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THE MACHINIST

ULTIMATE GUIDE TO PROFITABLE MANUFACTURING

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In search of the 'youthful edge'

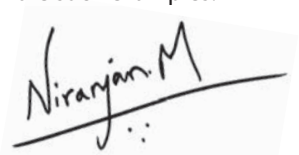
During his address to the Nation from the ramparts of the Red Fort on the 69th Independence Day, Prime Minister Narendra Modi asked some very pertinent questions. How can our youths become new entrepreneurs? How can our youths become new producers?

Now let us juxtapose these questions with a couple of questions that are often asked in the context of the manufacturing industry. Why aren't more youth – both qualified and unskilled – interested in manufacturing jobs? Why aren't more entrepreneurs blossoming in the manufacturing sector?

The common factor in all the above questions is 'youth'. It is really significant that the PM has highlighted this issue. What he simply means is that if the Indian manufacturing industry and Indian economy have to move ahead then the involvement of youth will have to play a critical role in this journey. Indeed, if manufacturing has to thrive in India then it must definitely have a youthful edge.

I recently met a highly successful manufacturing professional who came into manufacturing almost by chance. He was planning to pursue management studies after doing his engineering and was looking for a relatively 'easy job'. But an interview call, which he answered and cleared, changed the course of his professional journey. Of course, he also completed his management studies later but utilised the knowledge to make progress in manufacturing. Today, he is one of the finest professionals working with one of the finest manufacturing brands in the country and doing quite well. We need more such examples!

"IF THE INDIAN MANUFACTURING INDUSTRY AND INDIAN ECONOMY HAVE TO MOVE AHEAD THEN THE INVOLVEMENT OF YOUTH WILL HAVE TO PLAY A CRITICAL ROLE IN THIS JOURNEY."



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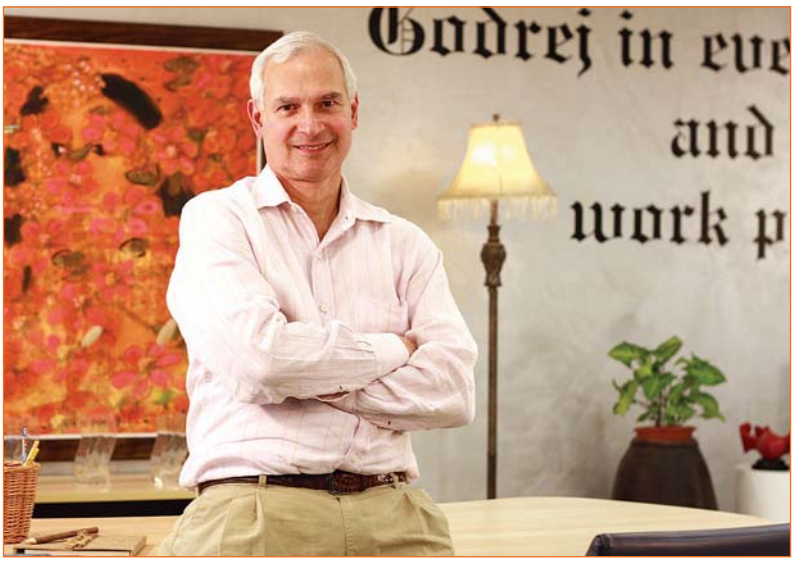

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NEWS

Bosch inaugurates its 14th manufacturing facility in India; invests Rs340 crore

Bosch has inaugurated its 14th manufacturing facility in India. The new plant is located at Bidadi, Bengaluru in the state of Karnataka and will manufacture products for the Diesel Systems division. It will be part of Bosch Limited, the flagship company of Bosch in India. Since the ground breaking in September 2013, around Rs340 crore (around EUR45 million) have been invested in the new plant at Bidadi, which has a built up area of around 38,000 sq m. This investment underlines the importance of India for the Bosch Group. "India is a key pillar of our growth strategy in Asia Pacific. A strong local presence is the basis for further growth in the region", said Peter Tyroller, the member of the board of management of the Bosch Group responsible for Asia Pacific. "Bosch is on track to double sales in Asia Pacific by 2020," said Tyroller, referring to the target the company had set itself in 2014. The construction of the Bidadi plant spans over two phases, with the second phase scheduled to be completed by 2018. The state-of-the-art manufacturing facility in Bidadi will produce Diesel products that were previously manufactured at the Adugodi plant, and would have over 2,600 associates working at the facility.

Dignitaries at the inauguration

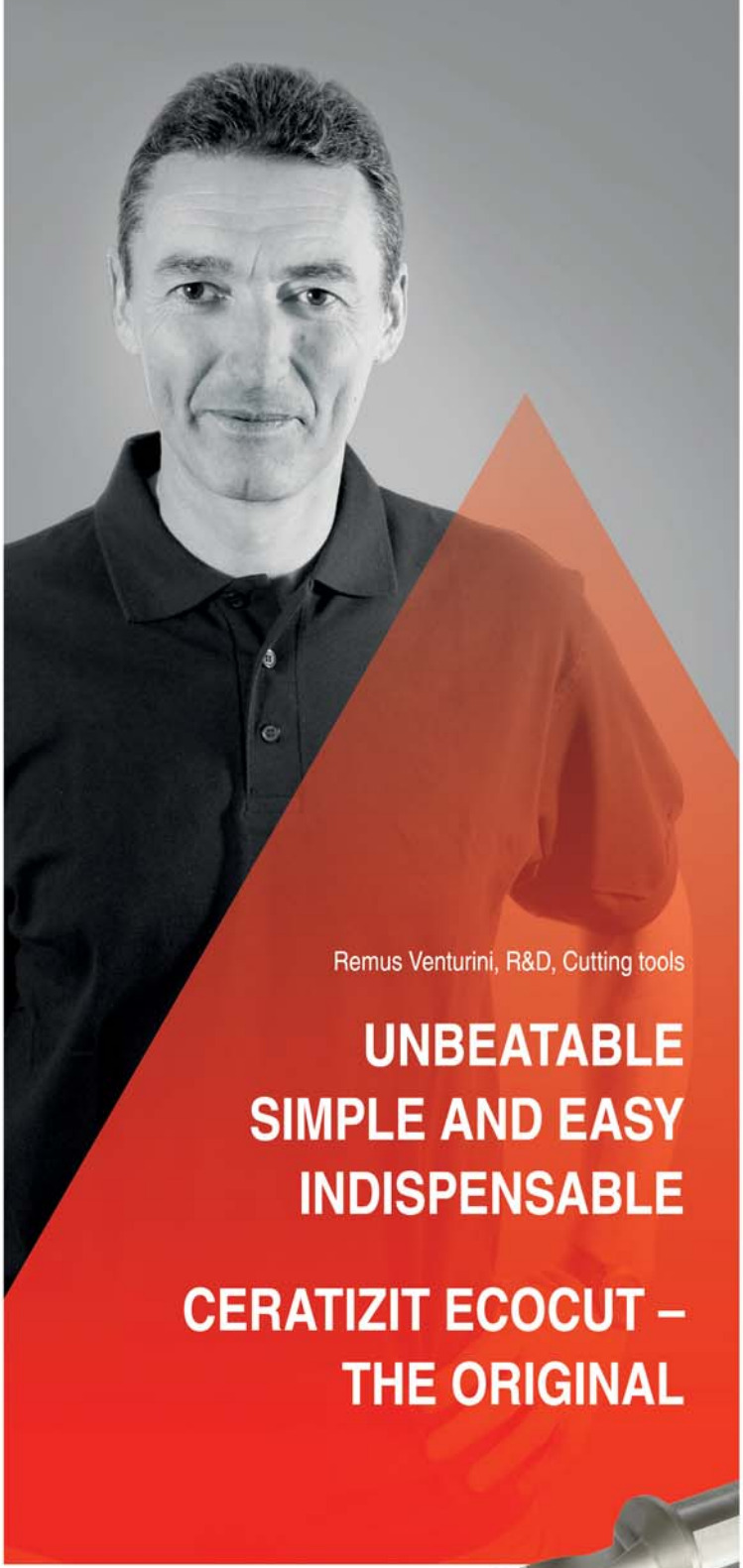
Messung enters building automation biz

Messung Group, a pioneer in Indian automation industry, has announced its partnership with Distech Controls, headquartered in Montreal, Canada. Messung Systems Pvt. Ltd. has been appointed as Master Distributor, serving the Indian market. Through this partnership, Messung will focus on offering innovative, greener and sustainable building automation solutions for the Indian market. "Distech Controls is excited to be partnering with Messung," said David Gill, VP International Sales. "The partnership will strengthen Distech Controls' global presence and position, offering new and expanded building automation and energy management opportunities for system integrators, consultants and customers in India," added Gill. Farook Merchant, CMD, Messung Group said, "Our alliance with Distech Controls marks Messung Group's entry into the building automation segment, allowing us to offer world class products and solutions to the Indian market." Messung will target sectors such as Building Infrastructure (IT, hotels, shopping malls & theatres), transportation infrastructure (airport, metro & tunnels), and manufacturing (pharma, textile, automotive & others).

Boeing forecasts demand for 1,740 new airplanes in India


Dr. Dinesh A Keskar, Senior VP, Asia Pacific & India, Boeing Commercial Airplanes at the "2015 India Current Market Outlook" presentation in Mumbai

Boeing projects a demand for 1,740 new airplanes, valued at $240 billion, over the next 20 years in India. The company released its annual India Current Market Outlook (CMO) in Mumbai recently, forecasting the South Asia region will have among the highest traffic growth around the world at 8.6 percent. "Over the next 20 years, Boeing forecasts India will need 1,740 new airplanes worth $240 billion," said Dinesh Keskar, senior vice president of Asia Pacific and India Sales, Boeing Commercial Airplanes. "India's economy and the country's potential for air travel growth – both for leisure and business – continues to be strong and we remain confident in the Indian commercial aerospace market." The largest demand from airlines in India will be for single-aisle airplanes such as the Next-Generation 737 and new 737 MAX, while twin-aisle airplane demand, such as the 777 and 787 Dreamliner families will also continue. The number of low cost carriers is projected to grow to more than 30 percent of the total Indian market.



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Eaton wins the Zinnov Award 2015 for Gender Diversity at the Workplace

Power management company Eaton has been awarded the Zinnov Award 2015 for 'Gender Diversity at the Workplace'. Eaton's focus on gender diversity and the initiatives implemented at India level were well received by the jury and scored across parameters such as; key drivers, initiatives, benefits, change mechanism, implementation of specific policies. This is the 6th consecutive year of the awards which have been recognizing individuals and organizations that have inspired and contributed to the growth of the technology industry in India.

Eaton has a well-defined Inclusion and Diversity strategy globally and has implemented robust initiatives to accomplish the Inclusion and Diversity goals. One such initiative has been the launch of Inclusion ERGs (Eaton Resource Groups). These ERGs are WAVE – Women Adding Value at Eaton and ENGAGE – Eaton Next Generation Achieving Goals and Excelling. WAVE focuses on enhancing Gender Diversity for Women and has active participation from global and India leadership team.

Klüber Lubrication India inaugurates new plant at Mysore

Germany-based Klüber Lubrication India Pvt Ltd which is a part of the Freudenberg Chemical Specialities (FCS), has inaugurated its state-of-the-art laboratories, production & warehousing facilities in their existing site at Mysore. FCS was one of the first to introduce speciality chemical solutions to the Indian market through its global brands Klüber Lubrication, OKS, Chem-Trend and Sur-Tec. The new facility has been built with an investment of Rs135 crore and will cater to various applications in the automotive, food, cement, steel, textile, and general industries for both domestic as well as global markets. Covering a surface area of 17,000 square meters on a site of around 40,000 square meters, the expanded facilities will make the Mysore plant one of the biggest of its kind in the FCS world. This is a commitment from the FCS group to continue its investment in infrastructure, operations and facility enhancement projects in emerging markets to deliver the same global standards locally.

Lenovo starts smartphone manufacturing in India

Lenovo has recently announced that it will start the local manufacturing of smartphones in Sriperambudur, Chennai. For the current fiscal, Lenovo and Motorola will generate a capacity of six million units. The Moto E has already started rolling out from the plant and the K3 note will follow soon. "Lenovo is not new to manufacturing in India. We recognised India's potential and invested in PC manufacturing several years ago. Lenovo's investment in the new manufacturing plant represents the potential we see in the Indian market and our long term commitment to our customers," said Chen Xudong, president MBG Group, Lenovo and chairman Motorola Mobility Operating Board. "In the past ten years, our brand has grown manifold in India. We are excited to expand our presence and tap into India's competent talent pool that will enable us to develop cutting-edge products for our customers across the world."

Hans Bangert takes charge as Bosch Rexroth India's Managing Director

Effective July 01, 2015, Hans Bangert has been appointed as Bosch Rexroth's MD in India, headquartered in Ahmedabad. Bangert comes from Bosch Rexroth Denmark - the regional subsidiary Nordic where he was MD. He will concentrate on driving growth for Bosch Rexroth in India by focusing on different market segments relevant to the company. Bangert holds a masters degree in mechanical engineering from the University of Ruhr, Bochum.

He joined Bosch in 1982 and has since then successfully established and led many innovative projects. He has held several positions at both Bosch and Rexroth and has a broad experience in leading product development, technology development, production and manufacturing processes. During a career span of over 33 years, he has served as MD, worldwide in various Group Companies.

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Mark your diary

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

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

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

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

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

EXCON 2015
November 25-29, 2015, Bangalore
www.excon.in

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

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

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

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

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

DIEMOULD India – 2016
April 6-9, 2016, Bangalore
www.diemouldindia.org

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

Machine Tool Expo
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Great **start!**

The first edition of IMTMA's Delhi Machine Tool Expo concluded on a positive note at New Delhi's Pragati Maidan recently. A Report.

The first ever Delhi Machine Tool Expo at Pragati Maidan, New Delhi, from August 20 to 23, 2015, organised by the Indian Machine Tool Manufacturers' Association (IMTMA), concluded on 23 August 2015. Held over a period of four days, the first edition of the Delhi Machine Tool Expo witnessed a total footfall of over 13000 visitors. The exhibition had 220 exhibitors displaying over 200 machines from 9 countries with group participation from 3 countries in 4 exhibition halls.

The Delhi Machine Tool expo displayed state-of-the-art technologies primarily focusing on manufacturing solutions from the industries located majorly from northern region. Fervent business activities transpired at Delhi Machine Tool Expo 2015 post-inauguration. Dealer enquiries were solicited, trade leads were generated, amidst a lot of learning, information sharing in a business environment, thus culminating into a heightened euphoria for the gathered manufacturing industry.

About 180 Indian and 40 overseas exhibitors displayed their technology solutions. Overseas exhibitors were represented from China, Germany, Italy, Japan, Korea, Taiwan, UK and USA. The machines and accessories on display focused on key industries such as aerospace, defence, railways, automotive and auto components, medical engineering, construction equipment, IT and electronics, and many more.

***L. Krishnan**, President, IMTMA*

"North India has major engineering and machine tool hubs. Manufacturers for long had been looking for a common platform. The Delhi Machine Tool Expo 2015 at Pragati Maidan has provided us with the best platform to focus on manufacturing technologies in northern states of India like Haryana, Punjab, Uttar Pradesh, Himachal Pradesh, Rajasthan, Uttarakhand and Jammu & Kashmir."

The show had the presence of more than 40 industry delegations representing various industry sectors such as Automobile, Aerospace, Defence, Electrical & Electronics and many other many others. Trade delegations from HAL, Indian Railways, Hero Motors, Tata Motors, Bajaj Auto, Maruti Suzuki, Honda Cars and Scooters, Harley Davidson, Shriram Pistons, Havells India, Kalyani Forge and various other industry chambers and associations came in large groups to the show.

Expressing his expectations from Delhi Machine Tool Expo, Chief Guest Ramesh Suri said "The auto component industry is slated to take a quantum of leap from US$ 38.5 billion in 2014-15 to around US$ 100 billion by 2020. To enable such growth requires a strong and consistent support from the machine tool manufacturers. Regional shows like Delhi Machine Tool Expo will help auto component manufacturers to achieve new heights."

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"The success of first edition of Delhi Machine Tool Expo has opened avenues for penetrating into the regional markets, to enhance the manufacturing capabilities of various industry sectors and we see a huge potential for this show to grow in the future editions."

V. Anbu, Director General, IMTMA

"This expo gave us a good platform to meet both the CNC machine builders as well as the end users. We are happy with our experience this year and will definitely participate in the next edition."

Harit Mehta, Unity Controls Pvt. Ltd.

"I would like to congratulate IMTMA for successfully organizing 1st edition of DMTX. We had a decent footfall of quality visitors at our booth who witnessed the State Of the Art newly launched products by MITSUBISHI. While industry situation still looks gloom, we are confident that our customers will benefit from our new concept – 'Your Global Craftsman Studio.'"

Prashant Sardeshmukh, Director, MMC Hardmetal India Pvt Ltd.

"The auto component industry is slated to take a quantum of leap from US$ 38.5 billion in 2014-15 to around US$ 100 billion by 2020. To enable such growth requires a strong and consistent support from the machine tool manufacturers. Regional shows like Delhi Machine Tool Expo will help auto component manufacturers to achieve new heights."

Ramesh Suri, Chief Guest, Delhi Machine Tool Expo

the show from a regional perspective, L. Krishnan, President of IMTMA expressed that "North India has major engineering and machine tool hubs. Manufacturers for long had been looking for a common platform. The Delhi Machine Tool Expo 2015 at Pragati Maidan has provided us with the best platform to focus on manufacturing technologies in northern states of India like Haryana, Punjab, Uttar Pradesh, Himachal Pradesh, Rajasthan, Uttarakhand and Jammu & Kashmir."

Speaking on this occasion V. Anbu, Director General, IMTMA said that "The success of first edition of Delhi Machine Tool Expo has opened avenues for penetrating into the regional markets, to enhance the manufacturing capabilities of various industry sectors and we see a huge potential for this show to grow in the future editions."

Concurring with the aforesaid statement, exhibitors have said that, "There is a huge demand base emerging in north India as a result of the foreseen growth in the manufacturing industry. Hence, the first edition of the Delhi Machine Tool Expo 2015 at Pragati Maidan has shaped up as the best platform to initiate business in northern region, this time around."

International exhibitors avowed, "The inaugural edition of the Delhi Machine Tool Expo has been a promising one. We were looking for avenues to penetrate into the markets in north India. This four-day mega event has enabled us to follow the requirements of the northern regional market. The show organiser has done a tremendous job by ensuring maximum foot falls from the northern region. We met with several local industrial giants. Our interactions with them have been fruitful. We will carry forward the relationship that has been established and are looking forward for entering into tie-ups with regional manufacturers based in north India."

Visitors also spoke exceedingly well about the event. They were quite happy to see numerous manufacturers from India showcasing their best products and manufacturing solutions at the Expo. The important highlight being the SMEs displaying their best technologies developed which could cater to the large manufacturing industries. Most of the products that were displayed at the Expo were at par with international standards.

The first edition of the Delhi Machine Tool Expo has been a phenomenal success. The strong presence of business visitors and policymakers from India has made it a truly a major event in the region. The expo has undoubtedly mirrored the positive sentiments of the industry as evident from the number of positive enquiries generated and volume of orders received by the participating exhibitors. Being exclaimed as one of the best shows in the northern region both by visitors and exhibitors alike, the Delhi Machine Tool Expo 2015 has provided a platform for the manufacturing industry to upgrade and improve productivity and quality requirements and demonstrate solutions to manufacturing industries especially the small and medium enterprise industries. The next edition of Delhi Machine Tool Expo is planned to be held in August 2017 at Pragati Maidan, New Delhi.

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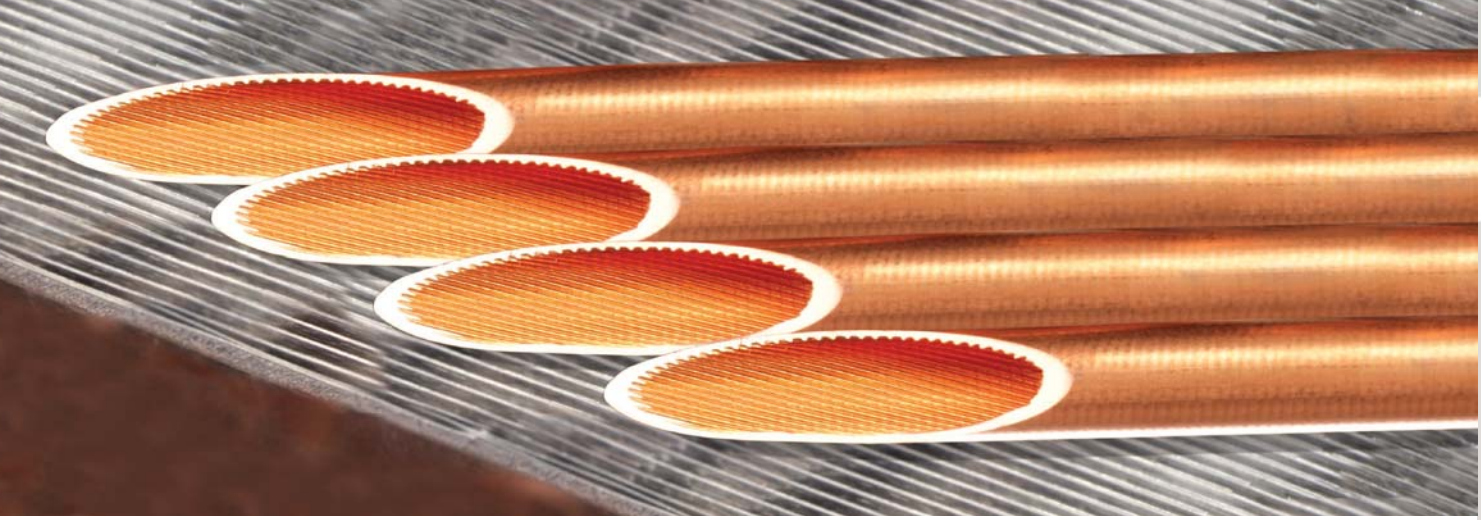

A Climate of **Innovation**

Now it is time to show that the same benefits that make MicroGroove so attractive for room air conditioners also apply to commercial and industrial systems.

By Shankar Sapaliga

The phasing out of popular CFC and HCFC refrigerants has been a major factor in spurring innovations in cooling technology in the past 20 years. Likewise, energy efficiency and sustainability have necessitated invention. End-users have their eyes on energy efficiency ratings and OEMs are highly motivated to use less material in their products.

Natural refrigerants

Natural refrigerants such as carbon dioxide and propane are fast becoming more attractive to OEMs and end-users for ACR and heating applications as technology advances. Also known as R744, carbon dioxide is used as a refrigerant in a growing number of applications ranging from vending machines and refrigerated supermarket display cases to ice-skating rinks.

Another natural refrigerant under consideration for use in air conditioning systems is propane. Known as R290, propane is an eco-friendly hydrocarbon (chemical formula C3H8) with outstanding thermodynamic properties that make it well suited as a refrigerant for residential air conditioners. The advantages of copper tubes in these applications include high thermal conductivity, corrosion resistance and strength. Smaller diameter copper tubes have even higher burst strengths and they allow for lower overall refrigerant volumes.

Copper is a proven technology with a well-established supply chain, including a network of trained installers with the know-how to ensure safety and reliability.

The most important factor

Perhaps the most important factor driving the development of new products is a better understanding of attitudes toward comfort and refrigeration in different climates and cultures. ACR product developers are responding better to the real needs and wants of end users in the built environment. They are right-sizing air conditioning and refrigeration products to allow for precise temperature and humidity control in specific zones without waste. The result is that end-users will enjoy healthy, eco-friendly products that deliver cooling capacity with high energy efficiency when as well as where it is most desirable.

"When coupled with internal enhancements to the copper tubes such as higher strength, thinner walls and internal micro-grooves, newer optimised heat exchanger designs can be smaller, more efficient, and lower cost compared."

Computer modelling is now commonly used to simulate total system design. Decisions about refrigerants, coils and components are now made with the assistance of increasingly accurate performance simulations.

Advances in Coil Design

Redesign of the coil has seen the use of smaller diameter copper tubes with inner-grooves increasing the internal heat transfer coefficient and raising COPs. Such improvements in coil performance may also be favourable for the use of new refrigerants, less materials, higher operating pressures (due to the smaller diameter tubes) and variable refrigerant flow (due to the increased number of branches). System design is dramatically changed for the

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better by using smaller diameter, inner grooved copper tubes in the coil designs.

Smaller diameter, inner grooved copper tubes have been proven to be well suited for the high-volume production of residential air conditioners. Now it is time to show that the same benefits that make MicroGroove so attractive for room air conditioners also apply to commercial and industrial systems. We would like manufacturers and mechanical systems engineers to come to realise the same benefits in commercial applications that OEMs of residential products already enjoy. The MicroGroove concept is applicable across the boards: residential, commercial and industrial refrigeration and air conditioning; and for evaporators and condensers. There are benefits in every case.

Traditional copper tube/ aluminium fin coil manufacturing technology when modified for smaller diameter copper tubes of 7mm to 5 mm, can achieve significant improvements in heat transfer. When coupled with internal enhancements to the copper tubes such as higher strength, thinner walls and internal micro-grooves, newer optimised heat exchanger designs can be smaller, more efficient, and lower cost compared.

