the customer at a lower price than our current products. This tool has all the benefits related to quality and accuracy, two attributes synonymous with us. We plan to spread the newly launched Primebore tool to all customer segments, from the smallest to the large scale customers. This tool has a boring range of dia 6mm to 128mm and comes with 2 microns size setting accuracy - all this in a through coolant, ground and lapped body with serrated design.

Q. How has been the market for your company in the last one year? What has been your growth rate?

Market has given a mixed response. Some companies in the private sector worked well and some did not, for us. The Government sector though was slow this time. Over all we have a forecast of +27 percent growth over last year.

Q. While a clean and clear revival is still months away, the Indian economy and the manufacturing sector have started to show signs of revival. What is your opinion on this and how is Wohlhaupter India gearing up to meet the growing demand?

The Indian economy and manufacturing sector are seeing some hope in the new government and its policies, though they will take time to get fully implemented. We have added manpower to cater to the growing demand. We have had some good news lately: inflation eased sharply in October; industrial output for

September saw a better-than-expected growth; and more recently, the government deregulated diesel prices. All this will convert into a more comprehensive economic revival in the coming months.

The fall in retail inflation — an index which is watched closely by the RBI — to 5.5 percent, along with the fall in wholesale inflation to 1.7 percent, is worth celebrating as it is far better than the RBI's target of 8 percent by January 2015.

As far as the IIP figures for September are concerned, the 2.5 percent growth rate is not significant, but still it is the fastest in last three months. Another positive aspect is that this growth is driven by higher output of the manufacturing sector. 15 out of the 22 industry groups in the sector have shown positive growth during the month. Capital, basic and intermediate goods also showed healthy growth. However, production of consumer durables, an indicator of demand, fell 11.3 percent. Drop in car sales, even during the festive session, is another area of concern.

Also the India-US agreement on the WTO row, the finer details of which are still unclear, seems a welcome development. It sounds great that our government has not compromised the interest of farmers and at the same time the Trade Facilitation Agreement, which seeks to make global trade faster, easier and cheaper, is likely to be a reality soon. If implemented, it will boost global trade in a big way, eliminating delays, uncertainties and high transaction costs in international trade to a great extent.

Q. Which are the industry (customer) sectors that give you more business? Are you looking at new sectors? Why?

Private sector customers have given us more business, particularly automotive sectors and gear box hosing manufacturers. We are looking at making more inroads into the heavy engineering and government sector as these companies focus more on quality and avoid rejection due to high component costs.

Q. Would you agree that the role of a tools supplier is now evolving from being a vendor to being a partner? What is Wohlhaupter India doing in this regard?

I completely agree as we help our customers in achieving quicker and more precise results with our high quality tools and evolving technology. Our range of Digital boring bars, Autobalance and Combiline tools which help in getting the best quality and low process time are an efforts towards this regard. We will continue with this trend to work really as a partner keeping ourselves in the shoe of our customer.

Growing With Customers

Gone are the days when there used to be a cutting tool supplier. MMC Hardmetal India (a subsidiary of Mitsubishi Materials) strongly believes in playing the role of a 'Friend, Philosopher & Guide', says the Company's Director **Prashant Sardeshmukh**

By Niranjan Mudholkar

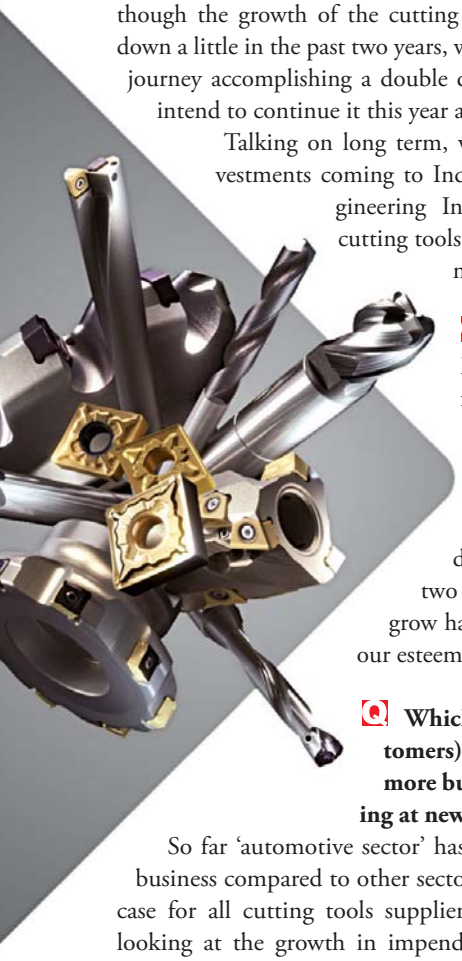
"Even though the growth of the cutting tool industry has slowed down a little in the past two years, we at MMC had a pleasant journey accomplishing a double digit growth last year. We intend to continue it this year as well."

Prashant Sardeshmukh

How has the market been for MMC Hardmetal India (a subsidiary of Mitsubishi Materials) in the last one year vis-a-vis the overall cutting tools market in India? What has been your growth rate?

We are proud to be associated with Indian engineering industry which has registered a rapid growth year on year. Even though the growth of the cutting tool industry has slowed down a little in the past two years, we at MMC had a pleasant journey accomplishing a double digit growth last year. We intend to continue it this year as well.

Talking on long term, with many worldwide investments coming to India, growth of Indian Engineering Industry is inevitable and cutting tools market in India will grow multifold in coming years.



What kind of targets have you set for MMC for the next two years?

Looking at the projections of Indian engineering industry, we have again set a double digit growth for the next two years. We would like to grow hand in hand together with our esteemed customers.

Which are the industry (customers) sectors that give you more business? Are you looking at new sectors?

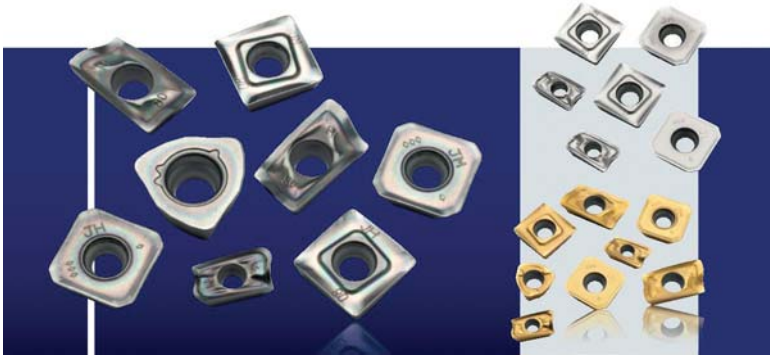
So far 'automotive sector' has been giving us more business compared to other sectors. And it is likely the case for all cutting tools suppliers in India. However, looking at the growth in impending sectors like aerospace, energy and medical engineering, Mitsubishi Materials recently launched many new products and we will be aggressively focusing on these sectors in the years to come.

How do you see MMC's international stature working to the advantage of Indian manufacturers? In what way?

World is coming closer due to globalisation. Many multinational companies have their manufacturing plants at multiple locations worldwide. Due to global presence of MMC, in many cases, the mother plants are already benefited by well-established solution from Mitsubishi Materials and Indian plants have to just implement the same technology here. It's easy and hassle-free. With global presence of MMC, we can help Indian customers to prove their new components with a well proven solution which is already established in other parts of the world.

Do you foresee having a full-fledged manufacturing base in India? In what time frame?

This has been a request from many of our loyal customers and we are actively considering it. We would like to offer competitive solutions to our esteemed customers not only in terms of price but overall quality and lead time as well. We would like to join the 'Make in India' campaign of our honourable Prime Minister Narendra Modi. This may take couple of years.



Q. While it is already a big issue in Europe, North America and Japan, the environmental and safety concern associated with the use of metal-cutting fluids is slowing emerging in India as well. What are you doing on this front?

Mitsubishi Materials is one of the first companies to foresee and address this issue in late 90s. We are well equipped to offer "Dry Cutting" solutions in most of the application. New technologies like "TOUGH-Σ Coating Technology", "ZERO-μ Surface", application oriented tungsten carbide grades & specialized tool materials like cermet with a hardened surface layer obtained by a special sintering process or CBN with "Particle Activated Sintering" are developed for effective "Dry Cutting" applications.

Q. With the growing demand for better performance from their products, manufacturing companies are increasingly relying on more and more difficult to machine work piece materials. How are you addressing the needs on this front?

Conventionally, metal cutting industry was governed by machining of alloy steel, cast iron & aluminium alloys. But due to strict environmental policies, higher demands and to increase the resilience of the product, work materials are changing. High temperature alloys, high strength materials or composite materials are on demand.

To cope up with these changes, MMC Japanese investing handsome amount of revenue on research and development to launch new grades, geometries or coating technologies. For example, we recently launched "SMART MIRACLE" end mill series with irregular helix and improved gash geometry for effective chip evacuation. This product is also powered by innovative coating technology called "ZERO-μ Surface" to enhance both smoothness and sharpness of the cutting edge for a longer tool life.

> "We are actively considering having a manufacturing base in India and would like to join the 'Make in India' campaign of our honourable Prime Minister Narendra Modi. This may take couple of years."

"SMART MIRACLE End Mills Series"

In recent years, there has been an increase demand in high efficiency machining for difficult-to-cut materials such as stainless alloy, titanium alloy, heat resistant alloy and corrosion resistant alloy used for aerospace and medical applications. Vibration Control End Mill for Difficult-to-cut Materials "SMART MIRACLE End Mills Series" have reduced cutting resistance and improved chip discharge performance. Additionally, the unique geometry helps to control vibration, thereby achieving high efficiency machining and longer tool life. By adopting both newly developed (Al,Cr)N coating, "Hyper Arc Activation Technology" and newly established technology smooth surface "Zero-μ Surface" that provide superior welding resistance and smooth chip discharge, as well as decreasing cutting resistance, this achieves high efficiency machining and longer tool life.

