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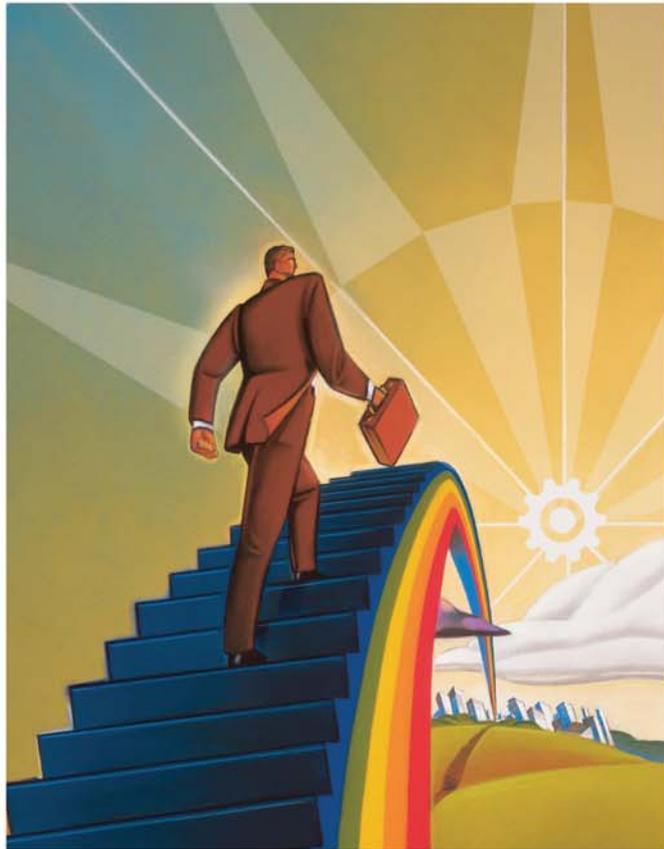
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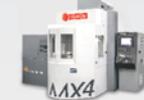
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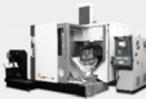
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Manufacturing matters!

During his clarion call to the world of 'Come, Make in India' during his Independence Day address from the Red Fort, our Prime Minister also asked a question to India's youngsters. 'Why, despite them, we are forced to import even the smallest of things?'

And he also offered the solution. "My country's youth can resolve it; they should conduct research, try to find out as to what type of items are imported by India and then each one should resolve that, through may be micro or small industries only, he would manufacture at least one such item so that we need not import the same in future. We should even advance to a situation wherein we are able to export such items. If each one of our millions of youngsters resolves to manufacture at least one such item, India can become a net exporter of goods," the PM said.

The Prime Minister clearly understands the importance of reviving manufacturing and that is certainly good news. That he looks at entrepreneurship as one of the means of doing it is another good news. Further, his emphasis on zero defect (so our exported goods are never returned to us) and zero effect (no negative impact on the environment), shows his farsightedness and how well he understands the evolving role and nature of manufacturing not just in its economic context but also across global and environmental aspects.

We at The Machinist welcome and appreciate the PM's earnestness and intent. But we also urge him to build and sustain the environment required for entrepreneurship in the country. It is one thing 'to ask the young people to conduct research to find out what type of items are imported by India and then manufacture them'. It is another 'to give them the essential ecosystem for research, skill development and manufacturing'. Of course, we are optimistic and we believe that the PM will surely follow up on his promise of making India a manufacturing hub. Let a million entrepreneurs bloom!



"WE AT THE MACHINIST WELCOME AND APPRECIATE THE PM'S EARNESTNESS AND INTENT. BUT WE ALSO URGE HIM TO BUILD AND SUSTAIN THE ENVIRONMENT REQUIRED FOR ENTREPRENEURSHIP IN THE COUNTRY."

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Niranjan M
Editor

THE MACHINIST

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NEWS

Japan to invest Rs2,10,000 cr in India over next 5 years



Indian PM Narendra Modi and the Japanese PM Shinzo Abe after signing the agreements in Tokyo, Japan on September 01, 2014. Image: PIB

Japan will play an increasingly important role in India's economic development. During his meeting with India's Prime Minister Narendra Modi,

Prime Minister of Japan Shinzo Abe has pledged a qualitatively new level of Japanese support and partnership for India's inclusive development, including transformation of India's manufacturing and infrastructure sectors. He has announced his intention to realise 3.5 trillion Yens, or US\$ 35 billion (Rs2,10,000 crore), of public and private investment and financing to India over the next five years. "He has expressed strong support for my vision of India's development and has committed support in all areas of development," said the Indian PM.

JCAPCPL starts new line for high-quality auto steel

Jamshedpur Continuous Annealing and Processing Company Pvt. Ltd's (JCAPCPL) Continuous Annealing & Processing Line was recently inaugurated. Cyrus P Mistry, Chairman, Tata Sons, and Shoji Muneoka, Chairman, Nippon Steel & Sumitomo Metal Corporation (NSSMC), jointly inaugurated the facility in Jamshedpur. JCAPCPL, a 51:49 JV of Tata Steel Ltd and NSSMC, has set up India's first Continuous Annealing & Processing Line that will produce 600,000 tonnes per an-



Cyrus Mistry, Chairman, Tata Sons, at the opening

num of high-quality cold rolled sheets exclusively for the automotive industry.

Mahindra to invest an additional Rs4,000 crore in Chakan

As part of its expansion plans, Mahindra & Mahindra will invest additional Rs4,000 crore over a 7-year period taking the total investment in



Chakan to Rs8,000 crore. A Joint Declaration was signed recently by Apurva Chandra, Principal Secretary (Industries), Government of Maharashtra and Dr. Pawan Goenka, Executive Director, Mahindra & Mahindra Ltd. "With this expansion, Mahindra will continue to play an integral part in the development of Chakan and the state of Maharashtra, as well as the Indian auto industry in times to come," said Goenka.

Honeywell India opens 7th manufacturing facility



Thomas A. Szlosek, Senior VP and CFO of Honeywell International inaugurating Honeywell's seventh manufacturing facility in Pune

Honeywell has launched its seventh manufacturing facility in India. This 75,000 sq ft facility has been built for Honeywell Automation and will significantly expand Honeywell's manufacturing capabilities in India.

"The Pune facility is the second manufacturing location we have built in India this year alone, demonstrating our continued commitment to India," said Thomas A. Szlosek, Senior VP and CFO of Honeywell International.

Chinese SMEs to explore greater business ties with companies in India

ASSOCHAM and Small & Medium Enterprises (SMEs) of China have recently signed five MoUs in different sectors to promote and help the SMEs to exchange technologies and enter joint ventures (JVs).

The MoU was signed between the two organisations by Wu Xiaochun, Director General, SME Bureau China and DS Rawat, Secretary General, ASSOCHAM at New Delhi.

Rawat said, India and China will identify the business opportunities in the SME segment across sectors. "China ranks 31st among countries contributing FDI to India. FDI inflows from China into India stand at \$0.575 billion," according to ASSOCHAM.



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Tata Power Solar to manufacture solar panels for ACME

Tata Power Solar (TPS) has won one of the largest DCR orders of JNNSM phase-2 batch-1. The company will supply the entire module requirement for the 20 MW (AC) project to be built by ACME Solar, a leading solar power developer in India. The 1,00,000 modules, constituting 60,00,000 cells, needed for the project will be manufactured at TPS' state-of-the-art manufacturing facility in Bangalore.

Tata Power Solar had recently announced a 60 percent increase in its module manufacturing capacity, and the Bangalore facility now has 200 MW module and 180 MW cell production



The panels will be manufactured at Tata Power Solar's Bangalore facility

capacities. Under the DCR policy of MNRE for the phase-2 of JNNSM, a total of 375 MW of solar power plants have to be built using domestically produced cells and modules. The initiative is aimed at promoting manufacturing in the country.

Eaton Technology Day highlights energy-efficient and critical operating solutions

Power management company Eaton recently hosted a Technology Day in Bangalore for the datacenter, infrastructure, construction, machine building, pharmaceutical and oil and gas industries. The Technology Day showcased Eaton's industry leading offerings that help improve energy efficiency, increase uptime in critical operations and protect people, property and the environment.

The Technology Day in Bangalore is part of a global Eaton initiative that leverages these events to reach out to customers, influencers and end-users to enable effective market interactions across major regions and key industry segments.



Nitin Chalke, Managing Director – India, Eaton, speaking at Technology Day

ACMA conference maps out opportunities for e-mobility

The changing customer paradigm is challenging today's mobility practitioners and transportation solutions industry to revisit their assumptions for electric mobility. The second national

conference on Sustainable E-Mobility jointly organised by Automotive Component Manufacturers Association of India (ACMA) and Society of Indian Automobile Manufacturers (SIAM), not only brought together experts to throw light on the road ahead for e-mobility in India, but also brainstorm on the roadblocks and share best practices. It stressed on the need to develop and grow an ecosphere of e-mobility in the country.



CII, labour ministry MoU for demand responsive vocational training

CII in partnership with the Ministry of Labour & Employment has facilitated the signing of four flexi-MoUs with Tata Sons, Flipkart, Raymonds and the Gujarat Industrial Power Company Ltd (GIPCL) at a National Consultation, 'Demand-Responsive Vocational Training', in New Delhi recently. The flexi-MoUs, which are a first of its kind and unique, will give companies the flexibility to design training programmes at ITIs in a manner that the youth are skilled according to the specific needs of the industry. Speaking on the occasion, Gauri Kumar, Secretary (L&E), Government of India, said the country has limited infrastructure therefore the government is looking at partnerships wherein companies can volunteer to help develop a last-mile employability module.

Manoj Verma appointed Global President & Director of NTL Lemnis

Manoj Verma has recently taken over as the Global President & Director, NTL Lemnis. "He will work closely with us to create a strong & successful business model for consumer products, beginning with LED Lighting, and later on expanding into other related products & technologies. This entire consumer business will be an independent business in our own brand under the umbrella of NTL Lemnis, to avoid any conflict of interest in the business of NTL Electronics," said Arun Gupta, MD, NTL Electronics.



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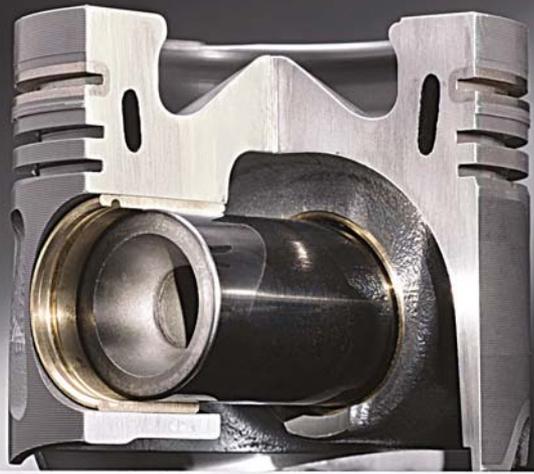


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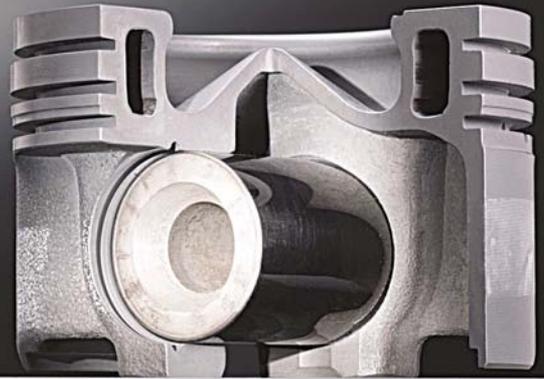
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Aluminium piston on the left & the new steel piston on the right



Diesel success story 2.0

Innovative engineering helps the global pioneer in diesel technology from Stuttgart to become the first to replace the hitherto conventional aluminium pistons in passenger car diesel engines with a new high-tech generation of pistons made of steel.

In 1936 Mercedes-Benz became the first company in the world to launch a diesel passenger car, thus taking on its role as a diesel pioneer. Stuttgart's automotive engineers consistently reinforced this leadership position over the decades that followed through the introduction of numerous technical innovations that have contributed significantly to making the passenger car diesel engine what it is today: powerful and yet economical – in short, efficient.

The engineers are now once again working to tighten the efficiency screw. In September 2014, new high-tech steel pistons are celebrating their world premiere in a standard-production passenger car, in the V6 diesel engine of the Mercedes-Benz E 350 BlueTEC. Thanks, amongst other things, to this technical innovation the saloon continues to deliver the same engine output (190 kW/ 258 hp), yet only uses around five litres of diesel fuel per 100 km.

Steel pistons are already commonly found in commercial vehicle engines, where they are combined with heavy cast-iron crankcases, while aluminium pistons have over the years gradually become the norm for passenger car diesel engines. The high-tech steel pistons that Mercedes-Benz has now developed completely from scratch harmonise perfectly with the state-of-the-art and much lighter aluminium engine housings and the multiple-award-winning NANOSLIDE cylinder bore coating technology also developed by Mercedes Benz.

Exploiting material advantages

Steel and aluminium have significantly different characteristics: steel expands less than aluminium when hot, conducts heat less well and is simply heavier. At first glance, this would seem to make the combination of aluminium housing and steel pistons tricky. Notwithstanding this situation, the Mercedes-Benz engineers discovered opportunities for the future by using the apparent differences between the properties of the respective materials to their best advantage.

They exploited the fact that a steel piston only expands with heat to about a quarter of the extent of its aluminium equivalent to fit the steel piston more tightly within the aluminium housing, with the effect that it sits very snugly in the cylinder bore. However, as the temperature rises during operation of the engine, the aluminium housing expands more than the steel piston – and the result is greater tolerance of the piston within the cylinder and thus less friction. As the piston/cylinder assembly alone causes between 40 and 50 percent of the mechanical friction, the potential for efficiency revealed here was significant.

“We are assuming that pistons made of steel will in future also be in widespread use in passenger car diesel engines.”

Joachim Schommers,
Head of Basic Engine
Development at Mercedes-Benz

Stronger, smaller, light

The steel pistons used up until this point were, however, little suited for the combination with engine housings made of aluminium. So instead, Mercedes Benz had to redesign the piston. The modern versions of the steel pistons that will now be fitted for the first time as

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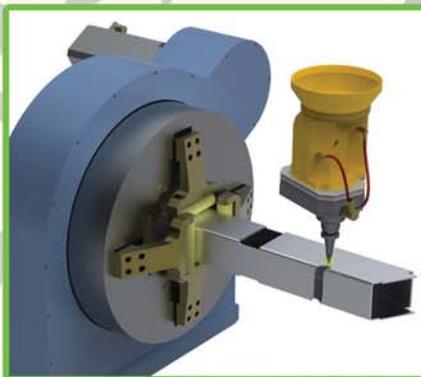
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standard in the V6 diesel on board the E 350 BlueTEC, within an aluminium crankcase with NANOSLIDE cylinder bore coating technology, are high-tech components forged out of high-quality, high-strength steel. The challenge for the piston supplier is considerable, since the manufacturing process for the new, high-strength steels is complex.

But the effort is worthwhile, as the higher strength of the modern steel allows for a more compact piston design, which more or less compensates for the fact that the material is around three times as dense. Indeed, the innovative steel pistons that will in future be working away within the six combustion chambers of the Swabian V6 diesel engine are as much as 13 millimetres lower than the aluminium equivalents used until now (aluminium pistons in the V6 diesel approx. 71.6 mm high, steel pistons only 58.6 millimetres). Thanks to this changed geometry and intelligent design, the weight of the unit comprising piston, gudgeon pin and piston rings is on a par with that of the version with aluminium piston. Mercedes-Benz has thus been able to compensate almost completely for the weight disadvantage of steel and even to ensure reserves of strength for peak pressures that may become even higher in future.

High efficiency, low consumption

The use of steel pistons has enabled the engineers to improve the level of efficiency, since the lower thermal conductivity of steel compared with aluminium means that higher temperatures are reached within the combustion chamber. The ignition quality thus increases, while the combustion duration is reduced. The result is lower fuel consumption and pollutant emissions. Mercedes-Benz took account of the lower thermal conductivity of steel with design modifications such as modified cooling ducts in the pistons.

Experience has shown that the innovative steel pistons optimise thermodynamic performance and, at the same time, reduce friction significantly. Furthermore, measurements showed that in the lower and middle speed ranges, so important in everyday driving, significant consumption benefits can be achieved.



The new Mercedes-Benz steel piston

“Experience has shown that the innovative steel pistons optimise thermodynamic performance and, at the same time, reduce friction significantly.”

Logical further development

These innovative steel pistons mark a logical next step in Mercedes-Benz’s work to further develop diesel technology. The V6 diesel engine, for example, which will now be going into series production with the new steel pistons for

the E 350 BlueTEC, has been through various stages of development since its first appearance in the W212 in 2008. It also benefits from another Mercedes-Benz innovation: NANOSLIDE cylinder bore coating technology. This technology, pioneered by Daimler in 2006 in the AMG V8 petrol engine, uses twin-wire arc spraying technology to melt iron/carbon wires, which it then sprays onto the inside cylinder walls of the lightweight

Advantage steel

As far as the future is concerned, the engine designers at Mercedes-Benz see further possible advantages in the use of the high-tech steel pistons:

- Steel not only allows the piston to be made smaller, but also offers greater reserves for coping with mechanical stresses. This is particularly advantageous for further downsizing concepts
- Since steel pistons are stronger than aluminium ones, a diesel engine fitted with them can operate at higher temperatures and thus achieve a higher level of thermodynamic efficiency.
- Since the lower thermal expansion of steel pistons compared with aluminium also means that the engine designers are able to reduce the gap between the cylinder wall and the piston as far as the first piston ring, it has been possible to reduce both pollutants and untreated emissions.

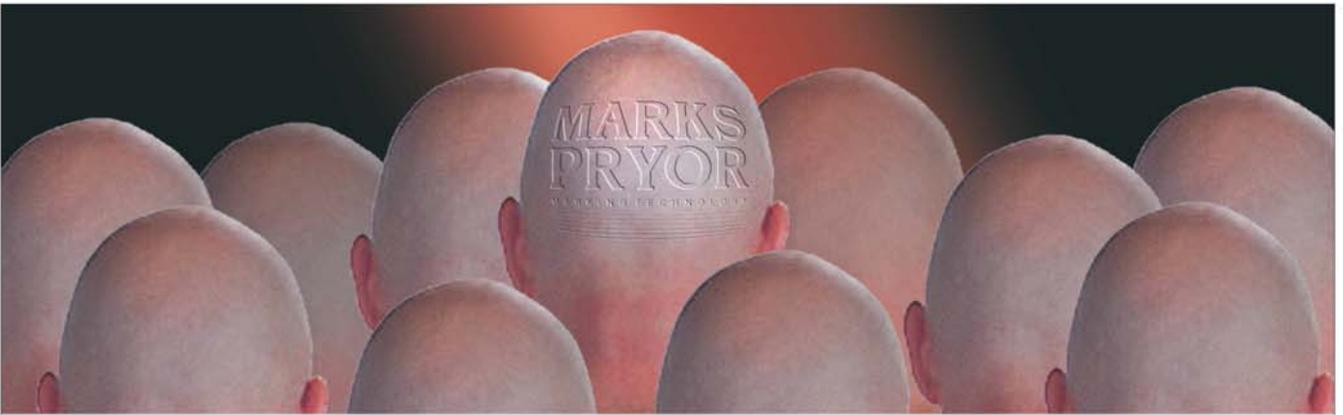
aluminium crankcase with the help of an inert gas flow. Very fine finishing of the resulting nano-crystalline iron coating creates an almost mirror-smooth surface with fine pores, which reduces friction between the piston assembly and the cylinder wall compared with when cast-iron cylinders are used, while also being extremely resistant to wear. Further benefits: lower engine weight, reduced consumption and CO2 emissions.

Thanks to the use of the steel piston, amongst other things, the figure for the E350 BlueTEC is now well below 140 grams. In a parallel development, the output has increased since 2008 from 155 kW (211 hp) to the current 190 kW (258 hp).

A step ahead

It is envisaged that the new pistons will very shortly also be in use in Mercedes-Benz’s four-cylinder diesel engines. Joachim Schommers, Head of Basic Engine Development at Mercedes-Benz: “We are assuming that pistons made of steel will in future also be in widespread use in passenger car diesel engines.”

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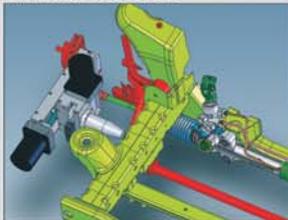
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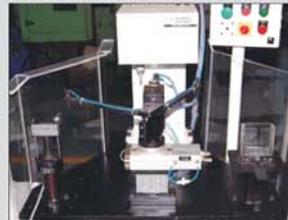
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Bus ride into the big league

Getting into full-fledged vehicle manufacturing is a natural progression for JBM as the Group has already been doing contract manufacturing for various renowned OEMs in the country, says **Nishant Arya**, Executive Director, JBM Group

By **Niranjan Mudholkar**

Q The JBM group launched its first low floor bus called CityLife designed for intra-city travel in India at the Auto Expo earlier this year. What has been the market analysis that prompted you to enter this segment?

Our latest foray into bus manufacturing focuses on creating a niche segment in the intra-city public transportation domain and aims at providing luxury, comfort and safety by way of our product. We have extensively worked towards understanding the requirements of this product category and have also studied similar products that are being used globally. We feel that a big opportunity lies in this segment and can be catered to with the introduction of the right kind of product. We are also very bullish about various urbanisation schemes where in the Government shall spend over US\$20 billion over the next seven years to transport modernisation. Getting into full-fledged vehicle manufacturing is a natural progression for

us as JBM Group has already been doing contract manufacturing over the years for various renowned OEMs in the country.

Q The market is already crowded in this category. How will you differentiate your offering?