A major innovation of small diameter copper tube technology enhances heat transfer by rifling or grooving the inside surface of the tube. This increases the surface-to-volume ratio, mixes the refrigerant, moves the refrigerant into contact with the interior surface of the tube, and homogenizes refrigerant temperature across the tube, resulting in more efficient conductive and convective heat transfer. The high efficiency of the inner grooved tube stimulates and promotes the development of energy-saving, high efficiency and miniaturisation for air conditioning systems. Typically, such surface enhancement can significantly increase overall heat transfer performance, with different inner groove geometries available for optimisation under various refrigerants and conditions.

Making Coils with Microgroove tubes

Manufacturers are using familiar equipment to make coils with smaller-diameter round copper tubes. Performance simulations and prototype designs of heat exchangers with smaller diameter copper tubes are indeed impressive. The savings in materials and reduction of refrigerant volume cannot be denied.

Fortunately, Microgroove copper tube technology is compatible with production methods and equipment already familiar to the HVAC industry. Equipment makers have made the necessary adjustments for producing smaller-diameter tubes and assembling them into coils. Such manufacturing equipment has proven production-worthy at major companies in China such as Haier, Midea, Kelon, Chigo and Goodman who have mastered the manufacturing and now are marketing products globally.

Typical Processes

The principles of tube insertion and tube expansion have been utilized in the industry for decades. The equipment used today expands the tubes circumferentially, i.e the circumference of the tube is increased without changing the length. This "non-shrinkage" expansion allows for better control of tube lengths in preparation for subsequent assembly operations. Tubes are inserted, or laced, into the holes in a stack of precisely spaced fins. Specially designed expanders are inserted into the tubes and the tube diameters are increased slightly until mechanical contact is achieved between the tubes and fins. The high ductility of copper allows for this process to be performed accurately and precisely. Heat exchanger coils made in this manner have excellent durability and heat transfer properties.

Drivers of innovation

Many factors are contributing to a climate of innovation in the ACR industry today, including

- Phase out of high-ODP and high-GWP refrigerants and use of eco-friendly refrigerants.
- Energy efficiency standards and Sustainable development.
- Computer simulation of components and system performance.
- Responsiveness to needs and wants in the marketplace.

Modern Manufacturing

Modern designs of the tube expansion equipment allow for tight tolerances and exact specifications using smaller diameter copper tubes. Otherwise the equipment and production lines closely resemble the existing equipment lines that have a long and successful history.

Manufacturing in general has become more precise and accurate and the equipment for working with smaller diameter tubes is no exception and manufacturers can quickly recoup the costs of equipment upgrades because the use of smaller diameter coils allows them to make higher value products with less material.

Antimicrobial Materials

Another factor influencing the design of air conditioning and refrigeration systems is new published research on copper's efficacy against the spread of fungi in air conditioning systems. OEM companies such as the Chinese air-conditioning giant Chigo and Hydronic in France have already developed all-copper products expressly for their antimicrobial properties. The use of all copper coils is not new but their use expressly to inhibit the growth of fungi and bacteria is a recent development that is expected to be an important factor in the development of innovative air conditioning and refrigeration products. Bio build up on the coil may be reduced by using all copper coils, helping to maintain high levels of energy efficiency for longer times and avoiding energy efficiency drop off over time.

The author is Senior Consultant HVAC International Copper Association India

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Nurturing **Global Leaders**

Ratan Shah, Group Talent Mentor (Manufacturing Professionals), Aditya Birla Group, explains why his Group is the most aspirational place for manufacturing professionals and how it is strengthening its leadership position through initiatives like the Global Manufacturing Leadership Programme (GMLP)

By Niranjan Mudholkar

Q. You have said,* 'If you can dream, the organisation provides the resources to make it a reality'. Can you explain this in the context of your professional journey at the Group?

I have been with the Aditya Birla Group for 38 years and I have worked across six businesses. Based on my experience, I can say that if you have an idea backed by strong conviction and if you can position it properly then it will get funded.

Let me explain. One, Aditya Birla Group gives you the environment to have ideas. Second, it gives you the freedom and opportunity to share these ideas. And third, if you can market those ideas then it gives you the resources to fulfil those ideas. Of course, it is a rigorous and long process but what's important is that the organisation encourages you to have ideas and provides resources to fulfil the relevant ones.

In fact, it is in the DNA of this Group. It believes in continuous improvement. The philosophy of this Group is that whatever establishments it has, those should be the most modern and state-of-the-art facilities as of date - irrespective of whether they were set up recently or 40 years back. It is this philosophy that allows individuals to have and present ideas that the organisation is willing to support. That's the fun to be with this organisation. It encourages you to do something new - rather than doing the routine - with the aim of continuous improvement. It motivates its people to become better and benchmark themselves with the best in the world.

Q. Most people think that a career in manufacturing is very restricted in terms of the opportunities it offers; that it is very unilateral in its scope. Incidentally, you have personally worked across businesses, across geographies, across functions, and even across roles. So has that been an exception?

First of all, I don't know if there was anything that made me special amongst the people who had joined along with me. At that time, almost everybody came from IITs or BITS Pilani. I also came from IIT. So it was not an exception. (Of course, today if you can hire an engineer from IIT, then it is an excep-

* *https://www.abgmlp.adityabirla.com/*

tion! Very few engineers want to come to the manufacturing sector today.)

Actually, there were two things that helped me stand out in my journey at the Group. And I believe that these factors are equally applicable today as well. First, I was fully mobile; there was never a question of an opportunity given to me and my turning it down due to the location. My first job was in Thailand. Then I worked in Karnataka, Maharashtra, Rajasthan and Uttar Pradesh, and that too at plants situated in the remotest of locations. Second, I was never content with what I had in terms of professional challenges and opportunities. I was always looking for more. Well, if you get comfortable and complacent in your job then you are not growing because of your own choice. So I was ready to take up the opportunities that this organisation offered me.

Equally important is the fact that very few business groups can offer you the diverse avenues of growth that the Aditya Birla Group can. Being in the same Group, I have worked for different listed companies, in different industry sectors and across geographical locations.

In fact, if you look at people in the Group now, you will find more and more are moving around, getting varied exposures and working in diverse industries.

So in fact, the opportunities today are much more than they were when I had started. When Mr Kumar Mangalam Birla took over, we were a US$ 2 billion Group and today we are a US$41 billion Group. So the opportunities have grown almost 20 times more than what they were during my times.

How is life at a manufacturing location different?

Let me tell you from my experience that it's a different and challenging life. For the first 25 years, I was at plants. You are operating away from the typical metro life.

But the good part is that our organisation takes very good care of our people in every possible way and even at the remotest of the locations. For example, we have the best of education systems brought to the plants for our children. We have all the modern facilities available from sports clubs to swimming pools, something people may not have easy or affordable access to in cities like Mumbai. We are even building digital theatres in some of our colonies to give our people another avenue of entertainment. Life at a manufacturing location is not a city life in any way. However, it also does not have the ills of the city life such as long travel time, traffic jams, pollution, etc., and offers a good work life balance.

There seems to be a big emphasis on training at the Aditya Birla Group...

Yes, the learning opportunities are much larger in the Aditya Birla Group. It was always focused on training but the emphasis on training today is immensely larger than what it was about 20 years ago. We basically learnt on the job. But today, we have so many formal mechanisms and avenues for training in this organisation that a manufacturing professional joining us will only keep growing. What I took twenty years to grow to, these people will grow in ten years time or may be even earlier. The Group has a great sense of urgency and purpose when it comes to training. Having a leadership position in manufacturing, the Group realises that it is its responsibility to train people proficiently with the aim of taking this industry to the next level not just for the Group but also for the country.

Tell us about your role as the Chief Mentor for Manufacturing Professionals at the Aditya Birla Group. How did you get into it and how is it shaping up?

About three years ago, we at Aditya Birla decided to work towards making this the best place to work. Since a large chunk of our profits more than 60 percent comes from manufacturing, we asked ourselves as how we could make Aditya Birla Group the most aspirational place for manufacturing professionals. So we moved from Aditya Birla Group as the best place to work to Aditya Birla Group as 'the' place for manufacturing professionals. Around this time, I had also started looking at what I could do different within the Group. I had a discussion and there was a lot of enthusiasm in utilising my experience for mentoring senior leaders in manufacturing. My huge experience with the Group also means that I understand the Group's values and vision quite well, which may not be the case if an outsider becomes a mentor.

"Our GMLP – Global Manufacturing Leadership Programme, aimed at reinforcing our technical and manufacturing strength is paying a rich dividend. The Aditya Birla Group is being increasingly viewed as the most aspirational place for manufacturing professionals in India".

Mr. Kumar Mangalam Birla,
Chairman, Aditya Birla Group, (excerpted from the Chairman's letter to shareholders, Hindalco – Annual Report 2014-15)

We set a couple of objectives: First is of course sharing my experience about how I could become a business head starting from being a shift engineer. It is about how I can guide other professionals to evolve similarly.

Second, when you have a mentor then people start sharing real time problems. So I share my relevant experiences related to those scenarios saying that this is what worked for me and may be you can also try the same. Mentoring is a lot about sharing experiences. Also, since I have worked for a long time in the Group, I know a lot of people with whom I can directly

put in a word to solve a given problem. Of course, this happens quite rarely.

We have started this on an experimental basis and so far the response has been positive, It is likely that the Group may call in for some more mentors. One reason why this mechanism is working is also because of its independent nature. While I have worked across different companies, roles and functions, in my current role, I am not directly affiliated with any one of these division. This brings objectivity, credibility, confidentiality and trustworthiness to my role as a mentor. It helps people in approaching me fearlessly without worrying about the chain of command or protocol.

Q Tell us about the 'Global Manufacturing Leadership Programme' (GMLP).

Talent is one of our biggest focus areas for the future. When we talk of aspirations and growth, the biggest question that we ask ourselves is whether we will have enough talent not only to maintain the current levels of growth but also to build on them. Of course, we already have a large number of initiatives operating within the Group. But periodically, we have found that we are not able to fill in the gaps internally. For example, if I need ten people for a project, I may have eight within the Group but I still have a shortage of two. At the same time, we also wanted to look at talent from other business sectors other than the ones in which we are operating.

> "People selected through GMLP will be earmarked for leadership roles in the Group based on their performance and potential."
>
> **Ratan Shah**

Second, we at this Group believe that we need to continuously reinvent ourselves. For doing that besides getting people who know the business, we also need to get people who come from a different business sector as they would bring a fresh perspective. So for GMLP, we are not looking at people who will maintain status quo but at people who will challenge the status quo with new ideas.

Third, people selected through GMLP come with 10 to 20 years of experience. They will be earmarked for leadership roles in the Group based on their experience, performance and potential. The careers of GMLP are monitored and facilitated by Group Human Resources.

From the first batch of GMLP, two are already at the Plant Head level while the others are at senior, functional head roles for large units. In terms of designation, they were all taken at the AVP or VP positions and have grown in the organisation.

Q What are the key qualities required to excel at GMLP?

We are looking at people who are not afraid to move across different business sectors that we operate in. They need to be open to move to different businesses and different locations. We provide them with the training as well as the opportunities to grow as long as they are willing to move around.

We are not looking at domain specialists per se. Yes, the fundamentals of manufacturing and business have to be good but equally important is the ability to bring new ideas and the flexibility to work across sectors.

People shortlisted by us are the people who are already successful in whatever they are doing. So they have grown faster in the businesses that they are. That's a key parameter. We look at how they have grown and what is the width of their experience.

Foremost, we look for their passion to do something new and to improve it. We are not interested in people who are looking for just a career growth. GMLP is much more than that. We are scouting for game changing manufacturing leaders. Equally important is the attitude to learn. We want people who consciously want to learn at every moment of their professional journey.

Q What makes GMLP 'Global'?

When you talk about the word global, the first and direct implication is geographical. Obviously since it offers opportunities to work outside India, it is global in that sense. The current batch of GMLP is undergoing a four-month training schedule where they are required to undertake two projects each in two different businesses. And all of them in their second stint are working outside India in countries like Spain, Germany, Korea and Hungary.

Global means you get to work with people from different cultures and work practices. The mindset of people working in India is more or less similar. However, it is quite different in other countries. So the successful GMLP candidates get exposed to these different mindsets at the global level.

The word Global is also used in the sense of global markets. Many of our businesses have global markets. For example, we are the world's largest producer of Carbon Black, Rolled Aluminium, and Viscose Staple fibre, and also have the single location world's largest copper smelter. Our market for all these products is the World.

When I was heading the acrylic fibre business, we had one plant in Egypt, another plant in Thailand, and the market was the whole world. While I had to coordinate with two manufacturing locations with completely different cultures, I also had to travel the world over to meet with my customers. That is one example. In fact, all our manufacturing businesses have global footprints.

Second, as a Group, we benchmark ourselves against global standards. Our people travel all over the world to visit and study some of the best manufacturing plants run by other companies. They also attend conferences and seminars to understand global best practices. In fact, even people working at our Indian locations get the opportunity to travel abroad on a regular basis. So we are global in every sense of the term.

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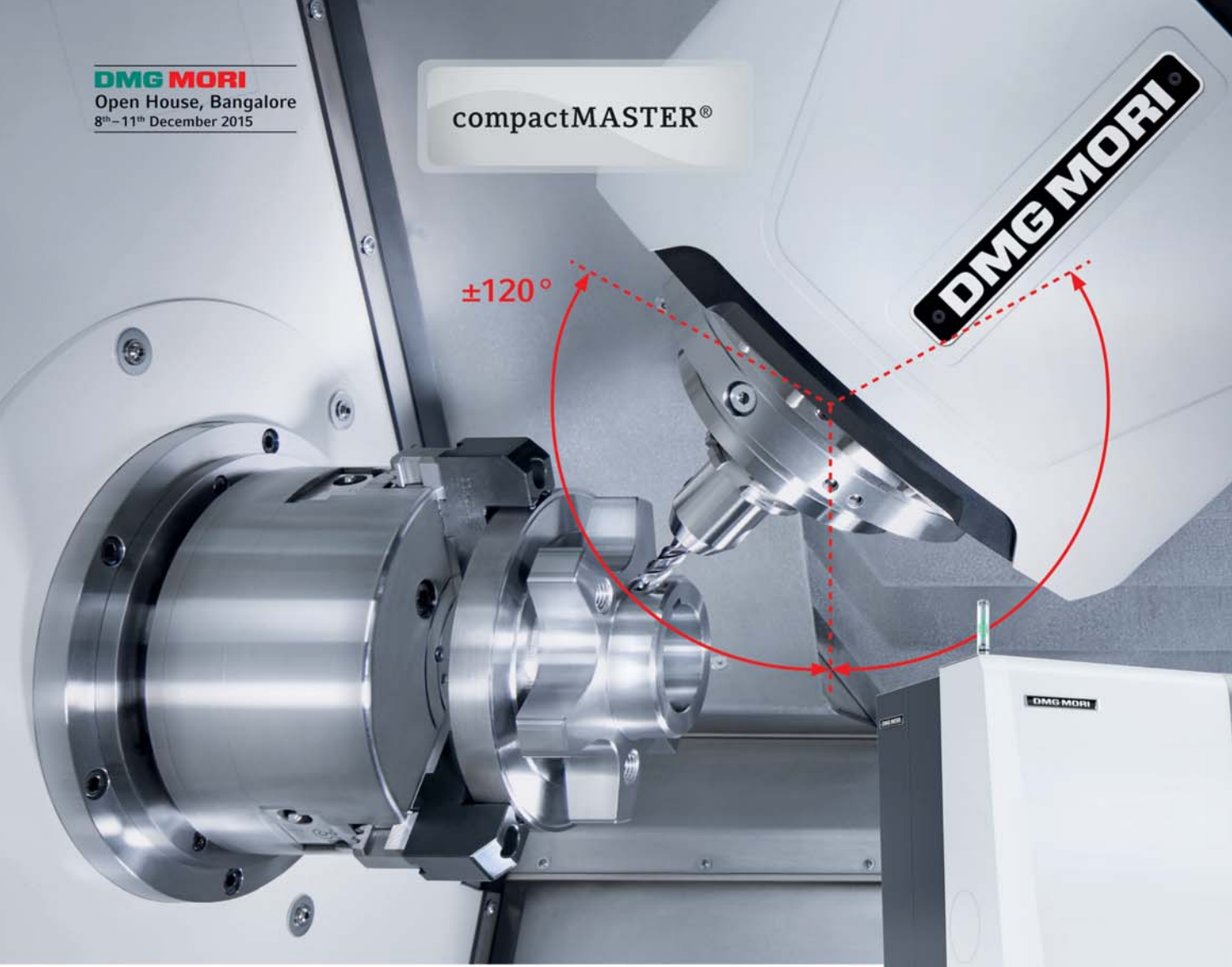

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Green makes Good Business!

Hussain Shariyarr, Sr. Vice President – Operations, Godrej & Boyce Mfg. Co. Ltd., Appliance Division, explains how the combination of lean and green has helped the company's Shirwal plant reach the pinnacle of manufacturing success.

By Niranjan Mudholkar

Historically, a lot of manufacturing at Godrej & Boyce Mfg. Co. Ltd. used to happen at the Vikhroli campus in Mumbai. When Godrej Appliances shifted its refrigerator lines from the Vikhroli campus to Shirwal (Satara District) in 1996, it was quite a challenge. Well, it was happening for the first time in the Group that two complete production lines were being shifted. So there was no past experience to rely on. Secondly, Shirwal is located about 50 km from Pune city and the land parcel itself was quite difficult. In fact, it was a barren land with rocky terrain on which the Godrej Appliances factory was created.

The Machinist recently visited this facility and also caught up with Hussain Shariyarr, Senior Vice President – Operations, Godrej & Boyce Mfg. Co. Ltd., Appliance Division, to understand this plant's journey. Shariyarr, who started his professional journey with Godrej as a Graduate Engineer Trainee about 21 years back, has grown through the ranks. Not only has he worked at various functions across different locations but also has had good international exposure. Currently, he is the manufacturing head for three plants, one in Shirwal and two in Mohali. Of course, the Shirwal plant is closer to his heart; he was the Plant Head here from 2008 to 2011.

"It is only in the last two to three years that our factory has been talked about," he tells us. "But we are quite proud of this journey which includes remarkable milestones like becoming the first Green Co. 'Platinum' rated factory in India (along with our Mohali plant). In achieving these milestones, we have realised that 'Green makes good business sense," he says.

Plant Data

Company: Godrej & Boyce Mfg Co. Ltd, Appliances Division
Location: Shirwal, Satara (Maharashtra)
Area: Total - 2,20,000 sq m (55 acres); Built up - 43670 sq m (11 acres)
Staff strength: Management staff – 119; Blue collared – 523 nos.
Products manufactured: Refrigerators (Direct cool and Frost free), Washing machines, Split air conditioners and Chotukool
Raw materials used: Steel, Plastics (PP+ABS+SAN), Isocynate, Isopentane, Iso-Butane and Propane Gas as refrigerant
Manufacturing principle: Mass Production – Single piece flow manufacturing following Toyota production system (Lean and Green principle).
Operational since: Shirwal plant started in 1996 with production of Washing machines.
Expansion plans: Addition of vaccine refrigerator production line, doubling the current AC manufacturing capacity, one lakh sq ft central warehouse in the factory premises.
Key supply chain partners
Reliance, all major steel companies (Uttam Galva, Bhushan steel, POSCO, JSW), Supreme Petrochemicals, UGC Supply chain solution, Expanded Polymers, China - Hongri Electric Appliances, Xiamen Hualian Electronics, Panasonic Industrial solution - Thailand, DCM corporation - Korea, Mitsui & Co. Ltd - Japan
Key markets
Domestic: All segments
Exports: Sri Lanka, Nepal, Bangladesh, Mauritius, Qatar, Bahrain and Afghanistan.

To start off, since it is located quite far from both Pune and Satara, the Shirwal plant has to be self sufficient - even in terms of emergencies like water shortages, power cut offs and labour issues. However, in preparedness to address these and similar such issues, the Plant has actually evolved into a fantastic manufacturing eco-system that is doing quite well on every front. It operates in a very competitive industry, where on one hand you have new players entering the fray regularly and on the other hand the customers are both demanding as well as

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Hussain Shariyarr

"Ours has been a three-pronged approach throughout: help the factory, help the community and help the environment."

price sensitive. In fact, as Shariyarr points out, 'Godrej Appliances is probably the only surviving 'Indian' brand in this business'.

When compared to the Korean and American products in these categories, initially the Godrej Appliances products lacked the fit, feel and finish earlier. And Shariyarr admits that it was a big weakness. "To address this issue, we made some technological changes in the lines in terms of introducing a state-of-the-art powder coating booth and advanced metal lines. These give us a high level of fit, feel and finish. Today, our products can compete even on the looks front," he says with pride. Not only has the Shirwal plant upgraded the two 'original lines' brought from Vikhroli but it also added a third new line (which is relatively more advanced than the first two lines) and a fourth completely automated line which is the most advanced line.

Milestones

- First Green Co. "Platinum" rated factory in India
- First amongst the Godrej plants to have women on the shopfloor
- First prize at National Excellence Award Practice Competition – Community Building by CII
- First prize in 26th Qimpro National Convention for case study on Waste management Control
- National Award for Excellence in Energy Management.
- NDTV mission Energy Prize for projects on Renewable energy.

Technological features

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23% reduction in Specific Energy Consumption
24% share of renewable energy in the total energy used for the plant operations.

So how is he managing costs at the shopfloor level to ensure good quality at competitive prices? "We have also had our difficult times. But we re-looked at our strategies and we revamped. One thing that we did on the manufacturing front was the integration of 'lean' and 'green'," Shariyarr says. This was a big shift from the traditional manufacturing philosophy. "The usual approach in the manufacturing industry is to focus on production. That – we realised – is very limited and short-term. Today, manufacturing includes many aspects like supply chain, the suppliers, design, after sales, adherence to the regulatory changes and so on," he explains. Shariyarr says that if India has to grow the share of manufacturing in its GDP then we need to understand and implement this comprehensive concept of manufacturing called the big 'M' rather than looking just at production. "Earlier we were looking at just 'operational efficiency' but realised that it was not enough and started taking a 360 degree approach, which also included suppliers, employees, impact on community and sustainable growth. The idea has been to involve all the key stakeholders," he says.

This change in approach has benefitted Godrej Appliances in many ways. And it has also established the reputation of the Company's manufacturing prowess internationally. Today, the Company has a tie-up with Bosch and Siemens. "The fact that a globally leading brand like Bosch and Siemens is going to use our facilities to manufacture their products says a lot about our factories. The Bosch and Siemens products will be sold in the Indian market as well as in eleven countries including Australia. And what really impressed them was our factory," Shariyarr says.

Thanks to the big 'M' that combines lean with Green, the manufacturing cost at the Shirwal Plant has been reducing year on year for the last five years now! And it has managed this amazing feat despite the rising power tariffs, increasing minimum wages and growing fuel costs. A key element in this achievement according to Shariyarr is the positive and proactive involvement of employees. "We believe that conventionally operators have been using only their hands; we have made our operators use their brains as well. We started the kaizen implementation as a result of which from zero contribution, every operator today contributes at least 12 ideas and even implements them every year," he explains. These ideas are in the field of quality, productivity, green initiatives, safety, cost and so on. These ideas have added substantially to the plant's success in terms of cost reduction, over and above the contribution of initiatives taken by the managerial staff. "We call them the cost take-out initiatives and everyone contributes. You would be surprised that we take ideas even

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from our house-keeping guys."

The Shirwal plant had a small valley like formation on a rocky hillock at its campus which could not be used for many years. "So based on a great idea, we created a water reservoir there to collect rain water and that stores 44 lakh litres of water. Thus, while insulating ourselves for any water shortage problems, we have also created a water body that is likely to attract migratory birds soon. And importantly, we have not used any flat land parcel for this purpose," Shariyarr says.

It may surprise many that the Shirwal plant does not use any fossil fuel. "Earlier, we used a lot of diesel for our ovens. Now, we have put up a gasifier which uses agricultural waste as fuel. And whatever residue that comes out is in the form of charcoal and it can also be used. This has saved us 30 percent on the fuel cost. Plus, it is environment friendly. Now, even if diesel costs go up, we are insulated against that rising cost," Shariyarr adds.

Shariyarr and his team gives a lot of emphasis on using the three 'R's - Reduce, Reuse & Recycle – when it comes to dealing with waste. The Shirwal plant recycles all its non-hazardous waste. In the hazardous waste, the sludge coming out of the effluent treatment plant (ETP) is usually sent to landfills. However, the Shirwal plant has stopped that. "We have tied up with one of our workmen who also operates a brick manufacturing kiln. Earlier he was using ash but now he is using the ETP sludge. In fact, we jointly did some tests with him to check the feasibility of using sludge for brick manufacturing and those have given excellent results. We do not charge him any money for it; he just needs to pick up the sludge from our ETP. So it is a win-win situation. Earlier, I had to pay for the disposal of the sludge and he was paying for the raw material. Today, we are both saving on that money and we have also protected the environment in the process. And that has been our three-pronged approach throughout: help the factory, help the community and help the environment," Shariyarr informs.

And it is not just the manufacturing processes which are green at the Shirwal plant. Even its products are absolutely green. In fact, Godrej was the first company to introduce 5-star rated products and it has also been the first to introduce 6-star rated products. "Today we have a 6-star rated refrigerator which no one else has. Our refrigerants are non-polluting. We use hydro carbons and not CFCs. In fact, we were amongst the first to make this shift. Secondly, our refrigerators and air conditioners (ACs) are amongst the most energy efficient products available in the market. The production line which manufactures these ACs has been funded by the German Government because we took the initiative that we want to build an AC which is not only completely green but also is the most energy efficient. This is AC is equivalent to 7-star rating in India. Today, the highest rating in India is 5-star. So you can see the difference. And that is why we enjoy the largest market share in this segment."

