

THE MACHINIST

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Budget 2015

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A THUMBS UP!

Super
Shopfloor
Awards

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Aerospace & Defence

*A ten point
action plan for
'Make in India'*

IT in Manufacturing

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Building India's DNA

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- Vertical Machining Centers
- Horizontal Machining Centers
- CNC Boring Machines

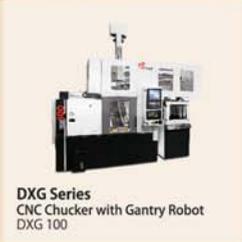
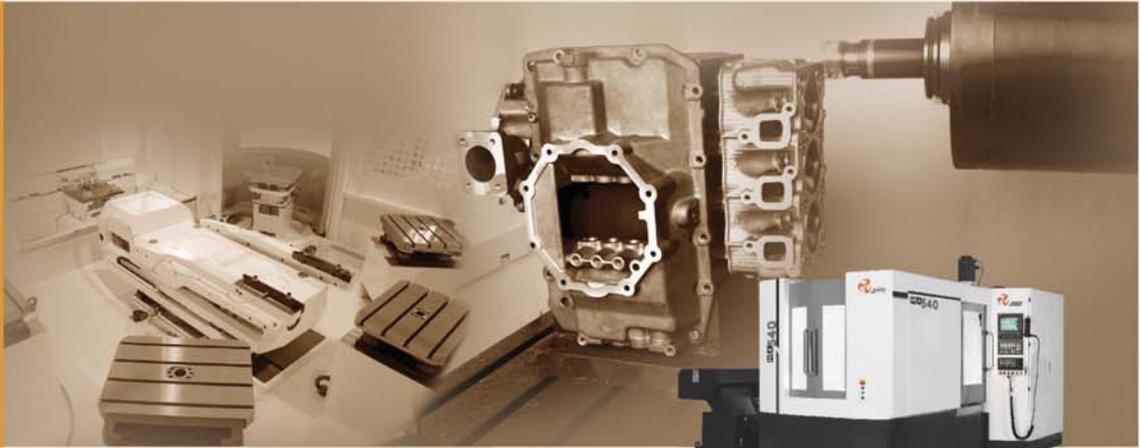
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MAKE IN INDIA



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The idea of transformation

Despite the volatile business environment today, organisations or economies themselves cannot improve things overnight. They have to bring about the transformation gradually to reach the top and, more importantly, to stay there. Of course, while there is no single formula for transformation, the basics remain the same – re-organise, innovate and pursue new goals.

In 1923, Alfred Sloan became the GM President and successfully implemented a transformation process that is still considered a benchmark in corporate history. His basic plan – *Federal Decentralisation*, as he called it – involved creating separate autonomous divisions within the organisations, which functioned independently and were answerable to the central office only for fiscal and policy issues. Importantly, the focus shifted from production to products and engineering. This empowerment coupled with discipline resulted in one of the best known turnarounds in the business world. From the verge of bankruptcy, GM became a market leader with a turnover of US\$1.5 billion.

This issue's Cover Story deals with a transformation process undertaken by an Indian manufacturing giant. It is not a giant because it is more than hundred years old but because of the impact it has on critical sectors related to national security and progress. Its MD & CEO has embarked on a challenging journey. If he is successful, it will indeed set new benchmarks.

With India itself going through a much needed transformation, we believe such stories provide insight and stimulation for the long haul. A robust and visionary Budget has already laid out the road map. Let us all undertake this journey and contribute to it.



Editor & Chief Community Officer

OF COURSE, WHILE THERE IS NO SINGLE FORMULA FOR TRANSFORMATION, THE BASICS REMAIN THE SAME – RE-ORGANISE, INNOVATE AND PURSUE NEW GOALS.

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Excellence - No Finish Line

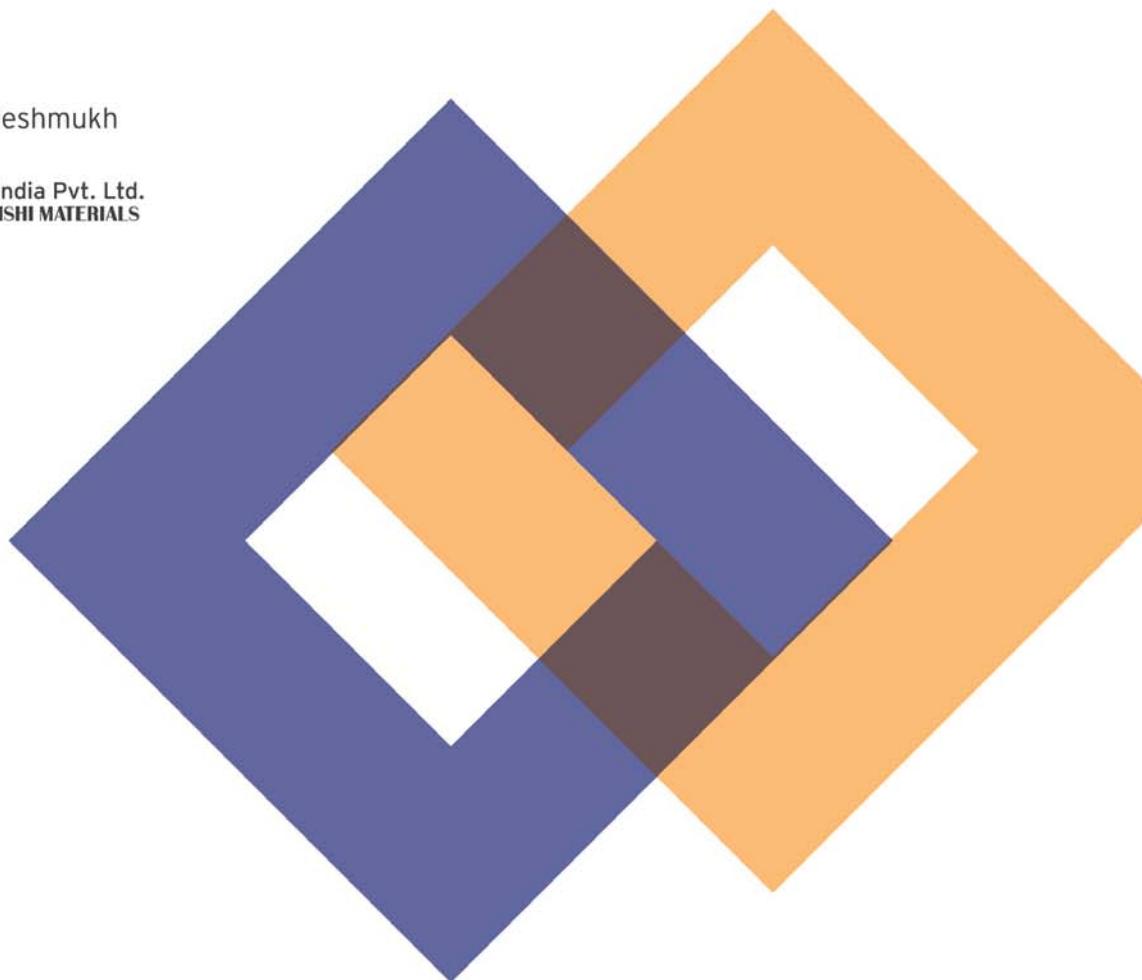
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Prashant Sardeshmukh
Director

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NEWS

Bharat Forge inaugurates high tech locomotive component manufacturing facility

Minister of State for Railways Manoj Sinha inaugurated the 'High Tech Locomotive Component Manufacturing Facility' at 'Bharat Forge Centre for Advanced Manufacturing' in Baramati recently. The Railways business segment is an integral part of Bharat Forge's plan to grow with India's infrastructure development and is the cornerstone of its diversification strategy. The company has been supplying to all major railways networks across the world including in the US, Europe, Russia



and recently to the Indian Railways. This 'High Tech Locomotive Component Manufacturing Facility' will exclusively focus on developing critical and sophisticated components and products for the Railway sector globally. Bharat Forge supplies critical and high performance components such as crankshafts, connecting-rods, portal axles etc. for locomotive applications globally. Currently, Bharat Forge is the only crankshaft manufacturer in India for the Industrial sector.

Cooper, Ricardo to jointly manufacture new engine series

Cooper Corporation Pvt. Ltd and UK based Ricardo will jointly develop a new line of engines. As a result, Cooper Corporation will expand its range of engines from 3.5 KVA to 1000



KVA. The entire range will be available in both Diesel and CNG versions. Working together with Ricardo, Cooper is the only company in India who has made 52 variants of engines in six

years including diesel and gas. The new Cooper engines will power applications for diverse sectors including automotive, gensets, marine, defence, construction equipment and agriculture. Speaking about the association, Farrokh N. Cooper, CMD, Cooper Corporation Pvt. Ltd said, "With this association with Ricardo UK, we will be covering almost 75 percent of the range of products available in the market putting us in the same league as the biggest players in the industry in a relatively short period of time." Ricardo will be responsible for the overall design of the engine and Cooper will develop all components for the engine, assemble and also conduct the required engine tests.

Samsung reinforces commitment to 'Make For India'

While launching a range of innovative products in various categories at the Samsung South West Asia Forum 2015, Samsung India Electronics has also reinforced its commitment to 'Make in India'. India is one of the key markets for Samsung. In the past 20 years of its operation in India, Samsung has set up two manufacturing plants and

three R&D facilities employing close to 45,000 people. HyunChil Hong, President and Chief Executive Officer, Samsung India Electronics said: "Samsung will continue to manufacture its products in India reinforcing its commitment to Make for India. In 2015, Samsung will continue to push technology boundaries and help consumers to create a better tomorrow."

Roll-out of 100,000th Tata ACE Zip at the Dharwad plant

Tata Motors recently celebrated the roll-out of its 100,000th Tata ACE ZIP at its Dharwad facility in Karnataka. The Tata ACE Zip is the second highest selling variant of the ACE family with an average volume of 2,500



vehicles per month. Speaking at the occasion, Ravi Pisharody, Executive Director, Commercial Vehicles, Tata Motors, said, "The Tata Motors' creation of the ACE in May 2005 and subsequently the ACE Zip went on to create new vehicle categories in India and are a clear indication of our understanding of the customer needs and commitment to cater to these with safe, cost-efficient transport solutions. It is leading the segment with a large 78 per cent share." The Dharwad facility is a green field project by Tata Motors.

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DICV delivers first bus chassis from its Chennai manufacturing plant, exports to Egypt

Daimler India Commercial Vehicle Pvt. Ltd. (DICV), a wholly owned subsidiary of Daimler AG, Germany, has started to export bus chassis from India. Hartmut Schick, Head of Daimler Buses, and Markus Villingner, Head of Daimler Buses India, were present at the Egyptian capital of Cairo to celebrate the delivery of the first bus chassis to the company's long-time business partner MCV. The products in



question are nine-ton bus chassis that MCV will equip with bodies in Cairo. Starting immediately, the finished vehicles will be sold as Mercedes-Benz-brand buses through MCV's nationwide sales network. The bus chassis are rolled out from the same assembly line as that of BharatBenz trucks, as they are technologically similar to the medium-duty BharatBenz trucks. As a

result, Daimler was able to begin with exports before the bus plant was completed at the Oragadam site.

Otis expands Bengaluru factory with elevator test tower

Otis Elevator Company (India) Limited has opened its expanded factory in Bengaluru that includes a new, state-of-the-art elevator test tower. The company is also announcing the

new 'Make in India' initiative, the factory will exclusively manufacture the new product at the expanded Bengaluru facility. Otis is a part of UTC Building & Industrial Systems, a unit of United Technologies Corp. Established 15 years ago in the Jigani industrial area, Otis India's production facility more than tripled the size of the factory footprint and doubled its manufacturing capacity with the recent enhancements. Zubin Irani, President, UTC Building & Industrial Systems – India, said, "We're delighted that with this expanded facility, Otis is equipped to 'Make in India' and well-positioned to meet the demand for sustainable building technologies in the country."



launch of a new Gen2 Infinity product line, developed for the mid-rise residential sector. In support of the country's

Haas Automation tops US\$ 1 billion mark in 2014

Haas Automation, Inc. reports that its annual revenues exceeded US\$ 1 billion for the first time in company history in 2014 – an increase of more than 11 percent over 2013 – making it the best year ever for America's leading machine tool builder. The company also



built more than 14,000 units in 2014 – a 22 percent increase over 2013, and an all-time record – further reinforcing Haas Automation's position as a global leader in the CNC machine tool industry. Sales of Haas CNC machine tools were strong throughout 2014, with a number of records set in the 3rd and 4th quarters. September was the 2nd-best sales month ever for Haas, thanks in part to a very successful IMTS. And October yielded records for machine tool production and sales, with more than 1400 machines built and revenue exceeding US\$100 million. The total number of Haas machines sold during 2014 topped 13,000 units – an increase of more than 9 percent over 2013. Haas also shipped more than 14,000 units worldwide during the year.

PM Modi inaugurates GE's new 'Brilliant Factory' in Pune

In a significant endorsement of India as a major global manufacturing destination, GE officially unveiled its new 'Brilliant Factory' at Chakan II in Pune, Maharashtra. The facility was inaugurated by the Prime Minister Narendra Modi in the presence of the Governor of Maharashtra Ch. Vidyasagar Rao and Chief Minister of Maharashtra Devendra Fadnavis. GE leadership was represented by John G. Rice, Vice Chairman, GE and Banmali Agrawala, President & CEO, GE South Asia who also announced plans for a Phase II expansion.

The 'Brilliant Factory' is one of GE's most advanced facilities bringing together automation, the Industrial Internet and 3D printing. It is built on the concept of flexibility, allowing for the manufacturing of a diverse set of products and catering to GE's broad range of businesses, including aviation, oil & gas and rail.

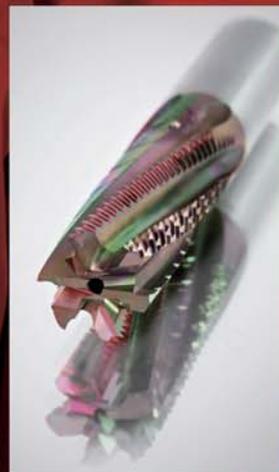
The factory will also serve both domestic and export markets, working on the principle of a 'Shared Centre of Excellence' on process, capability and human capital aimed at driving economies of scale.

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Mark your diary

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

ProMat 2015

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

Asian Tyre and Rubber Conference

June 12 - 13, 2015, Chennai
<http://atrc.in/>

Busworld India

March 28-30, 2015, Mumbai
india.busworld.org

Automotive Manufacturing 2015

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

Hannover Messe 2015

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

Aluminium India 2015

September 7-9, 2015, Mumbai
<http://www.aluminium-india.com/>

India Steel 2015

April 16-18, 2015, Mumbai
<http://www.indiasteelexpo.in/>

Global Additive Manufacturing Summit - 2015

September 24 - 25, 2015, Bangalore
<http://www.amsi.org.in/Conference.htm>

RAPID – 3D Event

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

EMO MILANO 2015

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

SUR/FIN Manufacturing and technology conference and tradeshow

June 8-10, 2015, Illinois (US)
www.nasfsurfin.com

FABTECH 2015

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

Machine Tool Expo

August 20-23, 2015
Delhi
www.mtx.co.in

September 24-27, 2015
Ahmedabad
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KEVIN FLYNN IS PRESIDENT & MD FOR INDIA, FIAT CHRYSLER

Fiat Chrysler Automobiles (FCA) India has announced the appointment of Kevin Flynn as the new President and Managing Director for India Operations. This appointment is effective immediately. Flynn replaces Nagesh Basavanhalli, who left the company to pursue other interests. Flynn is a veteran of the automobile industry with 30 years of international and multi-brand experience. He joins FCA from Jaguar Land Rover, where he served as MD of Jaguar Land Rover South Africa & Sub Sahara Africa. Flynn will be responsible for strengthening the overall sales of the Fiat brand in India and the new brands that will be introduced in the country. His role also includes the management of service, parts and customer care. Fiat will be introducing the Abarth brand in 2015, which will have its own brand identity.



JOHN CASESA IS GROUP VP - GLOBAL STRATEGY, FORD MOTOR COMPANY

Ford Motor Company has announced the hiring of long-time auto analyst and investment banker John Casesa as group vice president, Global Strategy as part of the company's commitment to accelerate its One Ford plan, deliver product excellence and drive innovation in every part of the business. Reporting to Ford President and CEO Mark Fields, Casesa, 52, will be the most senior leader and corporate officer overseeing global strategy and business development. The appointment is effective March 1, 2015.

Casesa will work with the company's business unit and skill team leaders to enhance existing business strategies and to identify and evaluate new opportunities leading to profitable growth. His work will be integrated into Ford's current process for driving results.



PUNIT RENJEN TO BE DELOITTE GLOBAL'S NEW CEO

Deloitte Touche Tohmatsu Limited (Deloitte Global) has announced that Punit Renjen, currently Deloitte U.S. member firm Chairman of the Board, has been selected as Deloitte Global's new CEO. Renjen succeeds Barry Salzberg, who will retire from Deloitte Global at the end of its fiscal year (May 31, 2015). Renjen will assume the new role on 1 June 2015, the start of Deloitte Global's new fiscal year. The Deloitte network is composed of 47 member firms, operating in 150 countries, and employing more than 210,000 people worldwide. "We are an organization led by a purpose – to make a positive, meaningful impact that matters to everyone Deloitte touches. I will do my best to serve the network by helping enable our leaders and people to fulfil their passion to make a difference," said Renjen who grew up in India.



ARVIND MATHIEW TO BE CEO AT MAHINDRA REVA

Mahindra & Mahindra Ltd. (M&M Ltd.), has announced that Chetan Maini, CEO, Mahindra Reva would be moving to a new and diversified role within the Group. The company has also announced the appointment of Arvind Mathew as the incoming Chief Executive Officer of its electric vehicle subsidiary, Mahindra Reva. Both the roles of Chetan Maini as well as Arvind Mathew would be effective May 1, 2015. Chetan will have a wider role in the Group and will be responsible for incubating new technology ventures. A post graduate in Mechanical Engineering and an MBA from the University of Michigan, Arvind comes with over two decades of experience with Ford Motor Company. He is credited with playing a major role in the development of new vehicle and power train program for Ford India and went on to become the President and MD of Ford India in 2005. In his last role, he held the position of CEO, Tata Advanced Materials Ltd.

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We'll get there!

For the 'Make in India' initiative to work in the aerospace and defence sector, India will have to take up a ten point action plan. Here it is!

By **Amber Dubey**, Partner and India Head of Aerospace and Defence at global consultancy KPMG. Assisted by SR Janakiraman, Senior Consultant, Aerospace and Defence, KPMG in India.

The aerospace industry is one of the key indicators of a country's global standing. It creates a huge multiplier effect in terms of economic growth and employment.

The Indian aerospace industry is dominated by Defence Research and Development Organisation (DRDO) and Defence Public Sector Undertakings (DPSU) that have traditionally kept the Indian private sector at bay. This is bound to change, given some of the recent actions of the Indian government.

Learning from China

In early 1990s, China was largely dependent on import of defence equipment. A relentless focus on self-reliance has transformed it, in a short span of two decades, to become the third largest arms exporter, behind USA

and Russia. China enhanced its research budget, reverse-engineered and indigenized critical technologies. It encouraged its private sector to play a bigger role. It fast-tracked programs such as the J-20 stealth fighter, C-919 regional aircraft and so on to build momentum. Using its demand pull as a bargaining chip, China convinced Airbus to establish an A-320 assembly plant in Tianjin. Airbus built a facility for composite components for A-350 at Harbin and is now planning to build an A330 completion centre in Tianjin. China is smiling.

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Learning from Israel

Israel is the eighth largest defence exporter of the world. In late 1980s, Israel had the foresight to drop the costly Lavi fighter jet program and focus on specific technologies instead. Today, it is one of the world leaders in missiles, electronic warfare, communication systems, guns and UAVs. According to SIPRI, 41 percent of all UAVs exported during 2001-2011 came from Israel.

We believe for the 'Make in India' initiative to work in the aerospace and defence sector, India will have to take up a ten point action plan as follows:

1 DEVELOP A CLEAR VISION

'Design and make in India' will be a 20-25 year marathon and not a sprint. A clear vision and focus are key. Global defence OEMs, reeling under budget cuts are looking for new markets. It's a time for India to go for the kill.

2 ESTABLISH AN AEROSPACE COMMISSION

We need an independent Aeronautics Commission in line

with the ones created for atomic energy and space. The Commission should be headed by a technical expert and should report directly to the Prime Minister. Its mandate should be to ensure self-reliance in aerospace sector, whatever it takes.