Q. The role of cutting tools player is now evolving from being a supplier / vendor to being a partner. What are some of the key activities / initiatives undertaken by you to strengthen this role as a partner?

Gone are the days when there used to be a cutting tool supplier. We strongly believe in playing role of a 'Friend, Philosopher & Guide'. Lot of things are on cards and we are working on it. Moreover, in case of service support, we have industry specific product specialists, who are trained in our manufacturing plants in Japan, to boost our support for all the technical needs of customers. Having the best tool in hand is one thing but applying it for the optimum results needs lot of upgradation in technical know-how. In-house training programs are conducted at customer's manufacturing facilities to transfer technical knowledge to the end users. This gives the desired application knowledge together with hands on experience about usage of new generation cutting tools. We have also launched E-Learning Courses for customers on our website.

Advanced Cooling Technology

At a technology seminar in Hyderabad recently, Walter Tools introduced its revolutionary Cryo-tec™ milling tools for the first time in India.

By Niranjan Mudholkar

Metal cutting is a material deformation process and it is natural that the occurring friction will generate heat. Too high temperatures need to be avoided in the process as high temperatures in the shearing zone will reduce the life of the cutting edge and affect the workpiece quality negatively. One of the future methods of reducing the cutting heat at the tool/workpiece interface is the practice of using a cold gas instead of the conventional flood coolant.

With its Cryo-tec™ milling tools, Walter AG has further developed this technique with amazing results. Two coolant channels in the Cryo-tec™ milling tools deliver CO_2 along with minimum-quantity lubrication compressed air or aerosol emulsion directly to the cutting edge through the machine tool spindle.

Walter and its partner in the technological collaboration, the Starrag Group, introduced this technology for the first time in India at the 'Blade Machining Technology Day 2014' in Hyderabad recently. Through an insightful presentation in front of a jam-packed audience consisting of manufacturing professionals from the power industry, Thomas Schaarschmidt, manager of business development–energy for Walter AG spoke about this advanced technology.

Schaarschmidt shared that the remarkable feature of the approach developed by Walter and Starrag is the liquid supply of CO_2 coolant through machine, spindle, toolholder and tool, right to the cutting edge – all without loss of pressure and therefore at room temperature.

"Cooling to a maximum of -78.5 °C first occurs at the nozzle, when the CO_2, which has been in liquid form until that point, expands. Therefore, users can machine up to 70 percent faster in comparison to dry machining. Conversely, the cryogenic CO_2 cooling doubles the tool life, as long as the cutting parameters are not increased," Schaarschmidt said.

The developers at Walter and Starrag have further refined their solution by introducing a second media channel that supplements the CO_2 cooling. "This channel can be used for aerosol or minimum quantity lubrication (MQL), for example for milling high-strength alloys for extremely heat-resistant turbine blades. Because both media – CO_2 and MQL – are completely separated and only come into contact with one another at the tool cutting edge, this allows a highly efficient lubricating effect to be achieved," Schaarschmidt informed. The CO_2 and lubricant, which have remained separate till exiting the channel ports, mix directly at the cutting edge.

"Two coolant channels in the Cryo-tec™ milling tools deliver CO_2 along with minimum-quantity lubrication compressed air or aerosol emulsion directly to the cutting edge through the machine tool spindle."

Thomas Schaarschmidt,
Manager of business development–energy for Walter AG

The Cryo-tec™ milling tools technology was earlier demonstrated at the leading trade fair EMO 2013 in partnership with the machine tool manufacturer Starrag AG, where the technology won the MM Award for Innovation for having the most innovative exhibit in the 'milling' category: The production-scale machining of turbine blades with CO_2-based cryogenic cooling.

In fact, having reached the optimal levels with the two-channel system, the two technology partners have now reached the next horizon. Walter and Starrag have together accomplished a multi-coolant solution, in which CO_2, aerosol and even the emulsion can be guided through the spindle. This enables the end customers to use a dedicated coolant strategy along with the workpiece material and the application – all on one machine tool setup.

In terms of reaching out to the industry, Walter will supply these futuristic tools with cryogenic process cooling under the brand name Cryo•tec™. In fact, Starrag machines are already available with optional CO_2 cooling.

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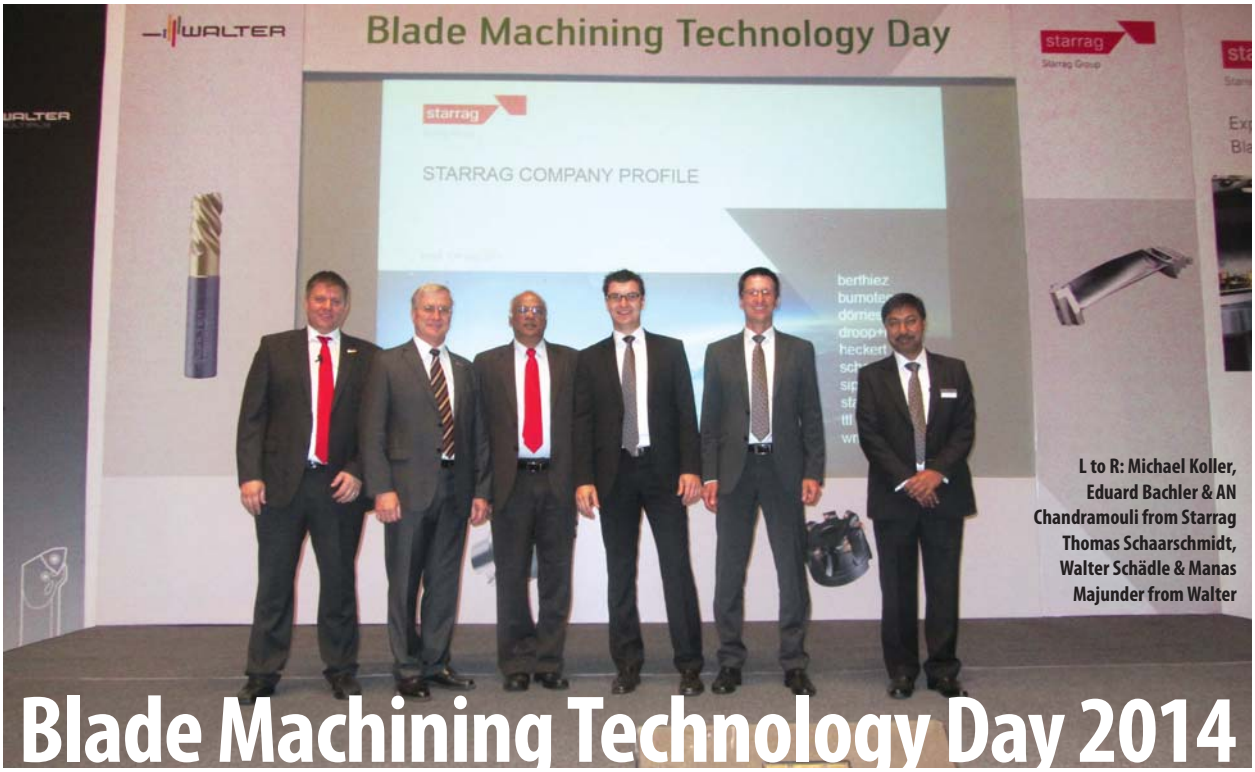

L to R: Michael Koller, Eduard Bachler & AN Chandramouli from Starrag Thomas Schaarschmidt, Walter Schädle & Manas Majunder from Walter

Blade Machining Technology Day 2014

The Starrag Group and Walter Tools AG had recently teamed up to present the latest cutting edge tooling solutions, technologies and machining centers for step changes in turbine blade machining.

By Niranjan Mudholkar

With Indian economy and its dynamic manufacturing sector once again shifting gears for a progressive journey, the country's power demand will only rise further. And there is already a huge demand-supply gap. Currently, the installed thermal power capacity in the country is about 225 Giga Watt and it is estimated that the demand will grow by 8 percent to 10 percent year on year in next 10 years. Of course, the power industry is working overtime to resolve the situation by improving efficiencies as well as by seeking and adopting newer technologies.

As a result, there is also a change taking place in the power plant technology. For example, there is a definite shift towards sub-critical to super critical steam turbines. With this fundamental change in technology, the raw materials required for the thermal blades are also changing from conventional materials to more difficult-to-machine materials. Recognising this transformation and with the aim of addressing the resulting manufacturing requirements of this industry, two technology giants Walter Tools AG and the Starrag Group are collaborating to bring the appropriate technologies as well as strategies in terms of machining and tooling. In this context, the two Companies had together organised the 'Blade Machining Technology Day 2014', a one day seminar in Hyderabad on November 5, 2014, to share the machining and tooling advancements of this sector with industry professionals.

The 'Blade Machining Technology Day 2014' was well attended by senior industry professionals from organisations like BHEL and Bharat Forge. Expert speakers from Walter and Starrag shared useful and important insights as well as information through interesting presentations on various relevant topics. Each presentation was well received due to its pertinent content and was followed up with stimulating conversations between the presenters and the members of the audience. The presentations were followed by a networking lunch session wherein the attendees continued their discussions with the specialists from Walter and Starrag. Post lunch, the attendees were driven down for a factory visit where they could actually witness the machining and tooling technologies in the form of live demonstrations courtesy of Ennem Excel Engineering (P) Ltd.

The Machinist magazine spoke to some of the key attendees as well as the organisers to understand the significance of

this event. Manas Majumder, General Manager, Sales & Marketing, Walter Tools India, shared the logic behind organising the event in Hyderabad. "Hyderabad is the hub of blade machining. The tier one suppliers of Hyderabad supply blades to majority of the Indian OEMs like BHEL and a substantial quantity is also exported by them. It would have been imprudent to conduct this Blade Machining Technology seminar in any place other than Hyderabad," he said. Agreed AN Chandramouli, Managing Director, Starrag Group India who said that his organisation wanted to bring solutions to the blade industry. "And since this industry has a significant presence in Hyderabad, we decided to organise the event in this city."