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Integration and connectivity

The Machinist magazine caught up with **Sameer Gandhi**, Managing Director, Omron Automation India, at the recently held Automation 2015 show.

By Niranjan Mudholkar

Sameer Gandhi, MD, Omron Automation with Munenori Odake, Executive Officer & Senior GM sales & marketing division HQ

Last year, your focus at this show was on vision and safety solutions. What is the theme this year?

This year, it is integration and connectivity. Integration of various elements including safety and vision together with control systems and robotics. And connectivity is in terms of MES and ERP.

What are the factors for adoption of industrial automation in India?

The principle objective of any business is making profits. One easy way to do that is improving productivity. Let us take an example of a factory with some machines that make 1000 pieces per day. If it can make 1100 pieces without adding machines with an associated fixed cost then the productivity increases by 10 percent. Also, can the factory increase realisation? Say, it is producing X, Y and Z products selling at A, B and C price respectively. Can it demand 2A or 2B or 2C price from the customer? For that, it needs to differentiate its products. Automation helps in both the cases. It can improve productivity as well as quality and it also allows you to change product lines quickly.

There is a certain segment in the society that feels automation can be detrimental to the 'Make in India' initiative, which aims to create more jobs. What is your opinion?

About 15-20 years ago, computerisation was going to be introduced in banks and almost all unions were protesting against that. The contention was that people would lose jobs, and training such a vast work force to operate computers was not going to be feasible. Today, look at what has happened. Because of computerisation, the banking industry has boomed and it is employing much more people than it was employing then. And I have not heard of any retrenchments happening because of the introduction of computers in banks. Same is the case with the adoption of automation in the manufacturing industry. Automation helps lower the cost of production and helps companies to produce better products, which in turn spurs the demand leading to a rise in economy. This would mean more factories and more people to work in those factories. Of course, the skill level of people working in those factories will have to go up. In fact, because of automation, work will become more meaningful. People will have to undergo certain amount of training and this will help them upgrade their skillsets. So automation will actually enhance the employability of workers and make them more valuable. At the same time, automation also enhances the safety factor in the work environment.

We must also understand that we work in the global arena today. Customers want good quality at competitive pricing irrespective of where it is manufactured. So I think people need to come out of this defensive and negative mindset about automation and look at the bigger picture.

How is adoption of automation amongst the SMEs in India?

It depends on the kind of customers they serve. But as a business, do SMEs want to make a quantum leap in terms of volume, quality and productivity of the product? If yes, then they have to look at automation. It is already happening but the rate of adoption is slow.

Omron India has been enhancing its footprint across the country in recent times. Tell us about this.

We want to be closer to our customers. We are not in this business to sell; we are in this business to provide solutions. And subsequent to providing solutions, we must also provide after sales services. For both, we need to have our technical people close to customers. Of course, we always had people working as resident engineers in these regions but now with our offices they can serve our customers better. We will keep doing it more in future.

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Green Manufacturing – Why Green is good for business.

02.50 pm: Case Study on Innovation / Product Development – What it takes to create a Global Product?

Panel discussions

IT in Manufacturing – Are we ready for Industry 4.0?

Quality Management – Can a customer focused approach be taken to quality in production?

CEO Panel Discussion: #Vision2020 – Indian Manufacturing Industry

Other highlights

Keynote Address by a noted speaker

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Enhancing **competitiveness**

Tata Steel has successfully implemented an operational excellence programme. **Alok Krishna**, Chief – Total Quality Management, Business Process Enhancement & Corporate Quality Assurance, Tata Steel, shares the why and how of this initiative.

By Niranjan Mudholkar

Q. What was the key reason behind implementing this programme of operational excellence?

With operations in 26 countries, commercial presence in over 50 countries and 80,000 employees across 5 continents – Tata Steel Group is not just set apart by the magnitude of its operations, but also by its people, innovative approach and overall conduct.

Initiatives for operational excellence are imperative to address the different phases of the business environment we are in and our growing aspirations. Operational Excellence is embedded in the scheme of Tata Steel's operating units and forms part of its ethos of serving common good.

The Tata Group's Code of Conduct, Tata Steel's Vision, Climate Change Policy, Environmental Policy and the UN Global Compact Principles guide Tata Steel's approach to operational excellence. A seamless process integration from mine-to-manufacture-to-customer is what enhances efficiencies and through it, competitiveness. At every stage, Tata Steel strives for sustainable excellence through value creation for all stakeholders and an emphasis on Environment, Corporate Social Responsibility, and Health & Safety.

Improvements in Key Performance Indicators for operational performance are driven through its Total Quality Management process; with objectives and strategies making excellence integral to the way business is conducted. The TQM structure provides a broad framework for driving improvements through a set of focused methodologies for specific application. It provides freedom to adopt the best technique suited for the operational requirement.

> "Improvements in Key Performance Indicators for operational performance are driven through its Total Quality Management process; with objectives and strategies making excellence integral to the way business is conducted."

Q. Achieving operational excellence requires the optimisation of a company's key resources - people, processes, and technology. How are you involving your people in this program?

Tata Steel group has continually focused on driving and maintaining excellence in operations. This has found expression in a relentless drive for excellence in process, product and people; a culture of continuous improvement; and a spirit of innovation that has helped the Tata Steel group sustain growth through turbulent times.

With the world economy facing a sustained slowdown, Tata Steel has successfully overcome the challenges, guided by its vision and a long-term strategy. With a continued focus on enhancing its competitiveness, Tata Steel has initiated several strategies that have enabled it to grow sustainably. The continuing integration of its processes has enabled it to increase efficiencies. Added to this is the enduring commitment of giving back to society that helps make the vision of sustainable growth a reality.

Tata Steel is committed to its people who are instrumental in its success. The Company invests significantly in the upskilling and development of its employees. In managing its

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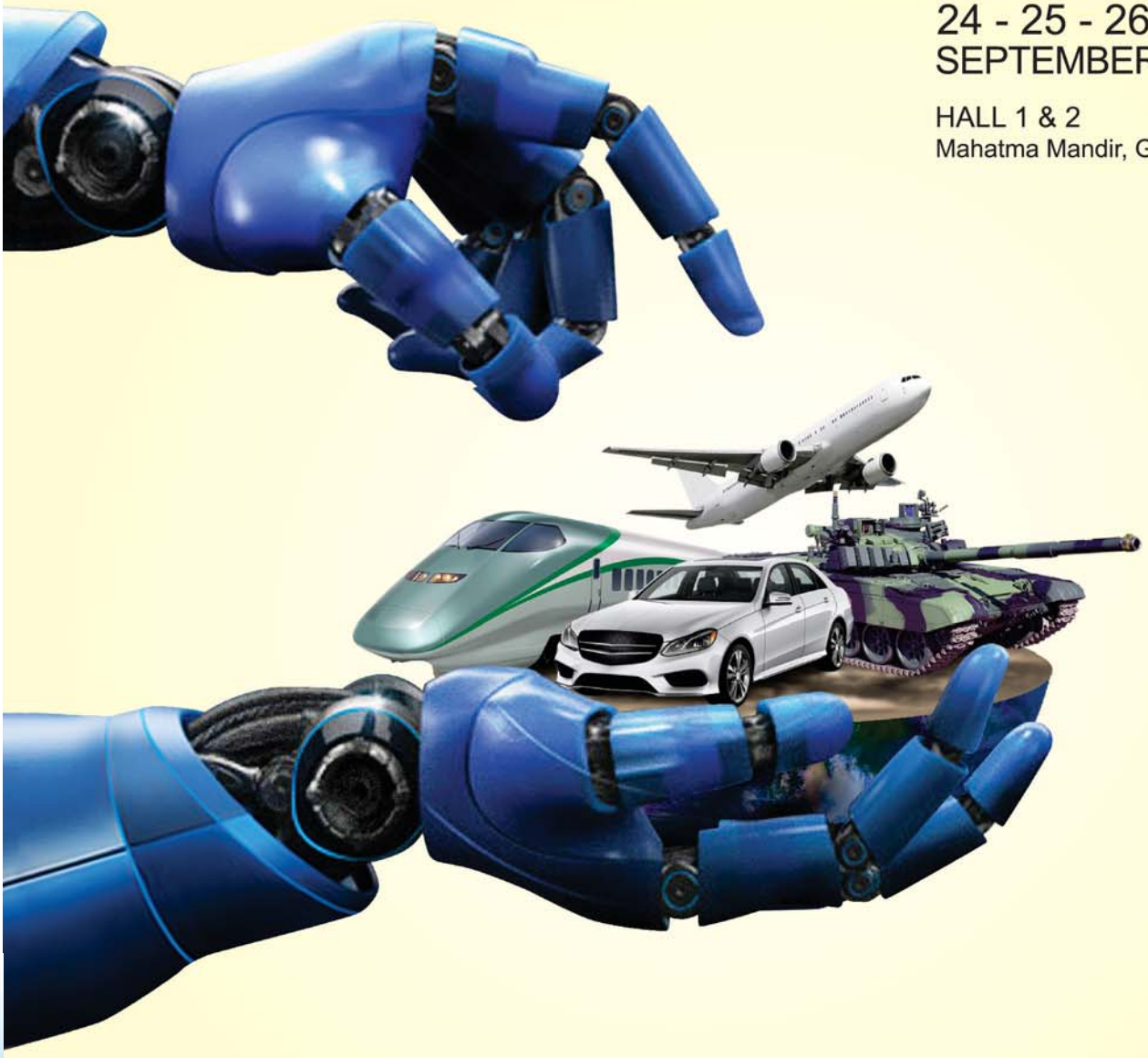

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Noteworthy innovations

- Tata Steel R&D together with CSIR-NML developed a low cost, online and fast method for online sensing of alumina in iron ores. This initiative resulted in an innovation that enables the blast furnace operation to decide on effective blend planning and impurity reduction.
- Bake Hardened 260 is a new hi-tech steel grade developed by Tata Steel Europe, which protects cars from dents and makes door and bonnets 7 percent lighter.
- Tata Tiscon developed Superlinks – stirrups made of high strength ribbed TMT reinforcement bar in commonly used sizes. Superlinks are manufactured through automatic and sophisticated machines, using strict quality control to ensure consistency, quality and accurate dimensions. Tiscon Readybuild is a ready to use Rebar for construction projects.
- Tata Steel has unveiled a range of sophisticated new electrical steel products which reduce electricity losses by 20-30 percent compared to conventional grain-oriented grades. The new products are being made by Tata Steel subsidiary, Cogent Power at their Orb works in Newport, South Wales.
- Tata Steel in India has embarked on "Project Innovent" – a vehicle for consumer-in Innovation, aimed at creating new services and solutions that can lead to higher margins and increased differentiation.

people, the focus is on the following areas:

Engaging employees at all levels of the organisation through people involvement programmes like Suggestion Management, Knowledge Management and Quality Circles – Small Group Activity and MASS +.

- Developing the capabilities of the workforce through training and recruitment targeted at filling capability gaps.
- Managing the employment cost base in a responsible manner

Please tell us about some of the key innovative methods employed towards achieving operational excellence?

Tata Steel over the years has developed some innovative and focused approaches towards achieving operational excellence, the outcome of which are given below:

- **Fret free transportation of steel coils:** Conventionally steel coils are transported through trucks and rail wagons by placing them on wooden saddles. Due to uneven road surfaces, defects appear in coils called fretting corrosion. A special cushion to eliminate the defect has helped significant savings of waste and increase in efficiency. The design has been patented by Tata Steel.
- **Novel technique to enhance the safe operation of blast furnaces:** To enhance the safe operation of blast furnaces, a reliable measurement technology to monitor staves for better cooling and safe operation was developed. This was implemented successfully in the blast furnaces at the Jamshedpur Works.

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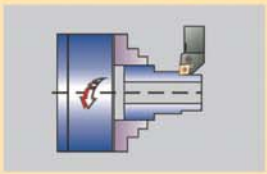
CNC Turning



SC-8K
GANTRY LOADER

SC-14
BIG BORE LATHE

SC-25
CNC HEAVY DUTY LATHE

CNC Internal Grinding

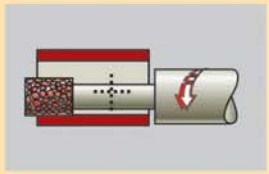
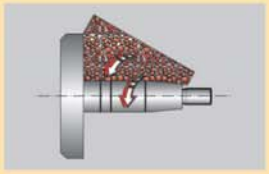


FIG-200 SPL CNC
BIG BORE GRINDER

FIGT-300 CNC
FOUR STATION TURRET

FIGE-150 CNC
ID / OD GRINDER

CNC Cylindrical Grinding

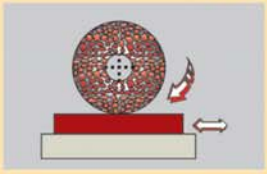


AWH-1500 CNC
LONG SHAFT GRINDER

AWH-2000 CNC
HEAVY DUTY GRINDER

SWH-400 CNC
AUTO LOADING

Surface Grinding



SG-106 CNC
CREEP FEED GRINDER

SGR-60
ROTARY GRINDER

SG-63
HYDRAULIC / PLC

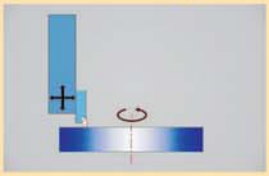
Automats

A15/25

TD36
AUTOLOADING

A42/60

Vertical Turning Lathe



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- **Bio-mimic of natural coal:** A high-end methodology was developed, to produce superior quality metallurgical coke. This innovation has never been achieved in the history of coke making at Tata Steel.
- **Celsius® 420:** A high strength, hot formed structural hollow section was developed. This allows more efficient structures, reduced material usage and lower installation costs. This is a new-to-world product and a patent application has been filed. In September 2014, the first supply of material to customers commenced.
- **Serica®:** Further extends Tata Steel Europe's range of premium offerings to the automotive industry. It is a premium hot-dip galvanized surface finish product. With guaranteed low waviness after forming, it offers customers the highest possible surface quality and paint appearance for exposed automotive panels, including hoods, doors, fenders and body sides.

Tata Steel has also identified opportunities for process improvement through TQM vehicles and methodologies like Policy Management, Daily Management and Cross Functional Management among others.

- The company continued its focused improvements in the quality of products and services.
- It has brought about a steep improvement in quality with strengthening of Quality Assurance systems through standardization initiatives like Tata Steel Standard for Lab Management, cross functional activities with respect to the deployment of Quality Module, facilitating Process Audits, Quality reviews etc.
- With a view to achieving operational excellence in supply chain, Tata Steel has implemented a Hub and Spoke model with multiple hubs at Delhi, Faridabad, Chennai, Gannavarm, Nagpur and Kolkata to optimise order lead times. Aligning with the 2.9 million tonnes per annum brownfield expansion at Jamshedpur and greenfield expansion at Odisha, investments have been made in the supply chain logistics integrated with its downstream expansion initiatives.

Tata Steel plants in India

Tata Steel's Indian operations draw its greatest strength as one of the lowest cost producers of steel in the world. The capacity expansion at Jamshedpur has been an important growth project and will help strengthen the product portfolio in India while rebalancing steelmaking capacities across the Group. The Kalinganagar Project – Tata Steel's second integrated steel plant in India – is also nearing completion.

The Jamshedpur Works currently comprises a 9.7 mtpa crude steel production facility and a variety of finishing mills. Stabilisation of the new LD#3 & TSCR plant at Jamshedpur Works, with an installed capacity of 2.4 million tonnes per annum of HR coils, consolidated the Company's position in the Flat Products market. With this new mill, the product mix has expanded to include HR coils up to 1680 mm in width and also higher strength materials.

> "With great emphasis on making products and processes more efficient and sustainable, our Technology Roadmap identifies projects aimed at increasing raw materials security while effecting reductions in energy use and emissions."

Q How do you engage your supply chain partners in this initiative?

Tata Steel is undergone a major restructure of supply chain management and the replenishment process under the Theory of Constraints initiative. The pilot projects, rolled under the initiative, have started yielding results in reducing stock outs and enhancing sales.

The marketing and sales wings of the company are rolling out offers to various customers' segments depending on their requirements. Thus, replenishment offers are being made to distributors while vendor managed inventory offers to original equipment customers, auto offers to auto customers and rapid response offers to some other selected customers.

Q How have your customers responded to this initiative? What benefits are they deriving?

The TQM initiatives like TOC and others offer a win-win situation for our customers and the Company. These initiatives have the ability to provide a reliable service in terms of delivery at significantly reduced time in certain areas, a reduction in overall system inventory, aligning supply closely with demand,

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improving inventory situation at the distributor and customer levels and, as a cumulative effect of all these, increasing the return on capital.

Q. Tata Steel has been a regular winner at the Tata Innovista programme, which is focused on innovation. Tell us what role is innovation playing in this journey of excellence?

Two ensure an end to end focus on innovation at Tata Steel, a two pronged approach has been adopted, namely, Inside the factory gate, where the objective is to take the company's product-based value propositions to the next level and Outside the factory gate, where the objective is to create differentiation (and revenue streams) based on solutions/services and business model innovation. The "Project Innovent" driven by Marketing & Sales is a concerted effort to promote a structured approach to innovation in the market place.

In order to reach out to students from select Indian Universities and get their insights into innovation, Tata Steel launched an open innovation platform in 2014 titled "Mind Over Matter". Tata Innovista is yet another innovation programme driven by the Tata Group Innovation Forum (a wing of Tata Quality Management Services of Tata Sons), in which Tata Steel participates every year.

An innovation driven company, Tata Steel believes that self-reliance in technology is a pre-requisite for growth, especially in the context of globalisation and expanding operations. With great emphasis on making products and processes more efficient and sustainable, our Technology Roadmap identifies projects aimed at increasing raw materials security while effecting reductions in energy use and emissions.

Tata Steel plants in European countries

Tata Steel is the second largest steel producer in Europe with a diversified presence across the continent. It has a crude steel production capacity of over 18 MTPA in Europe – more than two thirds of the Group's total capacity. The manufacturing facilities at Tata Steel Europe comprise manufacturing hubs (Strip Products Mainland Europe, Strip Products UK, Long Products Europe and Downstream Operations) and Integrated Businesses (Plating, Cogent Power, Speciality and Bar).

In UK & Ireland there are 3 steelmaking facilities (Port Talbot, Rotherham and Scunthorpe) with a combined crude steel production capacity of 11 MTPA. In all, there are 17 manufacturing locations and 22 distribution centres.

In Netherlands there is one steelmaking facility (Ijmuiden) and 5 manufacturing locations with 2 distribution centres.

In rest of Europe, there are 17 manufacturing locations and nine 9 distribution centres. Tata Steel has additional manufacturing operations in Germany, France, Belgium, Sweden, Turkey, Spain and USA. This manufacturing capability in combination with a wide service and distribution network enables the Group to grow and support its business worldwide.

Tata Steel plants in South East Asia

NatSteel's Singapore operations comprise steelmaking and rolling operations of capacity 7,50,000 tonnes per annum and has a well-established downstream business. The downstream business comprising direct sales to contractors uses 45 knowledge-centric services and consists of a cut and bend facility and products like mesh, cages and couplers which benefit the customers in terms of higher yields, higher productivity, lesser space requirement and just in time steel in desired sizes. The downstream facility in Singapore, produces over 4,00,000 tonnes per annum of cut and bend bars, mesh, pre-cages, bore pile cages etc., and is the largest single location facility in the world.

Tata Steel Thailand (TSTH), is the largest producer of long steel products in Thailand, with a manufacturing capacity of 1.7mtpa. Through its subsidiaries, TSTH manufactures rebars, wire rods and small sections. Rebar products comprise round bars and deformed bars for use mainly in the construction industry, including roads, bridges, buildings and houses. The company's manufacturing activities are undertaken entirely by its subsidiary companies – Siam Iron and Steel at Saraburi Province, NTS Steel Group at Chonburi Province, and Siam Construction Steel at Rayong province.

Q. Operational excellence is directly linked with environment management. Tell us more on this front.

Tata Steel has always focused on responsible environmental practices and responsible resource management which is achieved through operational excellence.

Tata Steel has been focusing on both energy and resource conservation projects. Over the years, Tata Steel has adopted clean technology to reduce and monitor pollution level. The one accomplished in Jamshedpur Steel Works include the adoption of High Top Pressure and Top Pressure Recovery Turbine (TRT) at Blast Furnaces to reduce emission levels.

To save on precious coal reserve which goes less in volume, during coke making, additional provision (in addition to existing one) has been made in blast furnaces for putting pulverized coal. This preserves the natural resources.

With changing in the blowing parameters of blast furnaces and subsequent improvement in raw material quality, coke rate has been reduced and coal injection rate has been increased to become Indian benchmark. This has significantly contributed in reducing the cost of hot metal.

Use of Coal Tar in Pellet Plant is yet another example of resource conservation through utilization of by-product generated in plant process.

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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.

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Innovating with a PURPOSE

Refrigerator and washing machine lines at the Godrej Appliances plant in Shirwal

Jamshyd Godrej, Chairman & Managing Director, Godrej & Boyce Manufacturing Company Limited, explains how his company is redefining innovation to provide great experience at low cost while touching and changing lives.

By Niranjan Mudholkar

Imagine a small box like device which weighs less than 9 kg, consumes only 55W electricity, has no compressor, can be operated with a car battery or an inverter but works almost like a normal refrigerator. Well, you don't really have to imagine it because it already exists! It is called 'ChotuKool', the low cost (not cheap!) refrigerator invented by Godrej Appliances. And by the way, you can have the design on ChotuKool's exteriors customised directly from the factory as per your choice!

> "We are not producing cheap products, instead producing low cost products that use the best in class technology, produced in highly efficient sophisticated plants and serve the markets using non-traditional channels with a purpose of providing great experience as a fraction of cost and in a manner that touches and changes lives along the way."

Rurbanisation or transformation of India's rural landscape is creating a new breed of customer who is economically still evolving and yet is aspirational. Godrej & Boyce Manufacturing Company Limited realised this long time back and ChotuKool is an excellent example of what the Company is doing to meet the aspirational requirements for the 'rurban' customers. "We are not producing cheap products, instead producing low cost products that use the best in class technology, produced in highly efficient sophisticated plants and serve the markets using non-traditional channels with a purpose of providing great experience as a fraction of cost and in a manner that touches and changes lives along the way. ChotuKool is our first product under this initiative. There will be more coming," says Jamshyd Godrej, Chairman & Managing Director, Godrej & Boyce Manufacturing Company Ltd.

Jamshyd Godrej's 'there will be more coming' is reflective of the journey of disruptive innovation that Godrej & Boyce has undertaken. And it is happening across all the different businesses where it has presence in like material handling, aerospace & defence, appliances, tooling and precision engi-

The Man

Jamshyd N. Godrej is the Chairman of the Board of Godrej & Boyce Manufacturing Company Limited. He graduated in Mechanical Engineering from Illinois Institute of Technology, USA. Godrej is the former Chairman of Ananta Aspen Centre (previously known as Aspen Institute India), Chairman & Trustee of Ananta Centre. He is the President of World Wide Fund for Nature – India and the Chairperson of the Board of Directors of Shakti Sustainable Energy Foundation, India Resources Trust and Council on Energy, Environment and Water. Besides being a Director of World Resources Institute, USA and Director of Global Footprint Network, USA, he is also a Trustee of the Asia Society, USA. He is a member of Toyota Motor's Global Advisory Board and Asia Pacific Regional Advisory Committee. He is also the Past President of Confederation of Indian Industry and also the Past President of the Indian Machine Tool Manufacturers' Association.

Godrej is an ardent yachting enthusiast and has done extensive cruising along the west coast of India, the Baltic & North Sea, the Atlantic Ocean and in the Mediterranean Sea. The President of India conferred on him the "Padma Bhushan" on April 3, 2003.

