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THE MACHINIST

ULTIMATE GUIDE TO PROFITABLE MANUFACTURING

RNI No 71129/98

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You are invited!

The stage is all set for The Machinist's inaugural 'Super Shopfloor Awards'. What started off as an interesting initiative for the print medium has actually evolved into a fabulous awards platform. We are truly overwhelmed by the response received in terms of nominations from shopfloors across the country. And considering the fact that we had invited nominations in just five categories and only from the discrete manufacturing segment, we have surprised even ourselves with the number of nominations. Thanks to our readers who have showed tremendous faith in the credibility of this publication.

The nominations were evaluated by our eminent team of jury members on April 29 in Pune. What an exhilarating experience that was! Not only did the jury members enjoy every bit of the evaluation process but also did share useful feedback on making this platform bigger and grander. Of course, that's for the future. Our focus now is on making the first edition as memorable and as exciting as possible. Someone asked me: 'What different are you going to do from some of the other awards platforms?'. My answer: Come and experience the difference! So if you haven't already registered for the event then now is the time. Visit http://supershopfloorawards.themachinist.in/ for details or just drop us an email at themachinist@wwm.co.in with 'Invite me' in the subject line. We will do the rest. And if you miss the action on May 22 at The Westin Pune, you can catch up with it in the June issue. Of course, it is not the same as attending the actual event but you will get the feel of it. Well, almost!

Editor & Chief Community Officer

SO IF YOU HAVEN'T ALREADY REGISTERED FOR THE EVENT THEN NOW IS THE TIME. VISIT *HTTP://SUPER-SHOPFLOORAWARDS.THEMACHINIST.IN/* FOR DETAILS OR JUST DROP US AN EMAIL AT *THEMACHINIST@WWM.CO.IN* WITH 'INVITE ME' IN THE SUBJECT LINE.

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NEWS

New Foreign Trade Policy announced; includes 'Make in India' programme to ease trade

The Government of India has announced a new Foreign Trade Policy for 2015-2020. Important measures taken in the Foreign Trade Policy 2015-2020 to include 'Make in India' and 'Digital India' programmes to ease the trade are: (i) Specific Export Obligation under Export Promotion Capital Goods (EPCG) scheme, in case capital goods are procured from indigenous manufacturers, has been reduced to 75% of the normal export obligation, in order to promote domestic capital goods manufacturing industry. (ii) Under Merchandise Exports from India Scheme (MEIS), export items

with high domestic content and value addition have generally been provided higher level of rewards. (iii) For reward schemes and duty exemption schemes, hard copies of applications and specified documents which were required to be submitted earlier have now been dispensed with. (iv) Landing documents of export consignment as proof for notified market, can now be digitally uploaded. (v) There will be no need to submit copies of permanent records/ documents repeatedly with each application, once the same are uploaded in Exporter/Importer Profile. (vi) For faster and paperless communication with various Committees of DGFT, dedicated e-mail addresses have been provided for various Committees. The Policy introduces two new schemes to increase and incentivise exports, namely, MEIS and SEIS.

Need cooperative tools to create investor confidence: FM

Cooperative tools are required to create confidence in EME (Emerging market economies) investors and to prevent currency crises according to Union Finance Minister Arun Jaitley. Jaitley said this at his Intervention made during his visit to Washington D.C. for G-20. The FM reminded that

once again the global economic situation requires ambitious policy reforms and international coordination. "The growth in some advanced countries has not improved as much as we had anticipated. Emerging market economies face a high risk of negative spill-overs from un-conventional monetary policy actions of advanced economies. The uncertainties about their extent and eventual normalisation have induced greater volatility and intensified pressures on both emerging market currencies and capital markets," he said. Jaitley underlined that some EMEs have had to dip into their foreign exchange reserves in order to manage the effects of volatile currency markets and others had to shore them up in the absence of other adequate safety nets. Given these challenges, there is need for clarity in communications and forward guidance to minimise surprises. "But we need cooperative tools which will create confidence in EME investors and prevent currency crises. As we have seen from the crises of the 90s in East Asia and Latin America, policies which place the burden of tackling the impact of capital flight solely on affected countries, are ineffective. We need to co-operate to cushion the impact of unconventional policies and their normalisation on affected economies which may face a flight of capital shortly similar to that of the "taper tantrum" of 2013."

Scania displays ethanol engine at the Busworld 2015

Scania Commercial Vehicles India Pvt. Ltd. displayed ethanol engines for the first time in India at the prestigious Busworld 2015 Exposition, which was held in Mumbai between April 28 and 30, 2015. The company also showcased its premium range of Metrolink 13.7 m coach and ethanol-powered Green Bus. Busworld also served as the perfect venue for the delivery of Scania's 13.7 m premium Metrolink coaches to Kaushik Logistics, Hebron Transports and Transit Logistics. Kaushik Global Logistics will ply, service and manage the buses for UPSRTC, paving the way for Scania's entry into north India.

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SKF signs strategic agreement with ReGen Powertech

SKF has signed a strategic agreement with Regen Powertech, a leading Indian wind turbine manufacturer. Under the terms of the agreement, SKF will supply pitch and yaw bearing sets and mainshaft bearings for the company's 1.5MW wind turbines.

Shishir Joshipura, MD and Country Head, SKF India, said, "This agreement positions us as a strategic partner with a key manufacturer of wind turbines in India. These bearings will be manufactured at SKF's state of the art manufacturing facility at Ahmedabad. This is a reflection of SKF's response and commitment to the government's 'Make in India' program."

"ReGen has been buying Main Shaft Bearings from SKF since its inception. The partnership with SKF has helped ReGen to grow in the Indian Market. The new agreement signed for supply of pitch and yaw bearings is another step towards strengthening this partnership between the two companies. SKF has always been the preferred partner for ReGen and this relationship will continue to grow," says Madhusudan Khemka, MD, ReGen Powertech.

Siemens India reaffirms commitment to 'Make in India'

Siemens India reaffirmed its commitment to Partner India at the Hannover Messe 2015. "On the way to Industrie 4.0 – Driving the Digital Enterprise". At the Hanover Fair, Siemens showcased latest and advanced Siemens production technologies that power and enable Indian manufacturing to become faster, flexible, efficient and competitive at a global level. The solutions and products are part of the comprehensive portfolio of electrification, automation, and digitalisation. "Siemens has designed and built intelligent technology solutions that have delivered benefits. We have the competencies and can deliver on India's requirement of Make in India," said Sunil Mathur, MD & CEO Siemens Ltd.

TJPS launches 'Welding Training School' for ITI students

Furthering its commitment to India, Toshiba JSW Power Systems Private Limited (TJPS), a Joint venture between Toshiba Corporation in Japan and JSW Group in India, reinforced its CSR activities with the launch of Welding Training School.

Established at the TJPS factory in Chennai, the Welding Training School will impart gratis (free of charge) training to 30 students recommended from neighboring Industrial Training Institute (ITI) from May to June 2015 in 3 separate training programs. The 12 days program will include fundamental sessions such as the theory of welding and learn high-level welding skill, followed by a Skill Evaluation. TJPS also aims to foster the importance of safety, time management, compliance of manuals, and environmental awareness in manufacturing processes through this training.

Commenting on the occasion, Yoshiaki Inayama, MD, TJPS said, "Toshiba Group's Corporate Philosophy emphasizes respect for people, creation of new value, and contribution to society. The Group slogan – "Committed to People, Committed to the Future." – expresses the essence of our corporate philosophy. We recognise that it is our corporate social responsibility (CSR) to put our philosophy and slogan into practice in our day-to-day business activities. We hope, with the help of our Welding Skill training, the students will upgrade to high-level skilled workers to become an integral part of the manufacturing industry in Tamil Nadu and contribute to "Make in India". We will continue to undertake such meaningful CSR activities in the future."

Sri City launches Skill Development Centre at Tada

Recognising the shortage of skilled manpower in the region, Sri City started a Skill Development Centre in the premises of the Industrial Training Institute (ITI) at Tada. Ravindra Sannareddy, MD, Sri City said, "As there is a shortage of skilled workforce in the far flung region, Sri City, right from the beginning, took initiative of training the local youth and creating them job opportunities. I am confident, this Centre will act as a catalyst in developing tailor-made skills among the youth, right at the door step of industries, suiting their specific needs."

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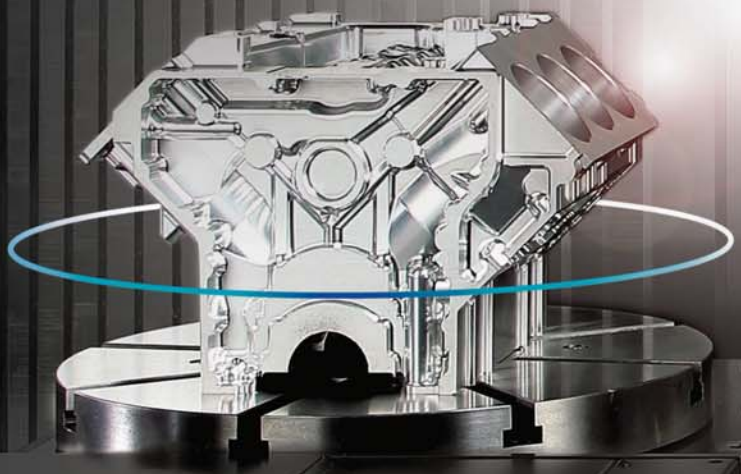

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Mark your diary

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

Intec 2015
June 5-9, 2015, Coimbatore
www.intec.codissia.com/

SUR/FIN Manufacturing and technology conference and tradeshow
June 8-10, 2015, Illinois (US)
www.nasfsurfin.com

Asian Tyre and Rubber Conference
June 12 - 13, 2015, Chennai
http://atrc.in/

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

India Warehousing Show
July 1-3, 2015, New Delhi
http://indiawarehousingshow.com/

Automotive Engineering show
July 7-9, 2015, Chennai
automotive-engineering-show.in.messefrankfurt.com

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

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

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

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

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

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

Machine Tool Expo

August 20-23, 2015	September 24-27, 2015
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Enhancing the **local flavour!**

Celebrating 'Make in India', BMW has further strengthened its commitment to the Indian market by increasing the level of localisation at its Chennai Plant up to 50%.

BMW has further strengthened its commitment to the Indian market and the 'Make in India' initiative by increasing the level of localisation at BMW Plant Chennai up to 50 percent. Legendary sportsman Sachin Tendulkar marked the occasion in a unique way by assembling a BMW 5 Series using parts from Indian auto component suppliers. Tendulkar said, "I am an avid BMW enthusiast and have been driving BMW cars since a very long time. But the experience of making a BMW with my own hands was unique and unforgettable. I am impressed by the high quality standards followed at BMW Plant Chennai that ensure the impeccable performance of a BMW. I got the opportunity to go through the tiniest details and efforts that are put into making a BMW. Next time I take my BMW out, I can proudly say – I have made one!"

Legendary sportsman Sachin Tendulkar makes cars along with the engineers at the assembly lines of BMW Plant Chennai

BMW Plant Chennai started operations on March 29, 2007. Since then, the BMW Group has strengthened its commitment to the Indian market and has continuously increased the number of its locally produced car models. Up to eight car models can be locally produced on two assembly lines at BMW Plant Chennai. Presently, the BMW 1 Series, the BMW 3 Series, the BMW 3 Series Gran Turismo, the BMW 5 Series, the BMW 7 Series, the BMW X1, the BMW X3 and the BMW X5 are locally produced at BMW Plant Chennai.

> "With a strong portfolio of locally produced cars, the time was appropriate to partner with major Indian auto component suppliers."
>
> **Philipp von Sahr,**
> President, BMW Group India

Philipp von Sahr, President, BMW Group India said, "The BMW Group has always looked towards India with a long-term perspective and our strategy is based on an inclusive approach. We have continued to build our operations in India in a systematic way. With a strong portfolio of locally produced cars, the time was appropriate to partner with major Indian auto component suppliers. This decision benefits BMW in terms of cost optimisation and value addition while at the same time it creates business and profitability for our suppliers – a win-win situation."

Some of the major auto components sourced for local production of cars at BMW Plant Chennai are: Engine and Transmission from Force Motors; Axles from ZF Hero Chassis; Door Panels and Wiring Harness from Draexlmaier India; Exhaust Systems from Tenneco Automotive India; Heating, Ventilating, Air-conditioning and Cooling Modules from Valeo India and Mahle Behr and Seats from Lear India.

Robert Frittrang, MD, BMW Plant Chennai said, "BMW Plant Chennai takes pride in producing cars that have the same international quality standards as any of the BMW production and assembly facilities worldwide. Highly skilled employees, advanced manufacturing processes along with state-of-the-art machinery and technology provide all the necessary ingredients to achieve these tough standards. The cars locally produced at BMW Plant Chennai now feature very strong local content. We are confident that through our partnership with Indian auto component suppliers, we will set even higher benchmarks in quality standards and supply chain management."

Headquartered in Gurgaon, BMW India is a 100 percent subsidiary of the BMW Group. Till date, the BMW Group has invested Rs.4.9 billion (69 Million Euro) in BMW India. The wide range of BMW activities in India include a manufacturing plant in Chennai, a parts warehouse in Mumbai, a training centre in Gurgaon NCR and development of a dealer organisation across major metropolitan centers of the country.

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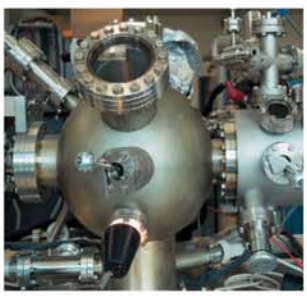

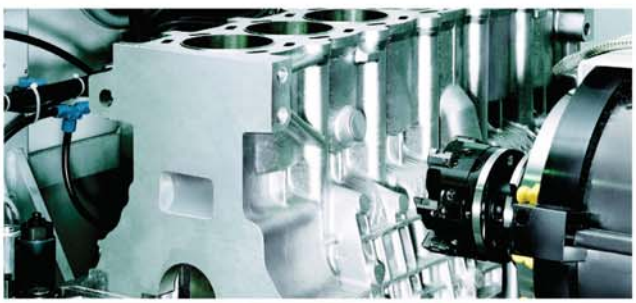

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Sustainable **Competitive Advantage**

Green Manufacturing needs to be an integral part of the organisational strategy; it needs to be enacted with defined goals for the short, medium and long term.

By ***By Joydeep Chatterjee,***
General Manager - Corporate Quality Assurance, Kirloskar Brothers Limited

To drive the Green Manufacturing strategy, the organisation must implement effective Green Manufacturing systems that will help in identifying the key success factors for its real-time implementation."

The Indian manufacturing sector has witnessed an unprecedented change in terms of complexity, increased uncertainty and turbulence in the business environment in the last two decades. There has been an increased interlinkage and a shift in the marketplace across the globe, which is skewed towards Asia with global businesses considering India and China as the fulcrum of the change.

With global corporations having recognised the potential of India and China's manufacturing capabilities, Indian corporates have been venturing out to garner an increased share of global manufacturing. While China has had an upper edge over India so far, largely on the back of abundant cost-effective labour, things are now changing with rising Chinese wages and demanding global customers. One important aspect that global corporations consider before selecting manufacturers in Asia / elsewhere is the vendor's approach to manufacturing.

"Going Green ideally starts in a company's own manufacturing facility, where they have complete control on the processes."

The paradigm shift towards environment-friendly approach in manufacturing by Indian corporate sector kicked off more as compliance with the changing regulations related to environment, as also the need to comply with the changing legislative requirements for exports.

As a concept, Green Manufacturing has its roots in Germany, which in the early-nineties started requiring its vendors to own the responsibility of disposal of packaging solid waste generated in their countries of manufacturing. This subsequently got extended and further established as a de facto global manufacturing standard instilling that, "any company wishing to compete globally must start making products that will comply with the green dictates of the huge global market."

There are different viewpoints about the Green Manufacturing approach. One of the most-widely accepted interpretations of Green Manufacturing is manufacturing of "green" products, by using renewable energy systems and clean technologies. The Green Manufacturing aims at reducing pollution and waste by minimising use of natural resource, recycling and reusing waste and reducing emissions.

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friendly products – the products manufactured with low energy consumption, organic raw material, lead-free paints, recyclable packaging – indicating that the global consumers are getting more concerned about the environment. This gives the corporates an opportunity to promote environment-friendly or "green" products, which will give them the competitive advantage for doing business globally, and an enhanced brand perception.

While it is an imperative for export-oriented companies to have a Green Manufacturing (GM) strategy, we feel that it needs to be an integral part of the organisational strategy. The GM strategy needs to be enacted with defined goals for the short, medium and long term.

More and more Indian companies have now begun adopting green approach in some or the other way, as it is being realised that Green Manufacturing can be implemented across the value chain – right from the Design stage to the Waste Management stage, and post the usage by consumers (Refer to Figure 2). Going Green ideally starts in a company's own manufacturing facility, where they have complete control on the processes. The aspect–impact analysis gives an indication of the possible environmental outcomes of the manufacturing processes.