KSN Murthy, Addl. GM, Technology / T&C, Bharat Heavy Electricals Ltd, said that the time is also ripe to introduce new technology in this sector in India. "For adding to the power generation capacities, we have to add more number of turbines and this means more business opportunities for the young people. This technology will help them manufacture faster and better. By demonstrating the improvements in machining and tooling, this event has showed the best possible processes suitable for Indian conditions in terms of long-term usability and affordability. I feel that just like Starrag and Walter Tools, other international companies should come forward and demonstrate how best Indian companies can use their technologies and benefit out of them," he added.

Chandramouli of Starrag Group India further explained why the time was right for the seminar and for bringing the advanced technology to India. He said that the blade industry has adopted high-end technology in Europe, whereas in India, it is still going through old concepts. The old technology results in very low productivity and not so desirable quality. He elaborated: "What I mean by old technology is the 3-axis machining centers. And the latest technology is the 5-axis machines. They tried to bridge the gap with 4-axis machines in between; some of these people upgraded to that in the last ten years or so. We want them now to jump to the 5-axis technology which gives them much better quality and much better productivity."

The highlight of the day was an introduction to Cryo-tec™ by Thomas Schaarschmidt from Walter and Michael Koller from Starrag.

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>
> **VS Sridhar,** Vice Chairman & Managing Director, Sesha Tools Pvt Ltd

"Apart from quality and productivity, customer demand is now increasing because of which they require many machines to produce the same volumes. For example, five machines with 3-axis or three machines of 4-axis can produce the same volume as a one machine of 5-axis. This means that in the old technology scenario, the number of machines in a given factory goes up. This requires more space, more people to run the machines, more tools, more fixtures and more energy. A 5-axis machine will not only save on all these resources but will also be able to perform better in terms of productivity," Chandramouli added.

The comment from Murthy of BHEL substantiated the usefulness of the event. "This seminar is very interesting and very helpful for organisations in this sector to absorb the latest technology. At this event, they have showcased how machining processes which earlier used to take one hour can now be done in twenty to twenty five minutes cutting down the cost by almost sixty percent. Machining processes in this sector have undergone a lot of technological changes and by experiencing this change through this event the local manufacturers will surely benefit from it."

According to VS Sridhar, Vice Chairman & Managing Director, Sesha Tools Pvt Ltd, the two companies (Starrag and Walter Tools) coming together is an excellent initiative. "Just by having the right machine nothing happens and similarly just by having the right tools nothing happens. It is the right blend of the two that makes the difference," he said. Sridhar himself is a blade manufacturer and a tool manufacturer. So he understands very closely the importance of manufacturing and tooling. And he also has the distinction of having the first Starrag machining center outside the public sector. "It was a tough time getting where we are now. Today, we are very con-

fident of using this technology," he said.

Majumder from Walter Tools also explained the benefits of the event for the industry. He said: "Walter in collaboration with the machine tool industry has brought various cutting tools and machining strategies to produce the right quality with high productivity. The basic purpose is to make the Indian blade manufacturers more competent not only in terms of the quality but also with regards to the cost of manufacturing. 'Zero Defect' mission can be achieved by the Indian blade manufacturers with the help of cutting tool and machining technology provided by Walter.

The ceramic and Cryo-tec tools from Walter will set a new standard in blade machining. It is expected that the modern technology from Walter will improve the productivity and overall cost of machining will come down."

Murthy from BHEL too pointed out the significance of tooling. He said: "The process is one part and the second important part is the cutting tools. The cutting tools used today offer a significant improvement in the cycle time and moreover there is further value added to the process. The cryogenic technology discussed in this event will have a significant impact in the years to come because that technology is very new to India. Nowhere else this technology has been adopted."

Sreenivas Nelli, Director, Ennem Excel Engineering (P) Ltd, who described the event as a very fruitful experience, said that the event provided a comprehensive glimpse into the technology of the future. "Cryogenic technology is the future of this industry. It might take another two to three years to come to India but as of now people are not well equipped with this kind of machines and tools. In that context, this event is very good as it tells people about the new technology." Incidentally, Ennem Excel Engineering has been an early adopter of this technology and have already got these machines and tools last year. "Our people have now good experience of operating on these machines. And they are now running it very well."

SB Sonawane, Senior Manager, Die Shop, Bharat Forge Ltd was also quite appreciative of the initiative jointly organised by the Starrag Group and Walter Tools. "It gave us an idea about the new technology in our sector and about the new blade machining technology in particular. We got a lot of information that will be helpful for us in progressing further in this business. It enabled us to understand the proper requirement of tooling in the power industry. Attending this session will surely be beneficial to us in our work sphere," he said.

Sridhar of Sesha Tools reiterated the significance of the 'Blade Machining Technology Day 2014' when he said that India definitely needs to be told as to what it needs to do tomorrow in terms of technology. "And seeing is believing. The initiative of taking the attendees to an actual site to see how the machines are actually functioning is very good. Not many of the people at the operator level get an opportunity to see such live demonstrations. So this visit will boost their personal confidence levels so that they can push the management to bring such technology into the country. I have been working with many public sector organisations as well as with private sector companies. If the operator doesn't have the confidence then I don't think the management will do too much to get there. And that is exactly what is happening now. The operators are getting exposed to the new technology and this will give them confidence."

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Nelli of Ennem Excel Engineering highlighted another important aspect of the event. "We also need to understand that the new technology showcased at this event will also be extensively used in aero engines. Lot of new aircrafts are been ordered by the Indian aviation industry and I am sure that in the years to come this technology will find great use in India."

Sridhar of Sesha Tools nicely summed up the event when he said despite of working in this industry for 40 years, most of things that he saw at the event were new. "It's wonderful to experience this. And that's the advantage of such gatherings," he said.

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Calling all manufacturing plants in India to send entries

THE MACHINIST
ULTIMATE GUIDE TO PROFITABLE MANUFACTURING

Super SHOPFLOOR 2015

The Machinist magazine is proud to announce its **'Super Shopfloor'** programme.

It is open to all manufacturing plants in India under two categories

Large enterprises *(Rs1,500 crore turnover and above)*

SMEs *(Less than Rs1,500 crore turnover).*

There will be three winners* from each category and winning entries will be felicitated in April 2015.

Participation is simple and there is no entry fee.

Tell us in 1,000 to 1,300 words why you think your shopfloor should be '**The Machinist Super Shopfloor 2015'**.

Your entry should explain the achievements of your shopfloor across the following five key aspects in last one year:

1. Safety, 2. Quality, 3. Productivity, 4. Sustainability, and 5. Innovation.

You may also attach supporting documents.

You must also provide the following details

Category (Large Enterprises or SMEs): .....

The overall company turnover is to be taken into consideration for determining the category

Name of the company: .....

Location of the plant: .....

Name of the plant head: .....

Plant size: .....

Staff strength: .....

Key products manufactured: .....

Annual capacity: .....

Key clients: .....

Key market (domestic / exports): .....

Manufacturing principle followed: .....

Recent milestones: .....

Technological highlights: .....

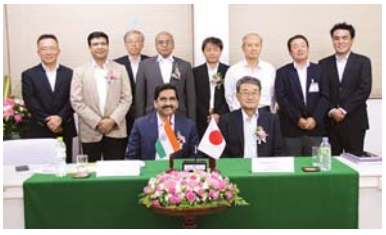
Please also provide two high-res images of shopfloor in JPEG format (300 dpi)

Note: Entries should be sent on a simple word document or a PDF file only. Entries in other formats will not be accepted. Images should be sent in high-resolution JPEG format (300 dpi). Please send your entries to niranjan.mudholkar@gmail.com and niranjan.mudholkar@wwm.co.in. Please mention 'The Machinist Super Shopfloor 2015' in the subject line of the email. For any queries regarding participation, write to the above email ids or call on +91 9819531819.
Last date for sending your entry is February 25, 2015

**The decision on the winners will be final and no query will be entertained after the winners are announced.*

RSB in technical assistance agreement with JBK Japan

RSB Transmissions (I) Ltd has signed a Technical Assistance Agreement with Jidosha Buhin Kogyo (JBK), Japan, to manufacture and sell the latest propeller shafts for the SCV/SUV/LCV segment in domestic and export market.



SK Behera & Masatoshi Ito flanked at the back by M Sankaranarayanan and SS Udgata with JBK top officials after sign off

SK Behera, VC & MD, RSB, inked the technical assistance agreement with Masatoshi Ito, President, JBK, Japan, in a special ceremony held on the occasion. M Sankaranarayan, President, RSB Transmissions and SS Udgata, Director, I-Design will be taking jointly the leads in transfer of technology.

Behera, after signing the agreement, said that "This technical assistance venture will further boost market growth of propeller shafts for RSB in the SCV/SUV/LCV segment pan India and overseas with use of latest state-of-art-technology from JBK. RSB brand of propeller shafts already have a major domestic market share and this collaboration will give a technological edge to make inroads into markets, hitherto untapped."

Ito said that JBK is delighted to work with RSB, a leading auto-comp manufacturer in India, are already well known for their in-house brand of propeller shafts, with a global presence in North America, Europe and Brazil, and such a tie-up will mutually boost the share of propeller shaft globally besides pan India, for which RSB is already a major player in domestic sector.