Process equipment plant

The Company

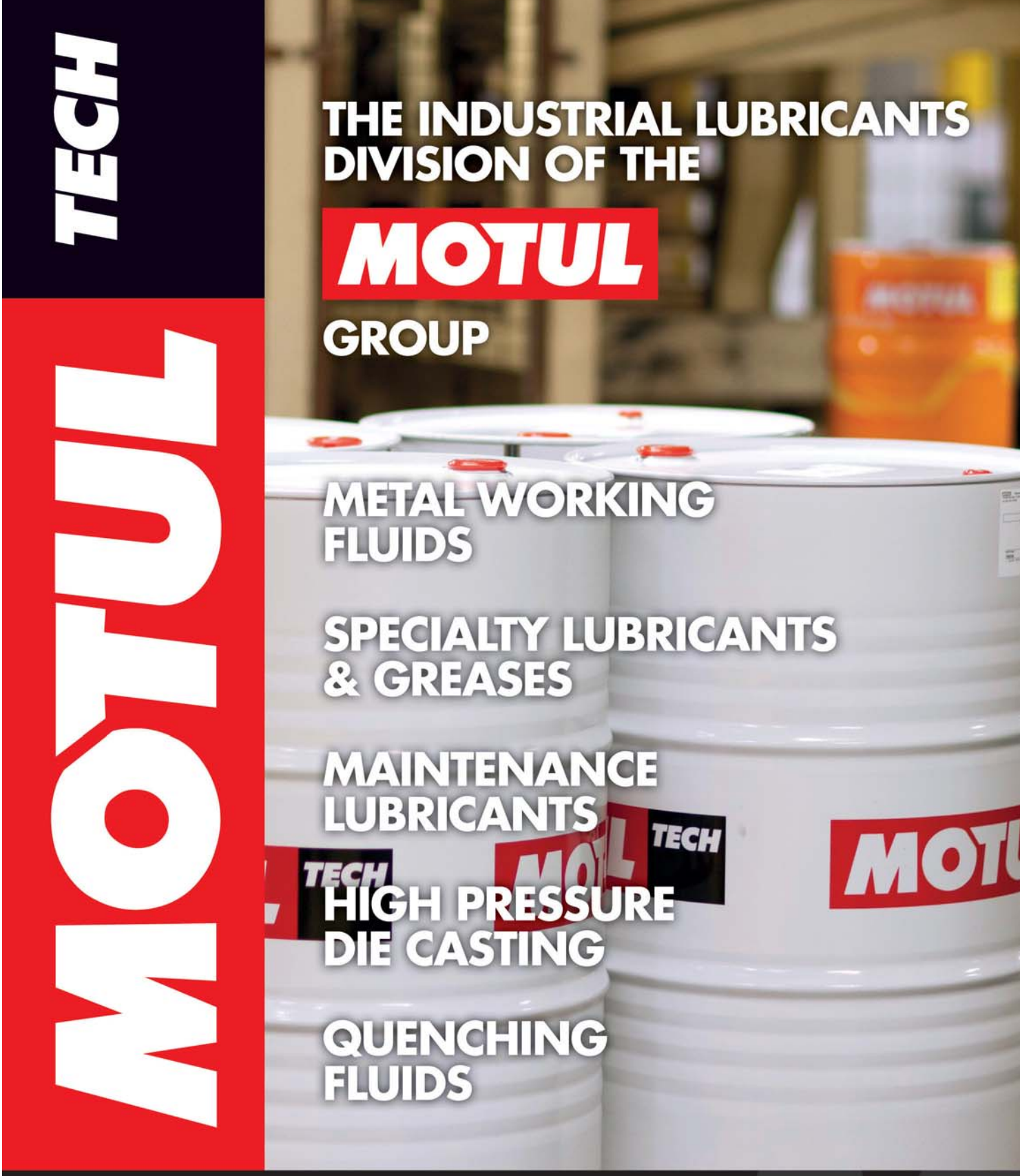
Godrej & Boyce is the holding company of the Godrej group. Its journey began in 1897 with the manufacture of high quality locks and continues with its outstanding engineering capabilities. These enable Godrej & Boyce to supply high-end products across diverse categories to discerning customers worldwide. Godrej and Boyce operates 39 plants pan India. It manufactures and markets refrigerators, washing machines, ACs, office & home furniture, security equipment for banks, commercial establishments & homes, locks and latches, forklift trucks & warehousing equipment, process equipment for chemical, petrochemical, refineries & allied industries as well as precision tools for sheet metal, zinc, aluminium.

neering. For example, Godrej's Interio division is promoting a disruptive furniture manufacturing model called U&US that integrates carpenters with great design ideas and standard components. "We are in several exciting businesses and doing well in all of them with dominant market leadership and share. We have maintained this leadership position because we have been constantly improving and innovating our products and processes. The businesses are at different stages of life cycle, so some may appear to have greater opportunities for innovations. But the DNA of the company is the same and runs across all divisions. Given the respective business context, all of the businesses are focusing on maintaining or becoming leaders in their field," explains the Company's CMD.

Talking specific about the different businesses, Godrej is already India's largest lift truck manufacturer-exporter when it comes to the material handling business. What is the next horizon? Godrej sees a sustained growth opportunity for the next decade and half in the Indian industry at the current stage. He believes that initiatives like Make in India, and the responsibility to uplift a large section of population would mean far greater emphasis and focus on manufacturing and distribution and logistics. "We have enjoyed market leadership position for the past over two decades and we will consolidate this and achieve even stronger market position. The developing economy will also provide greater opportunity for launching categories of products not available / used in the country today. So, our focus will be to expand our line of products and serve all or most needs of material handling in industry and logistics area." While consolidating the position in the domestic market, Godrej will also continue to focus and grow the overseas presence with the aim to be amongst the top 20 brands worldwide. "Given the presence of world leaders in those markets that will be a significant feat," he says.

"We are in several exciting businesses and doing well in all of them with dominant market leadership and share. We have maintained this leadership position because we have been constantly improving and innovating our products and processes."

Godrej was one of the few private players to enter the aerospace and defence sector much be-



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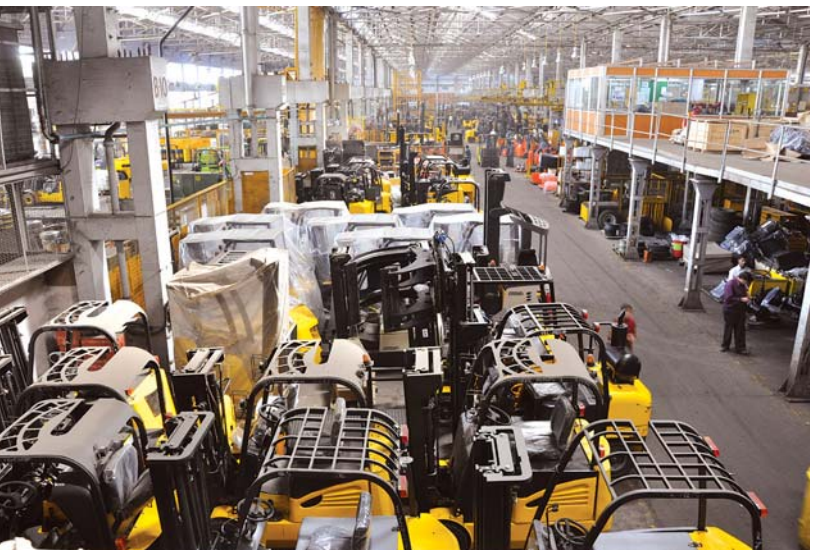

Material handling plant

fore most players could even think of it. Does Jamshyd Godrej believe this division has evolved enough to grab a considerable share of the pie which itself is now getting bigger with the Government further opening it up? He explains: "Our foray in Aerospace business was about three decades back and that in Defence sector about a decade and a half. It was more out of a sense of national duty and doing purposeful work. The volume of business did not justify the investments we made in infrastructure, people and building competencies and knowledge. And all of it was home grown, painstakingly developed in partnership with our customers. We are therefore poised well to grow the business under the new thrust for indigenous development. With the plans articulate by the government there is going to be a big surge and we are energised and ready to meet the demand."

It is noteworthy that Godrej & Boyce's tooling division is perhaps one of the oldest and yet one of the most advanced in this business. Godrej explains how it has evolved. "Our tooling division started out as a captive tool room to support the various products we launched from Locks, to Security Equipment, to Furniture, to Typewriters, to Appliances, to Material Handling Products to Storage solutions. For the past three decades we have gone commercial and focused on Auto sector. With the growth experienced in Auto sector in the past two decades, we have firmly established ourselves as a Tooling Solution provider of choice to all the major players in 2 and 4 wheeler industries. We see great opportunity in building our capabilities and emerging as the preferred choice for tools of all the players as they consolidate their manufacturing in India to serve the world markets. Simultaneously we are also serving overseas markets in Europe, North & South America."

> "Adopting green processes meant investing in new capabilities and technologies and calls for investment in terms of money and effort but as a responsible and concerned corporate citizen we chose to pursue that path."

Both the manufacturing units of Godrej Appliances' in Shirwal and Mohali became the first manufacturing units in the country to get the Platinum Green Co certification for their efforts in green manufacturing. Godrej believes that balancing between addressing diverse consumer demands and the environmental cause is very important. And one of the ways the Company is doing it is by innovating and revitalising the product lines and manufacturing them sensibly in an environmentally sustainable manner. "Adopting green processes meant investing in new capabilities and technologies and calls for investment in terms of money and effort but as a responsible and concerned corporate citizen we chose to pursue that path. The Government and increasingly the customers too are sensitive to it and demanding energy efficient products. So now we are producing energy efficient products adopting green manufacturing practices. The customers would be happy to know that the energy efficient products they are buying have been produced by best in class, green manufacturing processes," Godrej explains.

Not surprisingly, Jamshyd Godrej takes a holistic view of the term 'Green'. Amongst the many hats that he wears is being the Chairman of the CII Sohrabji Godrej Green Business Centre. The Centre is housed in a LEED Platinum demonstration building which is the first green building in India and the greenest building in the world at the time when it was rated. The Green Business Centre is a Centre of Excellence for green buildings, energy efficiency, energy conservation, non-conventional energy sources, water policy, water conservation, and so on.

Godrej & Boyce has been implementing innovation in its manufacturing & functions. So what is Jamshyd Godrej's vision behind innovation and what is his method of blending innovation with the seemingly monotonous manufacturing activities? "Revitalising, Reenergising, Improving and pursuing Disruptive Innovation - there are various shades or manifestations of our pursuit of innovation. We have not restricted this initiative to the products we manufacture, but to the way we manufacture, the way we distribute, the way we carry out sourcing. Innovation is an all pervasive thought. The pursuit of innovation is itself energising, motivating and satisfying and we are experiencing great benefits from this initiative. For manufacturing operations we have adopted Kaizen - continual improvement as a basis to first involve all categories on employees in the process of innovation and now using it to create sustained competitive advantage in everything we do. The seemingly monotonous manufacturing activities are no more so! With all minds working to constantly improve our processes they are very purposeful and satisfying," he says emphatically.

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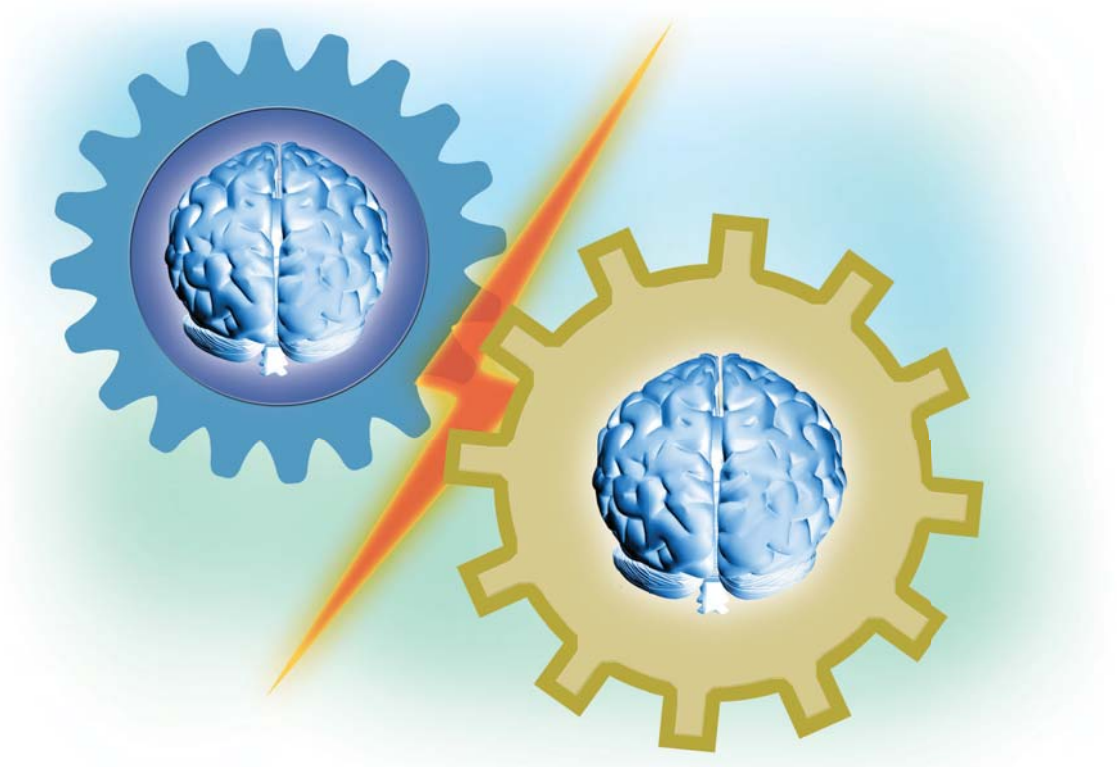


Is India ready for **Smart Manufacturing?**

The extensive adoption ICTs is now crafting the stone work to make way for disruptive approaches to development, production and the complete logistics chain.

By Dr. Jürgen Mössinger

The manufacturing industry is, for the most part, ripe for transformation. Technology is innovating swiftly and that also applies to the technology that is used to manufacture products and goods in our daily lives. Manufacturing set-ups are progressively using smart equipment, but the volume of data generated by automation systems are making it a challenge for traditional manufacturing systems which were not designed for this.

The major change that the manufacturing industry is coming into contact with right now is the Internet of Things (IoT). The first industrial revolution was powered by steam power and today IoT-centric solutions are driving the fourth industrial revolution. This 'smart' term is getting around quite a bit. Smart technology programs symbolise the latest innovations required for manufacturers to modernise and enhance work-flow. With the manufacturing sector making up only 15 percent of overall GDP, there is a need for India to overcome its challenges to keep up pace with countries like Malaysia, Thailand and Indonesia. The Narendra Modi government is hoping to boost manufacturing's share of India's overall GDP to 25 percent, however, to do so, it must rethink right from how factories are run and products are created, to how machines are operated and serviced.

"Manufacturers who create realistic strategies, put them into practice and begin to act now can stay ahead of the competition."

The Phasing-in of Smart Manufacturing

The advancement of the automation industry over the past decade has moved far beyond selling portions of equipment. This is because the innovations from suppliers and engineers around the world have collectively brought about the fourth Industrial Revolution. This

extensive adoption by the manufacturing industry around the world of ICTs is now crafting the stone work to make way for disruptive approaches to development, production and the complete logistics chain. Many technological innovations have occurred in the past few years and as this latest industrial revolution moves into the future, there are significant implications for the industrial workforce. Software is motivating the advances in today's manufacturing and for the companies that embrace it, smart manufacturing has the potential to trigger innovation and enhance productivity, facilitate greater worker and product safety, therefore improve operations.

Not more than a decade ago, several companies, especially in Asia, considered their factories albatross. Many industrialised countries faced in the last decades a reduction in the share of industry in GDP. The share of industry in GDP is going down close to 10 percent in France, UK. Germany has stopped at 23 percent. India is above 30 percent, and China even higher. A variety of factors has changed the perception of manufacturing. Smart manufacturing emerged as the convergence of data acquisition, analytics, and automated control to enhance the overall effectiveness of a company's factory network.

> "Requirements for innovation are diverse as these will play an instrumental role in manufacturing the smart."

A new era of 21st century Smart Manufacturing will optimise factories and supply networks by starting to transform them into profit centres. For most manufacturers, embracing smart manufacturing will happen in stages. This manufacturing intelligence enables the factory floor to become a profitable innovation center. Manufacturers who create realistic strategies, put them into practice and begin to act now can stay ahead of the competition and reap the benefits of smart manufacturing creating way for sustainable and profitable growth.

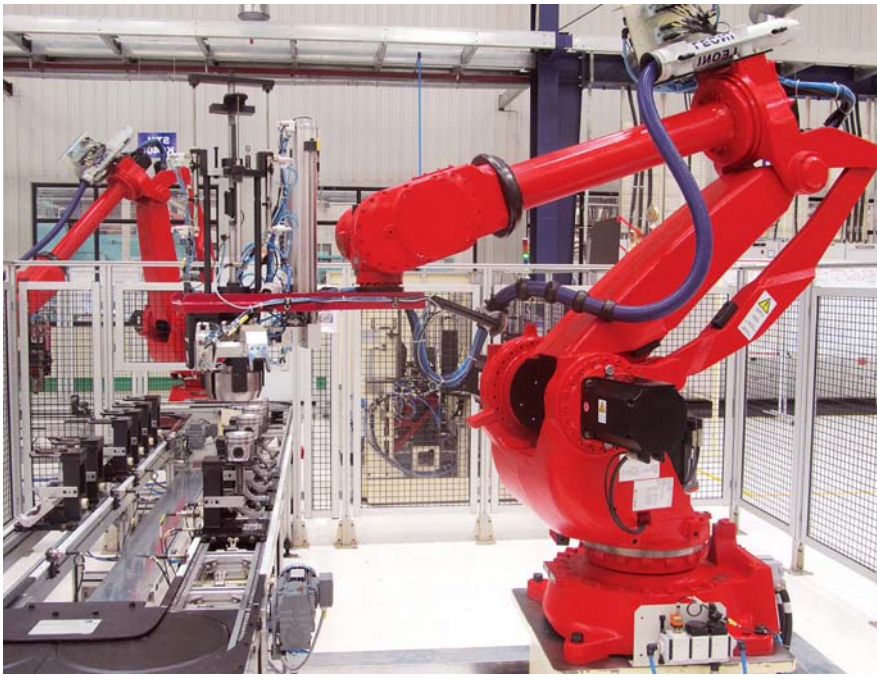
Smart Manufacturing reacts to and front runs a dramatic business transformation to demand dynamic economics keyed on customers, partners and the public. IT-enabled Smart factories and supply networks can respond better to national interests and strategic imperatives and can regenerate the industrial sector by facilitating global competitiveness and exports, providing sustainable jobs, and facilitating manufacturing innovation.

Smart Manufacturing will make India an attractive leader

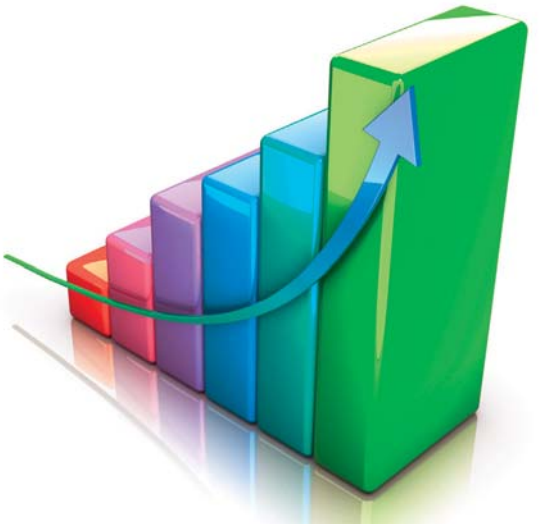
The Indian manufacturing sector is on the brink of scripting a new era for itself and become the fundamental enabler for the country to take up its role as the global manufacturing hub. A paradigm change is expected to be ushered in while the growth of manufacturing sector takes place. The plant is only one piece – currently, India is at a lower level compared to other countries in terms of plant sophistication. It is many times at pure mechanical manufacturing level. The looked-for level, or top of the pyramid, is a situation where Industry 4.0 is adopted completely. India is now going global with 'Make in India.'

Manufacturing gives millions of people a share in producing products and this is very important for India's future. If India wants to be successful in Make in India, it needs to become the hub for smart manufacturing. This requires a focus on exports. We need to now adapt Industry 4.0 concepts for India. Only this optimisation will give us the triumph in India. The country needs to take the bull by the horns so that the world market is not driven elsewhere like China or Indonesia. Having said that, in Industry 4.0 not everything can be done by suppliers or OEM by themselves. The partners are essential. There is also a potential for us to be successful in being the right partner for the industry worldwide.

For the success in Industry 4.0 beside a full ecosystem is required, users, enterprises, connected things and partners. In Industry 4.0, not everything can be done by suppliers or OEM by themselves. The partners are key. Here is also a potential for India to be successful in being the right partner for the industry worldwide. India's manufacturing sector could touch US$ 1 trillion by 2025, according to a report by Mckinsey and Company. There is



If Make in India is to be successful, India needs to become the hub for smart manufacturing.



India's manufacturing sector could touch US$ 1 trillion by 2025, according to a report by Mckinsey and Company.

potential for the sector to account for 25-30 per cent of the country's GDP and create up to 90 million domestic jobs by 2025.

Frugal Innovation

Frugal innovation is the significant for success in emerging markets. It helps raise the standard of people and supports in sustaining market size. However, it is not limited to emerging countries. Frugal innovation has been successfully used in the development of optimised solutions for specific market segments. Successful frugal innovation requires a change in the mind-set. An admirable understanding of the market needs is crucial. Therefore a development in the target region for the region is the most sustainable approach.

With the use of frugal innovation the focus comes to the real needs in countries like India. We are seeing a dramatic increase in efficient use of scarce resources. Having said that, India is today ranked among one of the most innovative countries in the world; in fact, the country has been able to progress from the position of a technology borrower to technology innovator.

We a nation that is now striving for efficient innovation; a country that is pioneering 'frugal innovation or engineering' has proved to be the key to success in emerging markets. In India we have the synergy of classical manufacturing with IT. With the help of frugal innovation, the system approach now focused on higher integration and replacement of sensors by models, furthermore power dissipation is now a key focus. As a result, there was a 30 percent reduction in size, 40 percent reduction in cost, reduction in the number of control units and an elimination of sensors by the use of modelling techniques. This application of frugal innovation proved to be a great aid to the automotive industry. The need for a successful frugal engineering approach has become inevitable.

Industry 4.0

Developed and industrialised countries are using technologies to setup up Industry 4.0 to defend their competiveness in manufacturing. Concurrently, competition is getting stronger and fiercer. It is important to constantly increase productivity while meeting the customers' new demands for high quality and customised products within shorter time intervals.

Positively, Industry 4.0 is more of an evolution in many small footprints that will essentially change the way manufacturing and industry does business. The ideal scenario pictures a self-controlling production process, in which production reacts autonomously and takes suitable measures. We are presently at the start of such a development, which will gradually become conventional in industry. India seems to possess an inherent advantage in creating attractive frugal solutions with global appeal. India has a well-paid middle class, but the masses are struggling. Industry gets the masses into jobs therefore Modi decides to go for Make in India. The 'Make in India' initiative will also take in a character of smart manufacturing which will guarantee superior adoption of automation and world class manufacturing practices.

> "With Industry 4.0 beginning, the Gen Z manufacturers will look absolute different from what we see today."

The Need of the hour

The application of Industry 4.0 is already in progress in industrialised countries like Germany, US. IoT is not only transforming factory control and production structures, it is also increasing agility and flexibility in the production process. The starting point for India is excellent - broad knowledge in classical manufacturing, IT knowledge and a huge pool of highly motivated workers.

We, as an industry, need to do to accelerate time to market, reduce costs, raise quality, lower energy consumption and increase customisation. Consider technologies that manage themselves, where smart products can take remedial action to evade damages and where individual parts are automatically replenished. What are the opportunities and challenges that lie in the future for manufacturers and what will it take to manage this? The expedition of creating and developing smart factories will be a complex and evolutionary. Requirements for innovation are diverse as these will play an instrumental role in manufacturing the smart.

With Industry 4.0 beginning, the Gen Z manufacturers will look absolute different from what we see today and we can anticipate a smart creation of the world with smart industries helping emerging nations to gain global competitiveness. Of course, smart manufacturing isn't just about equipment. Leaders must also rethink the way they hire and organise workers. The total realm of manufacturing is going to renovate and become entirely connected and networked with machines analysing almost every aspect of the manufacturing process.

The author is Vice President, Robert Bosch Engineering and Business Solutions.

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Torch **bearer**

Dinesh Khambhayata, President, Machine Tools Manufacturers Association (Rajkot), provides an insightful overview of the industry's progress and growth potential.

By Niranjan Mudholkar

Q Rajkot Machine Tools Manufacturers Association (MTMA) started in 1983 with an initial membership of 25 units. How many members do you have today?

Currently, around 270 plus members are registered with Machine Tools Manufacturers Association.

Q What are the key challenges faced by this industry and how is MTMA helping to resolve these issues?

At present we are passing through a big recession period. Machine tool as a product is considered as a capital item and due to slow down of new projects or lack of expansion of existing projects, demand has been badly affected. Marketing is very big constraint for MSME units as they do not have sufficient infrastructure. MTMA takes initiatives to encourage its members in participating in various trade fairs.

MTMA takes lead in negotiating for our members and offers concessional rates to its members for group participation as such exhibitions provide maximum exposure to products as well as access to B2B contacts. Upgradation of technology is another constraint for MSMEs. MTMA provides platform to its members by organising various seminars and giving emphasis as well as by spreading awareness to improve quality and increase productivity. MTMA is regularly arranging seminars and training programmes for its members.

As per today's situation, expansion of existing units is also very difficult due to unrealistic and unaffordable prices of land. No new GIDC estate has been established for a long time and hence MSME units are facing problem. Cash flow is also creating problem for existing units.

After completion of production, lifting of material and releasing of payment from customer is also difficult in current situation. Due to devaluation of our currency, input cost of imported material which is used in manufacturing of CNC machines has gone up and it has resulted into higher production cost.

Q What would be the collective turnover of the Rajkot Machine Tools industry?

The collective turnover of Rajkot machine tools industry can be estimated to be around Rs1200 crore. Rajkot comes next to Bangalore in terms of turnover with around 400 machine tools manufacturing units.

Q How has the Rajkot Machine Tools industry been

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growing in the recent times? Are you satisfied with this growth? What targets have you set for the current fiscal?

Growth of machine tools industries is a relative term. For example, the number of units may not have increased much compared to the previous years but in terms of turnover and employment numbers, definitely there are improvements. There are also big opportunities for growing this sector in future. Those from the young generation have started their career by joining the family businesses. As they are young, energetic and techno savvy, they are quicker to grab new thoughts and technologies. This is a very positive sign for the Rajkot machine tools industries. Due to the global recession, result for the current fiscal may be not up to the mark compared to last year's but still we hope to recover in the next few months till the end of year.