3 FOCUS ON TECHNOLOGY; PRODUCTS WILL FOLLOW

The Aeronautics Commission should identify 5-6 technologies, critical to India. These could be next-generation guided

SPECIAL DATES NEED NOT APPEAR JUST ONCE EVERY YEAR.



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missiles, stealth, cyber-security, avionics, communication systems, electronic warfare, super-alloys, composites, etc. Chasing everything may dissipate energy and funds.

Research in each focus technology should be led by an individual, chosen purely on merit, from DRDO, DPSUs, private sector or academic institutions. He/she shall have single point accountability.

4 RAISE FDI LIMIT IN DEFENCE TO 74 PERCENT

Defence technology is so complex that the biggest military power – USA – has permitted wholly-owned subsidiaries of non-US companies like Airbus, BAE, Rolls Royce, Saab etc.

The government should enhance the FDI limit in defence to 74 percent. 49 percent is no better than 26 percent, technically; and 100 percent is another extreme. Opposition from DRDO, DP-SUs and the ‘Bombay Club’ is perhaps driven more by insecurity than reason. They will be the ideal JV partners once leading OEMs come to India.

5 ENHANCE THE DEMAND PULL

The aerospace industry thrives on strong local demand. Our civil aviation sector needs to fire. Reduction in ATF cost, MRO taxes and airport charges; the ‘100 Smart Cities’ project; promotion of tourism, helicopters and corporate jets are key imperatives. Defence procurement programs like FGFA, MMRC, LUH, NMRH etc need to be fast-tracked.

6 JOINT DEVELOPMENT PROGRAMS

Global programs such as the Joint strike Fighter, Eurofighter Typhoon, Boeing B-787 and Airbus A-380 are built by companies collaborating across the world. India should push for co-development programs with USA, Russia, UK, France, Israel etc on focus technologies. India’s the buzzword right now, but not forever.

7 CREATE AEROSPACE CLUSTERS

Defence production needs world class infrastructure – uninterrupted power, water, land, access to ports, airports and

highways, etc; and talent. India requires 4-5 such aerospace clusters. Central and state governments need to work with anchor OEMs to identify the right locations and facilitate its development through PPP, fast clearances and fiscal incentives.

8 LEVERAGE EXISTING TECHNOLOGIES

For new programs like the Regional Transport Aircraft (RTA) and Light Utility Helicopter (LUH), etc, we should use off-the-shelf technologies from global OEMs to the extent possible and then go for gradual indigenisation. Trying to develop everything from scratch is a waste of time and money.

9 ENGAGE THE INDIAN PRIVATE SECTOR

India’s ignominious status as the world’s largest defence importer is thanks to a systematic alienation of its private sector, where graduates from India’s best science and engineering colleges join. It’s foolhardy to ignore them.

The biggest military power – USA – doesn’t depend on DPSUs. Its defence research is handled by DARPA, with less than 200 scientists and no labs. DARPA relies on US industry, universities, government laboratories and individuals and is, incidentally, led by Delhi-born US scientist Dr Arati Prabhakar. It’s time the Indian

defence establishment too starts trusting Indians.

10 GET OUR BOYS BACK

Some of the top global OEMs and research institutions have people of Indian origin in leadership positions. Some of these ‘Pravasi Bharatiyas’ could be keen to come back, provided their key expectations are met. They need to be reached out to, proactively.

To conclude, we need to learn from China’s and Israel’s amazing growth stories. We need to set up an Aeronautical Commission, focus on core technologies, revive our aviation sector, fast-track our defence procurement programs; and leverage our bargaining position to facilitate ‘design and make in India’. We’ll get there!

Views are personal. 

In late 1980s, Israel had the foresight to drop the costly Lavi fighter jet program and focus on specific technologies instead. Today, it is one of the world leaders in missiles, electronic warfare, communication systems, guns and UAVs.

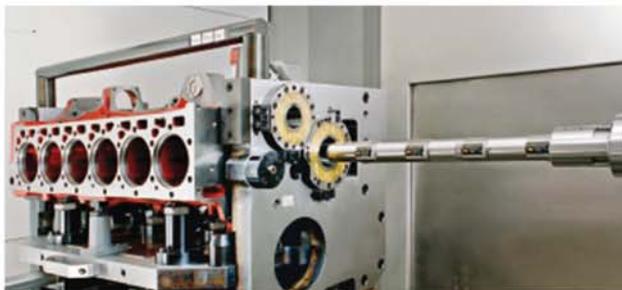
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A Herculean Task!

The pressure to increase performance and productivity when there is a skill shortage is the most strenuous activity which most corporates are going through currently.

By G S Ramesh, Chairman, Layam Group

In today's economic climate, managing people is the most strenuous activity. Business leaders and managers of today are going through mental turbulence to achieve desired results, as the industry has become competitive and qualitative with the focus on the just-in-time concept.

The pressure to increase performance and productivity when there is a skill shortage is the most strenuous activity which most corporates are going through. Despite India having the youngest population, globally our productivity levels are mediocre.

People management is directly linked to the performance of an organisation. Retaining talent and getting the existing talent to perform better is the biggest challenge for any management. To conquer this challenging problem, people managers need to engage the employees in an efficient manner.



People management is directly linked to the performance of an organisation.

Performance management is a continuous process that involves planning, developing, coaching, providing feedback and evaluating employee performance done at regular intervals. Your employees are the biggest assets you have. Their performance and attitude can result in the success or failure of your business. The most difficult part of any manager's job is to manage people.

Leader is a business driver and also sets an example to the employees. The organisational growth and its brand depend on the capable captainship of the leader as well as his philosophy and strategy. At times, it has been seen that the vision is not properly aligned to the top-down which results in misconception and misinterpretation of the management thought process.

Our efforts should be to make the management team environmental sensitive, employee sensitive and process sensitive. So initiatives have to be customised to be specific to the industry and the situation. There are many initiatives that can be undertaken.

Training and development

To keep pace with the cut-throat competition, organisations are now more interested in imparting skills that are specific to the key result areas of their human resource and also measure their performance at workplace for a given skill. As opposed to the classic picture of training that companies usually bear in mind, the interest in training and development activities now stems from learning speed and effectiveness of individuals to become competent in their respective work spheres.



Performance management is a continuous process that involves planning, developing, coaching, providing feedback and evaluating employee performance done at regular intervals."



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Organisations are now looking far beyond just a well-executed training intervention – what they now need is a quantifiable change in skill, knowledge and attitude which will result in a good return. I feel this paradigm shift is only for the good as people have come out of the process-oriented mould and have become more result oriented. As businesses are evolving more rapidly than ever, the ‘hire-train-deploy’ model is coming into existence wherein training plays an indispensable role in deciding the success of individuals and hence the company.

Appraisal

I truly believe that if we care for people the result will be high performance. Simple things such as promotion, right compensation and motivating the employees go a long way in managing their performance. This creates a winning collaboration and people want to perform and stay. Appraisals can definitely become the tool for employee engagement in an organisation. It would not only help the organisation build right work culture and climate but also build the passion and sense of ownership and belonging in the minds of employees. This, in turn, will make the organisation a ‘great place to work.’

Engagement and rewards

Employee engagement is a concept where the organisation strives to ensure that the employees are committed to their organisation’s goals and values, are motivated to contribute to organisational success, and are able at the same time to enhance their own sense of well-being.

The employer needs to trust employees and believe that they can do well. Only when the employees believe that, they will perform well. There needs to be a good communication system. It is the role of the management to reach out to the employees and make the system more accessible.

According to a study, ‘Leveraging Employee Engagement for Competitive Advantage Employees,’ people with the highest level of commitment perform 20 percent better and are 87 percent less likely to leave the organisation. This indicates that engagement is linked to organisational performance.

Reward scheme is instrumental in creating employee en-



Only when the employees believe that they will perform well, they can do well.



Organisations are now looking far beyond just a well-executed training intervention – what they now need is a quantifiable change in skill, knowledge and attitude which will result in a good return.”

agement. According to a study done on total rewards by London based Aon Hewitt, high performing companies have adopted total rewards as a way of thinking about attracting, motivating and retaining employees. Of late, all high performing companies have started total rewards as an area of focus and they are experiencing a stronger return on their investment in their employees.

Defining roles and responsibility

In most organisations, there are people who are unclear about their roles and responsibility. In order to effectively manage your staff, it is important to provide them with a clear definition and understanding of their role, function, and responsibilities in the workplace. One of

the first things I usually recommend is defining roles of every employee. If the manager cannot justify the roles of his employee, then the employee does not fit in the organisation. So it is extremely important not to hire for the sake of hiring. Along the way, some employees need to be let go and some new management changes need to be taken. This becomes an extremely emotional process but it’s a necessary change and we cannot avoid it.

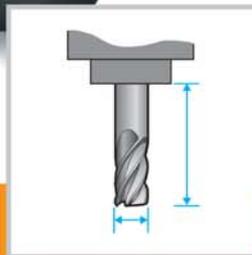
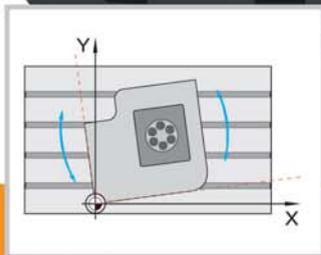
An organisation can follow all these tips and have the perfect system but the system will be effective only if the company has a good leader. A good leader will always be an inspiration to employees. It is the leader who builds a brand of a company. I always say that, ‘A good leader maketh a company.’ You can do all kinds of marketing and advertising but nothing helps the brand like the leader. Most high-profile companies have an inspiring leader leading them. They carry the company and the brand wherever they go. 

Break the past

A leader must break through the past and adopt the following philosophy:

- Manage rewards as an honest intervention than set of programmes.
- Maintain transparency and open communication.
- Implement performance-based benefits and rewards.
- Stay open to new and innovative ideas and be different.

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Excellence – No Finish Line

From operational excellence to state-of-the-art technology and from energy efficiency to safety standards, UltraTech Cement’s latest Greenfield plant Kotputli Cement Works is raising the bar across the board.

UltraTech Cement as a brand is associated with modernity, technology and innovation. Its manufacturing plants are testimony to how the organisation has focused on technology that enhances sustainability and productivity, with an unwavering focus on safety. The largest grey cement manufacturer in India, UltraTech has a pan-India presence with 12 integrated units, 12 grinding units, and five bulk terminals.

“India’s cement industry is one of the most energy efficient in the world. Our plants are modern with some of the best and latest technologies. At UltraTech, we combine technology, process and concern for the environment and society to create solutions and opportunities for our stakeholders. Our Kotputli plant, with a production capacity of 3.30 MTPA, is UltraTech’s latest Greenfield project and one of the lowest power consuming units in the industry. It has pioneered several

initiatives for the safety of the environment and its people and some of these best practices are being rolled out at other units of UltraTech as well,” says OP Puranmalka, MD, UltraTech Cement Limited.

The plant is fully automated, centrally controlled, energy efficient and environment-friendly. With two grinding facilities at Kotputli Cement Works (KCW) and Panipat Cement Works, it manufactures clinker and cement of OPC-43, OPC-53 and PPC grades.

System certifications

Within a short span of five years from its commissioning, KCW has been awarded with the following certifications from agencies of repute:

- ISO 9001:2008
- ISO 14001: 2004
- OHSAS 18001 : 2007
- ISO 27001:2013
- ISO 50001:2011

A strategic location

KCW gets a distinct advantage with its location which gives it seamless connectivity to major markets. The strategic location of the plant gives it accessibility to various modes of cement logistics. The plant is located between Delhi (109 km) and Jaipur (141 km). It has three railway stations in its vicinity - Dabra (35 km), Alwar (70 km) and Neem Ka Thana (45 km). It is just 2.5 kilometres away from the

national highway that connects it to Jaipur and Delhi.

Focus on technology

KCW is equipped with state-of-the-art cement technology from KHD & Loesche with pyro floor design coolers. Salient features of the plant include cross belt analyzers and vertical roller mills (VRM) for raw material and cement grinding. Novel systems include bulk reception units (BRU) for handling clinker stored outside silos, bulk loading facility, covered storage and mechanised handling of fuels and additives, and circulating fluidized bed combustion (CFBC) boilers registered for clean development mechanism (CDM) benefits.

The covered shed for coal has dimensions of 96 x 300 sq m and is the largest in Asia. KCW also has sheds to ensure pollution free and environment-friendly storage of additives and raw materials.

Thermal power plant

The thermal power plant at KCW (2 x 23 MW capacity) is equipped to use multiple fuels (coal, pet coke, and lignite). This is the world's first small scale CFBC boiler project

Awards and recognitions

1st prize in cement sector (Rajasthan Energy Conservation Award (RECA) 2014

Chairman's WCM Bronze Award- 2013

CII Excellent Energy Efficient Unit award for 2012, 13, 14

CII Excellent Energy Efficient Unit award in Power sector

to get CDM benefits from United Nations Framework Convention on Climate Change (UNFCCC). The fly ash generated is being used in cement manufacturing. The CDM benefit is availed based on boiler efficiency. The boiler efficiency has improved by 3.3 percent in CFBC boiler as compared to atmospheric fluidized bed combustion (AFBC) boiler used earlier.

KCW is one of the lowest power consuming units in the industry. Its boilers are registered with UNFCCC for carbon credits. The total credit of CO₂ will be 21509 tonnes/year. KCW has consistently won the National Award for Excellence in Energy Management instituted by CII.

Mines

The limestone mine is attached to it has total mineral reserves of 217 MT and total mine area of 867.56 hectares. While seven percent of production is through primary breaker, 93 percent is conventional mining. Since inception, KCW is using primary breakers to deal with hill edges, with conventional mining being used at the remaining part of the mine. This enables the unit to ensure scientific development of the mine.

The mines have witnessed continuous improvement in blasting performance parameters and won various accolades during Mines Safety Week and Mines Environment Week. One of the outstanding features of the mines is its state-of-the-art workshop with centralised distribution system for electric and pneumatic power, and highly mechanised lubricant dispensing system with metering units.

An eye on the environment

The cement industry promotes the use of waste as an alternative to raw materials and fossil fuels. KCW has obtained permission from Central as well as State Pollution Control Board for usage of non hazardous wastes. In addition, KCW has also received requisite permission for using hazardous wastes from automobiles, soft drink industries and pharmaceutical industry

“Our Kotputli plant, with a production capacity of 3.30 MTPA, is UltraTech's latest Greenfield project and one of the lowest power consuming units in the industry. It has pioneered several initiatives for the safety of the environment and its people and some of these best practices are being rolled out at other units of UltraTech as well.”

OP Puranmalka
MD, UltraTech Cement Limited.



Raw Material Handling section

as fuel. Currently, it utilises only non-hazardous waste like carbon black which is a product of tyre pyrolysis plants.

Fly ash is a waste generated at power plants, and is used as a raw material in the cement industry for manufacturing of Pozzolona Portland Cement (PPC). The increase of fly ash utilisation in cement manufacturing helps in the CO₂ emission reduction as well in solid waste management. In alignment with its sustainability objectives, KCW has increased the fly ash utilisation up to 32 percent and achieved the clinker factor of 1.31 till December 2014.

Conservation of natural resources like fossil fuels is ensured through utilisation of petcoke up to 100 percent in the cement and power plant. Natural resource conservation and ground water resource augmentation is ensured through development of artificial rain water harvesting structures at the plant, colony, mines and nearby areas. At KCW, it is ensured that rain water harvesting is done on a large scale.

Safety

Safety is a core philosophy at UltraTech, and this is reflected in the measures undertaken at KCW to ensure safety across operations and processes. Between July 2013 and October 2014, it recorded 6.46 million loss-time injury (LTI) free man hours. There is a reducing trend in FAC/fire, property damage, non-compliance in PPEs, and tools and equipment. The plant has also achieved 100 percent compliance to second party safety audit points.

The importance of safety at KCW can be gauged by the fact that it includes Safety Professionals in the selection process for all recruitments. The plant has trained 16 supervisors on Employee Action in Improving Safety (EAIS), a business-wide initiative at UltraTech Cement for empowering employees to promote safety culture across the organisation. These supervisors will further train other identified employees, and in turn safe behaviour will percolate down to every single workman involved in the unit.

A unique safety feature at KCW is *Samvaad* - an initiative to enhance safe behaviour at the shop floor. It aims to establish two-way communication among employees and contract workers. Under *Samvaad*, employees are trained in safety standards in classroom by teams comprising members from HR, safety, subject matter experts and area in-charges. Inputs are gathered and scope of improvement is prepared in terms of safe behav-



Preheater tower having 6 stages and 2 strings

To enhance logistics productivity, KCW introduced a unique system named 'Eye on Wheels' for reducing truck turnaround times. Launched in late 2013, the system has reduced the truck turnaround time at the unit by more than 70 percent.

our. Check points are prepared connected to safety standards. These teams visit the shop floor based on the inputs and probe check points. They appreciate good performers and give feedback for improvements. Employees are also recognised for good safety behaviour with different awards such as Good Citizen Award and initiatives like *Khatra Pehchano* (recognise danger) drive, among others.

To make driving within and outside the plant safe, KCW has started a seat belt interlock mechanism which ensures that the engine of a vehicle doesn't start unless the driver wears the seat belt. KCW has also made its packing operation safe for its employees. It has started using compressed air breathing apparatus that is generally used in the pharmaceutical industry. It has modified the product to suit its requirement in collaboration with the supplier. The product ensures that the person in charge of packing the cement bags doesn't inhale the dust, while the air around his face is kept cool.

KCW is also the first unit at UltraTech Cement to build a park that showcases our safety standards. Live demonstration of various safety practices and standards is made at the safety park for better understanding of safety concepts among contractor workers.

Eye on Wheels – a unique initiative in logistics

To enhance logistics productivity, KCW introduced a unique system named 'Eye on Wheels' for reducing truck turnaround times. Launched in late 2013, the system has reduced the truck turnaround time at the unit by more than 70 percent. The moment a truck arrives at the yard gate, it is sensed by the sensor and gets registered in the system. The dispatch instructions / lorry receipt (DI/LR) is issued by the concerned department and the vehicle sequencing position and allotted packer number is displayed to the driver. After making an entry into the plant, vehicles approach the automated weigh bridges for weighing and go to the final destination for loading or unloading.

Way forward

Having achieved some impressive milestones, KCW now plans to consolidate its performance and work on the finer aspects of the plant with a continued focus on sustainability. Skill building among wage board employees and ingraining the Group culture in them is what the unit aspires for in the days to come. 

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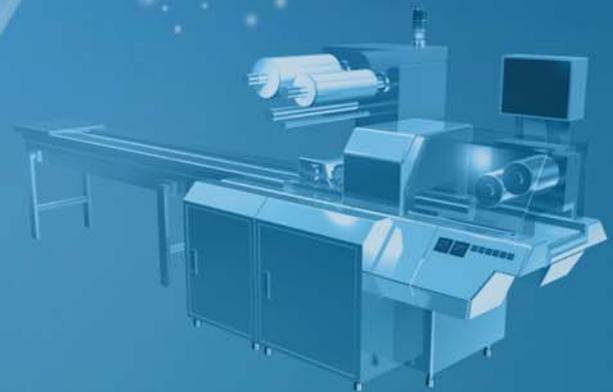
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The first series production Light Combat Aircraft, Tejas, made by HAL was handed over to the Indian Air Force on January 17, 2015.

Ready for the **big opportunity**

The policy initiatives of the Government for the defence sector coupled with the fact that European and USA market for defence have saturated, augur well for the growth of Aerospace and Defence sector in the country, says **T. Suvarna Raju**, Chairman HAL.



T. Suvarna Raju

Indian Military and Civil helicopter market is a big opportunity for our company. HAL has taken steps to position itself well into this market by having products in the two to 10 ton category."

The year 2015 is going to be a very special year for HAL as we will be celebrating 75 years of our existence and we are proud that we have been contributing to the nation's defence needs and "Make in India" concept over several decades.

Coming to the projects front, let me start by apprising you about Light Combat Aircraft-Tejas. I feel extremely proud to tell you that our Hon'ble Defence Minister handed over the first series production Light Combat Aircraft, Tejas made by HAL to the Indian Air Force on January 17, 2015.

HAL has established a new production line with around 28,000 sq m of hangars, engineering and administrative blocks. Extensive investments have been done to make this state-of-the-art production line. Upgrade and augmentation of production tooling has been done with Jigs already calibrated to Micron level tolerances. HAL is all set to roll out the numbers that customer desires with this production infrastructure.

Su-30MKI is the biting teeth of IAF and we at HAL have been manufacturing and delivering this agile multirole aircraft since 2005. HAL has successfully absorbed the technology for manufacturing this 4.5 generation fighter. We are now manufacturing aircraft from raw material stage and have already delivered 150 of them to IAF.