Our bus CityLife has been designed keeping in mind Indian traffic and weather conditions, usage pattern of the travellers and expectations of the consumers for an improved product. We have introduced some very unique features in the bus that are first of a kind in the Citybus category. For example, passengers complain about stubbing their toes on rods of the seats, hence the bus has cantilever seats and armrests, ensuring more room for standing passengers and also extra luggage space below the seats; wheelchair ramp, kneeling facility, Stop request button, etc. Other unique features include a monocoque structure to ensure maximum strength and minimum weight, matching European standards for safety in case of front/side collision and rollover accidents. Additional safety is provided through five large diameter detachable cylinders with an automatic valve close in case of leakage.

Q How competitively is your bus priced?

In the bus category, the final price is determined depending on the specific requirements of the customer with regard to the features, engine type, customisation, and so on. We are targeting three primary segments in the initial phase i.e. Citybus segment, airport/airlines segment and schools. Under each category we will roll out standard and premium buses available in CNG and Diesel powertrains. All pricing shall be at par with the prevailing market rates of similar products.

Q What is the total investment for this project so far?

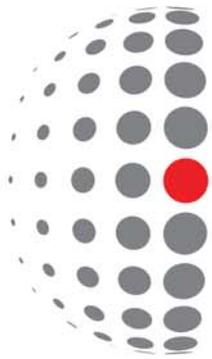
We have invested Rs500 crore in two plants for bus manufacturing, R&D facilities and product development centre towards the bus project. As we expand further to a more diversified bus portfolio, we will look at investing more as per the requirement.

Q You are collaborating with European bus-maker BredaMenarinibus (BMB) for this venture. Why did you choose this particular partner?

Italy based BredaMenarinibus (BMB) has supported us with domain expertise and experience in the bus manufactur-



The bus construction is based on the globally-acclaimed monocoque platform, which has a single uniform frame structure that reduces the number of weld points, unlike a conventional body-on-chassis configuration.



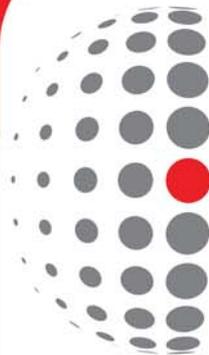
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ing business. BMB boasts of over four decades of experience in this domain. The legacy of BMB in this business was a key factor in our association with them.

Q Tell us about the R&D activities behind this project?

JBM Group has invested heavily in its R&D and product development capabilities with over 400 engineers dedicated towards such activities across its offices in India and abroad. Prior to the launch of bus project, we invested almost three years that encompassed extensive research regarding the existing public transportation infrastructure in India and abroad, products and services prevailing in the system and necessary improvements required in the Indian scenario.

Basis these studies, we have designed this product that shall take the city transportation domain to the next level.

Q In terms of manufacturing, what are some of the features that you have introduced in this bus with regards to the Indian conditions?

CityLife has been conceptualised keeping in mind the Indian travel sentiments. It has an Inverted Portal Axle (IPA) leading to the low-floor construction and completely flat floor from front to back; an Independent Front Suspension (IFS) ensuring a stress-free ride and extra passenger comfort (first time in India). The construction is based on the globally-acclaimed monocoque platform, which has a single uniform frame structure that reduces the number of weld points, unlike a conventional body-on-chassis configuration. This results in uniform load distribution throughout the body, ensuring maximum strength and lower vehicle weight. Owing to complete flat floor, the carrying capacity of CityLife is 41 sitting and 59 standing passengers. With lesser number of CNG cylinders but with higher volume, CityLife can run more in a single CNG refill compared to existing buses in the city.

The monocoque platform offers a significant reduction in maintenance costs, thereby promising lower total cost of own-

“
Yes, we are extremely bullish about this project and strongly believe that this project shall catapult us in the big league. Our current group turnover is Rs7,000 crore and we target to reach Rs10,000 crore in the next two years.”

ership for customers. Successful for more than 35 years across the globe, the durable powertrain adds to the product's credibility, which has undergone thousands of kilometres of testing in Indian conditions as well. Customer trials of the vehicle will commence soon with the product set to hit the market shortly thereafter in three engine options: 230 hp and 280 hp CNG, and 280 hp diesel. For the comfort of specially-abled people, a separate space has been allotted with a provision of a wheel-chair ramp. Additionally, the double-door entry and exit enhances commuter convenience. Besides standard features, fitment options such as automatic ticket machines and rear-view cameras could be fitted on the vehicle as per customer preference and demand.

Q Will you be looking at other segments? Any plans to get into trucks?

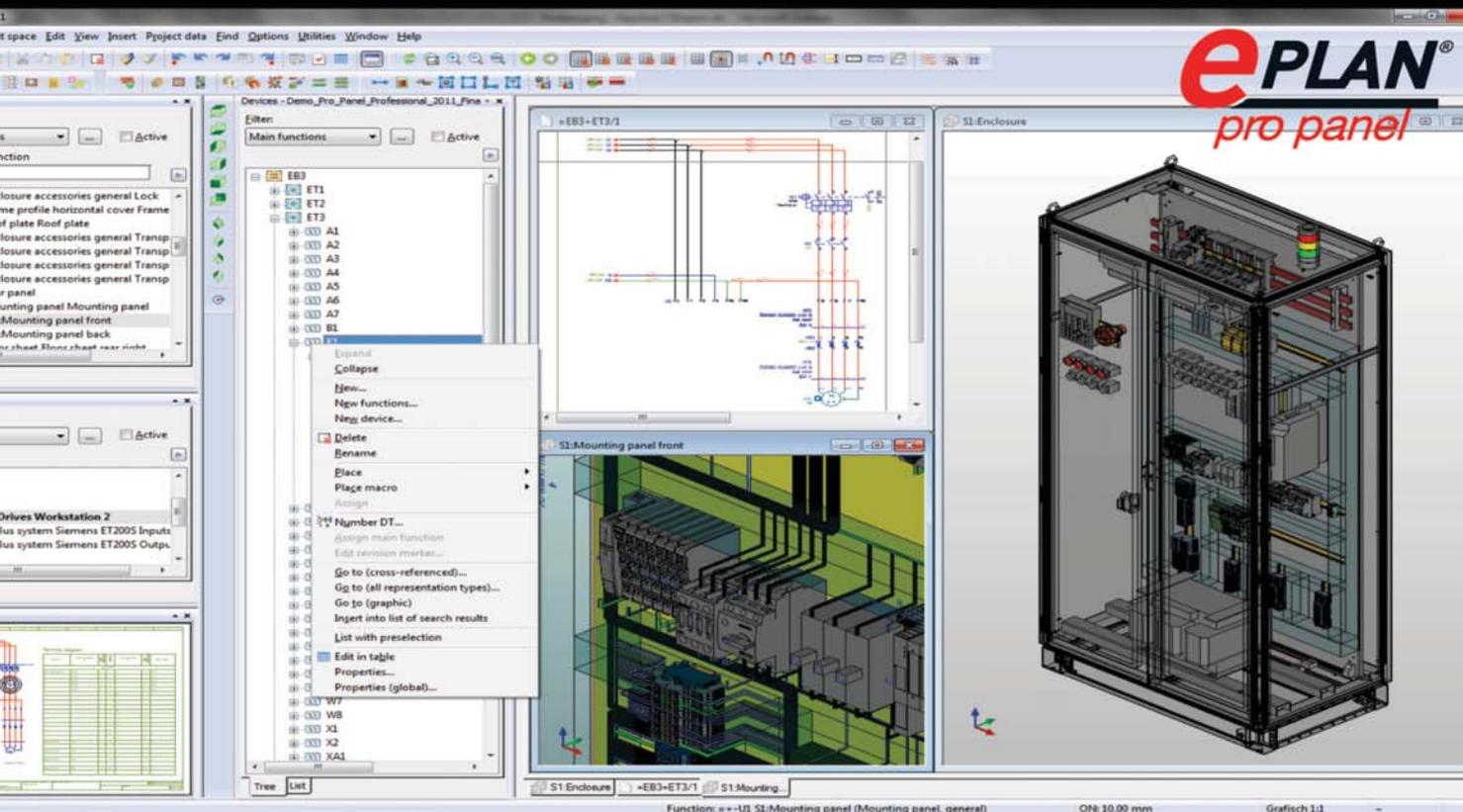
Going ahead, we will concentrate on building an integrated bus portfolio. But there are no plans towards trucks manufacturing.

Q Tell us about the manufacturing capacities of the two plants where you are manufacturing this bus?

The company has commissioned state-of-the-art production facilities at Faridabad (Haryana) and Kosi Kalan (UP) that will be operational by October 2014. The monocoque body structure shall be manufactured in Faridabad while the assembly will be undertaken at Kosi. At peak capacity, these plants will roll out 2,000 buses annually.

Q Will this project catapult JBM into the bigger league?

Yes, we at JBM are extremely bullish about this project and strongly believe that this project shall catapult us in the big league. Our current group turnover is Rs7,000 crore and we target to reach Rs10,000 crore in the next two years. We firmly believe that the bus project shall be a major driver of overall growth trajectory in the next few years. 



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Sunny Days ahead

Kenichiro Yomura, President, Nissan India Operations and MD & CEO - Nissan Motor India Pvt Ltd, is confident that the company is on track to become a major force in the Indian automotive sector.

By Niranjan Mudholkar

It has been about 17 months since Kenichiro Yomura or Yomura-San, as he is fondly called, took charge as the President, Nissan India Operations and MD & CEO, Nissan Motor India Private Limited. And while Nissan is far from its set targets in India, Yomura-San's leadership has already started having the desired impact. Nissan India has registered a robust growth of 60.3 percent in August 2014 compared to the August 2013 numbers. In fact, the financial year-to-date comparison sales numbers are still better at 116.2 percent! Of course, in terms of volumes, Nissan India has a long way to go (August 2014: 3,999 and FY2014 to date: 21,596) and this Nissan lifer is well aware of that.

Having spent his entire career spanning more than three decades at Nissan, Yomura has worked in different markets like North America, China, the Middle East and, of course, Japan. Riding on this diverse and collective experience, he has been handling the India stint quite well but he understands that the Indian market is different from anywhere he has worked before. Notwithstanding the challenges, he looks at the positive side. "The Indian market has a big growth potential and the customer base

"We are committed to build Nissan into one of the largest overseas manufacturers in India with a significant market share and a formidable presence in the domestic automotive sector."

About Yomura-San

As the President of Nissan India Operations and the MD and CEO of Nissan Motor India Pvt. Ltd, Kenichiro Yomura oversees manufacturing, R&D and joint venture businesses. He is responsible for developing strategies to maximise Nissan's business performance, managing product introduction and significantly increasing the presence and accessibility of the Nissan brand through continuing network expansion. Prior to his current position, Yomura served as the General Manager at the Global Head Quarters with overall responsibility to manage Nissan's business in Middle East Region. Since joining Nissan in 1982, he has held various roles of increasing seniority across numerous functions in the US, China, Japan and the Middle East.

is very demanding with diversified needs. It is always exciting for me to work in the fast-growing market, trying to understand and accommodate the customers' expectations and requirements that would change over time," he says.

While growth has come back to Nissan India, it will really have to accelerate to fulfil its ambition of grabbing 10 per cent share in the Indian automotive market by 2017. "Our objec-





The Chennai plant

The Renault-Nissan Alliance Manufacturing facility at Orgadam, Chennai has an annual capacity of 400,000 units based on its current shift pattern, with the potential to increase to 480,000 units if operated on maximum shifts in line with business needs. "Currently, we are producing over 340,000 units," shares Yomura.

tive remains unchanged, to be a major player in the Indian market which is very important to Nissan, with a ten percent market share. We have a plan to achieve it but like any other business plan it has to be adapted over time. But make no mistake, our direction and goal remains the same," Yomura says with certain confidence. His confidence comes from the fact that India is a huge and growing market. "There are only 15 cars here per 1,000 people which points to the potential despite short term challenges for the economy."

Yomura is also sure that Nissan will be able to build momentum over the good start it has got this year and that's why his outlook for the year remains positive driven by new product offerings in key growth market segments. These include a refreshed Sunny and the Datsun GO+. "We will achieve double digit growth in India this year," he states.

To support its product range, Nissan India has a robust retail presence. It has created 129 outlets in less than four years building one of the most rapidly established networks of any new entrant. But Yomura wants to go further.

"We plan to have 200 outlets by the end of FY14; 300 outlets by FY16 with an aim to cover 98 percent of network TIV (total industry volume) by FY16. Our key focus is on Tier 2 & 3 markets with high TIV potential. We will grow our market share but first we will ensure that our foundation is in place."

India being a very price sensitive market, reducing cost at the manufacturing level is a key to produce competitive vehicles. Yomura knows it well. "Yes, Indian market is very price competitive and that is one of the reasons that motivated us to invest so much in a

big manufacturing plant, together with our Alliance partner Renault so that we could produce vehicles for the both domestic and export markets, to realise the scale of economy which is key for the cost reduction. Localisation of procured parts is also a big pillar for cost reduction," he explains.

India will be one of the key markets where the Renault-Nissan Alliance will introduce new products with the CMF-A platform. "We have confirmed last year, that Renault-Nissan Alliance is developing all-new vehicles to meet

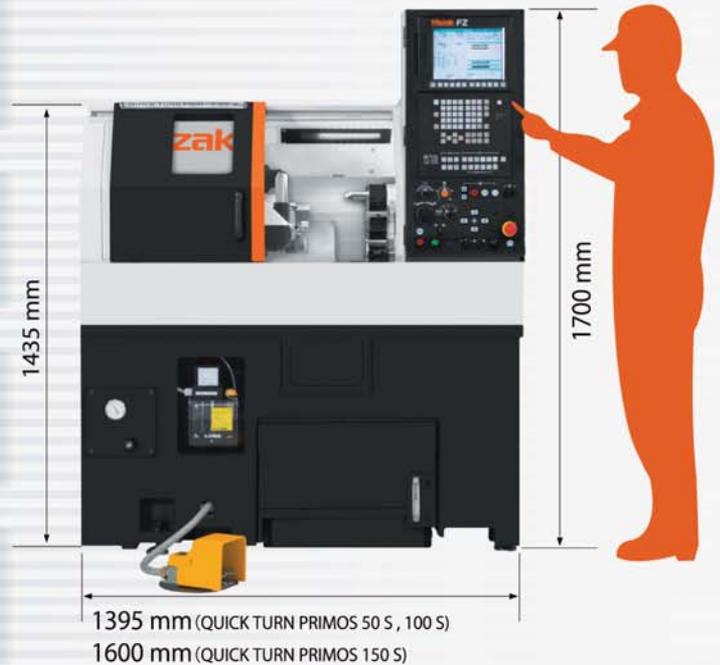
"We have a plan to achieve ten percent market share. But like any other business plan it has to be adapted over time. But make no mistake, our direction and goal remains the same."

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The CMF platform

The Renault-Nissan Alliance is currently working on what it calls the 'Common Module Family' (CMF-A) platform. This is being developed for the growing economic markets. The Common Module Family (CMF) approach defines vehicles as five essential modules: the engine bay, cockpit, front underbody, rear underbody and electrical/electronic architecture. The compatible parts can then be assembled into hundreds of possible configurations, for maximum efficiency and brand differentiation.

the specific demands of new car buyers in the world's fastest growing economies. The program, internally named CMF-A, covers the most affordable category of cars in the Common Module Family, Renault-Nissan's unique, modular system of vehicle architecture," Yomura shares.

The CMF approach defines vehicles as five essential modules: the engine bay, cockpit, front underbody, rear underbody and electrical/electronic architecture. The compatible parts can then be assembled into hundreds of possible configurations, for maximum efficiency and brand differentiation.

"Our mission is to create attractive designs for the excitement of our customer's everyday life. In achieving this mission, we source our ideas from the emotional value customers expect from an automobile and strive not just to fulfil them, but to go an extra mile."

Production of vehicles within the CMF-A scope will begin in 2015 at the Renault-Nissan Alliance plant in Chennai. "Renault and Nissan will reveal additional details, including pricing details and product volume, closer to the start of production. Like all CMF categories, CMF-A offers a high degree of flexibility. Significant body style and powertrain variations can be matched to specific customer needs and preferences in India and other high-growth markets," explains Yomura, adding that it is too early to say whether the CMF-A products would be exported from India.

Of course, exports remain a key aspect of the overall picture. "Export is critical to the business operations in India and showcases world-class Indian production quality on the global stage. However, our primary focus is to become a major player in the Indian market. We will continue to explore opportunities for widening the export base for India-built cars. We have enough capacity currently to satisfy both export and domestic demands," says Yomura.

Nissan, today, exports products to over 100 countries including Europe, Middle East, Africa and South American regions. "The European markets account for about 50 per cent of the company's exports while the



The Chennai plant is capable of producing cars complying with regulatory and quality standards of all export markets.



remaining 50 per cent goes to Middle Eastern countries and other overseas markets including some parts of Africa. Our plant is capable of producing cars complying with regulatory and quality standards of these markets," he adds.

Some industry analysts claim that the design of some of the Nissan products is not very appealing to the Indian customer. What's Yomura's take on this perspective? "At Nissan Design, our mission is to create attractive designs for the excitement of our customer's everyday life. In achieving this mission, we source our ideas from the emotional value customers expect from an automobile and strive not just to fulfil them, but to go an extra mile."

He further explains Nissan India's design approach: "In India, we have offered some of our very unique designs. For example, Nissan Terrano conveys modernity while paying homage to Nissan's SUV design heritage seen in models like Patrol and Pathfinder. The model's front-end highlights Nissan's V-Motion design signature, which starts from the angled strut grille and moves up through the bonnet. The chrome finished grille gives the vehicle a strong attitude while the sharp headlamps - with a four-pod design - cast a deep-set eye impression and feature sleek, integrated turn signals. The wide, tough front lends the Terrano a very powerful personality. The New Sunny, for example, breaks convention with its bold, fresh face



Localisation of procured parts is also a big pillar for cost reduction.

"Yes, Indian market is very price competitive and that is one of the reasons that motivated us to invest so much in a big manufacturing plant, together with our Alliance partner Renault."

courtesy of a bigger front grille and boomerang shaped headlamps, while chrome detailing around the car gives the sedan a classy appearance."

Earlier this year, Nissan launched the Datsun brand in India targeted at the emerging middle-class. Carlos Ghosn, Nissan's global top boss has already said that he expects Datsun to play a significant role in Nissan's India growth story. And making that happen will be Yomura's key responsibility. So, does the fact that Datsun hasn't really become a chart buster worry Yomura? "Datsun is an all-new brand and the Datsun GO is a very capable product. Not to mention, we are competing with some of India's strongly established brands in its segment.



Production of vehicles within the CMF-A scope will begin in 2015 at the Renault-Nissan Alliance plant in Chennai.

Like all CMF categories, CMF-A offers a high degree of flexibility. Significant body style and powertrain variations can be matched to specific customer needs and preferences in India and other high-growth markets.

Though the brand building process appears to be slow to the outside world, we as an organisation are taking progressive steps to offer the car to customers across various tiers in the Indian market."



Getting personal

On India: "Last month (August), I visited Agra and Jaipur with my family, which was my very first personal travel and experience in India. It was a remarkable experience and my family was also very happy. I wish I had enough time to explore incredible India, other than business trips."

His Car: "Nissan stands for Innovation that Excites. The Nissan stable is full of exciting products and I have driven many of them in different phases of my career in various countries. At present, I am driven in a Nissan Teana which is a luxury sedan, and I have Nissan Skyline back in Japan."

The Datsun GO has been appreciated as a product. But - as Yomura points out - when it came to purchase intent, it was naturally pitted against the existing brands in the segment which no doubt are much established and command better mindshare among car buyers.

"For customers to appreciate the value that the Datsun brand brings to the table we are establishing more presence in terms of customer touch points and increased engagement. Distribution reach is one of most critical aspect of Datsun strategy. We need to be close our customers."

Together with the Datsun brand, Yomura's aim and ambition is to establish Nissan as a

The European markets account for about 50 per cent of the company's exports while the remaining 50 per cent goes to Middle Eastern countries and other overseas markets including some parts of Africa.

major force within the Indian auto industry. "Any business plan is subject to change. Timing is of less importance to us than achieving the overall objective and we are on track to do so. Ultimately we are committed to building Nissan into one of the largest overseas manufacturers in the country with a significant share of the market. We are working towards becoming one of the top six players in the Indian automobile industry. We are already the second highest in exports and we are working towards having a formidable presence in the domestic market with both Nissan and Datsun brands," he explains. 

"We are already the second highest in exports and we are working towards having a formidable presence in the domestic market with both Nissan and Datsun brands."

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A new world of opportunities

The Global Manufacturing Leadership Program aims to build a robust leadership pipeline, says HR Shashikant, Group Executive President, Group HR, Aditya Birla Group.

By Niranjan Mudholkar

The Aditya Birla Group's huge and diverse manufacturing footprint is spread across the globe in 36 countries with over 70 percent of its employees engaged in the manufacturing businesses. This focus will continue with 83 percent of its revenues and 68 percent of its profits contributed by its manufacturing businesses comprising of metals, cement, textiles, pulp & fibre, chemicals, mining, carbon black, insulators and fertilisers.

Driving businesses of such scale and complexity requires truly global manufacturing leaders. While the Group already has some of the finest manufacturing leaders working with it, creating and grooming the next line of leaders is an equally strong thrust. Accordingly, the Group has been running the

Global Manufacturing Leadership Program (GMLP). The Machinist caught up with HR Shashikant, Group Executive President, Group Human Resources, Aditya Birla Group, to understand more about this unique and interesting initiative.

According to Shashikant, over the last few years Aditya Birla Group has emerged as one of the most aspirational places to work for manufacturing professionals. He says: "We are continuously working towards further strengthening and consolidating our position in the manufacturing sector. GMLP is a unique initiative which strives to build a pipeline of 'Global Manufacturing Leaders'. The GMLP was launched by Aditya Birla Group to identify talented mid-career technical professionals and groom them for leadership positions for the Group not just for India but also for its global locations, thereby building a robust leadership talent pipeline for the future.

Shashikant further points out that a leader in manufacturing which the Aditya Birla Group is, requires 'leaders' to propel its growth and meet newer challenges. "GMLP strives to hone talented manufacturing professionals into global leaders, towards this objective."