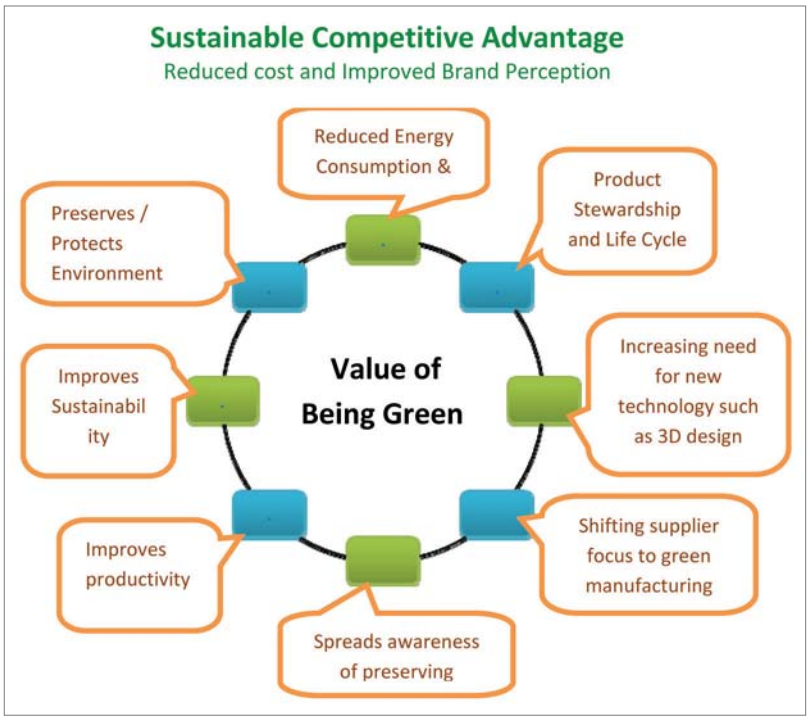


Figure 1 : Competitive Advantage through GM

At the operational level, it requires to implement the (new) manufacturing processes that minimise the use of natural resources, promote the use of alternative energy sources such as solar or wind power, minimise the impact of packaging wastes through developing environment-friendly biodegradable material, adopt technology-shifts to minimise emissions and refining practices in the industries, all of which ultimately contribute in lowering the organisation's overall carbon footprint.

The focus on design aims at minimising the overall environmental impact throughout the entire lifecycle of the product or process, and the product stewardship till it reaches the end of life. Designing a product not only focuses on minimising the usage of toxic substance to ensure customer safety and lowering the usage of fresh raw materials, but it also focuses on recyclability of wastes and its safe disposal.

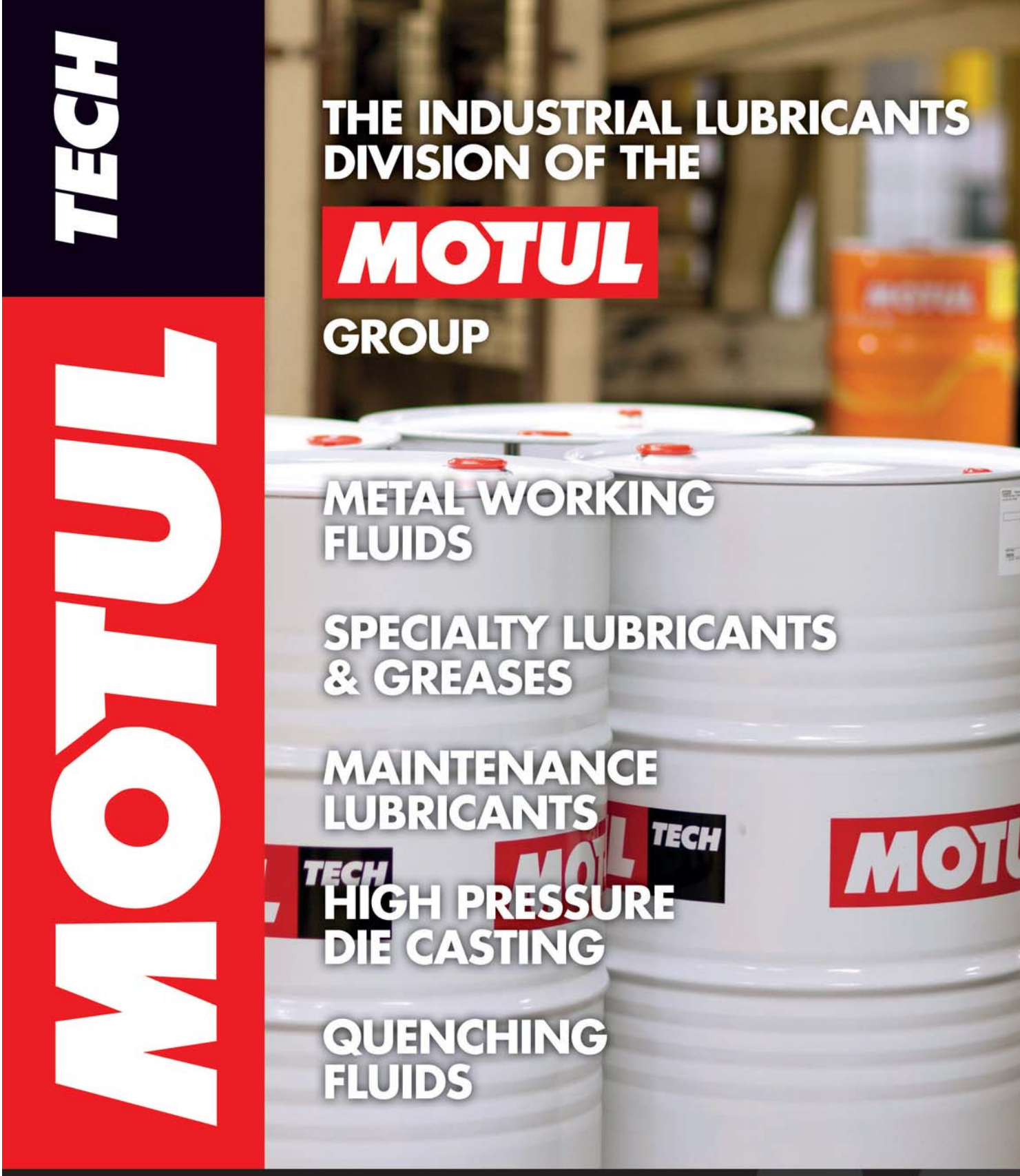
To drive the Green Manaufacturing strategy, the organisation must implement effective Green Manufacturing systems that will help in identifying the key success factors for its real-time implementation. In real-time industrial context in India, the systems model is still focused on three dimensions – Green Design, Green Manufacturing processes and Green Packaging (Refer to Table 1). To ensure effective implementation of the Green Manufacturing strategy, it needs to be dropped down to specifics. For the successful implementation of Green Manufacturing, the senior leadership must be committed towards the greener future on a broader and long-term perspective. The scope enhances to the other areas of value chain once the process matures in the identified areas.

> "For the successful implementation of Green Manufacturing, the senior leadership must be committed towards the greener future on a broader and long-term perspective."

Challenges encountered in going Green

Green Manufacturing can directly benefit the environment, and corporates get many benefits of getting engaged in the journey. However, there are challenges that need to be addressed through well laid-out strategy right from the organisational level to the operational level. The major challenges in implementing the Green Manufacturing are briefly discussed below.

a) *Leadership commitment:* It is extremely important to have a high level of leadership commitment right at the board-level. Although it has been established that Green Manufacturing has several long-term benefits in terms of enhanced value, it calls for investments, and hence, negative returns in the short term. There is always a debate whether Green Manufacturing is good business or a bad investment. Hence, it is important how an organisation



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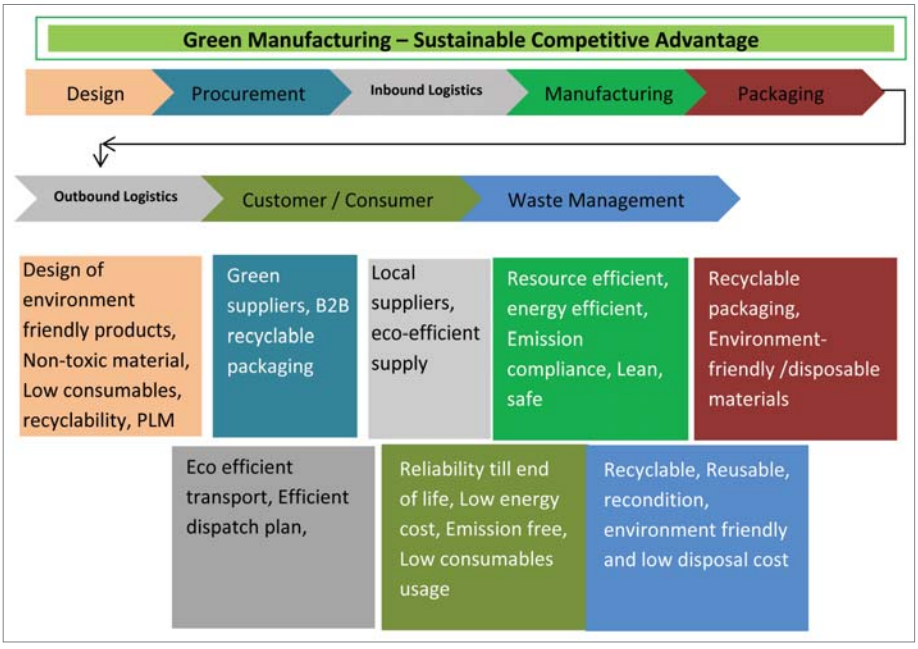

Figure 2: Green approaches across the Value chain

balances the long-term benefits of its Green strategy and the interest of the shareholders and protects their profits. Fortunately, the financial community has started realising the long-term benefits of Green Manufacturing and established pricing strategies for the Green approach, Social and Environmental externalities.

b) *Strategic outlook:* Often in organisations, the Green Manufacturing strategies are one of the operational-level strategies, which are aimed towards cost reduction, resource conservation or compliance to management systems requirements such as Environment Management Systems. It is important to integrate the concepts of sustainability and Green Manufacturing within the core strategy of the organisational value chain and the process design. This will enable the organisation to have a holistic approach towards the initiative. This will also enable them to establish metrics which will be monitored and reviewed to check for the effectiveness of implementation. Few leading business conglomerates in India have adopted such integrated framework such as Sustainable Operational Excellence or Green Cards which are enabling them to get the best of the advantages.

While it is an imperative for export-oriented companies to have a Green Manufacturing (GM) strategy, we feel that it needs to be an integral part of the organisational strategy.

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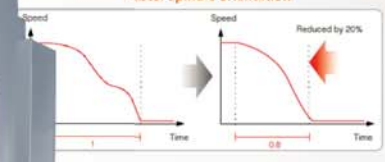

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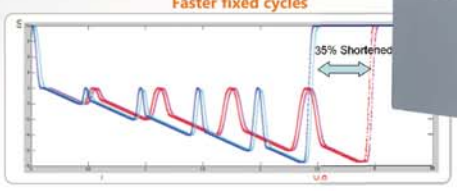

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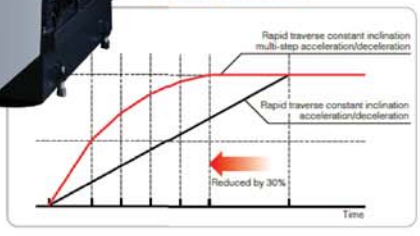

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Green approaches and benefits		
Dimension	Definition	Benefits
Green Design	Product Design philosophy treats environmental attributes as design objectives as an opportunity, and not as constraints. (not clear) It aims at incorporating the attributes without compromising on the fitness-for-use and the useful lifecycle of the product.	• Differentiated product offering to the customer • Brand image through organisational commitment towards green • Improved product lifecycle • Enhanced Customer Value Proposition
Green Manufacturing	Green Manufacturing is a method of manufacturing that minimizes the waste and pollution. In the process, it slows the depletion of natural resources while lowering the extensive amounts of bio-non-degradable waste that enter the landfills. Its emphasis is on reducing parts, rationalizing materials and reusing components to help make products more efficient to build.	• Reduced waste and harmful emission • Reduced costs through lifecycle assessment approaches and total cost of ownership • Non-renewable Resource conservation • Cradle-to-cradle design, promoting reuse, recycle and re-conditioning • Protecting environment • Systemic approach through management systems such as EMS 14001, EnMS 50001 etc. • Advancement in manufacturing technologies and processes
Green Packaging / Sustainable Packaging	Green Packaging is the use of packaging material (for goods sold) that has low impact on the environment and energy consumption.	• Using recyclable and biodegradable materials • Reusability of packaging material • Cost reduction through down-gauging • Reduced negative impact on environment through reduced landfills • Responsible solid waste management • Reduced emissions during packaging waste disposal

Source: Eco evaluator

c) *Market communication:* Organisations that have embarked on this journey often miss out in getting the best of the benefits from the Green Manufacturing drive. It is equally important to communicate to the customers and all interested parties about the Green commitment as a differentiator. This enables the organisation to bring forth the differentiated and enhanced value proposition to the customers as well as improve its brand perception.

d) *Implementing across the value chain:* Although it might be relatively easy for organisations to implement the Green Manufacturing initiatives within their own manufacturing facilities, it is lot more difficult to implement the same at the suppliers' end. Unless the suppliers have a clear line of sight, it might not be possible for them to implement the same at their end. This becomes all the more challenging as most manufacturing organisations have a highly fragmented pool of suppliers.

e) *In-house training and awareness:* In order to effectively drive the Green Manufacturing initiatives, it is important to ensure that the employees are engaged, because it calls for total employee involvement. It is therefore extremely important to enhance the awareness level of the employees through appropriate training.

"Fortunately, the financial community has started realising the long-term benefits of Green Manufacturing and established pricing strategies for the Green approach, Social and Environmental externalities."

Conclusion

Although Green Manufacturing has picked up in a number of large business houses in India, there needs to be a national level drive for creating awareness at the larger level. This will help eliminate the confusion and misunderstanding regarding its implementation, costs and benefits. A marked shift is being observed in the urban consumers' perceptions, who are now demanding products which are not only low-cost and high-quality, but that are also safe and produced with materials and processes that are environmentally responsible. This market pull will force organisations to shift towards a differentiated approach with an enhanced value proposition for the wider customer base.

In order to ensure that the Green Manufacturing strategy is successfully implemented, the leadership team must be committed and foster the culture through communicating clearly their vision of going Green. It needs to be an integrated part of the organisation's core strategy. This will help achieve the global vision to 'Go Green'.

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Considering various factors, the industry is expected to continue growing in the near-medium term with tractors, tillers and threshers continuing to account for majority of the sales.

By Ajay Tiwari

Mahindra & Mahindra's new Arjun Novo. The Company continues to dominate the tractor segment in India.
Courtesy: M&M

The Indian agricultural equipment market was estimated to be around INR 317 Bn in 2014. The industry grew at a fast pace of 17.4 percent CAGR during the 2009-13 period driven by scarcity of farm labour, the need for productivity and the adverse impact of unpredictable monsoon.

While farm mechanisation has made significant inroads in northern states like Punjab, Haryana and Uttar Pradesh, it has been limited in the Northeastern states owing to hilly terrain as well as socio-economic parameters. Among the rest of India, MP and Chhattisgarh in Central India; Maharashtra, Rajasthan and Gujarat in the West and TN and AP (undivided) in the South are increasingly adopting farm mechanisation owing to increasing awareness of the benefits amongst farmers.

Majority of equipment sales are for the heavy and intensive laborious work in the various stages of farming, with soil preparation contributing 81 percent of sales by volume and harvesting contributing to around 12 percent of sales. Among them tractors currently account for 68 percent in terms of sales volume, and almost 90 percent in terms of the Industry value.

In recent years tractors sales have been growing at 20 percent year-on-year and around 15-16 percent of the total sales are of above 48 HP. Though currently subsidies are restricted to the tractors below 30 HP, labour shortage and increasing usage of implements are expected to drive the demand for higher power tractors in the coming years. Manual threshing is gradually waning and due to this demand for high capacity bulk-fed power threshers are expected to witness significant growth going forward.

While power tillers are in demand for paddy cultivation of small land holdings, rotavators are slowly replacing them. This is primarily due to the fuel savings and efficiency that rotavators achieve in soil pulverization. The market for rotavators is growing at ~25 percent per year and is expected to be one of the better performing segments in the coming years.

Due to the practice of alternate rice-wheat cropping with less transition time between the crops in Punjab, Haryana and UP, the demand for Zero till seed drill is expected to significantly increase in the near-medium term. Among the other major farm equipment, the current market for combine harvesters and rice transplanters are relatively small. But with custom hiring model gaining acceptance, the sales of combine harvesters are expected to increase in the future.

Considering all the above factors, the industry is expected to continue growing in the near-medium term with tractors, tillers and threshers continuing to account for majority of the sales. But the overall industry growth rate is expected to come down and be at a healthy 7.4 percent CAGR for the 2014-18 period.

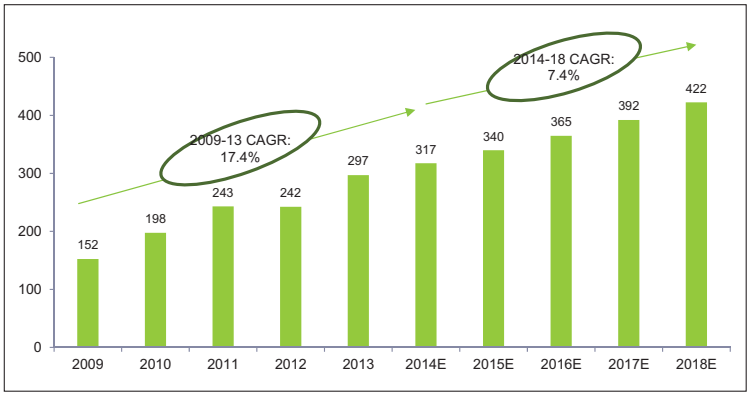

Fig 1: Agricultural equipment market size (INR Bn)
Source: TechNavio and Secondary research

Industry structure

There are around 250 medium and large scale enterprises, 2,500 small scale and 18,000 tiny units engaged in the manufacture of agri-equipment in India. While most of the manufacturers sell their equipment through dealers, State agencies play an important role in some segments.