On January 9, 2015, we handed over the first overhauled Su-30 MKI aircraft to the Indian Air Force from our newly established overhaul facility at HAL Nashik made with an investment of over Rs2000 crore. With this establishment, HAL has developed capacities and capabilities to support Su-30 fleet for next 30 to 40 years and this is only one of its kind facilities in the world and will have significant export prospect since nearly 10 countries operate Su-30 fleet. During December 2014, MiG complex of HAL has also celebrated 50 years of fruitful contribution to the Nation.

Su-30 has become a very lethal weapon delivery platform with the successful integration of BrahMos supersonic cruise missile.

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HAL has done BrahMos integration with all the analysis being done by HAL's internal design team. HAL has provided a cost effective indigenous solution to BAPL and this aircraft is being handed over to IAF through BAPL for carrying out live firing.

During 2014, we made our country proud with the success of Mars Orbiter Mission and GSLV MkIII launch. We have made significant contributions to these projects. On December 1, 2014, the then Chairman of ISRO laid the foundation stone for Integrated Cryogenic Engine Manufacturing facility at our Bangalore Complex. This facility will manufacture, integrate and test the Cryogenic Engine CE20 and Semi Cryogenic Engine SE2000.

Research and Development

HAL recognises the need for technology development in order to cope up with the upcoming technological challenges that require HAL to develop new products and product enhancements. The total R&D expenditure of HAL was Rs1083.3 crore for 2013-14 and this works out to 7.2 percent of financial turnover. Critical technologies have been identified in the area of design, manufacturing, avionics and material to support indigenisation. On R&D front, our company has done extremely well during the year by filing for more patents.

HAL's home grown Jaguar DARIN-III upgrade is going to further accentuate the performance of Jaguar and would be a cost effective, state of the art solution. Mirage upgrade programme has made significant progress with the first aircraft already under test flying.

HAL is jointly working with DRDO laboratories, CSIR-NAL, CIPET, IITs and IISc towards achieving self-reliance in the aviation field harnessing the Partnership Strategy. Towards this MOUs have been signed with ADA, NAL, IITs & IISc. HAL has already established Chairs at IIT Roorkee, IIT Kharagpur, IIT Mumbai and IIT Kanpur.

HAL is developing capabilities in the design & development of aircraft, helicopters, engines and niche technology areas like SDRs, AESA Radar, Aero Engines, UAVs etc either through indigenous effort or through collaborations.

Future outlook

The Government has recently increased the limit of FDI in Defence sector besides taking out several items from the list



HAL Chairman with the PM at Aero India 2015

New initiatives to boost HAL capability

Proposal for a 'Green-field facility' for manufacture of Light Utility Helicopter (LUH) and Naval Multi-role Helicopter (NMRH) in Timkur District, Karnataka.

HAL and National Aeronautical Laboratory (NAL) will jointly take up design, development and manufacture of 70 to 100-seater regional civil aircraft through a Special Purpose Vehicle (SPV).

HAL has tied up with Bangalore Chambers of Industry & Commerce (BCIC) and Society of Indian Aerospace Technologies & Industries (SIATI) for skill development in aerospace sector.

A Design & Development Management Board (DDMB) under the chairmanship of HAL with members from DRDO Labs, Department of Defence Production and Services for synergizing the R&D efforts in country.

New manuals for purchase, system audit, accounts, outsourcing policy, indigenisation policy, R&D policy, Employee Handbook have been released to align business processes towards better operational efficiencies.

of products, requiring industrial licence. These policy initiatives coupled with the fact that European and US market for defence have saturated, augur well for the growth of Aerospace and Defence sector in the country.

Indian Military and Civil helicopter market is a big opportunity for our company. HAL has taken steps to position itself well into this market by having products in the two to 10 ton category. The development of LUH would be very crucial to our plans as defence market capitalisation is based on timelines of this programme. Based on the current growth rate (approximately 10 to 12 percent), it can be predicted that the industry may have 400 to 600 helicopters by 2021. HAL is targeting this segment demand by customising ALH and by making efforts for civil certification of ALH.

The fixed wing defence market will see a lot of interest by foreign OEMs as the Indian Defence and civil requirements have made it as the fifth largest market in the world. FGFA and MTA programmes have the capability to catapult us into the league of technology leaders.

LCA, IJT and HTT-40 are the in-house technology drivers and would provide the strategic edge to our defence forces. These platforms would have significant export potential.

Vision & conclusion

The vision for HAL in coming years is to become a technology company while pursuing excellence in operations. HAL aspires to achieve operational excellence and would strive towards realising India's long cherished dream of self-reliance in Aerospace & Defence by catalysing itself through PM's vision of "Make In India". 

Delivered at the Aero India 2015. Source: HAL

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Growth Oriented & Inclusive

The Finance Minister has delivered a Budget which is strong on vision, reflects clear intent to put the economy on the path of double digit growth and has a strategy to execute challenging reforms in critical areas.

By Dr. Baba Kalyani, Chairman & MD, Bharat Forge Ltd

The first full budget of the government led by Prime Minister Narendra Modi has come at a time when green shoots of economic revival appear to be taking root. It also comes on the back of huge expectations. My impression is that the Finance Minister has delivered a Budget which is strong on vision, reflects clear intent to put the economy on the path of double digit growth and has a strategy to execute challenging reforms in critical areas.

From a macroeconomic perspective, the government has done well to meet the fiscal deficit target of 4.1 per cent. The softening of global crude oil and commodity prices has contributed in a significantly lower current account deficit. Foreign Exchange reserves at US\$ 340 billion are at an all-time high. The government is committed to keep inflation at below 5 per cent. All these factors have given the Finance Minister a platform to lay out a road map of lowering fiscal deficit to 3.9 per cent in FY 16, 3.5 per cent in FY 17 and to 3 per cent in FY 18.

The budget clearly provides a tremendous impetus to 'Make in India'. Increased investment in infrastructure of Rs70,000 crore and a higher allocation of Rs2,46,727 crore for Defence will clearly provide a boost to domestic manufacturing industry and help in creating new employment opportunities. Importantly these investments would help revive the investment cycle and contribute to increasing the share of manufacturing in national GDP from 15 per cent to 25 per cent. As a follow up, we now expect the Government will expedite announcement of the new Defence Procurement Policy to facilitate larger private sector participation in Defence production. The steps to facilitate 'ease of doing business' will further support revival of growth in the domestic manufacturing industry.

Some of the key enablers to achieve manufacturing growth include roll out of GST from April 1, 2016, announcement of five ultra-major power projects a 4,000 MW each which will give a boost to the capital goods industry, the initial Rs1,200 crore allocation for the Delhi Mumbai Industrial Corridor with assurance for more funds later, significantly higher investments in the renewable energy sector, opening of opportunities for Medium and Small industries, emphasis on the housing sector and corporatisation of Ports.

The road map to reduce the basic rate of Corporate tax



We now expect the Government will expedite announcement of the new Defence Procurement Policy to facilitate larger private sector participation in Defence production."

from 30 per cent to 25 per cent over the next four years, deferring the applicability of GAAR for two years and avoidance of retrospective taxation will considerably increase confidence of domestic and foreign investors. The decision to abolish Wealth Tax and replace it with an additional two per cent surcharge on individuals with higher incomes is also welcome.

While the Finance Minister did speak about the need to push exports, I am slightly disappointed that Minimum Alternate Tax and Dividend Distribution Tax on Special Economic Zones have not been withdrawn or at least lowered as was expected. We hope the new Foreign Trade Policy to be announced next month will provide incentives for exporters.

This budget has a Vision to propel India to double digit growth and make the country a manufacturing hub of the world. It is also an inclusive budget that seeks to make a difference in the life of every Indian. 



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ROADMAP FOR REFORMS!

The Machinist presents a snapshot of the industry's reaction to the 2015 Union Budget.



GROWTH-ORIENTED

We welcome the growth-oriented Budget 2015. It is consistent with the stated objectives of the Government, reinforcing its commitment to realisation of infrastructure projects. The Government seems inclined to follow its bold path of building infrastructure and improve ease of doing business. Its intention to increase public investments while decreasing Corporate Taxation over a period of time are also steps in the right direction, and we are sure these steps will further improve the confidence of investors and industry alike.

■ **Sunil Mathur**, MD & CEO, Siemens Ltd



REFLECTS INTENT IN ACHIEVING INCLUSIVE GROWTH

Quick implementation of market and policy reforms proposed in the budget will help in achieving a GDP growth of 8.5-9 per cent y-o-y. The proposal to reduce corporate tax to 25 per cent in the next few years is welcome. The proposals on social security for all and welfare schemes for senior citizens indicates the government's intent in achieving inclusive and equitable growth. Increase in the import duty on steel will help in improving the competitiveness of the domestic steel industry.

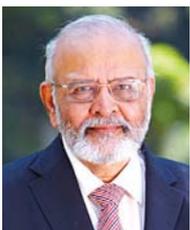
■ **TV Narendran**, MD, Tata Steel, India & SEA



HIGH ON GOVERNANCE

With this 'high on governance' budget, the government has moved away from sectoral SOPs completely and has focused on critical macro points such as transparency, ease of doing business and social welfare. Steps taken towards creating a transparent model of governance and project clearances, setting a direction for GAAR is a clear and positive message to the investors towards ease of doing business. The roadmap for reducing corporate tax gradually is a welcome move that will drive investments.

■ **Shishir Joshipura**, MD and Country Head, SKF India



BUSINESS LIKE, BOLD AND AMBITIOUS

The Finance Minister has presented a budget which is sound, forward looking, business like, bold and ambitious. It is focused on economic growth and job creation. While the tax rate adjustments will result in welcome simplification, the major gain will come from the promised rationalization of the rules for tax assessment, and from the simplification and speeding up of procedures. It caters for all segments of society, and will provide boost for employment, wealth creation, and for social development.

■ **Dr. Abhay Firodia**, Chairman, Force Motors Ltd.



AUGURS WELL FOR THE INFRASTRUCTURE SECTOR

It has created a sustainable growth momentum by focussing on allocations for infrastructure and subsequently a higher emphasis on the fiscal deficit. The measures and allocations announced in the Budget should accelerate large-scale infrastructure development in the country. The Government's decision to allocate Rs70,000 crore augurs well for the infrastructure sector. We welcome all these moves by the Government and particularly applaud the decision to set up the national infrastructure fund.

■ **Anil Chaudhry**, Country President & MD, Schneider Electric India



BOOST TO BOTH INFRASTRUCTURE AND MANUFACTURING

The Finance Minister has taken a very pragmatic approach and crafted a budget in a manner which can provide a boost to both infrastructure and manufacturing which will create employment and also augment India's competitiveness vis-à-vis its peers and at the same time adhered to the Prime Minister's 'Make in India' vision. The most encouraging step has been to slightly relax his fiscal discipline targets in order to channelize more funds for infrastructure creation. This is a very pragmatic approach.

■ **Hemant Kanoria**, CMD, *Srei Infrastructure Finance Limited*



A GOOD BUDGET FOR THE ECONOMY

It is heartening to see that the GST rollout date has been committed as April 2016. Now after an eternal wait, we can finally begin the countdown to a simpler indirect taxation regime. This will definitely give a massive fillip to the manufacturing and logistics industry as effective economies of scale can be achieved and processes can be simplified. Focussed disinvestment in loss making PSUs coupled with a contemporary bankruptcy code will definitely aide in cleaning the mess. Overall a good budget for the economy.

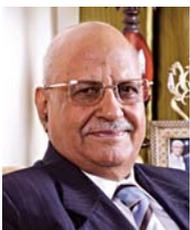
■ **Tushar Mehendale**, MD, *ElectroMech Material Handling Systems (India) Pvt. Ltd.*



PRACTICAL AND BALANCED

It is practical, balanced and growth oriented. With focus on FDI in defence, Make in India, ensuring there is inclusive focus on skill development, technical entrepreneurship, and Institutional mechanism to finance the MSME sector is encouraging for the defence sector.

■ **Sudhakar Gande**, Vice Chairman of *AXISCADES Group of companies & Chairman of FICCI Task Force on Aerospace and Air Defense and member of FICCI- National Executive Committee*



A VISIONARY BUDGET

It can be termed as a visionary budget which lays the road map for achieving long-term goals of raising funds for Infrastructure and Industrial growth. The exception from SAD and reduction in the excise duty of LED drivers and MCPCB for LED lights, fixtures and LED lamps is a clarion call to boost domestic LED Lighting and Electronics Industry. We are also enthused by the reduction in corporate tax and MAT as it will encourage corporate operations.

■ **VP Mahendru**, Chairman and MD, *EON Electric*

FOCUSED ON BRINGING IN INVESTMENTS

It is growth oriented and focused on bringing in investments while addressing the current account deficit. We welcome initiatives on ease of doing business, enhancing the global competitiveness of the Indian industry, skill development for creating employment in rural sectors, rationalisation of taxes for GST rollout and enhancing social security. Overall we hope it will uplift the business and consumer sentiments. There will be a marginal increase of basic duties. The service tax increase is not expected to have much impact on manufacturing since there is a facility to offset it.

■ **Rakesh Srivastava**, Sr. VP - Sales & Marketing, *Hyundai Motor India Ltd*



DEFINITIVE MEASURES TO EASE OF DOING BUSINESS

We appreciate the focus on providing impetus to the Make in India vision by giving clarity on taxes, definitive measures to ease of doing business in India and encouraging domestic and foreign direct investment. However, in our view to provide further stimulus for investment in captive renewable power by the manufacturing units, interest rebate should be given. Further, innovative financing measures such as infrastructure bond, creation of MUDRA bank for MSME sector also augurs well for Make in India.

■ **Tulsi Tanti**, Chairman, *Suzlon Group*



VERY POSITIVE AND BALANCED

It is a very positive and balanced one as it addresses the requirements of multiple stakeholders and creates platform to take the economy on a high growth trajectory. The proposed national investment fund can open up massive amount of capital to help finance India's one trillion dollar infrastructure sector and could be a potential game changer for the industry. The doubling of coal cess will provide incremental 10,000 crores a year to help push renewable energy and will bring the cost of solar power to grid parity.

■ **Ratul Puri**, *Chairman, Hindustan Powerprojects*



LOT OF PRAGMATISM FOR A LONG HAUL

Shows lot of pragmatism for a long haul. It gives 'long term' direction by way of reducing Corporate Tax from 30% to 25% which is definitely welcome. The Make in India initiative is also well supported including by way of infrastructure growth. Clean Ganga initiative has been given budgetary support and tax exemption, thereby putting investments behind the intent. Companies that have the technology to clean Ganga will now be able to avail tax exemptions.

■ **Pramod Chaudhari**, *Executive Chairman, Praj Industries*



WILL DEFINITELY REJUVENATE THE INDUSTRY

The announcement that the much awaited Goods and Service Tax (GST) will be introduced on 1st April 2016, will definitely rejuvenate the industry. GST will make manufacturing more competitive and support the 'Make in India' Campaign. How fast the Finance Minister will move the wheels of change to usher in GST will be keenly watched in the coming days. While other than infrastructure spending there are no visible and concrete steps that could be seen on the 'Make in India' campaign.

■ **SM Lodha**, *Chairman, Indsur Group of Companies*



INDEED A FORWARD LOOKING BUDGET

The new government's budget is indeed a forward looking budget. It seems to be more credible with higher allocation for infrastructure along with clarity in taxation structure. The proposal for 5 "ultra mega" power projects is definitely a positive move and a big boost for growth. The progressive nature of the budget will provide the much needed impetus for growth and timely implementation will put the economy back on track. Clarity is awaited on a lot of points, however, the overall approach is positive.

■ **Sivasubramanian Natarajan**, *MD, ThyssenKrupp Industries India Pvt. Ltd*



POSITIVE BUDGET FOR THE INDUSTRY

Overall it's a positive budget for the industry. As direct investment in the infrastructure sector will surely lead to increase in the GDP growth of the country. The National Investment and Infrastructure Fund (NIIF) with an annual flow of Rs 20,000 crore has been announced and this will help raise investments as equity in infrastructure finance companies which can further fund the Renewable Projects at competitive pricing.

■ **Vineet Mittal**, *Vice Chairman Welspun Renewables*



CREATING AN INDIGENOUS SELF-SUSTAINED ECOSYSTEM

With the current Government promoting domestic manufacturing via the 'Make in India', this initiative is taking good shape. In this budget the government emphasized heavy investment in infrastructure, defence, electronics and skill development. All consistent with transforming India into an indigenous self-sustained ecosystem for research, engineering and manufacturing.

■ **Rafiq Somani**, *Country Manager India, ASEAN and ANZ, ANSYS, Inc.*



HAS SOMETHING FOR EVERYONE

It is more of a directional budget which talks about the “what” & “where” rather than “how”. The intent of the budget has been to focus on Growth & Equality and as a budget which has something for everyone. The thing which stands out that the government has realised that there is a very strong case for improving the Global Competitiveness of India by focusing on infrastructure, ease of doing business by bringing in regulatory reforms to cut bureaucracy and improve existing taxation norms and help to generate jobs.

■ **Sanjeev Ranjan, MD, International Copper Association of India**



A WHOLESOME BUDGET, REPLETE WITH FRESH IDEAS

After a long time, we have had a wholesome budget, replete with fresh ideas. With Rs70,000 crore allotted to infrastructure – there is going to be a surge in allied activities – means more jobs and more money in the hands of the people. Much needed to revive growth and give India the necessary wings to fly. Ease of doing business seems to have been focussed on the large sector. Some more could have been done for easing of rules for the MSME sector.

■ **Samit Jain, MD, Pluss Polymers**



CREATES AN ENABLING ENVIRONMENT

The Finance Minister has done a fantastic job providing impetus to the LED lighting industry through a cut in excise duty. Moreover this budget creates an enabling environment and promotes innovation. Both of these aspects will make PM’s ‘Make in India’ concept into reality.

■ **Jitendra Guha, Chief Executive Officer, Neev Energy**



MOVE TOWARDS GLOBAL STANDARDS

The macro indicators are positive and there is a direction set to strengthen the governance of financial markets and move towards global standards, commitment towards investment directly by the government and through public participation in Infrastructure development. The reduction in tax on Royalty will encourage technology infusion and manufacturing of technology products in India.

■ **Dinesh Aggarwal, Jt. MD, Anchor Electricals Pvt. Ltd**



CREATES A PREDICTABLE POLICY ENVIRONMENT

The government needs to be commended for staying its strategic course. The budget is consistent with its policy stance and stands for continuity. It creates a predictable policy environment, which should go a long way in soothing the nerves of investors. This along with its stress on creating a transparent and ethical context for business will boost the confidence of both doth domestic and foreign investors.

■ **Ravi Uppal, MD & Group CEO, JSPL**

DIRECTIONALLY VERY POSITIVE

The budget is directionally very positive, with a long term vision to spur inclusive growth. The most important aspect is its predictability, which is likely to boost investor confidence on the India economy. Thrust to infrastructure, measures to revive the investment cycle, focus on ease of doing business and boosting entrepreneurship would be the four key takeaways from the Budget. The proposal to unveil a Bankruptcy Code deserves particular mention as it would go a long way in improving the ease of doing business.

■ **Kaushal Sampat, President & MD – India, Dun & Bradstreet**

Uncontrolled heat while grinding can lead to repeated wheel dressings, wear and increased rejection

Grinding being one of the final finishing processes, it pains to see burn marks on the final component after all the efforts taken. While some burns are purely cosmetic, severe burns are catastrophic and could induce residual tensile stresses in the component.

Studies indicate that intense amount of heat is generated between the grinding wheel and work piece due to friction and the subsequent cutting process. A coolant with poor lubricity would be ineffective and would not be able to manage the resultant temperature rise.

Another problem regularly faced is the chatter marks on the components after grinding. Coolants with poor flushing properties, will be unable to clear the fine dust particles, leading to wheel loading and rubbing phenomenon.

Repeated wheel dressings and burn / chatter marks on components result in machine down-time and increase in rejection rates.



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The factory of the future will be more capital efficient and flexible. Updates from product design teams will be introduced more quickly, and customisations incorporated more easily.

While manufacturers vary greatly, on the scale of production and the kinds of products they make, Internet of Things (IoT) can add value to most, if not all. Companies can start small, using sensors to track shipments for example, but also think big, like moving to servitization.

Shifts driving adoption

As with other industries, many manufacturers must now gather more data in order to comply with regulation — for example “food to fork” rules that require chain-of-custody recording. IoT is also creating opportunities to capture and interpret data leading to new services, avoiding commoditisation. And of course, manufacturers are always looking for ways to streamline processes and increase efficiency.



By **Arun Kundu**,
Director, Professional Services, Asia Pacific & Global Strategy, Verizon Enterprise Solutions

“By connecting production-line systems, manufacturers can move to predictive maintenance, helping to make better use of resources and reducing unplanned downtime.”