A unique program

The GMLP is not a vacancy driven initiative but a proactive HR exercise aimed towards creating and grooming leaders. "We proactively seek manufacturing professionals and provide them with the learning and growth opportunities which are industry agnostic. The GMLP is a premium and exclusive leadership program of our Group. It accelerates the development of talented middle and senior manufacturing professionals as global leaders to take on challenging roles at our plants spread across the globe," says Shashikant.

The Group's vision here is to shape manufacturing leaders of tomorrow through exposure to world-class technologies and processes, state-of-the-art research and development facilities, continuous learning and development opportunities. The program offers a platform for high-performing, ambitious and passionate manufacturing professionals, who enjoy working in a challenging but supportive environment.



GMLP will develop the selected candidates to take on leadership roles in manufacturing in diverse businesses and geographies."



Selected candidates take on challenging roles at the Group's plants across the globe.

“Selected candidates enhance their leadership and functional skills, get exposure to key Group processes. They are given opportunities to work in cross-functional areas besides their current area of expertise. They gain immense expertise through their engagement in our key sectors,” explains Shashikant. After this process, they emerge successful, joining the league of leaders at the Aditya Birla Group in roles across geographies in 36 countries. “Of the five GMLP candidates recruited in 2011, three of them have already taken on their next leadership role as independent unit heads, one in China and two in India,” he shares.

The idea and the process

The thought process behind identifying the mid-career candidates is that they would bring in a fresh perspective having worked with different organisations and locations.

The GMLP attracts qualified engineers in the manufacturing industry with 10 years to 20 years of experience in various sectors. The process is customised for identifying and selecting exceptionally talented manufacturing professionals who have worked in the plants and on the shop floor and clearly display leadership potential. “A rigorous selection process has been put in place, spanning over four months and six levels of assessment involving senior leadership of the Group. It consists of Business Directors, CEOs, Technical Heads and Chief Peoples Officers, who help us to handpick the best.”

Global exposure

The candidates selected through GMLP undergo an extensive on-boarding, mentoring, transition and development process before being provided leadership opportunities in line with their skills and experience. “Selected candidates can look forward to enhance their leadership and functional skills, gain exposure to key processes of manufacturing, research, product development, project management and operations, etc.,

through challenging assignments.” They are given cross-sectoral exposures at both Indian and global manufacturing locations of the Group in different functions. “Open to manufacturing professionals irrespective of their technical specialisation, GMLP will develop the selected candidates to take on leadership roles in manufacturing in diverse businesses and geographies,” Shashikant adds.

Win-win situation

This program offers a holistic learning experience both on the professional and personal front. “It is an opportunity to work in completely different cultures where language, food and foreign environment test your personal endurance and tenacity. Candidates enjoy this experience to the hilt as they gain tremendous exposure in a very short span of time. Alongside

GMLP selection process

The GMLP recruitment process begins in the month of September rightly coinciding with Engineers day celebrations. Interested candidates can visit the dedicated and interactive website (www.abgmlp.adityabirla.com) which is specifically designed to facilitate the recruitment process under this initiative. After all the applications are screened, shortlisted candidates are taken through three levels of interviews followed by an intense Development Assessment Centre for a whole day. This assessment centre is conducted by world leaders and experts in assessment techniques. “Candidates who emerge successful are interviewed by the top leaders of Aditya Birla Group which includes Business Heads, Directors and CEO's, they help us handpick the brightest of the best from among the talented pool of professionals,” Shashikant says.

various opportunities are provided to hone their skills through structured training conducted at our world class internal university Gyanodaya, facilitated by a global faculty from some of the best institutes in the world.”

Shashikant believes that while the GMLP has a direct positive impact for the Group, it also benefits the manufacturing industry. “Manufacturing is a core strength of our Group. We have a strong manufacturing footprint. In that sense Aditya Birla Group is a microcosm of India's manufacturing industry. The growth of the manufacturing sector is going to require talent at all levels, especially at the leadership level. GMLP, which focuses on developing leaders for manufacturing, is therefore beneficial to both the manufacturing industry and Aditya Birla Group in particular.”

Shashikant is well aware that very few top calibre engineers consider manufacturing as their first career option. “We all know that in the last 15-20 years, other sectors have lured the best, at the cost of manufacturing. Programs like GMLP will give confidence to top talent to opt for the manufacturing sector over others and increase the collective capability of the manufacturing industry.” 



Plant image courtesy: Kia Motors

Kia is now able to reap the many benefits from the S4C+ to IRC5 controller upgrade.



Robotic brain improves uptime

A recent upgrade to a newer version of a robot controller—the robot’s ‘brain’—has led to key improvements in failure risk, maintenance and spare part utilisation for a car manufacturer’s large plant in Hwasung, South Korea.

One hour’s drive south from Seoul, South Korea, resides the coastal city of Hwasung. Situated on the Yellow Sea, it is home to a 3.2 million square meter Kia Motors facility, built in 1989. As one of the three South Korean factories, Hwasung boasts an annual output of 600,000 vehicles of which about 70 percent are exported to some 170 countries—a fact that is very fitting considering the name ‘Kia’ means to “come out of Asia” in Korean. Kia Motors Corporation is Korea’s oldest manufacturer of motor vehicles and is part of the Hyundai-Kia Automotive Group.

To support the large-scale production in Hwasung, 15,000 employees are working two shifts at three huge production lines to produce many of Kia’s most popular car models including the Optima, Cerato, Forte, Cadenza, Quoris, Sorento and Borrego.

In this large factory, about 200 ABB robots carry out a wide variety of tasks. Up until earlier this year, some of those robots were still operating using the older S4C+ controller—the computer that acts as the robot’s brain

by carrying out commands and ensuring safety. However, in January 2014 ABB completed an upgrade of the S4C+ controllers to the newer IRC5 controllers for 20 of these robots. They included the IRB 6400R, IRB 4400 and IRB 6600 used for foundry, die casting, surface treatment and material handling.

“To reduce costly production line downtime, ABB offered us two options,” says a Kia Project Manager authorised to speak on the company’s behalf. “The first was one in which all the S4C+ key components were replaced and the second in which the entire

controller was replaced. Despite the higher cost of replacing the entire controller we were convinced it would help improve our productivity even further. Despite a tough delivery timeframe ABB managed to replace the controllers in time and on budget.”

The installation was performed during weekends when lines were officially halted and risk for impacting production was minimised. Prior to the upgrades, ABB conducted a pre-inspection of the factory, systems and work environment, leading to a well-organised project schedule, a full understanding of the programming needs and the order process.

“This was a project that had never been attempted before at ABB, so we had to face the unexpected,” says Seon-Moon Jung, ABB Project Manager. “Nevertheless, the project was completed successfully thanks to global ABB team support and proactive feedback from our Korean ABB colleagues.”

Kia Motors is now able to reap the many benefits from the S4C+ to IRC5 controller upgrade, including a reduced failure risk, easier maintenance, standardisation with other factory systems, and fewer spare parts needed.

Kia Motors is now able to reap the many benefits from the S4C+ to IRC5 controller upgrade, including a reduced failure risk, easier maintenance, standardisation with other factory systems, and fewer spare parts needed. As an added benefit, the new controller comes

with a new operating system that has Korean language support.

“We are truly satisfied with what ABB has done for our production line,” says the Kia Project Manager authorised to speak on the company’s behalf. “With our new, easier-to-understand controller system and reduced maintenance from standardisation with our other factory systems our robotic systems are prepared for the future.”

Source: ABB

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What's *new in* SOLIDWORKS 2015



This release includes ground-breaking enhancements and true productivity improvements across the entire range of products, covering 3D design, electrical design, simulation, product data management, collaboration, and manufacturability.

Building on the solid foundation and success of the last 22 releases of its flagship 3D CAD software, SOLIDWORKS 2015 demonstrates its commitment to providing its customers with software and services that make them more successful and more productive than ever before. This release includes ground-breaking enhancements and true productivity improvements across the entire range of products, covering 3D design, electrical design, simulation, product data management, collaboration, and manufacturability.

SOLIDWORKS 2015 enables you to speed through your designs with powerful new features

SOLIDWORKS 2015 enables you to speed through your designs with powerful new features, substantial performance boosts, and an enhanced user experience. You can quickly document your designs for manufacturing and assembly, share project information across your global team with minimal effort, and integrate your design processes with downstream production operations to help lower costs and accelerate time-to-market.

The KEY Themes on SOLIDWORKS 2015

Improve your everyday productivity

SOLIDWORKS 2015 is packed with engineering and design performance boosts to help your work done faster and easier. The user experience puts your focus on design, not 'CAD overhead' to get the information you need, in record time.

Focus on design, not the modelling software for faster design iterations – new features accelerate your design process.

Get the information you need, faster – improved overall performance, faster analysis, and streamlined approaches give you the data to make decisions and keep designing. Work quickly and easily with the enhanced user experience and simulate multiple design scenarios quickly. With access to extensive online training, the new MySolidWorks Professional subscription level delivers improved product skills and a centralised technical reference resource.

Focus on design, not the modelling software for faster design iterations

Optimize your work process

Share project information across your global team with minimal effort. Easily manage product structures up front in the design process, and then quickly document designs for manufacturing and assembly. With access to information from everywhere, all stakeholders stay connected to quickly move product development forward. Easily access social collaboration and

online data management tools for faster development and decision-making.

Enable top-down design by visually creating assemblies and managing product structures upfront with SOLIDWORKS Treehouse. Access and use your design information from any device; connect to SOLIDWORKS Enterprise PDM from any location with Web2.

Reduce operations costs

SOLIDWORKS 2015 helps speed up your production, integrate design processes with downstream manufacturing, lower costs, and accelerate time-to-market. It gives:

Enhanced cost analysis for better upfront estimates across many manufacturing methods with SOLIDWORKS Costing.

Integrated inspection simplifies the process of creating documentation and performing inspection for quality assurance with SOLIDWORKS Inspection.

Better communication between design and manufacturing teams enabling them to share Product Manufacturing Information directly in 3D with SOLIDWORKS MBD.

Faster development of electrical schematics and incorporate them into the 3D model with SOLIDWORKS Electrical

Solve more design challenges

SOLIDWORKS 2015 delivers new technical capabilities that support a wide array of industries and help you overcome industry-specific engineering and design challenges.

Create layouts and manage digital models for BIM.

Accurately simulate construction machinery & tools.

Improve manufacturability of products.

Enhance product aesthetics and usability.

Key features

Every enhancement in SOLIDWORKS software delivers productivity and usability improvements. Across the entire product portfolio, these features or products stand out:

1 New product development workflows: SOLIDWORKS MBD enables drawing-less product detailing and manufacturing with annotations and PMI; output to SOLIDWORKS, customizable 3D PDF, or eDrawings file formats.

SOLIDWORKS Treehouse for fast, easy assembly structure planning, creation, editing, and viewing; automatically populate a new SOLIDWORKS assembly.

2 Integrated capabilities connect design & manufacturing: SOLIDWORKS Inspection automates creation of inspection drawings and reports. SOLIDWORKS Costing now supports “sensors” and costing of weldments, plastic/cast parts, machined castings, and 3D printed parts.

Print directly to 3D printers (AMF and 3MF formats).

Flattening of non-developable surfaces.

3 SOLIDWORKS performance: Faster modelling, analysis, and rendering provides more time to improve designs. Saved file size reduced ~50%. Faster Hide/Show of assemblies, component patterning, editing/changing configurations. SOLIDWORKS Simulation: support Intel® solver and multi-core contact detection. PhotoView 360 – define graphics region for rendering. SOLIDWORKS Enterprise PDM: Faster open/interaction for large data set.

4 Part and surface modelling: Faster and easier creation of sketches, complex patterns, and advanced geometry. For example, sketch – line from mid-point; rectangle with horizontal/vertical construction lines.

“This latest release is packed with more than 200 user-driven enhancements and innovations from our two million-strong SOLIDWORKS community; and, only ten of them are covered in this article!”

5 Assemblies: Faster assembly functions leave more time for engineering your designs. For example, Pattern along open or closed loops to simulate roller/energy chains.

6 Drawing improvements: Find drawing views faster and enjoy more drawing detailing automation and control. Automated drawing sheet zone annotations track view locations.

Improved formatting control over drawing and table notes.

Omit layers from printing; use splines as leaders.

Improved angle dimensioning.

7 Design Simulation: Simulate many more real-life scenarios and use concurrent engineering. SOLIDWORKS Simulation – predict product life under cyclic dynamic loading; define self-contact between faces of a single body or part for nonlinear analysis; Load Case Manager tests performance of structure for multiple load combinations.



Enhance product aesthetics and usability with increased surfacing flexibility

8 Electrical design: Dramatically speed up development, creation, and integrity of electrical systems design. For example, Dynamic Connector creator – simplified creation, design, and use of electrical connectors.

9 User experience: Work more efficiently and better understand/visualize design intent in your models. For example, Dynamic Reference Visualization enables you to graphically view relationships in the FeatureManager.

10 Expanded design communication and collaboration: Expand the reach of your design tools with faster, easier connection to your data and better collaboration with colleagues, suppliers, and customers - anytime, anywhere.

SOLIDWORKS has an enviable track record of delivering innovations for product development with each and every release. This latest release is packed with more than 200 user-driven enhancements and innovations from our two million-strong SOLIDWORKS community; and, only ten of them are covered in this article! The expectations of the user community get higher with each and every release and we believe they have been surpassed once again. The best place to learn more and discover how your business can take advantage of SOLIDWORKS 2015 is by visiting our website:

www.solidworks.com/launch

For more info pls. contact: solidworks.in.marketing@3ds.com



Gateway for the growth of lasers

Laser World of Photonics India 2014 brings technological progress into India's south from September 23-25 at BIEC, Bengaluru

Laser technology is finding greater application in various precision critical industry sectors. Globally, lasers find widespread use in engineering applications and even in India it is seeing wider use in the growth sectors like automotive, diamond cutting, semiconductors, biophotonics, metal forming, industrial automation and so on.

Indian laser and photonics industry's flagship event, Laser World of Photonics India 2014, in its third edition from September 23-25, 2014 at Bangalore International Exhibition Centre, Bengaluru, will showcase laser application industries such as these and a lot more. Around 100 exhibitors and represented companies will be on display at the 3rd edition of India's only trade fair for lasers and photonics. China, Japan, Germany, Lithuania and Great Britain will be among the countries exhibiting in national pavilions. The show would prove to be an important gateway for the growth and use of lasers and optoelectronics in every industry sector.

Like the previous editions, Laser World of Photonics India 2014 has received support from the Government of India; Ministry of Communication and Information Technology, Department of Electronics & Information Technology and Ministry of Micro, Small and Medium Enterprises as well as the Indian Laser Association, the Optical Society of India, The Optical Society, the German Hightech Industry Association, the German Competence Networks for Optical Technologies and the Automotive Component Manufacturers Association of India (ACMA) to name a few.

Speaking on the ever-growing prospects of the application of the laser industry, Mr. Bhupinder Singh – Acting CEO of MMI India Pvt. Ltd said, “The road shows in select cities have set the stage for Laser World of Photonics India 2014, at BIEC Bengaluru, which will bring together the industry experts and research fraternity from the industry and at the same time showcase the latest in technology that the industry has to offer. We are looking forward to a successful show.”

As a curtain-raiser, MMI India, the organisers of the show, staged series of road shows focusing on application industries

at various locations. The shows kicked off at Mumbai focusing on the importance of lasers in the metal forming industry, followed by Surat which showcased the use of lasers in the diamond industry. The last leg of these shows culminated with a focus on the automotive industry in Pune.

Laser World of Photonics India offers the industry and visitors a perfect platform to network with the research academicians, experts, scientists and other renowned personalities of the laser and photonics industry. A power packed conference and workshop program will provide valuable insights and experience in this technology.

On September 23, there are short courses on Packaging of Optoelectronic Components and Nanophotonics: Design, Fabrication and Characterization offered by The Optical Society. Also, MMI India along with The Optical Society of India is organising a Seminar on Laser Basics and Applications: The Way Forward. Beside basic technology informa-

tion, two application panels will focus on laser applications for the machine tool and the electronics industry.

On September 24, for the first time, ACMA has joined hands with Laser World of Photonics India and is organising a national conference on “Smart Manufacturing” to keep the automotive industry updated on the latest technologies and application of lasers for innovating manufacturing capabilities.

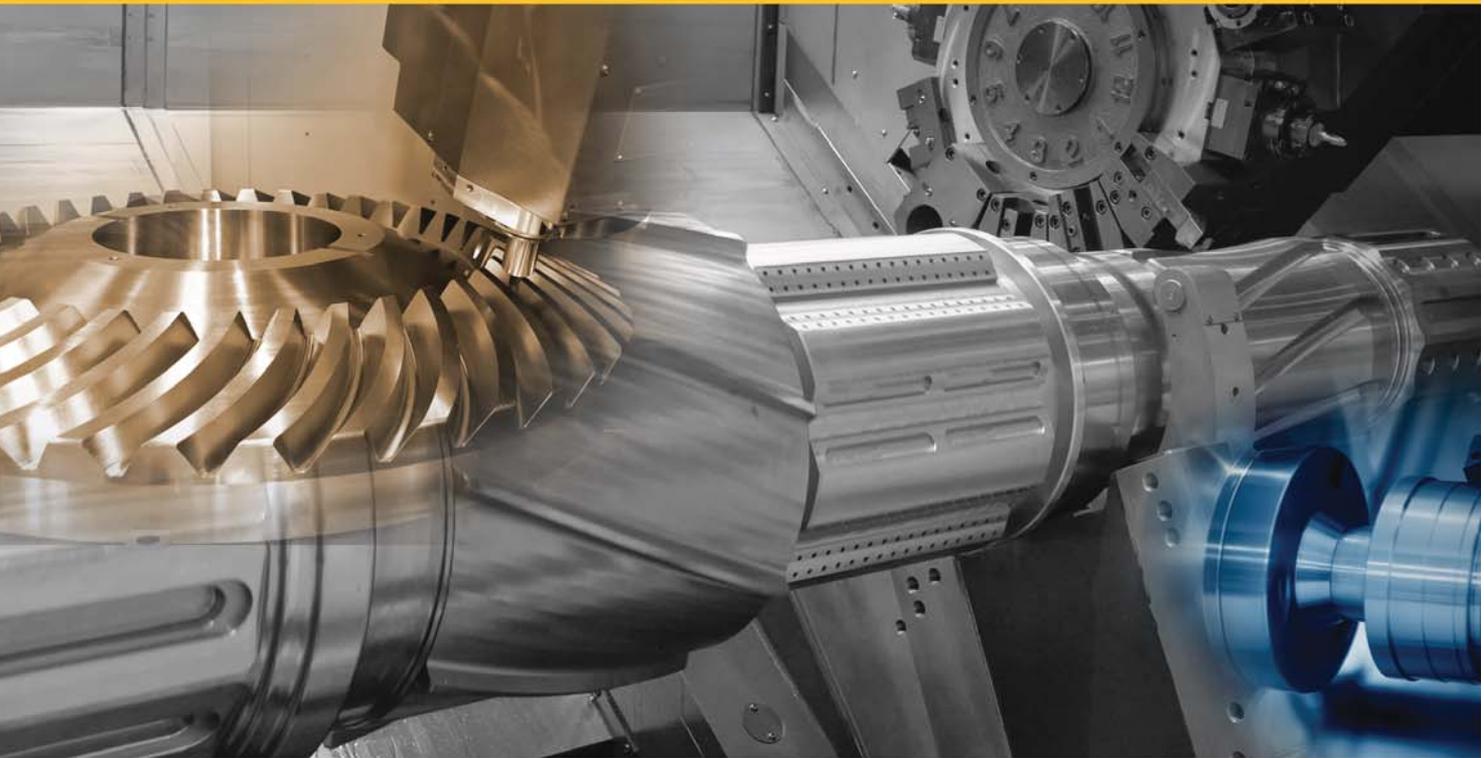
Vinnie Mehta, Director General, ACMA, said: “ACMA is pleased to associate with the Laser World of Photonics India.”

Expressing their confidence in Laser World of Photonics India, key exhibitors like TRUMPF India, IPG Photonics, Laser Science, Sahajanand Laser Technology Ltd., Amada Miyachi India, Magod Laser, Ametek Precitec, Ekspla, OptoTech, Sill Optics, Schneider, Mahr Metrology, TOPTICA and others would once again display their products. The product portfolio includes products like fibre lasers, CO2 lasers, diode lasers, cameras, optics and opto mechanics, optical manufacturing systems, sensors, metrology systems, ultrafast systems, tables, pulsed laser deposition systems, atomic layer deposition, fibres processing systems and solar simulators with applications in various fields. The co-location with electronica India and productronica India will also be beneficial for the visitors. 



Visitors at last year's event

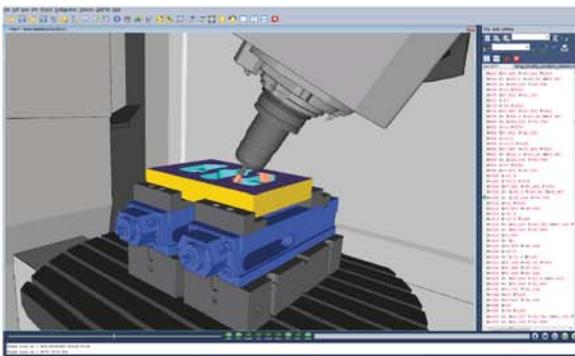
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The new age enabler

The emergence of new age technologies specifically 'SMAC' will further add to the transformation of the manufacturing sector.

By Ramesh Subramanian

In order to remain competitive in the global arena, Indian manufacturing sector has to really gear up as competition is intense and low cost destinations are always around the next corner. Factors such as labour and capital productivity, infrastructure, environmental clearances are critical to the manufacturing sector, but the most significant is technology.

As technology is bound to change the way manufacturing businesses operate, it will also have an effect throughout the operating cycle – from product design, development, and supply chain management to distribution. Organisations have already started moving from legacy systems and most of them have adopted ERP. The challenge however is integration of IT and to train and enable an optimum man-machine interface which convinces management and employees to adopt new systems and processes and supports smooth roll-out of the same.