- *Tractors :* Manufacturers -> Dealers -> Farmers

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- *Combine harvesters :* Manufacturers -> Owner users/ custom service providers
- *Micro irrigation equipment :* Manufacturers -> Dealers/ State agencies -> Farmers

The Indian tractor segment is concentrated with top five players constituting almost 90 percent of market, while 68 percent of the tiller segment is controlled by two players. However, the other farm equipment market is dominated by small and medium enterprises who account for more than 50 percent of market share. Given the dominance of small and local players in majority of the equipment types, this trend is expected to continue in the near term as the volume/ value proposition may not justify entry of major players.

While significant exports happen out of India for tractors, there are foreign players too that are setting up operations here. Some of the players are like New Holland Agriculture are expanding their operations and others like John Deere India have launched machines specially made for India, in the harvesters segment, given that it accounts for almost 40 percent of overall cultivation cost. Considering all this, the competition between the players is expected to further intensify in the future. Differentiating factors for companies would be quality, wider dealer/ after-sales service network and programmes to educate the farmers about the benefits of their products.

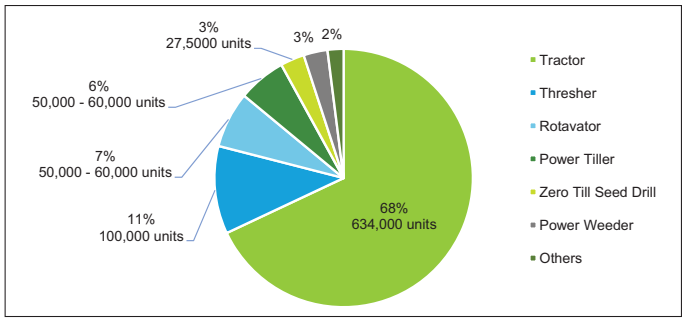

Fig 3: Volume split of select agricultural equipment sales (2013-14)

*Others include Combine harvester, Rice transplanter, Self-propelled vertical conveyor reaper, Multi crop planter, Laser land leveler

Source: Research & publications and secondary research

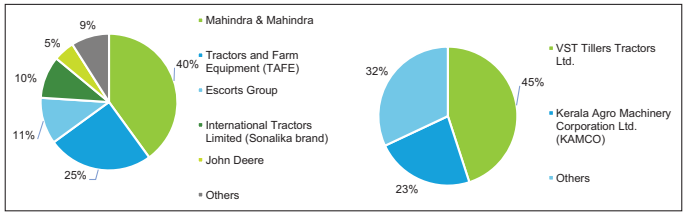

Fig 4 : Major companies and market share – Tractor Fig 5 : Major companies and market share – Tillers

*Others include New Holland Fiat, HMT, VST Tillers and other small players

*Others include Indo Farm, Chinese manufacturers and other small players

Source: Research & publications and secondary research

Small and medium players are mainly into the manufacture of threshers, rotavators, planters and zero till drill. Tiny units and village artisans focus on machinery like ploughs, spade, yokes, etc. While these units are based in agriculturally progressive states and their products are cost competitive, to scale up they would need to focus on quality and after-sales service.

Dealers shall continue to be an important link in the value chain as they would be responsible for educating the farmers about the latest technology and also assessing the local needs and requirements. State agencies and local administration too will play an important role in this industry, especially in regions where farm holding sizes are small and access to credit is poor.

Issues and challenges, recent developments and way forward

While the industry has seen good growth in the recent past, there are multiple issues and challenges that it is facing

- Unique customer requirements due to highly diverse farm size & soil types
- Viability of purchase of expensive equipment given the skewed and seasonal usage
- Driving the projects for area under irrigation given the strong correlation with equipment sale
- Access to cheap capital and total cost of ownership
- Constraints on customization and adaptation of equipment

To address some of the issues, various organisations like Central Institute for Agricultural engineering (CIAE) have developed agri implements for women farmers in hilly region, where mechanisation is not possible. Manufacturers are also focusing on local requirements, increasing the number of models aligned to the customer price point as well as exploring MNC tie-ups for specific technologies. Further, companies are also exploring business models like lease options. Given the rising income, manufacturers are also focusing on convenience features like mobile start-stop devices, GPRS, HVAC, as well as reducing the cost of ownership through fuel efficiency and driving the value proposition of high powered equipment.

Some of the aspects that may help drive the penetration of equipment and thus farm mechanisation in the country would be,

1. Easier and wider availability of credit for second-hand machines
2. Cluster based models of equipment deployment on pay for use basis, supported by Government funding at the village panchayat level
3. Driving the programs that would help improve the irrigation capability and water availability
4. Partnership between marginal farmers, local government and manufacturers to facilitate equipment adoption by developing customized solutions.

The author is Director, Deloitte Touche Tohmatsu India Private Limited.

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Key to **success**

Succeeding in the 'Make in India' environment will also require that we look beyond the shopfloor and take a supply chain view of the business.

By Alagu Balaraman

What do manufacturing companies need to do if they are to thrive in the 'Make in India' environment? They will have to worry about capital, skills and culture. Each of these has significant impact on the shopfloor where the outcomes of all these plans, both Government and corporate, will actually face reality. As we shall see, it will also require that we look beyond the shopfloor and take a supply chain view of the business.

Drive capital efficiency on the shop floor

Any form of growth needs capital infusion to support it. With more and more companies coming in, there is likely to be an increasing demand for capital. Despite a lower inflation level, this will place challenges on lowering interest rates. If so, how efficiently a company uses capital will be key in deciding its ability to succeed and grow.

Our work in CGN, across various manufacturing industries, has shown that there are tremendous opportunities to improve capital efficiency in Indian shopfloors. This could be a loss of capacity or lowered productivity. Capacity is lost for a variety of reasons: material non-availability, labour non-availability, re-work, machine downtime for maintenance or power outage. These are areas where too often we set our standards too low. In one case, we estimated that there was a 30-50 percent capacity increase possible, with little or no investment. By utilising this capacity the company had a potential to drive up EBIT by as much as 8-10 percentage points. This will encourage investors to pump more money in the company and will reduce the need for delayed growth because new capacity has to be installed.

Another area of capital blockage in our shopfloors is in inventory. While working capital may be funded by banks, it is not an efficient use of that capital. One company looked at a program to release capital deployed in inventories to create new productive assets. So, on the one hand reducing inventories allowed faster response to the market and reduced space requirements. On the other hand, the same funds could be moved to creating new productive capacity and supporting growth.

Working with partners along the supply chain will be critical to drive capital efficiency. No matter how good 'my shop' is, it will be affected if my supplier is irregular or of poor quality. Similarly, it will be thrown off if the customer is inaccurate in ordering. Capital efficiency cannot be attained in isolation, but only if we reach out and work with our business partners in the supply chain. The concepts of supplier collaboration are well know, but very poorly executed. Small changes in these areas can lead to significant improvements.

*By **Alagu Balaraman,** Partner & Managing Director – Indian Operations CGN & Associates India Pvt Ltd*

"No matter how good 'my shop' is, it will be affected if my supplier is irregular or of poor quality."

Skills cannot be easily bought

Often the pace of growth of any company or manufacturing facility is limited by the ability to staff people. Not just any people, but skilled people. Unfortunately, skilled people cannot be cloned. It takes time for a person to develop and build the experience and expertise that is so valuable to driving the productivity increases discussed in the last section.

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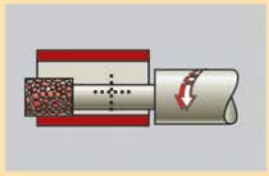

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FIGT-300 CNC
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FIGE-150 CNC
ID / OD GRINDER

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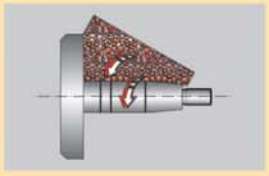

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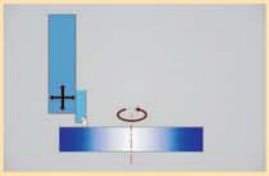

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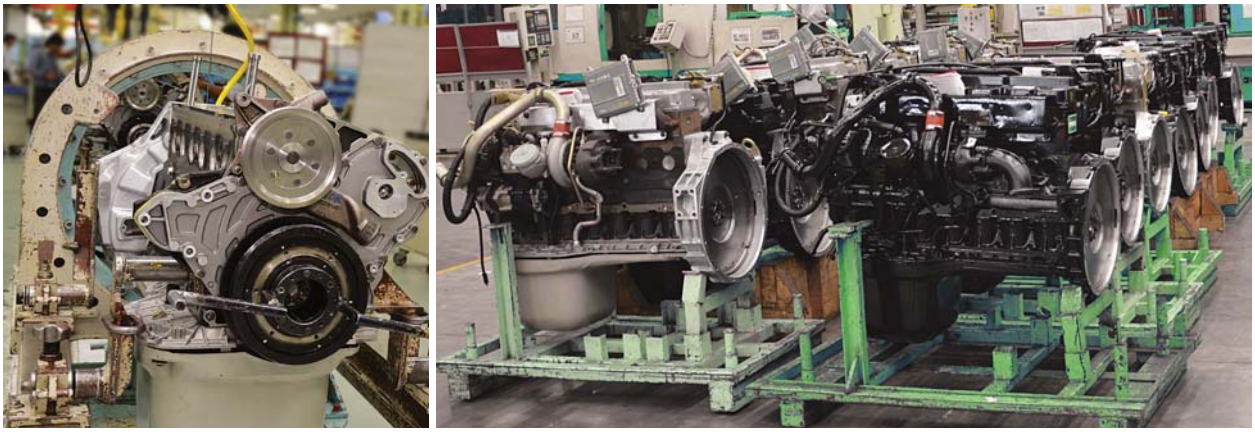
hire people, but this usually only benefits the people being hired. While they get a higher salary, there is no guarantee that they will be able to deliver the results being sought. Each manufacturing unit is relatively unique, if not because of the machines, but because of the other people and ways of working that are followed.

What can companies do about this? Focus on people development by tasking senior manufacturing people with the responsibility of oversight, rather than leaving it to the HR department. Develop and invest in programs to accelerate learning of people who join, at all levels and not just at the shop floor. This can be done by a combination of short-term assignments done in parallel with regular work and structured communication on processes being followed. Finally, include step function improvements by bringing in external skills and meshing them with internal teams and give them goals to drive improvements.

What are the critical areas of shortfall in skills? Most companies focus a lot of the training on manufacturing methods. However, manufacturing management and supply chain planning methods usually fall short. The impact of poor design and planning is to drive up the need for headcount and actually makes it more difficult to improve skill levels. The converse is also true. By increasing skill levels in management and planning it is possible to drive up productivity and reduce the number of people needed. This makes it easier to get a better profile of people and to continue to train them better.



Reducing inventories allows faster response to the market and also reduces space requirements.

Going beyond skills and changing culture

In a conversation with the head of a reputed manufacturing unit, we were discussing about the difference between skilled people and the culture of a shop. He was explaining to me that a shop with a strong and established culture will be able to provide high levels of performance even when new people join or existing people leave. An example of this is a company like Toyota, which even allows people to come and study what they do. You can buy the same machines, you can convince people to join, but you will find it very hard to get the same results because the culture is unique.

How can you create a culture on the shopfloor? Culture forms with repeated behaviour. Behaviour is driven from the top. Whatever a person is 'told' to do, formally or informally, they will pick up cues on what the senior leadership actually values. Is it more important to solve a problem in a systematic and sustainable fashion? Or is it more important to get the problem out of the way 'somehow'? Is it important that machines are running or is it more important that there are matched sets that can be shipped to customers? Does the leadership appear for every daily meeting and get involved in the discussions or are they 'called' by the corporate office?

This can also be seen in how the leadership views the shop itself. Is it a standalone entity or is it a part of a chain that delivers products to the end customer? If the leadership conducts daily shop visits, how often do the leaders walk through a supplier's shopfloor? Or do they meet with the leaders at the OEM or dealer end to discuss possible improvements in how to work together? If a wider and supply chain viewpoint is taken by the leader, the better the impact on the culture of the organisation. These are things which help to set up and develop a culture of excellence and once that gets established, it is very hard to copy.

In conclusion: It works even otherwise!

As a program, 'Make in India' has the potential to trigger a surge of growth in manufacturing in India. This is a potential wave that manufacturing companies can ride. However, it will also increase competition both in the marketplace and for scarce resources. Taking a wider supply chain view and driving improvements on capital efficiency, skills and culture can help companies thrive in this environment. The best part is, these capabilities will help companies thrive irrespective of what the Government does.

The author is Partner & Managing Director – Indian Operations, CGN & Associates India Pvt Ltd

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Demand to **pick up**

Increasing application of tractors for non-farm operations like infrastructure and construction projects, and better crop realisation clubbed with continued government support and increasing farm labour costs are key growth drivers of tractor industry, says a recent ASSOCHAM study.

Karnataka had emerged on top with highest compounded annual growth rate (CAGR) of over 18 per cent in terms of tractor sales registered during the eight year period of 2004-05 and 2011-12 and remained the only state to have registered higher growth than all-India level (16 per cent), according to a recent ASSOCHAM study.

"However, Karnataka is suffering from poor tractor penetration of just about three per cent," noted the study titled 'Future Outlook for Demand of Tractors in India,' conducted by The Associated Chambers of Commerce and Industry of India (ASSOCHAM).

"Haryana and Punjab remained on top with highest tractor penetration of about 27 per cent in both the states followed by Uttar Pradesh (23.5 per cent), Bihar (20 per cent) and Odisha (12 per cent)," highlighted the study prepared by the ASSOCHAM Economic Research Bureau (AERB).

Tractor production in India has grown at a CAGR of double digits (10 per cent) during decadal period of 2001-02 and 2012-13, noted the study.

Clocking a compounded annual growth rate of over 26 per cent during 2003-2013, India had registered third highest growth in exports of tractors after Poland (31 per cent) and China (30.5 per cent).

However, tractor penetration in India is very low and that might encourage potential demand for tractors. "Demand for tractors is heavily dependent on agriculture production and level of monsoon received, thus with forecast of normal Monsoon this year production, demand and sale of tractors might improve in the latter half of this year," said D.S. Rawat, National Secretary General of ASSOCHAM.

India might get normal monsoon rainfall at 102 per cent of long-period average during June-September this year," noted a recently released ASSOCHAM-Skymet Weather joint study.

"However some pockets that might be deficient (by a narrow margin) include Himachal Pradesh, Punjab, Haryana, Uttarakhand, Marathwada, Rayalseema, South Interior Karnataka, North Tamil Nadu and parts of the North East," noted the study titled 'Monsoon 2015: Agri-business Risk or Opportunity,' conducted by ASSOCHAM and Skymet.

> "Demand for tractors is heavily dependent on agriculture production and level of monsoon received, thus with forecast of normal Monsoon this year production, demand and sale of tractors might improve in the latter half of this year."
>
> **D.S. Rawat,**
> National Secretary General of ASSOCHAM.

Growing at a compounded annual growth rate (CAGR) of over 20 per cent, the domestic tractor industry (in volume terms) is likely to cross eight lakh units by the end of this fiscal. Increasing application of tractors for non-farm operations like infrastructure and construction projects, transportation, haulage and better crop realisation through higher minimum support prices (MSPs) clubbed with continued government support through increase in budget outlays for agri sector and increasing farm labour costs due to scarcity are key growth drivers of tractor industry.

Apart from being used in farming and crop cultivation, tractors find application in activities like harvesting, canal irrigation, land reclamation, drawing water, powering agricultural implements and serves as a multi-utility vehicles, this has expanded the domestic tractor market.

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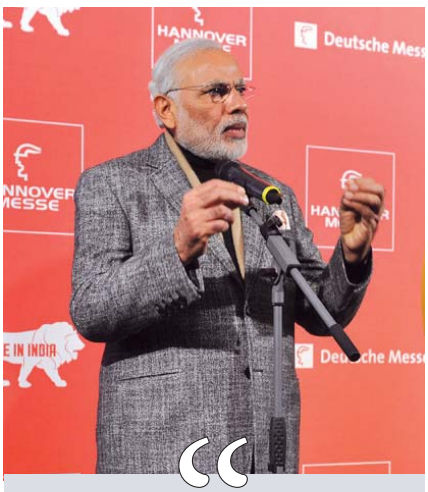
Showcasing **India's potential**

India's participation in Hannover Messe 2015 had been engineered to amplify its clarion call to the world—'Make in India'

In what stands as the most significant international statement the Make in India program has made to date, the Prime Minister of India, Narendra Modi delivered an inspiring address to a confluence of over 300 top global leaders in business, technology, industrial scientists and policy makers at the gala opening ceremony of Hannover Messe, the world's largest industrial fair. Reasserting his vision to transform the country into a global investment destination and manufacturing powerhouse, the Prime Minister of India, Narendra Modi said, "Whatever we choose to do, from reaching the cutting edge of industry to meeting the most critical social need, we require investment and technology, industry and enterprise. That is why for me, Make in India is not a brand. Nor is it simply a slogan on a smart lion! It is a new national movement. And, it covers the whole spectrum of our government, society and business," while inaugurating the Hannover Messe 2015 with the Chancellor of Germany Angela Merkel.