Starting Small: Tracking assets and protecting people

Inventory, equipment, and sites are extremely valuable and sensitive, so security is paramount. IoT-connected alarms, door locks, cameras, and tracking devices installed on plant, equipment, and stock offer an easy way to help staff maintain security integrity. Sensors can also protect staff and goods from hazards, such as the build-up of noxious or explosive liquids and gases.

IoT-enabled asset tracking not only provides manufacturers with better control of their

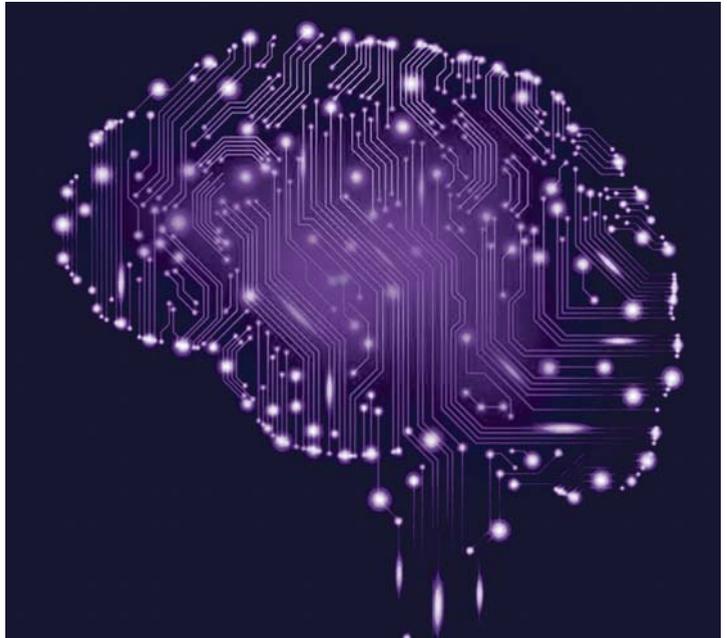
logistics, but using the data can also enable them to offer their customers near real-time tracking of shipments, an appealing differentiator.

Production line monitoring and automation is one of the most mature IoT applications. By connecting production-line systems, manufacturers can move to predictive maintenance, helping to make better use of resources and reducing unplanned downtime. This strategy can improve equipment utilisation and plant output overall. Most production-line systems already contain the necessary sensors — it’s just a case of adding connectivity. Manufacturers can also track pallets, shipping containers, and equipment both on- and offsite, using location-aware IoT devices.

Using a mix of connectivity technologies, including cellular and satellite, this tracking can cover shipments across road, rail, sea, and air transport. This end-to-end monitoring reduces the chance of loss or theft, and additional sensors can be used to verify that perishable or fragile goods are kept in appropriate conditions and handled properly throughout their journey.

The factory of the future will be more capital efficient and flexible. Updates from product design teams will be introduced more quickly, and customisations incorporated more easily. Schedules will reflect changes in demand within hours, not days. Managers will be able to see what stock and raw materials are on hand, and exactly where they are, from their tablet.

By adopting asset tracking throughout the supply chain — from inbound raw materials and parts to outbound ship-





ments of finished products — manufacturers can reduce shrinkage and damage; and forecast their material needs more accurately, achieving the ultimate in lean operations, lower stock, and fewer outages.

Thinking Big: The shift towards servitization

Manufacturers of larger goods — generators, elevators, air-conditioning units, jet engines, and medical equipment — frequently already sell maintenance contracts along with equipment. These contracts are often lucrative, but they create problems for both parties. They require regular inspection and maintenance visits, and customers still experience downtime and an emergency call-out if there's a problem in between visits.

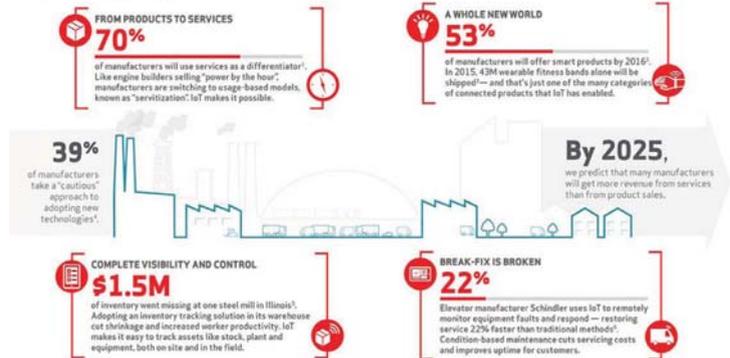
Manufacturers are increasingly moving towards “servitization”, where instead of selling products they contract to deliver outcomes. With IoT, manufacturers can remotely monitor the condition of equipment and look for indicators of imminent failure — for example vibration, temperature, or pressure outside normal limits. This means that the manufacturer can make fewer visits, reducing costs and freeing up employees. For the customer it means less disruption, increased uptime, and ultimately higher satisfaction.

Taking this to the next level, manufacturers can offer a

State of the Market: The Internet of Things 2015

BUILDING TOMORROW'S MANUFACTURER

The Internet of Things (IoT) can help transform the manufacturing sector, with greater operational efficiency, new revenue streams and even new business models.



Courtesy: Verizon

price-per-use, inclusive of all hardware, installation, and servicing. This is servitization, and it's very attractive to customers looking to spread costs and increase accountability. While the smart home is fairly new concept, sales of wearable computing devices, smart thermostats (like Google Nest), and smart lighting (such as Philips Hue) have been strong, and Verizon's network data shows an 89 percent year-over-year increase in the number of connections for smart alarms, cameras, and other home security solutions. 

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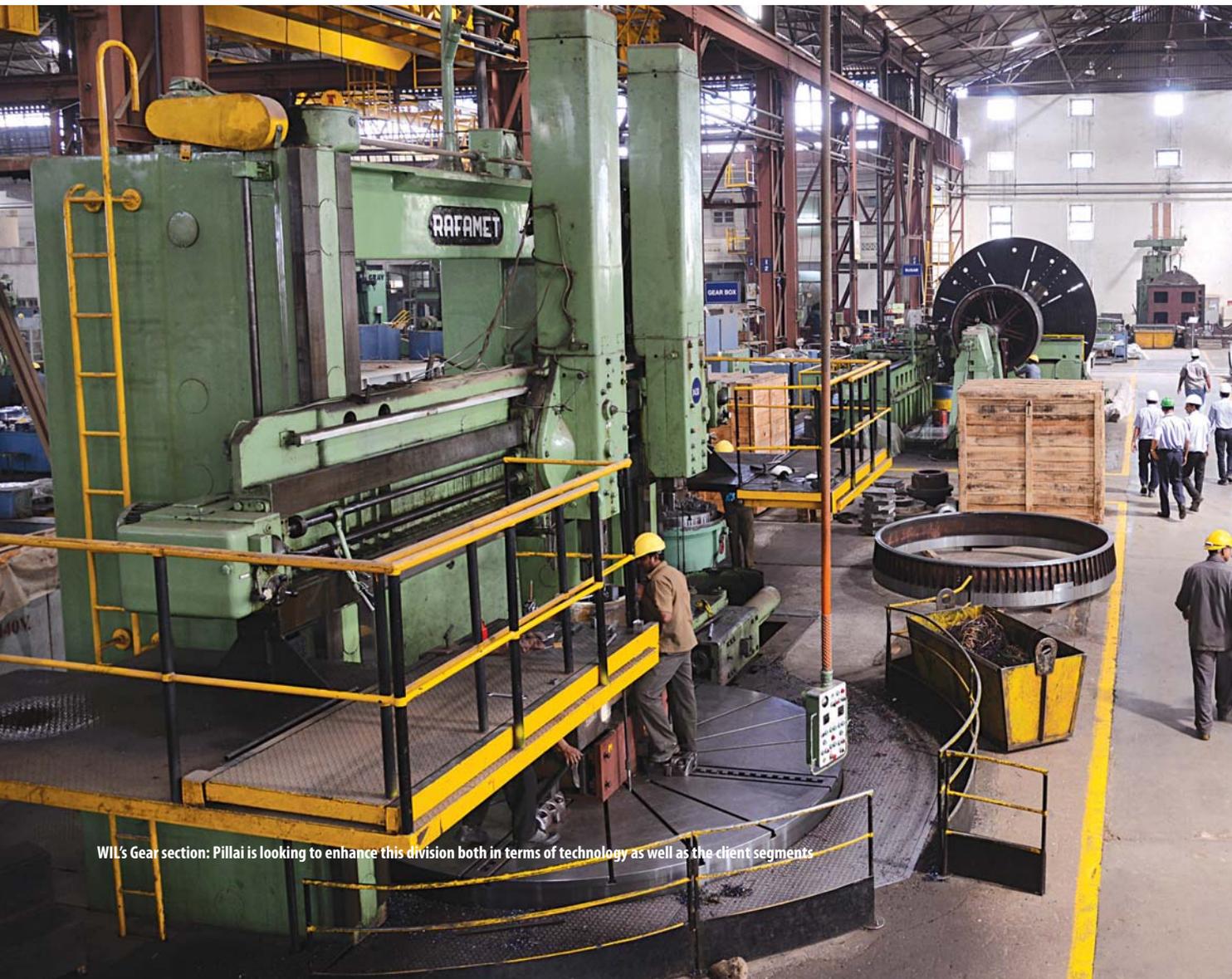




Building India's DNA

While sharpening the focus on Defence, Nuclear and Aerospace sectors, **G K Pillai**, MD & CEO, Walchandnagar Industries Ltd, is steadily transforming his organisation.

By Niranjan Mudholkar



WIL's Gear section: Pillai is looking to enhance this division both in terms of technology as well as the client segments



It was September 24, 2014. Almost every single person at the Walchandnagar industrial township was glued to the television set. No, it was not a World Cup final match! India's Mars Orbiter Mission was inching towards its destination. And soon enough, it successfully entered the orbit of the Red Planet. India became the first nation to successfully send a mission to Planet Mars on its first attempt.

While our Prime Minister was congratulating the scientists at ISRO, the industrial township of Walchandnagar erupted in joy. From its school to the shopfloors and from the administrative block to the residential area, everybody was celebrating and congratulating each other. Walchandnagar Industries Limited had once again played a key role in a national cause and they were all proud of it. "The kick that you get out of such achievements is simply enormous; it is something you cannot quantify in terms of monetary value," says G K Pillai, MD & CEO, Walchandnagar Industries Ltd (WIL) recalling the day.



Some of WIL's manufacturing achievements

- Critical components for nuclear reactor
- Main propulsion gear boxes for Indian built navy frigates
- Components for satellite launch vehicle for ISRO
- Critical components for 235 MW & 500 MW nuclear power project
- One of the largest optical telescopes in India
- Major critical components in the first Indian built nuclear sub-marine 'INS Arihant'
- Critical components for India's first Moon mission 'Chandrayaan-1'
- Critical components for India's Mars mission 'Mangalyaan'
- Major critical components for India's Intercontinental ballistic missile programme - Agni V.

The distinct colour of patriotism is part of the culture at Walchandnagar. In fact, it is integral with the Group's foundation laid by Seth Walchand Hirachand decades ago, Pillai says. "So whether it is contributing to the space missions or the intercontinental missiles, whether it is contributing to the sub-marines and frigates or to the all important nuclear projects, we have been playing our role in building India's DNA – Defence, Nuclear and Aerospace," he explains.



Inside view of a 5-axis machine used for machining Aakash Missile components



A specialised job inside the clean room

Bringing transformation

Pillai has been at the helm of WIL for three years now. And he understands the spirit and the strength of this organisation very well. "That's the reason I am busy transforming it," he says, as we step into the car. We have just finished the plant tour and now we are heading towards his office. The old world charm of one of India's oldest industrial townships is only accentuated as we chat inside the 1950s Dodge. "It's not practical to take this car out of the township but I use it whenever I am at Walchandnagar," he says without hiding his fondness for the vintage car. "And this is something I am not going to change," he adds with a smile.

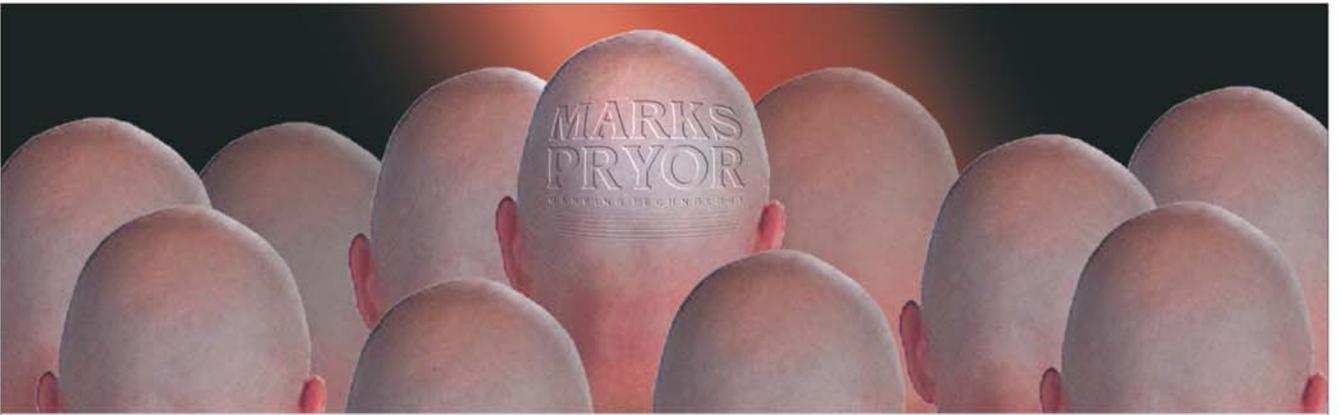
Pillai seems to know exactly what he wants to change about WIL. By the way, it wasn't as if WIL was not doing well before he came. "WIL was quite happy with what it was doing earlier. But I am hungry. I am hungry for growth, I am hungry for improvement, I am hungry for profitability, I am hungry for new technology, I am hungry for success, and my hunger is insatiable," he says. We are now inside his office. And before I can appreciate the interiors of the room and the lovely paintings on the wall, he informs me that it was done during the tenure of the previous MD. "My choice would

Developing niche capabilities

Being associated with nuclear and space programmes requires working with difficult materials as well as sophisticated machinery, complying with various international codes and inspection requirements. Pillai says WIL is continuously upgrading its capabilities in terms of equipment as well as know-how. "As far as our facilities are concerned, we are geared up to meet the needs of machining/fabrication requirements both in terms of size and accuracy. Machines like 5 Axis Machining Centres, Horizontal Boring Machines, Plate Bending Machine, etc. give us the versatility required to manage such jobs with the desired accuracy," he says. Moreover, working with different materials (e.g. Titanium Sheets / Incoloy, etc.) has been a learning experience for WIL and these skills have been built up over a number of years. A lot of this learning actually happens via a trial and error process – with machining and welding parameters being fine-tuned to get the desired finish / strength / tolerances. "We have a Welding Development Centre which caters to such requirements and guides our welders to get qualified in welding of exotic materials. We also keep consulting with leading experts in this field for specific guidance on an ongoing basis. With further developments on the horizon, we would also look to improve our capabilities in Al- Alloy as well as Composites," Pillai adds.



Latest CNC machines for the missile division



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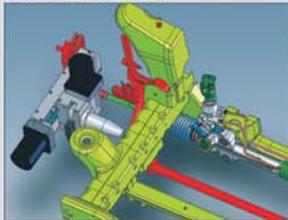
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have been much simpler but I am fine with this," he says. Another legacy that he is not changing. Of course, the change that he intends to bring is far from superficial. "It is a cultural and strategic change that we are bringing," he says, almost reading my mind.

People involvement

Pillai started the transformation process from day one and now he has only intensified it. He points out that any change starts with people and the changes that you see on the outside are a result of the transformation in people. "I have brought three fundamental changes at WIL: empowerment of the younger generation, discipline at all levels and focus on productivity." Due to the nature of the work and the traditional set up, productivity has been comparatively low at WIL. "And today, people at WIL understand that without discipline one cannot improve productivity. It is not that people don't like discipline; they just need to be made aware," Pillai says.

So bringing discipline in terms of increasing productivity and then getting people involved has been a focus for Pillai. "People get better involved if they are empowered to contribute. We are also encouraging the young talent within the organisation to build up a leadership pipeline. It is important to make them understand that they are not producing just any product but that it is an important product. We are making people realise both internally and externally that WIL is not a small or ordinary company but an important company in terms of its contribution not just to the important sectors of aerospace and defence but also to the overall economy. And I want my people to feel proud of their contribution to the nation," Pillai says.

But hasn't there been resistance to change - more so because WIL is a very old set up? "Normally, one would expect a lot of resistance in such cases. I also joined with this notion in mind. But when I talked to the people and explained them the logic behind the change, there has been very little resistance to the new ideas. I have got tremendous support from people within the organisation including from those who have

WIL's manufacturing capabilities*

| Heavy Engineering at Walchandnagar | Precision Instruments at Dharwad | Foundry at Satara |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Area under crane: 56,000 sq m. Crane capacity up to 250 tonnes. ASME Certification for NB, R, S, PP & U stamps. Fully equipped with modern manufacturing facilities including CNC machines, dust free halls, sophisticated welding systems, large sized furnaces with data acquisition systems. Excellent ability to handle critical and exotic materials. | Total area of Dharwad site is 65,000 sq m with built-up area for manufacturing at 2,220 sq m. Manufacturing facility for pressure and temperature gauges, various instruments. Plant comprises of automats, hobbing machines, press shop, heat treatment facility, testing lab, chemical treatment facility and tool room. | Excellent product related infrastructure, pattern shop, machine shop and metallurgical Lab. With cranes used in foundry ranging from two to 35 tonnes, the liquid metal capacity of this facility is 1,200 T / month. Satara foundry is spread over an area of 38 acres. |

**A fourth facility is planned at Dabej, which will be shore-based. "We are in the process of chalking out our strategy for optimal use of our Dabej land. Though earlier this asset was earmarked primarily for manufacturing of nuclear equipment, we would not like to remain fixated to only one sector and would also look at opportunities like general fabrication and process equipment, etc." Pillai says.*

"We have set an ambitious target of Rs1,000 crore revenue from Defence and Aerospace by 2020 from Rs150 crore presently."



Talent retention

Since WIL works in a niche segment, it can be quite challenging to find the right talent in India. Pillai agrees. "Yes finding the right talent is definitely a challenge especially for postings to sites, which are not located in big cities." However facilities like residential accommodation, schools, medical care, recreation facilities, community welfare and so on, which WIL provides has ensured an ecosystem to nurture the talent pool. There are in-house training programs in both hard and soft skills – project management, technical training, presentation & communication skills, etc. There is also a lot of on-the-job training through a mentor-mentee concept where seniors guide young talent. "Even for our workers, we have on-going training programs and we also run an ITI to develop special skills required in our kind of industry," Pillai shares.

been with this organisation for 30 years or even more. In fact, they are welcoming the change in the overall organisational culture," states Pillai.



“Does the country need WIL for sugar industries or for the DNA industries? The answer is obvious. And that’s the reason we are focusing on these segments. We are trying to refocus the entire manufacturing activities with this approach.”

It is a fact that many employees have been part of WIL for decades. It is not uncommon to see three generations of a family finding employment at WIL. “May be that was the right thing to do 50 years back. But now we are changing this tradition as well. If a person has dedicated 30 years or 40 years of his life for the Company it is not necessary that his son or grandson should also get employment with the Company. Unless of course, the next generation is qualified for the job. In fact, if he is qualified and he is ready to compete then we will give him preference. But the selection will be purely on

the basis of talent. Thankfully, people are understanding and accepting it now,” shares Pillai, who has played hockey with the likes of Ashok Kumar. They say in hockey - ‘Keep moving if you want the Ball’ and ‘You can’t score if you don’t shoot’. Pillai seems to be following these hockey basics even now!

Change at all levels

Pillai is bringing change at all levels. “For example, materials are being decentralised now. This in turn is giving more power to the individual businesses.” While there are many industry sectors that WIL caters to, Pillai has restructured it into three business pillars – EPC, manufacturing and engineering. “EPC is what we do for sugar, cement and power industry. EPC business is relatively easy as you are just buying products, doing some engineering and delivering the project. Having said that, we will continue to do EPC.

The second business pillar, manufacturing is core to our growth plans. So WIL is now increasing its focus on manufacturing. “Our aim is to grow the share of manufacturing in our overall turnover with a clear shift in focus from revenue growth to profitability. Revenue growth is important but not at the cost of depleting the bottom-line,” he says. The third

Gearing up!

Pillai takes certain pride in WIL’s capability to manufacture gearboxes for Indian naval ships. “It is a specialised job and so far, we have supplied 52 gearboxes to different ships for the Navy.” He wants to leverage on this expertise and further build it by investing in new technology. “It will surely be a focus area for us in terms of technology and we are looking to upgrade it continuously. Going forward, we would be looking for gear applications not just in the naval segment but also in other segments such as defence and general industries. We are in fact looking at various partners for that segment,” Pillai shares.