The emergence of new age technologies specifically SMAC will further add to the transformation of the manufacturing sector. Here is a glimpse of how each technology will have its impact on manufacturing.

Social (Collaboration Tools)

Manufacturing companies have started using collaborative tools in the last few years, though in a very ad-hoc way. Investment in social collaboration tools is not seen as priority right now for manufacturing sector, with the tradition of very few 'knowledge workers' needing collaboration as opposed to administrators, blue collar workers and machines. While there have been specific collaboration tools to ease communication flow in the supply chain, using a truly 'social' approach is as yet not on the radar. This will inevitably change with the introduction of more intelligence in the supply chain, in manufacturing processes, and disaggregation across the value chain- all of which would lead to a higher need for 'social' collaboration as opposed to directive information-sharing.

Mobility

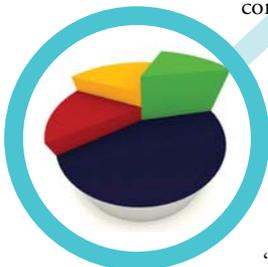
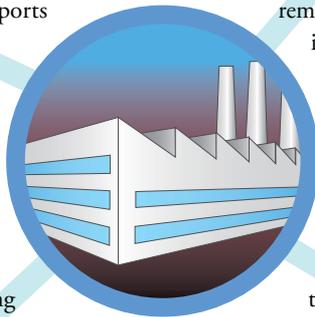
The adoption of mobility is still low within the manufacturing sector. The impact would vary throughout the manufacturing value chain – product design and engineering may have a very low impact; sales, customer service and installation may have a very high impact.

Most enterprises are hesitant as the ROI from mobility is still not clearly established. Mobility just doesn't mean providing mobile devices to employees, but entire ecosystem needs to be built and integrated to get true benefits of mobility. This includes connecting shop floor to production department, inventory management and even with sales and customer service. This can enable real-time information flow throughout the supply chain, with production managers, sales team can get real time information about the inventory, can supervise the shop floor remotely. Though the benefits of mobility are clear in terms of reducing costs, bringing in efficiency and productivity, the challenges remain in terms of a clear cut strategy which can really work. There are multiple devices and platforms, and integrating them together as well as enabling machine to machine and man to machine communication would be a challenge.

The other challenge is to drive 'consumption' that is to derive meaningful usage of reports, statistics, workflows and analytics using the mobile platform, so that such details are always available with managers and decision-makers of the company at all times. As competition in the consumer market grows, and government policy and infrastructure turn into enablers rather than disablers, we should see the need for speed and agility come to fore, and result in a strong 'pull' for such services in all manufacturing industries.

Analytics

Most manufacturing companies have already implemented ERP and BI tools. However these tools remain restricted to basic information about sales, inventory and purchase, for the management, and are still not used for fact based decision





making. Advanced and predictive analytics can change New Product Development, efficiency in Supply Chain Management and enhance Customer Relationships. Manufacturing units may have collated huge volumes of data over the years, which primarily remained unutilised. Analysing this data can help to identify causes for supply chain inefficiencies and enable mitigation in advance.

Product lifecycles have become shorter, so to stay competitive, enhancement of existing products and development of new products by understanding customer psyche is increasingly important. Analytics can help to understand the knowledge generated during developmental phase of a product and can help the product development team. Analytics can help to analyse customer data and thus develop a product which is more apt for the market. Adoption of Analytics should increase for manufacturing sector with the increasing facilitative conditions for Indian Manufacturing.

Cloud

Cloud will have greatest impact. With the Cloud, manufacturing units don't have to set up their own infrastructure.

“The challenge is integration of IT and to train and enable an optimum man-machine interface.”

The three core components of Cloud – IaaS, PaaS and SaaS enable any manufacturing unit to adopt and use latest tools and technologies without wasting time and resources. Cloud can replicate similar IT services in manufacturing units spread across different geographies. Integrating IT in different units spread geographically used to be a big challenge earlier, but with the adoption of cloud, this issue can be put to rest easily and at a very low cost.

Earlier when setting up a unit in remote location, engineers' would usually travel to, build the entire IT infrastructure, run it for months and then train the employees before finally handing over to the locals in factories. Now with Cloud, one can easily replicate the existing infrastructure in new plants and can make the system can be up and running with limited costs and resources.

Cloud adoption also enables the conversion of capital expenses in IT into an operational, and transaction-correlated operational expense. This of course leads to far greater agility than possible with own IT resources, not to mention the ability to focus better on operations rather than on IT.

The author is Global Delivery Head, Blue Star Infotech.

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TECHNOLOGY FOR INDUSTRY



Trends accelerating cloud adoption

The overall cloud awareness and readiness has improved and the manufacturing industry is responding by building a just-in-time technology foundation based on public and private clouds

By Prashant Gupta

Economically, manufacturers have the strongest ties to other sectors with production processes that drive demand for raw materials, energy, construction and services from a broad array of suppliers. Growth in this sector results in job creation, investments and innovation across many industries. However, manufacturers are under constant pressure to increase accuracy, speed up processes and make every supplier, distributor and service interaction count.

The 2014 edition of the Cloud Readiness Index by Asia Cloud Computing Association confirms a trend that the overall cloud awareness and readiness of Asia Pacific countries has improved across the region. The manufacturing industry is thereby responding by building a just-in-time technology foundation based on public and private clouds. This is enabling manufacturers to meet their business objectives and stay ahead.

Let us understand the five trends that have become catalysts for cloud adoption by manufacturers:

1. **Demand for Analytics and Business Intelligence:** “A cloud computing solution can turn valuable data embedded across the supply chain into actionable intelligence such as which products are selling fastest and where,” comments Prashant. The cloud is also speeding communications with suppliers and distributors which can help manufacturers stay ahead of the competition.
2. **Pressure to Reduce Capital Costs and Create New Revenue Streams:** Challenged by modest growth and fierce competition, manufacturers must create efficiencies within their existing operations in addition to continuing to create products and services that are in demand. Op-ex versus Cap-ex based cloud platforms can help

create financial efficiencies and innovations in supply chain management and improve quality.

3. **Accelerated Decision Making:** With supply chains distributed across the globe, Prashant notes that, “manufacturers must have ready and secure access to critical data such as current inventories, production and delivery schedules and pricing fluctuations.” Cloud-based platforms, in combination with mobility solutions, can extend ERP (Enterprise Resource Planning) and inventory management systems to teams in the field so that informed decisions can be made at headquarters or at any point along the global supply chain.
4. **Dynamic Operating Models:** Manufacturers, says Prashant, “require flexible global operating models that allow production to shift quickly from one location to another and easily accommodate changes in volume which are both hallmarks of cloud computing.”
5. **Improved Customer Experience:**

Keeping pace with customer expectations when it comes to production schedules is a major concern for manufacturers. Cloud-based platforms can create efficiencies across an operation and securely mobilizing CRM (Customer Relationship Management) applications can more tightly link front-line sales forecasting to back-end production.

The advent of cloud adoption has begun already with a number of organizations employing it and many following suit. The future of any organization depends on its IT infrastructure growth and IT has therefore become a critical component of this equation. Organizations are becoming increasingly aware of the benefits that cloud provides thereby reducing the barriers to its adoption. 



Manufacturers are under constant pressure to increase accuracy, speed up processes and make every supplier, distributor and service interaction count.”

The author is Head of Solutions, Verizon Enterprise Solutions, India



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Ensuring robust innovation

Madhusudan Kestur, Director, AceMicromatic MIT, explains how the company's real-time manufacturing intelligence products helps companies improve their shop-floor productivity and profits.

By **Niranjan Mudholkar**

Q AceMicromatic MIT (formerly known as PioneerCT), is part of the Ace Micromatic Group. How are you leveraging on this legacy to help your customers better?

As India's leading manufacturer of CNC machines, AceMicromatic group is acutely aware of the specific pain points faced by our customers, in their quest for productivity and profits. Our group also has component manufacturing companies that represent our target market profile, which makes us not just aware, but also part of the eco-system needs.

With the rich domain knowledge in machines, controls and allied automation components, we are able to bring to market solutions that are able to make an instant impact on shop-floor productivity and profits. Our continuous R&D and perpetual testing on our own shop floors also ensures "Innovation that is Robust" and industry-ready.

Q Can you name some of the key customers who are currently benefitting from TPM-Trak?

Our customers span the entire value chain of engineering and automotive companies, such as OEMs (eg. New Holland,



Honda, Volvo, TVS...), Large Tier-1s/2s (eg. Sona group, QH Talbros, Super Auto Forge, Bosch...) to SMEs (Tier3/4/Micro).

Q The business of manufacturing is extremely dynamic and one of the key requirements arising out of this fact is smart and efficient connectivity between the shop-floor and the PCs/servers. How are you helping manufacturers on this front?

Our TPM-Trak framework establishes last mile connectivity between machines and central software servers. Our hardware and software have built-in data compression and protocols for resilient 100 percent loss-less data store and forward, even taking care of power loss conditions, which are typical of shop-floors.

Q Quality remains a business differentiator, more so in today's highly competitive world. So monitoring and managing quality of manufacturing and that too in real-time is vital to the success of businesses. How do you help customers in this critical function?

TPM-Trak frameworks are extensible to include gauging and metrology data, which when combined with accurate part production signatures from machines, is able to provide part-specific quality data, such as SPC/SQC/rejection analysis functionality for real-time analysis, or as inputs to PPAP/FPA.

Q Speed, innovation, quality and cost-reduction are the key concerns of the manufacturing industry today. While it is relatively easy for the large enterprises to address these issues, it is very challenging for the SMEs. How are you helping Indian SMEs on this front?

Agility and costs go hand-in-hand and that's a driver and challenge for most enterprises. We have made it extremely easy for SMEs to take advantage of our TPM-Trak solutions and innovations, by making them:

- Productized, with very little customisation needed, for any machine type or for any application
- Priced on a per node basis, to avoid significant fixed costs as in the case of software server licenses.
- Providing Productivity-as-a-Solution (PaaS) services which connects shop personnel to productivity experts using a secure platform.

TPM-Trak

TPM-Trak framework drives data acquisition and analytics of various aspects of production workflows and productivity parameters. It caters to customer needs in the areas of:

- Real-time OEE, Machine and productivity parameters analytics
- Real-time energy correlation and benchmarking for every part produced
- Real-time SPC, with correlation to part production
- Conveyors and assembly monitoring/workflows
- Automated help request systems
- eSHOPx – workflow enabler for operators
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Product of Proven Performance



A tool in cost optimisation

eSourcing has become the go-to method to increase efficiency in the chain.



By Chirag Shah

With internet access now almost universal, eSourcing is being seen as the next big platform for bringing greater efficiency and competency to the sourcing process. I have outlined the six major benefits of eSourcing that can be game-changers for any business:

Improved vendor discovery: Just as search engines make it easy to search for hotels, even in cities you have never set foot in, eSourcing vendors have a database that provides access to organisations offering multiple goods and services. The quality of such databases varies significantly, based on the quality of the information sources, the ease of searchability, and the range/number of variables that can be searched. Another key factor for consideration is the number of vendors on the database; greater the pool of suppliers available, higher the probability that a company finds a more cost-effective and technically competitive vendor.

Simplified process: As part of the procurement process, it is common for companies to ask suppliers for a 'Request for Information' or a 'Request for Proposal'. eSourcing centralises and simplifies this process for procurement professionals by allowing them to create such forms online, and issue them electronically.

In addition to the enormous savings on printing and mailing, the technology offers further advantages over a traditional paper or spreadsheet based process. For example, questionnaires can be instantly and uniformly modified should requirements change halfway through the process without having to re-issue all the questionnaires. Also, respondents are forced to submit their responses in a uniform manner and incomplete or incorrect submissions can be addressed immediately. The biggest advantage is that the electronic medium provides companies a means to monitor responses from vendors throughout the qualification period.

Improved negotiation outcomes: With eS-

ourcing, buyers can utilise the online auction tool to negotiate and obtain the most competitive pricing for the contract. On-line auctioning fosters a more competitive environment yielding a more competitive price to win the bid. This simplifies the negotiation process and also generates better commercial outcomes.

Better decision-making: eSourcing provides a central platform that contains all vendor information in a standardised format, making information synthesis and analysis easier for buyers. By using best-in-class eSourcing technology buyers can apply scoring and weighting capabilities to answers, and provide scenario analysis — all of which contribute to optimising procurement decisions.

Greater transparency: eSourcing technology provides an audit trail of all respondents' information and the criteria used to make decisions. This helps procurement professionals justify buying decisions, even long after they have been made.

Reduction in cycle time: All of this automation through internet-based systems massively reduces the time and effort required in conducting sourcing projects. The overall time invested in the sourcing cycle is reduced by as much as 70 percent in some cases.

So overall, e-enablement of the sourcing process offers a myriad of benefits to procurement departments, from drastically reducing the cycle time for conducting the sourcing process, to significantly improving the suitability of the vendor base. But most importantly, commercial terms can be notably improved—with companies frequently reporting average savings of 7-10 percent, going up to 30 percent in some exceptional cases.

Going forward, I expect to see eSourcing extend beyond its original remit to provide further services such as business analytics to enabling enhanced supplier management for companies, among many other benefits. 

The author is Executive Director, Procurement Services, Xchanging.



“The biggest advantage is that the electronic medium provides companies a means to monitor responses from vendors throughout the qualification period.”



Embracing the Customer Lifecycle

Automotive companies must embrace the new targeting tools to help them understand customer lifecycle.

By Kirthiga Reddy

We live in a time where access to information is at our fingertips, where consumers can quickly research their major purchase decisions with a touch of a button. Just like other businesses, the auto industry must change the way its communicates with consumers to fit into the new consumer lifecycle in this fast-paced, always-connected culture.

Because of digital, the way people shop for cars has changed. The consideration phase has extended and general 'awareness' is now a shorter, but still important phase. Mobile is incredibly important to stay top of mind and the access to (and use of) 'shopper data' is incredibly helpful to target the right people who are in market. With the global growth rate projected to decrease over the next few years—according to Society of Motor Manufacturers and Traders, 2014 global growth is predicted at 3.5 percent vs. 5.2 percent growth in 2013—the environment for automakers will continue to be increasingly competitive. As a result, now more than ever before, it's urgent to make your media work smarter (not harder) by reaching the right people at the right time.

Nowadays, no one buys a car without researching first on the web, and ownership is being documented online at an increased rate as well. As a result, online platforms are growing in scale as well as in capability to address this consumer need. This growth has helped improve targeting capabilities (due to the collection of all this online data, and the ability to connect it with offline data) for automotive marketers. Improved targeting means that auto companies can now reach consumers at every stage of the customer lifecycle.

People Shop: As more people shop for cars and conduct research online, marketers have never had a greater opportunity to influence their decisions. The ability to present your audience with the right product, and information at the right time is crucial during the car-shopping experience.

Where do I find potential customers? The web has allowed people to curate their own personalised "news feeds", where they control the content they consume daily. These feeds can



be prime real estate for marketers to relevantly reach out to consumers likely to be interested in their brand and products. In addition, mobile is a powerful channel and a necessity as more people are using multiple devices to consume digital content. Auto companies should target these people who will respond to their messaging in order to more efficiently drive the passive 'shopper' to become an active 'buyer'.

People Buy: The digital world has created more people-centric, data-driven platforms, enabling marketers to put people at the heart of their marketing. Targeting is simple to use and effective in reaching and analysing your potential and existing customers. This makes creating "clusters" of in-market consumers who are likely to buy now a reality today, and is a critical component to making marketing budgets more efficient and effective.

People Care: People love their cars and this love extends to the overall brand as well. With all of these targeting capabilities, marketers can consistently deliver the right message, offers and/or service reminders to the people who will act upon them. When correctly utilised, this allows marketers to manage and deepen relationships with customers.

By tailoring their message to influence the lifecycle of the customers, companies have a tremendous opportunity to improve awareness and consideration of their brands, move cars off the lot, and even drive revenue from their existing owners. To take full advantage of this opportunity, automotive companies must embrace these new targeting tools to help them understand where people are in their customer lifecycle, and how to relevantly put the right message in front of the right customer. 



Online platforms are growing in scale as well as in capability to address consumer need."

The author is Managing Director, Facebook India

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Enabling transformation

Aggressive innovations in design technology are transforming the way we make things, says **Rajiv Bajaj**, Country Manager - Manufacturing Solutions, India and SAARC, Autodesk Inc



By Niranjana Mudholkar

Autodesk University India & SAARC 2014 will be held in September in Mumbai. What can Indian manufacturing professionals expect at this event?

Autodesk University is the world's largest learning and networking event for Autodesk product users. This renowned industry event aims to help design and engineering professionals improve their skills and enhance productivity. This is a platform where Autodesk will showcase its best R&D efforts and latest technology innovation that will be the gateway to the future. This year we are doing it in India which has been one of the most encouraging and steadily growing markets for Autodesk.

The preparations are in full swing and we will ensure it to be a great experience for everyone who attends. It will be bigger and better than the event we had last year in December which was the Autodesk University Extension.

Aggressive innovations in design technology are transforming the way we make things. Promising new technologies, such as additive manufacturing, 3D printing and advanced robotic automation, have the potential to change how objects are fabricated and assembled. New open and crowd sourcing platforms are helping in evolving and transforming the tools and workflows of manufacturing. Intelligent materi-

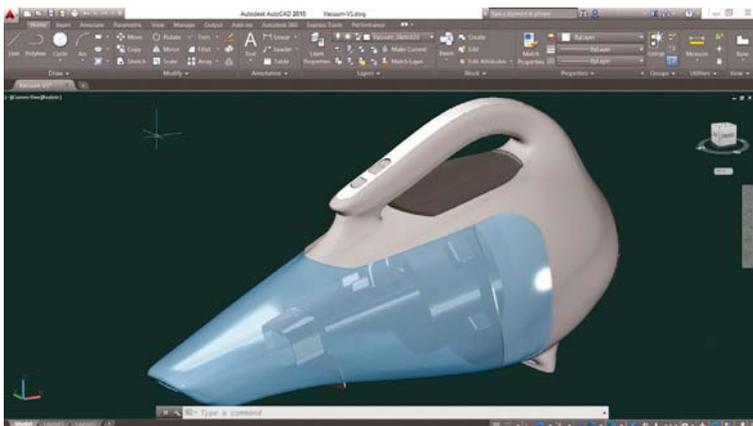
als will enable manufacturers to create products with fantastic new properties.

We have a slew of new technologies that are going to be unveiled this time at the event. The manufacturing industry is undergoing a big transformation, especially in the area of 3D printing. At the Autodesk University, we have the Automotive Innovation Forum where manufacturing professionals can learn to design, create and manufacture with the help of digital prototyping and also watch demos of the latest technologies being offered in the automotive sector. Also, we are launching the Spark 3D printer which will use both the software and hardware designed by Autodesk.

Earlier in May this year, Autodesk released its 2015 Design Suites in India. Tell us about it.

Autodesk unveiled new Digital Prototyping software – geared specifically for manufacturers – that will deliver affordable access to the complete Autodesk portfolio of solutions. The 2015 Autodesk Manufacturing design suites are comprised of Autodesk Product Design Suite (PrDS), Autodesk Factory Design Suite (FDS), data management offerings and a comprehensive Simulation and software portfolio. Both Suites include an enhanced version of Autodesk Inventor, which brings impactful additions to the 3D modelling environment, while also delivering a strong package of productivity improvements.

Autodesk 2015 Design Suites feature tighter integration with Autodesk cloud services. The 2015 Design Suites offer the ability to collaborate, simulate, analyse and more, with just one click from within the suite. One of the things designers traditionally struggled with is the amount of processing power required to run powerful and sophisticated simulations. If you do not have state-of-the-art hardware, running simulations becomes tedious and cumbersome. This is where the practically infinite processing power of cloud plays a crucial role. Autodesk



AutoCAD 2015 showcases the biggest redesign in more than a decade, and is included in the Autodesk Design Suites 2015.



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Published : 25, Jul 2014

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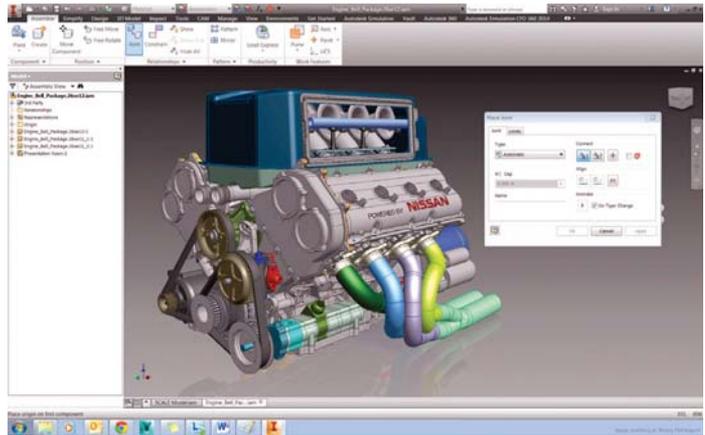
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is helping its customers transition from a PC-centric world to an environment where, through mobile and cloud technologies, the user is at the computing centre of their world.

For the automobile manufacturing industry, CAD enabled digital prototyping is already saving huge sums of money for automakers by accelerating the manufacturing process as they no longer are limited to creating and testing physical prototypes. Now a digital prototype of a car can be used to explore, visualise and model a product even before it is made and can be tested for safety, resilience, durability, balance, performance at the click of a button. Products like Autodesk Alias enables seamless flow of surfaces all the way from the designer's initial sketch to production.



A fully integrated Autodesk Digital Prototyping design environment enables Nissan Motorsport to design and build a racing version of the Nissan Altima in record time.

How is the manufacturing industry deriving benefits from the 2015 Design Suites?

The Autodesk Design Suite has enhanced versions of each software which allows the designers to be far more efficient and enables them to work much faster and reduce errors.

What digital prototyping enables

- Create more innovative concepts and engineer more accurate digital prototypes
- Perform simulations on digital prototypes to optimise designs
- Streamline documentation, data management, and collaboration
- Develop compelling, realistic visualisations to experience products before they're real
- Design, visualise, and simulate your factory layouts.