Michelin opens world's 1st plant for airless radial tyres

Michelin has opened its newest plant in North America, which will produce the innovative Michelin X Tweel Airless Radial Tyre. An idea first conceived by Michelin research engineers in the US, the Tweel is a non-pneumatic tyre that changed the configuration of a conventional tyre, bringing together the tyre and the wheel assembly into one solid unit. The Tweel comprises a rigid hub connected to a shear beam by means of flexible, deformable polyurethane spokes, all functioning as a single unit. Unlike conventional tyres, the Tweel has no air, thereby solving what had seemed to be the unavoidable challenge of chronic flat tyres that plagues the landscape, construction, contracting, refuse/recycling and agricultural industries.

The new plant gives Michelin the ability to boost output of its award-winning Michelin X Tweel SSL skid-steer tyres and begin production of the new Michelin X Tweel Turf as original equipment for John Deere to equip its ZTRAKTM 900 Series line-up of zero-turn commercial mowers.

"The Tweel airless radial tyre is the industry's first commercialised airless radial solution and verifies Michelin's leadership for the next generation of mobility," said Ralph Dimenna, Head, Michelin Tweel Technologies. "The Tweel airless radial tyre enables us to enter new markets and expand its reach in existing business segments within the low-speed application category. The industry is hungry for solutions contributing to productivity, safety and bottom lines. Serving our customers is at the center of our strategy for success."

Automated driving takes a significant step forward with Delphi

Delphi Automotive will partner with Ottomatika, Inc (a company started by Carnegie Mellon University) to jointly develop technology that will help accelerate automated driving.

Delphi, the company that first introduced automotive radar systems, will integrate its active safety technologies with Ottomatika's automated driving software. The combination of the two creates a technology platform that enables a vehicle to make human-like decisions when driving in the city or on the highway. The platform is flexible and can be expanded and upgraded as the software is updated. It will also support vehicle-to-environment (V2X) communications.

"Dealing with highly complex real-world decisions is a limitation for much of the current technology in the market," said Jeff Owens, Delphi's Chief Technology Officer. "This partnership with Ottomatika will represent a significant step forward in making automated driving a reality. Your car just got a lot smarter."

Using their individual strengths, Delphi and Ottomatika have developed a vehicle platform that can instantaneously make complex decisions, like stopping and proceeding at a four-way stop, timing a highway merge or calculating the safest maneuver around a bicyclist on a city street.

Delphi is supporting the collaboration by making an investment in Ottomatika. Together, the two companies will design a short- and long-term roadmap of steadily increasing vehicle automation in the coming years.

"Ottomatika leverages ground-breaking expertise and long-term experience in vehicle automation," said Raj Rajkumar, co-founder and CEO, Ottomatika, Inc. "Delphi and Ottomatika working together have the potential to solve the automated driving challenge, which makes roads safer for everyone."

Volkswagen India ramps up its exports further; brings the new Polo to Mexico

With the market introduction of the new Polo in Mexico since the beginning of November this year, Volkswagen India has now expanded its export activities further. The new Polo, which is being manufactured at the Volkswagen Pune Plant, is the second model, after Vento that is being exported to Mexico from India.

Exactly one year after the successful market entry of the Indian Vento in Mexican, the new Polo 1.6 Highline becomes the second Volkswagen car made in India to be sold in the North American country. Volkswagen provides the Mexican customers with the new Polo – a high quality car with powerful yet low fuel consumption engine and practicability in a car that appeals to all its customers. The export versions of the Vento and the new Polo together account for nearly every second car produced at the Pune Plant.

Mahesh Kodumudi, President and Managing Director, Volkswagen Pune Plant and Chief Representative, Volkswagen Group India commented, "With successful entry in Mexico last year with our Vento, we set an example of world class quality being manufactured in India. With further expansion into the Polo segment, we have reiterated the fact that we are able to manufacture top products through our Indian operations." He added further, "We build the same quality of cars in Pune as around the world with equally robust construction. The Polo built in India has achieved a 4-star Global NCAP rating which is a strength when it comes to exporting to global markets."

Volkswagen India started exporting cars from its Pune Plant in 2011 with the first export market being South Africa. Since then, the export operations of Volkswagen India have expanded to over 32 countries across three continents of Asia, Africa and North America. The range of cars being exported includes left-hand drive as well as right-hand drive cars. Additionally, Volkswagen India also exports parts and components of its cars to Malaysia which are assembled there for the Malaysian domestic market. Volkswagen Pune Plant has produced over 89,000 cars for export till date.

VW India starts regional competency centre for global IT support

Volkswagen Group India has inaugurated the Volkswagen Group IT Regional Competency Centre at Hinjewadi Tech Park in Pune. With the goal of insourcing IT solutions for the Group, Volkswagen Group IT has taken the step to setup the RCC. Catering to the global operations of all the brands of Volkswagen Group, the RCC is expected to bring in foreign revenue besides creating high value employment for IT professionals.

Information Technology (IT) has become an integral part of automotive industry. IT requirements in the automotive industry begin right from conceptualising future projects to sourcing of parts to production processes all the way to sales and after sales service. To cater to these integrated and sophisticated IT requirements and to insource business critical process knowledge and technological know-how in the long run, Volkswagen Group IT has set up this Regional Competency Centre (RCC).

Volkswagen Group IT RCC established in Pune currently employees over 100 IT professionals and plans to grow significantly in the coming years. The Group IT RCC professionals are experts from various IT technologies such as SAP, Microsoft, Java, NET, BI, BO, Big Data and Mobility Solutions. The RCC will provide 24x7 Support for application services and project rollouts.

Global auto wiring harness market to grow by 8.0%

According to a report from Research and Markets, the global automotive wiring harness market is projected to grow at a CAGR of 8.0 percent from 2014 to 2019 to reach a value US$59.2 billion by 2019. The global automotive wiring harness market is dominated by major players such as Yazaki Corporation (Japan), Sumitomo Electric Industries Ltd (Japan), Delphi Automotive LLP (U.K.), Lear Corporation (U.S.), Leoni Ag (Germany), and Samvardhana Mothersons Group (India)

The automotive industry has been ever inclined towards improving the quality aspect of vehicles. An increase in the demand for high-end electronic and safety features in the passenger cars, upcoming legislations for safety technologies in developing countries, and increasing overall vehicle production are the factors which will drive the market of automotive wiring harness.

Continental's '48-Volt Eco Drive' technology to reduce fuel consumption

International automotive supplier Continental has developed its '48-Volt Eco Drive' system to reduce fuel consumption and emissions even further. With this new system, the Company claims to have bridged the gap between the reasonably priced 12-volt start-stop systems and the more expensive hybrid solutions with voltages from 110 volts. The new Continental technology will go into production with European car manufacturers for the first time in 2016.

The new hybrid technology can be easily integrated into the architecture of conventional-drive vehicles, yet, at the same time, it provides features that up to now have only been found in high-voltage hybrid systems – such as switching off the combustion engine while driving ('sailing' and 'coasting'), extremely quick and comfortable premium engine start-up and

efficient brake energy recovery (recuperation).

"Car manufacturers are demanding 'clean power' solutions at a price in the lower double-digit euro range per gram of CO2 reduction – and our '48-Volt Eco Drive' system fits the bill exactly," said Christopher Breitsameter, Head of Business Development & Strategy in the Powertrain Division.

"We assume that the greatest demand for the system will come from the large-volume segments of compact and midsize class vehicles and that Europe will lead the way when it comes to its introduction," Breitsameter adds. According to estimates within the industry, around 20 percent of new vehicles worldwide will have electrified drive systems by 2025 – with around half of these being 48-volt hybrids.

Toyota to launch its hydrogen fuel cell vehicle (FCV) Mirai in Japan

Toyota Motor Corporation will launch its all-new 'Mirai'1 hydrogen fuel cell vehicle (FCV) in Japan on December 15. The Mirai signals the start of a new age of vehicles. Using hydrogen—an important future energy source—as fuel to generate electricity, the Mirai achieves superior environmental performance with the convenience and driving pleasure expected of any car.

The Mirai uses the Toyota Fuel Cell System (TFCS), which features both fuel cell technology and hybrid technology, and includes Toyota's new proprietary FC Stack and high-pressure hydrogen tanks. The TFCS is more energy efficient than internal combustion engines and emits no CO2 or substances of concern (SOCs) when driven. Drivers can also expect the same level of convenience as offered by gasoline engine vehicles, with a generous cruising range and a hydrogen refueling time of about three minutes3.

According to Toyota, the Mirai delivers everything expected of a next-generation car: an immediately recognizable design; driving exhilaration stemming from superior handling stability achieved by a low center of gravity; and quiet but powerful acceleration provided by the electric motor. The Mirai also features an exclusive telematics service for a safe, secure and comfortable ride, and the vehicle can double as a high-capacity external power supply system during power outages, disasters and other emergencies.

Hydrogen can be generated using a wide range of natural resources and man-made by-products such as sewage sludge. It can also be created from water using natural renewable energy sources like solar and wind power. When compressed, it has a higher energy density than batteries, and is relatively easy to store and transport, therefore it also carries expectations for potential future use in power generation and a wide range of other applications. FCVs are able to generate their own electricity from hydrogen, meaning they can help make a future hydrogen-based society a reality, and are therefore expected to further contribute to accelerating energy diversification.

JLR starts construction of its first manufacturing facility in Brazil

Jaguar Land Rover has started construction of its R$750m state-of-the-art manufacturing facility in the state of Rio de Janeiro and confirmed plans to build its first overseas Education Business Partnership Centre there.

Dr. Ralf Speth, Chief Executive Officer, said: "Our new facility in Brazil is an important strand of Jaguar Land Rover's long term sustainability. The start of construction today is a significant milestone and represents another step forward in our plans to create a truly global manufacturing footprint.

The new Discovery Sport has been confirmed as one of the vehicles that Jaguar Land Rover plans to build in Brazil, with the first customer cars are expected to drive off the production line in 2016.

Jaguar Land Rover is the first British automotive company to invest in a manufacturing factory in Brazil. In the programme's first phase, the new 60,000m² manufacturing facility in Itatiaia will employ 400 people and will have an annual capacity of around 24,000 vehicles.