> "Yes, definitely there is rise in demand for CNC machine tools compared to conventional machines. The main factors for this increasing demand of CNC machine are customers' demand for improving productivity and quality while reducing dependability on skill labour."

Q Do you see a rise in the demand for CNC machine tools compared to the conventional machines in the market? What factors are responsible for this trend?

Yes, definitely there is rise in demand for CNC machine tools compared to conventional machines. The main factors for this increasing demand of CNC machine are customers' demand for improving productivity and quality while reducing dependability on skill labour. Another reason is the pressure from customers of MSMEs for upgrading their manufacturing capabilities by way of quality and delivery.

Q Tell us about the exports activities of your members?

For machine tools manufacturing sector we can classified this sector in to mainly three sub sectors: 1) High technology machines 2) Conventional machines and 3) Orthodox machines. For the high technology machines, the main export market includes developed countries. In this case, our manufacturers have to face competition from global players. To get a business entry into these markets, we have to prove our products both in terms of quality as well as pricing by way of introducing automation and relevant features.

For conventional and orthodox machines, the key markets are in the underdeveloped countries. Most of the manufacturers of these sectors are MSME units and they do not have adequate knowledge and infrastructure to fulfil complete formalities.

Q What is your assessment of the market scenario with regards to the buyers of machine tools? They have definitely become more demanding and price sensitive. But have they evolved in terms of factors like understanding of technology, value propositions and lifecycle cost? What is MTMA doing to educate the customers?

In the earlier decades, getting information and response was difficult for the customer. However, nowadays due to internet and web based technologies, information is easily available very quickly and almost free of cost. Today's market is buyers' market in all the commodities. Today, the buyer can easily assess all the information from the available sources and the buyer also has the choice of selection and comparison between various products.

Customers are becoming more demanding and price sensitive. There may be some customers in the low cost machine segment and while they may be more price sensitive, they are not much bothered about understanding technology. But majority of customers are now focusing more on after sales service, performance of machines, calculation of payback period, recurring cost and life cycle of machines. As an Association, we are continuously trying to create awareness in our members to focus on quality and customer satisfaction by way of various seminars and training programmes.

Q Is MTMA planning to organise any major event in the times to come? Please tell us briefly about the same.

We are organising the Lean Manufacturing Program. Eight members of MTMA have formed one cluster to implement the "Lean Manufacturing competitiveness Scheme" with the guidelines of the Ministry of MSME. Duration for implanting of this project for individual units is about 12 months to 18 months. Besides, we also have the regular seminars and training programs as per our event calendar. We are also planning to organise the Rajkot Machine Tools Show 2016 in November 2016.

Various activities initiated by MTMA

A) Technology Upgradation Program: UNIDO (United Nation of Industrial Development Organization) had adopted 12 units of MTMA for technology upgradation program in the first phase of the project. With the success of the program in all units in the first phase, another 25 units of MTMA have been adopted by UNIDO for the second phase of this project.
B) Group participation of MTMA members in various industrial exhibitions in the country like Imtex, Engimac, Intec, Rajkot Machine Tools Show, etc.
C) Group visit of MTMA members for international exhibitions & industrial visits
D) Group visit of MTMA members for technology exposure
E) Interaction meeting with various other associations
F) Organising training programs
G) VISION 2020, Udaipur: A joint initiative of IMTMA and MTMA Rajkot.
H) Lean Manufacturing Program.

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- Largest profile of laser applications
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- 22+ international installation base
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- 10% contribution in R&D yearly

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Utilising **the synergy**

Presence of a strong machine tool industry which is the mother industry of manufacturing brings lots of synergy to the prosperous manufacturing sector of Gujarat, says **P.G. Jadeja**, CMD, Jyoti CNC Automation Ltd., Rajkot

Q. Since how long is your business associated with Gujarat? Was there any particular reason why Gujarat was chosen by your company?

Jyoti CNC is in its 27th year of operation is the state of Gujarat. Since decades, Rajkot is one of the hubs of machine tools. The core skills required for machine tool industry is imbibed in the DNA of local professionals. This justifies the location of operation in Rajkot in the state of Gujarat.

Q. How has been your experience of doing business in and from Gujarat?

By and large, Gujarat is an industry friendly destination and any business operating from Gujarat is bliss. Governance is at its best in terms of creating a conducive and supporting business environment. Our experience is fairly good in doing business in and from Gujarat. The constant thrust in inviting foreign investors in the state through the Vibrant Gujarat Summit helps local entrepreneurs to utilise this platform to penetrate businesses globally. Availability of basic infrastructure, availability of skilled manpower and fast decision making processes at government bodies have helped us a lot in the multifold expansion of our business.

Q. What are the advantages of that Gujarat offers generally for the manufacturing sector and particularly for your industry?

As an industry friendly destination of the nation Gujarat has a great core competence to attract manufacturing sector to the state. Through global platforms like Vibrant Gujarat Summit, lots of manufacturing giants across the globe have zeroed down on Gujarat as a manufacturing hub. Lots of automobile companies have already initiated their operations in the state and eventually this would directly help our industry (machine tools industry) to increase business volumes catering inside the state only.

Machine tool industry being the mother industry of manufacturing brings lots of synergy to prosperous manufacturing sector of the State. Further to that, Gujarat offers the largest coastline with very good quality ports which helps convenient and cheap logistics particularly in terms of exports.

Q. Your future outlook for this state?

Future outlook of this state seems excellent! We foresee Gujarat as a growth engine of our nation. Gujarat would contribute a lion's share in our "Make In India" campaign. We are equally optimistic about the growth of the automobile industry in Gujarat. Gujarat's contribution to national GDP always remains much higher than the average and surely this will increase in the days to come.

Future outlook of this state seems excellent! We foresee Gujarat as a growth engine of our nation. Gujarat would contribute a lion's share in our "Make In India" campaign."

Q. Anything else that you would like to add?

Further to all strategic benefits this state offers, we should also rank Gujarat much higher in terms of overall safely, security and good governance. The Government of Gujarat is giving proper thrust to education throughout the State and, as a result the State is having a good strength in terms of availability of technically and commercially qualified manpower. Being located centrally in the country Gujarat offers relevant proximity to the remote locations to serve in terms of logistics. Last but not the least, the people of Gujarat hold entrepreneurship in their blood since centuries which would drive the state towards prosperity through one up business acumen.

Gujarat – Fact file

Name of State: Gujarat
Location: Western India; **Total area:** 1,96,024 sq km
Population: 60,383,628; **Capital:** Gandhinagar
Principal Language: Gujarati
Other Languages: English, Hindi and others
Literacy Rate: 79.31%; **Average Rainfall:** 93.2 cm
Temperature: Summer (March to May): min 25 degrees Celsius to 45 degrees Celsius
Winter (November to February): min 15 degrees Celsius to max 35 degrees Celsius
Eco System: Ranges from deserts, scrublands, grasslands, deciduous forests, and wetlands to mangroves, coral reefs, estuaries, and gulfs.
Time: GMT +5:30; **Currency:** Indian Rupee
Climate: Tropical
Airports: Ahmedabad, Vadodara, Jamnagar, Porbandar, Surat, Rajkot, Bhavnagar, Bhuj
Sea Ports: Kandla, Mandvi, Mundra, Sikka, Okha, Porbandar, Veraval, Bhavnagar, Salaya, Pipavav, Mahuva, Jafrabad, Hazira. Also, Gujarat's 40 minor ports, many in the private sector, handle around 80 percent of cargo handled by all private ports in India.

- World's largest **grass root petroleum refinery** at Jamnagar
- India's first **LNG Chemical Port** terminal at Hazira
- World's largest producer **of processed diamonds**
- Amul ranked world's top 21 largest dairy business by international Farm Comparison Network (IIFCN)
- World's largest **producer of caster & cumin**
- World's largest **gas based single location sponge iron plant**
- World's 3rd largest **denim producer**
- World's largest **single location copper smelter** at Dahej
- World's largest ship breaking and dismantling hub

Source: GIDC

Seven Stars

These are the seven reasons why Gujarat is emerging as India's manufacturing hub

By Niranjan Mudholkar

1 Strategic location

With an excellent geographically strategic location on the West Coast of India, Gujarat can be termed as the Gateway to the Northern, Central and Western regions of the country. The presence of many excellent ports strengthens Gujarat's claim as a gateway since it offers good access to all major port based markets in Asia Pacific, as well as to the Gulf Countries and even some African and European nations. Besides being a key component of the Delhi Mumbai Industrial Corridor, Gujarat is very well connected with the rest of the country through various airports as well as roads and highways.

2 A 'power'ful state

Good quality and consistent power supply is a pre-requisite for the development of the manufacturing sector. Gujarat has been at the forefront in ensuring that the industries in the region are never short on power supply. For example, the State Govt. has been relentlessly working towards transforming the State Electricity Board into a profit making and professionally managed company. There has been an increase in the plant load factor with decrease in the T&D losses. The State also has the biggest CNG and LNG infrastructure in the country. Not surprisingly, about three years ago when half of India was powerless for two nights after the northern power grid tripped, the Gujarat government was selling its surplus power to other!

India's first Ultra Mega Power Project (UMPP). *Courtesy: Coastal Gujarat Power*

Courtesy: Sardar Sarovar Punarvasvat Agency, Govt. of Gujarat

3 Nurturing the industry with water

Gujarat has made serious efforts in all the important areas of water sector such as source augmentation, source management and distribution management through reduction of dependence on the scarce ground water resources. This has been achieved through water grid and master planning and implementation of several schemes under Sardar Sarovar project, Sujalam Sufalam Yojana and multivillage rural water supply schemes. With the Sardar Sarovar Project, the benefits in the form of water as well as electricity will be reaching 500km away from the dam. There also has been a strong emphasis on rain water harnessing and scientific management of water. Besides interlinking of rivers, the administration is also creating 2.25 lakh new water bodies by constructing check-dams and farm ponds.

4 Talent pool

If you read some of the interviews in this 'Gujarat Special' section of this issue, you will clearly see why industries are giving preference to Gujarat. The state has been at the forefront in implementing various initiatives in this regard. For example, the Gujarat State Skill Mission has been set up to converge schemes of various departments, to avoid duplication or overlap and to strengthen quality of skill training. Gujarat Knowledge Society has a major programme of conducting skill trainings for enhancing employability in the existing buildings of schools and colleges. The Society has a target of training one lakh youth per year! At the same time, a massive project is on to create 11 new universities, 400 new colleges, 1.25 lakh new teachers, 38,000 new schoolrooms and doubling the seats for technical courses.

5 Solid infrastructure

People travelling to Gujarat often vouch for the excellent road network in the State. Gujarat is in fact the first state in India to enact a legal framework for PPP (public private partnership) in the infrastructure sector with the Gujarat Infrastructure Development Board (GIDB). Gujarat is today the front runner State in development and privatisation of infrastructure. With private participation a number of ports, roads, railways, hydro electric projects have been developed. The State has a robust infrastructure that facilitates travel and logistics both internally as well as externally.

6 Celebrating the entrepreneurial spirit

Gujarat has been known as the land entrepreneurs. Some of the finest Indian entrepreneurs have come from this State. That is also the reason why not just in India but also world over, the Gujarati community has been recognised for its enterprising character. The success of the well-known 'Gujarat Model' of development would not have been possible without the entrepreneurial spirit of the Gujaratis. Little wonder that Gujarat is also the land where micro, small and medium enterprises have been thriving by being an integral part of a robust manufacturing ecosystem.

7 Business friendly environment

As one can see from the previous six points, the State of Gujarat has most of the ingredients required for successfully operating a manufacturing business. The list is completed with the business and investor friendly climate in this State. Whether it is land acquisition or getting various compliances and approvals related to finance, tax, labour, infrastructure, utilities and environment, Gujarat has been leading from the front. It has been adequately highlighted through investor forums like the Vibrant Gujarat Summit.

Changing **Gears!**

While Setco Automotive Ltd. has four manufacturing facilities – two in India and one each in UK and US – almost 90 percent of actual production happens in India. And its key manufacturing base is in Kalol, Gujarat.

By Niranjan Mudholkar

When Harish K. Sheth, Founder Chairman & Managing Director, Setco Automotive Ltd, returned to India more than thirty years back, he chose Kalol in Gujarat as the site for his manufacturing business. Besides the emotional fact that his father came from this region, the local authority was also keen to develop it. Moreover it is located near Baroda, which offered good educational facilities.

Since then, Setco's Kalol facility has evolved into an excellent manufacturing plant accounting for the Company's majority of production. "The Kalol plant has played a major role in Setco's rise as the largest manufacturer of clutches for Medium and Heavy commercial vehicles in India," Sheth says.

The next horizon for Setco is to become the preferred clutch of choice in the global arena too. Sheth wants Setco to sell at least one out of every three clutches sold in the commercial vehicles segment and one out of five clutches sold in the farm tractor segment globally. And he believes that the Kalol plant with its excellent manufacturing infrastructure, testing facilities and state-of-the-art R&D facilities will play a key role in accomplishing this target. "Importantly, good availability of skilled manpower in the region is an encouraging factor for us," Sheth adds. The Machinist magazine paid a visit to the Kalol plant to get an overview of the facilities progress.

Kalol Plant

Plot area: **72500 sq. m.**
Built-up area: **19000 sq. m.**
Plant operational since: **1982**
Key clients: **Tata Motors, Bharat Benz, Ashok Leyland, MAN India, Mahindra & Mahindra, Volvo – Eicher Commercial Vehicles and Asia Motor Works** amongst others.
Certifications: **TS 16949, ISO 14001, OSHAS 18001 and VDA 6.3.**
Key supply chain partners: **RBD, SSS, Valeo, ASPL, Schaeffler Group – FAG, Asian Tubes.**
Key green features: **Only EMS – OHSAS certified Clutch Company.**

Products

Key Products manufactured: Clutches: Friction Type dry clutch

- Operation wise (Pull Type/ Push Type)
- Material Wise (Ceramic /Organic etc.)
- Dia. wise (170/280/310/352/380/385/395/400/430 etc) (in mm)
- Exports models: 352,385,395,400,430 (dia. in mm)
- OE: 310/352/380/395/430 etc
- Indian After Market: 170/310/352/380/395/400/430 (Dia in mm)
- Coil Spring Type (Axial/Angular)
- Diaphragm Type

Capacity: 30000DP + 60000CA / month - Kalol, 3 shift basis
60000DP+45000CA / month - UKD, 2- shift basis

CNC OXY / Plasma Cutting Machine

Cap.: 6mm To 500mm x 25 Meter

Application: Sheet Metal Profile Cutting

Application Industries:


Machine Manufacturing


Automotive Industries


Defence & Railway Vehicles


Construction Solutions


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- **Hydraulic Machinery**
  - HYD. Press Brake
  - HYD. Shear
  - HYD. C Type Press
  - HYD. H Type Press
  - Iron Worker
  - Bus Bar Bending / Cutting / Punching Stamping
- **Transmission Tower Making Machine**
  - Angle Shearing Machine
  - Angle Punching Machine
  - Angle Stamping Machine
  - Angle Knotching Machine
- **Special Purpose Machine**
  - Structure/Plate Processing Machinery
  - Tube Processing Machinery
  - Elbow Bewelling Machine
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Manufacturing principle

Setco Automotive's Kalol plant has been adopting and practicing lean manufacturing. The emphasis is on cellular and one piece flow assembly lines with focus on waste reduction as well as continuous improvement in the manufacturing practices. "Having an environment that promotes safe working as well as encourages employee engagement is an integral part of the Setco philosophy," Sheth says. Across all its plants, Setco follows stringent quality checks at supplier end, incoming stage, in process checks and the final stage to maintain supply of zero defect products to its customers.

Key technological features

- Semi – Automatic / manual type operations in production shops.
- Computerized Comprehensive testing machines at the end of line to certify the functionality of products.
- Quality Lab with key critical machinery like CMM, Profile projector digital / good quality gauges.
- NPD department in-development proto shop with state of the art validation lab having all functional testing in-house facilities.
- Semi-Automatic CNC shops with VMS and CNC machine lathes by Fanuc, Siemens.
- Old-school machinery equipped machine shop too, with the same for conventional mechanical chores on sub-components.
- Press shop equipped with range from 1000T to 160 T mechanical and semi-automatic presses.
- Heat treatment consisting of SQF and IPSEN furnaces equipped with SKADA software as well as a in-house phosphating plant.
- A newly developed in-house Diaphragm production plant.
- In-house Metallurgical Department for inspection and testing of material for clutches with all testing machines like UTM, spectrometer, Microscope, micro Vickers hardness tester.
- R&D Department, with 24*7 Endurance Testing machine Lab and performance testing Lab with machines like Hysteresis and Parameters Testing machines, Burst testing machines and performance parameters testers.
- Dynamo testing Machine and Clutch Actuation Model for both automatically and manually testing the product, respectively.

CSR Activities

- In 2007 Setco Foundation was set up with a clear goal to reduce the infant mortality and look after young mothers in under developed areas.
- Setco dedicates 5% of its profits annually towards CSR.
- Our focus is on health and nutrition, education and empowerment for the under privileged, rural women and children
- Setco Foundation works alongside and supports the efforts of ICDS and Government anganwadis because we believe that both SCALE and IMPACT can be achieved by Public Private Partnership. We are utilizing the anganwadis as an axis of change

Empowerment: The Setco Foundation empowers women at the grass root level in Gujarat, enabling them to become financially and socially independent, thereby empowering the community around them.

Railroad Air Brake

Marine (Fuel & Oil)

Chemical Transfer

Utility

Transportation

Pharmaceutical Medicine

Electronic Cooling

Air (High Pressure)

Sewer Cleaning

Maintenance Repair Operation

- PHARMA COSEMETIC & CHEMICAL HOSE
- JACK HOSE
- AIR LESS PAINT SPRAY HOSE
- SWER JETTING HOSE
- PNUMATIC TOOL HOSE
- SUPER SPRAY HOSE
- WELDING HOSE / LPG BUTANE PROPANE
- CNG FLAME RESISTANT ELECTRICALLY CONDUCTIVE HOSE
- CEMENT GROUTING HOSE
- CHEMICAL HOSE
- WATER SUCTION / DISCHARGE HOSE
- PETROL DISPENSING HOSE
- OIL SUCTION & DISCHARGE RAIL / ROAD
- RADIATOR, HUMP, MULTI HUMP,
- TURBO CHARGE, REDUCER HOSE
- FIRE REEL HOSE
- AIR-CONDITIONING HOSE
- MOBILE EQUIPMENT & EARTHMOVING
- RUBBER, BRAIDED & SPIRAL HIGH PRESSURE FLEXIBLE HOSE
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- PTFE (TEFLON) HIGH TEMPERATURE & HIGH PRESSURE HOSE
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On **fast track** of **Progress!**

The Government of Gujarat has been very supportive of investments in the state as its economic promotion initiatives are renowned not only in India but across the world. It provides good prospects due to its progressive stand, good governance and investor friendly policies.

By Harsh Dhingra, Chief Country Representative, India, Bombardier Transportation

After more than five decades of investing in the country, Bombardier Transportation has built up capabilities, which cover the complete range of railway vehicle manufacturing, software development, and customer service competencies. Its large manufacturing presence in India combined with its local experience, international expertise and eco-friendly technologies mean it is ideally positioned to elevate India onto the world stage in terms of rail transportation. In fact, the company has the capability not only to address the country's rail industry requirements for the production of metros, electric multiple units and locomotives, advanced IGBT propulsion systems and signalling systems, but also to supply state-of-the-art made-in-India trains to neighbouring markets in the region.

Presence in India

Bombardier, headquartered in Montréal, Canada, has demonstrated its strategic commitment to the Indian market with several major investments over the years. These investments have taken the form of manufacturing facilities, proven technologies, local engineering and most importantly talent. The company employs around 1,100 people in India, where it has established a significant industrial presence. It operates a new railway vehicle manufacturing site including a bogie assembly hall at Savli, Gujarat, as well as propulsion systems manufacturing facility and software development centre for signalling and traction applications at Maneja, Gujarat, Rail Control Solutions Centre at Gurgaon near Delhi NCR and an engineering centre in Hyderabad, Andhra Pradesh, which is already sourcing key global projects. Bombardier is the first foreign multinational company with the capacity to manufacture complete railway vehicles in India, including bogies, carbody production units, a final assembly area, and state-of-the-art rail equipment.

Savli Site

In 2008, our most recent Indian site, a state-of-the-art facility in Savli, Vadodara Gujarat. Bombardier proudly became the first foreign multinational company to set up a wholly-owned railway manufacturing plant in India for the production and final assembly of bogies and carbodies. The Savli site represents one of the largest investment of Bombardier in Asia (33 million euros / Rs230 crore) built in a record time of just 18 months making Vadodara, the only city in the world with the capacity to deliver all key electrical and mechanical components for the manufacturing of railway vehicles. Bombardier Transportation is one of the first companies to use robotic welding technology in carbodies manufacturing in India.

The vast metro market potential in India and focus on localisation convinced Bombardier to set up a railway vehicle-manufacturing base in India. The Greenfield factory inaugurated on Nov 13, 2008 delivered its first train to Delhi Metro on June 5, 2009 within 8 months of factory

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MECHANICAL / HYDRO MECHANICAL
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PINCH TYPE PLATE BENDING MACHINE
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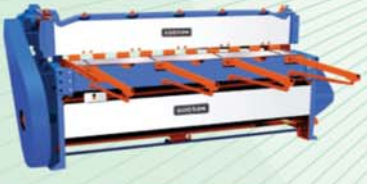

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Thickness : 1 mm to 20 mm

HYDRAULIC / MECHANICAL PRESS BRAKE
Capacity : 25MT to 300MT

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Thickness : 1 mm to 30mm (M.S)

HYDRAULIC PRESS M/c.
POWER OPERATED
Capacity : 15 to 200 Ton

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Thickness Upto 6 mm (M.S.)

STEEL WORKER
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Chanel Upto 200mm

POWER PRESS
Capacity : 5 Ton to 200 Ton

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Savli plant data

Name of the company: Bombardier Transportation in India
Location: Savli, near Vadodara, Gujarat
Total area: 165,000 sq m of which 55,000 sq m is covered production facilities.
Staff strength - (blue collared + white collared): Around 500 employees
Key products manufactured: Rolling Stock (Metros, Commuters Trains, Bogies)
Capacity: 32 metro cars per month
Operational since: November 2008
Key market addressed: India and for Exports – Asia Pacific, South America, Europe and Middle East

inauguration and the 600th car inauguration was held on October 22, 2012. The site has proven to be a real impetus to the local economy, to date 800 new jobs and over 3,000 indirect jobs through the local supplier network have been generated.

As for indigenisation, Bombardier has so far achieved an indigenisation level of approximately 70 percent in terms of subsystem indigenisation. Bombardier delivered 578 cars from the Savli site out of the total order volume of 614 cars across three contracts from Delhi Metro reaching a remarkable manufacturing rate of one car per day.

With the recent contract awarded for 162 additional metro cars from Delhi Metro in June 2015, Bombardier will manufacture all of these metro cars at Savli plant. Delivery of these additional trains will begin in the third quarter of 2016 and is expected to end in early 2018. The new trains will increase the number of DMRC's existing fleet of MOVIA metros from 614 to 776 and make it one of the largest metro fleets in the world.

In recognition of achievement of three million accident free hours, Gujarat Safety Council and Directorate Industrial Safety & Health, Government of Gujarat has recently awarded our Savli Site in Vadodara, Gujarat a 'Certificate of Merit'.

Safety is our major priority and it was confirmed by our Savli site receiving International Railway Industry Standard (IRIS) certification – Environmental standard (ISO 14001:2004) and Occupational Health and Safety standard (OHSAS 18001:2007) – was recently upgraded, making it the only railway vehicle manufacturing site in India that is accredited with Quality Management System Certification IRIS Revision 02 and Health, Safety and Environment (HSE) management system compliant.

Our Bogie production has completed 1500 accident free hours adding another remarkable achievement to our Savli site. We have already manufactured more than 1,250 BOMBARDIER FLEXX Metro 3000 bogies in Savli and the site is capable of producing 1,500 assembled bogies a year. Site will manufacture another 334 bogies for additional Delhi metro order. Savli site carbody manufacturing and bogie assembly hall incorporates some of the most advanced production equipment available today in India.

Exporting from Savli Site

Savli site was built with the intention to serve projects in India and develop export-oriented activities; received its first export order in June 2012 only three years after commencing commercial production at the site, to supply bogie components for Adelaide A-City EMU's in Australia.

Subsequently, Savli site also started to export bogie components for regional and commuter trains in Victoria Australia. In its third export order, Savli site will export 626 bogie frames to Bombardier Brazil for São Paulo monorail project with deliveries starting by end of March 2014.

In its fourth export order and first for metro cars, Bombardier and its consortium partners recently won an order from Queensland New Generation Rollingstock (QNGR) to deliver 75 new six-car trains (450 commuter cars) manufactured at Savli site, maintenance services for a period of 30 years and the construction of a purpose-built maintenance centre under a 32-year public-private partnership.

The new commuter trains are being designed and engineered in Australia and will be manufactured at Bombardier's facility in Savli, India. Initial propulsion boxes will be manufactured in Sweden then undertakes a transfer of manufacture to Maneja site in Vadodara, India. Bogies will be manufactured at Savli plant, India.