A specialised gear grinding machine for large and heavy workpieces up to 2500 mm and 25 tonnes. WIL is one of the handful companies in India to have this capability.



business pillar is engineering. And that will be another big focus area for us to make Walchandnagar once again a predominantly high-tech engineering hub,” he says. Walchandnagar has always been known to be a good engineering company delivering specialised products. “Engineering has been a strength for us but over the years it has slightly dwindled. This has happened because people have started giving less importance to engineering and giving more importance to production. But we are changing it now.”

Delivery to the customer is very important. But given the nature, scale and complexity of the work at WIL, on-time-delivery has taken a back-seat a few times. Pillai is honest enough to accept it. “Our focus has been to supplying the product not withstanding that sometimes it is a bit late. That is something that we are changing drastically. So besides delivering the right product, now there is equal importance given to on-time delivery. Empowering people and decentralisation are steps taken towards this goal,” he says.

The big opportunity

Conventionally, the sugar industry has been a big focus for WIL over the decades. In fact, WIL started off with the sugar industry. Earlier, the sector was important in terms of the machinery. But today, the machinery and equipment for this industry have become commodity products; these are not high-tech products. Moreover, the sugar business itself is not a very lucrative one. “WIL’s expertise has all along been on good heavy engineering. So we said, why not focus on segments which really enhance this aspect and really utilise this

Retaining the Sweetness

With growing focus on the DNA segment, there could be suggestions that WIL exit the sugar business. And it may be logical as well. But Pillai doesn’t agree. “Well, we have an expertise built over about 70 to 80 years. Why throw it away? We can be selective. In fact, there is a substantial exports market for this industry and we are focussing there. And when I am exporting into a foreign country, more than WIL, for me it is actually Indian exports. So, it is dually important to us because the name of the country is added to the name of WIL.”

capability.” And which are these areas? Defence, Nuclear and Aerospace, or the DNA as Pillai likes to call them. “Does the country need WIL for sugar industries or for the DNA industries? The answer is obvious. And that’s the reason we are focusing on these segments. We are trying to refocus the entire manufacturing activities with this approach,” he says.

WIL has been one of the few private players with capabilities and expertise in the aerospace and defence sector. But the ‘Make in India’ campaign and the opening up of the defence sector have truly widened the opportunities for WIL. It recently hired PwC to chalk out a strategy for enhancing



A giant horizontal boring machine. Not many heavy engineering companies in India can boast of having such unique capability.

its defence portfolio. “The canvas has grown and we wanted to understand the areas that we can go after besides the ones that we are already catering to. The recommendations are, of course, confidential but we have identified opportunities that are a) In Line with our existing capabilities, b) Step Out opportunities, and c) New Opportunities. The exercise has not just been about formulating the strategy but also about building technical and marketing along with plans for investments to meet the strategic objectives. We have set an ambitious target of Rs1,000 crore revenue from Defence and Aerospace by 2020 (from Rs150 crore presently),” Pillai explains. WIL is also keeping its options open in terms of technological tie-ups. “We are not averse to joint ventures as well,” he adds.

At the same time, WIL also wants to evolve a business model for equipment manufacturing which is regular in nature and gives consistent revenue. Besides the DNA segment, Pillai also sees lot of opportunities in railways, renewable energy, general fabrication and process equipment fabrication segments.

Patriotic industrialisation

The founder of this Group Seth Walchand Hirachand was described by Sardar Patel as a ‘Patriotic industrialist’. Pillai believes that this description will always remain to the core of WIL. “Our founder was a visionary who established institutions like HAL and Hindustan Shipyard. To think of something like this at that time required great vision. In fact, WIL itself was established with the objective of ‘Make in India’. We are only carrying forward that tradition with a renewed vigour and focus.” 

Calling all manufacturing plants in India to send entries

THE ULTIMATE GUIDE TO PROFITABLE MANUFACTURING
MACHINIST

Super 
SHOPFLOOR 2015

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

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

Large enterprises (Rs1,500 crore turnover and above)

SMEs (Less than Rs1,500 crore turnover).

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

Participation is simple and there is no entry fee.

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

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

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

You may also attach supporting documents.

Please provide a brief video related to your nomination. (One video per nomination if there are multiple entries).

Each video should be preferably in MP4 format and maximum time should be 4.30 minutes.

You also may send it via WeTransfer or SendSpace or on a CD / DVD / pen drive if the file size is heavy.

You must also provide the following details

Category (Large Enterprises or SMEs):

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

Name of the company:

Location of the plant:

Name of the plant head:

Plant size:

Staff strength:

Key products manufactured:

Annual capacity:

Key clients:

Key market (domestic / exports):

Manufacturing principle followed:

Recent milestones:

Technological highlights:

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

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

Last date for sending your entry is March 25, 2015

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



Boeing awards Titanium forging contract to Bharat Forge

Boeing has signed a multi-year contract with Bharat Forge of India to supply titanium forgings for wing components for the Next-Generation 737 and 737 MAX. Under the agreement, Bharat Forge will begin supply-



ing pre-machined forgings from its facilities in Pune and Baramati to Boeing in the first quarter of 2016. The titanium parts will be heat-treated, shaped in a forging press, and machined by Bharat Forge before being shipped to Boeing Portland for finish machining into components. The components then will be installed in the Next-Generation 737 and 737 MAX wings at the Final Assembly plant in Renton, Wash.

“We are pleased to welcome Bharat Forge into our supply chain as they have an impressive record of performance across many industries,” said Kent Fisher, Vice President and General Manager, Supplier Management, Boeing Commercial Airplanes. “Our discussions with Bharat Forge Chairman and Managing Director Baba Kalyani and his leadership team leading up to this agreement have demonstrated not only a high level of technical expertise, but also an understanding of the need to meet aviation market requirements for affordability.”

“This contract demonstrates our accelerating engagement with Indian suppliers to scale-up aerospace manufacturing aligned with the Prime Minister’s ‘Make in India’ initiative,” said Pratyush Kumar, President, Boeing India.

“The partnership with Boeing highlights our capabilities in titanium forging and our unwavering commitment to offer high end technology and tangible value in the aerospace sector,” said Kalyani. “We have mastered the stringent process requirements for titanium forgings and will be supplying critical forgings for wing components in one of Boeing’s high volume products. This also confirms our resolve to meet the aspirations of the ‘Make in India’ drive.”

Premium Aerotec & Aequus Aerospace sign \$50 million deal for seven years

At Aero India 2015, Premium Aerotec received the first aluminium series components from Aequus Aerospace as part of a long term agreement to supply the Airbus Legacy programme. “For Premium Aerotec this is the start of a strategic partnership with Aequus Aerospace and reflects an important step we are taking to reorient our supply chain in collaboration with global partners in the detail parts sector,” said Florian Mack, Head of



Strategic parts procurement at Premium Aerotec, during the hand-over of the first components at the Aero show in Bangalore. According to Mack, Aequus offered a very attractive value proposition from its precision engineering ecosystem, located in its Belagavi SEZ. “It is exciting to deliver these first components to Premium Aerotec under our long term agreement,” said Walt Sirmans, President of Aequus Aerospace. Over the next seven years, Aequus Aerospace will supply approximately \$50 million worth of precision machined parts for the Airbus A320, A330, A380 programs.

RUAG Aerostructures partners with TAL for India for components

RUAG Aerostructures, a global supplier and integrator of Aerostructure components and TAL Manufacturing Solutions Ltd., a Tata Enterprise and a leading company in Commercial & Defence Aerospace manufacturing in India, entered into partnership for manufacturing and supply of aero structural components and sub-assemblies. The two companies signed a multi-year contract with a potential value of over US\$ 150 million. The work scope allows RUAG to strengthen the global supply chain to the advantage of Airbus. TAL will manufacture and supply over 550 sheet metal components, machined parts and sub-assemblies to RUAG, for Airbus’ fast moving, successful A320 programme. Going into two fuselage sections of the Airbus A320, these parts are processed from steel, aluminium and titanium and involve use of some of the most sophisticated and futuristic equipment in aerospace manufacturing. Adds Rajesh Khatri, ED & CEO of TAL, “This contract will see us investing further in our state-of-art aerospace infrastructure at Nagpur.”



Dynamatic produces first Chinook Aerostructures for Boeing

Bangalore-based Dynamatic Technologies Limited has produced the first set of aft pylon and cargo ramp assemblies for Boeing's CH-47F Chinook helicopter. "In a competitive world where our customers are increasingly demanding more for less, this delivery is a milestone that demonstrates the capability we are scaling-up with our supply-chain partners, right here in India," said Prat Kumar, President for Boeing India. "We set up a new assembly line with Dynamatic Technologies soon after the Prime Minister formally launched the 'Make in India' program in Sep-



tember 2014. Going forward, our participation will continue to accelerate with support from government and our industry partners," remarked Kumar.

"The production of major aerostructures for Boeing's CH-47F helicopter is a major accomplishment, and is a significant milestone for the Indian aerospace industry," said Udayant Malhoutra, CEO and MD, Dynamatic Technologies Limited. "We are proud of our partnership with Boeing, who has invested considerably in development, training, tooling, and quality systems working closely with us in establishing advanced manufacturing capabilities in India, which is truly in consonance with the 'Make in India' program."

"The Chinook is an advanced helicopter requiring complex manufacturing processes, and this Make-in-India capability demonstrates that Indian companies can deliver high standards of quality and productivity within a competitive cost structure that is essential for the aerospace sector," said Dennis Swanson, VP, Boeing Defense, Space & Security India.

Aequs invests in Spartacus3D for ALM



Aequs, an emerging global player in aerospace manufacturing supply chain, has made a minority equity investment in the Farinia Group's Spartacus3D, an upcoming French company specializing in Additive Layer Manufacturing (ALM), more commonly known as 3D printing technology to the general public.

"As cutting-edge manufacturing technology, ALM offers tremendous potential for creating new manufacturing capabilities and economies of scale and scope. ALM provides a means for creating complex, high-mix, and low-volume parts that would be impossible or cost prohibitive using traditional subtractive manufacturing techniques, such as machining," said Aravind Melligeri, Chairman and CEO of Aequs. "ALM's potential for reducing the cost of production changeovers and customization and for increasing the variety of products each unit of capital can produce, makes it a compelling innovation for the aerospace and defence (A&D) industry, which in contrast to other industries, is more reliant upon low volume production."

This partnership brings to market the combined aerospace manufacturing prowess of Aequs and technical ALM expertise of Spartacus3D to provide A&D industry customers new supply chain options unavailable elsewhere. "Both traditional subtractive manufacturing and ALM offer distinct advantages and disadvantages in manufacturing speed, scope, scale, capital intensity, and cost," said Aravind Melligeri. "By adding ALM to our already broad value chain capabilities – engineering, machining, forging, fabrication, surface treatment and assembly - we create greater manufacturing flexibility and cost effectiveness to serve the particular needs of each of our A&D customers."

HAL hands over BrahMos Missile Integrated Su-30 to Indian Air Force

HAL handed over the first BrahMos missile integrated Su 30 to IAF in an exclusive event at Aero India 2015. "This is a proud moment for HAL. The successful completion of the first Su 30 aircraft integrated with BrahMos missile shows the synergy between DRDO, HAL and IAF. We are hopeful of rolling out the second aircraft in a record time," said T. Suvarna Raju, Chairman, HAL. SK Misra, CEO & MD, Aerospace Pvt Ltd was present on the occasion.

The Flight Clearance Certificate was handed over by Dr.

K. Tamilmani, distinguished scientist and DG (Aero) to Air Marshal SBP Sinha, Deputy Chief of Air Staff. The Aircraft Acceptance Certificate was handed over by AM Raja Kannu, DG (AQA) to Air Marshal Sukhchain Singh.

This unique programme was taken up as an indigenous challenge by HAL's Nasik division in 2010. The team overcame several difficulties due to limited design data of Su-30 Mk I and received approval in Jan 2011 and order for integration was obtained from BAPL on techno-commercial merits against OEM in January 2014.



New generation of Diablo high temperature resistant polyamides aimed at applications in automotive engine compartments where temperatures can reach as high as 260°C

The Heat is On!

New polyamides have what it takes for air intake systems in smaller, hotter car engine compartments.

By Ojas Mehta, Segment Manager Automotive, DSM Engineering Plastics

Automotive companies are looking at ways to improve fuel efficiency, reduce fatalities in road accidents and improve the driver and passenger experience. This has led to numerous innovations in systems designs, with an inevitable knock-on effect in the plastics materials used in those systems.

While plastics innovation has been most visible inside the passenger compartment, from a technical point of view the most startling progress in recent times has been made under the bonnet, an area increasingly out of sight to drivers of modern vehicles. In fact, most of the recent plastics materials innovations are linked to use in components integral or attached to the engine.

Norms on engine emissions are tightening: One area receiving a tremendous amount of attention is the air-fuel system. Due to increasing sensitivities regarding pollution and emission of toxic and greenhouse gases, many countries are adopting increasingly stringent fuel efficiency and emissions norms, with Europe and the USA leading the way. For example, European Regulation 443/2009 sets an average target for carbon dioxide (CO₂) emissions in new passenger cars of 130 grams per kilometre. The target has been gradually phased in since 2012, and this year will be the first in which all new cars

will have to meet it. Soon, a more strict target of 95 grams per kilometre will be phased in, to fully apply from 2021.

Improving turbocharger efficiency: As a result of these legislative developments, carmakers have for some time been looking at ways to improve fuel efficiency. One of the tools they have been using is lightweighting, which is why, for example, the use of plastics in exterior panels continues to increase. Another tool has been to make engines inherently more efficient. One approach to achieve this is to use turbocharging, which is rapidly gaining in popularity now in petrol engines as well as diesel engines.

Turbochargers increase engine efficiency by compressing the air that is used for combustion, but they also introduce new elements into the engine, and so add weight (two steps forward, one step back, so to speak). Furthermore, they significantly raise the demands on heat resistance of materials used to make the air management systems: because the pressure in the turbocharger is applied very quickly (adiabatically), to a very high level, the air becomes extremely hot—200°C or more.

Many turbocharged engines also incorporate charge air coolers (CACs, also known as intercoolers). These are heat exchangers that cool the air from the turbocharger while keeping it compressed, further increasing its density and hence the efficiency of the engine. In such engine designs, the need for

extra-high thermal resistance shifts from the air intake manifold (AIM) to the CAC.

Manufacturers often use CACs made in metal. However, recent advances in polyamide technology allow CACs, even those in high performance engines where the air is even hotter than in regular engines, to be converted into plastics and integrated fully into the manifold. The use of lighter materials, together with the ability plastics provide to create more efficient designs, can save precious grams in vehicle weight.

As is the norm, the first engines to take advantage of this technology are in the luxury segment, but it is very likely that the trickle-down effect will soon see it applied to more popular models.

This shift from metals to plastics in CACs is very similar to the one that has already taken place with the air intake manifolds themselves in regularly aspirated engines. Use of glass-reinforced polyamides for air intake manifolds is now virtually ubiquitous in car engines. The polyamides used for manifolds are in very large part polyamide 6 and 66.

Liquid-cooled CACs outperform air-cooled versions: A hybrid sports car introduced last year powered by an electric motor combined with a powerful turbocharged 1.5-L petrol engine features the world's first high-heat plastic AIM with integrated CAC.

The new sports car uses the latest type of CAC, which is liquid-cooled, and which is more efficient than earlier water-cooled types. When integrated into the AIM, it delivers still higher efficiency, since the design has a lower air duct length and improves engine responsiveness. However, the air temperature reaching the CAC from the turbocharger can be as high as 220°C in continuous use, with peaks up to 250°C in high pressure pulses. This increase in pressure and temperature puts additional demands on the manifold material.

Integrated high temperature AIM/CACs have been produced before, but they have typically incorporated metal components for the CAC component. Car makers will benefit from plastics solutions that minimize weight and maximize the design flexibility to enable a highly functional assembly to fit into a small space.

All-plastics AIMs with integrated liquid-cooled CACs achieve a giant step forward in improving engine responsiveness and reducing turbo lag, yet they require a great deal more from the plastics materials used to create them, not only in terms of simple thermal resistance. Integrating the cooler into the AIM drastically changes the geometry of the manifold in a way that could cause a loss of stiffness and strength, which are critical at higher temperatures.

The new geometry also requires materials with high weldability and weld line-aging resistance to maintain the part's integrity. At the same time, the material must withstand exhaust gas recirculation (EGR) and blow-by.

Significant weight-saving potential: The new injection moulded AIM/CAC is made in a modified form of a relatively new type of polyamide—PA46—Stanyl Diablo OCD2100

from DSM. This material contains 40 percent glass fibre reinforcement as well as a specially developed and patented heat stabilizer. It can provide a weight reduction of up to 40 percent versus aluminium, and its optimized processing characteristics reduce system cost. It combines very good mechanical performance with its outstanding high temperature resistance.

The stabilization technology provides a significant improvement in thermal resistance that can be used in numerous air management components located around the engine—mixing tubes and resonators for example, as well as such as air intake manifolds and charge air coolers. Diablo technology can be applied to all types of polyamides, and in fact DSM licences it to other polyamide producers. DSM itself incorporates Diablo technology into grades of Akulon PA6 as well as StanylPA46 intended for high temperature applications.

A new generation of heat resistance technology: Temperatures in automotive engine compartments are still rising. In response to this trend, DSM last year launched a new generation of Diablopolyamides with unprecedented heat resistance,



Stanyl Diablo PA46 delivers performance on the world's first high-heat plastic air intake manifold with integrated charge air cooler.

both long-term and short term.

The latest version of Stanyl Diablo polyamide 46 is able to withstand a continuous use temperature of 230°C. In addition, it has improved resistance to short-term high temperature peaks as measured by deflection temperature under load (HDT), which is 267°C.

Stanyl Diablo grades outperform competitive materials in thermal oxidative stability, maintaining high stiffness at elevated temperatures and pressure loads. Optimised processing characteristics reduce material and production costs.

Modified PA6 may sometimes be enough: Not all engines run at the same temperature of course. For lower temperature AIM applications, a polyamide 6 incorporating Diablo technology may be sufficient. New Akulon Diablo HDT2500 withstands 220°C under continuous-use conditions, and has an HDT of 245°C. It therefore fills the gap between 'regular' PA6 and PA46 Diablo by combining short- and long term thermal resistance with very good mechanical properties that will be more than sufficient for many new vehicles. 



More than **Pipe Dreams**



While consolidating his core business of pipe manufacturing, **Prakash P. Chhabria**, Executive Chairman, wants to transform Finolex Industries Ltd into a company engaged in the business of managing water.

By Niranjan Mudholkar

His casual style of conversation is exactly opposite to the earnestness that he brings to the business table. What remains common is the simplicity and honesty in the approach. Prakash P. Chhabria, Executive Chairman, Finolex Industries Ltd, has already completed 25 years in the industry and yet his enthusiasm is something that could very much be associated with a young 25-year old professional. As he readies to take Finolex Industries into the next phase of growth, you simply cannot miss the overwhelming zeal that guides what could be termed as his second entrepreneurial innings.

Chhabria recently announced that Finolex Industries would be investing Rs90 crore over three years for increasing capacity by 40 percent to 3,20,000 tonnes to cater to the water supply and water equipment market. Importantly, while consolidating his core business of pipe manufacturing, he wants to transform Finolex Industries Ltd into a company engaged in the business of managing water. ET Polymers travelled to Finolex's Chinchwad office complex to know the strategy behind this move and to understand what it exactly entails.

The strategy

"Very simple," is his straightforward answer as he begins to explain the genesis behind his plans. "We have spent many years in building the brand. We have established ourselves as a national player – biggest in pipes and fittings. So far, we have just focussed on ground work which includes an active dealer and sub-dealer network of 15,000 across the country. The new Government formed under the leadership of Prime Minister Narendra Modi has always been speaking about developing segments that will create new demand for pipes. You can see this right from the Budget announcements. Let's take the example of the 100 smart cities. These 100 smart cities will be coming across the geographical spread of the country and over a period of time. Imagine the demand for pipes from this kind of development! And this is just one example. We thought that if the government can take such progressive measures and



Before the interview, ET Polymers also visited the Urse manufacturing plant of Finolex Industries to get the feel of the activities on the shopfloor

“Today, there are 500 companies making pipes in the country. Yet, I am the only one who is selling on advance; most expensive pipes selling on advance. This is possible because of the brand value that we have created, nurtured and protected over many years.”

shake up the entire machinery then why should we be left behind. We also re-energised ourselves,” he says.