The new Discovery Sport will be manufactured in Brazil

Honda unveils all-new FCV concept fuel-cell vehicle

Honda Motor Co., Ltd. has unveiled, for the first time in the world, the Honda FCV CONCEPT, a concept car for an all-new fuel-cell vehicle (FCV), and the Honda Power Exporter CONCEPT, a concept model for an external power feeding device that enables AC power output from the FCV with maximum output of 9 kW*1. The all-new FCV that will be based on this concept model is scheduled to go on sale in Japan by the end of March 2016 and subsequently in the U.S. and Europe. In addition to the FCV and external power feeding device, Honda will further promote the application of the Smart Hydrogen Station (SHS), a packaged hydrogen station unit that adopts Honda's original high-differential-pressure electrolyzer. In this way, Honda will work toward the forthcoming hydrogen society under three key concepts – "generate," "use" and "get connected" – and strive for the early realization of a CO2-free society.

The Honda FCV CONCEPT is a concept car for Honda's next-generation FCV, a successor model to the FCX Clarity, with which Honda strives to achieve a further improvement in performance and a reduction in cost. The newly-developed fuel-cell stack installed to this concept car is 33% smaller than the previous fuel-cell stack and yet realized output of more than 100 kW and output density as high as 3.1 kW/L, improving the overall performance by approximately 60% compared to the previous version of the fuel-cell stack.

Wacker opens airbag competence center in Japan

Wacker Asahikasei Silicone, a Japanese joint venture of Wacker Chemie AG, opened a new development laboratory for airbag applications today. The competence center will spearhead the development of silicone coatings for airbags and technical textiles in the region. Investment in the new laboratory amounts to roughly €1 million. Wacker Asahikasei Silicone (AWS) is jointly owned by Wacker and the Japanese chemical group Asahi Chemical Industry each with a fifty-percent stake. The Airbag Competence Center of Excellence in Silicones (ACES) is located at the AWS technical center in Tsukuba, some 70 kilometers north-east of Tokyo. The competence center will support airbag manufacturers and their suppliers and has been equipped to develop novel high-performance silicone materials for coating airbags. Key material tests, such as coating, heat-resistance and fire-safety tests, can now be performed locally. "The airbag market is growing by six to seven percent annually," noted Peter Summo, head of Wacker's Engineering Silicones business unit, during the opening ceremony of the laboratory in Tsukuba. "Since every major airbag manufacturer produces in Asia, we decided to strengthen our expertise in this region. Now, we can develop new and innovative coating materials in Tsukuba. At ACES, we will be able to contribute to the development of innovative airbag technologies and make vehicles even safer in the future."

As the world readies for the New Year, we find out how the year going by will impact the industry in 2015.

By Niranjan Mudholkar

The election of a new, stable government is clearly the most remarkable highlight of 2014. And the biggest highlight of the year for the manufacturing industry, without doubt, has been the announcement of the 'Make in India' campaign by our Prime Minister Narendra Modi. Not only has this initiative galvanised the industry in India but it has also given a renewed confidence to foreign players. As Andreas Lauenroth, Executive Director – Technical, Volkswagen India Private Limited, says "Because of this initiative, the manufacturing industry has already started showing symptoms of recovery. There is an increased interest from foreign investors to further invest in local manufacturing. Additionally, the positive developments in areas of infrastructure and the steps that are

> "We are eager to participate in opportunities for collaboration between private and public sectors that are driven by "Make in India." One such opportunity involves the Medium Multi-role Combat Aircraft (MMRCA) project for the Indian Air Force."
>
> **Aravind Melligeri,**
> Chairman and CEO of Aequs

being taken to simplify doing business in India will boost the Indian manufacturing industry to great extents."

Aravind Melligeri, Chairman and CEO of Aequs believes 'Prime Minister Modi's 'Make in India' campaign has quickly produced tangible and decisive action in the form of policy and diplomacy to develop, enable and promote Indian manufacturers in both the public and private sectors'. "One specific example is the raising of the foreign direct investment (FDI) ceiling from 26 to 49 percent in the aerospace defence sector. This policy change enables greater participation by foreign aerospace manufacturers to partner with Indian manufacturers and thus promotes valuable technology transfer to the latter," Melligeri says.

Nitin Chalke, Managing Director, Eaton – India finds the campaign very promising to deliver a boost to manufacturing as well as creation of jobs in India. He explains why: "The campaign includes major initiatives to facilitate investment, foster innovation, protect intellectual property and build best-in-class manufacturing infrastructure. This has potential to make India a global manufacturing destination. Such progressive initiatives coupled with efficient governance and successful implementation of strong policies can lead to faster growth rates and may prove instrumental in helping India transcend the current state of economic uncertainty."

The initiative has also given new hopes even to the SME sector. G Raj Narayan, Founder & MD, Radel Group believes that 'the campaign came as a booster to the sagging morale of Indian manufacturing industry'. "This was followed by visible changes to the functioning of the bureaucracy across the country resulting in a perceptible change in self-belief among a majority of the educated sections of India, who had earlier turned cynical," he says.

As RN Rao, Director - Sales & Marketing, AMW Motors Ltd, rightly points out, "The manufacturing industry is key to India's economic growth and the Government's new initiatives underscore its importance. There is potential for the sector to account for 25-30 per cent of the country's GDP and create up to 90 million domestic jobs, by 2025."

> "Progressive initiatives – like the Make in India campaign – coupled with efficient governance and successful implementation of strong policies can lead to faster growth rates and may prove instrumental in helping India transcend the current state of economic uncertainty."
>
> **Nitin Chalke**
> Managing Director, Eaton – India

PM Modi's 'Make in India' initiative has given a confidence boost to the manufacturing industry

> "With expectations of revival, India's manufacturing sector is projected to touch US$ 1 trillion by 2025 as per global management consulting firm McKinsey and Company."
>
> **C Santhakumar,,**
> Plant Director, NCR Puducherry Plant, NCR India

The Union Government has been making all the right noises and it is also demonstrating the willingness to improve the economy on every front. "Work and policies initiated and proposed by the new government in its first few months in power have been very encouraging for the manufacturing sector," says Chalke of Eaton. Kumar Kandaswami, Senior Director, Deloitte, agrees. He says: "The initial indications that we are seeing of this administration and the stated desire to push through policy decisions and working together of ministries are very good signs. Further, the political establishment seems to have a clear business-friendly outlook as demonstrated in several instances. If this promise is converted into reality in the coming years, it can create a big impact on the manufacturing economy."

C Santhakumar, Plant Director, NCR Puducherry Plant, NCR India says that with expectations of revival, India's manufacturing sector is projected to touch US$ 1 trillion by 2025 as per global management consulting firm McKinsey and Company. "The burgeoning demand in the country and the multinational corporations' desire to establish low-cost plants in India can contribute to this."

Plans, aspirations and commitments

For 2015, Aequs is committed to enhancing its manufacturing capabilities, forging stronger relationships with customers and suppliers, developing employee skills, and improving its quality systems. "We will expand our aerospace presence outside India as we follow our path toward serving our customers as an agile global supplier. In our automotive business unit, we will launch integrated forging and machining manufacturing. Finally, we will expand our oil and gas manufacturing to support the assembly of electro-mechanical products," says Melligeri.

India is an important market for Eaton and forms a key part of the company's overall business strategy of generating 30 percent of global revenue from emerging markets. "We are in the process of expanding our manufacturing footprint in India – thereby bringing in new technologies and capabilities to the Indian market. Eaton in India is working on its second Greenfield project in India over 60,000 square feet of manufacturing space at Puducherry," says Chalke of Eaton. "We see Eaton's role in India as a leader in power management and a sustainability practices. Eaton aims to make focused efforts towards achieving sustainability and greener development – striving for maximum energy awareness and efficiency to make urbanization, as well as economic and social development, more sustainable," he adds.

The successful flight testing of an in-house designed product of Radel in a Jaguar aircraft of the IAF, leading to

Hopes for CV industry

"The commercial vehicles (CV) sector is one of the most important contributors to economic growth, as a manufacturer as well as transporter of goods and people. The industry is seeing some signs of recovery after several sluggish years, while new manufacturers have set up operations in India.

The last few years have been tough for all of us in the industry, but we have gained some extremely valuable learnings. Our operations have become much more efficient, our product offerings are deeper and more specialised, our customer focus has become sharper and we have done all this with valuable reductions in costs. We are confident that these have put us in a good position for the next decade. We consider these measures as very significant achievements this year. 2015 seems to be the year where demand will pick up at a more predictable pace as industry starts gaining from the economic measures and growth starts accelerating. We expect core sectors like mining, power, construction, roads and highway projects to gain momentum and if the availability and cost of finance become easier, the commercial vehicles industry can benefit considerably."

*By **RN Rao,** Director - Sales & Marketing, AMW Motors Ltd.*

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> Director - Sales & Marketing, AMW Motors Ltd.

its certification for regular use in all Jaguars, was the high point of Radel's performance in 2014. "Radel hopes to repeat the above success with another product, which is currently under an advanced stage of testing for the IAF, in 2015. Overall, Radel hopes to grow by at least 60 percent and look for opportunities in the global A&D market, says the Company's Founder & MD, G Raj Narayan.

According to Lauenroth, the Executive Director – Technical, Volkswagen India has been working hard on localisation and deep localisation. "Our efforts of the past months in these areas will start paying off as we would commence assembling engines locally from the end of 2014. We will continue improving the local content of these engines in the coming years. Apart from this, we have been concentrating on improving productivity and efficiency of manufacturing at our Plant. Better utilisation of the manufacturing capacity will remain one of the key targets for 2015 in this respect," he says.

Volkswagen India has been increasing its focus on the exports market and will continue to do so in 2015.