India's participation in Hannover Messe 2015 had been engineered to amplify its clarion call to the world—'Make in India' and this was echoed by German Chancellor Angela Merkel's address "This year, the focus is on one country in particular. India is the partner country of Hannover Messe for the second time since 2006. And we have already been able to experience that India is presenting itself with new strength." at the Hannover Congress Centrum which saw a 3000 strong audience.



> If we want to fulfill the dreams of our youth, we must turn our industry into a manufacturing hub for the world and an engine for employment at home."
>
> **Prime Minister Narendra Modi**

Outlining his governments' resolve to accelerate economic growth and create jobs for our youth; to build world class industry and infrastructure; to transform cities and villages; clean up the environment; and improve quality of life, the prime Minister stated that "We will naturally pursue our goals on the strength of our own resources, skills and enterprise. But, we know that we will be more successful when we do this in partnership with the world. For people in India, Germany is a valued partner; and, an enduring symbol of technology and innovation, quality and productivity."

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India's tremendous demographic dividend, he attributed the renewed interest worldwide in building partnerships of trade, investment and innovation in India to its vast pool of young empowered citizens with unstoppable entrepreneurial energy. The Prime Minister added that "It mirrors the surge of hope in our own people and industry; the new tide of expectation in our 800 million youth – for opportunities and progress. And, if we want to fulfill the dreams of our youth, we must turn our industry into a manufacturing hub for the world and an engine for employment at home." With the world's fastest-growing working-age population, India is set to be the world's talent base. The demographic dividend section of the India Pavilion inaugurated by PM Modi and Chancellor Merkel, detailed India's skill-building initiatives, skill demand and employment projection for 2022.

India's participation at Hannover Messe was not only aimed to pave the path for transformation of the world's largest democracy into the world's most powerful economy but also to present a unique perspective of India as a vibrant, dynamic modern India with its traditional culture and roots intact. Official partner country India wove its heritage, cultural diversity, and accomplishments in technology and enterprise into an immersive multimedia performance.

The information design of India's pavilion at Hall No. 6 of Hannover Messe depicted the economic potential of the country's most fertile sectors including IT & BPM, industrial corridors and smart cities and the demographic dividends it hopes to reap. A prominent section had been dedicated to Indo-German alliances, potential avenues for partnership, and initiatives to harmonise the interests of both nations. Major national programs such as Skill India and Digital India have also been represented. The India pavilion charts India's economic road map for the next decade.

Evoking India's great poet and philosopher, Rabindranath Tagore's famous lines, the Prime Minister said that Germany has done more than any other country to open India to the Western World. India and Germany can collaborate and gain from each other's experience and expertise in leading-edge technology and services. Engineering, environmental technologies, infrastructure, electronics, renewable energy, water and food processing are some of the sectors that hold tremendous promise of cooperation. "For people in India, Germany is a valued partner; and, an enduring symbol of technology and innovation, quality and productivity," he added. German Chancellor Merkel also stated in her encouraging remark that "The trade volume with India is a good foundation to further develop our economic contacts. It amounts to 16 billion euros, making Germany India's most important trade partner in the European Union. Of course, we want to remain in this position."

Urbanisation & infrastructure

Urbanisation is now a global megatrend and by 2050, around 64 percent of the developing world and 86 percent of the developed world is expected to be urbanised. Rapid urbanisation is putting a strain on the infrastructure, environment and social fabric of cities. The new Indian government has taken cognisance of this accelerating expansion. Investments required to stabilise, augment as well as build a robust urban infrastructure are at the forefront of the government's current agenda.

This was echoed in the inaugural address at a seminar on 'Smart Cities - The Urban Challenge' by Amitabh Kant, Secretary, Department of Industrial Policy and Promotion (DIPP), Government of India, where he said, "One of the key challenges for India to grow at 9 to 10 per cent per annum is the challenge of urbanisation." He further remarked that according to a recent study, India will have 700 million people getting in the process of urbanisation by 2050 and therefore the challenge for India is to create two and a half Americas by 2050 and do it in a far more innovative and sustainable manner.

Further elaborating on India's urbanisation journey, Kant said "The process of urbanisation has ended in America, has ended in Europe and nearly ended in China. But urbanisation has just started in India. India is growing at a rate of 6.5 per cent and in two years time we are aiming to achieve nine to ten per cent growth rate. India is an oasis of growth in a barren economic landscape."

Drawing the attention towards development of industrial corridors in India and the challenges and opportunities therein, Kant said, "Lastly, India is building many industrial corridors.

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It takes 14 days for goods to reach from Delhi to Mumbai but in 2018 beginning goods will reach in 14 hours. The kind of infrastructure being created hasn't happened anywhere else in the world. Indian policymakers are taking proactive steps in transforming their traditional city models and infrastructure for a balanced overall growth and are looking to achieve 'more with less'."

Stressing on the future significance of smart cities, Kant said, "It's not the states that will drive India's growth but the cities. Cities account for just 3 per cent of the total landmass however they contribute to almost 75 per cent of the GDP generated. They also account for two thirds of the greenhouse gases generated. The challenge therefore is not just building these green-field cities but improving the existing ones and making them more efficient. Many lessons in this area come from the Eastern part of the world and not from the Western part of the world."

Important MoUs signed

In addition to the one signed between FICCI and Hannover Milano Fairs India for creating a relevant platform on Smart Cities, six more MoUs (Memorandum of Understanding) were signed by Indian public sector companies today at Hannover Messe 2015 to enhance cooperation with global firms, during a special event organized by Engineering Export Promotion Council of India (EEPC) at the India Pavilion.

The MoUs, signed by companies under Department of Heavy Industries, consisted of tie-ups between Bharat Heavy Electricals Ltd. (BHEL) India and Russian Joint Stock Company, INTMA for upcoming projects in Russia and Kazakhstan, Rajasthan Electronics & Instruments Ltd. (REIL) and Milkotronics Ltd., Bulgaria for manufacturing milk analyzers in India, Instrumentations Ltd and KE Kauer Engineering, Germany for production of control valves, and three MoUs by Hindustan Machine Tools (HMT) with Num Controls, Switzerland for manufacturing of CNC controls, systems and drives; FT Machine Tools, Germany for collaborating on flow forming machines and Enit GmbH, Germany for total engineering solutions.

Sigmar Gabriel, Federal Minister for Economic Affairs and Energy and Vice Chancellor, Germany visited the pavilion of the official partner country - India at the Hannover Messe 2015 today where Nirmala Sitharaman, Minister of State (Independent Charge) for Commerce & Industry, Government of India and Amitabh Kant, Secretary, Department of Industrial Policy & Promotion, Ministry of Commerce & Industry, Government explained the Make in India vision. He took keen interest in the installations showcased by India to explain key facets of Make in India that make India the destination for investment and manufacturing.

Fostering India's skilling challenge

The day three of India as the Partner Country of Hannover Messe 2015, India continued to showcase 'Make in India' by discussing India's need for skilling and Heavy Engineering & Motion Drive and Automation and the potential that India presents.

Referring to India's challenge of skilling its large base of unskilled workforce, Pawan Agarwal, Joint Secretary, Ministry of Skill Development and Entrepreneurship, Government of India said, "98 percent of our workforce does not have any skilling whatsoever. The Government of India's expectation from this Ministry is take up skilling at a very large scale." He said this in the expert seminar on Skill Development titled: India-Germany: Towards a Strategy "Skilling India" organised by CII along with the Ministry of Skill Development & Entrepreneurship and Ministry of Labour & Employment, Federal Ministry of Education and Research (BMBF) and Association of German Chambers of Industry and Commerce, DIHK.

He shared that the most crucial insight gathered by the Ministry since its inception is about providing skills for jobs. He said, "Each job has a role that is defined by the industry which will ultimately employ. We have to provide a curriculum on that job role. This has to be done very rapidly and at a massive scale." Referring to the National Skill Development Corporation, Mr Agarwal said, "We have inherited a very strong skilling ecosystem that can deliver skilling at a much bigger scale than earlier thought of."

Deep Kapuria, Chairman of the Hi-Tech Group of com-

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panies referred to the ongoing discussion about how Make in India is not about protectionism but about partnership and collaboration across the value chain. He further added, "This can only come through if there are skills and competencies within the whole system. Then it would be possible to do what the aspirational issue of moving the manufacturing GDP from 15 percent to 25 percent." He furthered referred to successful skilling programmes of Bosch and Daimler in India.

Dr Volker Treier, Deputy, CEO, Association of German Chambers if Industry and Commerce, DIHK Germany said, "The Indo-German Chamber in Mumbai, will become a showcase of Vocational Education and Training (VET) to become a reference point of how it can be strengthened in India." He further added that Germany will guide and support India in building this system of dual education based on the unique requirement of the country.

Shankar Aggarwal, Secretary, Ministry of Labour and Employment, Government of India said, "We have taken a

resolve that we will change all our labour laws." He also highlighted the need to take into account the safety and security of workers while doing so. He also said, "We are taking away the rigidity from the labour laws so that people can set up their enterprises without any hassle."

Additionally, he emphasised the need to envision the jobs that will be created in the near future and align the skill set with this requirement.

EEPC India, the lead agency for partner country - India's participation at Hannover Messe 2015, organized a seminar on "Heavy Engineering & Motion Drive and Automation" jointly with Department of Heavy Industry, Government of India and German counterpart VDMA, to support the Indian government's drive for promoting major investments in infrastructure, energy, transport and industrial manufacturing.

Rajan Katoch, Secretary, Department of Heavy Industry, Government of India conveyed the 'Make in India' vision to augment India's position as a leading export hub. Talking about the 100 percent FDI facilitation for companies entering in the heavy engineering and capital goods sector, he said, "With the GDP of India growing at 7 percent, there is a need for capital goods in all areas where manufacturing is a focus at present. Motion, Drive and Automation (MDA) is the new center for technological development in the heavy industries area."

The vision of Digital India

On the fourth day, as the Partner Country at Hannover Messe 2015, India focused on Indio-German collaboration on Digital India. Experts in the domain from both India and Germany participated in an in-depth discussion on the opportunities that India presents in its journey to become a digitally empowered nation.

The Seminar on Digital India was jointly organised by CII, Department of Electronics and IT (DeitY), Ministry of Communications & Information technology, Government of India and ZVEI - German Electrical and Electronic Manufacturers' Association. It explored the approaches of how government and industry can partner to implement the "Digital Presence" on the ground by creation of compelling digital strategies and services and how emerging trends and technology imperatives can impact the lives of its citizen. Favoured with government policies, burgeoning market for local consumer electronics and telecom products and availability of skilled labour, there is a renewed thrust to attract investments to boost the Indian EDMS (electronic document management system) industry.

R S Sharma, Secretary, Department of Electronics and IT (DeitY), Ministry of Communications & Information technology, Government of India and UWE Beckmeyer, Parliamentary State Secretary, German Federal Ministry for Economic Affairs and Energy was present at the Opening Session.

Speaking to an audience comprising members of both Indian and German industry, Rajendran Kumar, Joint Secretary, Department of Electronics and IT (DeitY), Ministry of Communications & Information technology, Government of India shared the vision of Digital India. He reiterated the areas where there are opportunities for India and Germany to collaborate towards India's aim to provide access to broad band to every citizen, ensuring the cyberspace is made safe and secure, integrated services and digital empowerment of Indian citizens.

The Seminar looked at International Best Practices and Case Studies of implementation of a transformative digitisation campaign that has ensured reach of citizen-centric services to the masses. Speaking at the Seminar, R Chandrashekhar, President, Nasscom said, "There are 27 German companies in India in the IT sector. All of these companies are doing cutting edge work in India. Therefore, as India aims at Make in India and Germany at Industry 4.0; utilising the huge base of German companies is a great opportunity to move forward."

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Bosch is pooling its motorcycle activities from the areas of riding safety systems, powertrain technology, and display instruments into one business unit, the newly formed "Two-Wheeler and Powersports."

Great **beginning!**

The Bosch Group has made a good start to 2015. In Q1, sales grew by roughly 13%.

The Bosch Group has made a good start to 2015. In the first quarter, sales grew by roughly 13 percent. After adjusting for exchange-rate effects, the increase was 5.4 percent. For the current fiscal year, the global supplier of technology and services expects its sales to grow 3 to 5 percent after adjusting for exchange-rate effects. Because these effects are considerable, Bosch expects its nominal sales growth to be higher than this range. Presenting the annual financial statements in Gerlingen, Germany, Dr. Volkmar Denner, the Chairman of the Bosch board of management, said: "Our economic and technological strength in our established fields of business allows us to open up new market segments." Internet-enabled products and internet-based services are one of the focal points of the company's future sales growth. "We are driving connectivity forward in all our business sectors and playing an active role in shaping it," Denner added. In 2014, Bosch launched many new products and connectivity solutions. They include web-enabled ovens and software solutions for connected heating systems and buildings, as well as for connected industry and connected mobility.

*By **Dr. Volkmar Denner,** Chairman of the board of management of Robert Bosch GmbH*

"Our economic and technological strength in our established fields of business allows us to open up new market segments."

Business developments in 2014:

In 2014, product innovations again helped Bosch to further improve its market position in many areas. In the past business year, the company increased its sales by a nominal 6.3 percent to 49 billion euros. Adjusted for exchange-rate effects, growth was 7.4 percent. As a result of negative exchange-rate effects to the tune of some 500 million euros, the temporarily strong euro had a considerable impact on the sales figure. This strong development of sales also contributed to an improved result. Earnings before interest and taxes (EBIT) rose to 3 billion euros last year –

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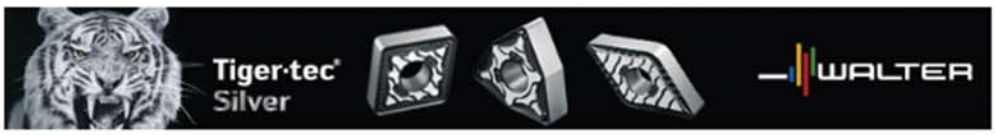

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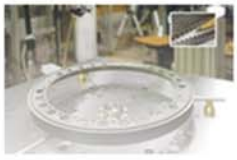

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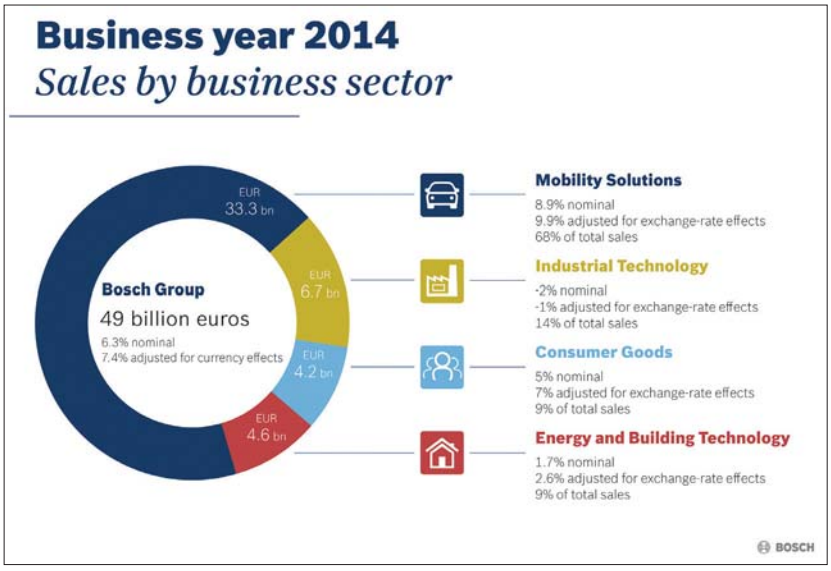


The Bosch Group increased its sales by 6.3 percent in 2014, to 49 billion euros.

a year-on-year increase of roughly 10 percent. Bosch thus disclosed an EBIT margin of 6.2 percent in 2014. This is roughly one percentage point better than the value for 2013, adjusted for one-off and extraordinary effects.

"Our rigorous work on costs also played a part in this significant improvement in result. In 2014, we were successful despite only moderate global economic growth," said Dr. Stefan Asenkerschbaumer, the Bosch Chief Financial Officer and Deputy Chairman of the board of management. Following the complete takeover of BSH Bosch und Siemens Hausgeräte GmbH (now BSH Hausgeräte GmbH), the supplier of technology and services has strengthened its position in the area of smart homes. And with the acquisition of ZF Lenksysteme GmbH (now Robert Bosch Automotive Steering GmbH), Bosch has added to its portfolio in the growth area of automated driving.

Highlights

- Growth targets **surpassed in 2014**, despite difficult environment
- **Sales growth** in all **business sectors** and **regions**
- Sales expected to rise by **3 to 5 percent** in **2015**
- Increasing importance of **software competence**
- **15,000** software engineers, **3,000** for the internet of things

Mobility solutions for tomorrow's traffic

For Bosch, automated driving is a significant area of growth. The company is successively launching new driver assistance systems. For example, 2015 will see the start of series production of remote-controlled parking, the traffic jam assist, and an assistance function for evasive maneuvers and turning against oncoming traffic. In the Mobility Solutions business sector, more than 2,000 engineers are working to make the auto pilot for drivers a reality. When it comes to the mobility of the future, Bosch is not only concerned with automation, but also with connectivity and electrification.