Each Autodesk 2015 Design Suite includes AutoCAD 2015, the most advanced AutoCAD yet. Manufacturing industry customers gain easy access to new offerings such as Process Analysis 360, a cloud-based service that helps engineers and system designer's model, study, and optimise manufacturing processes. This accessibility – combined with other feature enhancements and refinements – removes the barriers to entry so that everyone can design and engineer great products.

With clear signs of growth coming back, how can the industry in India leverage on digital manufacturing?

India's manufacturing sector has to constantly evolve in order to compete with the highly competitive global market.

Digital Prototyping technology can significantly shrink waste and save large amount of time which is otherwise lost in creating reiterations of product design in the physical world. Digital Prototyping is a revolutionary approach to product development that lets you design, visualise, and simulate products rapidly and cost-effectively.

With sustainability becoming a key business

requirement, what role will Autodesk solutions play?

Autodesk solutions help multidisciplinary teams from the manufacturing sectors to explore, implement, and communicate sustainable design decisions. These processes help product designers, engineers, and manufacturers create, validate, optimise, and communicate ideas from the conceptual design phase through the manufacturing process and delivering innovative products to market faster. The adoption of advanced technologies in the manufacturing sector that can go a long way in cost reduction and facilitating smart and sustainable product development. 3D Design technology is actually the way forward for India's manufacturing sector.

SMEs will be playing an increasingly important role in the evolution of Indian manufacturing. How are your solutions enabling their growth?

Small and medium enterprises (SMEs) are core to Autodesk's business. The SME space is what we understand very well as traditionally our growth has always been dependent on the small designers and companies. As a part of the initiative we have also expanded to Tier II cities like Ludhiana, Coimbatore, Nashik, Surat and Trivandrum. In fact, the subscription-based software purchase and cloud services as a part of our 2015 Design Suites can deliver significant value for SMEs and professionals like architects, engineers and designers.

While the new Design Suite has a lot of new features, enabling subscription and cloud services would be very useful for our customers. We decided to move to a system which is subscription based and can be used as per a user's need and pay only for that time period. One of the things designers traditionally struggled with is the amount of processing power required to run powerful and sophisticated simulations. If you do not have state-of-the-art hardware, running simulations becomes tedious and cumbersome. This is where the practically infinite processing power of cloud plays a crucial role. In addition to that, Autodesk subscription offers customers new purchasing options that enable to choose the plan that best fits their current project needs and budget. 

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Enabling the next growth wave



Enterprise systems are fast becoming table stakes, so the next big push would be to exploit convergence of social and mobile technologies for customer data and sensory data.

By Prasad Satyavolu and Badrinath Setlur

The Indian manufacturing sector has huge headroom to grow as both in-country consumption and exports are projected to grow. An All India Management Association report estimates that by 2020, India Inc. will generate US\$139-365 billion of additional revenue.

Volatile environment

The demand scenario is more dynamic than ever before—and this is further fuelled by a growth in product options. For instance, the automotive manufacturing ecosystem will likely see a spurt in the number of products—from around 165 now to more than 300—over the next three to five years. Impending regulatory changes, recall management, complex labour laws, and sustainability will require specific competencies and value chain redesign. In a survey of 105 companies in 2014 by MIT's David Simchi-Levi, around 39 percent of the participants said they were considering moving some manufacturing back to the US. Various reports point to labour arbitrage between the US and traditionally low-cost countries approaching diminishing returns by 2015.

This is relevant to India because labour arbitrage alone will no longer be a differentiator. Indian manufacturers now face relentless pressure to create innovative and high quality products and components. Increasing numbers of customers are now digitally connected. This has resulted in significant adoption of next-generation technologies such as Social, Mobile, Analytics, and Cloud (SMAC), along with sensors, engendering a complete digital ecosystem, where most transactional and decision processes are digital.

The next wave of innovation

Faced with rapidly changing conditions, how can manufacturing organisations remain market-aligned and synchronised with manufacturing and design? Delivery of first-part-right, right-by-design, right-on-time, and intended customer experience are critical desired outcomes. The questions that call for attention are: What processes in product design, supply chain, shop floor management, in-process quality and production need to change? How can manufacturers leverage information explosion?

There is mounting data to reflect the potential of mobile and internet penetration in India. With more people getting online, the organisations that are able to exploit this will be at the leading edge.

Enterprise systems are fast becoming table stakes, so the next big push would be to exploit convergence of social and mobile technologies for customer data and sensory data from intelligent products, intelligent machines as well as environment (for example, weather and traffic data). These new information sources can create opportunities for service-based business models as well.

Making the most of this opportunity requires manufacturers to visualise opportunities across four overarching themes: Connected products, process excellence, data & analytics, and organisational change management at the grassroots level.

Connected products and machines

While connected products pose challenges of increased cost and complexity of embedding chips and sensors into products, they offer great potential to glean quality data. For example, leveraging real-time product/machine performance



data in preventive maintenance can assist manufacturers in reducing downtime and improving productivity.

Connected product data is used for three purposes: Product identification, tracking and tracing, and product condition monitoring. Track-and-trace initiatives are fairly well established, thanks to the prevalence of bar coding, RFID, and so on. In a Cognizant study about informed manufacturing, nearly 82 percent of the respondents said they were using these technologies for supply chain visibility. Comparatively, automation of product condition monitoring is not as prevalent yet, but is gaining ground, with around 53 percent respondents stating they had at least partially automated it.

While most companies use data internally, there is growing recognition that sharing relevant data with external stakeholders will yield significant benefits across the supply chain.

Excellence through technology

Studies demonstrate that approximately 80 percent of Indian manufacturers have implemented lean manufacturing techniques. The operational impact is undeniable: high productivity, reduced lead time, improved first-pass correct output, and reduced inventory and space requirement. But the Indian manufacturing sector has not leveraged technology enough to enable lean concepts. The perception that the cost of technology adoption is high and the ROI is suboptimal is one of the major hindrances.

This is set to change. The technology market has expanded and the range of available options increased. Cloud technologies enable even the smallest of organisations to adopt sophisticated solutions without high upfront cost and effort. New consumption models based on usage and services, such as time & payroll and procurement-as-a-service, present a wide range of benefits such as increased agility, customised solutions, automatic upgrades, and enhanced business continuity at much lesser costs.

Embrace data

With proliferation of intelligent products and technologies, it is time to become smart about not just capturing data, but also using data to drive critical thinking and decision-making. Studies suggest that companies doing this are able to outperform the industry. In an Economist Intelligence Unit survey, over 59 percent of outperforming companies rated data as being extremely important.

Increased leverage of analytics and data can help manufacturing organisations optimize inventory, enhance productivity, and improve quality. Integrated information management provides better visibility into waste in the manufacturing system. Data-driven thinking entails having



While connected products pose challenges of increased cost and complexity of embedding chips and sensors into products, they offer great potential to glean quality data."

a strategy and right technology infrastructure in place to exploit data. With multiple visualisation solutions available, it is far easier to engage the next generation entering the workforce.

Enable change management

The success of any technology adoption is based on deep employee engagement. The Indian labour situation is a bit complex, what with 44 central labour laws, 150 state labour laws, and innumerable standing orders often taking a divergent view of 'wages' and 'worker'.

The key question therefore is around the role of technology in enabling an adaptive workforce and better engagement. The answer

mostly points to mobile solutions. It is time to think of creative ways to deliver technology attuned to the Indian mobile user experience as boundaries between personal and work areas blur.



Cloud technologies enable even the smallest of organisations to adopt sophisticated solutions without high upfront cost and effort.

Looking ahead

Clearly, there is a great opportunity for Indian manufacturers to grow through technology. This needs a sustained, futuristic and pragmatic effort. Technology can help organisations get more information from products and manufacturing systems, while improving time-to-market, quality, and process efficiency. The new digital and connected world holds far-reaching promise, but requires organisational as well as ecosystem-level initiatives, where value chain partners can adopt common solutions and transform businesses. 

Prasad Satyavolu is Assistant Vice President for Innovation, and Badrinath Setlur is Senior Director of Consulting in the Manufacturing and Logistics practice of IT and consulting major, Cognizant.



Sheet metal expertise and beyond

RadCAM Technologies has a multiple product line so that a mechanical engineering company or an engineering services company can have a single source of supply and support, says **Shiddhalingesh Jolad**, its Director



By **Niranjan Mudholkar**

Q Getting sheet metal design, plant design and engineering calculations right are crucial for the success of any manufacturing business. How is Radcam helping Indian manufacturers on these fronts?

RadCAM was established with vision of serving sheet metal business primarily through Radan. Then we learnt that companies were facing problems in sourcing software for their different needs across entire business. Hence we decided to bring multiple products under one roof and help these companies reduce dependency and today we have multiple product line so that a mechanical engineering company or an engineering services company can have a single source of supply and support and we are working hard to increase the product line to fulfill this dream.

Radan: Does sheet metal design, automatic high performance nesting, automatic tooling and programming, costing, bending calculations and simulation, multi axis laser and tube cut-

ting laser programming. (Product from Vero Software, UK)

Bricscad: It is the powerful CAD software platform unifying the familiar feature set of native dwg with advanced 2D tools and intelligent 3D direct modelling on Windows and Linux. BricsCAD in addition to being extremely similar to use of AutoCAD offers unmatched productivity solutions. (Product of Bricsys, Belgium)

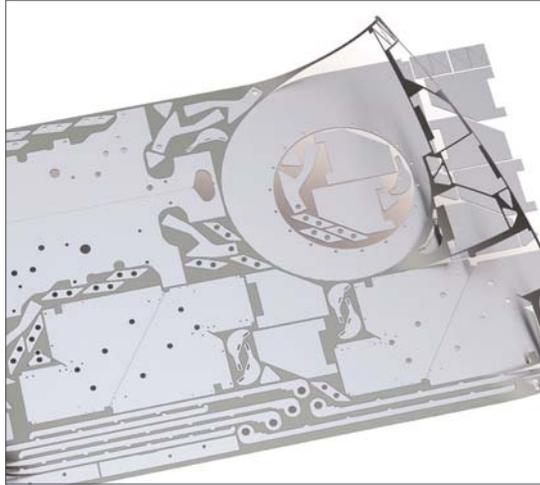
Plant 4D: Plant-4D modules cover complete plant engineering requirements from Basic Engineering – PFD & P&ID to Static Equipment Design to Detail Engineering - 3D modeling (Piping, Equipment, Structure etc.) to Electrical & Instrumentation to Deliverables – BOM, Layouts and ISO's , etc.. (Product of CEA systems, Netherlands)

Q Radcam has strategic alliances with Vero Software UK and CEA Systems Netherlands. How are you leveraging



SUCCESS STORY **£80,000 on material savings**

UK-based Eminox Ltd switched to the Radan sheet metal CAD/CAM software and saved £80,000 on material usage in the first year. According to Alex Mills, the Company's Information Systems Manager, the savings were purely the result of Radan's excellent nesting capabilities. Eminox had changed nothing; In fact, it used the same files and geometry to create exactly the same products. But according to Mills, Radan nests the components far more efficiently than the standard



software provided with the laser cutters. With more than 8,000 active laser parts at any given time, Mark Atkinson, Laser Nester and Production Planner, creates between 40 and 50 Radan nests a day, to create an average of 1,000 parts. The actual combination of parts varies from day to day. And Atkinson believes that using Radan's Project Nesting function enables quicker and more efficient creation of new nests specific to each day's individual requirements. Most nests take approximately five minutes to generate, containing a maximum of 30 different parts on two and a half 2,500 x 1,250mm stainless steel blanks.

Next, the parts are assembled into Eminox's high value environmental control systems such as Eminox CRT (Continuously Regenerating Trap), SCRT (CRT + Selective Catalytic Reduction) and FBC (Fuel Borne Catalyst). These systems reduce pollutant gases and particulate matter in medium and large sized diesel engines on commercial vehicles, trains and offroad vehicles.

Being a just-in-time company, Eminox's ERP software uses the Japanese Kanban style of scheduling which determines what to produce, when to produce it, and

how much to produce at its main manufacturing site in Gainsborough, Lincolnshire. The company builds thousands of systems every year for OEMs and for retro-fitting. Its Laser Module Access database identifies the day's manufacturing demand from the ERP software, which generates the schedules for the production department to know what to cut. It identifies the dxf files corresponding to those parts and quantities, and builds the system files for Radan. Once manufacturing starts on the exhaust system

design, created from Catia, the sheet metal is not touched by human hand till the profiled part is removed off the laser for rolling or bending. No inspection is done at the laser production stage; Mills is confident that Radan will get it right first time.

That's because every part transferred from design to the ERP system is checked by Radan. In case of any issues, like unwanted open contours, Radan won't allow the part to be transferred. The CAD software is completely integrated with Radan using VBA tools. Besides the whopping £80,000 first year material savings, Eminox also got other key advantages from Radan including automation through the VBA capability. With the press of a single key, Atkinson can perform a sequence of operations that would otherwise require six or seven keystrokes. Mills says that he and his team push Radan's nesting functions to the limit. The fact that Radan is developed by a software company makes all the difference, according to him. Now, Eminox is considering investing in CNC machines for laser tube cutting and it will be choosing Radan to program it, irrespective of the machine manufacturer.

on these collaborations for the benefit of your manufacturing clients?

Vero software today is the biggest CAM Company in the world leaving behind Siemens and Dassault systems as per CIMdata. (<http://www.verosoftware.com/news/articles/Vero-Number-1-CAM-Business>). They have a product each for any of your CAM needs, be it wood, solid metal, stone, sheet metal etc.

CEA systems is again a very high end plant engineering company with big names in Oil and Gas industry as its client base across the globe (like Shell, bp, Exxon, Areva).

Similarly our recent collaboration BricsCAD is a Belgian DWG Cad tool, with more flexible real time rendering, archi-

ecture modules, and easy CAD modeling functions.

All these world class products are rightly priced for the territory like India and they give value for money and moreover all these products are user friendly and take hardly a week to adopt to them reducing the lead times and learning curves.

What kind of after sales support do you offer to your customers?

After sales support is very much automated. The customers will have to drop one email to the support team or call and everything is sorted through online desktop sharing tools, cutting on any travelling lead time / machine idle times to the company. 



Enabling efficient engineering

His Company's emphasis is on the competence of optimised and efficient processes, which help customers to be competitive in the long term, says **Ramji Singh**, Country Head, EPLAN India



By **Niranjan Mudholkar**

Q Please explain the thought behind your Company's motto 'efficient engineering' and how does this translate into making manufacturing companies more competitive?

The Company motto emphasises the competence of optimised, efficient processes, which help customers to be competitive in the long term. We advise companies about process optimisation, develop software-based engineering solutions for mechatronics and implement made-to-measure CAD, PDM, PLM and ERP interfaces in order to accelerate our customers' product creation processes. This allows our customers to work more efficiently and reduce their time-to-market. The scope of our work includes a comprehensive range of services, including corporate consultancy to variant management and configuration, process consultancy to standardisation, automation and integration, implementation, training and support services. Our software products and services are of the highest quality and are continuously being enhanced and further developed. This enables us to safeguard the technological advantage and investments of our customers in the long term.

Q Interoperability and data synchronisation are extremely critical aspects in today's competitive manufacturing

“The merger will ensure that we will be able to offer our engineering customers useful solutions in a previously non-existent product range and simultaneously offer a strong depth in consulting and implementation. The international position of Rittal and Eplan will definitely help us to market our products and solutions much more effectively on the up-and-coming markets, especially in Asia.”

Lenz Finster, CEO, CIDEON AG

environment. Recently, EPLAN, in close collaboration with Cideon Software GmbH, made possible the fully automatic data synchronisation between the EPLAN Platform and SAP PLM and SAP ERP. Tell us more about this and its implications for the manufacturing world.

The objective is to also become the leading solution provider in electrical and mechanical engineering – together with Eplan and CIDEON, drawing on Rittal's international position as world market leader for enclosure systems.

Tools for computer-aided planning and design (CAD) have become ubiquitous in industrial development and design departments. The expertise of EPLAN, Kuttig and CIDEON will now significantly streamline the process of product designing as it combines electronic CAD (E-CAD) and mechanical CAD (M-CAD). Another aspect to be taken into account is to ensure connectivity to superordinate software systems. Both Cideon's and EPLAN's systems boast a number of technical interfaces to link up with SAP and market-leading Product Lifecycle Management Systems (PLMs).

Q EPLAN has recently come up with combination of EEC One & Propanel module. How is this contributing to the growth and evolution of manufacturing?

EEC One enables the automatic generation of electrical or fluid power schematics based on standardised macros and components. EPLAN is now expanding this technology to also include control cabinet engineering: mounting panel layouts will soon also be automatically generated. Standardisa-



tion and automation produce significant gains in efficiency. At the same time, the degree of re-utilisation increases substantially. At the Hannover Messe, users got a first glimpse of the software, which will be available beginning in autumn 2014 with the new EPLAN Platform 2.4. EPLAN Pro Panel, the 3D solution for virtual control cabinet and switchgear construction, is an elementary component of the EPLAN Platform. In the shared component database, data is available for EPLAN Pro Panel and is thus also accessible in EEC One. For instance, the 3D macros required, as well as the preassembled standard layouts for mounting plates, will from version 2.4 also be utilised in EEC One. Mounting plate configuration is specified via variables or values.

Subsequently, the components are assigned to the appropriate mounting rails and precisely positioned using placement options with predefined spacing.



EEC One Pro Panel: The 3D solution for virtual control cabinet and switchgear construction



“The fact that we, together with EPLAN and CIDEON, not only offer process consulting and implementation alongside market-leading software technologies for E-CAD, M-CAD and PLM means we

can now provide end-to-end service in these areas. This is unique in the market.”

Maximilian Brandl,

EPLAN CEO, responsible for integrating the software business units of Rittal Software Systems.

Q For a plant to supply the final product, it has to go through various stages including conceptualization, design, communication, integration and production. How does EPLAN help in these different steps to make manufacturing efficient and profitable?

We do not offer a solution of the shelf, but offer carefully matched industry-specific modules. This is based on our extensive knowledge from over 30 years of successful collaboration with companies of all dimensions. EPLAN has got different verticals with different solutions and functionalities to address each stage. EPLAN Preplanning module can be used

to do the initial conceptualization such as Defining and describing machine / higher-level function areas to divide into meaningful structures and units, Preparation of initial graphical overviews as a general planning foundation, Definition of ‘rough placeholders’ for functions or items that cannot be defined yet in detail at this time, Definition and estimate of initial quantity structures (drives / sensors, PLC inputs / outputs, etc.), Creating initial bills of materials in support of calculation and capturing of long lead time components. EPLAN offers different solutions like Electric P8, Fluid, PPE, P& ID, Pro Panel etc can be used for design and documentation. Also the different disciplines/ solutions are integrated with each other which make design work easier, reducing engineering time and manufacturing costs. In this way EPLAN addresses all the areas like Conceptualization, Design. Cideon & EPLAN together come into play a role in Integration of EPLAN Platform and Sap PLM and Sap ERP. EPLAN Pro Panel module helps in smoothening the production process by its features like prototyping in 3D with O/P of mounting list, 3D wire routing, NC data with individual hole pattern & 1:1 drilling template

Q This year Eplan celebrates its 30th anniversary. What is the message on this milestone to your customers?

To quote Maximilian Brandl, President of EPLAN, on reaching this milestone: “Eplan is excellently positioned as a global company and I see huge opportunities in view of growth markets around the world.” As a company EPLAN has grown strong with more than 40,000 loyal customers and more than 100,000 license base worldwide. We have also established three new subsidiaries: Japan, South Africa and Turkey. 



Verifying the vitals!

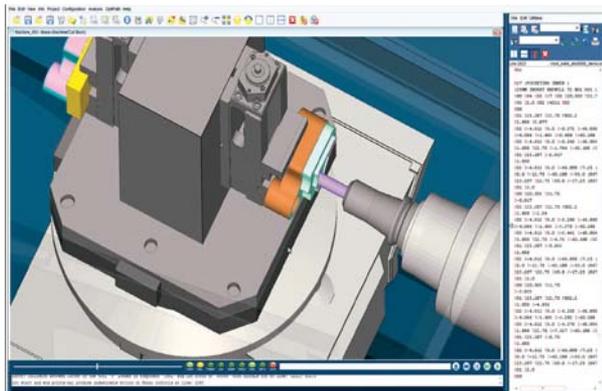
Simulation speed is very important to manufacturers, but so is the amount of time spent preparing a simulation and its accurate representation of the physical process, says **Bryan Jacobs**, Marketing Communications Manager, CGTech



By **Niranjan Mudholkar**

Q What exactly is VERICUT and how is it helping manufacturing companies become more profitable? Since 1988 CGTech's product, VERICUT software, has been the industry standard for simulating CNC machining in order to detect errors, potential collisions, or areas of inefficiency. VERICUT is an advanced solids-based software program that interactively simulates the material removal process of an NC program. It enables users to eliminate the process of manually proving-out NC programs. It reduces scrap loss and rework. The program also

optimises NC programs in order to both save time and produce higher quality surface finish. VERICUT simulates all types of CNC machine tools, including those from leading manufacturers such as DMG/Mori Seiki, Mazak, Makino, Matsuura, Hermle, and Chiron. It runs standalone, but can also be integrated with leading CAM systems such as Catia, NX, Creo Parametric, Mastercam, Powermill, EdgeCAM, Hypermill, GibbsCAM and more.



“The new Reviewer iPad app helps reduce errors in the workshop by visually communicating CNC machining processes to the shop floor. It gives machine operators greater confidence when running new or complex machining operations.”