Great expectations!

Melligeri of Aequs is looking forward to Prime Minister Modi's administration reinstating the SEZ incentives which had been rolled back by the preceding administration. "These incentives are powerful levers for encouraging foreign investment and promoting the export industry, particularly manufacturing, and thus directly support 'Make in India'," he says.

Aequs is also eager to participate in opportunities for collaboration between private and public sectors that are driven by 'Make in India'. One such opportunity involves the Medium Multi-role Combat Aircraft (MMRCA) project for the Indian Air Force. Since the announcement in 2012 that the Dassault Rafale was selected as the winner of the MMRCA competition, contract negotiations have continued slowly. "We look forward to the resolution of these negotiations which will then enable Indian aerospace manufacturers to compete for opportunities to participate as Tier 1 and 2 suppliers for the MMRCA," he says.

Chalke of Eaton expects initiatives like 'Make in India' to fuel massive growth in the manufacturing industry – thereby creating greater demand for reliable and efficient power. In addition, investments in infrastructure development, focus on the mining industry, impetus to defence and aerospace manufacturing, creation of 'Smart Cities' etc. should potentially generate newer and bigger opportunities in the area of power management. "Eaton in India is well positioned to leverage these opportunities and address our customers' key power management challenges through our industry leading electrical, hydraulics, vehicle and aerospace technologies and solutions," he says.

> "Additionally, the positive developments in areas of infrastructure and the steps that are being taken to simplify doing business in India will boost the Indian manufacturing industry to great extents."
>
> **Andreas Lauenroth,**
> Executive Director – Technical, Volkswagen India Private Limited

NCR is keen to leverage the new state-of-the-art facility in Chennai. "It will help us expand from manufacturing solutions only from financial industry to new growth industries like retail and hospitality," says Santhakumar.

"We are confident that the worst is behind us and we have seen some positive pick up in our haulage range, especially tractor trailers. When core sectors like mining and construction start gaining traction, we are sure to benefit as we have some of the best product offerings in these segments. We also expect the steps taken by us during the last two years to strengthen our profitability. We are prepared for rapid ramp up of production and see much better days ahead," says Rao

of AMW Motors Ltd.

SMEs like Radel have overcome the long gestation period associated with the Aerospace & Defence sector and will now look to leap forward with more prestigious projects. "The 'Make in India' campaign, both in the industrial as well as the A&D sectors, is bound to open up huge opportunities for MSMEs with strong design and development capabilities. Radel hopes to capitalise on these and grow into a nationally recognised organisation," says Raj Narayan.

Lauenroth of Volkswagen India hopes to see further growth in the manufacturing sector in 2015. "In fact, the reforms announced in 2014 will start showing true results only in the upcoming year and we would like to be a part of it. With improvement in infrastructure and with ease of making business, we are confident that the Indian manufacturing industry will develop further. Additionally, adoption of new technologies and innovations will benefit the manufacturing industry," he says.

As Kumar Kandaswami, Senior Director, Deloitte, says the promising start makes one want more! "Clearly, demand creation is a big expectation. While consumer demand will get generated with inflation getting under control, it is critical to jump-start infrastructure build-out, which can and should be the engine of growth for some years to come. While it will be incorrect to expect all of that to happen in one year, it is important to see a clear sign of a strong beginning of this cycle in 2015. Further, the commitment of the government to a high growth manufacturing economy is likely to be measured by the nature of reform it is able to push through. GST, labour reform and land acquisition are areas of high importance and one would hope these will be addressed in the coming year."

Some achievements and milestones!

- In July 2014, NCR Corporation announced the shift of its manufacturing facility from Puducherry to Chengalpet, near Chennai. Strategically located and in close proximity to suppliers and customers, this new facility with additional capacity will improve operational efficiency and enable faster delivery of innovative products to the market.
- In 2014, Eaton in India was again named among India's Best Companies To Work For by the Great Place to Work® Institute (GPTW) for the third consecutive year. In addition, this year, the Company also completed 10 years of the Eaton India Engineering Centre (EIEC) in Pune which is the largest integrated, multidisciplinary Research, Development and Engineering Centre outside the USA. 2014 also saw Eaton in India releasing its first sustainability report titled 'Powering Sustainable Growth in India.'
- Aerostructures Assemblies India Pvt Ltd (AAI), a joint venture between Aequs and Saab, delivered its first batch of aircraft structural assemblies to Saab in 2014 for use in the Airbus A380 program. The first batch of assemblies was successfully delivered within just four months of inauguration of the Greenfield facility. In 2014, Aerostructures Assemblies India Pvt Ltd (AAI) achieved AS9100C certification for its manufacturing facility located in the Aequs SEZ, Belgaum, Karnataka, India. Aequs Oil & Gas in 2014 earned for its manufacturing facility in India certification in the American Petroleum Institute (API) Specification Q1 standards, which specify rigorous quality management requirements for manufacturers in this sector.
- Volkswagen India expanded its export operations to a new level this year. Manufacturing cars with quality that is truly at global standards has helped us to reach out to markets across Asia, Africa and North America. This year, the Company is expecting to export every second car that it produces at the Pune Plant. This marks almost a three-fold increase in export volumes from its facility as compared to previous year. Mexico has been its largest export market and Volkswagen India is now able to export both Volkswagen Vento as well as Volkswagen Polo to this North American market.

> "The 'Make in India' campaign, both in the industrial as well as the A&D sectors, is bound to open up huge opportunities for MSMEs with strong design and development capabilities. We hope to capitalise on these and grow into a nationally recognised organisation."
>
> **G Raj Narayan,**
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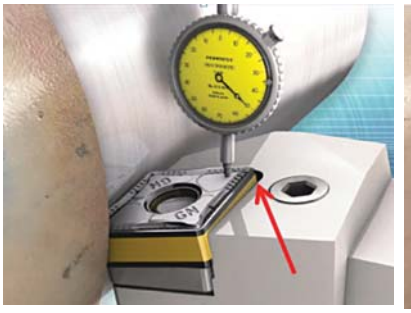
>
> **Kumar Kandaswami,**
> Senior Director, Deloitte

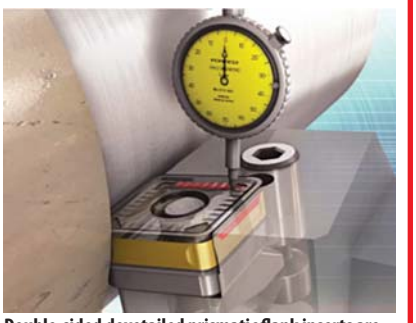
ISCAR's Innovative Clamping System for Rough Turning

ISCAR has developed an innovative dovetail pocket combined with a lever clamping mechanism. The new system provides a very firm and rigid insert clamping that eliminates the need for the top clamp, which interferes with the chip flow.

Rough turning is characterized by high Depth of Cut (4-10 mm) and high feed rates (0.4-1.5 mm/rev). Usually, large single-sided inserts are used on top-clamp tool-holders to withstand interrupted cut and high machining load. The current method of using single-sided inserts and top-clamp holders has the disadvantages of a low number of cutting edges and an interrupted chip flow due to the obstruction of the top clamp.



The cutting forces tend to cause the insert to tilt in lever clamp tools

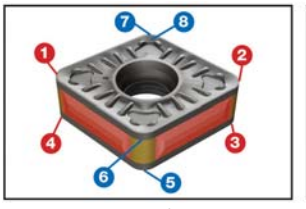


Double-sided dovetailed prismatic flank inserts are firmly held in place

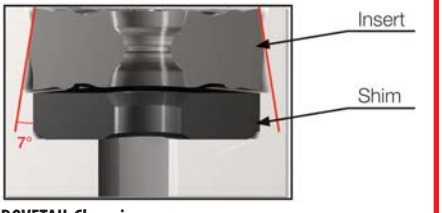
Innovative Double-Sided Insert for Heavy Duty Turning

Double-sided G-type inserts are limited up to 0.5-0.6 mm/rev feed, while the new, double-sided inserts with dovetailed flanks can run up to 1.0 mm/rev due to their open, unobstructed chipformer configuration.

The DOVE IQ TURN clamping mechanism can firmly hold double-sided inserts featuring double negative prism flanks. The dovetail pocket and insert prismatic flanks prevent the insert from being lifted by the cutting forces.



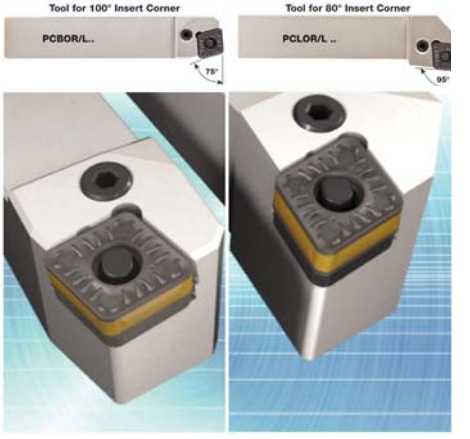
4 Cutting Edges for 80° and 4 Cutting Edges for 100°

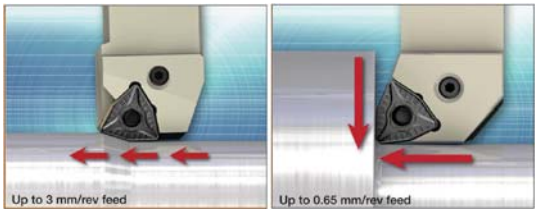


DOVETAIL Clamping

The DOVE IQ TURN double-sided inserts can be used in heavy chip load conditions. Available are 3 insert geometries with prismatic flanks: WOMG-R3P-IQ, COMG-R3P-IQ and SOMG-R3P-IQ designed with a new R3P chipformer for rough turning of steel. The new system enables 50% higher metal removal rates, when compared to the regular W/C/SNMG double-sided insert.