As of now, the company has received 30 orders relating to electrical powertrains. Each year, Bosch invests nearly 400 million euros in electromobility, not least in further developing battery technology. "We were instrumental in the success story of the diesel. We want to do the same for the electrical powertrain," Denner said. One key to the market success of electrical powertrains is their suitability for everyday use. For example an app developed by Bosch gives drivers access to a network covering 80 percent of all web-enabled charge spots in Germany. For users, this means that recharging their electric vehicles is easy.

Today, Bosch sees itself as a supplier of mobility solutions that cover more than just the car. In 2014, systems such as gasoline and diesel direct injection were once again extremely successful. Increasingly, they are being joined by software solutions and mobility services. "Connectivity makes completely new solutions possible for the multimodal traffic of the future. And in established areas as well, it will play a significant role in creating customer benefit and conserving resources," Denner said. Last year, for example, Bosch debuted connected electronic engine management systems for two wheelers. Riders can use their smartphones to read and evaluate vehicle data.

Growing significance of software competence

In the connectivity business, there is a new "3S": sensors, software, and services. Bosch is the globally leading manufacturer of micromechanical sensors, more commonly known as MEMS sensors. This year, it will manufacture 1.6 billion such "sensory organs," nearly 25 percent more than in the previous year. Moreover, for some years now, the technology company has been expanding its software competence. Today, one in three of the 45,700 associates working in research and development is a software engineer. Three thousand engineers are working on the internet of things alone. "For Bosch, software expertise is a key competence for the future," Denner said. "Embedded software is already one of our strong points, and we are successively adding to this with IT software know-how." Only recently, Bosch acquired the connectivity specialist ProSyst, a supplier of gateway software and middleware. In smart homes, ProSyst software acts as an interpreter for the devices of different manufacturers.

Bosch is working on some 100 projects related to connected solutions in its own plants. *Pictured: associates working in the area of Industry 4.0 at the Bosch plant in Blaichach.*

Bosch IoT suite: platform for the internet of things

One central software platform for the internet of things is the Bosch IoT suite. It orchestrates communication and data exchange between web-enabled objects such as factory machinery, heating systems, and security cameras. The Bosch IoT suite can also analyze and process the kind of big data generated in areas such as connected manufacturing. Bosch also makes parts of its IoT suite accessible for open-source developers. "Our IoT suite is meant as an invitation to participate. In shaping the connected world, we put our faith in open solutions, since we believe they will drive forward the manufacturer-independent networking of devices and machines," said Denner, whose responsibilities on the Bosch board of management include research and advance engineering.

> Today, Bosch sees itself as a supplier of mobility solutions that cover more than just the car. In 2014, systems such as gasoline and diesel direct injection were once again extremely successful.

A multitude of services on the internet of things

According to Denner, the business potential of the internet of things lies above all in the services that can be derived from connectivity. "Bosch is in equal measure a supplier of technology and services, and both are an advantage for us in the connectivity business." Even today, Bosch offers a wide range of service solutions for many industries and customers. For example, its Security Systems division offers telematics services such as eCall for 500,000 vehicles in 16 languages. By the end of 2015, Bosch will have facilitated the connectivity of some 100,000 vehicles for the fleet management of leasing and insurance companies. At the Hannover trade fair, Bosch presented its remote service manager. In connected manufacturing, it makes the remote maintenance of machinery possible.

Data security and data protection

With growing connectivity, there is also a growing demand for data security and data protection. "The decisive factor for the widespread acceptance of connected solutions will be data protection, and thus people's trust," Denner said. In this context, the Bosch CEO called for rapid adoption of the EU General Data Protection Regulation. "Both legally and technologically, there is still much to be done to make Europe truly ready for the internet of things." In the area of data security, the company is already in good shape. Bosch employs more than 100 associates who specialize in secure data transfer. The company operates a center of competence in which it brings together relevant know-how in areas such as cryptographic methods and the management of certificates.

The business year 2014 by region and business sector

Asia Pacific: growth region number one: In Asia Pacific, Bosch grew its sales 17 percent (19 percent after adjusting for exchange-rate effects) in 2014, to 13 billion euros. At just under 27 percent of total sales revenue, the region's share of sales reached a new high. Sales growth was especially strong in China, rising a nominal 27 percent to 6.4 billion euros.

Americas: significant growth in North America, difficult en-

vironment in South America: The Group's business in North America developed very well, growing 8.6 percent to 8.5 billion euros. Adjusted for exchange rates, the increase was as much as 9.3 percent. In South America, weak automotive production and weakness of the Brazilian real had a negative effect on sales developments. At 1.5 billion euros, sales were down by an exchange rate-adjusted 4.4 percent on the previous year. In nominal terms, the drop in sales was 13 percent.

Europe: economic situation remains difficult: Despite an economic situation that remained difficult, Bosch increased its sales in Europe by 2.1 percent to 26 billion euros. Adjusted for exchange-rate effects, growth was 2.5 percent. The region thus accounted for 53 percent of total sales. In Germany as well, sales were up year on year, at 10.8 billion euros.

Mobility Solutions: growth twice as fast as the market: The Mobility Solutions business sector was once again able to accelerate its rate of growth. Sales rose 8.9 percent (9.9 percent after adjusting for exchange-rate effects) to 33.3 billion euros. Bosch thus grew twice as fast as the automotive market. The business sector's EBIT was 2.4 billion euros, and its EBIT margin 7.2 percent. Without one-off and consolidation effects, the year-on-year improvement in operating result is roughly 0.9 percentage points.

Industrial Technology: back on a growth path: In 2014, the Industrial Technology business sector's sales amounted to 6.7 billion euros, a nominal 2 percent below the previous-year level (1 percent after adjusting for exchange-rate effects). This slight drop is due to a weak market, as well as to the divestment of the sector's pneumatics business in early 2014. Excluding this consolidation effect, sales increased by 2.5 percent, and 3.6 percent after adjusting for exchange-rate effects. All in all, Industrial Technology improved its EBIT to 67 million euros.

Consumer Goods: market leader in power tools: Encouraging growth was posted by the Consumer Goods business sector. Its sales grew 5 percent to 4.2 billion euros, or 7 percent after adjusting for exchange-rate effects. Last year, the business sector generated EBIT of some 550 million euros and an EBIT margin of 13.1 percent. Its EBIT included the pro rata after-tax profit of the BSH Bosch und Siemens Hausgeräte GmbH joint venture.

Energy and Building Technology: enhanced competitiveness: In 2014, the Energy and Building Technology business sector increased its sales by 1.7 percent (2.6 percent after adjusting for exchange-rate effects), to 4.6 billion euros. Its EBIT came to some 170 million euros. EBIT margin stood at 3.7 percent.

Headcount: 12,000 new hires this year: In 2015, Bosch plans to take on some 12,000 graduates worldwide, 1,200 of them in Germany alone. Total Bosch headcount grew by some 9,000 in 2014, to 290,000. Following the integration of the former fifty-fifty joint ventures BSH Bosch und Siemens Hausgeräte GmbH and ZF Lenksysteme GmbH, the Bosch Group now employs roughly 360,000 associates (as per April 1, 2015).

Ushering the era of **Smart Machines**

EMAG India will gradually enhance its smart machine family to help its customers to reduce the cost per piece with the modular machine concept across machining operations, says **Andreas Zieger,** Director of the Company

One answer is our new product strategy with the smaller, flexible smart turning machines, which are more affordable, are nice compact and very flexible to change parts or scale the production up during later stages."

Andreas Zieger, Director, EMAG India Pvt. Ltd

How would you describe the current market scenario vis-à-vis the situation before Imtex 2015? Do you see growth coming back?

Using a picturesque language, I feel like in a starting area of a car race, where everyone is waiting for the shot and where the participants are wondering why nothing happened so far and from the speakers you here, 'more patience please'. Yes the expectation was high, visitors streamed in thousands but business was not yet that big. On the other side I have to agree that the focus is on the industry and that a change will not happen overnight.

Some movements on the baselines, like the tax system or the reduction of entry hurdles, are recognisable, not all to the high expectation, but it shows that critical points were recognised and one has tried to improve it. On the other side I see that the government is making a good international marketing and that brought the focus back on India from the international sourcing world and in addition the Indian suppliers gain confidence to approach international markets.

How would you describe the evolution of the Indian customer? What are the key driving factors for machine tool buyers in India and how are you addressing the same?

With the new self-confidence and the drive to develop the future and also the focal points of the government on technology and local production in an international competition I see that topics like automation in the production process, updating of the technology and quality topics come up much more, which gives us a chance to show our competence. It is still a price sensitive market but the understanding that quality has a price is more visible. And in that direction flexibility, lifetime of machines and at the end total production cost against only the initial investment are more often discussed. Also the financial instruments like leasing and financing are more often discussed, which shows the shift to the total cost consideration.

Which customer segments are you focusing on?

EMAG stands for manufacturing systems for precision metal components. The focus for us is the automotive industry with its parts in transmission, engine or steering and its quantities and the demand on short cycle time and quality, what we are capable to fulfil.

Buying the right machine is one thing and using that machine optimally is another. This can be particularly true in case of new customers. How you are helping customers use your machines more effectively?

Our customised solutions are developed around the customers' part from the single technology machine till to the whole line. With our trained local service team we install the machines and help the customer to set it up and here we also put effort in a good training. On the other side we have customers who know the machines already and they can buy our smart machine out of the catalogue. Here we offer services to tool up the machine and offer optimisation support of the production process. That is all tailor-made according to the need of the customer. If the machine is then running to the optimum we have an excellent after sales service team. And here we support the customer with preventive checks also possible with AMC till to fast support in case of failure in the process.

But the most important thing in my eyes is to have a machine or tool which is sturdy, well designed and self-controlled to minimise the impact of misuse. And together with a regular small maintenance effort our machines have shown very long life time.

PM Modi has urged that 'Make in India' is a national movement and not just a slogan. How are you contributing to this campaign?

At the moment we change from a pure trading company to an assembly unit. We will indigenise our products and thus contribute to that movement. On the other side is our core business targeting in the same direction and is supporting the production plants for precision metal components. And if that movement is showing success we can say we helped and like the whole country we will benefit from it.

SMEs form a major portion of Indian manufacturing sector. However, their buying power is limited. How are you reaching out these customers?

One answer is our new product strategy with the smaller, flexible smart turning machines, which are more affordable, are nice compact and very flexible to change parts or scale the production up during later stages. On the other side we have a strong application team to support initial set up and calculations and at the end we have interesting financing partner to reduce the upfront investment. All that targets to support the SMEs. And coming from Germany I know that a strong wide base of SMEs is a solid ground for the prosperity of a country.

On having a Technology centre in India

"I think you have to distinguish between show and benefit for the customer. Our focus is here to have skilled people close to the customer instead of an outdated show room with anyhow not the right technology. The nature of our product portfolio requires also a more international centralised approach. Sample production of laser parts or electrochemical manufactured parts cannot be made everywhere, but the modern, global world is also not making it necessary to have it 50km around the corner.
We have international tech centers and expert teams to develop optimal solutions with our customer and prove the process capability. On the other side we realise that the customers become more skilled too and do not ask for simple turning tasks but need detailed technology support that starts with deep theoretical sound knowledge and ends in complex sample production in challenging material. For our customer I see our educated sales and service force and the global technology hubs the right mix for the future."

Have you launched any new product recently?

The smart turning machine concept is introduced during IMTEX 2015 and has with the vertical pickup machine concept significant advantages, from short loading, easy chip removal, small foot print, ease-in-linking and so on. We will promote that benefits and will give that advanced solution to our customer for an attractive partly 'Made in India' price. This smart machine family, which we will enlarge by adding further technologies like grinding, hobbing and other more, will show our customer how that modular machine concept helps to reduce the cost per piece. And the already mentioned flexibility is so fascinating and reminds me on the moments I explored the first time the famous LEGO toy blocks.

Any plans of expansion?

As mentioned we will start with an assembly line for our machines in India and on the other side we will expand our sales and service network to be a reliable, close partner for our customers who can count on contribution to their success in India or international. So to come back to the initial picture, the race is already on. Indian team have come back to it already and if everyone is starting to move India can be in the top field.

Making **Cars Smarter**

In all vehicles wireless connectivity is rapidly expanding right from luxury to high-volume mid-market models, and this changing landscape of connectivity would build a new set of specifications for the cars of future.

By Ashish Gulati

We are entering into the age of the "Internet of Things," where sensors, computers and devices are connected in a self-managing ecosystem. The concept of connected devices generally known as the Internet of Things is all set to explode and there will be a revolution in coming times. The goal is to achieve human-to-human, human-to-machine and machine-to-machine interactions that enhance all our activities and enrich our lives. The number of connected devices is rapidly increasing and expected to increase by 30 percent in 2015 to 4.9 billion by 2020 according to research by Gartner. The connected car is already a reality. In all vehicles wireless connectivity is rapidly expanding right from luxury to high-volume mid-market models, and this changing landscape of connectivity would build a new set of specifications for the cars of future.

With an increasing need for digital content within a vehicle, it has emphasised the need for latest infotainment system and simultaneously created wide opportunities for application developer and graphics designer. According to recent report from McKinsey, prominent increase in vehicle connectivity that is transforming the automotive sector could boost the value of the global market for connectivity components and services to €170bn (£127bn) by 2020, more than five times higher than today's €30bn.

The car of today is already packed with electronics and, in fact, has the highest density of electronic components as compared to other consumer machines. A plethora of technologies powers the car today and these technologies fall into three domains: safety & security, infotainment & telematics, and powertrain/fuel economy.

Infotainment and telematics are addressed by technologies that enable smart traffic management, positioning & location-based services, car-to-car and car-to-infrastructure communication and in the future, perhaps autonomous driving. The powertrain/fuel economy domain is addressed by technologies in engine control, shift-by-wire, stop/start, engine downsizing, vehicle electrification and street predictability.

The internet of cars becomes a full platform within the internet of everything. Safety and security as well as infotainment and telematics are richly enhanced with the benefit of connectivity and data transfer. In today's time Safety without doubt is a serious concern for car users. The technology within the cars when connected together can help each other to be safer. Armed with smart sensors to detect the environment around the car, connectivity to be online, and satellite positioning to establish relative location, cars can inform condition of traffic and road conditions and other concerns ahead.

Taking safety and security as a top priority, an innovative example of Telematics in India is in Kerala. She -Taxi service has been launched in collaboration with Maruti Suzuki Ltd and Kerala State Women's Development Corporation to help women reach their desired destinations safely. She-Taxi has been designed and integrated with web-mobile based convergent technologies which will monitor and track the activities of the passenger as well as the cab driver. Safety Alert Switches for Drivers near the seat, passenger safety alert switches at the back side, drivers safety systems on their mobile phone, safety alert receivers at control stations, GPS based tracking system, controlling over speed, rash driving, sudden brake, sudden turn, remote engine off, theft protection are all an extension and part of Telematics which are playing a role in making taxi services in India safer.

According to Frost & Sullivan, the telematics market in India is expected to reach 1.3 mn units by 2021, from its Commercial Vehicle Telematics Market Outlook.

Apart from this infrastructure development will be critical to the development and innovation in the telematics market. Government policies on the installation of telematics devices in commercial vehicles (CVs) will help in the growth of the telematics market in India.

Currently, 2G/2.5G based modules have dominated the Indian telematics market, but with the launch of 3G and 4G networks, a shift towards 3G and 4G based modules is expected over the coming years.

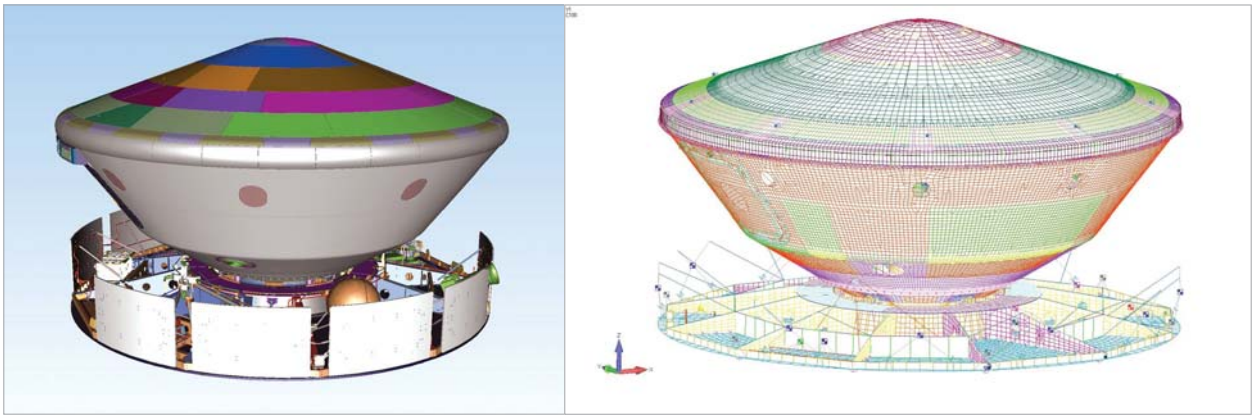
Telematics applications can automatically execute emergency assistance calls in the time of accidents. Vehicle maintenance, the preventive route to car safety, is already being greatly enhanced. Remote diagnosis of the vehicle and data logging can keep track of and highlight the need for running repairs of the vehicle. Telematics also enables anti-theft features as a stolen car can be tracked and its whereabouts reported to the authorities. On a macro level, the internet of cars can enable intelligent traffic forecast and management through a unified communication network for vehicles that is leading to safer roads, less congestion and lower emissions caused by cars stuck in traffic jams. With GPS technology in car navigation and the capability to receive signals from multiple satellite systems to collect information has improved accuracy and response time in determining vehicle position and this has expanded the utility of this function beyond basic navigation to safety-related applications.