A consortium comprising Bombardier Transportation, John Laing, ITOCHU Corporation and Uberior will deliver the order. The total value of the contract is approximately 4.4 billion AUD (3.0 billion euro, $4.1 billion US) with Bombardier's share valued at approximately 2.9 billion AUD (2.0 billion euro, $2.7 billion US). There is an option for a further 24 x six-car EMUs. The new commuter trains will provide improved capacity, security and passenger flow and will feature the BOMBARDIER ORBIFLO advanced condition-monitoring system to enhance vehicle reliability.

Development of Local Vendors

Bombardier's commitment and investment in Gujarat has attracted other world class vendors to set up production facilities either within the state of Gujarat, in India or around our sites. This means an increasing amount of our product is truly Indian, with components available in Indian Rupee and not subject to the volatility of international currency markets. Savli site has increased local content considerably from the time manufacturing started at the site in 2008, after the vast components procurement programs initiated by Bombardier Transportation locally. The localisation process has enabled us create a set of quality local vendors thereby reducing the dependence on offshore suppliers. This in turn would also help metro rail operators in India to find easy availability of Spares and services, as well as address issues of Obsolescence, which is a critical problem in today's world with high technology and low product lifecycle.

Re-engineering

Interaction with local vendors has resulted in the re-engineering of components to simplify and adapt to local manufacturing capabilities, selection of alternate material to satisfy customer requirements. This had again resulted in accelerating the

localization process and delivering reliable components made locally meeting Bombardier's Quality standards.

Building Local talent

Our employees in India are fully trained on special tools and processes to ensure standard quality. What started as rail engineering experts from across the globe moving to India to set up a manufacturing site has rapidly evolved into a truly Indian production and engineering hub with high international standards. The quality of talent in India is superlative but as the industry evolves cost of talent acquisition and retention will go up. We however do believe that the available good engineering and managerial talent can support and contribute to the growth story of the mass transit industry.

Bombardier's key strength in India is our local engineers. They have an in-depth understanding of specifications for Indian metro operators requirements and help our international colleagues interpret these to meet conditions on the ground. To ensure the highest possible standards, we have aligned our engineering teams in India and globally in such a way, that comprehensive customer support is available. In addition, all major systems are drawn from global vendors who are already established in India.

Maneja Site

Bombardier's long-standing relationship with Indian Railways began with the award of a contract in 1993 to design and build electric mainline passenger and freight locomotives. Bombardier's Propulsion and Controls Production and Development Centre at the Maneja site in Vadodara, Gujarat, was recently expanded and has been supplying Indian Railways for decades with converters and electronic devices for train control and communications. Maneja Site recently completed 15 years of commercial production and supply to rail operators in India.

Our Maneja site is responsible for production of propulsion and control equipment for the order from Mumbai Railway Vikas Corporation (MRVC). It involves design, manufacturing, delivery and testing of BOMBARDIER MITRAC propulsion and control equipment, as well as additional equipment including fans, compressors, passenger information systems and high voltage instruments. The order relates to a total of 72 commuter trains of 12 cars each. Bombardier has started series deliveries and the first train entered revenue service in March, 2015. Our team in Maneja site is working on executing the project for the citizens in Mumbai to travel more safe and comfortable.

Gujarat: During setting up of Savli Site

When we were evaluating options to set up our new railway vehicle site in India, response from all state and central governments was exceptional. We decided to set up the factory at Savli in Vadodara, Gujarat due to our long standing presence in the state. Post taking a decision to set up a unit in Savli, Gujarat, and the Government has been very supportive of our activities.

Our factory in Gujarat was set up in only 19 months which is a record in itself in Bombardier and first car was produced from the site in next 18 months thereafter with industry average been around 24 months.

Association with Gujarat Government

The Government of Gujarat has been very supportive of investments in the state as its economic promotion initiatives are renowned not only in India but across the world. It provides good prospects due to its progressive stand, good governance and investor friendly policies. The state of Gujarat, called "the Growth Engine of India", has a strong business oriented leadership with limited bureaucracy. It is very fulfilling for a company like Bombardier to be present in Gujarat where we have large industrial establishment employing around 900 people and generating around 3000 indirect jobs with manufacturing sites and local engineering catering to India and markets around the region.

CSR activities in Gujarat

Bombardier has a proud track record of supporting Indian communities, local schools, orphanages and Non-Governmental Organisations around our sites in Savli and Maneja near Vadodara. Most notably, in the last couple of years the company has contributed both time and money to provide access to drinking water to students at a high school close to the Savli plant and to renovate a computer room, plant trees in the schoolyard and provide notebooks to students.

In another project, Indian employees at Bombardier

involved school children in a tree planting initiative through which they were able to educate the pupils about the environmental importance of maintaining wooded areas instead of cutting them down for firewood or other economic gain. Around 200 Bombardier Transportation India employees recently participated in Vadodara Marathon in February 2012 to raise funds helping education of underprivileged kids in Vadodara. Recently, Bombardier is actively involved with Clean India Movement with company employees voluntarily undertaking clean-up drives in Vadodara.

Participation in industry event & supporting trade bodies

Bombardier Transportation has been participating in Gujarat's premier investment exhibition, Vibrant Gujarat from its inception due to our long standing presence in the state. In 2011, we displayed our "Made in Gujarat, India" BOMBARDIER MOVIA Metro car which has been supplied to Delhi Metro from our site in Savli. Bombardier has always supported trade bodies in Gujarat and participates in related industry events showcasing our commitment to the state of Gujarat where we have received immense support from the Government.

Aim for our sites in Gujarat

We are determined to make our sites in Gujarat as one of the best in the world with a common and focused goal to be lean sites with flexibility, innovation, respect for the environment and a customer-oriented approach. The four main cornerstones of our philosophy are: to ensure top quality of our product and all deliverables; to deliver to schedule; to develop a trusted and quality network of local suppliers and last, but not least, to provide a cost-competitive product without compromise to quality

Future plans for the state of Gujarat

Bombardier Transportation is committed to the growth of rail transportation industry in India and as we grow in the coming years, if deemed necessary we will also look at increasing our presence in the state of Gujarat.

Future Investments and Employee Plans for India

In India, a strong employee base of 1100 are currently support our Indian customers (DMRC, MRVC & Indian Railways) and executing exports orders to Australia, Middle East, Europe and Brazil. Bombardier has invested around 100 million USD in the last two decades in manufacturing sites, engineering expertise and centres, proven technologies and more importantly in local talent. We are open to more investments and increasing headcount locally subject to winning the projects we are currently pursuing for India. Bombardier always keeps investing in new technologies and people on a regular basis to support customer requirements.

Hot and happening

We present a snapshot of activities and updates over a period of time that highlight Gujarat's rise as a manufacturing and economic hub

Manufacturing cities Envisaged in DMIC Project

Out of the 24 proposed manufacturing cities in Delhi Mumbai Industrial Corridor Project, four will be located in Gujarat. These are:

Ahmedabad-Dholera Special

Bharuch-Dahej

Surat-Navsari

Valsad-Umbergaon

Guj CM approves vertical estate & All-Women Industrial Area to encourage MSMEs & women entrepreneurship

Under significant decisions taken by Gujarat Chief Minister Smt Anandiben Patel, she approved All-Women Industrial Area in Sanand GIDC estate, with a motive to encourage women entrepreneurs to contribute in industrial growth of the state. 500-1000 sq mt plots will be provided to women to undertake their entrepreneurial activities. She directed officials to speed up the procedures involved and undertake an efficient and transparent process to allot plots in this area. This will prove to be an important initiative by the state government to facilitate women empowerment. 50 percent of the cost will be extended by Government of Gujarat, which has been already provided for in the budget. CM Smt Patel has also approved the proposal to build multi-storeyed industrial sheds (Vertical Estate) in existing GIDC estates where there are few remaining plots for further allotment. According to this, Vertical Estates will be built in Lodhika and Chhatral GIDC estates. As per this scheme, 50-100 sq mt-fully equipped industrial sheds will be provided to MSMEs as per their requirements. Apart from this, over 15 Industrial Parks were granted in-principle approvals during the State Level Empowered Committee meeting held in Gandhinagar recently. These parks will have well-developed plots earmarked for MSMEs.

Courtesy: Govt. of Gujarat

Manufacturing Destinations of India: Ahmedabad

"Ever since Tata Motors moved its manufacturing plant into Sanand near Ahmedabad in early 2010, the city gone into top gear in terms of growth in the manufacturing sector. The State industrial body (GIDC) proactively acquired more than 1,500 hectares of land adjoining the 'Nano Plant' in Phase 1, foreseeing the investments that would follow.

The focus was to develop Ahmedabad as a major automobile and ancillary cluster in India. Ford India's entry in Sanand in 2011 with a proposed investment of Rs4,000 crore and a direct employment proposal of 5,000 persons was another major milestone. A host of other industries followed, not only in the automobile sector but across sectors. Notable examples are Hitachi Hi-Rail, Hyundai Engineering, Bosch, Inductotherm, Nestle, Colgate Palmolive and Beiersdorf AG, to name just a few.

Additionally, a Special Investment Region (SIR) is being developed in Mandal–Bechraji (laid out over 8 villages), about 90 km from Ahmedabad. For this initiative, the Government of Gujarat and JETRO (the Japanese Government's business promotion arm) has joined hands to develop a Japanese Industrial Cluster.

Maruti Suzuki, the country's largest car manufacturer, has committed a greenfield manufacturing plant there with an investment to the tune of Rs4,000 crore. Honda Motorcycle and Scooter India Private Ltd (HMSI) has also announced an investment of Rs1,100 crore for a two-wheeler manufacturing plant. Other major industrial occupiers who have already been allotted land in this park include Mitsubishi Aluminium, ROKI Minda and TS Tech Co. Ltd.

The modus operandi of the Gujarat Government has to provide enabling infrastructure like good connectivity, uninterrupted power, quality water and industrial gas to the industries, rather than just offering incentives to lure industries. Even with minuscule incentives, the state has successfully managed to attract significant investments into the manufacturing sector. According to DIPP data, Gujarat saw industrial investments of Rs70,172 crore from 2010 up to October 2013 in the form of IEM (Industrial Entrepreneur Memorandum) or actual projects delivered on the ground, which is more than 1/3rd of the country's share in this period."

By Nirav Kothary, Head - Industrial Services, JLL India
(From JLL's Manufacturing Destinations of India Report)

JBM Auto Ltd. opens auto components plant in Sanand

In the last week of June this year, JBM Auto Ltd. India's leading auto component manufacturer opened its latest and state of the art manufacturing plant in Sanand, Gujarat. The plant was inaugurated by Nigel Harris, President and Managing Director, Ford India in the presence of S.K. Arya, Chairman and Nishant Arya, Executive Director, JBM Group amongst other dignitaries. The total investment at the plant in Sanand is Rs200 crore where components such as C-Pillar; D-Pillar; Cowl Top; Shotgun and high level sub-assemblies etc. shall be manufactured for Ford India Pvt. Ltd, the Indian subsidiary of Ford Motor Company. The plant which is spread over 20 acres shall supply components to Ford India for rolling out 2.5 lakh vehicles annually.

This investment has led to a generation of employment for 500 people in the region; which includes graduates from JBM's multiple Skill Development Centres who shall benefit from the company's special earn while you learn program.

GTU signs MoU with Glass Academy India

The Gujarat Technological University (GTU), in association with the Glass Academy, has launched the Glass Academy Skill Institute in Gujarat to train and certify students, engineers and entry level semi-skilled workers in Building Façade Industry & Glass Processing Industry and create

a bank of skilled workforce. Approximately 350 students are expected to benefit in the first year of the operations. To mark the occasion, a Memorandum of Understanding was signed by Dr. Akshai Aggarwal, Vice-Chancellor, Gujarat Technological University, and Padmakumar, Mentor – Skill Development Initiatives, Glass Academy and Head of Human Resources for Flat Glass Business and Research of Saint-Gobain in India.

Maruti Suzuki's setting up Rs3000 crore vehicle manufacturing plant

Image courtesy: anandibenpatel.com

The Chief Minister of Gujarat, Shrimati Anandiben Patel, laid the foundation stone for Suzuki group's Gujarat vehicle manufacturing plant earlier this year. The Suzuki Group will set up three plants at Hansalpur with a total annual capacity of 750,000 vehicles. The first plant is scheduled to start production in mid-2017. It is being set up at an investment of about Rs 3,000 crore, and will have an annual capacity of 250,000 units. The vehicles manufactured at these facilities will be supplied exclusively to Maruti Suzuki India Limited (MSIL) and support MSIL's objective of reaching annual sales of two million units in the medium term. Speaking on the occasion, Osamu Suzuki, Chairman & CEO Suzuki Motor Corporation, Japan,said: "For the Suzuki group, setting up of this new manufacturing facility in Gujarat is the start of a new era. Under the "Make in India" program proposed by the Prime Minister H.E. Mr. Narendra Modi, we will set up a state-of-the-art production plant here in Gujarat, with high focus on productivity and efficiency." The campus, spread over 640 acres, will also have an integrated suppliers' park.

Sanand - India's Detroit in the making

Ford's Sanand facility. Courtesy: Ford India

Brought to limelight by the then Chief Minister Narendra Modi when he gave land for Tata Motor's dream project for Nano cars, Sanand has since then emerged as a hot automotive hub in Gujarat. It is estimated that approximately investments worth Rs15,000 crore – Rs20,000 crore have been planned over the next 3-4 years by various OEMs as well as component manufacturers in Sanand in the form of manufacturing facilities. Once these plants are operational, the region will have a combined capacity of 1.5 million passenger vehicles and three million two wheelers per year. And if India's automotive industry continues to deliver as per its market potential then Sanand is likely to see additional investments of Rs15,000 crore by fiscal 2017-18 from major OEMs like Maruti Suzuki and Honda Motors who will take the installed capacity of the region to 2.2 million units per annum. At the current levels, production capacity in this industrial zone is on its way to leave behind the three key auto hubs of the country: Delhi/NCR belt, the Pune belt in Maharashtra and the Chennai belt in Tamil Nadu. The Government of Gujarat – with its aggressive plans to take increase the share of automotive industries in its overall engineering output to 10 percent by 2020, from the current 3.7 percent - will further provide a boost to Sanand's rise as India's Detroit.

China signs three MoUs in Gujarat

During the state visit of the President of the People's Republic of China Xi Jinping, three Memoranda of Understanding (MoUs) were signed between the two countries in the presence of the Chinese President and the Indian Prime Minister.

1. MoU establishing 'Sister Province' relations between Guangdong, China and Gujarat, India which covers cooperation in economy and trade, environmental protection, public policy education, health, science and technology, tourism and culture.
2. MoU between the cities of Guangzhou, China and Ahmedabad, Gujarat, India for closer cooperation between the local authorities of the two cities, which will facilitate engagements in the fields of economy and trade, environment protection, public policy, education, health, science and technology, tourism and culture. Knowledge sharing will be done through delegation visits, institutional meetings and sharing of experiences in areas of mutual interest.
3. MoU between Industrial Extension Bureau (iNDEXTb), the nodal agency of Government of Gujarat for investment promotion, and China Development Bank, under which iNDEXTb will assist Chinese investors in obtaining required clearances and creating infrastructure facilities in the industrial parks.

RORO operations at Pipavav Port starts

APM Terminals Pipavav (Gujarat Pipavav Port Ltd) and NYK Auto Logistics (India) has recently announced the commencement of RORO operations at Pipavav Port. Ford Motors India Pvt Ltd dispatched the first lot of its new Ford FIGO built in its Sanand plant in Gujarat for exports. The first RORO vessel, m.v.Grand Dahlia, berthed at Pipavav on August 26 and loaded 1,300 vehicles. Officials from APM Terminals, NYK Auto Logistics and Ford Motors welcomed the vessel and marked the inauguration of RORO operations with a simple ceremony held on board. The vessel departed this morning after successful completion of operations. APM Terminals Pipavav currently has three business verticals under its service portfolio which include container, bulk and liquid cargo. Automotive cargo will be the fourth business unit which will add to both the top line and bottom line and help the business grow in the long run.

Keld Pedersen, MD, APM Terminals Pipavav, said, "As per our commitment to adding value to our existing service portfolio we are honored to have partnered with NYK Group for automotive cargo."

CM affirms Guj's support to Land Acquisition Bill 2015

While at Second Meeting of the Governing Council of NITI Aayog, Gujarat Chief Minister Smt Anandiben Patel took a balanced stance on the amendments proposed in the Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act 2013, terming them as "well-considered" and "practical". Welcoming the Central Government's move to consider states' major concerns and incorporating them suitably in the Amendment Bill, CM Smt Patel said that we support the measures that would reflect our motto of "Sabka Saath Sabka Vikas".

In her speech, CM Smt Patel thanked Hon'ble Prime Minister for his commitment to taking the states along as partners in national development and reiterated that her government stands with all progressive initiatives aimed at speedy development and overall national progress.

Pointing out that amendments to the Land Acquisition Act 2013 had become necessary only because of the time-consuming and complicated procedures, she commented that inordinate delay in infrastructure projects do not benefit anybody. Neither the farmers nor the project agency is benefitted by delays in project implementation.

Partnering in **progress**

Gujarat's contribution in India's progress rally will be higher than the average in across various segments whether it's national GDP or technology, says **V. Nagesh**, one of the Founder Directors of the Cosmos Group.

Q Since how long is your business associated with Gujarat? Was there any particular reason why Gujarat was chosen by your company?

Cosmos is an India-based multinational company and an Indian leader in CNC Machine tool technology. With its operations set in all major cities with 400+ employees, the company has 15+ sales and marketing offices all over India with strength of 40+ sales and 55+ service team and two manufacturing centers in Vadodara, Gujarat.

Gujarat is gaining its position as the business hub of India. It has already taken a strong hold in Indian business economy. Connectivity with each corner of India, best banks and complete work monetary and skilled resources availability attract and encourage businessmen.

Q How has been your experience of doing business in and from Gujarat?

An industrial and economic powerhouse, Gujarat shines bright guiding India to prosperity. Gujarat is not just the state of enterprise but a land where change is inherent, where change is being in sync with the times. A place where change and update is about absorbing the knowledge, information, tools for development of one and all from early days.

The under-water and well developed city of Dwarka, remains of ancient Indus Valley Civilisation found at the most developed port town of Lothal and urbane Dhola Vira are the examples of the knowledge technology people had in those times too.

"With single-window clearances, minimal procedures and cutting out of any red-tapism, we see 'Make in India' as a vital impetus for all states of India for employment and growth."

Gujarat is served by better governance since decades and boosted by Shri Narendra Modi (now Hon. Prime Minister of India). In Gujarat, all major cities including Vadodara are connected to both national and international business. Fruitful policies, complete dedication of civic bodies, better coordination among municipal corporation, SWACHH BHARAT ABHIYAN, Vibrant Gujarat Summit, infrastructure and real estate developed in last decade and recent times make Gujarat easily accessible by road, rail and air from every major city and most of the states of India. For example, the Express highway between Ahmadabad-Vadodara saves plenty of time during operations and sales among the cities.

What are the advantages of that Gujarat offers generally for the manufacturing sector and particularly for your industry?

Being a manufacturer and exporter of precision CNC Vertical Machining Centers, Surface Grinding Machines & Turrets and providing machine tool solutions by sourcing technology from Taiwan and Japan, Cosmos is benefited by industry friendly environment, strong infrastructure, positive government vision and progressive policies.

Global activities like the Vibrant Gujarat Summit and enabling good support for execution of trade shows like PLASTINDIA, ENGIMACH attract lots of manufacturing giants from across India and world.

> "Gujarat is gaining its position as the business hub of India. It has already taken a strong hold in Indian business economy. Connectivity with each corner of India, best banks and complete work monetary and skilled resources availability attract and encourage businessmen."

Your future outlook for this state?

'Come, Make in India'! PM Modi's aggressive push to revive an ailing manufacturing sector has found resonance with India Inc. With single-window clearances, minimal procedures and cutting out of any red-tapism, we see 'Make in India' as a vital impetus for all states of India for employment and growth. Gujarat's contribution in this rally will be higher than the average in each subject whether it's national GDP or technology.

Anything else?

At Cosmos, we are committed to provide, advance and high quality machine tools, accessories and solutions, with the highest reliability, at an optimum cost and further back them up with the solid service and support, before, during and after sales. Our suppliers also share the same philosophy because of which we are able to be….'Your Partner in Progress'.

Our vision and mission also will be as per our slogan 'Your Partner in Progress', where progress could be of Gujarat's contribution towards Indian technology in engineering sector or 'Make in India' rally success. We believe in 'Make in India and have achieved some milestones in our sector like manufacturing state-of-the-art CREEP FEED technology machine, first time manufactured by Cosmos in Vadodara (Gujarat), which has received the FIE AWARD at the Indian metal-cutting Machine Tool Exhibition.

We are a manufacturer of precision technology of CNC Vertical Machining Centers with various range as well as NC & CNC grinding machines having range of standard and special purpose. Additionally in our bucket of manufacturing list are Hydraulic & Pneumatic turrets, CNC Rotary Tables, Index Tables & other accessories.

One and only, **Gujarat!**

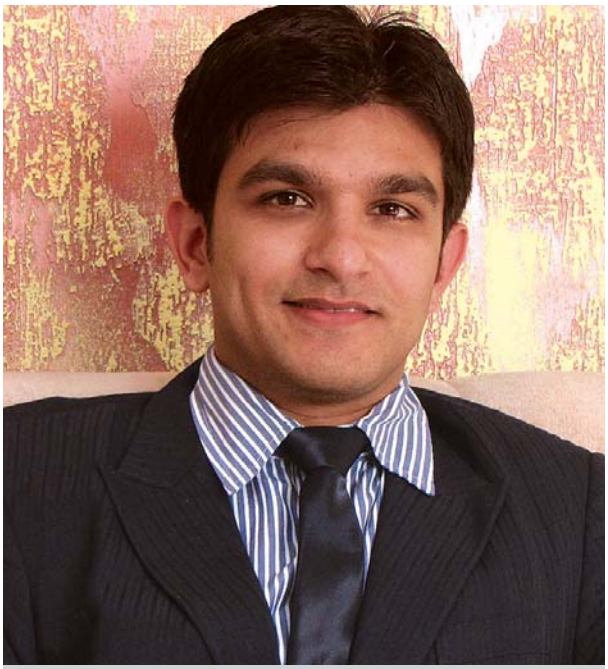
Thanks to the advantages offered by Gujarat (coupled with his emotional attachment to the land), **Maulik Patel**, Executive Director, Sahajanand Laser Technology Limited, says that the Company couldn't have started its first factory anywhere else in the country!

Q Since how long is your business associated with Gujarat? Was there any particular reason why Gujarat was chosen by your company?

It was 1989 when we inaugurated our first factory in Gujarat and the glorious journey has begun since then. Though the association of our business is from last 26 years, I've been attached to Gujarat since the moment I was born, as it is my birth place. There was a strong notion, a burning desire to bring this land, my motherland beyond the horizons of success.

When we used to think about setting up the plant, not a single time such thought occurred to us, to set it up outside of Gujarat. As the knowledge we've embraced, the experience we've attained, which consequently helped us enormously, to realise our dream, it was this land only. To conclude, it wasn't about reason. It was all about the contribution in the growth of our land and through that, to our country.

"When we used to think about setting up the plant, not a single time such thought occurred to us, to set it up outside of Gujarat. As the knowledge we've embraced, the experience we've attained, which consequently helped us enormously, to realise our dream, it was this land only."



"The State should encourage renewable sources of energy and approach toward education with a focus on improving quality of education and training programs."

Q How has been your experience of doing business in and from Gujarat?

It would be not easy for me to describe the experience in words, because of the intensity of that sheer joy. It seems like the matter of yesterday only, when we have initiated our un-

dertaking. Truly, these 26 years have passed in just a blink and you will find the same answer from any member of our organisation. Through all these years of innovation, empowerment and togetherness, the experience has been thoroughly incredible. Each and every single stakeholder, be it our teammate or an associate, have put tremendous efforts to make the company successful.

Q. What are the advantages of that Gujarat offers generally for the manufacturing sector and particularly for your industry?

It is believed that the spirit of entrepreneurship is inherent in our blood congenitally. However, the environment plays a very vital role to encourage the entrepreneurs as the risk is by default attached with business and the environment of Gujarat is very business-friendly. Gujarat government supports magnificently to those Ventures who have the will and wit to do business. When it comes to most precious asset which any organisation can possess, the teammates, Gujarat can be considered as the most desired place to get them. To talk about our industry particularly, we identified the need of the market and fulfilled their requirement with our philosophy of excellence through empowering innovations.

"When it comes to most precious asset which any organisation can possess, the teammates, Gujarat can be considered as the most desired place to get them."

Q. Which are the areas that need improvement?

Since we are connected to the laser technology, what we have observed so far is that, we as a nation require strengthening the laser application industry. And that would only be possible by the collaborative efforts of the government as well as private sector. The State should encourage renewable sources of energy and approach toward education with a focus on improving quality of education and training programs. Simply put, the efforts of thousand people leave a greater impact than the efforts of a few.

Q. Your future outlook for this state?

I perceive Gujarat as the State that would achieve benchmarks in numerous areas which are the best in the developed countries of the world. Gujarat would be a market with world-class infrastructure and the preferred destination for domestic and international investments. Looking forward for Government initiatives which would transform Gujarat into a thriving knowledge and service economy. The GIFT initiative can produce a platform for scaling up finance and technology associated services in the state. The proposed knowledge corridors would create universities and centers of excellence in various disciplines that will engender skilled manpower.