A single insert for two applications - uses either 80° or 100° insert corners:





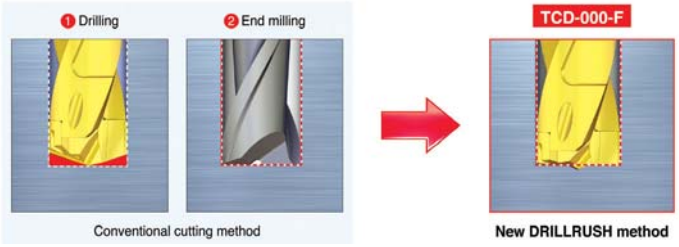
ISCAR has also introduced the PWXOL 3232P-10-TF-IQ lever lock toolholders with a 18.5° lead angle, for fast feed. The new tools carry a new insert WOMG 100716-T3P-IQ with a new T3P chipformer, double-sided 6° negative flank trigon, for high feed turning of steel, up to 3 mm/rev and up to 2.8 mm D.O.C. longitudinal turning. Due to the ability to run at extremely high feed, the new tools reduce machining time and costs.

For more info, visit: www.iscar.com
Tool advisor: http://www.iscar.com/ita/MainPage.aspx
Mail: iscar@larsentoubro.com

Two-steps in one with new flat-bottom head drill

Using two drills to machine a flat bottom hole can not only be time consuming but also increase the likelihood of errors. To resolve this issue while at the same time saving on downtime, TaeguTec has introduced a new geometry that makes hole making operations easier and hassle free.

The hugely successful Drill Rush line has been extended with the introduction of a flat-face geometry head for flat-bottom machining of diameters ranging from 8 to 25.5 millimeters. This new product line eliminates the need to use a two-step process thus shortening cycle times and substantially increasing productivity.



To keep this drill head cost effective, TaeguTec has made it available for its current DrillRush line of bodies in the same size.

Furthermore, the combination of the new flat-bottom drill head and DrillRush body offers excellent chip breaking while easily performing high precision flat surfaces. The new head is specifically, but not exclusively, designed for applications like bolt-hole machining which requires a nearly flat bottom hole.

These are also designed for machining on a wide range of work piece materials.

Both the flat-bottom head and DrillRush body are coated with TaeguTec's exclusive TT9080 PVD grade which provides high wear resistance, chipping resistance and prolonged tool life.

The combination of the new flat-bottom head and DrillRush body can be used with TaeguTec's recently released chamfering rings that drill and chamfer in a single operation in order to optimize cycle times as well as inventory and tooling cost for improved cost effectiveness.

Another option available for the DrillRush are special plugs that have an internal thread for coolant connections used on lathes that can be pressed into the cavity on the back end of the shank.

Contact: TaeguTec India P Ltd.
Tel: +91-(0)80-27839111 Fax: +91-(0)80-27839123
E-mail: sales@taegutec-india.com

EVENT

Thousands attend HaasTEC event in Ahmedabad

HaasTEC returned to India on November 19-22 when the Haas Factory Outlet (HFO) Phillipscorp, CNCSSIPL staged it at the complex of Vatva Industries Association in Ahmedabad, Gujarat. Around 2,500 visitors from 1,000 regional companies attended, drawn to see a range of innovative, affordable Haas CNC machine tools on display. What's more, over 500 engineering students paid a visit to gain an insight into the latest machining technologies. The HaasTEC was inaugurated by chief guest, Sushil Luhar, MD, Ambica Engtech Pvt Ltd. Making its debut appearance at the show was the UMC-750 five-axis universal machining centre. All Haas CNC machine tools at the event were under power and cutting metal. In addition, Haas specialists from the HFO were on hand to guide visitors through the demonstrations and answer questions about the machines. The UMC-750 five-axis vertical machining centre drew a great deal of interest at the HaasTec. The event also featured a number of the company's industrial partners, all offering complementary technologies and advice. Among them was metrology specialist, Renishaw, which described the HaasTEC as a "well organised event that gave us the opportunity to make very good contacts and offer our assistance in solving particular manufacturing challenges".

Representatives from cutting tool companies Sandvik Coromant and Kyocera agreed: "The customer turnout was very good," said a Sandvik spokesman, while Kyocera declared it was already "looking forward to the next HaasTEC". "The HaasTEC show in Ahmedabad was a resounding success with excellent customer attendance and keen interest in the latest Haas products and technology," says Terrence Miranda, MD, Haas Factory Outlet Mumbai. "I am so pleased that we welcomed over 2,500 visitors to the event, which once again proves that the HaasTEC format is an effective means of reaching and communicating with customers on a regional level."

High Dynamic Direct Drive Rotary Table from UCAM

The latest UDDR-T-200/100 model from UCAM is a high dynamic performance Direct Drive Rotary Table which drastically reduces component machining cycle time in demanding working conditions. With much lesser number of parts as compared to conventional Worm Gear driven Rotary Tables, these Direct Drive Rotary Tables have high acceleration / deceleration characteristics and reliability. These tables run on Nimble Electric Torque Motors and have peak speed of 200 RPM and Clamp Torque of 650 Nm at 5 bar pneumatic pressure. These are ideally suitable for present day High Speed Machining Centers for varied precision applications for both indexing and rotary interpolation applications. UCAM offers Direct Drive Rotary Tables with value added accessories like Manual or Power Chucks, Tail Stocks etc. UCAM specializes into manufacturing of CNC Rotary Tables of various sizes ranging from Dia. 125mm to 4000 mm. The 4th & 5th Axis Tilting Rotary Tables are available from dia. 150mm to Dia. 1200mm.

For more info, visit: www.ucamind.com

Grease for CNC Chucks

CIMLUBEMBK102C is extremely resistant to high temperatures, loads, and corrosion, and it provides long- term protection from wear even in presence of mixed water like coolants in machine shop, water vapour, Hot or cold water and salt water applications. It contains a combination of solid lubricants that provide it with extra backup lubricating properties, especially at maximum rates or loads. It is compatible with all good quality elastomers and seals, except those of the EPDM types. It is classified X-CEIB2 under the standard ISO6743-9 (NFT60-506).

Advantages: • Resistant to Plain, saline water as well as to water soluble coolants. • Wide range of temperatures • Lowest consumption.

Applications: Machine Tool mandrels, Chucks, ball screw support bearings, LM guide ways, bushes and all other applications where remote lubrication is required. This can also be used when there is interface with cutting oil. Best for contamination-free, assembly and long-time lubrication. CIMLUBEMBK102C is suitable for all ball or roller bearings, or couplings under heavy loads, in the presence of water or cutting liquids, and when there are long periods between re-lubrication sequences.

For further details about the product and get the complete offer of MotulTech, Please visit www.motul.com or contact ykumar@alsl.net

EVENT

BFW Learns From Mangalyaan Team

Key members of the highly successful Mangalyaan Project of ISRO shared their experience with BFW officials in November 2014. The ISRO team was headed by the deputy project director (propulsion) of the Mars Orbiter Mission, R Shashi Shekar. ISRO created history on September 24, 2014 by inserting Mangalyaan into the orbit of Mars in its maiden attempt.

The ISRO team, consisting of HS Venkatesh, Group Director, SCPSG; S Krishnan, Manager, Software; and P Venkata Reddy, Senior Systems Engineer (Propulsion) enthralled the BFW team with its simplicity, humbleness and magnanimity. The ISRO team thanked BFW, the industry, and the citizens of India for reposing faith in them and the Govt. of India for strongly backing up the Mission. Success of the multi-location year-long Mission with hundreds of active members and nano-second precision was possible due to the sheer selfless dedication of each member, who sometimes worked for 36 hours at a stretch. The Team was very ably supported by the top leadership, who served as role model.

The Team shared some of the techniques that helped it complete the Mission with clockwork precision and no overspend. The Mars aircraft cost India just US$74 million, less than the budget for the mulit-academy award winning science fiction thriller film 'Gravity'. When shared with the Team, pat came the reply – Rs440 crore is no small sum.

Ravi Raghavan, Shashi Shekar and Team

The session ended with a token of felicitation from the BFW CEO Ravi Raghavan.

More pieces per edge

New Beyond Drive™ from Kennametal Drives success in stainless steel and cast iron turning

New Beyond Drive inserts from Kennametal feature a bronze TiOCN top coating that increases wear resistance and functions as a wear indicator.

Manufacturing is experiencing a powerful resurgence worldwide, and along with that resurgence come tighter schedules and more competition, increasing the pressure on manufacturers to deliver more components faster and reliably to the plants that need them. The need for different and better thinking is more focused than ever.

New Beyond Drive™ cutting tool inserts from Kennametal are helping component suppliers expand and thrive in this environment with enhanced performance and extended tool life that mean many more finished pieces per cutting edge.

Specifically designed for cast irons, steels, and stainless steels that make up many critical components over a variety of industries, Kennametal's new Beyond Drive inserts are a product of ongoing design leadership, engineering, materials science, and manufacturing directly targeted to the needs of component manufacturers.

Like all of Kennametal's Beyond™ line of products, Beyond Drive inserts feature a proprietary post-coat surface treatment that improves edge toughness, reliability, and depth-of-cut notch resistance, and a micro-polished surface to reduce friction and workpiece sticking (BUE). A fine-grained alumina layer allows for increases in cutting speed, improving productivity and reliability at high cutting temperatures.

With Beyond Drive, adding a new titanium oxy-carbonitride outer coating (TiOCN) not only increases wear- and abrasion-resistance, its bronze colour is also an effective wear indicator. Depending on the application, field tests are showing anywhere between 30 percent and 125 percent more parts per edge.