Q Earlier this year, CGTech announced the availability of its new 'VERICUT Reviewer' iPad App. How does this App help manufacturing professionals? The new Reviewer iPad app helps reduce errors in the

Case study: Reducing prove-out cycle

Generating tool paths for turbine blades can be one of the more complex tasks for NC programmers. With as many as 40,000 lines of code required to mill the blade surfaces to the exact tolerances required, programming and proving-out the data can be a daunting task. Alstom Power Stromerzeugung GmbH recently decided to change its machining strategy for manufacturing turbine blades in order to improve its part accuracy. Alstom switched from multi-spindle to single-spindle machining and invested in five modern Huron machining centres that are networked together and controlled by a Sinumerik-840D. “The machining process with one spindle is easier than with multiple spindles,” explains engineer Rainer Pfeufer. Changing machining strategies also presented an opportunity to improve the NC programming process.

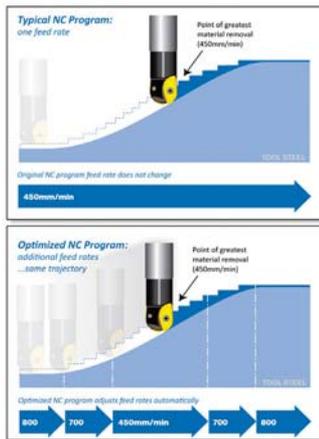
Part of that change was looking into a new NC verification solution. Engineers at Alstom use Catia for design. All CAM functionality, measurement, and quality control are handled by internally developed software. After selecting VERICUT for third-party verification, each NC programmer attended two days of basic training where they experienced first-hand the type of results they could expect to achieve. “Depending on the machining task, we can reduce the part programming time by 5 to 10 per cent,” says Rainer Pfeufer. Additionally, safety is increased as potential collisions between tool, fixture, workpiece and machine components are recognised in advance. But the real productivity gain was evident on the shopfloor. Because programs are quickly and easily tested on the computer, Alstom was able to dramatically reduce the prove-out cycle.



workshop by visually communicating CNC machining processes to the shop floor. It gives machine operators greater confidence when running new or complex machining operations and improves efficiency by quickly referencing current production jobs in meetings, in the factory, during hallway discussions -- virtually anywhere.

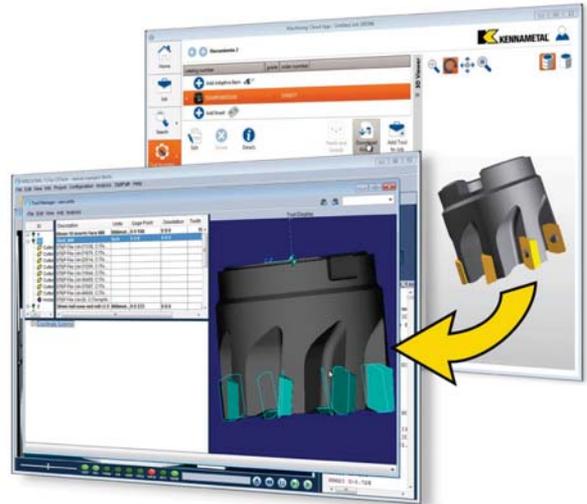
At a trade fair in Mumbai, you also demonstrated the OptiPath module that is known to be a beneficial technology for die and mould applications. Tell us more.

VERICUT is a true knowledge-based machining system: through the simulation process, it learns the exact depth, width, and angle of each cut. And it knows exactly how much material is removed by each cut segment. With that knowledge, OptiPath divides the motion into smaller segments. Where necessary, based on the amount of material removed in each segment, it assigns the best feed rate for each cutting condition encountered. It then outputs a new tool path, identical to the original but with improved feed rates. It does not alter the trajectory. OptiPath has been well received in India.



CGTech will be demonstrating new integration with Kennametal's NOVO application at the 2014 International Machine Tool Show. Tell us more.

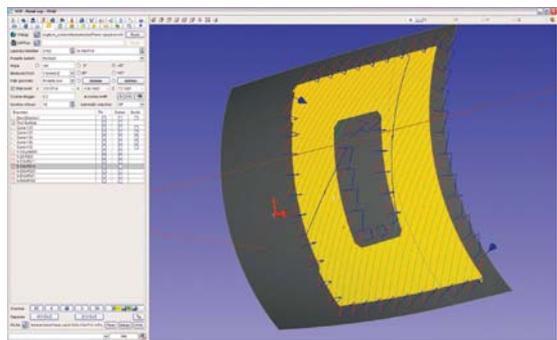
Simulation speed is very important to our customers, but so is the amount of time spent preparing a simulation and its accurate representation of the physical process. We continually look for new ways to reduce the time to setup VERICUT and ensure it correctly mimics the operations. Online catalogs and tool selectors have become common options for manufacturers looking for the latest tool solutions for their production process. NOVO goes far beyond the concept of the online



catalog by integrating Kennametal's application engineering and production experience. As a result of the CGTech-Kennametal partnership, VERICUT users can directly download a Kennametal tool assembly and use it within VERICUT software with significantly fewer steps compared to manually configuring a tool for use in a simulation session.

New developments in automated composite fabrication machines are making this technology relevant across sectors. How are you facilitating this evolution?

Productive automated composite lay-up machinery has become a reality, and CGTech has been at the forefront of this evolution. The technology has been driven by aerospace, but is transferring to other industries such as wind, automotive and even shipbuilding. For over 25 years, CGTech has been constantly improving its VERICUT suite of software for met-



al cutting. But it was in 2004 that CGTech thrust full speed into the world of composites, after being contacted by Boeing (a CGTech customer since 1989) to develop a program for AFP machine simulation for 787 fabrication. This project progressed in 2005 to include the development of a programming solution for AFP machines.

Today, VERICUT Composite Applications are used by dozens of companies to program and simulate their automated composite machinery offline, regardless of the make or model of the AFP or ATL machine. 



hyperMILL millTURN CAM software:
The module is completely integrated in hyperMILL

Safer, better and faster machining

Our main advantage is the possibility to react very quickly – with no loss of precision and quality, says **Rajeev R. Vaidya**, MD, OPEN MIND CAD/CAM Technologies India Private Ltd



Give us a background about your flagship hyperMILL CAM/CAD software.

The company behind hyperMILL is OPEN MIND Technologies AG, a German company with 100 percent holding of Mensch und Maschine SE (also a German company). Founded in 1994, today OPEN MIND is one of the largest providers of CAM solutions. The CAM solution hyperMILL focuses on CAM users, who attach importance to high-end, easy-to-use CAM software with a special focus on the 5 axis market.

During the 90s and thereon the CNC machine tool industry was rapidly growing and subsequently the demand to use these machines much more efficiently and optimally for 2D, 3D and 5 axes machining applications started increasing. At that time there was no dedicated simultaneously controlled 5 axis CAM software to meet these demands. This was the opportunity to develop a dedicated CAM for 5 axis at Daimler Chrysler and then we patented our technology.

Due to very intense challenges in the CNC market we developed dedicated and very strong CAM solutions for the combined applications in MillTurn machines also. Using our patented technology we created a sophisticated set of special application for various market segments, e.g. the turbine industry for power plants and the aerospace market and specific mold and die segments like the tyre mold industry.

What are the various industry sectors where hyperMILL can be used? What are its different applications?

We are covering most of the industry segments. The major focus lies on automotive, especially formula one and tire industry, aerospace, tool and mold manufacturing, mechanical engineering, power and energy sector, medical, watch and jewellery.

Applications of hyperMILL include e.g. engine and structural parts as well as landing gears in aerospace, complex mold and die machining for tool rooms and automotive industry, R&D areas, prototyping. Very famous applications are turbine wheels and rotors, blades, bladed disks, shrouds, impellers and orthopedic implants.

How useful is hyperMILL when creating prototypes?

Prototyping is an ongoing process and it is a very tedious job involving manpower and a lot of man hours. Our main advantages are the possibility to react very quickly – with no loss of precision and quality, because hyperMILL offers powerful CAM strategies and supports CAM changes very fast. That's why our customers save a lot of time.

Do you regularly introduce upgraded versions and new products? How does it affect customers?

We keep updating our software versions at least twice in a year and normally the available current version will be fully capable of handling any changes needed by the automotive industry. This is due to the fact that any user will not be fully utilising all the features in the CAM software and when needed we offer our online support or at site support to solve these issues or upgrades. Most of our users are already informed online if any up gradations are available or needs to be done. Our current installed versions with latest features are far ahead with any of our competitions and innovations still going on, for e.g. Tire Mold Package is a special tailor made package and uses unique 5 axes dynamic roughing strategies

The aerospace industry requires critical components that are often complex and difficult to machine. All this



needs to be done with adherence to the strictest quality norms. What role can hyperMILL play in this scenario?

Indeed, this industry is very challenging. These materials are tougher, lighter and have a very good durability. Aluminium alloys, special steels, Titanium Inconel, high temperature resistant materials and composites are already being machined for many years and many users have adopted conventional methods to machine them. There is high degree of complexity when we do rough machining and then the part goes for any external treatment and once again put back on the CNC machine. We have to be very careful in choosing the correct finishing strategy.

We have made our own experience worldwide in machining of aerospace engine parts like Blades, Impellers, bladed disks, diffuser, casings, rotors, and they need very high degree of dimensional accuracy and finish.

Let's take an example, to machine an aerospace actuator, the material is tough, with complex surface profiles and requires multiple operations and very tight dimensional and surface quality parameters. hyperMILL takes its advantage by using very innovative strategies right from roughing, semi finishing, and final finishing, to cite a few cycles like, 5 axes arbitrary roughing and finishing, rest material removal, production mode, 5 axes drilling, 3D probing, automatic rest machining, and finally collision avoidance plays a very major role as the 5axes CNC milling machine also has some limitations in simultaneous movements. Safety becomes utmost priority and hyperMILL has a very distinct advantage in this area by way of integrating Virtual Machining.

We provide well known and proven cutting strategies to achieve consistent quality. That's why hyperMILL plays an important role in the aerospace industry.

The key advantages of hyperMILL

It addresses the most important issues of the manufacturing area: hyperMILL significantly reduces programming time of high-quality NC programs. It offers a patented, automatic collision avoidance technology to make machining safer, better and faster – e.g. air cutter movements are reduced. The CAM system offers the ability to program the latest machining technology within an easy-to-use user interface. As we also develop the postprocessor technology, hyperMILL comes with an all-in-one PP including 2D, 3D and 5 axis machining which requires no manual editing. Finally, the continuous use of hyperMILL leads to an enhanced tool and machine life.

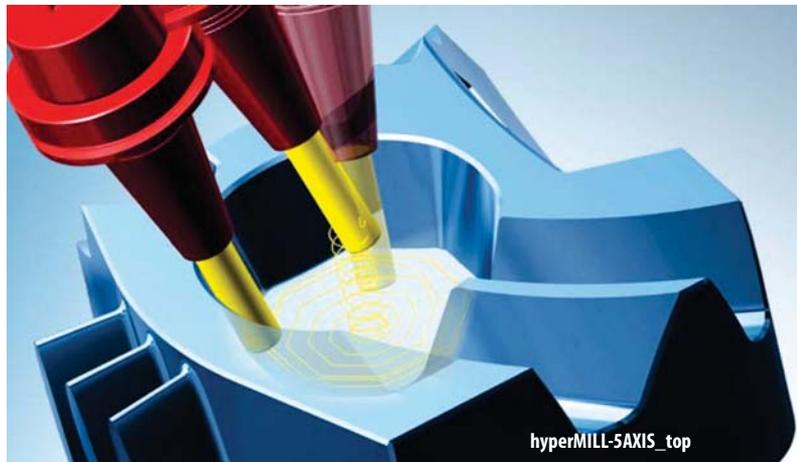
Die and mold industry's success is determined by efficiency, cost-effectiveness and quality of mass production. How do your CAM systems serve these objectives?

Die and Mold industry of today and especially in India is demanding in terms of quick deliveries, quality, and cost. Many customers and tool rooms utilise only the 3D strategy

for these applications. This is prevalent in India. Whereas if you see globally in Europe, US, and China, Japan, they use 5 axes milling machines of different configurations and utilise very effective strategies to achieve economy in terms of mass production of dies or molds and not forgetting quality.

We see a big benefit for Indian companies in the area of 5 axes methodology with Machine and CAM software to get best results. The number of dies and molds are increasing and the 5 axis technology is already in production modes in various big and small tool rooms, (commercial tool rooms also).

hyperMILL CAM strategies are designed to meet these demands. Let me give you an example: starting to machine from a big block of steel, there is a lot of material removal, in fact the costly CNC machine merely becomes a chip making machine. Then follow semi finishing and finishing operations. The machine employs high performance cutters, and other consumables to achieve the best results. To support all



the above factors we employ specific strategies like high performance cutting, e.g: hyperMAXX in simultaneous 5 axes roughing and finishing. Depending on the existing cutting conditions, hyperMAXX dynamically adjusts the feedrate to attain the maximum possible feedrate at all times. This enables highly efficient material removal with high process stability, thereby reducing machining times significantly. hyperMAXX is suitable for the machining of both hard and soft materials.

Do you provide automation?

Yes, we provide an in-depth automation for hyperMILL. World-wide known companies, like Volkswagen, Fiat and Embraer, rely on our intelligent automation solutions. The results are always outstanding and very persuading. After the automation, the user can produce perfect NC programs for e.g. to machine a family of parts with just a few clicks.

One of OPEN MIND's unique methods to drive automation processes is the "CPF" (= Customised Process Feature) that allows the user to identify repeated geometric components and to apply predefined manufacturing sequences for it. This unique OPEN MIND technology will be definitely influence the future of CAM/CAD. 



In search of the

Why on-time delivery in manufacturing has remained elusive for several years?

By Satyashri Mohanty

Most discrete manufacturing plants struggle with maintaining good on-time delivery performance. Consistent on-time performance of high 90s (sticking to committed deadline) is extremely rare. In fact, many organisations have “built-in” low reliability in their commitments; they commit in wide ranges of delivery lead-time or use monthly or weekly buckets to measure delivery performance. Few have the ability to commit to a date and meet it. (The best way to validate this hypothesis is to check the level of skew of dispatches or order completion in a month or a quarter for long lead-time environment. If the order arrival is erratic throughout the month, we expect the due dates to be staggered across the month. However if most of the order completions are skewed towards month or quarter end, it is a sign of poor on-time performance. Skewed completions of orders or dispatches during month-end or quarter-end are an industry wide epidemic).

The real challenge of maintaining high on-time performance in discrete job shops is meeting different objectives, which at times, conflict with each other. The need to maintain high on-time performance can come in the way of ensuring maximum capacity utilisation from the critical work centers.

Evolution of MRP (Material Resource Planning)

Academicians, consultants and plant managers have been dealing with the problem for decades. Attempts were made with MRP, MRPII (also called Manufacturing Resource Planning) and later with Advanced Production Schedulers or Optimisers (APS or APO) to solve the problem.

Each solution tool was designed with limited understanding of the underlying problem. The solutions were also “biased” based on the capability in computing technologies, available at that point of time.

When MRP was invented, it seemed like a panacea for all ills in manufacturing. With the available computing power, one could do a batch process and convert the independent end product demand to demand of dependent components after netting off the available inventory. The “pre-fixed” lead-time of each stage can be used to calculate the due date, and derive the corresponding production or procurement schedule. By touching just a button, one could get to know what “dependent demand” components need to be manufactured/procured, in what quantities and by when. One needed to just

meet the intermediate due dates of components processing to meet the final due date. This seemed like a breakthrough for managers trying to do the same manually wherein the efforts were not only time consuming but were prone to human errors.

While the logic of just using a fixed lead-time to schedule procurement orders was reasonable, it is not suitable for a manufacturing system as it is an erroneous assumption. The capacity usage by loaded orders has an impact on lead-time of new orders. Hence one could not use a fixed lead-time to schedule as doing so would imply that the capacity is being completely ignored.

The gap in MRP (of ignoring capacity) was “plugged” by building in the module of capacity requirement planning – leading to invention of MRPII. After one has completed production schedules, a subsequent step of capacity loading can be checked. With this step process, one



“The need to maintain high on-time performance can come in the way of ensuring maximum capacity utilisation from the critical work centers.”



SILVER BULLET

could find out the over load and under loads on different work centers – which is not possible at time of initial rough cut capacity planning. However if the capacities were overloaded, one was supposed to adjust the demand, which in turn can create overloads in new set of work centers. This process was a near impossible task as the iterative loops can go on forever. The “closed loop” process of capacity requirements planning was only on paper – it never really “closed” in real life. The step process of capacity requirement planning just indicated the load but the iterative adjustment of demand to remove the overloads was a laborious process due to the batch processing technology of MRP.

The “compromise” of accepting overloads at specific work centers discovered only in the execution was normal. However allowing perpetual loading on already over loaded work-centers can lead to a manufacturing system going out of control. Experienced managers have worked a way out of the conflict by using the concept of planning horizon. Within a planning horizon, orders are not rescheduled despite the overloads at work centers. The correction happens at end of the planning period where pending orders, along with new orders, are considered for execution in the next planning period.

In many plants, the planning horizon was set at a monthly level. After every monthly planning horizon, the production planner would take the backlog of orders along with new orders and re-schedule the entire production plan. However, this constant re-scheduling affected capacity utilisation particularly at the beginning of the planning period. This was due to the fact that the latest knowledge of “spill-overs” of current planning horizon could only be known close to end of the period. So, planning for new horizon could be done



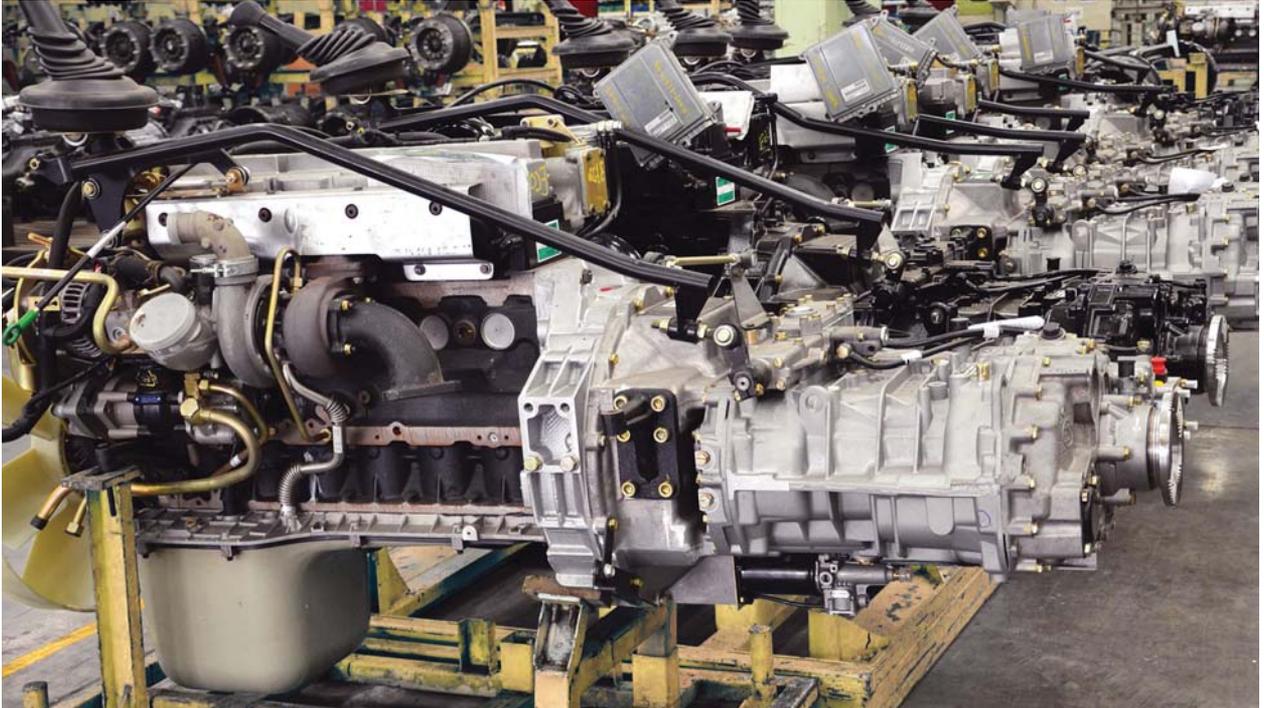
With a capacity buffer on the single constraint resource, one could get a schedule that stays stable without trying to have buffers in many resources.”

when it had already started. Since it always takes time for raw material to be aligned to the new schedule in the new period, there is usually a drop in output in the first part of a new planning horizon. The concept of continuous “rolling” plans invented to solve the problem never worked as many vendors/work centre managers did not make plans. They waited for the fixed plans of the month so that they could avoid manufacturing unwanted inventory. The first part of a planning period is always sluggish. Efforts go up close to the end of the planning period leading to a skew at the end. Because the skew was at the end, the real spillovers of a planning horizon could be known only at the end, which in turn caused a sluggish first half. A vicious loop!

If someone could find a solution to avoid the overloads, the problem would be resolved. The MRP II earned the stigma of assuming “infinite capacity”, and the “quick-fix” solution of capacity requirement planning did not help in any way.

APO: The New Saviour?

With newer technologies of data processing, people found a “technology” solution to the MRP II problem. A good algorithm of optimisation, which can do a simultaneous check against multiple constraints, can provide answers faster than the sequential and batch process approach of MRP II technologies could. The key selling point was the best of both worlds – optimal usage of capacity and other limiting conditions (material or tools) along with high on-time delivery. The capability to do fast on-line processing also made “what-if” analysis and rescheduling much easier than MRPII did. “On paper”, one had found out the way to avoid overloads, right in the planning phase when order due dates were being set. It seemed as if everyone had finally got the



Within a planning horizon, orders are not rescheduled despite the overloads at work centers.

elusive silver bullet!

However most of the implementations of APO failed to give the desired results – overloads happened in execution. The feature of frequent rescheduling actually did not help much. The plants which tried to do so had to stop it immediately because frequent rescheduling amplified a small uncertainty into chaos in the shop floor. In some cases, the schedules churned out by APO tools did not make intuitive sense to shop floor managers so they did not follow it.