> "The goal is to achieve human-to-human, human-to-machine and machine-to-machine interactions that enhance all our activities and enrich our lives."

India Telematics market is exhibiting growth as the consumers are becoming more cautious about their safety while driving. Moreover, automobile companies are collaborating with telematics module manufacturing companies to develop in-built telematics systems during the production process itself. Added to this, the low-cost telematics solutions are encouraging the end users as they are able to afford this technology and also enjoy the services.

The Internet-ready vehicle brings with it host of security concerns related to the data it will generate. Like the smartphone platform, the new technology cars are also facing critical issues related to business model, standardisation etc. The absence of a certified body or an agency for standardisation and regulations of Telematics industry is the biggest challenge faced by this sector. Regardless of certain core challenges like adoption of technology, developing countries have a massive potential to leverage and reap benefits of road safety and also improvements in economic efficiency.

The author is Country Head India at Telit Wireless Solutions.



Mars Rover Spacecraft CAD and CAE models

When **perfection** is paramount

Finite Element Analysis (FEA) tools are used by many manufacturers to check designs before they are used in the field to ensure that the products made are fit for purpose.

By Alastair Robertson

Computer Aided Engineering (CAE) and, in particular, Finite Element Analysis (FEA) tools are used by many manufacturers to check designs before they are used in the field. This helps ensure that the products made are fit for purpose and handle the rigours and stresses of harsh environments. But there are some designs that, for one reason or another, have to be right first time. For anything that's sent up into space for example, there is no going back and fixing things that might go wrong, and this is where you need some really powerful and accurate simulation with advanced analysis performed up-front.

The challenge

Testing products and designs that are going to be used in places far outside the constraints and norms of daily life is difficult. Additionally, recreating these stresses and scenarios is complex, but given the nature of these deployments, there is only one chance to get it right and no margin for error.

To meet these modern challenges, manufacturers are constantly looking to expand the performance limits of their structures to enable lighter and more capable designs, at the same time as delivering cost savings for the manufacturer and the end-operator.

Simulating how real-life events will impact these designs has proven to be a key asset in these efforts. This technology enables engineers to explore different designs and materials to arrive at an optimal design by reliably predicting when these designs will fail to meet the rigorous safety margins.

> “Being able to automate and customise simulation processes ensures that the designs work perfectly and that everything goes according to plan.

Demanding environments

Whether it's the vacuum and near absolute zero temperatures of space, or the heat and friction of re-entry or the pressures of the bottom of the ocean, these projects require meticulous planning and precision performance. It's not enough to test individual parameters such as heat, friction or stress in isolation. Rather, any simulations need to be able to replicate these conditions in conjunction and with a variety of different combinations.

Complex design

Very rarely are the products used in these critical deployments simple. Items such as satellites, spacecraft, deep water submersibles and high-end research equipment are generally very intricate designs. Each item is often a one-of-a-kind product, which must be designed from scratch, for both digital simulation and mechanical construction. Thousands of these discreet components combine in a single unit, every one of which must be able to operate flawlessly within certain tolerances and must remain in alignment with each other.

Because there will be only one opportunity for these projects to succeed, every part and as-

sembly of every system needs to be thoroughly tested to ensure that all instruments will function flawlessly under expected conditions.

As such, engineers need to be able better understand loading conditions throughout these complex products. They must be able to take a structure, run the analysis and see what breaks. More specifically, designers should be able to import geometry from any 3D format, helping quickly switch from a virtual prototype to the FE model with a consistently accurate import process. Here, the virtual prototype stage is vital for structural and thermal analysis as well as digital simulation.

Combining CAE solvers in conjunction with the right tools, engineers can conduct simulations to ensure each part does not interfere with another and that parts and assemblies have sufficient strength to withstand extreme temperature variations and vibrations under load and during normal operating conditions.

New materials

The use of composite materials in designs has increased significantly in recent years. These can be particularly in these critical, bespoke designs where more exotic combinations might be required to offer protection from the harsh elements. Being able to run simulations and testing that account for the specific properties of these composite structures is crucial to fully realising the success of mission critical projects.

James Webb Space Telescope full CAE model

A visual approach

When dealing with complex, mission critical designs, being able to visualise the results is an increasingly crucial element to solve any analysis issue quickly and effectively. It enables engineers to find where the breaking points are and how the design reacts to temperature and pressures.

Engineers can easily understand the mathematical results of an analysis conducted with a solver, but visualising analysis results using Femap shows exactly what is going on. As such, visualisation in post-processing is a key advantage. Visualisation is key to being able to view and interpret the output data including offering contour and criteria plots, deformed shape animations, time and frequency domain animations as well as dynamic cutting plane and iso-surfaces.

With a wealth of visualisation capabilities at hand, engineers can view and interpret the results to quickly understand the model behaviour. To be fully effective in complex designs, this needs to include intricate design features such as beam modelling and meshing.

Model visualisation is also key to beam modelling. Users can view these elements as solid components and include offsets as well as display options including shear and bending moment diagrams.

Parallel computing

Given the complexity of, not just the design, but the environments and potential scenarios that may be encountered, it's equally vital that simulation and analysis can test as many different cases as possible. This also needs to be done in a timely manner. Effective parallel processing means numerical simulation of the finite element model can be done more efficiently because it leverages the potential of multi-core and multi-processor machines, using ultra-fast solving. Parallel computing can cut processing times by as much as 30 per cent compared to using single processor systems.

Conclusion

FEA of critical design components, at the early design stage and on the engineering change list, ensures that the design can meet deformation, stress, vibration and/or temperature specifications for the worst case configurations specified. This greatly enhances the overall quality of any product, but is absolutely vital in those scenarios where there is no room for failure.

Analysis results identify critical areas which carry the bulk of stresses caused by deformation or vibration, as well as less important areas in which material reduction may be possible. This generally means the number of prototypes required can be reduced and the costs can be minimised without jeopardising the project. The right Femap allows engineers to virtually model components, assemblies or systems to determine behaviour under a given set of boundary conditions, and is typically used in the design process to reduce costly prototyping and testing, evaluate differing designs and materials, and for structural optimisation to reduce weight.

For mission critical projects, Femap can be used as the pre- and postprocessor. It uses the CAD model to generate meshes for a mathematical model and, after finite element analysis, extracts results and views the condition and state of the structure under the various load conditions.

When it comes to launching a telescope into space, landing a rover on Mars, or exploring the very bottom of the ocean, the cost of failure is immeasurable. Being able to automate and customise simulation processes ensures that the designs work perfectly and that everything goes according to plan. In short, when perfection is paramount, Femap helps deliver mission-critical success.

The author is Femap Marketing - Mainstream Engineering Software, Siemens PLM Software.

On **track!**

Haas F1 Team is on schedule to make its debut in the FIA Formula 1 World Championship in 2016, becoming the first American-led Formula One team in 30 years.

Haas F1 Team is on schedule to make its debut in the FIA Formula 1 World Championship in 2016, becoming the first American-led Formula One team in 30 years.

Getting a start-up team to the grid is a massive logistical and technical undertaking, but under the leadership of Team Principal Guenther Steiner, Haas F1 Team has many vital pieces already in place despite the 2016 season being a year away.

Augmenting Haas F1 Team's United States home in Kannapolis, North Carolina, is the recent purchase of a facility in Banbury, Oxfordshire, U.K. The 39,350 square-foot (3,655 square-meter) building will serve as Haas F1 Team's European base, allowing for easier and quicker access to the team's overseas suppliers and streamlined logistics for when the team travels to Formula One venues in Europe.

Construction of the team's equipment, from transporters to the pit apparatus to garage setup, is well underway. Upon completion, all will be housed at Haas F1 Team's Banbury location.

Key personnel have also been added, notably Dave O'Neill as Team Manager, Rob Taylor as Chief Designer and Ben Agathangelou as Chief Aerodynamicist.

> "Our technical partnership with Ferrari has allowed us to develop our car and our people at an exceptional pace. The way we're going about our F1 team is new and different, but it's working. We're committed to our plan, we're committed to F1 and, most importantly, we're on schedule."
>
> **Guenther Steiner,**
> Team Principal, Haas F1 Team

O'Neill came to Haas F1 Team from Marussia F1 Team, joining what was originally Manor GP in 2009. O'Neill's experience is quite valuable to Haas F1 Team, for his task upon joining Manor was to set up a Formula One team in six months. Recruitment of personnel, the purchase of equipment and infrastructure, oversight of car design and supplier selection were just a few of O'Neill's many duties. O'Neill was the team manager for Jordan Grand Prix from 1998 through 2005 before joining A1GP, a racing series promoted as the "World Cup of Motorsport". As the chief technical coordinator for A1GP, O'Neill set up the series and track testing of cars. During this time, he also served in the role of team manager for A1GP's Team Ireland, winning the A1GP championship in the series' fourth season (2008-2009).

Taylor also joined Haas F1 Team from Marussia, where he held the post of deputy chief designer. Prior to Marussia, Taylor was the senior design team leader at McLaren from April 2006 through December 2010. Before McLaren, Taylor was head of vehicle design for

Red Bull Racing, Toro Rosso and Jaguar beginning in 2002. Senior design roles at Arrows (1997-2002) and Scuderia Ferrari (1992-1997) were achieved after stints at Cosworth (1987-1989) and Benetton (1989-1992). Taylor's role with Haas F1 Team marks his 28th year in Formula One, a tenure that has provided a range of experience in all disciplines of Formula One design.

Agathangelou paired with Haas F1 Team from Scuderia Ferrari where he managed the upgrade of the team's wind tunnel and testing systems in Maranello, Italy, in March 2012. Prior to that, Agathangelou was with Dallara, serving as an engineering consultant for a number of projects the Italian race-car manufacturer had dating back to 2009, which included the technical lead for the Campos F1 project, 2012 technical upgrades for GP2 and the World Series Renault, design and development of the DW12 Indycar chassis, and management of the Alfa Romeo 4C "low cost" sports road car project.

Agathangelou has a wealth of Formula One experience, for he was the head of aerodynamics for Jaguar and later Red Bull Racing from 2002 through 2007. Agathangelou held the same role with Renault F1/Benetton from September 1999 to March 2002. Agathangelou began his Formula One career in 1994 with McLaren as an aerodynamics analyst, moved to Tyrrell in August 1997 as senior aerodynamicist and then joined Honda Racing Development in April 1998 as chief aerodynamicist to prepare Honda's 2000 Formula One entry.

Agathangelou and Taylor have already designed the 60-percent scale model of the car Haas F1 Team will race in 2016. The duo has logged numerous hours in the wind tunnel it shares with Haas F1 Team technical partner Scuderia Ferrari. By working diligently to develop the scale model now, Haas F1 Team will be ready to go racing in 2016.

Following his Formula 1 dreams. The man behind the Haas F1 Team

About Haas F1 Team

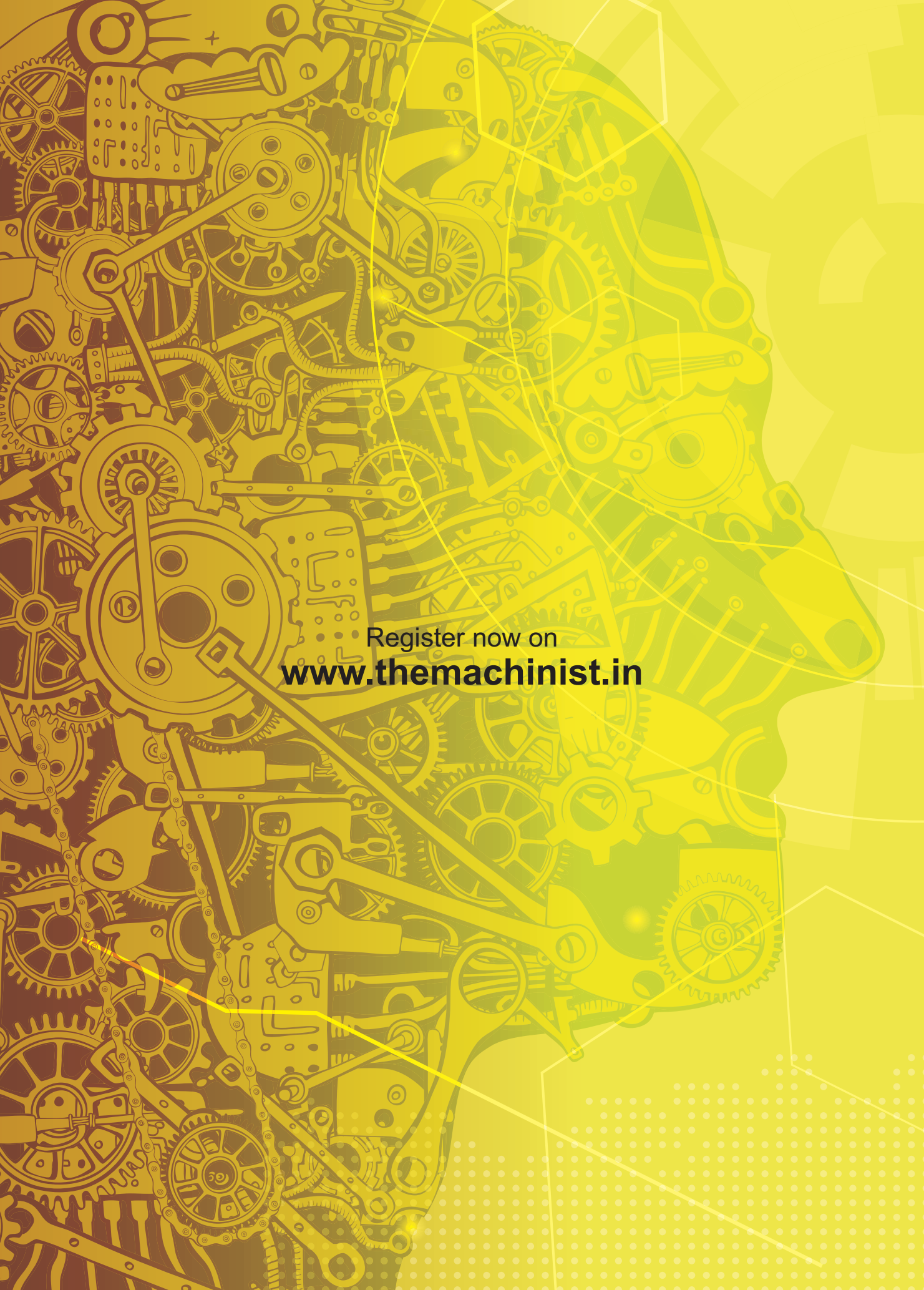
Haas F1 Team will debut in the FIA Formula 1 World Championship in 2016, where it will become the first American-led Formula One team since 1986. Founded by industrialist Gene Haas, Haas F1 Team is based in the United States on the same Kannapolis, North Carolina campus as his championship-winning NASCAR Sprint Cup Series team, Stewart-Haas Racing. Haas is the founder of Haas Automation, the largest CNC machine tool builder in North America, and he is chairman of Haas F1 Team.

"While there is still a lot of work to do, a lot has already been accomplished for Haas F1 Team to be competitive when we join the F1 grid in 2016," said Steiner, a Formula One veteran who was originally recruited by three-time Formula One champion Niki Lauda to join Jaguar in 2001 as the team's managing director. "Our technical partnership with Ferrari has allowed us to develop our car and our people at an exceptional pace. The way we're going about our F1 team is new and different, but it's working. We're committed to our plan, we're committed to F1 and, most importantly, we're on schedule. This time next year, our cars will have already been tested and we'll be readying them for Melbourne."

Melbourne, Australia, serves as the kickoff race for the Formula One season. It's where Haas F1 Team will make its debut following preseason testing. Haas Automation, Inc., the CNC machine tool builder Haas F1 Team chairman Gene Haas founded in 1983, will serve as the team's primary sponsor. In addition to Haas F1 Team, Haas' motorsports holdings include Stewart-Haas Racing and Windshear.

Stewart-Haas Racing is co-owned by Haas and Tony Stewart. Stewart-Haas Racing fields four entries – the No. 14 Bass Pro Shops/Mobil 1 Chevrolet for Stewart, the No. 10 GoDaddy Chevrolet for Danica Patrick, the No. 4 Budweiser/Jimmy John's Chevrolet for Harvick and the No. 41 Haas Automation Chevrolet for Kurt Busch. The team operates out of an 18.581 square-meter (200,000 square-foot) facility with approximately 280 employees.

Windshear is a 290 kph (180 mph) rolling-road wind tunnel in Concord, North Carolina, that is the first of its kind in North America. Founded by Haas, it is only the third rolling-road wind tunnel of its scale in existence and the world's first commercially available, full-scale, rolling-road wind tunnel. Windshear is available for hire to all motorsports teams and auto manufacturers. NASCAR, INDYCAR, sports car and NHRA teams utilise Windshear, as does the United States Council for Automotive Research (USCAR), which has conducted tests on production cars at Windshear.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THE MACHINIST
ULTIMATE GUIDE TO PROFITABLE MANUFACTURING

Super SHOPFLOOR 2015 Awards

Powered by
Ace Micromatic Group

You are invited!

on May 22, The Westin Pune at Registration Starts: 9.30 am

Interact with Top CEOs as they talk about 'Make in India' in an exciting Panel Discussion

Pratyush Kumar, President, Boeing India • **GK Pillai,** MD & CEO, Walchandnagar Industries Ltd.
Sudhir Kumar Mishra, MD & CEO, BrahMos Aerospace • **Kishore Jayaraman,** President, Rolls-Royce, India and South Asia.
Anders Grundstromer, MD, Scania India And Senior VP, Scania Group • **Nitin Chalke,** Managing Director – India, Eaton.