And in this process of re-energising, Chhabria has not forgotten his key customer – the farmer. In fact, the farmer remains in the focus. “We serve the most to the farmer. The most precious thing for a farmer – after God’s blessings – is water. And the farmer gets water through pipes. So, we believe that the farmer’s prosperity flows through pipes. We want to reiterate our commitment to farmers that we are contributing to their prosperity and that we want to do it throughout their lifetime. That’s where we thought of our new tagline – ‘Tarakki Zindagibhar’ meaning ‘Prosperity for lifetime,’” he adds. And while the agricultural sector forms the core of Chhabria’s business, he has significant presence in the non-agricultural segments with 30 percent of his business coming from there. This includes housing, telecom, construction and industries.

Seeking new partners

Finolex would continue to focus more and more on water. But Chhabria does not want to get into the other regular water businesses like water tanks, for example. There are a lot of new things happening in the water sector all over the world

and that’s where his interest lies. “There are many different things happening, which have not come into the limelight. They are not coming to the forefront because those innovators and manufacturers do not have the reach. Creating and manufacturing a product is one thing and having a reach for the product is another. In fact, getting or developing that reach is much more expensive and time consuming.” And Finolex has both the brand name as well as a robust reach in the market.

“So I have decided to work with people who have a great product but have no reach. That is my game. I cannot make anything and everything for the water sector but there are many people out there with a variety of good products. We want to provide the right reach to them; that is what we call the Finolex Water World. This world is not just about pipes and fittings; although it does include pipes and fittings,” he adds with his signature smile. In terms of collaborating with other people, Chhabria is keeping his mind and options open. And he is hopeful of creating a lot of new entrepreneurs as he pursues the new endeavour. “May be I will become the mega

| Finolex Manufacturing Capacity Pipe Manufacturing | |
|------------------------------------------------------|---------------|
| Location | Capacity |
| Ratnagiri Plant | 1,00,000 MTPA |
| Urse Plant | 80,000 MTPA |
| Masar Plant | 50,000 MTPA |
| Total | 2,30,000 MTPA |

| PVC manufacturing | |
|-------------------|---------------|
| Location | Capacity |
| Ratnagiri Plant | 2,70,000 MTPA |



The Urse plant's capacity is 80,000 MTPA

sole distributor for them. Or maybe I will even pump in equity in their manufacturing business," he says. And he is not looking just for Indian entrepreneurs or Indian business entities. "My doors are open to foreigners as well. So if someone is interested in having a joint venture here in India then I am open to that as well."

Focussing on the new venture

Chhabria knows that there are going to be a lot of challenges as he moves ahead for creating what he calls the Finolex Water World. And to deal with those challenges, he is kind of freeing himself off from the main business so that he can give his 100 percent to the new project. "Saurabh S. Dhanorkar, the Managing Director of my Company, who's been with us for 27 years and who has risen through the ranks, has been given the responsibility of taking care of the existing business. I spend just about half an hour with him daily and leave the rest of the business in his able hands. In fact, I have even shifted my office to a different building but within the same complex. So this has given me the necessary detachment while still keeping me close enough."

Chhabria is now concentrating more on new things - new

An exclusive warehouse for fittings

There are 700 types of fittings. Managing the inventory for 700 types of fittings can be very challenging. "But it becomes much easier if you have the physical ability to take care of the stock. That's why we have built a large warehouse within our Chinchwad complex to stock these fittings. It is spread over 1,50,000 sq ft and is completely dedicated to PVC fittings. I think this is one of its kind in India. This is how we like to do. The market is large enough; there is no dearth of customers," Chhabria says.

Look at all the pillars of our economy; from infrastructure to manufacturing and from agriculture to services, water is required everywhere. And you need pipes for water. So the timing is just perfect for Finolex to enter into its next phase of growth.

things in terms of products, manpower and ideas. Of course, he has just started the new venture and there is a long way to go. "We already have three people operational on this project and I will be building up a completely new team. So I am regularly meeting people. Earlier I was interviewing just one person once in a month but currently I am interviewing at least three people every week." He also wants to evaluate and ensure that anything new which he accepts has to be worthy of the Finolex Brand. "I cannot dilute my Brand Name. Today, there are 500 companies making pipes in the country; I am the largest and I am still growing. Yet, I am the only one who is selling on advance; most expensive pipes selling on advance. This is possible because of the brand value that we have created, nurtured and protected over many years. So whatever new I do, I cannot dilute the brand name."

Entering a new business not only entails market study but also a strong focus on research and development with regards to new products. Chhabria is well aware of that. "Earlier, we were not so focussed on new products. We concentrated on growing what we had in our hands. And you can't change the shape of a pipe. In fact, the shape of pipe has not changed since the beginning of civilisation. Pipes will always remain pipes. But we also realised pipes have new requirements and new applications. For example, we did not have column pipes



so we have introduced them. Similarly, we started off late in the C-PVC segment but now we have covered the full range in that segment,” he explains.

Internalising change

Chhabria strongly believes that change has to come from the top and knows that it is equally important to align employees with the new thought process. He wants to take each and every employee into confidence as Finolex embarks onto a new journey. “Recently, we had organised a dinner for 1,200 of our employees at our Chinchwad complex grounds. It started at 4 pm and ended at 1am lasting for nine hours. It was an informal way of initiating our people into the new ideas. After that, we did three marathon meetings with 400 people each time talking only about change. “Unless, the message goes to each and every one of our employee change is not going to happen. At the end of the day, these are the people who will be carrying this change. They will be the torch bearers,” he says adding that the fantastic growth at Finolex has been possible because of the involvement of its employees.

The ambition, the vision

Finolex which clocked a turnover of Rs 2,453 crore in 2013-14 is expecting to grow at a CAGR of 15 percent to 20 percent over the next five years. “We want to become a billion dollar company – that’s about Rs6,000 crore – in the next five years.



The Urse plant has a large open space warehouse

Out of this Rs6,000 crore, the new business should contribute at least Rs1,500 crore. I am aware that this is a very aggressive target but that is how I want to approach it.” Chhabria’s ambitions stem from the fact that he is not diversifying into something with which he is not connected to. Water remains the driver of his business.

Another reason for his confidence is the healthy financial



The brand name emerges!

Finolex would continue to focus more and more on water. But Chhabria does not want to get into the other regular water businesses like water tanks, for example. There are a lot of new things happening in the water sector all over the world and that’s where his interest lies.”

performance of Finolex Industries Ltd. “If you look at our financial numbers for the last three years – 2012, 2013 and 2014 March ending – we have brought down the overall debt every year. Importantly, we have made it possible without selling any asset or raising equity. That is the true colour of Finolex. My overall debt is shrinking and that is the quality of our business,” he says. Finolex has always focused on the domestic market. Exporting pipes

is neither feasible nor necessary, Chhabria feels. “The freight cost would simply nullify my profits and anyways I have a huge and dynamic domestic market to cater to,” he adds.

Contributing to ‘Make in India’

Chhabria is quite appreciative about Prime Minister Narendra Modi’s ‘Make in India’ initiative and also aspires to contribute to this campaign. “It is a brilliant idea by our Prime Minister. I mentioned about bringing foreign JVs under the new business to India. If and when these JVs happen, these will have a manufacturing base in India whether they are serving the domestic market or whether they are exporting. In fact, I will ensure that the JVs have to make in India. If you are selling me technology, the manufacturing will happen in India,” he says emphatically.

Chhabria sincerely believes that the timing is just right for the new venture that he is getting into. “The timing is beautiful; we have a new government, a new vision and new ideas. And the best thing is that water remains the common denominator for all. Look at all the pillars of our economy; from infrastructure to manufacturing and from agriculture to services, water is required everywhere. From ‘Make in India’ to Swachh Bharat Mission to Smart Cities, water is essential. And you need pipes for water. So the timing is just perfect for Finolex to enter into its next phase of growth. We will grow with our farmers and we will grow with our country,” he says as he signs off on a very positive note. 



Transforming with Thermoplastics

Rapid growth comes with environmental challenges which means that manufacturers need technologies that not only contribute to greater fuel efficiency and fewer emissions, but that also help them meet design aspirations and durability requirements.

By Janardhanan Ramanujalu, Vice President, SABIC South Asia & ANZ

Engineering thermoplastics have fuelled the imagination of designers, innovators and manufacturers across the globe, resulting in the creation of revolutionary solutions that meet the ever-changing needs of our times. Efficient solar cells, smart fabrics, bendable displays and lighter weight modes of transportation are examples of how engineering thermoplastics are driving the development of new solutions that enhance our lives.

This is all the more applicable in rapidly developing countries such as India. The plastics industry, armed with new processing methods and technologies, has become a vital component

of the domestic economy, helping to meet basic needs and improving the quality of life for people in both urban and rural areas. High-performance thermoplastics are helping customers across varied industries create solutions that incorporate innovative designs alongside more efficient production processes. The result: products that are thinner, stronger, lighter, more economical and environmentally friendly than ever before.

This is certainly true in the mass transportation industry where outstanding performance – impact and chemical resistance, mechanical strength and fire retardancy – are critical if manufacturers are to remain competitive in the coming years.

The modernisation of



Tailgate with thermoplastic technology

Mumbai's suburban rail system is one such example. The Mumbai rail network is perhaps the most densely packed and intensively used rail network in the world. Recently, the Mumbai Rail Vikas Corporation (MRVC), in a joint venture with the Ministry of Railways, implemented a project to increase capacity and modernize services. MRVC assigned Integral Coach Factory (ICF) in Chennai to produce world-class railcars for this project. ICF determined that the existing seating system needed an upgrade, as the thermoformed seating in place was limited in its ability to withstand high passenger loads, provide ease of maintenance and a comfortable experience for passengers. To help it address these challenges, ICF decided to work with SABIC's Innovative Plastics business as the company was able to collaborate with them on a total solution from concept through commercialisation.

With support from SABIC, ICF designed a three-seat modular system using injection-molded polycarbonate to replace conventional single thermoformed seats. With enhanced passenger comfort, easier maintenance and end-of-life recyclability, the new seating also meets internationally recognized rail car standards for flame resistance. An additional benefit



Janardhanan Ramanujalu

High-performance thermoplastics are helping customers across varied industries create solutions that incorporate innovative designs alongside more efficient production processes."

to using polycarbonate is that it makes the manufacturing process more efficient compared with thermoset plastics, which require significantly more manual labour and time. Through materials expertise and technological know-how, SABIC and ICF worked together to develop a sustainable solution that enabled ICF to meet regulatory requirements.

Similarly, the aircraft industry is facing many challenges, which need innovations to help ensure the long-term success of the industry. Airlines face rising fuel costs and increasingly stringent regulation on carbon emissions; therefore, it is vital that aircraft designs are lighter, more sustainable and more compliant than ever before. Cabin designers must balance these needs with the demand for modern, light-filled cabin environments. Engineering thermoplastics can enable this balance, helping designers to provide long-awaited solutions to airlines' quest for differentiated cabin interior designs while also reducing weight resulting in a more fuel-efficient aircraft.

SABIC continues to expand its film, sheet, foam and resin portfolio for the aircraft industry to support design innovation. Aircraft interior designers are often restricted by the clarity and compliance limitations of the transparent materials currently available to them; hence, SABIC developed a clear sheet with 80 percent light transmission, the highest level of light transmission available in sheet material today. This lightweight polycarbonate sheet helps design engineers to create components that meet the highest industry standards for flame resistance without the need for secondary processing.

“ An additional benefit to using polycarbonate is that it makes the manufacturing process more efficient compared with thermoset plastics, which require significantly more manual labour and time. ”

Continual developments in engineering thermoplastics, such as these, could soon lead to self-service refreshment stations on aircraft (which require large transparent windows so that passengers can see what is available).

Engineering thermoplastics are also playing a part in transforming the automotive industry. In India, the market is growing rapidly, spurred by an emerging middle class and the increasing affordability of vehicles. This rapid growth comes with environmental challenges which means that manufacturers need technologies that not only contribute to greater fuel efficiency and fewer emissions, but that also help them meet design aspirations and durability requirements. Engineering thermoplastics can help manufacturers to achieve this balance



Mahindra XUV 500 - Advanced thermoplastic technology from SABIC enabled Mahindra & Mahindra to launch India's first plastic fender. Courtesy: Mahindra & Mahindra

through contributing to the optimisation of systems, parts and processes.

SABIC's work with Indian automaker Mahindra & Mahindra is a good example of this. For its critically acclaimed global XUV500 SUV, the automaker needed a durable fender solution that would help reduce the overall weight of the vehicle. With support from SABIC, Mahindra & Mahindra produced India's first injection moulded plastic fenders, which are 27 percent lighter than an equivalent steel solution. Additionally, because plastic can be moulded into shapes that aren't possible with steel, the OEM had the freedom to design aggressively flared fenders with accentuated curves and bold lines to create the desired design. Also, this fender is much more durable and stands up better against minor accidents because of its impact strength, its ability to flex as well as the broad resistance to the elements that it offers.

SABIC continues to help the automotive industry find new ways to replace conventional materials such as steel and glass, combining high-performance thermoplastics with engineering design competence. Many OEMs continue to explore the use of polycarbonate glazing for window applications in place of glass. This can remove up to 50 percent in weight, depending on the design and complex ability of a window part. SABIC has also been working on an all-thermoplastic tailgate concept, which can save up to 30 percent in weight compared to tailgates made out of conventional materials.

Engineering thermoplastics are helping manufacturers achieve the highest levels of design, quality, performance and aesthetics, which have not been possible using traditional materials, such as metal. Working with its customers in India and across the globe, SABIC continues to create solutions to help solve some of the greatest challenges of today and the questions of tomorrow. 



The Faucet People

Hindustan Sanitaryware Industries Ltd (HSIL), a pioneer in India in the sanitaryware manufacturing domain has set up fully automated plants and has exploited CNC technology optimally.



*Ajay Jain,
Vice President,
HSIL*

I had personally visited the Haas plant in the US and after lot of deliberations and discussions as regards use of these machines to manufacture faucets, we were rest assured with Haas' technology and placed a single order of 22 machines"

When we get up in the morning, the first thing we do is to splash a lot of water on our faces so as to start the day afresh. The humble faucets installed in our sinks and bathrooms do just this and more and have undergone a radical change in both aesthetics and functionality over the last few years. Hindustan Sanitaryware Industries Ltd (HSIL), which already has plants at Bahadurgarh and Hyderabad, set up another plant near New Delhi where it manufactures faucets. HSIL has been manufacturing a wide variety of bathroom products along with faucets for the past 55 years with plants in Bahadurgarh and Hyderabad and a new plant in Rajasthan for faucet manufacturing.

"It was just six months ago that the company commissioned a new plant at Kaharani Industrial Area near Bhiwadi in Rajasthan where HSIL carries out only faucet manufac-

turing. Though it is a new plant, we have the capacity to manufacture 2.5 million pieces in a year. With around six decades of experience behind us, we are confident of increasing our annual productivity by almost 25 percent YOY depending on the sales and market conditions," the Vice President of the Company, Ajay Jain said.

Explaining the manufacturing process in detail, Jain said, "We purchase brass ingots, melt them in large furnaces after which casting and cutting is done followed by machining. Once the component is ready, it is then sent for grinding, polishing, electroplating before being assembled at a different section. The faucet is then ready for despatch into the market."

HSIL is a pioneer in India in the sanitaryware manufacturing domain that has set up fully automated plants and has exploited CNC technology optimally. "From foundry till the plating line, the entire plant is auto-

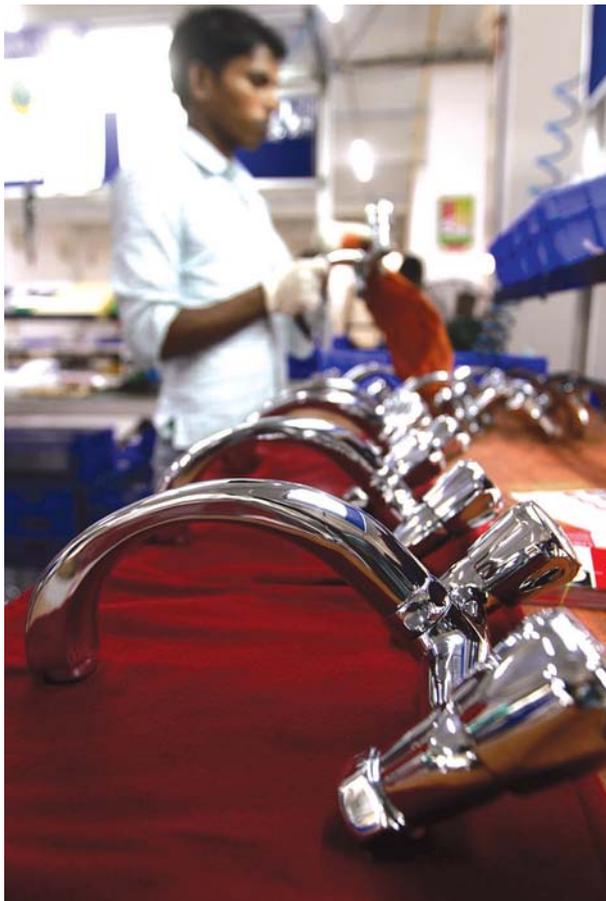


mated. Besides these machines, we have also placed an order for robots from Italy apart from forging and zinc casting machines. This way we have an entire blueprint ready to increase the annual production capacity at this plant at least four times (10 million) pieces,” Jain said and added that the company has 22 Haas vertical machining centres (VMCs) on which the machining process is carried out.

Apart from the bathroom product division, HSIL also manufactures glass bottles under the brand name of AGI while the sanitary-ware products are marketed under the brand name of Hindware and Benelave. “All these manufacturing processes are carried out on Haas VMCs as we find our American made Haas machines meet our expectations and provide real value for money. These machines are manufactured at a single location in the US and their quality is good as far as production of our products is concerned. I had personally visited their plant in the US and after lot of deliberations and discus-



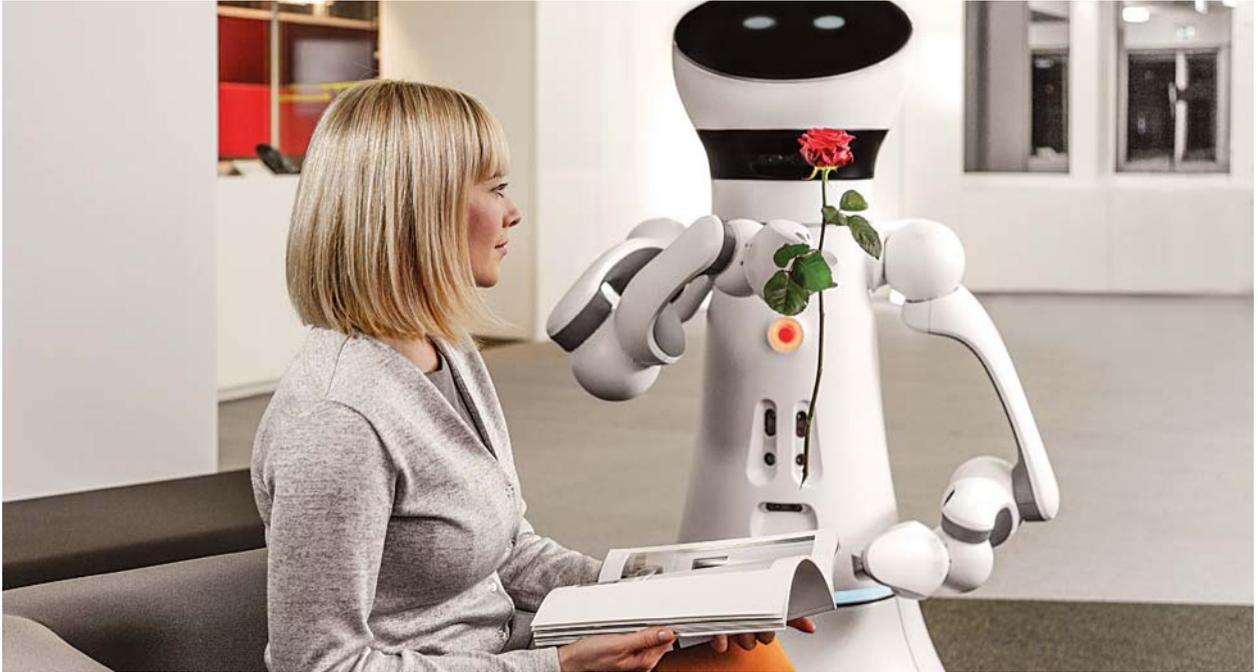
“From foundry till the plating line, the entire plant is automated. Besides these machines, we have also placed an order for robots from Italy apart from forging and zinc casting machines. This way we have an entire blueprint ready to increase the annual production capacity at this plant at least four times (10 million) pieces.



sions as regards use of these machines to manufacture faucets, we were rest assured with Haas’ technology and placed a single order of 22 machines,” Jain quipped.