Guidelines for creating a highly reliable plant

1. Ensure constraint stays at one place in planning and execution
2. Use buffer in capacity loading while quoting dates
3. Use pull based material release on a constant WIP system to ensure utilisation, rather than depending on precise capacity definition during planning
4. Define a clear priority system for orders
5. Follow daily perpetual demand planning rather than a “bucket” based planning

Faulty Assumption of APO systems

APO was built in a lab without considering the “real world”. The practical world has two problems, which make it difficult to define capacity accurately at any point of time. First, Variability is a way of life – there is no perfect plant without breakdowns, rejections, absenteeism, and even changing demand requests. And second is the changing product mix (capacity available can change based on product mix loaded

on the plant at a point of time).

The combined effect of these two factors makes it difficult to precisely define capacity. Product mix changes impact capacity and so does variability in terms of worker skill, machine conditions and many other factors. It is nearly impossible to consider all possible factors that can accurately define capacity at a point of time.

Because of the above conditions, it is difficult for a computer schedule to match the intuition of a plant manager. A plant manager will always have more information (not considered by the computer) to arrive at a “better” decision. For example a dyeing department would want a specific colour sequence to maximise its output but the subsequent spinning department would want a conflicting sequence based on its need to produce a desired sequence of “count” of the yarn. In the real world, the schedule given by a computer, which has globally considered both, may not be acceptable to either work centre manager. On a specific day, the dyeing manager may want to avoid making the difficult shade of colour (as per the schedule generated by the computer), because the most experienced person who can do the colour mixing without rejections for the “difficult” shade is absent. At the same time, the spinning manager might want to avoid taking up a particular schedule because it is not productive to produce the specific yarn after breakdown maintenance. Such numerous considerations cannot be incorporated in the capacity definition because at times such conditions are also not “rigid” enough to be followed. Considering all such numerous conditions as rigid can de-rate the overall capacity of the plant.

The other problem originated from the very stated advan-

tage of APO algorithms they can optimise under environment of multiple constraints. In an environment of dependencies (the way one schedules a particular work centre has an indirect impact on subsequent work centre), it is mathematically impossible to maximise the usage of multiple constraints to the full capacity. At the same time, when there is variability in the system, namely shortages, rejections, breakdowns etc, there is a need to leave aside adequate buffers in all identified constraint to maintain stability in the system. Without adequate buffers, one would be forced to reschedule very frequently with even minor variation. When multiple work centers are rescheduled on every variation, de-synchronisation sets in feeding departments making the plant chaotic. The waiting time can amplify many times over multiple work centers. Alternatively, if one wants to have a stable schedule from an APO in an environment of multiple constraints and seemingly conflicting objectives, the level of buffers required at multiple places would make the plant stable but reduce the output significantly.

APO investment ultimately resulted in lot of efforts and resources without any meaningful outcome. The plant performance in terms of on-time performance remained at the same level.

The Theory of Constraints Approach

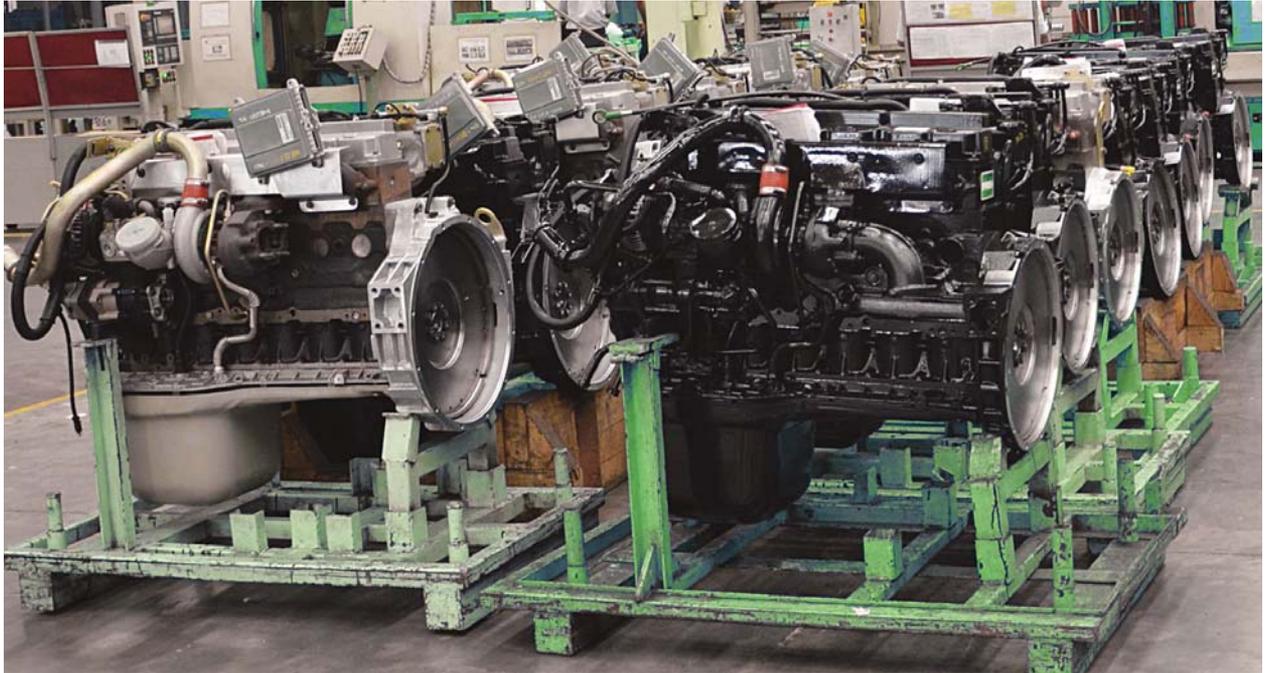
The way to maintain reliability is to have stability in the due date scheduled; variability should not force change in schedules. This required one to keep aside protective capacity while scheduling, which means, practically, there should be only one constraint in the plant. Having many constraints will force one to keep buffers in many places with low overall output of the plant. So with a capacity buffer on the single constraint resource, one could get a schedule that stays stable without trying to have buffers in many resources. This approach can ensure one has the maximum output from the plant as a whole while maintaining a stability of due dates.

This means that other limiting conditions (or constraints) have to be removed. This may seem like an impractical idea due to potential investment required. However, in most plants, various visible “multiple constraint” problem is more of a symptom than a real problem. An environment of very high WIP in a plant can create temporary bottlenecks in many work centers. At the same time, it could also lead to cases of artificial material shortages due to diversion of common material used across orders. When there is lot of WIP, and every work centre is driven by utilisation/

“
The silver bullet
in manufacturing
systems lies in the
approach of “good
enough” planning
(schedule with
capacity buffers)
coupled with a
perfect execution
by the way of
controlling WIP every
day.”



The capacity usage by loaded orders has an impact on lead-time of new orders.



Variability should not force change in schedules.

efficiency, each work centre “cherry picks” components across orders. Also, the consideration for “cherry picking” is different for different machines. As a result production lead-time goes up and order reliability becomes extremely poor. This unreliability creates urgencies/fire-fighting in the plant due to late orders. Urgencies create additional set-ups creating multiple bottlenecks leading to low plant output.

As a first step towards removing the symptom of multiple constraint and associated chaos is to reduce the WIP, and forcefully maintain the WIP at a constant low level. With low WIP, the opportunity to “cherry pick” orders is limited as there are few orders on the shop floor. However, very low WIP can lead to starvation and low output. The way to check if one has excessive WIP is to compare the touch time of an order with the total production lead-time. If the touch time is less than 10 percent of the lead-time, and if there is day-to-day fire fighting with frequent requests for expediting, the WIP is definitely high. In such an environment, halving the WIP does not lead to starvation. Reduced WIP along with a priority system focused on order completions prevents wastage of capacity and the output of the plant goes up. At the same time, with reduced WIP, the real constraint is revealed. As part of the solution, a constant reduced WIP is maintained before the constraint resource. All other resources subordinate to ensure there is no starvation at the constraint resource. The material release to the plant is based on the WIP maintained. So, if the output of the constraint resource falls (due to uncertainty or product mix changes), further material release is stopped to maintain the WIP. Similarly, if the output of the constraint resource increases (due to no murphy or favourable product mix), material release is increased so that there is no starvation

at the constraint. In other words, WIP is maintained. This mechanism of “pull system” of using constant WIP ensures maximum utilisation of the constraint resource without the need to precisely define capacity in the planning phase. At the same time, one could leave behind a buffer capacity in planning (while quoting due dates) without any fear of losing it in execution. This would also ensure that the reliability of orders goes up.

In a plant where reliability (i.e. order due date performance based on initially committed dates) is extremely high, there is no need to follow the concept of a planning horizon or the bucket system of planning. One can follow a system of daily perpetual planning of new orders, without following the planning bucket (or horizon) system for rescheduling based on observation of past period performance. The concept of daily perpetual planning also ensures high utilisation throughout the month.

In some manufacturing plants, there can be cases of interactive constraints due to drastic changes in product mix. The only way to solve this problem is to ensure that orders are throttled in planning as well as releases to ensure constraint stays at one single place both in planning and execution. In the long run, it pays to elevate such temporary bottlenecks to ensure a stable plant.

The execution based pull system of Theory of Constraint takes away the need to be “perfect” in planning. The silver bullet in manufacturing systems lies in the approach of “good enough” planning (schedule with capacity buffers) coupled with a perfect execution by the way of controlling WIP every day. 

The author is Director, Vector Consulting Group (South East Asia).



Mark your diary

A list of key events happening between September 2014 to April 2015, both nationally and internationally

Laser World of Photonics India

September 23-25, Bangalore
www.world-of-photonics-india.com

SPS Automation India 2015

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

Automation 2014

October 15-18, Mumbai
www.iedcommunications.com/index.php

Plastindia 2015

February 5-10, 2015, New Delhi
www.plastindia.org

KnowledgeExpo

November 20-22, New Delhi
www.ciiknowledgexpo.in/Default.aspx

India Automation Technology Fair

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

International Mining and Machinery Exhibition (IMME)

December 3-6, Kolkata
www.immeindia.in

ACMA automechanika

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

India Rubber Expo and Tyre Show

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

ProMat 2015

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

Imtex 2015

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

Hannover Messe 2015

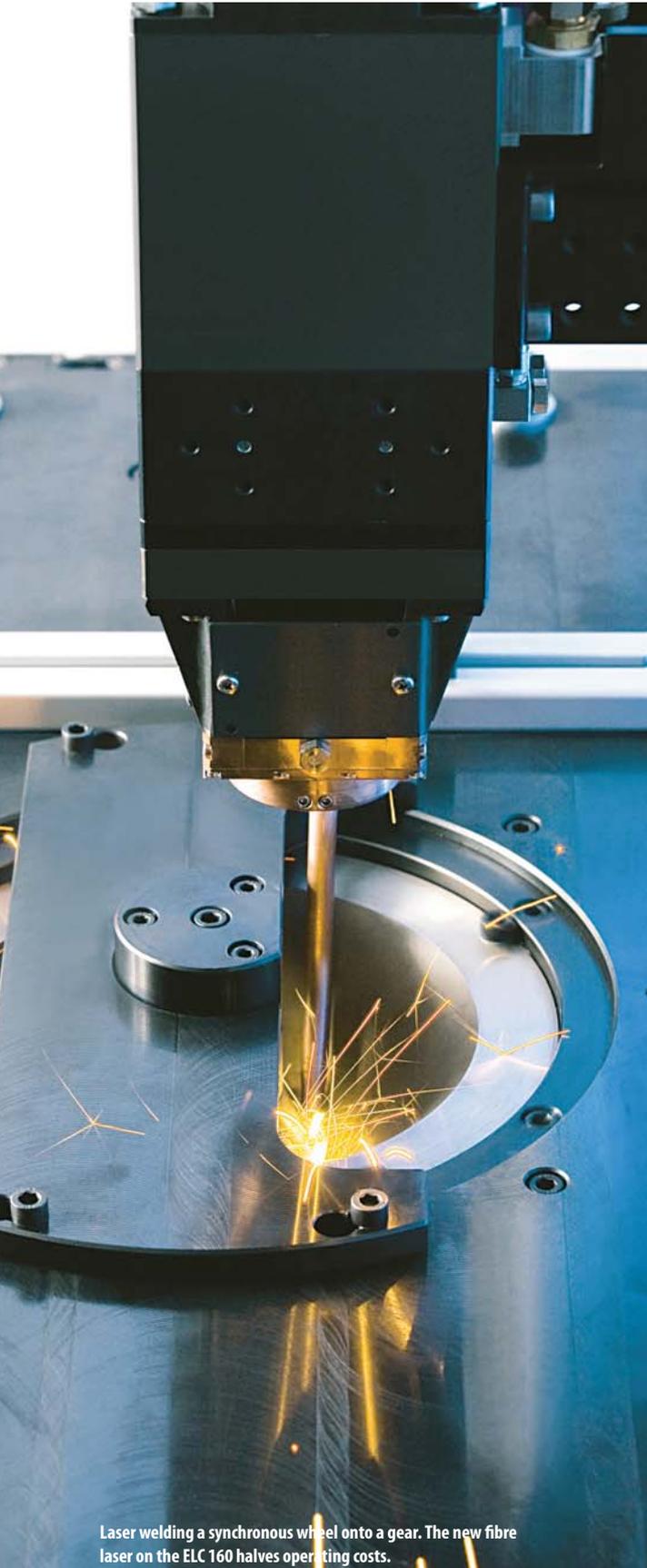
April 13-17, 2015, Hannover
www.hannovermesse.de/home

Machine Tool Expo

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

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Laser welding a synchronous wheel onto a gear. The new fibre laser on the ELC 160 halves operating costs.

NextGEN Transmission Manufacturing

Laser welding can play a decisive role in the manufacturing of a typical transmission component efficiently and at the highest precision.

From Dual-Clutch Transmission to the classic differential: modern transmission technology is a pivotal research sector in the automotive industry. With new materials and altered geometries designers optimise the functionality of the different gearwheels. Furthermore, these wheels are required in ever larger quantities owing to the fact that the number of speed-gears in many passenger cars is on the increase. The innovations that promote the effectiveness of the production processes being applied include, for example, laser welding. With their ELC series of machines, the specialists at Emag have developed integrated solutions for the application of processes with high output rates. The company's in-depth knowledge of the production processes used for many transmission components, has added to its competency.

"The complete joining+welding process for a gear-wheel takes just 12 seconds. This ensures that the components for a differential are thus finish-welded within no more than 40 seconds."

A first glance at a typical transmission component makes it plain where the challenges lie: even a small wheel with integrated synchronous gear represents a relatively complex design. To manufacture it efficiently and at the highest precision calls for the two different parts to be produced separately and subsequently joined in a joining+welding process. It is at this point in modern transmission manufacture that laser welding comes into its own," explains Dr Andreas Mootz, Managing Director, Emag Automation. "The process allows you to concentrate a carefully dosed amount of the energy emitted by the laser beam on the welding point, minimising possible warping, whilst still achieving high welding speeds."

Furthermore, the welding process from Emag uses solid-state lasers of outstanding energy efficiency. Whereas a classic carbon dioxide laser will achieve an efficiency factor of just about eight percent, the Emag specialists can rely on an efficiency factor of approximately 20 percent with their technology. In other words: the power used to achieve the same optical performance is noticeably less, with energy costs in the production department massively reduced.

Stationary welding device scores heavily

Similarly effective within the total process is the integration of different production sequences on the ELC system. For starters, the work spindle uses the pick-up principle to load itself. The components involved are then clamped and pressed together in the joining press. The clamping technology used ensures the highly accurate positioning of the components, providing ideal conditions for the welding process. The design of the stationary optic ensures great operating safety and optimal stability of both machine and welding process. Dependent on workpiece or material, the components can be induction-preheated prior to the welding process and brushed after it – and whatever is required, the process is completed in a single setup. The complete joining+welding process for a gearwheel takes just 12 seconds. This ensures that the components for a differential are thus finish-welded within no more than 40 seconds.



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Dr Andreas Mootz,
MD, Emag Automation and responsible for the development of the production laser welding technology

Laser welding leads to advances in light-weight construction

The differential housing as an example clearly shows the possibilities the laser welding technology opens up in the general development of vehicle production. "For some time now, automotive companies have been replacing the screw-type connection between differential housing and crown gear with a welding seam. The result: the cost of materials reduces and the weight of the assembly falls by approximately 1.2 kg. "When looking at the advances made in light-weight construction in the automotive industry, this kind of savings mean the world," explains Dr Mootz.

The customer benefits from practical knowledge

Seen in context, the welding specialists from Heubach, Germany is able to look back on a truly impressive history of success. Over 50 ELC systems have been sold in the last decade. All leading automobile manufacturers are using them. Emag is the world leader in solid-state laser systems for the production of transmission and powertrain components. How did this success come about? "It is of decisive importance that we have at our disposal a large reservoir

of know-how in the manufacture of these components. We know the whole of the manufacturing process, from turning and grinding, and from welding right up to the concluding ultrasound testing process", emphasises Dr Mootz. "We can develop and construct the whole of the process chain. This massively simplifies the planning of new production sites and the expansion of existing ones."

General market development is positive

The general market development does play into the hands of the German machine builder: It is not only the successful dual-clutch transmission that ensures the need for more gears. Conventional transmission systems too tend to have more speed gears, as this reduces petrol consumption and improves the driving comfort. "Having said that, we are offering a well proven welding technology that provides an energy-saving, high-precision manufacturing process and, at the same time, helps to advance light-weight construction and reduce production costs. This is no doubt a very successful and persuasive combination," concludes Dr Mootz. 



Joining a gear and a synchronous ring on the ELC 160



'On process' thermographic monitoring

Total Thermal Vision is an innovative thermographic detection system for the dies of High-pressure die casting of nonferrous metals

By C. Raone, F. Cecchetto, S. Salini

Total Thermal Vision (TTV) is unique system for the on process thermo-graphic detection of thermal maps of a die through infrared camera(s). MotulTech Baraldi is marking a significant step towards process optimisation, R&D and total process certification of die-casting through its patented 'TTV'.

The constant application of the survey of the surface temperature of the die ensures the accurate and immediate verification of the conditions of temperature, probably the most important variables in the die-casting of light-alloys. The engineering of the system allowed obtaining the information on process 24/7 (online), surpassing the traditional and well-known application of infrared thermography performed exclusively during process start-up or during limited process optimization phases intermittently.

The integration of the measurement of temperature of the dies amplifies the capacity of thermal adjustment of the process through the action of spraying, strategic phase for the improvement of quality and for improvement of die life as well as for the spare of lubricants. In addition to the benefits of process improvement system TTV certifies and quantify in



a scientific and objective way the final condition of the die-casting process and make it available in the history of the final die cast product (Thermal ID).

The certification of the die-casting process is thus enriching it with the combination of traditional 'shot profiles' (including position, velocity and pressure diagrams) together with the thermal maps of the die for each part produced.

TTV is an infrared thermographic detection system specifically created and implemented for die-casting applications. The goal of obtaining an accurate measurement of the temperature of die surface during the working cycle using an infrared camera at every shot each work cycle imposed the challenge in building a device simple and reliable, especially oriented to the harsh context of die casting working cell in the rough environment of the foundry.

The interaction of the system with the automation of the machine-plant is composed by only a few signals: one or more digital starts for triggering the acquisition and optional feedbacks



TTV software main page.

for the management of part rejection or even for stopping the machine. This is, indeed, the strength and the effective engineering of the protection system for the camera, which has allowed obtaining a real industrialised product suitable for the foundry and not just for laboratory tests.

The protective case and the pneumatic system, which protect the camera from heat, fumes, from metal splashes and any other hostile element has already been tested widely with series of several million cycles to ensure a well-established system in the process. TTV also consists of standard devices such as the PC and an IR camera model suitable for industrial process control.

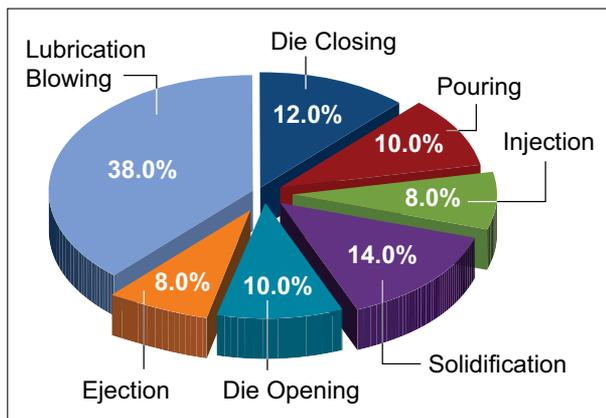
Simplicity and power of IR images

The software for the acquisition of thermal images results as simple as powerful. It allows to view IR images on-time and to make them available for subsequent post-analysis or verification specifically together with filling simulations having real thermal profiles.

The software of TTV consists of no more than seven screens and is very intuitive; using it doesn't require training. As a matter of fact TTV does not require specific knowledge on the theory of infrared but intuitively facilitates the identification of critical points for the surface temperature and with simple actions allows for establishing tolerance limits for 'regions of interest' (ROI) or points of 'thermic interest'.

The measurement and control of temperature result in the identification of a few 'sensible' objects (points or areas) and find the values of minimum and maximum within which to stabilise the process and ensure adequate thermal equilibrium. Very useful in practical application returns the detection of the surface and the acquisition of the 'thermic-map' both before lubrication-blowing and after sprayer action on the die. It comes to evidence that this double information is fundamental for process knowledge and improvement:

- Temperature measurement before lubrication-blowing is needed to better understand where it is not necessary to remove heat;
- Temperature measurement after spraying is necessary to



Cycle time distribution for a DCM.

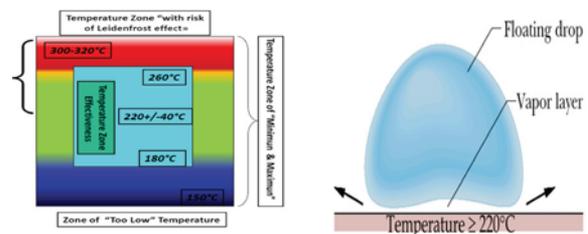
Below we present three different case histories that represent the potential expressed by this system.