The future of **Making things!**

The Machinist magazine caught up with **Pete Baxter**, Vice President – Delcam Worldwide and **Vineet Seth**, Managing Director – South Asia & Middle East, Delcam Ltd., at the Delcam Asian Technical Summit 2015 in Bangalore recently.

By Niranjan Mudholkar

Q. Delcam (an Autodesk Company) started its Asian Technical Summit (ATS) in 2000 and since then this annual event has been conducted at a variety of locations across Asia. So, is this the first time you are doing it in India?

Vineet Seth: This is the 15th anniversary of Delcam India so the Summit coincides beautifully with this milestone. Also, we have been doing it rotationally in one country in Asia every year and this year it was India's turn with the previous edition done here in 2010.

Q. How has this event evolved in the last 15 years?

Vineet Seth: Incidentally, this event was not started as Delcam ATS when it was originally started in 2000. It was called Delcam ATS in 2003 in Australia. And the reason why we call it a 'technical summit' is because we focus on all the technical facets of our software in these gatherings.

Q. Pete, during your presentation – which was pertinently titled as 'The Future of Making Things' – you mentioned about how the dynamics of manufacturing are changing and that products are also becoming more connected. What role do you see Delcam playing in this change?

D.K. Sharma, Godrej Ltd – Tooling Division, giving a presentation on PowerMILL Machining of Casting Dies

Pete Baxter: I think this whole idea of products being connected and even being able to 'upgrade' themselves through software rather than becoming outdated is something that has started to happen. Tesla is one great example and that's one reason why they have been able to differentiate themselves in the market. Who would have thought that a new car manufacturer could emerge in the US in the current climate?! I think – not just from Delcam's perspective but also from Autodesk's perspective – this idea, of 'Internet of things' about creating these virtual networks of components which pass information to each other and things can then modify their behaviour and enhance, is something that a lot of technology companies are talking about. We see it as a means of the next level of development going into the next phase of products. So reinventing and prototyping become a continuous salvo! The role of Delcam is clearly that we develop new methods of production and new advance manufacturing processes to better respond to the needs of our consumers to produce better and more efficient products. The reason why Autodesk (the parent com-

"The role of Delcam is clearly that we develop new methods of production and new advance manufacturing processes to better respond to the needs of our consumers to produce better and more efficient products."

Pete Baxter,
Vice President – Delcam Worldwide

"Our role essentially is that of an enabler. We help companies improve their processes, their throughout, their manufacturing capabilities and their quality leading to improvement in their profitability.

Vineet Seth,
Managing Director – South Asia & Middle East, Delcam Ltd

pany of Delcam) is investing in technology is also for collecting this data and analysing it to discover the patterns which would allow us to make better informed decisions.

Q. Autodesk also has this interesting design suite called 'Digital Factory'. How do you connect that with what you are saying now?

Pete Baxter: Well, a machine doesn't exist in isolation; it is part of a factory. And the factory design suite is designed exactly for this. It is about laying out your factory in response to the needs of what the end product is going to be. It is about ensuring that you have adequate supply of basic resources to run the machines. It also ensures that you can adapt your factory set up to the dynamic needs of the market in terms of new products so that you can be agile in your manufacturing process. Today's production lines need to constantly change and evolve.

Q. Indian economy in general and the manufacturing sector in particular are on a verge of a transformation with a boost from initiatives like 'Make in India' and 'Digital India'. What role do you see Delcam playing in this scenario?

Vineet Seth: Our role essentially is that of an enabler. We help companies improve their processes, their throughout, their manufacturing capabilities and their quality leading to improvement in their profitability. We are aware that people could be looking at adopting change at different stages and we are ready to facilitate that whether it is tool design validation, CAM process validation, inspection validation and so on. We work with machine tool builders on their platforms seamlessly to allow customers to be in sync with their requirements. As one of our customers mentioned during his presentation, we help our customers bridge the gap between design and production. The designers produce the best of designs but it is not always manufacturable. It has to be design validated to make it more feasible and that is where we help. That's what we are good at!

The same customer told me that we are the only company which keeps coming back to train our people, listening to us, understanding and sorting out our issues, and that is what makes a difference.

Q. Auto components players are quite comfortable using software when it comes to the design aspect but that's not the case when it comes to the development aspect. How are you breaking this barrier?

Vineet Seth: Actually, it is a process that goes hand-in-hand with the OEMs. When it comes to component design that is always with the OEM and when it comes to tooling design, it is always in conjunction with the OEM. With companies like Bajaj and Tatas, we are reaching out to their vendors - many of whom are SMEs. Incidentally, majority of our customers come from the SME segment. We are adding 500 customers every year and quite a lot of them are SMEs. A good thing about SMEs is that they are very proactive. They are very keen to learn, to adapt and to improve. They are very intense in a positive way.

Q. Earlier there was mass production and customisation. In your presentation, you (Pete) mentioned about a future trend called 'mass customisation'. What do you think about it?

Pete Baxter: We already see examples of mass customisation. For example, if you take photograph of your ear from an i-Phone and send it to a certain company then it will create and send you customised earphones that will fit your ears perfectly. Even in the car industry, the Mercedes C-Class is customised to suit individual customer requirement in terms of some optional extras. So yes, the ability to customise to individual needs is increasing. At the manufacturing end of it, it is about designing the machine in a way to meet the customisation requirements of the manufacturer. One of the reasons why it is going to happen more and more in the market is because of the collaborative tools that involve customers and designers at a much early stage of design. Moreover, new manufacturing techniques like 3-D additive manufacturing and use of materials like polymers and composites are going to enhance the capabilities to manufacture things more rapidly as well as in customised manner.

The ULTRASONIC mobileBLOCK can be used for applications in aerospace or wind energy, for instance.

The ULTRASONIC mobile BLOCK, a mobile 5-axis milling unit, enables structured handling of the actual repair tasks in a few minutes while at the same guaranteeing 100 percent consistent quality, precision and repeatability.

Machining of Composites for **MRO and production**

The use of an innovative technology combined with the integral process approach enables a groundbreaking solution for the highly efficient machining of high-performance materials in optimum component quality.

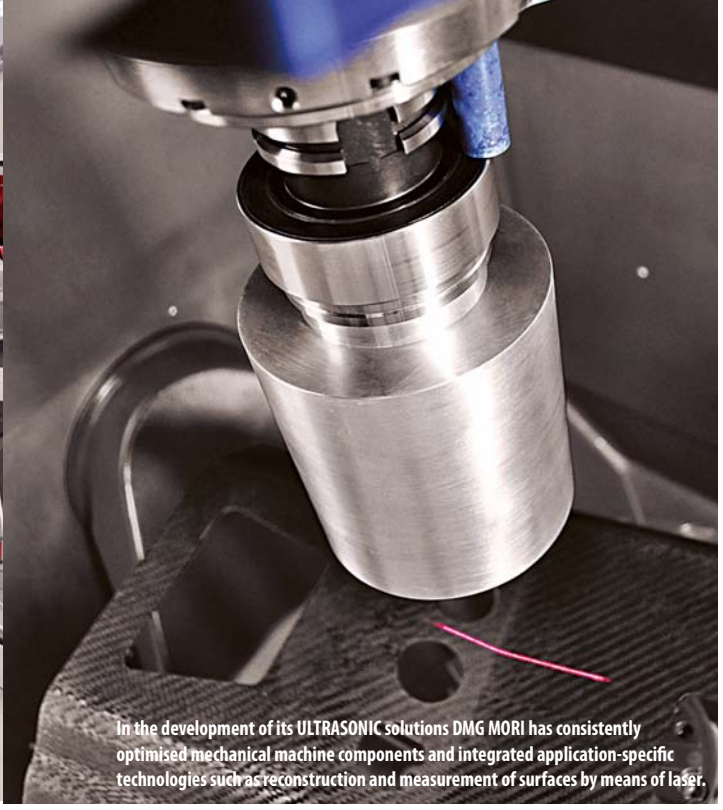
Due to their high specific strength and light weight Carbon Fibre Reinforced Plastics (CFRP), as they are called in aerospace technical jargon, are predestined for the manufacture of relevant lightweight components. The use of CRP and even GRP is rising continuously in civil aviation and all premium manufacturers in the car industry use fibre-reinforced plastics for the production of key structural components. In the wind energy sector, too, all aerodynamic components are already being produced from composite materials.

However, there is also a sustained demand for an automated, economical machining option for the maintenance, repair and overhauling (MRO / Repair & Rework) of damaged fibre composite components, in addition to the actual production of new items. The use of ULTRASONIC technology combined with the integral process approach of SAUER enables a groundbreaking technological solution for the highly efficient machining of these high-performance materials in optimum component quality for both categories. And DMG MORI offers a cross-application machining solution – mobile as well as stationary – for the two sectors production and MRO.

Efficient ULTRASONIC machining of high-end COMPOSITE components

Conventional machining processes for the machining of fibre composite materials are often pushed to their technological limits due to their high degree of tool wear, frequently inadequate component quality and insufficient feed rates. And it is precisely here that the innovative ULTRASONIC technology of DMG MORI comes into play. The targeted transmission of an ultrasonic vibration into the longitudinal axis of the tool results in a significant reduction in torsional moment, lengthening of tool life and improved chip break which in turn optimises chip removal.

Targeted overlaying of the cutting direction with ULTRASONIC enables clean cutting of the fibres of the material thanks to the increased cutting speed and thus meet the high demands on productivity and component quality. Reduction of the effective process forces by up to 40 percent also results in clean edges thus eliminating fibre pull-out and delamination. This applies to both typical machining tasks such as trimming, the placement of pockets or drilling of CRP / GRP / ARP components for serial production as well as the placement of stepped mountings, for example, by means of accurate exposure of the individual laminate layers.



In the development of its ULTRASONIC solutions DMG MORI has consistently optimised mechanical machine components and integrated application-specific technologies such as reconstruction and measurement of surfaces by means of laser.

"There is also a sustained demand for an automated, economical machining option for the maintenance, repair and overhauling (MRO / Repair & Rework) of damaged fibre composite components, in addition to the actual production of new items."

In its development of the new machining solution DMG MORI has consistently optimised mechanical machine components and integrated application-specific technologies (reconstruction and measurement of surfaces by means of laser, surface cleaning and activation using atmospheric pressure plasma etc.). This has resulted in a mobile milling unit and stationary machining centres that enable the highly effective and flexible machining or repair of COMPOSITE components for serial production and damaged surfaces in the MRO sector.

Stationary ULTRASONIC high-performance cutting of fibre composites with an integral machine concept

ULTRASONIC technology is already integrated into DMG MORI products by SAUER GmbH. Based on a standardised HSK tool holder the company developed a special actor with implemented piezo technology. This innovative actor system also enables flexible integration of other fibre composite-compatible manufacturing steps. Laser measuring systems, for example, for surface reconstruction or atmospheric pressure plasma for surface cleaning and activation can be used as independent tools which can be changed over in the machine automatically.

DMG MORI has equipped the DMF 260 linear and the DMF 360 linear, among others, with this path-breaking ultrasonic technology. As ULTRASONIC 260 and ULTRASONIC 360 versions these models also profit from the rigidity, long-term stability and thermo-symmetric concept of the machine that ensures a high level of precision in continuous operation. DMG MORI has included the ULTRASONIC 85 with proven monoBLOCK® construction in its range for the machining of smaller fibre composite parts measuring up to 700 x 700 x 500 mm. For stationary ULTRASONIC high-performance cutting DMG MORI uses the so-called technology frame – based on the gantry design of the A-axis combined with the B-axis swivel head. This allows dynamic 5-axis machining of complex workpieces such as rotor blade segments. In addition the machines are equipped with a machining area with adequate air extraction and integrated fine particulate monitoring (plus heat recirculation). The explosion-proof high-performance filter system always guarantees a stable filtering performance.

Mobile milling unit for MRO as well as demanding production tasks // small, light, mobile – with top performance

The use of fibre composite materials for primary structures is already increasing in the latest generations of aircraft. Whole wings and fuselage segments are today being produced using ultra-light carbon fibres. This in turn confronts service companies with completely new challenges, because conventional repair processes are no longer economically viable. To date the repair of damaged fibre composites is normally carried out in complex and expensive manual processes. This often involves moving the aircraft back into the hangar for it be repaired

The ULTRASONIC 260 and ULTRASONIC 360 offer 5-axis-machining and profit from the rigidity, long-term stability and thermo-symmetric concept of the machine that ensures a high level of precision in continuous operation.

The ULTRASONIC mobileBLOCK can be used for applications in aerospace or wind energy, for instance.

manually. Such repair work takes anything from a few days to several weeks. The aerospace industry is looking for adequate solutions that would enable fast, high-quality repair of their CFRP planes – because even in the age of carbon continuous operation inevitably leads to damage of the skin of the aircraft.

The focus of the new ULTRASONIC mobileBLOCK from DMG MORI and SAUER is just such sophisticated applications. For the very first time these mobile 5-axis milling units enable structured handling of the actual repair tasks in a few minutes while at the same guaranteeing 100 percent consistent quality, precision and repeatability. Sophisticated +/- 95° machining is possible also on curved surfaces thanks to the 5-axis kinematics of the integrated rotary swivel axis. Its lightweight design means that the ULTRASONIC mobileBLOCK can be docked simply and flexibly by means of vacuum suction feet. In addition to repair work this innovative mobile milling unit can be just as effectively integrated in demanding production tasks (e.g. the placement of boreholes, notches or pockets in CRP components).

The adjustable vacuum suction feet of the ULTRASONIC mobileBLOCK generate a suction force of 256 N per foot. 12 vacuum suction feet are included in the standard version – 16 are available as an option. Moveable ball joints and mounting arms that can be pivoted up to an angle of 45° enable fast and simple adjustment to even surfaces (e.g. wings) and especially to components with radii and complex contours (e.g. frame elements on the fuselage of the aircraft). Thanks to its extremely compact and lightweight design and low overall weight of just 90 kg this mobile 5-axis milling unit is more than predestined for fast and simple docking directly onto the damaged area. The frame, X-axis gantry, housing of the servo-motors, adjustment arms and the Z-axis slide of the ULTRASONIC mobileBLOCK are all made of CRP making them especially insensitive to thermal expansion. This construction design also highlights the intelligent lightweight concept.

The standard version of the ULTRASONIC mobileBLOCK can be adapted quickly and simply by crane. This allows the mobile milling unit to be docked onto many different surfaces in a question of a few minutes. A new design study is looking at a possible scenario for automatic positioning of the ULTRASONIC mobileBLOCK using a mobile transport carriage on wheels or rails. This will enable universal, automatic adaptation for both MRO and production tasks.

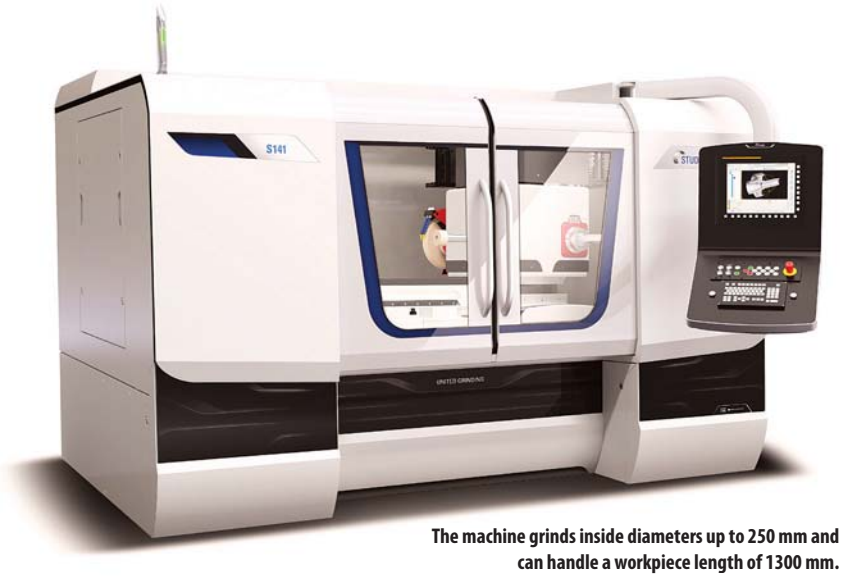
The 5-axis Beckhoff TwinCAT 3 NC control ensures simple, PC-based operation via a 21" multi-touch screen for the user. The integral operator guidance is extremely user-friendly offering the operator expedient support starting from the component drawing, on to definition of the damaged area, the machining task, laser surface measurement of the workpiece and on to include creation of the final NC file. Possible integration into an existing company network and continuous Internet access are standard features.

> "The use of two different CRP-optimised lasers is possible for actual machining preparation. The point laser scanner is used to detect the workpiece surface in Z, while the integrated line scanner is used for reworking the surface of 3D shapes with up to 640 individual pixels."

The use of two different CRP-optimised lasers is possible for actual machining preparation. The point laser scanner is used to detect the workpiece surface in Z, while the integrated line scanner is used for reworking the surface of 3D shapes with up to 640 individual pixels. Both components can be installed and removed in just a few seconds depending on the different machining tasks. The intelligent kinematic design with X, Y, C, Z and A-axis allows unlimited 5-axis simultaneous machining and top dynamics thanks to optimised positioning of the centre of gravity. The high-performance 35,000-rpm spindle has an A-axis swivel head (+/-95°) and is mounted in a Z-axis slide made of CRP.

Source: DMG MORI

S141 – New internal cylindrical grinding machine



The machine grinds inside diameters up to 250 mm and can handle a workpiece length of 1300 mm.

The new S141 from STUDER is a completely new development. However, the development also incorporates the know-how from many decades of grinding experience and consolidated state-of-the-art engineering knowledge. In addition to long-lasting and reliable quality and precision, the use of both cutting-edge and proven technologies, optimal ergonomics and ease of use were also important goals.

The machine's ergonomic design and user friendliness are evident at first glance. Two generous sliding doors create optimal accessibility for both workpiece and grinding wheel change. Short changeover times and quick reprogramming of the control help to reduce auxiliary times, making the machine interesting for the production of individual components as well as small and large batches.

The series is available in different design lengths, for workpieces with maximum lengths of 300, 700 and 1300 mm.

The S141 is the ideal machine for grinding chuck components, spindle shafts, spindle housings, rotor shafts or axes. Many workpieces are in the areas of machine tools, drive elements, aerospace and toolmaking.

Highlights of the S141

The machine bed, comprising patented Granitan® S103 mineral casting with excellent damping characteristics, ensures outstanding surface quality of the ground parts. Temporary temperature fluctuations are extensively compensated by the favourable thermal behaviour of Granitan®. The StuderGuide® guide system for the X and Z axis is coated with Granitan® S200 wear-resistant guideway surfacing material and offers the highest precision, high load bearing capacity and strong damping across the entire speed range. StuderGuide® extends the benefits of hydrostatic systems and guideways with a patented surface structure. A big advantage of StuderGuide® in comparison with hydrostatic guides is the damping component in the direction of motion. The slides are driven by linear motors with direct measuring systems.

The grinding spindle turret has four grinding spindles, including a maximum of two external grinding spindles. Internal grinding quills of lengths up to 265 millimetres can be used. A direct drive and high-resolution direct measuring system ensure quick, controlled rotational movements and precise positioning with a repeatability precision of less than one angular second. Workpieces can be completely machined both internally and externally in a single clamping with minimal auxiliary times. In addition, the grinding spindle turret has a universal measuring probe, which can be used e.g. for length positioning of a workpiece or diameter control measurement.

The workpiece table, for workpiece lengths of 300, 700 and 1300 mm depending on the machine, can be automatically swiveled from -10° to +20° via the machine control system for axis-parallel grinding of tapers.

The workhead can be driven directly or via a belt, as required. The robust steady-rest specially designed for internal grinding enables simple setup and universal use.

The machine can be equipped with up to two pivoting dressing units with fixed or rotating dressing tools. This enables the engagement of optimized grinding tools throughout the machining process, fulfilling a key prerequisite for maximum precision with dimensional stability, contour accuracy and surface quality of the workpieces.

The 15" touch screen operating terminal of the Fanuc control system series 31i-B with integrated PC is positioned on the right of the generously dimensioned double sliding door. The grinder thus has the best possible overview of the work area during machine operation.

Two different intuitive operating systems, StuderWIN and StuderSIM, are available. Both operating systems are suitable for a wide variety of internal grinding applications and enable reliable programming of all basic cycles for grinding, dressing and process-supporting measurement.

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

Opening up new opportunities

Walter is enhancing its M4000 milling cutter range with a slot drill and a T-slot cutter. Other new features: The key component of these milling cutters is a system insert for all tool bodies – this component is now available in more indexable insert sizes and geometries, as well as in a new cutting tool grade. As a result, the tools can be finely adjusted and specifically adapted to individual machining tasks.

Wolfgang Vötsch,
enior Product Manager, for Milling at Walter AG in Tübingen
Image: Walter AG

"In field trials using M4000 milling cutters, we were able to reduce cutting tool material costs per component by a half."

The universal M4000 milling system from Walter previously consisted of the M4002 high-feed cutter, the M4132 shoulder milling cutter and the M4574 chamfer cutter. The system is now being extended with the addition of the M4575 T-slot cutter and the M4792 slot drill. As a result, users of this tool range can now successfully tackle just about all milling operations in many sectors of the metal cutting industry, using one and the same system. And that's not all. All the milling cutters are also equipped with the same system insert, which is square, positive and has four cutting edges. One indexable insert for all milling cutters, and one milling cutter range for almost all operations.

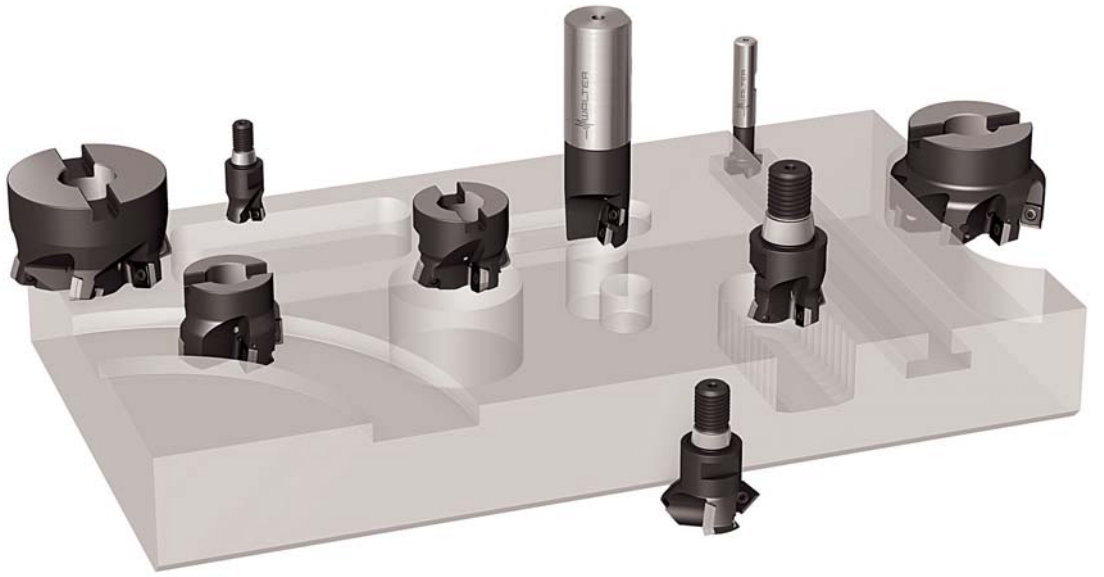
For machinists who are cost-conscious when making their calculations and whose work involves applications that are frequently changing, this universality of tool use is a major factor in achieving higher profitability. "In field trials using the M4000 milling cutters, we were able to reduce cutting tool material costs per component by a half," explains Wolfgang Vötsch, Senior Product Manager for Milling at Walter AG in Tübingen. "In addition, because the range of equipment in the tool cabinet is also considerably reduced, this also means a drop in costs relating to procurement and stock maintenance."

There is one exception – which is design-related – and that's the new slot drill. In addition to square system inserts, the tool with through coolant is fitted on the periphery with a rhombic indexable insert. This is necessary in order that the cutting edges can overlap, thereby creating an even surface when milling. Drilling to depth and then continuing to mill in the y/z direction is no problem when using this tool.

Like the slot drill, the new T-slot cutter also has a Weldon shank and internal coolant. As a cost-effective specialist for

New to the universal M4000 range of milling cutters from Walter: The M4575 T-slot milling cutter. *Image: Walter AG*

New to the universal M4000 range of milling cutters from Walter: The M4792 slot drill. *Image: Walter AG*



Using face, shoulder, chamfer, slot drill and T-slot milling cutters, the M4000 system is very well positioned to perform all commonly encountered machining tasks that call for the use of indexable insert milling cutters. *Image: Walter AG*

T-slots according to DIN 650, it is oriented precisely towards this field of application. It is cost-effective because it does not require application-specific indexable inserts, and is instead fitted with the square system inserts. In addition to T-slots, the milling cutter is also suitable for radial slots.