On a query about the technical benchmarks that HSIL considered before finalising Haas, Jain mentioned that high rapids and feeds combined with quick tool changes and excellent spindle rpm/torque ratios resulting in increased productivity were among key reasons for this decision. “The Haas team also helped us in design, development and supply of fixturing after studying our many components. This helped us in machining most of our components in a single set up. Our process involving machining in a single clamping ensures accuracy, reduces cycle time and makes redundant the need to change references. The resultant flexibility and excellent component cycle times of three minutes or less ensured that we need not look beyond Haas for our machining requirements.”

Besides meeting all the technical product parameters, the HSIL management is also happy with the way the Haas engineers have been responsive towards company’s grouses, if any. “Right from prompt delivery to timely service, the Haas engineers have been supportive towards our needs and have cooperated with us in resolving all our problems right from installation of the machine to improving its productivity,” Jain added. 



With its polite and likeable manner, the Care-O-bot 4 is a gentleman. Source: Fraunhofer IPA, Photo: Rainer Bez

A gentleman with modular components!

Care-O-bot 4 – a mobile service robot – developed by the Fraunhofer IPA in Stuttgart, celebrated its world premiere at the Schunk Expert Days on Service Robotics.

Friendly and likeable. Invisible when not needed. On call around the clock. The butler of the future – called “Care-O-bot 4” – was developed by the Fraunhofer IPA in Stuttgart, and celebrated its world premiere at the SCHUNK Expert Days on Service

Robotics. The modular design of Care-O-bot 4 allows diverse configurations and application scenarios.

“Its high degree of standardisation makes Care-O-bot 4 a milestone in the field of mobile service robots,” emphasised Henrik A. Schunk, Managing Partner of Schunk GmbH & Co. KG in Lauffen am Neckar. Both the arm joints and the 1-finger hand of the Care-O-bot 4 are taken from Schunk’s standardised modules for mobile gripping systems. “Since service robot solutions are generally used in mobile applications, the components have to be lightweight and energy-efficient,” Schunk said. “Mobile gripping systems



The modular design of Care-O-bot 4 allows the set-up of an individual robot platform for various applications, decisively reducing the costs for developing new service robotics solutions. Source: Fraunhofer IPA, Photo: Rainer Bez

“Since service robot solutions are generally used in mobile applications, the components have to be lightweight and energy-efficient. Mobile gripping systems from Schunk are designed exactly for such scenarios.”
Henrik A. Schunk,
Managing Partner, Schunk GmbH & Co. Kg



The newly developed one-finger hand is characterized by simplicity, elegance, and integrated sensors. Source: Fraunhofer IPA, Photo: Rainer Bez



from Schunk are designed exactly for such scenarios. The components can be used both in industrial applications and in measuring and testing applications, as well as in assistance systems that support people in everyday life.”

Agile, modular, and affordable

While the predecessors of the Care-O-bot 4 focused on object detection or safe navigation, an important step has now been taken in the direction of commercialization. “The fourth Care-O-bot generation is not only more agile, more flexible and more charming than its predecessors, but also features more affordable construction principles,” said project manager Ulrich Reiser, team leader at the Fraunhofer IPA. The majority of the interior consists of folded sheet metal constructions, which can be manufactured cost-effectively even in small quantities.

Cost-optimised modular solutions

The modular concept allows diverse configurations. It is possible, for example, to eliminate one or both arms. Standardized Schunk Powerball ERB modules with a compact

“The fourth Care-O-bot generation is not only more agile, more flexible and more charming than its predecessors, but also features more affordable construction principles.”

Project Manager Ulrich Reiser,
Team Leader at the Fraunhofer IPA

spherical form that facilitates integration are used as arm joints. The entire electronic control and regulation circuitry of these components are integrated in the joint drives. Position, speed, and torque can be flexibly regulated.

Since the supply lines for the gripper and tools are completely within the arms, there are no interfering cables on the peripheral devices. Integrated intelligence, universal communication interfaces, and cable technology for data transfer and power supply allow their use as single modules or as completely pre-configured Schunk Powerball lightweight arms for easy integration in higher level units, such as Care-O-bot 4. For portable use, the modules operate by a 24 V DC power supply or even rechargeable batteries for complete mobility. The consistent lightweight construction and torque motors ensure low energy consumption. That lowers

energy costs, provides for longer work periods when using rechargeable batteries and also allows the use of small-format batteries.

Different versions can be implemented

The costly ball joints of the Care-O-bot 4 in the neck and hips, as well as many sensors, are optional. If the application only requires the serving of beverages, it would be possible to replace one hand with a tray or to only use the mobile base as a serving and transport cart. Individual adaptation to specific tasks creates economical solutions. One of the primary concerns of the development engineers was user-friendly handling, because most people are intimidated by robots, especially if they are hard to use and program.



The standardised Schunk Powerball Lightweight Arm combined with the one-finger hand allows various gripper operations. Source: Fraunhofer IPA, Photo: Rainer Bez

An easily accessible interaction area on the head allows intuitive operation of the Care-O-bot 4 and can be used in either sitting or standing position. Of course, interaction with the robot by means of words or gestures is also possible through the means of cameras and microphones for recognition of specific people through by their speech and gestures. The

robot responds with gestures such as nodding or shaking of the head to signal whether it has understood. Light effects and a laser pointer in the hand of the Care-O-bot 4 also enable the exchange of information.

Successful symbiosis of design and engineering

“Care-O-bot 4 is a successful symbiosis of design and engineering, of function and emotion that quickly moves the user to interaction,” said Andreas Haug, managing director of the Stuttgart-based design studio Phoenix Design, which was involved in the development process. With its streamlined design, the two arms and head help make the robot resemble a human being.

An overly human appearance was not desired, however, because that would give the user “false expectations” according to Ulrich Reiser. Only the “inner values” are human: it always maintains a discreet distance, clearly indicates what it has understood and what it is about to do, has a command of simple gestures, and can even show emotions. Social behavior, as has been demonstrated in studies, is indispensable for acceptance by future users. While Care-O-bot 3 was a butler, its successor is a gentleman. 

Courtesy: Schunk Intec India Private Limited

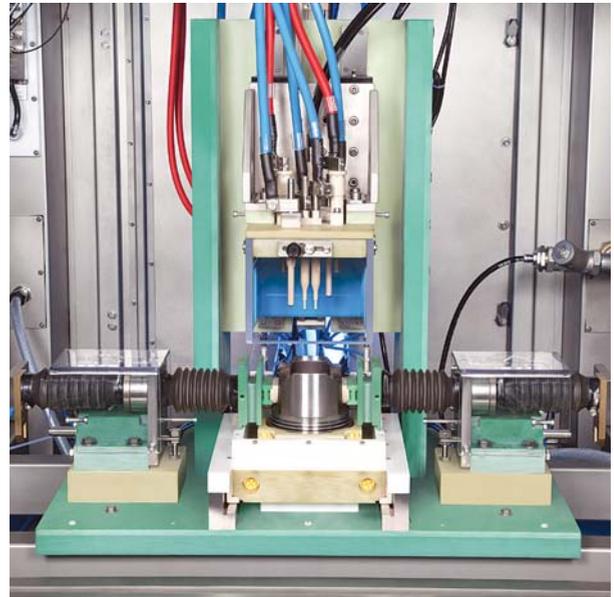


Streamlining the **process chain**

For the drilling of the necessary bores engine builders are increasingly using the ECM technology. This non-cutting production technology radically simplifies the whole process.

Downsizing' the engine has been a dominating trend in the automotive industry for years. Cylinder capacities are forever shrinking, whilst the application of turbocharging increases the pressure of the fuel/air mixture. And this affects all components involved. Take, for instance, the piston. The extreme stress this component is put under in the modern engine, calls for an improved cooling system. For the drilling of the necessary bores engine builders are increasingly using the ECM technology. This non-cutting production technology radically simplifies the whole process.

The development of an innovative piston design with improved cooling system presented a considerable challenge for the production planner of one sub-supplier in particular. How was he to drill the holes in the piston in one efficient, large-volume process? The use of classical boring processes was causing a real problem with the removal of the chips, as it proved very difficult to clean out the relevant cooling zones with absolute process integrity. "The customer came to us with this problem, originally thinking of using our ECM deburring process. However, this idea supplied the impetus for the design of a machine that uses our innovative ECM process intelligently in



The ECM drilling unit for pistons. The ECM drilling process is very safe and requires no post-treatment.

the drilling of complex bores," explains Richard Keller, Member of the Management, EMAG ECM GmbH.



*Richard Keller,
Member of the
Management, EMAG
ECM GmbH*

ECM drilling shortens the whole manufacturing process for pistons, camshafts, crankshafts, turbochargers, injection system components and other workpieces with complex bores and geometries."

Ideal for difficult bore transitions

The ECM method for this application is completely non-cutting. And that means no ridges or burrs – ideal conditions for homogeneous bore transitions. The fact that a number of bores can be drilled simultaneously on the same workpiece (and, if required, even on a number of workpieces at the same time), ensures that the technology scores highly when it comes to speedy processing. ECM stands for Electro-Chemical Machining.

A DC or pulse source polarises the workpiece as positive (anode) and the tool as negative (cathode). An electrolyte solution that runs between the two removes metal ions from the workpiece. There are neither mechanical nor thermal stresses involved. As the shape of the tool cathode represents that of the hole to be drilled, material will only be removed at the desired points.

Simplifying the production process

At its ECM laboratory in Gaildorf, the Company headquarters, the experts from EMAG tested the efficiency and the accuracy of the



View of a complete ECM cell for the drilling process.



drilling process on the piston beforehand. The detailed preliminary studies carried out here do not only assess the general feasibility of the application – for instance through material testing and by establishing the viability to hold given tolerances and to ensure reproducibility – the Company also checks the economic viability of the ECM process compared to other processes.

Based on the results of these checks and tests, they are able to quote actual cycle times and to define the machine concept most suitable for the component in question. This gives the customer a chance to assess whether the ECM process is the optimal solution for his particular production requirement. “This is surely a central aspect of the quality of our work. These accurate preliminary studies we offer to all our customers, of course,” confirms Keller.

That the sub-contractor decided, on completion of the series of tests, in favour of the innovative ECM technology, has a lot to do with the simplicity that ECM adds to the machining process. The process chain is noticeably shorter than with traditional machining methods. How? The bur-free ECM drilling process can be added at the end of a process chain, carried out on hardened components, if necessary, and requires no post-treatments. “This brings an enormous advantage to the whole production solution. In the end, it means that the customer saves himself the expense of having to buy a deburring machine and, at the same time, reduces the production area requirement,” underlines Keller.

In the passenger car sector

These and other advantages (for instance the minimal tool wear and the total absence of adverse thermal effects on the workpiece) brought the success story of the ECM drilling process in the commercial vehicle sector also to the attention of the passenger car sector. As a result, EMAG engineers developed, on request of an international automotive company, a tailor-made solution for the precision machining of camshafts. The oil holes on the shaft can be drilled with great precision and minimum tool wear using the ECM process. It is true to say that technological development like this support the success story of the process also in the passenger car sector.

The search for fuel-efficient engines also changes the design of their integral components. Conventional drilling methods often come up against insurmountable limits. ECM stands for the simplification of the process chain. “The ECM process is usually found at the end of the process chain and rounds it off cleanly, efficiently and without complications. It can be a very persuasive argument,” comments Keller.

Five advantages of ECM drilling

1. **Simplicity:** no ridge and bur formation; consequently no need for chip removal.
2. **Stability:** The microstructure is not damaged by thermal influences.
3. **Speed:** Multiples of bores (and workpieces) can be machined simultaneously; requiring no subsequent deburring.
4. **Flexibility:** The process can be used both in hard and soft processing chains.
5. **Savings:** The life expectancy of the boring cathode is extremely high. High tooling costs for deburring are avoided.

ECM stands for Electro-Chemical Machining



The ECM laboratory machine PTsmart can be found at the laboratory facility in Gaildorf. On it, detailed preliminary studies establish the feasibility of the process, whilst other EMAG staff determine the cost-benefit ratio of ECM in comparison to other methods.

In the aircraft industry

With another step in the same direction, the experts at EMAG have succeeded in taking their success in the commercial vehicle and the passenger car sectors also to the aircraft industry. The ECM process as such has here been used successfully for years. Engine parts, blades and blisks are being finish-machined using the electrochemical removal method. It makes for consistently good surface finishes. An extreme challenge is posed by materials such as Inconel. This tough nickel-based alloy can be cut only at the cost of heavy tool wear and extremely long cycle times, disadvantages that also apply to the drilling operation. A central engine part in

Inconel has a large number of holes to be drilled. Until recently, the whole operation of the relevant chip-removing process took > 40 hours.

“Using ECM drilling technology, we can shorten the cycle time to approximately 10 hours. That represents a quantum leap for our customer’s production,” explains Keller. The ECM specialists in their laboratory at Gaildorf presented a preliminary study also for this application. It clearly showed the enormous improvement offered by this process. The first ECM drilling machine for the aircraft industry is presently at the design and implementation stage.

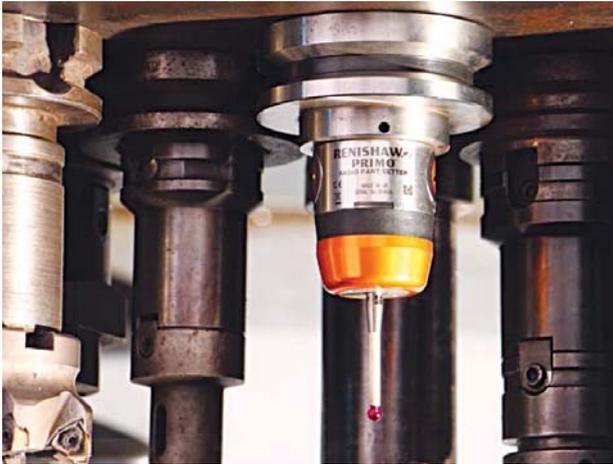
When the automotive industry is planning a new production facility and is looking for efficient production processes, it frequently finds it cannot do without ECM drilling, according to Keller. “Not only does this technology simplify the whole production process for pistons, camshafts, crankshafts and other components with complex bores and a demanding geometry, it also helps to keep investment costs low. Electrochemical metal removal guarantees excellent component quality and low cycle times,” he adds. 

Source: EMAG



'Universal' Truth

The Pune-based Universal Manufacturing Company (Unimac) has consistently reduced inspection time by 90 percent over four months after installing a twin probe system, designed for on machine part setting, part inspection and tool setting.



A Primo system was installed at Unimac five months ago, following a process audit



Amazing 90% reduction in inspection cycle time on turbocharger housing

The Pune-based Universal Manufacturing Company (Unimac) has consistently reduced inspection time by 90 percent over four months after installing a Primo twin probe system, designed for on machine part setting, part inspection and tool setting. Unimac manufactures components for railway engines, power generation plants, cement manufacturing plants, and other heavy engineering applications. For Unimac, maintaining accuracy of 15-20 microns on large parts is vital.

A major challenge for Unimac has been the inspection of large parts during the manufacturing process. According to its Director, Ashok Mungale, "The issue was resolved five months back when Renishaw's Primo system was installed on the machine, based on application requirements. The on machine probe is not only easy to use, but performance driven, which has resulted in increased machine utilisation time. Renishaw has truly been instrumental in our growth by providing an outstanding probing system that helped shorten our cycle time."

Innovative probing

The Primo twin probe system consists of

a Radio Part Setter and a Radio 3D Tool Setter. It enables automated on-machine part setting, part inspection and tool setting, helping to eliminate manual setting errors, improve accuracy and part conformance, whilst reducing non-productive time and scrap. All of which increase productivity, improve quality and boost profits.

The Primo system is straightforward to install and use, and represents a low initial financial outlay. It also has an exclusive, enhanced warranty to offer users peace of mind.

Up and running in a day

It is so easy to use the Primo system that at Unimac its installation and evaluation were completed on the same day. The Primo Go-Probe training kit and pocket guide make it very quick to learn and implement the system. A key benefit is that there is no need for extensive G-code knowledge. Simple, single line commands are used instead of multiple lines of code, removing the necessity for any special training.

Unimac, the company

Mungale started Unimac in 1987, after purchasing a second-hand machine from Germany for manufacturing components needed



*Ashok Mungale,
Director, Universal
Manufacturing Company*

The on machine probe is not only easy to use, but performance driven, which has resulted in increased machine utilisation time."



in sugar and cement plants. He later switched to manufacturing general engineering components. Currently, the company manufactures large precision parts used for railway engines, power generation plants, cement manufacturing plants and other heavy engineering applications. The company has its own tool room, horizontal boring machines, floor boring machines, HMCs and VMCs. One of the VMCs has a bed size of 4.5 m x 2.75 m.

Making a difference

Unimac manufactures precision components, such as turbochargers that are used in railway engines and one-off single components, for its customers. Before the Primo system was installed, the cycle time for machining a turbo charger housing was 46 hours. During this process, at the semi-finished stage, the part would be taken to an inspection facility to be checked for flatness, squareness, parallelism and positional accuracy. The part would then be brought back to the machine, and have to be realigned and set before further machining could take place. This process would take three hours and have to be carried out twice, meaning that the machine lay idle for six hours during each manufacturing cycle. In this manual process, part setting itself takes 30 minutes.

The Primo twin probe system enables inspection to take place on machine, removing the need to breakdown and move the part, and reset it once it has been inspected. Now

“Now at Unimac, the new inspection process takes just 30 minutes. It has reduced inspection time by 90 percent, reduced cycle time by 12 percent and has led to a very fast return on investment (ROI) in just four months.”

at Unimac, the new process takes just 30 minutes. It has reduced inspection time by 90 percent, reduced cycle time by 12 percent and has led to a very fast return on investment (ROI) in just four months.

Optimising throughput

“After installing the Primo system, the manpower cost, material handling costs, material equipment and power consumption charges are saved so no additional investment is required. This gives flexibility to the manufacturing unit in accepting orders for any size and for segments such as the machine tool industry. The manual analysis of results is also avoided, as the data is available on the same controller. It’s an amazing experience to use Renishaw machine tool probes, which are being used by us for the first time,” Mungale said.



Primo – twin probe system

“Another advantage of the Primo system is that it combines part set up, part inspection and tool setting capabilities in one system so there is no need to source separate items. The Primo system is definitely worth recommending for every engineering industry.”

Building trust

Unimac first heard about Renishaw when ten years ago it purchased its CMM, which came fitted with a Renishaw probe. Following this, Unimac formed a relationship with Renishaw, and received regular updates about new product developments. Renishaw engineers analysed all of the machining applications at Unimac thoroughly, and offered best practice advice and guidance on which Renishaw products would be most suitable for Unimac’s needs. The Primo system is the company’s first machine tool probe.

“Since we were convinced with the sales, service and application aspects of Renishaw, we installed its telescoping ballbar to help maintain machine accuracy. After this, it was easy to ascertain whether the fault was during machining and the errors could then be eliminated. Results from the ballbar are always perfect so a mutual trust has developed between Renishaw and us,” Mungale concluded. 

Features of Primo

- The Primo Radio Part Setter accurately locates a workpiece before machining and automatically updates the machine tool’s work co-ordinate system. It eliminates manual setting errors, saves time and reduces scrap caused by alignment errors. It can also be used to measure and verify conformance prior to the removal of parts from a machine.
- The Primo Radio 3D Tool Setter enables on-machine automated tool setting, further eliminating manual setting and input errors. This method is typically up to ten times faster than manual or offline tool setting.
- The Primo Interface enables communication between the system’s probes and the machine’s controller. The radio transmission makes longer communication distances possible, so the Primo system is suitable for most machine sizes. The interface also displays the user’s remaining credit allowance.
- The Primo system offers the same part setting and tool setting benefits as other probing systems, but with greatly simplified operation. Non-productive time, costs and scrap are reduced, whilst productivity and profits are increased.

Source: Renishaw



Growing smoothly

At Imtex 2015, The Machinist caught up with **Jiten Goswami**, Chairman, Atlantic Lubricants & Specialities Pvt Ltd, along with **Yatendra Kumar**, Business Head – Motul Tech India and **Olivier Vergnes**, Marketing Manager, Motul Tech.

By Shivani Mody

Q Tell us about your lubricants business and growth plans for India.

Jiten Goswami: Motul is well known as the specialist in synthetic lubricants. It was among the first lubricant companies, to manufacture a 100 per cent synthetic lubricant for automotive engines, namely, 300V formulated using Ester Technology. Esters were initially developed for the aerospace industry and Motul was the pioneer in the use of Ester Technology in the formulation of 100 per cent synthetic automotive lubricants.