Meet our Special Guests, who share their experience and insights

Chief Guest: **Shri Kalraj Mishra,** Hon. Union Minister of Micro, Small & Medium Enterprises Government of India.
Keynote: **Baba Kalyani,** Chairman & MD, Bharat Forge Ltd.

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THE MACHINIST
ULTIMATE GUIDE TO PROFITABLE MANUFACTURING

Super SHOPFLOOR 2015 Awards

POWERED BY

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The Jury has spoken!

The Machinist Super Shopfloor Awards Jury Meet was successfully held on April 29 in Pune. The foundation was laid for the grand awards ceremony to be held on May 22

The Machinist Super Shopfloor 2015 Awards Jury Members flanked by our Editor on left and Publisher on right.

Santanoo Medhi,
MD & CEO, Premium Transmission Ltd.

"In order to fulfil the dream of "Make in India", it is important that Shopfloor best practices are recognized and rewarded through a transparent yet rigorous assessment process. However, it is more important that these best practices are widely circulated and made known across the manufacturing industries so that these could be adopted by them. This will set off a chain reaction of continuous improvement which will eventually make Indian manufacturing industry globally competitive."

Shrikant S. Bairagi,
MD – India, Tremec Torque Transfer Solutions

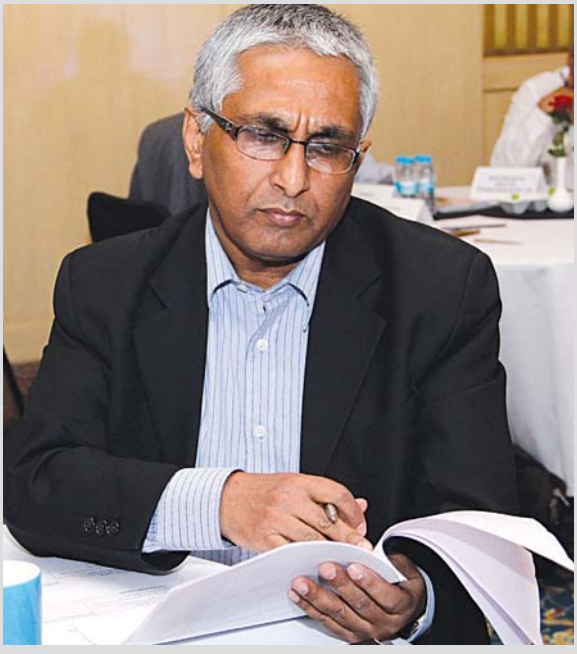
"This award recognises forward thinking manufacturers who are excelling on the shop floor management practices, which is crucial for the success of "Make in India" initiative."

Viren Joshi,
President & CEO, Sigma Electric Manufacturing Corporation Pvt. Ltd.

"The Indian manufacturing industry has created an enviable track record of performance in India and globally. The recent 'Make in India' program has brought further global focus to the strengths of Indian manufacturers. It is equally important for us to recognise and honour the achievements of these excellent companies, who have contributed to the growing prominence the Indian Manufacturing Industry."

Ravind Mithe,
Partner, KPMG Advisory Services

"For 'Make in India' to become a competitive advantage Indian Shop-floor must transform. The transformation should be holistic impacting assets, people, processes and place. Transformation journey should significantly reduce conversion costs, manufacturing lead time, inventories and quality. Most importantly not only large shop floors but the smallest one with limited resources should be involved in this journey. Awards that recognise and celebrate the shop-floor transformations will play a key role in this journey by publishing the success stories and recognizing shop-floor heroes."



Dr Dhananjay Kumar,
CEO & Head (Engineering, Global Project & BD), KLT Automotive & Tubular Products Ltd.

"Recognition is the incentive for improvement & sustained recognition drives towards excellence. The 'Make in India' drive has manufacturing inbuilt and we can achieve world class manufacturing status only if comparative excellence is recognized by a neutral forum like yours."

Chandra Nataraja,
Managing Director, Knorr-Bremse Technology Center India Private Limited

"Between the cup and the lip a lot of things can happen. Similarly in a manufacturing industry, a lot of things do happen between design and shopfloor. Shopfloors give life to the design and light to the end-user. It's time we recognise/reward this and pursue our endeavour for 'Make in India'."

With nominations coming from every corner of the country and across all categories in huge numbers, it was going to be a big task for the Jury.

More so, because some of the finest manufacturing brands had sent in their nominations. (By the way, some companies were sending their nominations even on the Jury Meet day but we had to politely refuse the same). But the Jury Members thoroughly enjoyed the entire process, which started at 9.30 am and ended just before lunch. The jury members appreciated the endeavour

Madhu Ranjan,
MD, Elringklinger Automotive Components India Pvt. Ltd.

"Awarding exemplary work is a great motivator for an individual or the team to excel, innovate and thereby drive a manufacturer to achieve market leadership."

Viresh Shah,
IT Country Head, Dana Corporation

"This is an excellent initiative. Much needed for the industry. I am sure this will become bigger."

by Team Machinist and expressed the desire to continue their association with the platform.

They also offered useful suggestions for enhancing the effectiveness of the platform. The Jury members have evaluated the nominations and shared feedback with our team. These have been tallied to arrive at results and the same will be announced on May 22at a Grand Ceremony at The Westin Pune.

And yes, if you want to attend the Awards ceremony then just send an email to themachinist@wwm.co.in with 'Invite Me for May 22' in the subject line! We will send you the registration form.

Avinash Sankhe,
Director - Global Shared Services Center for Industry & Facilities Business Lines, Bureau Veritas

"The manufacturing sector that is backbone of our national economy is not only the place where actions are executed at crazy pace but many of the innovations and continuous improvement practices originate from here and recognizing those efforts will do a lot of good to those engaged in this industry. It is all the more relevant with 'Make in India' ongoing campaign by the Indian PM."

All jury members were felicitated for their contribution in making the Jury Meet a great success. Here you see Rajeev Mittal (right), Head IT/IS, Piaggio Vehicles Pvt. Ltd., being felicitated by Rishi Sutrave, our Publisher.

An Initiative By
THE TIMES OF INDIA

THE MACHINIST Super SHOPFLOOR 2015 Awards

May 22, 2015, The Westin, Pune

Delegate Registration Form

Please complete this form and email it to themachinist@wwm.co.in

Full Name: .....

Designation: .....

Company: .....

Division: .....

Location: .....

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Mobile No: .....

Email id: .....

Registration starts at 9.30 am

RSVP:

Ms Rishika Bhati

Email: themachinist@wwm.co.in

Direct: 022-2273 3452 ● Cell: +91 9969 462 127

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Associate Partner: POWER2SME, CAMWorks

Jury Meet Partner: TYROLIT

Knowledge Partner: KPMG cutting through complexity

Complete System Competence for Maximum Productivity

Top customised engineering: DMG MORI Systems combines technology, machine tool, automation and peripherals in holistically coordinated 360° solutions for your production systems.

Flexible automation guaranteeing process reliability is an elementary factor of success for a universally digitalised production world. With this in mind DMG MORI Systems already offers its customers the possibilities and competences to produce successfully here and now. And this performance commitment applies to every segment of automation technology: to machine-integrated automation as well as standard automation and on to include flexible manufacturing cells and comprehensive turnkey production lines.

The future is automatic

In the age of "Industry 4.0" the automation of manufacturing processes is gaining dynamically in importance. At the same time the merging of virtual and real production worlds demands an integral communication capability of machines, systems and components.

360° system competence

DMG MORI Systems meets this challenge of the future actively by offering a holistic range of services from a single source for technology, machine tool and automation solutions. This diverse service offer is based on the unique experience of DMG MORI in the sector of technology design and automation that is bundled within DMG MORI Systems GmbH.

Added to this is the engineering expertise and strong partner structure that together with its experience enable DMG MORI Systems to configure and implement ideally aligned systems for every customer and every requirement. And it achieves this for a diverse range of workpieces, from a small precision part to tool moulds, and for a multitude of different lot sizes from single parts right through to serial production with automation solutions that range from standard to turnkey.

Highlights – DMG MORI Systems

- DMG MORI Systems is an efficient combination of technology, machines, automation and peripherals
- Planning, simulation and implementation of turnkey solutions
- Core competences: control system conception, tool design, clamping conception, machine tool and automation
- Top machines for serial production
- Top project management = a contact person for all questions
- Strong partner for the integration of peripherals and tools.

The DMG MORI Systems range is organised in four segments	
Segment 1: Machine-integrated automation • Integrated in the machine • Universal production	**Segment 3: Flexible manufacturing cells** • Implementation of customer-specific machining processes combined with automation of in-house machines and third party products
Segment 2: Standard automation • Solutions for tool, workpiece and pallet handling • Portal and robot solutions	**Segment 4: Production lines** • Planning, simulation and implementation of turnkey solutions based on the DMG MORI corner-type solution

Process reliability with maximum productivity in the turnkey sector: The interaction of different disciplines from technology, machine, automation and peripherals make turnkey projects the supreme disciple of automation and system technology. In addition to its wide range of products in the field of machine tools DMG MORI also offers proven expertise here in all fields – in the engineering of technological applications as well as in material flow and the required peripherals.

This consistent integration is in turn the basis for a high level of cost-efficiency. , as Silvio Krüger, General Manager of DMG MORI Systems GmbH, explains: "The convincing features of the production lines include low unit costs, outstanding machining performance, a high system availability of over 95% and high output. They achieve the shortest cycle times and offer impressive flexibility where workpieces are concerned." Parallel manufacturing processes are also possible and flexible programming leaves considerable scope in the production process.

Reliability and process stability are ensured by the use of advanced and proven technologies and products on the one hand and the global presence of DMG MORI on the other.

Helitronic Diamond Evolution

The new super-compact erosion and grinding machine featuring the 'two-in-one' principle from WALTER, which has already been used successfully for the last 14 years, is specially designed for the production and regrinding of PCD tools with diameters of up to 165 mm and lengths of up to 185 mm (end face operation) and/or 255 mm (outer diameter operation). With a minimum space requirement of only 4.2 sq m, the Helitronic Diamond Evolution can be used to erode and/or grind PCD tools – including shank, profile, circular and roll millers, multi-step tools and countersinks, as well as cutting and profile cutting plates. A high drive output is required for grinding such tools. With a drive output of 9 kW, the Helitronic Diamond Evolution offers one of the most powerful grinding spindle drives on the market. As is the case for other 'two-in-one' eroding and grinding machines from WALTER, the Helitronic Diamond Evolution is equipped with Diamond-Plus as standard for an optimised cutting edge and processing time.

Extendable: The machine is also available with a robot loader for a maximum of 72 HSK tools or a maximum of 7,500 cylindrical tools (diameter-dependent) – the perfect solution for loading with reduced staff levels.

Innovation that meets the trend: There is a clear trend within the PCD market. The aviation and space industry as well as the automotive sector are focusing on light-weight yet durable materials, such as high-strength aluminium and carbon fibre-reinforced plastics. Tools with particularly hard blades made of polycrystalline diamond (PCD) and complex geometries are required for machining such materials. There is a clear development in terms of the design of these tools; they are

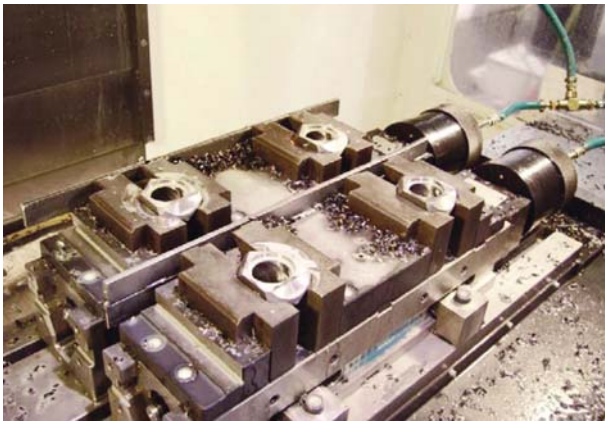
becoming smaller and increasingly diverse and their geometries are increasing in terms of complexity. Tool manufacturing equipment should also also be able to realise cost savings through having a space requirement that is as low as possible and should offer a short purchase amortisation period.

This machine requires a minimum of floor space and offers optimal value for money, which can erode and also efficiently grind carbides, and which also includes a powerful and flexible software package that is perfectly suited for the production of the most common types of PCD tools. The Helitronic Tool Studio grinding software was specially adapted and expanded for eroding operations. 3D live simulation, collision checking and operations such as K-Land and variable spirals are just a few examples of the new flexible features available for PCD tool programming.

For more info, http://www.grinding.com/en

Pneumo-Hydraulic Twin Vice

Arnold twin high pressure vice is the product that allows to clamp the different types of components at much ease and less cost. This come with a spindle integrated with a hydraulic pressure booster, which boost the pressure upto 40KN just by using hand rotational movement. It has a pressure regulator that controls the clamping force at different intervals. Thus enable to clamp rigid components at high pressure and slender components at accurate and lighter pressures.



Arnold Twin can be operated, Manually, Pneumatic - pressure at a minimum pressure of 6Bar & by Hydraulic pressure – with 300 bar pressure.

ARNOLD Twin can be clamped vertical for HMC or horizontally for VMC , there can be various types of jaws suitable to clamp various components. ARNOLD twin comes with GGG70 body hardened and ground to 60HRC, It has a 3rd hand mechanism which allows operator to clamp the component one after the other.

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

Manufacturing solutions for medium and large component batches

At the China International Machine Tool show (CIMT) that took place from April 20th to the 25th at the New China International Exhibition Centre (NCIEC) in Beijing, the EMAG Group presented exciting new developments in the machining sector. For example, the exhibited machines of the VL series – with integrated pick-up automation and easy to link up to other machines – make ideal manufacturing systems for chucked components, optimally suited for the use in production lines for medium and large component batches.

VL 2 manufacturing system for chucked components.
The raw-parts are loaded onto the conveyor belt of the first machine. When the machining cycle (OP 10) has been completed, the components are turned and transferred to the second machine for OP 20.

The VL series consists of vertical pick-up turning machines for the medium and large batch manufacture of chucked components with a max diameter of 400 mm and forms part of the highly successful modular machine concept that EMAG first introduced in 2013.

The special features of the modular machine concept include a uniform basic machine construction that always includes integrated pick-up automation. This distinctive characteristic of the modular machine, where the pick-up spindle loads and unloads the workpieces from an also integrated parts conveyor, forms the basis for the outstanding performance of the VL series.

Machining area of the VL 2: 12 turning or up to 12 driven drilling and milling tools ensure that a variety of machining operations can be carried out in a single setup. The machine can be equipped with a Y-axis as an option.

The different types of automation

As indicated by the expression „modular“, the machines of the VL series can be customised to suit a variety of manufacturing scenarios. Besides the machining technologies that can be applied, this also refers to the automation systems used for the component transport. At the CIMT in Beijing EMAG will present two VL 2 machines interlinked by means of a turnover unit. This allows for chucked components to be complete-machined in just two setups. After the first VL 2 has pre-machined the component in a first setup, the workpiece is turned and transported to the second VL 2, where it is finish-machined in a second setup.

Integration into production lines

When the EMAG engineers developed their type of modular machines, including those of the VL series, their focus was firmly on the high-productivity manufacture of medium and large component batches. It should therefore come as no surprise that the machines of the VL series are all fully prepared for the link-up of a number of them, to be integrated into production lines. The small footprint of these vertical machines and the unchanging transfer height of the workpieces make planning the automation system components child's play – compared to horizontal machines.

Cornerstones of the manufacturing solution

- Low-manpower production
- Turnover and transport units handle the components between machines
- Economic raw-part supply in pallet cages at the start of the production line
- U-automation provides large component buffer

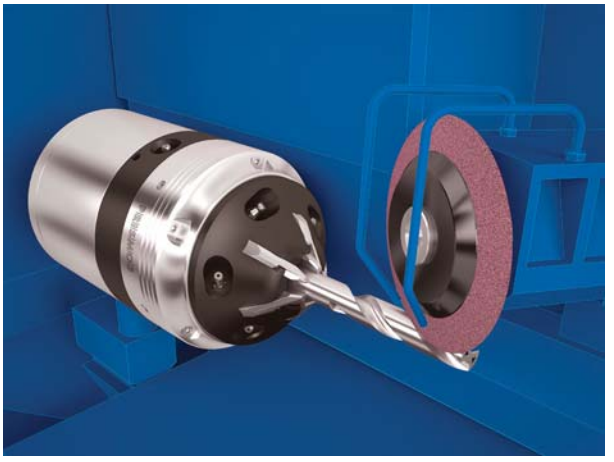
The advantages of the VL 2

- An uncomplicated automation concept ensures top machine availability
- Integrated automation, automatic workpiece changes
- Short travels for machining and loading, resulting in short cycle times
- The machine base in polymer concrete MINERALIT® provides a high degree of stability and has outstanding vibration damping qualities
- Ideal chip flow conditions
- Small footprint
- Exceptionally easy access to machining area and service units
- Uncomplicated tool changes
- Integrated component measuring (optional)
- Optional Y-axis

For more info, www.emag.com

Flexible precision toolholder for automated tool grinding

The new generation of SCHUNK PRISMO tool grinding toolholders promise more efficiency during production grinding and re-sharpening of tools. PRIMSO3 directly clamps every shank diameter between 3 mm and 20 mm fully automaticly without using collet chucks or intermediate sleeves on the fly at a run-out and repeat accuracy of less than 0.005 mm. The tool shank is automatically centered in the toolholder during the clamping operation. An optimized interfering contour ensures a better interference between the grinding wheel and the toolholder even in case of demanding operations. Compared with conventional multi-range grinding toolholders, the set-up time with PRISMO3 is lowered up to 70 percent. Moreover, the users don't have to invest in intermediate sleeves and collet chucks. Since the X axis is independent from the tool diameter and does not change, every type of chuck jaw can remain at the same axial position, which allows unmanned machining of various drilling, reaming, and milling tools in small quantities without having to re-program the L1 dimension around the clock. Expensive additional programming and the danger of a crash are now a thing of the past.