All new Beyond inserts are CVD (chemical vapour deposition) coated, but whereas conventional CVD coatings are under tensile stress, Beyond inserts undergo a proprietary post-coat treatment on all surfaces to reduce this stress, which improves coating adhesion and reduces micro-chipping. More uniform and reliable wear of the cutting edge results in improved and more consistent tool life. "Together with the right geometry, we've seen big improvements in cutting performance and tool life in both internal and field tests," says Manuel Sedan, senior product manager, turning products, at Kennametal.

All new Beyond inserts are CVD (chemical vapour deposition) coated, but whereas conventional CVD coatings are under tensile stress, Beyond inserts undergo a proprietary post-coat treatment on all surfaces to reduce this stress, which improves coating adhesion and reduces micro-chipping."

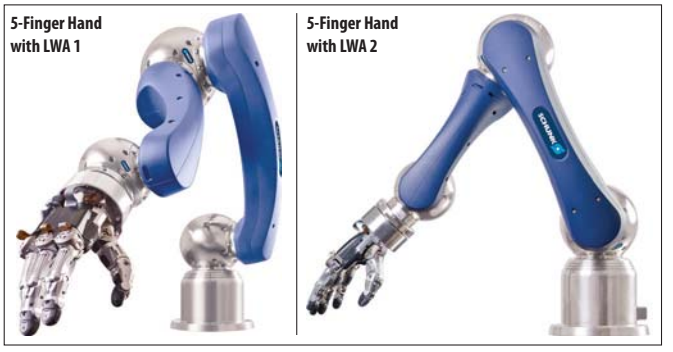
For example, in one test for a plant producing cast-iron transmission components, with no change in feed, spindle speed, or depth of cut, Beyond Drive completed 325 pieces per cutting edge compared to 200 pieces for the plant's current inserts. Not only was this a phenomenal increase in parts per edge, projected machine hours freed per year totalled 125 while the number of inserts required per year dropped from 813 to 500.

"A stronger supply chain that gets more parts to the market reliably is the foundation of a healthy and growing manufacturing industry," Sedan adds. "Plus the days of one man-one machine are long in the past. With one operator running a cell or any number of machines, greater predictability and performance with tools is an increasingly crucial component for success. Beyond Drive is a truly exciting development that promises more pieces per shift, more efficient machine utilization, and long tool life."

Beyond Drive is available in eight grades and numerous insert styles, covering a complete range of applications for turning steel and cast iron components.

For more information, visit www.kennametal.com

Mobile Gripping Systems



On option, the 5-Finger Hand from SCHUNK (used on a Powerball Lightweight Arm LWA 4P) can be controlled via Profibus or CAN-Bus.

Schunk has optimised its 5-finger hand concept study. The motor controllers have been completely integrated in the wrist of the latest anthropomorphic gripper hand, and therefore very compact solutions are available now. Via defined interfaces, the gripper hand can be connected with the lightweight arm, which is already on the market. For mobile applications, the energy supply of the 5-finger hand requires a battery-servable 24 V DC. In the first version the hand is controlled via a serial Bus. Now the gripper hand is available as a left and right hand version. It is amazing how much it resembles its human model in size, shape, and mobility. By means of nine drives, its five fingers can carry out various gripping operations. Moreover, numerous gestures can be constituted, whereby the visual communication between human and service robot is simplified, and the acceptance for applications in the human environment are increasing. The use of tactile sensors in the fingers will grant the necessary sensitivity of the gripper hand for mastering gripping and manipulation tasks even in unstructured and unforeseeable environments. Elastic gripping surfaces ensure a reliable hold of the gripped objects.

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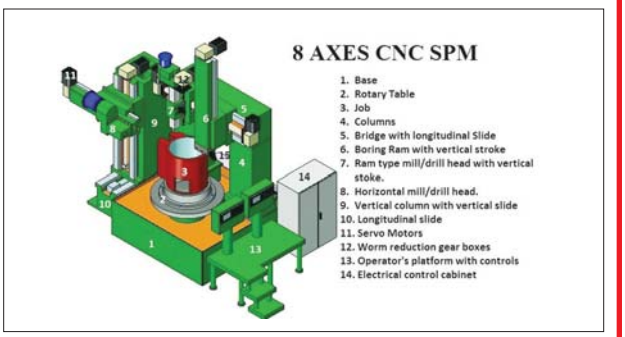
8 AXES CNC SPM

Shenoy Engg Pvt Ltd, a Bangalore based SPM manufacturers is in the process of manufacturing a 8 axes CNC SPM, having the capabilities of HMC & CNC VTL. This machine is under manufacturing and expected to get ready for trial running by mid, Jan., 2015. The salient features of the machine are mentioned herebelow:

- VMC, HMC & VTL rolled into a single dedicated SPM with innumerable general purpose machining capabilities.
- A servo driven rotary table for accurate positioning of the job & for providing rotational feed to the job while boring.
- Self feeding vertical ram for boring, turning operation, mounted on the top bridge with integral horizontal side.
- Separate 5 HP vertical ram type, mill, drill head for operations like milling, drilling etc
- For machining the sides, horizontally mounted mill, drill head, located on a 3 axes slide.
- All the linear axes and rotary table are servo controlled with Siemens advanced controllers.
- VFD controls for stepless spindle speeds in combination with lever operated gears.
- Combined functions of VMC, HMC & CNC VTL facilitates any machining operation, be it boring, milling, drilling or tapping.

For more information, please contact: Shenoy Engg Pvt Ltd; Ph: 91-80-28361767 Fax: 91-80-28361725 Cell: 00-9243437487; Web: www.shenoyengineering.com; Email: info@shenoyengineering.com



List of machining possible:

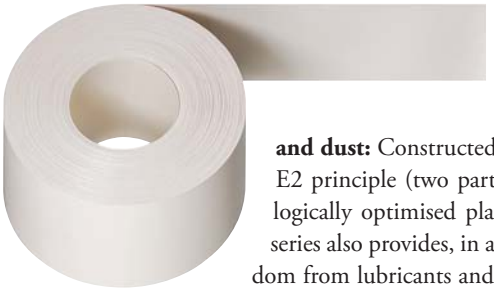
Using Boring Ram	Using 5hp Ram Type Mill/Drill Head (Vmc Config)	Using Horizontal Head Configuration (Hmc Config)
• Straight Bore • Taper Bore. • Profile boring.	• Drilling. • Milling. • Hole milling using interpolation • Slotting using end mills. • Tapping. • Boring. • Milling, drilling of inside bore walls using a right angle attachment.	• Drilling. • Milling. • Hole milling using interpolation • Slotting using end mills. • Tapping. • Boring.

Using interpolation feature of CNC system many more types of operations can be performed.

High machine reliability at low cost

igus presents a new tribo-tape and other new products for the machine tool industry

Pricing pressure is increasing in the machine tool industry in order to keep pace with international competitors. Therefore, it is necessary for manufacturers to be able to use high-quality and reliable components at a low cost. igus offers products for machine tools that are high quality and also cost effective. The tribo-tape made of a new material, the lubricant-free polymer slewing ring bearing with individually adjustable swivel angle, or the new chip-proof R2.75 energy tube. *"Save money – safe quality":* This igus slogan symbolises the provision of reliability in conjunction with cost savings to the customer. Thus product and process costings for machine tool manufacturers should be reduced without compromising on quality. A novelty is the tribo-tape made of the material iglidur V400. The liner is now available in a more wear-resistant material. This withstands temperatures of up to 200°C, is extremely resistant to media and easy to bond. An example of this would be in machine beds; the iglidur tribo-tape provides great freedom in the construction of gliding surfaces.



The iglidur tribo-tape for machine guides made of the iglidur V400 material is extremely wear-resistant and withstands temperatures up to 200°C continuously. *(Source: igus GmbH)*

The chip-proof R2.75 energy tube has snap-open lid on both sides, whereby the installation time is reduced. *(Source: igus GmbH)*

The ready to install iglidur PRT slewing ring bearings are now available with individually adjustable angle stops. *(Source: igus GmbH)*

Protection against chips, dirt and dust: Constructed on the basis of the cost efficient E2 principle (two parts per chain link) made of tribologically optimised plastics, the energy tube of the R2 series also provides, in addition to the advantages of freedom from lubricants and maintenance, protection against external dirt accumulation and flying chips. The contours of the lid are smooth and its curvature and narrow manufacturing tolerances guarantee that there is no accumulation of chips between the stop dogs. At the same time the two-side flip-open lid saves assembly time, since they need not be completely removed to equip the energy tube with cables. Due to the double stop dogs the R2.75 energy tube can absorb high additional loads and handle even long unsupported lengths. The integrated grid also ensures a firm hold of the interior separation, even in side-mounted applications. All cables are effectively protected from abrasion and wear by smooth interiors and modular partitioning systems using snap-on separators.

Ready to install iglidur PRT slewing ring bearings: The ready to install iglidur PRT slewing ring bearings, widely used in the pivoting arms of control panels and screens of machine tools, are now available with individually adjustable angle stop. The angle range is freely selectable and adjustable in increments of 2°. If a subsequent adjustment of the angle is necessary during operation, this can be easily performed by manually converting the stop dogs. The conversion of the variable twist limitation does not require anything more than the manual loosening and shifting of stop dogs and pins.

Plastic gliding elements made from the proven igus material iglidur J are used in the slewing ring bearings, so that any external lubrication and maintenance can be fully dispensed with, avoiding machine downtimes. The ruggedness against chips, dirt or dust is increased, since there is no oil or grease for adhesion. For a low-friction operation, the counter-running surfaces of the polymer gliding elements are hard anodised. In addition to the ready to install standard slewing ring bearings, slewing ring bearings can be universally installed by means of special universal gliding elements made of iglidur J; by joining together individual parts, slewing ring systems can be manufactured from an inner diameter of 500 mm to virtually infinite, as desired. The slewing ring bearing with a diameter of one metre constructed on the basis of these gliding elements, depending on the version, can be loaded with up to ten tonnes.

For more information, visit: www.igus.in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