Our products are well recognised in the Indian market. We are exclusive suppliers to a large number of OEMs and have a close relationship with manufacturers such as Mercedes-Benz, Mitsubishi, Royal Enfield, Bajaj Auto and Yamaha.

Other than the automotive lubricants we are also present in the industrial lubricants business. MotulTech sells these specialty lubricants in almost all major world markets. Specially the metalworking fluids and high-performance lubricants are sold in many parts of the world and are sought after.

In India, the industrial business is relatively new. Currently we are growing this division - networking and setting up distributors across the country. During Imtex 2015 we had leads to expand our network in Pune - West region, Bangalore, Coimbatore, Chennai - South region and Delhi, NCR – North region.

Q Kindly share your experience at Imtex 2015.

Yatendra Kumar: There is major opportunity in the lubricants market and at Imtex 2015 we had some fruitful discussions. From the conversations we also got valuable feedback, which will help us improve our product offerings and services for customers. People were curious and were enquiring about our new products. Since the industry is focused on environment friendly products our offerings created quite a buzz.

We participated for the first time in Imtex and it has been



In India, the industrial business is relatively new. Currently we are growing this division - networking and setting up distributors across the country."

Jiten Goswami



Yatendra Kumar and Olivier Vergnes

a real surprise. It has been a good platform to interact with potential customers. All major machinery manufacturers and lubricant manufacturers were present under one roof.

The exhibition reflected the positive economic activity and market sentiments in the country. It also gave us an indication of the machining and metalworking market in India and also a glimpse of the global industry.

The overall response has been enthusiastic. We definitely envisage business growth in the future and Imtex 2015 has been a good starting point.

Q Tell us about some of your products that could bring a value-add for Indian machine manufacturers.

Olivier Vergnes: With use of our products, customers in the machining and metal working industry can improve their performance and safety aspect. Also as laws are becoming stringent globally, using a good quality lubricant is a necessity and part of the rules and regulations.

A challenge we face is the mindset of people – that is looking at immediate savings and not developing a long-term strategy. Manufacturers have realised the importance of using high tech machines and are upgrading the older ones. But the benchmark of using high quality lubrication has not been up to the mark. Companies need to modify or upgrade their machines to use high quality lubrication.

One of our innovative solutions is the minimum quantity lubrication. The oil is in the form of a mist that can be sprayed on the machine. It is beneficial as it gives better machining efficiency, improved productivity, savings in terms of reduced consumption and fewer hassles during the cleaning process. This product is good for large parts and is highly bio degradable. We envisage greater demand for the environment-friendly lubricants in the future.



Small but Powerful Positive Insert with Dovetail Design

TaeguTec is proud to introduce a brand new product line to its popular CHASEMILL family. The CHASEMILL POWER line has a unique design with “double dovetail” shape 2PKT inserts that enable high productive machining.

The double dovetail insert pocket bears most of the cutting forces and relieves the insert screw from the cutting load thus provides powerful and secure insert clamping. Moreover this unique design makes it possible to clamp the insert with a bigger size screw compared to similar size conventional design

inserts. These features combined with the high positive design make the CHASEMILL POWER an excellent choice for high productive machining even in low power and unstable setups.

The unique 2PKT 05 insert is a high positive double sided insert with 2 cutting edges. The double sided design protects the unused cutting edge from potential damage or micro-chipping due to chip-hitting. The 2PKT 05 can take depth of cut upto 4.2 mm (max) and produces true 90 degree shoulder even with multiple passes. This new line is available in end mills from 12mm-32mm, modular type from 12mm-25mm and face mill type from 32mm-40mm. In end mill type these



are also available overcut diameter sizes 13mm, 17mm and 21mm to facilitate deep cavity or shoulder machining. 2PKT 05 inserts are available in 2 geometries, “M” for general purpose machining applications and “ML” for low power machining in unstable setups and long overhangs.

The CHASEMILL POWER line is ideally suited for die and mold, automotive, miniature and general purpose industries. The CHASEMILL POWER is a versatile tool that can perform general face milling, true 90 degree shoulder milling, full slotting, straight as well as helical ramping with high productivity and reliability.

Large dia holes are a sweat no more



Producing large-diameter holes can be a big headache for many shops that are aiming to be cost effective and competitive in today’s global market.

TaeguTec has introduced the SpadeRush, a new line of high productivity head changeable drills for large diameter hole-making. Its optimized cutting edge and unique rigid clamping system generates outstanding performance while reducing cycle times in large diameter hole making.

Available as a standard drill in 3xD and 5xD for a diameter range of 26 to 41 mm, the SpadeRush’s unique clamping technology enables customers to quickly change drill heads without removing the clamping screw from the holder – an

important feature that greatly reduces tool setting times and also machining downtime. Furthermore, the asymmetrical base design of TaeguTec’s SpadeRush means error proof insert mounting, high tolerance, improved tool accuracy as well as repeatability, and an excellent surface finish.

Its self-centered design eliminates the pre-centering function that many shops have to put up with when performing large diameter hole making applications.

The SpadeRush’s through-coolant hole feature permits coolant to be applied directly to and in the hole-making area which also prevents the tool and holder from premature wear and damage. The post-treatment of the SpadeRush’s flute design improves chip evacuation, reduces power consumption and strengthens vibration dampening, which strengthens the tools durability.

Several tests were performed while creating TaeguTec’s new line, and invariably, SpadeRush outperformed the competition. In one case, for example, of alloy steel drilling, SpadeRush outperformed a popular competitor’s similar tool by increasing tool life by 30 percent at exactly the same cutting conditions.

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



HSX 540 - High performance 4-axis horizontal machining centre



High speed, High Performance 4-Axis Horizontal Machining Centre is equipped with Electro-Spindle which can easily perform variety of operation starting from heavy roughing to precision finishing work with high cutting feed. Heavily ribbed structure provides excellent balancing while machining operations. The unique feature of HMCs is its "TRIM Technology" (Table with Integrated Motor) with axis resolution of 0.001-deg. The machine equipped with Electro Spindle & faster ATC enables reduced non-cutting time and hence reducing the overall cycle time. HMC-450 is having many alternates in Spindles, ATC & Palletization.

HSX 860 - For high-volume large part machining

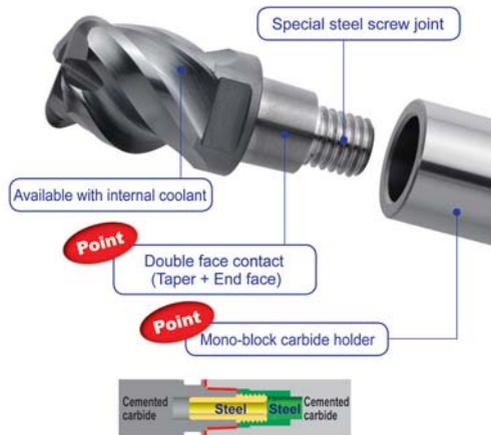
HMC-860 is a popular platform for high-volume large part machining in cast iron and light alloys. HMC-860 integrated with the Electro Spindle which reduces vibration during high-speed operation and increases acceleration/deceleration. Heavily ribbed structure provides excellent balancing during roughing operation and final finishing operations. B-Axis available with axis resolution of 1-deg or with "TRIM Technology" (Table with Integrated Motor) with resolution of 0.001-deg, as per customer's requirement. The machine is having many alternates in Spindles, ATC & Palletization.



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

Exchangeable Head End Mills

Mitsubishi's iMX End Mill Series is a world first in tooling as it comes with Carbide (Head) + Carbide (Holder). The iMX series is a revolutionary end mill system that enables efficiency, high accuracy and rigidity by combining the advantages of both solid carbide and indexable end mills. It offers security and rigidity close to that of a solid type end mill because the clamping faces are all carbide. It is excellent for reduced inventory over a variety of applications due to the exchangeable head.



next generation of coated end mills that delivers long tool life when machining stainless steel and other difficult-to-cut materials.

Comparison of economy: Exchangeable head end mills have a cost advantage compared to solid end mills. In a comparison test against a ø10mm corner radius end mill, the iMX type was shown to become more cost effective at the point where a third solid end mill was needed. In addition performance doesn't deteriorate with iMX, but the re-grinding of solid end mills results in changes of

Smart Miracle: This is a newly developed (Al, Cr) N group coating which delivers substantially better wear resistance. The surface of the coating has been given a smoothening treatment resulting in better machined surfaces, reduced cutting resistance and improved chip discharge. This is the

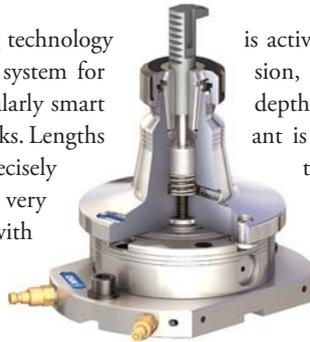
dimension and shorter tool life.

Contact: MMC Hardmetal India Pvt Ltd; Tel: +91-80-3080-7400; E-mail: mmcindia@mmc.co.jp; Website: www.mitsubishicarbide.com



Collet chuck module for cylindrical parts

Schunk, the competence leader for clamping technology and gripping systems extends its modular system for efficient workpiece clamping with a particularly smart collet chuck module for parts with cylindrical shanks. Lengths of pipes, shafts, and other small parts can be precisely clamped with the Schunk VERO-S SEZ within a very short time, and can be machined from five sides with an optimal accessibility. The same applies for unstable workpieces with a short shank. Since the system can be quickly made ready for use, it is particularly suitable for machining individual pieces, small series such as plungers and ejectors in tool and mold making. First of all, the comparably light but robust collet chuck module is put onto an existing Schunk VERO-S quick-change module, is equipped with a workpiece, and then the pull-down jaw system



The Schunk VERO-S SEZ collet chuck module was particularly designed for machining small components with a cylindrical shaft.

is activated. This ensures a maximum clamping precision, great dimensional stability, and an adjustable depth stop provides for a great repeat accuracy. Coolant is discharged through an integrated drain. Since the system can be used together with all common ER collet chucks, it provides a maximum degree of flexibility to the users. The Schunk VERO-S SEZ collet chuck modules are available for Schunk VERO-S NSE plus 138-V1 (ER 32-120 and ER 40-120), and VERO-S NSE mini 90-V1 (ER 25-100) quick-change pallet modules. The clamping diameter amounts from 2 to 20 mm (ER 32-120), 3 to 26 mm (ER 40-120), or 1 to 16 mm (ER 25-100).

The maximum clamping depths is 96 mm (VERO-S SEZ), or 85 mm (VERO-S SEZ mini).

The powerhouse shoulders heavy loads

The Schunk linear modules of the Delta series are able to bear very heavy loads and are the specialists for demanding linear motions with high moment loads. Schunk, the competence leader for clamping technology and gripping systems, now presents the Delta 145C, a particularly compact module that enables powerful strokes up to 4,000 mm. Its inner dual-profiled rail guide ensures maximum rigidity and precision, thus exhibiting superior performance in absorbing heavy loads. To increase the reliability and the service life of the module, a specially fixed plastic cover strip protects the guidances, and drive elements from dirt. The innovative family-owned company offers the module with the option



The rigid Schunk Delta 145C linear module enables precise positioning of high loads.

of a spindle drive for constant high power and high precision or with an economically priced, large-sized toothed belt drive for extremely high accelerations and process speeds. The Schunk Delta series is finely graded and comprises a total of four sizes with profile widths between 110 mm, and 240 mm and strokes up to 7,720 mm (Delta 240C). With a toothed belt drive, a maximum driving force of 2,200 N, a maximum speed of 5 ms⁻¹

and a repeat accuracy of +/- 0.08 mm are achieved. With a spindle drive, the series enables driving forces up to 6,000 N, speeds up to 2 ms⁻¹ and a repeat accuracy of +/- 0.03 mm. They can be flexibly integrated into systems by means of T-nuts or mounting strips.

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

Flexfit Threaded Adaptations



Following the market demand for HELITANG T490 LINE endmills that have various overhang shank lengths, ISCAR has also added the following tools: T490 LNM-M-08 - Extended flute endmills with a FLEXFIT threaded adaptation carrying T490 LNMT/LNHT 08 tangentially clamped inserts with 4 helical, 8 mm long cutting edges. T490 LNK-M-13 - Extended flute endmill with a FLEXFIT threaded adaptation carrying T490 LNMT/LNHT 13... tangentially clamped inserts with 4 helical, 13 mm long cutting edges. The T490 ELN D25-3-M12 tool has been added to the existing T490 ELN-M-08 family. All the new tools can be mounted on standard FLEXFIT shanks with corresponding thread sizes.

For more info, visit: www.iscar.com

Tool advisor: <http://www.iscar.com/ital/MainPage.aspx> Mail: iscar@larsentoubro.com



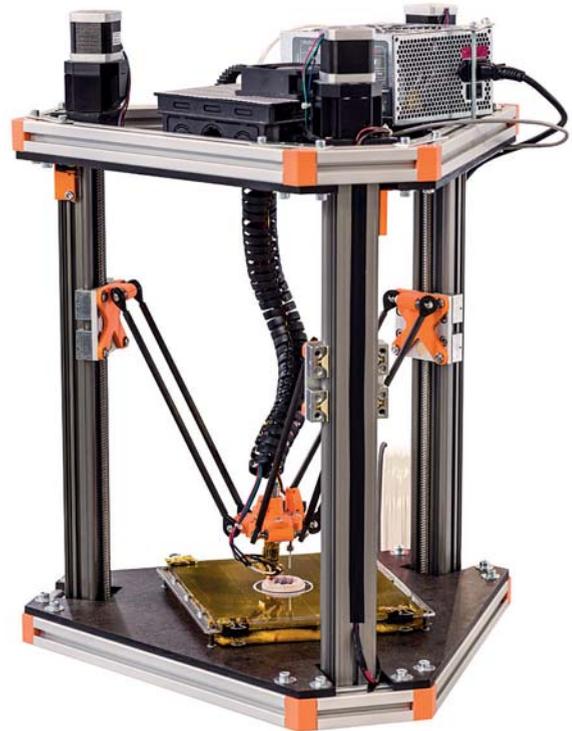
Print your own components for moving applications with the new tribo-filaments

3D printing offers users new ways to print objects with complex designs. This is a good alternative, especially for designers, to manufacture components using the latest low cost technology. igus, the tribo-expert, manufactures suitable linear systems for use in 3D printers, but also the right printing filament. With the iglidur I180-PF, igus now introduces an advanced filament that is easier to process which means that real components for real applications can also be easily manufactured and used immediately.

After the world's first tribo-filament for 3D printers was premièred at the Hanover Show, igus; specialist for 'plastics in motion', now offers its second filament that has been optimised for friction and wear. "iglidur I180-PF, the new material from our 3D filament range, is even easier to process than the iglidur I170-PF material presented at the Hanover Show, because it has a higher elasticity," says Tom Krause, Product Manager for iglidur tribo-filaments at igus. "It is now already available in 1.75 or 3 millimetre diameter." The tribo-filaments from igus are up to 50 times more abrasion-resistant than materials that are traditionally used in 3D printers. These special materials are the result of years of research conducted in the igus test lab, where all products are put through their paces, so that service life, coefficients of friction and wear, can be reliably predicted.

Components for 3D printer

The filaments, and other 'motion plastics' products from igus are also suitable for use in 3D printers for axis. For instance, igus has recently released the low-priced solid plastic bearing drylin RJ4MP. The bearing made of wear-resistant igus plastic, iglidur J4, has the dimensions of the so-called compact "Japanese standard", which has in the meantime established



Tribo-expert igus offers several components for 3D printers -- from plain bearings and energy supply systems to friction and wear-optimised filaments. (Source: igus GmbH)

itself as a popular size for linear guides in 3D printers.

Like all products of the drylin linear and drive systems, the new solid plastic bearing operates completely dry and without external lubrication and maintenance. This reduces costs due to reduced downtimes through routine lubrication and maintenance. The complete drylin E systems have already established themselves. They are delivered including a stepper motor in a variety of designs and can be installed immediately. In addition to plain bearings, lead screws, and linear plain bearings, igus also offers compact energy chains for use in 3D printers. The E2 micro series is available in over 180 different variations. Designed for horizontal, vertical, hanging or standing, circular or lateral movements – the E2 micro can be attached easily to the machine using various mounting bracket options. A chain opener is always included in the delivery for the openable models.



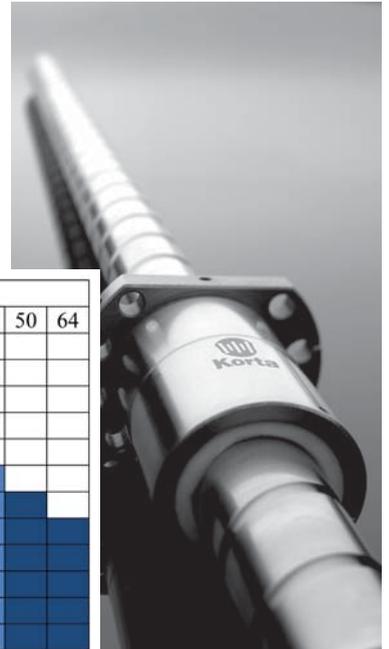
After the world's first tribo-filament for 3D printers has been premièred at the Hanover Trade Fair, igus as a specialist for 'plastics in motion' now offers its second filament that has been optimised for friction and wear. (Source: igus GmbH)

Contact: igus India; Phone: +91-80-45127800; website: www.igus.in/



Ball screws

Korta India was established by Korta Group in September 2007 to cater to the burgeoning demand for precision engineering components such as ball screws and lead screws in India and overseas markets. The Company commenced commercial manufacturing operations in May 2008 and has so far made its presence felt across a wide cross section of over 150 engineering manufacturing goods industries in India and overseas markets. Backed by Korta SA's technical and manufacturing strengths, ball Screws and lead screws manufactured by Korta India have been deployed in various applications and industry sectors such as OEM's, SPM's, Plastic Injection Moulding Machinery, Textile Machinery, Printing industry and Auto Ancillary sector. Korta India has the requisite experience in specific industrial segments such as Aerospace and Energy applications. Korta India specialises in manufacture of stainless steel ball screws.



| Diameter | Lead | | | | | | | | | | | | |
|----------|------|---|---|---|----|----|----|----|----|----|----|----|----|
| | 4 | 5 | 6 | 8 | 10 | 12 | 16 | 20 | 25 | 32 | 40 | 50 | 64 |
| 12 | | | | | | | | | | | | | |
| 16 | | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | |
| 32 | | | | | | | | | | | | | |
| 40 | | | | | | | | | | | | | |
| 50 | | | | | | | | | | | | | |
| 63 | | | | | | | | | | | | | |
| 80 | | | | | | | | | | | | | |
| 100 | | | | | | | | | | | | | |
| 120 | | | | | | | | | | | | | |
| 160 | | | | | | | | | | | | | |

Contact: Tel. +91 080 28396422;
 Fax: +91 080 28396411;
 E-mail: india@korta.com;
 Website: www.korta.com

Standard dimension of Korta Ball Screws:
 Accuracy Grade: C0, C1, C3, C5, C7

EVENT

DMG MORI kicks-off new financial year



Additive Manufacturing: With its additive manufacturing machine LASERTEC 65 3D, DMG MORI presented an innovative combination for additive and cutting machining.

With order intake of € 177.1 million and 688 products sold – including major orders from the USA (€ +11.7 million), from China (€ +10.4 million) and Japan (€ +4.9 million) – DMG MORI takes positive stock of the in-house exhibition in Pfronten this year (previous year: € 167.6 million). This industry-highlight was held for the 20th

time at DECKEL MAHO and is the traditional kick-off for the new financial year. Nevertheless the financial year 2015 remains volatile. From February 3 to 7, 2015, DMG MORI registered a record number of 8,797 international trade visitors in Pfronten. In particular international customers and potential customers (percentage: 59 percent) contributed to this. Their main interest fell on innovations, trend-setting products and particularly on CELOS. With its apps, CELOS control technology simplifies the process from the idea to the finished product. Four new CELOS apps and a CELOS PC version were presented for the first time. In total, 76 high-tech exhibits were presented over the 5,800 sq m floor area, including four world premieres. Other focus points included system solutions for the automotive and aerospace industry, as well as for line production. With its additive manufacturing machine LASERTEC 65 3D, DMG MORI presented an innovative combination of additive and cutting machining. At the press conference on the balance sheet on 12 March 2015, the Group will publish the figures for financial year 2014 and will present an outlook for the current financial year.

STATEMENT OF OWNERSHIP

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I, Joji Varghese, hereby declare that the particulars given above are true to the best of my knowledge and belief.

(Joji Varghese)
Date: March 1, 2015
Signature of the Publisher

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Master –
Gripping System
Components

J. Lehmann

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with Borussia Dortmund 2002**

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IT JUST GETS BETTER



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