The SCHUNK PRIMSO3 tool grinding toolholder convinces with a broad clamping range, optimised interfering contours, and a sophisticated clamping principle. It offers optimum preconditions for fully automated production grinding and re-sharpening of tools.

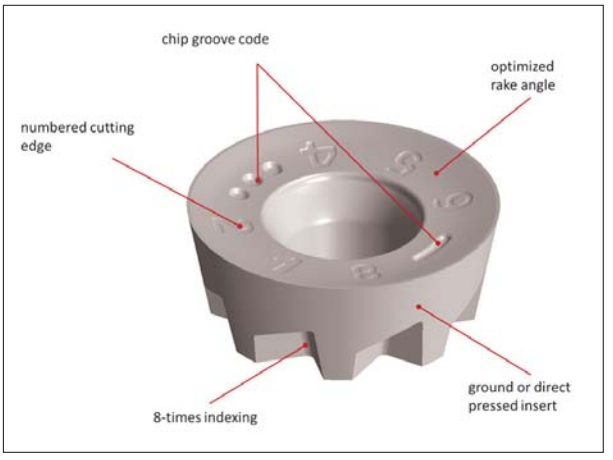
Compact dimensions and robust design

The constructional design, the basic sleeve, and the robust nature give a particularly high rigidity to the toolholder. Its stable jaw guidance avoids a swing up of the grinding wheels, and completely avoids tube imbalance. The hard coated chuck jaws are particularly robust and durable. If damage should happen, the complete set of chuck jaws can be exchanged. The toolholder is rinsed with clean oil during the grinding operation which prevents pollution, and a consistently high precision is achieved. No matter if axial clamping cylinders, radial power chucks, or an individual machine interface is concerned: PRISMO3 is compatible with the grinding machines of renowned manufacturers. The compact dimensions of 125 mm x 125 mm leave enough space for the tools during the grinding process and loading operation.

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

Program expansion – NEW Chip geometry – NEW Grades

CERATIZIT presents a new and complete program for copying and face milling applications with MaxiMill 251-RS. New geometries in combination with the new milling grades SILVERSTARTM and BLACKSTARTM represents the new and complete button milling insert program of CERATIZIT.



What's New:

- Complete and consistent geometry program for a wide field of applications
- Designation of the indexable insert geometry referring to the CERATIZIT designation system
- Numbered cutting edge for optimum run out properties of the tool (from Ø10mm)
- 8-times indexing for maximum economy at varying conditions
- Detailed selection opportunities for wide range of applications
- Milling grades: SILVERSTARTM, BLACKSTARTM.

For more information: www.ceratizit.com/

Large Through-Bore Haas Turning Center

Today's shops need large-capacity machines to handle the big jobs commonly found in such industries as oil & gas exploration, alternative energy, mining, and aerospace. Haas Automation presents the right solution.

Big parts are big business. And today's shops need large-capacity machines to handle the big jobs commonly found in such industries as oil & gas exploration, alternative energy, mining, and aerospace.

The ST-55 from Haas Automation, Inc., is a heavy-duty, large-bore turning center that is extremely rigid, highly accurate, and very thermally stable. The machine's twin-chuck capability, high-torque spindle, and 12.5" (318 mm) diameter through-bore make it ideal for machining heavy pipes and fittings, large couplers, and long rollers. It has a maximum cutting capacity of 25.5" x 80" (648 x 2032 mm), with swings of 34.5" (876 mm) over the front apron and 25.5" (648 mm) over the cross slide. A servo-driven tailstock (MT6 taper) is standard, and a steady rest provision is available for additional support of long shafts.

A 55 hp (41 kW) vector dual-drive unit powers the ST-55's spindle through a Haas-built two-speed gearbox to provide 4250 ft-lb (5762 Nm) of torque in low gear. High gear provides a maximum spindle speed of 1000 rpm. Both front and rear A1-20 spindle noses accept a variety of aftermarket large-diameter manual and pneumatic chucks.

The ST-55 comes equipped with a massive hydraulically clamped 12-station bolt-on style tool turret that accepts 7.25" (184 mm) split boring bar holders, as well as standard BOT toolholders. Standard equipment includes rigid tapping, a colour remote jog handle, a 15" colour LCD monitor, and built-in USB connectivity. Available high-productivity options include a belt-type chip conveyor, high-pressure coolant systems, and much more.

To tackle the types of jobs common in oilfield work, the ST-55 is available with Haas Automation's proprietary Intuitive Programming System, which includes powerful built-in threading and rethreading cycles for both straight and tapered threads – something found on no other machine.

The ST-55 features a heavy sheet metal enclosure that provides complete protection from chips and coolant during machining. A pair of wide sliding doors provides unobstructed access to the front chuck and main work area, both from the front and the top, allowing easy overhead loading.

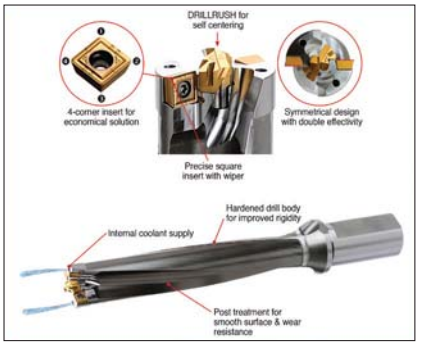
To tackle the types of jobs common in oilfield work, the ST-55 is available with Haas Automation's proprietary Intuitive Programming System, which includes powerful built-in threading and rethreading cycles for both straight and tapered threads

The rear chuck area is also fully enclosed during machining, but a wide sliding door and swinging end panel provide complete access from the front and top, simplifying chuck installation and adjustment, and making it easy to load pipe using an overhead crane. Unlike some competing machines, it's not necessary to remove sheet metal panels or modify the enclosure to handle drill pipe.

Built in the USA by Haas, the new ST-55 is backed by the worldwide network of Haas Factory Outlets – the most extensive system of support and service in the industry.

For further information please contact:
http://www.cncssipl.com/ or www.HaasCNC.com

Two drilling masters wrapped in one



TaeguTec is combining the power of two of its popular drills into one package called Twin Rush. The TwinRush takes away the worries associated with machining large diameter holes by assuring that the new addition to the TaeguTec drilling line offers excellent performance and high productivity.

On first glance, the noticeable feature of the TwinRush joins together a centering insert with a pair of precise square inserts on either side in order to combine two different drill types onto one drill body.

In order to protect the TwinRush from premature wear or damage and extend the drill's life, which saves on tool cost and downtime, TaeguTec shields it with the remarkable TT9080 PVD multi-layered coated grade.

The centering insert is TaeguTec's revolutionary and highly popular DrillRush indexable head – a tool that continuously enables precision self-centered machining for achieving hole concentricity.

Both outer inserts are the specially designed economical 4-corner SPGX type and are equipped with a wiper ground area for improved surface roughness. When compared to conventional inner/outer indexable type drills, the SPGX type inserts' symmetrical alignment offers double the productivity.

Further benefits include an internal through hole coolant system, a hardened body for rigidity, smooth surface and wear resistance due to the drill's post–treatment process.

TaeguTec's TwinRush comes in a diameter range from 26 millimeters to 45 mm and 5xD drilling depth of cut and is available as standard items.

When it comes to drilling deep holes and/or large hole diameter machining, the TwinRush's improved body rigidity, excellent chip control, precise 4-corner insert with wiper, double effective design and ability to drill directly without a pilot hole makes this the go-to tool when quality of the manufactured part, cost reduction and productivity are the main focus.

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

DX-200/12 - Longer jobs with small diameter

A need to machine longer jobs with small diameter inspired us to design DX-200/12 turning machine model. DX-200 12 with Step-up concept enables consistent machining performance because of widely spaced guide ways, even with bigger diameters. In today's competitive market, one needs to produce world class products quickly, accurately & with minimum of non-productive time. This machine, with a unique feature of "follower-rest" is able to turn longer jobs with small diameter.

Mill Tap 20 – High productivity in demanding areas

PX-20 is a vertical machining centre, developed with the aim to deliver higher productivity to cope up with various arena of demanding manufacturing industry. PX-Series puts its position for a broad range of working area in 3-Axis Machining Segment to be a productivity partner with better rigidity, higher rapids & compatibility to give output for various applications of machining solutions.

RX 20 - Greater accuracy & total reliability along at higher speeds

To match demand of greater accuracy & total reliability along at higher speeds, JYOTI CNC has developed Performance Series Vertical Machining Centres with a rapid of 40 m/mins. The high dynamic structure supports rapid axis take-off with high accelerations. The machine si with broad rigid base with heavy cross ribbings structure which dampens the effect of vibrations & balances the whole machine while taking heavy cutting load at higher rapids. The spacing of LM guides for slide movements are in such a way that it ensures stability in full working area during dynamic as well as static conditions.

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

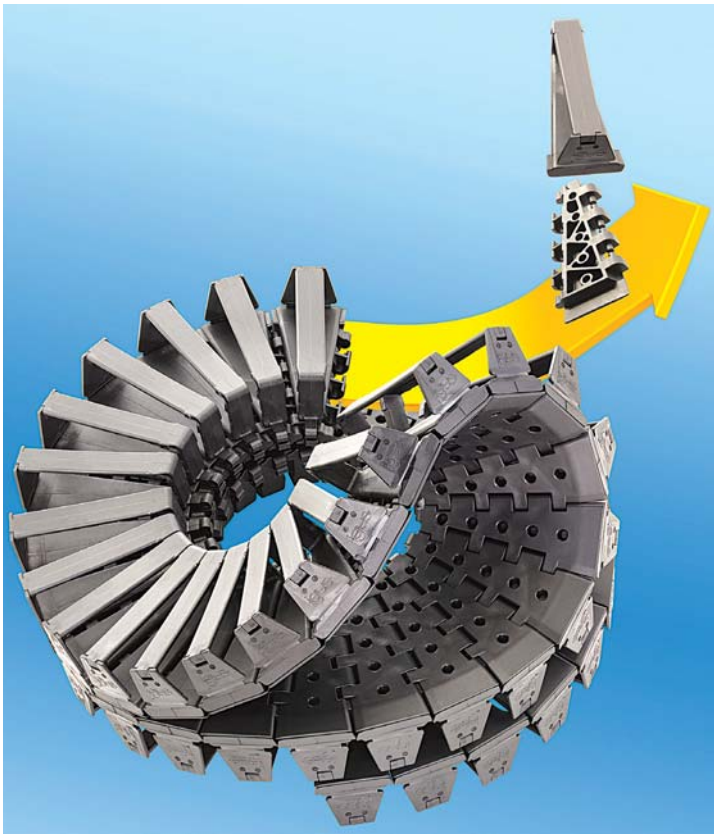
New energy supply system for rotary motion up to 7,000 degrees - lightweight and highly flexible

The twisterband HD is one of more than 100 innovations presented by igus at the 2015 Hannover Messe

Rotary motions in machinery can be tricky when managing cables and hoses. In order to protect and guide them safely, igus has expanded its range of energy chains for rotary motion with a 'heavy duty' version of its twisterband. The new twisterband HD is an even stronger, compact, spiral-shaped energy chain for circular motion, with rotations of up to 20 rotations possible.

igus has developed the twisterband HD for guiding energy, data and media cables to give operational and functional reliability in rotary motions with high loads. It combines the design features and qualities of the proven twisterchain, a circular energy chain for rotary motion up to a maximum of 360 degrees, with its twisterband, the winner of the Red Dot Design Award. The new twisterband HD combines the strength and stability of the chain with the compactness, flexibility and the rotation angle of the band and therefore fills a gap between the two igus products.

To deliver the "Heavy Duty" (HD) in the new "twisterband HD", the designers at igus have reinforced the band segments significantly and constructed it for more strength and stability. On the other hand, a hinge was developed for the connection of the individual segments, so that the twisterband HD withstands extreme loads with exceptional flexibility and rotational mobility (up to 20 times around its own axis). By using this design to connect the elements, the individual parts can be injection-moulded from the standard igus material for e-chains. The twisterband HD is optimised for temperatures below 0°C and therefore suitable for outdoor use.



At the Hannover Messe, igus presents the new twisterband HD for rotation in very confined spaces with very high load capacity. *(Source: igus GmbH)*

Compact design for cable protection in the smallest installation spaces: The twisterband HD guarantees high strength with minimal installation space requirements. The outer diameter of this product is just 300mm, the height starts at 250mm and varies according to the required rotation angle upward. Due to the innovative design, high angles of rotation are possible: horizontally to around 7,000 degrees and vertically to around 3,000 degrees. The design principle also open up the potential for larger versions. But despite this rotational capability, the cables are always well protected. Combined tests with chainflex cables in the igus' in-house lab arrived at a service life of one million rotary cycles and more. The predefined minimum bending radius contributes towards this, preventing damage to cables. The special hinge design enables a fast filling from the outside. Together with the tribo-optimised high-performance plastic of the band, a long service life is ensured even under difficult ambient conditions such as temperatures from -40°C to +80°C. Technically advanced, yet inexpensive, the twisterband HD is the ideal, low wear and low maintenance solution for carrying cables in rotary applications, encased in a compact and tough guiding system.

> The new twisterband HD is an even stronger, compact, spiral-shaped energy chain for circular motion, with rotations of up to 20 rotations possible.

More details contact: Harish Booshan, Product Manager, E-ChainSystems® & ReadyChains®; igus (India) Private Limited, Phone: +91-80-49127809 (Direct); Email: Harish@igus.in; website: www.igus.in

Hollow Tool Holder

"BBT-AHO" is technologically advanced "Hollow Tool Holder" developed by NT Tool Corporation, Japan. This tool holder generates high precision & influences the machining accuracy of tools to acquire better product quality in less time and increase productivity.

Features:

- Light weight holder reduces load to the spindle resulting in improved energy efficiency.
- Chip removal rate increases by 20-50%.
- Two face contact and ideal sustaining balance of taper and flange achieves remarkable increase of performance.
- Perfect two-face contact even at high-speed rotation.
- High repetitive accuracy and inhibition of fretting due to its continuous contact between taper and end face.

Chamfer Mill 45°

Chamfer Mill 45° from Nine9, Taiwan is designed for Chamfering and Countersinking with an indexable insert. The insert is a specifically designed for use in high speed machining thus optimizing performance and reducing cutting time. Ultra high speed and feed rate is the biggest advantage of Nine9 Chamfer Mills. It runs 4 times faster in cutting speed and 10 times higher in feed rate.

Excellent Repeatability

- It's the smallest insert in the world for Chamfering Mill, diameter 4mm.
- Smallest indexable counter sink, diameter 7mm.
- The insert has dual relief angle, with special honing of edge and with optimized coating for high cutting speed application.

Application

- 90°Counter sink and 45° Chamfering.
- For Counter Sink, Circular Chamfering, Contour Chamfering and Face Milling.

Power Hydro Chuck

PHC.A from NT TOOL CORPORATION has improved clamping pressure for higher precision. This system is additionally equipped with "Dual Clamping Points System" for stable and high precision clamping as well as with stopper pin for higher precision chucking between PHC.A Chuck and Collet.

Features:

- 20% more clamping force than a collet holder.
- Numerous ID sizes in 1mm increments (4mm-32mm).
- Simple one hand clamping operation with a hex wrench.
- Using PHS collet, variety of shank sizes can be clamped and protect inner shank from damage/scratch.
- This system has remarkably minimized set up time.
- Cutting tool height can be adjusted on the side with a hex wrench.
- Anti-vibration effect provides better surface.

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

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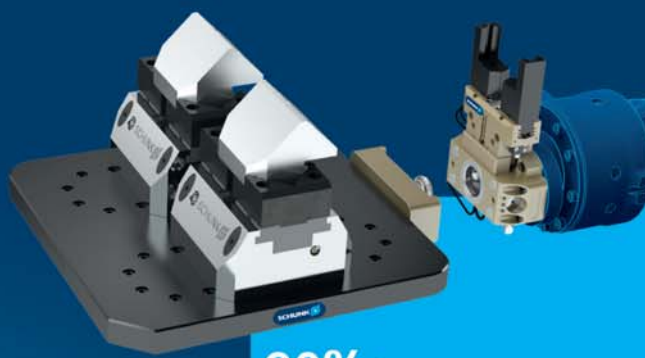
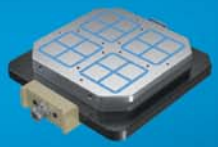


90% lower setup costs
with quick-change pallet system
VERO-S and robot coupling NSR

TANDEM clamping force blocks



MAGNOS magnetic clamping technology

Double bracket tombstone VERO-S

ROTA chuck

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Industry applications

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