New indexable inserts are extending the range

So that fine adjustments can be made to the particular application and the range of use of the tooling system can be expanded. Walter is also extending its range of indexable inserts, in parallel to the milling cutters:

On the one hand, the new WSM45X cutting tool material grade with CVD coating has been added. This is suitable for machining stainless steels and difficult-to-cut materials. Together with the Tiger•tec® Silver WKP25S and WKP35S grades for steel and cast iron, this addition means that the range now includes a total of three CVD grades. Where a high level of toughness is required, users also have the option of resorting to the three PVD grades WKK25S, WSM35S and WSP45S. And on the other hand, the extension of the range of inserts continues with the Tübingen manufacturer of precision tools now having all M4000 milling cutters (with the exception of the previous, medium-sized indexable inserts (SD... 09T3)) also available in the range with both smaller (SD... 06T2) and larger (SD... 1204) inserts.

The two established geometries F57 ('The universal one') and D57 ('The stable one') are being supplemented with the addition of two new geometries: The A57 ('The special one') for unfavourable machining conditions and high feeds, and the D51 ('The quiet one'), which has an anti-vibration geometry for long projection lengths. The clearance angle of all variants is 15°. The overall geometry is therefore always highly positive. That is why the cutting forces and, consequently, the power requirement, are reduced, which is an aspect that is particularly accommodating to operators of less powerful machines.

Set-up time is no minor consideration in terms of costs, but with M4000 tools, this concern is reduced to a minimum

The different geometries are identified by the presence, or absence, of a particular design of wave profile along the flank face. For example, A57 = no wave, D57/D51 = one wave, F57 = two waves. That makes it easier to identify the indexable inserts and facilitates handling for the machine operator. Important information can also be found directly on the tool bodies themselves. All M4000 milling cutters, even those with small diameters, carry laser-engraved lettering which provides important data on assembly parts and tightening torques. Wolfgang Vötsch explains: "These clearly visible identification markings save tool managers a huge amount of time, because it means they do not have to first refer to their documentation when they want to prepare tools in readiness for use or put them back into stock again afterwards."

For more information: www.walter-tools.com

Saving resources

In view of the growing shortage of raw materials, today's consumers increasingly want to know how things are manufactured. In particular, how much CO2 was needed to make a product, for example. Walter therefore decided to produce the M4000 range using a fully CO2-compensated system. The M4000 range therefore not only allows savings to be made, but also represents a concept of consistent sustainability.

New Seco MS2050 milling grades optimised for titanium machining

Seco has increased the versatility of its MS2050 milling grade with new variations that bring optimised cutting performance to shops processing parts from titanium and high chromium content steels. The latest additions span a wide scope of insert sizes, radii and geometries along with special coating technology.

Milling_Inserts_Assortment

The grade's new silver-colored PVD uni-coating provides enhanced heat-resistant capabilities as well as virtually eliminates the occurrence of built-up edge when cutting sticky materials such as titanium. And with the absence of built-up edge, the inserts last approximately 50 percent longer than existing products, which provides users with reduced tool costs.

Applicable for use with the company's Turbo 10, Helical T4-08 and Highfeed cutters, the new MS2050 insert grades are available in a radii selection from 0.4 mm to 6.3 mm as well as positive geometries that can perform productive shoulder, face, copy and high-feed milling operations.

For additional information on this highly wear-resistant grade, please contact a local Seco representative or visit www.secotools.com/en-IN/Global/Products/Milling/MS2050/

Seco extends X4 product line for reliable short-reach grooving and parting-off

Seco continues to grow its innovative, highly productive X4 product line to expand the benefits of its short-reach grooving and parting-off system to an even greater range of applications. The line now includes larger radii, additional angled inserts and TGH 1050 grade inserts.

The X4 multi-edge system meets industry demands for grooving and parting-off tools with narrow cutting edges and consists of indexable tangential inserts and a highly stable clamp design. These strong, dependable system components achieve high accuracy, repeatability, productivity and surface quality in external grooving and parting-off operations involving small parts, slim bars and tubes made from a wide variety of common materials.

X4_Insert

In addition to the current radii options of 0.1 mm and 0.15 mm, Seco now offers eight new large radii CP500 grade insert versions with widths from 1.5 mm - 3 mm with corner radii of 0.2 mm and 0.3 mm. These target those applications where customers require specific radii. With the larger radii options, customers can apply higher feeds while maintaining high quality surface finishes. Also added are two 1.5 mm angled inserts with smaller radii available.

The extended X4 line also includes the unique TGH 1050 grade featuring a very hard micro grain substrate and new PVD coating for efficiently cutting hardened steels. The new grade, which is available in six widths of 0.5 mm - 3 mm in MC and FG geometries, will benefit manufacturers in all industry segments, especially automotive. While it was designed for hardened materials, the TGH 1050 is also well suited for machining superalloys/heat-resistant alloys often found in the aerospace and power generation industries. In testing, the TGH 1050 cut significantly faster and lasted much longer as compared with existing grades.

For more information on X4 multi-edge system, please contact a local Seco representative or visit http://www.secotools.com/en-IN/Global/Products/Turning/Grooving--Parting-off/X4/
Contact details: Email: seco.india@secotools.com; Tel: 02137-667300

Jyoti VTL 500 - For larger diameter components machining

VTL Series machines are specially designed for larger diameter components machining in heavy engineering industries such as Oil & Gas, Earth Moving, Automobile and Subcontracting industries. Bed and Column made from higher grade cast-iron providing maximum rigidity, thermally stability for better machine life and accuracy. X & Z Axis are with wide, harden & ground box guideways which allows vibration free cutting and more rigid machining at greater extension from turret. These machines are offer wide range of cutting size along with Rigid Table and fast Bi-directional Servo Tool Turret, which makes it most suitable for hard part turning. Options for Live Tool Turret give flexibility to machine of multiple operations including turning and milling in a single setup.

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Indexable insert drilling simplified

Mitsubishi Materials thinking has led to simple solutions for some old problems associated with indexable insert drilling. Difficulties such as chip clogging on deep holes, dissimilar rates of wear on inner and outer inserts due to differing peripheral speeds, plus flexing and wear of the drill body itself have all been resolved with a new and innovative design.

Tool body

The tool body is designed with through coolant holes and an optimum sweep of the flutes that provides extra metal thickness behind the direction of the principal cutting force. This controls tool body deflection and helps to achieve reliable deep hole drilling up to 6 x D. Additionally the body surface is heat treated to prevent wear from chip evacuation. The sizes available are Ø17mm-Ø63mm and in L/D=2, 3, 4, 5 and up to L/D=6.

Different grades for inner and outer inserts

The outer insert in this type of drill naturally runs at a higher speed than the inner, thereby leading to higher levels of wear. Consequently the inner insert needs to have a higher level of stability and resistance to fracturing at lower speeds. This anomaly has been negated by using a CVD coated outer insert that has higher abrasion resistance, in tandem with a PVD coated inner insert that can cope better with fracturing forces and resistance to welding. This combination means improved reliability and fewer changes of insert for increased levels of productivity.

Insert grades for steels, stainless steels and cast iron

A new CVD coated grade MC1020, is suitable for placing on the outer cutting edge. It displays high wear and plastic deformation resistance, allowing it to be effective when used for machining steels and stainless steels. For cast iron drilling, a different CVD grade, MC5020 is used for the outer insert. Excellent abrasion and thermal cracking resistance makes it ideal for cast and nodular cast irons. The inner insert uses a VP15TF grade, with a PVD coating based on the famous Miracle type. VP15TF has a broad spectrum of desirable properties such as a micro grain substrate for strength and an excellent resistance to chip welding. These all round properties also allow it to be used as a replacement of the outer insert when conditions become unsuitable for a CVD coated insert.

For more information, visit www.mitsubishicarbide.com

iglidur X: Plain bearing material withstands temperatures from -100 to + 250°C

igus has been offering a material for the extremes for many years - iglidur X. Pressure, heat, cold, moisture or acids – is no big deal for iglidur X. As part of the igus standard range campaign that covers 113 dimensions, more are being added to the existing 312 catalogue dimensions. All standard sizes of the plain bearing material are thus available from igus within 24 hours.

iglidur X is the perfect material for applications that can be really hot, cold or harsh. iglidur has been designed by igus for extremely difficult environments. These include extreme operating temperatures from -100 to +250°C, even in continuous operation and with aggressive chemicals.

Pressure, heat, cold, moisture or acids - nothing makes iglidur X give way. *(Source: igus GmbH)*

The chemical resistance of iglidur X makes it ideal for use in, inter alia, fuel pumps. Traditionally other plain bearings such as PTFE-coated bearings have at times contaminated the fuel and damaged the shafts. Now the iglidur X bearing ensures a longer service life of the pump. One of the most extraordinary areas of application of iglidur X was in the 'Porton Man', a robot used for testing protective clothing in the British defence industry. This was among the submissions for the 2015 manus competition for exciting bearings applications. The rugged iglidur X bearings that withstand the stress of chemical, biological or radioactive materials are applied in all joints of the robot being used for testing the protective clothing.

Contact: Santhosh Jacob, Product Manager- iglidur, igubal, xiros; igus (India) Private Limited;
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Fresmak ARNOLD IZ vice

ARNOLD IZI hydraulic High Pressure vices, are compact automatic vices with extensive movement, specially designed for rapid clamp or robotized systems. They are made out of steel and have a 0.01 mm clamping repeatability. All components are tempered and ground. These vices are suitable for working in horizontal and vertical machining centres. Its fixed jaw is firmly clamped to the base body in order to maintain a secure reference. However, the moveable jaw is guided by interior slides at the base of the vice to avoid upward movement of the work-piece. The vices are totally hermetic and thus no cleaning operations are needed.

The ARNOLD IZ1 are double effect vices. Hydraulic pressure is required for both clamping and releasing. Hydraulic pressure should not be over 250 bar. These vices have three separate hydraulic points for connection: one on either side of the vice and one underneath the vice. The connection points have a 1/4" thread. These are hermetically plugged when not in use. The connecting points are used when the vice is positioned on the table. The vices are connected by means of rigid or flexible piping. These need to be heat proof to avoid burning chippings, etc. The underneath plug points do not need a thread connection and are installed with the use of 'o' rings. This system is used when placing the vices on a palette/plaque with internal hydraulic distribution. The vices can be operated simultaneously or individually by means of independent valve connectors.

For more information: Fresmak ARNOLD Precision Engineering Pvt. Ltd.; Phone: +91 (80) 6765 4250;
Email: info.india@fresmak.com; Website: www.fresmak.com

UPDATE

Hypertherm buys Robotmaster Software's maker Jabez Technologies

Jabez Technologies, creators of software to simplify complex robotic programming, is joining Hypertherm, a U.S. based manufacturer of plasma, waterjet, and laser cutting systems, to make it easier for companies to utilize robots for manufacturing applications.

Simple offline programming is a key barrier to the wider utilization of robotics in manufacturing. Hypertherm and Jabez believe combining Hypertherm's cutting expertise with Jabez's skilled engineering and support staff will make it easier for robotic programmers and integrators to achieve optimal results. At the same time, Jabez can enhance its support for a wide variety of robotic programming applications, including those beyond cutting, by leveraging Hypertherm's global infrastructure and strong engineering community.

"A growing trend toward lean and flexible manufacturing is resulting in the expanded use of robotics in our served industries. Manufacturers realize that robots are increasingly critical to producing higher quality products at a lower cost, and to achieving the speed and flexibility needed to remain competitive," Evan Smith, Hypertherm's President and CEO commented. "Adding Jabez to the Hypertherm team will enable Hypertherm to bring even greater value to our robotic customers, and at the same time provide Jabez with the support and resources to achieve its wider vision, which we share."

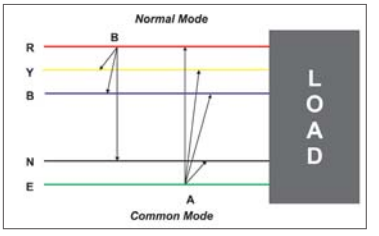
Hypertherm is not making any major changes to Jabez's operations, leadership structure, or distribution channels. Chahe Bakmazjian, founder and president of the privately held company, will continue to lead his team as part of Hypertherm's newly established Robotic Software group. Jabez's current offices in the Montreal area will remain intact, with no consolidations or reductions planned. Support for non-Hypertherm cutting systems, non-cutting applications and previously planned investments in engineering and support resources will continue. In addition, Jabez Associates will receive all Hypertherm benefits, including profit sharing and full participation in the company's employee stock value plan. The transaction was structured as a purchase of substantially all assets of Jabez Technologies. Financial terms are undisclosed.

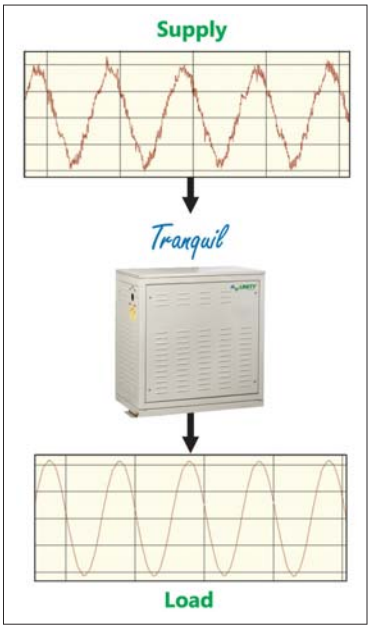
"We are excited to join the Hypertherm family. Hypertherm's vision regarding the future of industrial robotics as well as the cultural alignment between our companies made a perfect and natural fit," explains Chahe Bakmazjian. "Additionally, we can leverage Hypertherm's global service, support and logistics resources to better serve our rapidly growing base of robotic integrators and end users to accelerate the growth of Robotmaster."

Tranquil ultra isolation transformer

Did you know that most AC power lines are superimposed with spikes, surges, transients, sags, RFI noise and harmonics?

This is due to Inductive and SMPS loads, electronic ballasts, PWM switching systems, or even improper earthing. Such electrical noise often damages costly Hi-Tech machinery, unduly interrupt factory operations and increase down time resulting in increased expenses. The lack of adequate protection in such environments results in the steady rise of failure rate in such equipments. Isolated power supply has therefore become a necessity in order to prevent such breakdown time and costs.





Ultimate protection against electrical noises: As an Ultra Isolation Transformer, Unity's Tranquil is the most powerful solution to help reduce all types of noise, particularly Common Mode Noise, Spikes, and Transient Noise, which act as silent killers inside factories and commercial parks alike. The Tranquil series offers transformers with various levels of noise attenuating capabilities, including the most commonly used 100 and 120 dB, and other custom requirements can also be met.

Designed for Energy Efficiency & Reliable Performance: The Tranquil series offers transformers with various levels of noise attenuating capabilities, including the most commonly used 100 and 120 dB, and other custom requirements can also be met. Tranquil transformers are built to meet the stringent requirements of the most sophisticated equipment being used today, resulting in a clean and noise-free power supply. Each Tranquil is intelligently designed using advanced technologies and proven engineering principles to provide reliable performance and energy efficiency year after year. Furthermore, by completely isolating primary and secondary sides as well as the neutral to ground bond on the secondary side, Tranquil creates a separately derived power source to combat current loops.

Key Features

Total Protection: Shields electronic equipments that produce different types of electrical noise, typically CNC Machines, Drives, Hardening machines and Telecommunication equipment.

Energy Efficient: Reduces operating costs due to high efficiency design and high quality of magnetic.

Noise Elimination: Prevents damage due to circulating noise interference within electronic equipments.

Causes of Electrical Noise

Electrical utilities such as Capacitors, MCCB's, ACB's and Inductive loads such as large Motors, Compressors, Overhead Cranes, Elevators, Presses cause switching noise.

Welding systems can pollute earthing systems, add notches and high frequency noises in the wave form, generating anomalies in power quality.

Inverters, Converters, SMPS cause electrical noise due to switching of Thyristors, Transistors and Relays.

Effects of Electrical Noise

Occurring over a wide band of frequency ranging from 1KHz to 100 MHz or more, in magnitudes as high as 4000-6000 Volts on 3 Phase supply systems.

High frequency noise can interfere with digital electronic equipment and cause untraceable data errors, change of programme, memory loss and erratic machine behaviour.

High voltage spikes can cause the failure of Thyristors, Transistors, Microprocessors, etc.

What makes Tranquil the Best?

- Conforms to stringent technical specifications
- High Noise Attenuation Characteristics Better Than 100/120 dB
- Very Low Leakage Current
- Designed for Safety and Reliability
- Lower Running Cost and Longer Life

Unity's Tranquil Transformers are used to protect:

CNC & Hi-tech Machines
Large Computer Installations
Printing Machinery & Presses
Textiles & Garments Manufacturing Machines
Bio-Medical, Pharmaceutical and Hospital Equipment
Equipment at Oil & Gas Refineries and Power Plants
Telecom & Mobile Network Equipment and more.

Contact: Unity Controls Pvt. Ltd
Tel +91-22-25013832/33
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Web: www.unitycontrols.in

Focus on device data

Eplan has presented a new, fee-based web service at the Hannover Messe: Eplan Data Portal Professional. Users get comprehensive functionalities to update or enrich device data, as well as significantly expanded filtering possibilities. When device data has been updated in the portal, the system alerts users as to which data is more current than that found in their local database. The advantage: users can update their data at the push of a button, without manually searching and replacing. The portal's new data enhancement functionality begins at the start of a project, when device data is not yet available in the device management system. Users can send lists of devices or model numbers to the Data Portal, and then they receive a shopping cart to download with all the found device data. Besides supplementing commercial data, these updates also include important engineering data such as macros, documentation and production data. Users can begin designing without having to go through the tedious process of setting up master data beforehand. Another practical benefit: once device data has been enhanced, the change is accounted for during the update routine for device data. Comprehensive filtering options such as the ability to save prefilters can be assigned to individual persons via the integrated rights administration. Components can be located more quickly, considerably increasing the speed of the design process.

Eplan Data Portal, now with a new web service, allows users to find everything they need for design engineering and is considered a strong marketing tool by manufacturers.

Direct exchange, precise data

With the revised feedback functionality, users can use the e-mail function to contact manufacturers directly from the portal if components are not correct or not in the database. Device manufacturers receive direct answers to the following crucial questions: How many times has a component been downloaded? What countries are the products being used in? Which products are the most interesting to users? Comprehensive evaluations offer precise controlling data to manufacturers' product management and sales departments. Fields of action can be derived using this information, and product successes more precisely planned. Eplan helps manufacturers integrate their own electronic product catalogues into Eplan Data Portal. The services range from the migration of existing catalogues and product configurators to the development of new configurators. The result is a tailor-made electronic product catalogue that offers users custom engineering support.

Eplan Data Portal has been expanded with new updating, enhancing and filtering functions for device data. Users can start designing without having to go through the tedious process of setting up master data. For manufacturers, the new Report Center delivers statistics about downloads and therefore important key figures for marketing and sales.

Advantages for users	Advantages for manufacturers
• Device data easy to locate quickly • Minimal effort to administer master data • Significant time savings for design engineering • Increased documentation quality • Supports interdisciplinary processes.	• Development of additional sales channel • Direct access to around 75,000 Eplan users • Transparency about company's product usage • Comprehensive evaluations with controlling data • Direct user/manufacturer e-mail contact.

Source: Eplan Software & Service

Bosch joins Ko-HAF research initiative

Bosch started testing automated driving on public roads at the beginning of 2013. The latest test vehicles are based on the Tesla Model S.

Bosch has joined forces with a number of other suppliers, automakers, and public-sector partners to launch the "cooperative highly automated driving" (Ko-HAF) research initiative, which aims to push forward the development of automated driving. The publicly funded project will tackle the challenges of highly-automated driving, in which drivers no longer need to be constantly vigilant. But for this to happen, technical precautions are necessary. "Highly automated vehicles rely on information about their surroundings – information which supplements the data collected by their own sensors," says Dr. Dieter Rödder, head of the future mobility systems unit at Bosch's corporate research and advance engineering. Within the framework of the Ko-HAF project, Bosch has assumed primary responsibility for developing a backend solution for collecting and making available such information about a vehicle's current surroundings, including the traffic infrastructure. In addition to the backend solution, the Ko-HAF project is also working on precise self-localization for highly automated vehicles.

Automotive plastics market to be worth US$53.49 billion by 2022

The global automotive plastics market is expected to reach US$ 53.49 billion by 2022, according to a new report by Grand View Research. Global automotive plastics market was 8.69 million tons in 2014 and is expected to grow at an estimated CAGR of 9.5 percent from 2015 to 2022.

Increasing demand in power train and interior & exterior furnishing applications is expected to be a major driving factor for the global industry growth over the forecast period. Plastics

Borouge supplies dedicated material solutions for components in the China made Volkswagen Golf A7 car. *Pic: Borouge*

are increasingly being adopted as metal & alloy substitutes in automotive parts, in order to reduce overall vehicular weight, increase component performance and chemical corrosion resistance. Regulations such as CAFE in the U.S. and EC legislations in Europe aim at improving fuel efficiency and are expected to positively impact automotive plastics industry growth.

Asia Pacific dominated the global industry and accounted for more than half of the global demand in 2014. Increasing automotive production in China, India and Japan along with growing aftermarket sales in Southeast Asia are expected to be major factors driving automotive plastics demand in APAC. Electrical components and interior & exterior furnishing applications collectively accounted for over 70 percent of the regional volume in 2014.

Nexteer automotive opens 4th steering plant in China

Nexteer Automotive, a global leader in intuitive motion control, announced the opening of its fourth China-based steering manufacturing plant in Liuzhou, China. The plant will produce brush electric power steering systems (Brush EPS or BEPS), which is a unique product specifically designed for the Chinese automotive and other developing markets.

Liuzhou was chosen as the location of the new plant due to its proximity to key strategic customers and its highly skilled workforce. The city is one of China's twelve-state export bases of automobiles, parts and components. "As adoption of brush EPS systems in China has grown, additional production capacity is needed to meet increasing customer demand," said Liu. "By expanding our capabilities with new operations in Liuzhou, we can better serve the Chinese automotive market. We look forward to growing our presence in Liuzhou as we address the needs of a growing market and drive innovation in the steering industry." The plant will operate as a wholly-owned subsidiary of Nexteer Automotive known as Nexteer Automotive Systems (Liuzhou) Co., Ltd. (Nexteer Liuzhou). The facility covers an area of 10,000 square meters. Nexteer Liuzhou currently has more than 200 employees and expects to double its workforce in 2016.

Daimler celebrates 10 years of passenger car production in Beijing

The anniversary event saw the lighting of a 6 meter rotating Mercedes star that shines above the BBAC site.

Daimler's Sino-German production joint venture Beijing Benz Automotive Co., Ltd. (BBAC) has successfully commemorated its tenth anniversary. The joint venture between Daimler and its Chinese partner BAIC Motor was established on August 8, 2005, and started to locally produce its first E-Class vehicles (model series 211) just about four months later. Today the Beijing-based site is the only Mercedes-Benz plant worldwide that manufactures front- and rear-wheel-drive vehicles and engines under one roof. The anniversary event also saw the lighting of a 6 meter rotating Mercedes-Benz star that will shine brightly in future above the BBAC site.

"2015 marks a decade of a successful partnership between Daimler and BAIC. Our joint venture BBAC undertook tremendous development over the past ten years to now become a key production hub for our company on a global level," said Hubertus Troska, Member of the Board of Management of Daimler AG responsible for Greater China. "BBAC represents the firm confidence of Mercedes-Benz in the Chinese market, because continuous investment in localization has and will always be essential for our business growth in this country."

"The strength of BBAC ten years after its establishment is evidence of the successful Sino-German business partnership between BAIC and Daimler," noted Xu Heyi, Chairman of BAIC Group and its subsidiary BAIC Motor.

WABCO enters into long-term supply agreements with JMCH

WABCO has entered into several long-term supply agreements with JMCH, a new customer and an established major truck manufacturer based in China that is expanding into the heavy-duty truck segment. WABCO's new business involves wheel-end solutions, including air-disc brakes, as well as conventional brake valves, other brake components and clutch servo technology. WABCO will support two new and separate platforms for the customer's different brands of medium- and heavy-duty trucks. Series production is planned to begin in three years for the Chinese market and expected export to Southeast Asia. WABCO China further differentiated its offering for this customer through highly cost-effective wheel-end solutions specially designed to satisfy local market requirements. Among other vehicle safety and efficiency technologies, WABCO will supply JMCH with industry-leading MAXX™ air disc brakes (ADB) – the industry's lightest and highest performing single-piston ADB for commercial vehicles. Superbly engineered and compactly designed, WABCO's MAXX air disc brake technology fits any wheel size from 17.5 to 22.5 inches across light-, medium- and heavy-duty applications for trucks, buses and trailers. As a result, WABCO's game-changing MAXX braking technology fits virtually every wheel size of commercial vehicles around the globe.

Tata Motors launches the ACE Mega

Tata Motors has announced the launch of a new smart pick-up – Tata ACE Mega. According to Ravi Pisharody, Executive Director, Commercial Vehicle Business Unit, Tata Motors Ltd., "Tata Motors has been a pioneer in creating and growing the Small Commercial Vehicle market in India with its varied portfolio in this segment. With the advantage of being the market leader in the segment, we know our customer requirements very well and the ACE Mega is one such product which emerges out of our in-depth knowledge and consumer insight." Designed to deliver maximum customer value, the Tata ACE Mega offers a rated payload of 1 ton with a new reinforced load body. The vehicle also offers a suitable cargo load deck size for market load operation. 14 inch tyres, high ground clearance of 175 mm and gradeability of 30% ensure the stability of the vehicle on varied load and road conditions.

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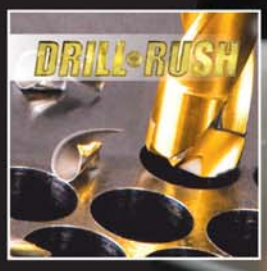

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