Warm-up cycles reduction and optimisation

This case presents the results obtained using TTV system to improve the management of start cycles while ensuring product quality and life of the die. In order to work in a safe way with a complex and expensive die a diecaster decided to set 10 cycles as start-up shots (cycles to be executed automatically with low value parameters of speed and pressure) each time the machine had a significant stop and later reduced to 6.5 cycles with TTV. Thus, it resulted in total savings worth US\$ 232,887 (in one year for one die casting machine).

Cycle time reduction

A diecaster was able to reduce the cycle time from 55 sec to 52 sec with TTV and thus increased production by six percent or saving per year on one die casting machine worth US\$ 91,728.



Process improvement considering Effective Temperature Zone and Leidenfrost effect.

Other significant benefits:

- Significant reduction in lubricant used.
- Reduction of the amount of compressed air and energy consumption
- Important improvement of the thermal efficiency of the mould.

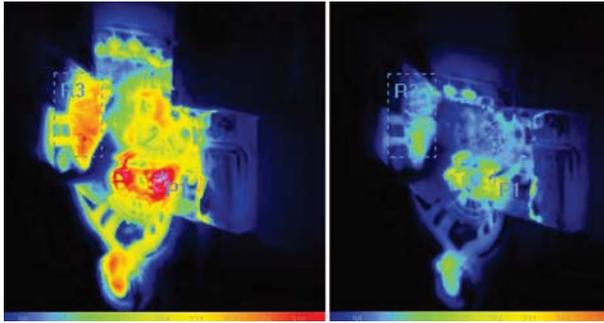
Detection of defects using special analysis

A diecaster has sampled the production using a new die. So decided to validate the new production project with TTV as follows:

Plug problem: A plug of the die has undergone to frequent breaks after intervals of 6 hours. To solve the problem, resize of thermoregulation channels with the input from TTV.

Image subtraction: The subtraction of images applied as post-analysis. Reduction in cycle time by 5.5 percent by modification applied to die cooling channels and optimising the lubrication spraying.

Image superposition: TTV can present a sequence of thermal images as a "movie" and thus giving a quick overview of temperature discontinuities or irregularities.



Movable die before spraying.

Movable part after spraying.

understand if the heat has been effectively removed as required to reach the correct heat distribution / thermal balance.

Moreover both temperature measurements are important to evaluate whether the removal of heat has been performed in the shortest possible time and to assess the effect of the parameters of lubrication/blowing action (e.g. pressure and speed in sprayer cycle). One of the major goals and effective results is a sensible reduction of spraying/blowing time.

Actually the time for lubrication is the biggest portion of the process cycle where it is possible to obtain significant results in terms of reducing the cycle time.

A system easy to use and to install has great impact on process measurement. To use the words of a process engineer who has experienced the system, 'this allows you to see and measure on a die what even an experienced eye cannot see nor evaluate.' Like for the control of the injection process, it is very easy to arrange an archive the historical information on the sequences of die temperatures for the regions of interest and for the control points so as to constitute a complete database concerning the thermic behaviour of the process.

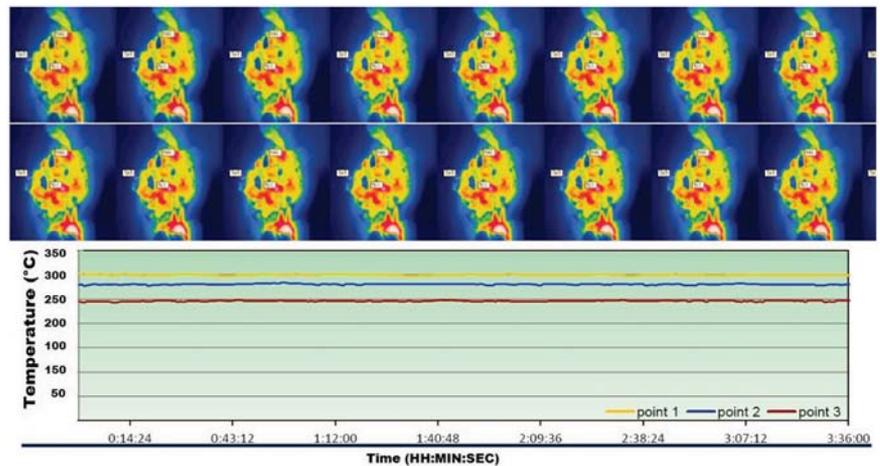
Moreover, the representation of statistical diagrams of temperature values is a tool that optimally represents the degree of stability of the process and highlights the anomalies or inefficiencies as represented in the pictures.

Spot checking vs fully automated survey: **There is no doubt that an important component of this system is the systematic application "online" during production pro-**

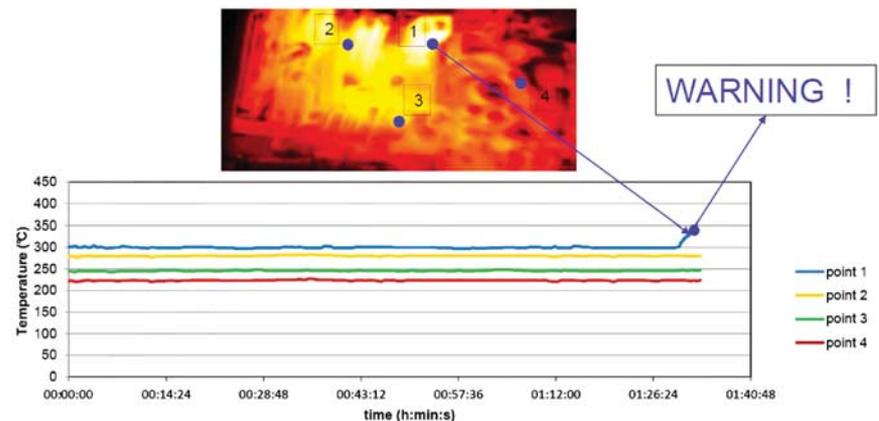
cess. The thermographic measurement becomes a standard process variable with all the elements of objectivity and comparability that arise. It is no longer a survey 'impromptu' which is executed in the start-up phase or during sampling but it is part of the automation process itself.

The use of the IR camera for occasional reliefs has the function of providing temperature measurements with the goal to refine thermoregulation and lubrication/blowing cycles. Sometimes this operation leads to useful and interesting information for process diagnostics and improvement. This way of using IR camera, is usually performed by the mean of a mobile device. This technique has certain disadvantages like 1. Too infrequent to detect sporadic phenomena and anomalies, 2. Has poor reproducibility and objectivity, 3. Collects a limited number of samples, and 4. Often is performed with interrupted cycles, such as 'stop and go'.

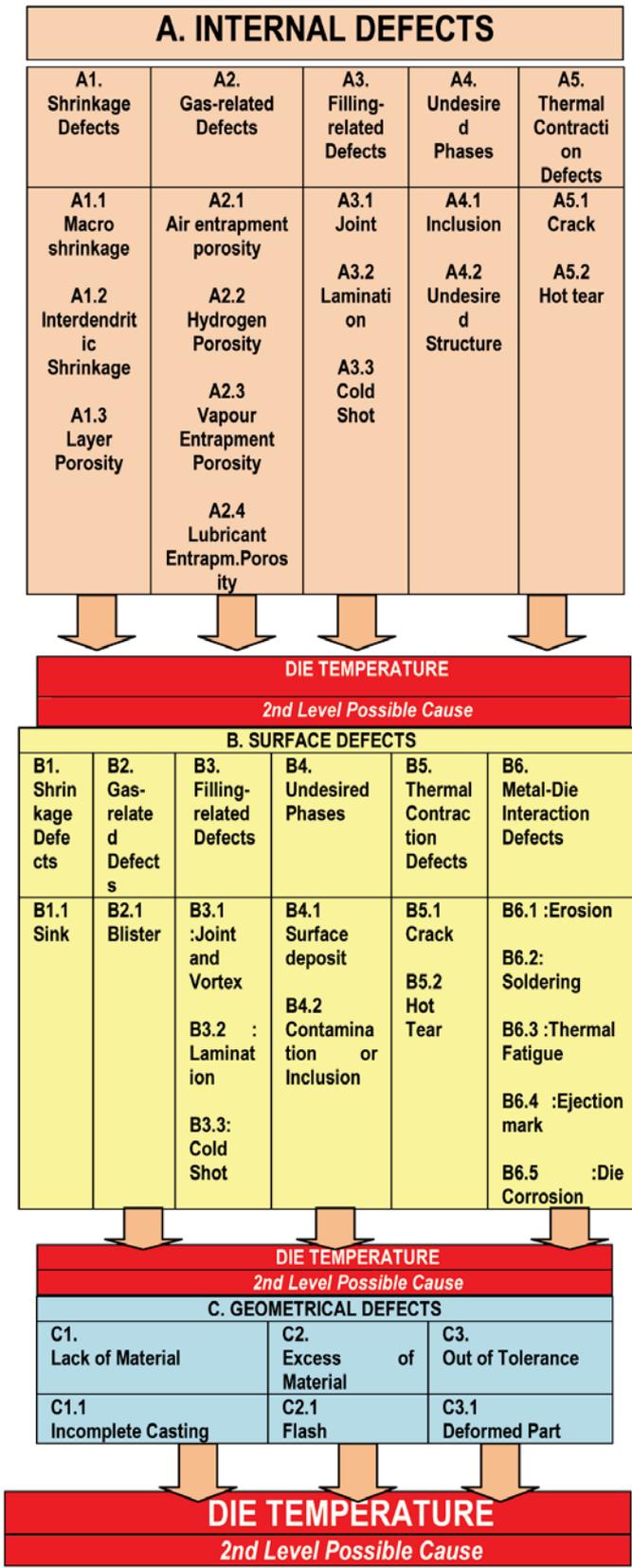
The on-line application of the thermographic measurement performed at every cycle has more important benefits added to the aforementioned objectives. This way of use also permits to catch even minor process failures and to monitor continuously the plant. With many advantages, it identifies for every cycle if a temperature is not in tolerance and also enables immediate



IR images and temperature trend on three different ROIs.



IR image and monitored temperature trend over four ROIs.



From NADCA diecasting defects classification.

TTV and Thermic behavior of Die

TTV system provides valuable information to improve the process providing data and making them easily interpretable through images illustrating the conditions of thermal equilibrium of the die.

It also provides objective and reliable information for the project and for the revision of the die design. In conjunction with the use of simulation; thermographic survey during sample procedure can be used in the process of simulation as precise and realistic thermal boundary conditions.

An accurate knowledge of thermal behavior of die always leads to an evident improvement of the complete process as shown in the following pictures representing the die surface temperature of some selected area measured for an initial period of monitoring using TTV and after having applied the analysis process to improve and keep controlled the process with TTV.

action upon detection of anomaly, Moreover, it allows post-analysis for better understand process variables and dynamics and can be active 24/7.

Direct and indirect benefits of thermographic monitoring

The nomenclature of diecasting defects shows that the die temperature is the most influential variable on most of the anomalies of production.

Through thermographic survey most of these cases can be detected offering the knowledge base for acting on: thermoregulation, spraying cycle setup, cycle time, external conditions.

The direct relationship between the possible faults and generalised qualitative and the mould temperature, the measured variable and guarded by TTV, has an intuitive and immediate explanation, even before any thorough scientific analysis: the process of injection of the metal into the mould cavity is summing elements mechanical, hydraulic, fluid dynamics and metallurgical involving a complex heat exchange but that are 'imprinted' also on the surface of the mould which, in turn is covered by a delicate heat exchange.

The opportunity to measure this important process variable introduces a degree of control over the quality of the final product. 

The authors work with MotulTech Baraldi.



RoHS-compliant high performance plastics bearings

The extended EU Directive 2011/65/EC (RoHS II) became valid at the beginning of the year, therefore tightened the permissible limits for hazardous substances in more and more areas. From the 22nd July, products with unacceptably high concentrations, such as lead-containing plain bearings face extinction in the Medical Technology industry. igus offers iglidur polymer bearings as a RoHS-compliant alternative that promises legal and functional reliability to the manufacturer, and safe use and disposal to the user.

Since the mid-1990s, limitations on the use of environmentally hazardous substances were enforced for electrical and electronic devices and their components all over Europe. Steadily tightened guidelines under the abbreviation 'RoHS', (Restriction of [the use of certain] Hazardous Substances) set limit values for the use of industrially-necessary but potentially harmful substances such as, chromium, lead, mercury or bromine. With the new RoHS II standard, a maximum value of 0.1 percent of the total weight is determined for most. Many manufacturers changed their production accordingly in the past, and others must now respond because exemptions, such as for the medical and control technology, will expire soon. Since similar regulations are also put in place in countries such as the US, Japan or China, these standards must be met increasingly with a global perspective. However, metallic composite bearings often have alloys that are not compliant with RoHS.

Reliable planning and amendments: Customers, who consider the RoHS compliance, have an immediate alternative with iglidur bearings. This is because the substances covered by the Directive basically have no role to play in this material made of thermoplastic compounds. Based on the principle of dry lubrication, the iglidur bearing technology uses tribologically optimised base polymers, solid lubricants and fillers of exclusively non-metallic and RoHS-safe ingredients.

The provisions of the RoHS Directive are also subject to



Just one example of the variety of RoHS-compliant iglidur materials is iglidur G, which is suitable as a universal material for the most diverse applications (Source: igus GmbH).

permanent review and thus there is the possibility of future revisions of the legal requirements. Manufacturers, whose equipment and components today fulfil the admissible limits, or are even excluded from the standards today, must expect a further tightening. iglidur polymer bearings provide planning reliability today. In addition to their "traditional" advantages of freedom from maintenance and lubrication, all igus products are without hazardous substances. RoHS compliance is therefore one of the natural features of iglidur plain bearings. The igus plain bearings are safe not only in terms of laws and regulations. By the option of life prediction and configuration using online tools, all metal bearings can be replaced quickly and easily by iglidur plain polymer bearings.

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Contact cooled rotary screw air compressor

Ingersoll Rand has forayed into the Uttar Pradesh market with the launch of Evolution, its recently launched brand of contact cooled rotary screw air compressor. The new 'made in India' Evolution brand has been designed specifically to meet industry requirements while delivering energy efficient performance. With the Evolution range of air compressors, Ingersoll Rand will be covering Small and Medium Enterprises (SMEs) and focusing on all key sectors in the state.

The Evolution range of compressors are designed with the latest technology providing prominent benefits including more CFM/kW, low maintenance cost, long life Ultra-coolant, three stage separation system, efficient cooling at 46°C and control at fingertips.



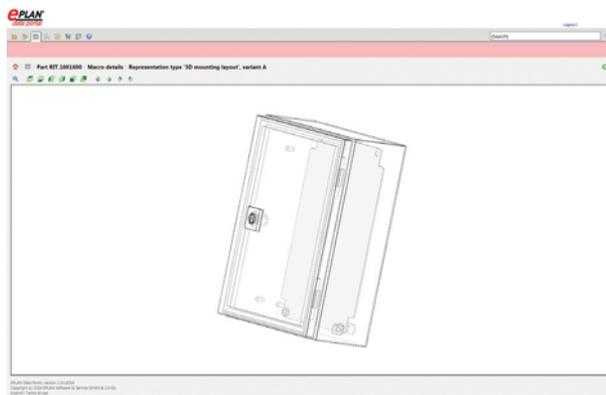
(Re)Launch of a new data portal

It comes with an integrated 3D viewer, a new surface with manufacturer logos in the grid, additional manufacturers and updated component catalogues.

The new version of the Eplan Data Portal is available since August 2014. Users will benefit from enormous time savings and increased project quality. The current 470,000 part data, including schematic macros, geometric dimensions and documents, can be imported to engineering automatically. This is made more simple thanks to innovative functions such as a newly integrated 3D viewer, which enables users to view and assess components quickly and easily. It is possible to call up several different views such as front, page or isometric views very easily with a click of the mouse. Free rotation and zooming functions allow that individual detailed views can be generated in a very flexible manner. The advantages for the user are obvious: When placing the part in the project, they receive reliable decision support as to whether the component is suitable for the proposed control cabinet, for example.

Innovative operation with feedback function

The surface of Eplan Data Portal has also been optimised. The view of the 66 manufacturers that are currently involved has been adapted to the design of Data Portal App. Displaying the manufacturer logos in a grid speeds up navigation. The feedback function has also been expanded. Users can respond to manufacturers in the application directly, for example if they want to send information about missing components or faulty representations. This means that the quality of the data is constantly increasing. The manufacturers involved also reap the rewards: the feedback function provides a direct line to the customer. The manufacturer knows what is required in concrete terms and can fulfil the user's requests in an optimal manner. The improved search function is another new addition to the portal. Search requests for article or type numbers are directly displayed as the first search results – this means the right component can be found faster.



The 3D viewer allows several different views such as front, page or isometric views with a click of the mouse.



470,000 part data including schematic macros, geometric dimensions and documents can be imported to engineering automatically using the Eplan Data Portal.

66 manufacturers with more than 470,000 records

The Eplan Data Portal has made a major leap forward in terms of functionality and in regard to the manufacturer catalogues. Since the last update in July, five new product catalogues have been added. A further ten product catalogues have been expanded and updated. The number of devices has gone up by over 20 percent; more than 470,000 available now. The Italian firm Finder are now represented with almost 700 records. Another addition: ifm electronic, which supports its customers with almost 500 records in the fields of sensors and evaluation systems. The new integration of the Vega configurator is interesting. The user is provided with standard components for process measurement technology from Vega Grieshaber KG and also has the option of selecting and configuring components as per project demands.

Updated and expanded data

Manufacturers that were already integrated into the Data Portal have also amended or expanded their product portfolios. Siemens, for example, has set up more than 2,100 records from the 3VA series in the portal. As well as the commercial data and the switch symbols for Eplan and documents, 3D data including production information is also now available. SMC Pneumatic has updated and expanded its product spectrum. Fluid users now have a variety of cylinders, valves and tubes at their disposal since there are now more than 15,000 records to choose from. ABB, General Electric, Icotek, Helukabel, Numatics, Rockwell Automation, Sick and Wieland have also updated their product ranges in the Eplan Data Portal.

Conclusion: Users benefit from a constantly increasing amount of device data – combined with an innovative technology that supports efficient design.

More information: www.eplan.de/edp



Polygonal Clamping Technology

S chunk, the competence leader for clamping technology and gripping systems sets new standards in high-speed cutting. The Schunk TRIBOS-Mini HSK-E 20 polygonal tool holder is the first standardized precision tool holder for micro machining with the pioneering HSK-E 20 spindle interface. In comparison to conventional steep taper interfaces, the HSK-E 20 interface provides an axially flat work surface for the tool holder, ensuring excellent change and positioning accuracy, but also a high process reliability. Also, the narrow tolerances of the tapered seat ensure maximum precision and superior running smoothness at high rotation speeds.

With a concentricity and repeat accuracy of < 0.003 mm at an unclamping length of 2.5 x D and a balancing grade of G 2.5 at 25,000 rpm, the TRIBOS-Mini HSK-E 20, which is manufactured exclusively at Schunk headquarters in Lauffen upon Neckar, fulfills the highest demands. It is suitable for all tool shanks in h6 quality, transmits torque up to 4.5 Nm (at ø 6mm) and makes high rotational speeds



TRIBOS-Mini HSK-E 20 offers users in the watch and jewelry industries, medical and dental equipment, as well in die construction, new opportunities for high-speed cutting.

of up to 85,000 rpm possible. Like all polygonal tool holders from SCHUNK, the mount has no movable parts, which almost guarantees almost completely maintenance and wear-free clamping. Even after several thousand clamping rounds there are no signs of material fatigue on the tool holder. Both the precision on the work piece, and the service life of the tools benefit from the excellent concentricity properties. Since even extremely small shanks can be clamped, there is no need for time-intensive and expensive special tools. Process reliable tool changes can be done in seconds with the help of a hydraulic clamping device. The micro specialist is available for ø 1.0 mm, 1.5 mm, 2.0 mm, 3.0 mm, 4.0 mm, 6.0 mm and 1/8". The L1 dimension is 35 mm. In addition, smaller shank diameters of 0.3 mm and up, intermediate sizes, and other special designs are possible.

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Enhanced tooling performance

Seco recently improved the productivity and process safety of its line of Jetstream Tooling products through multiple enhancements, including a new lever clamping design and optional roughing inducer. These extras further increase the performance levels of Jetstream Tooling, enabling manufacturers to attain higher productivity and part quality by removing heat from turning applications.

A lever clamping design replaces the original pin-clamping systems for negative inserts to establish several new Jetstream Tooling advantages, including better indexing accuracy and prevention of insert movement under high loads in roughing applications.

On shanked toolholders equipped with Jetstream Tooling Duo, an additional coolant outlet underneath the holder directs a jet to the secondary heat zone just below the cutting edge. This boosts cooling efficiency and part quality. Additionally, an optional roughing inducer can be ordered separately to adapt the coolant jets for larger depths of cut and higher feed rates. On all inducers, the coolant outlet design



has been improved to obtain further precision and efficiency of the jet.

For more information visit www.secotools.com/in;
Tel: 02137-667300;
Email: seco.india@secotools.com



The **biggest** success by
winning the UEFA Cup in 1997

Jens Lehmann, a German goalkeeper legend



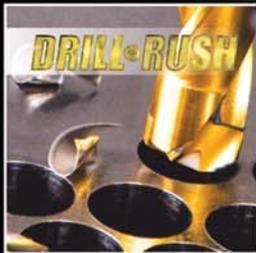
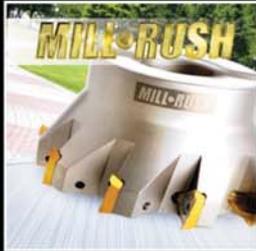
The **largest** chuck jaw program
with 1200 products

Claw jaws, a chuck jaw from SCHUNK

Thilo Schumacher, Production Department Chuck Jaws,
Master Area Special Chuck Jaws

Superior Clamping and Gripping





IT JUST GETS BETTER



MILL 2 RUSH

TOTAL
GR
SOLUTIONS



Die & Mould



Wind Power



Shipbuilding



Railway



Aerospace



Power Generation



Automotive



General



Miniature