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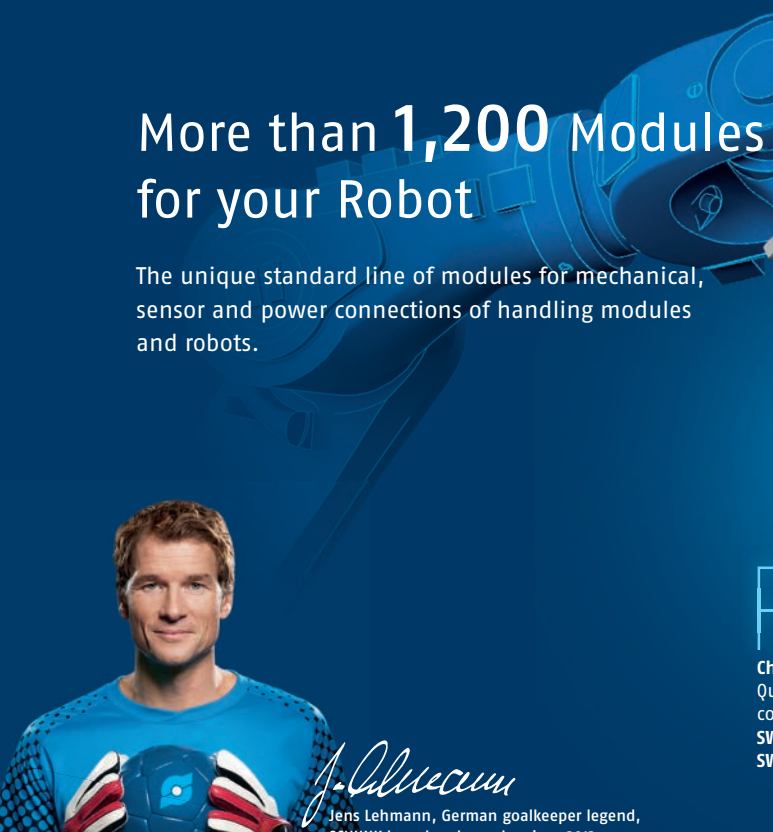

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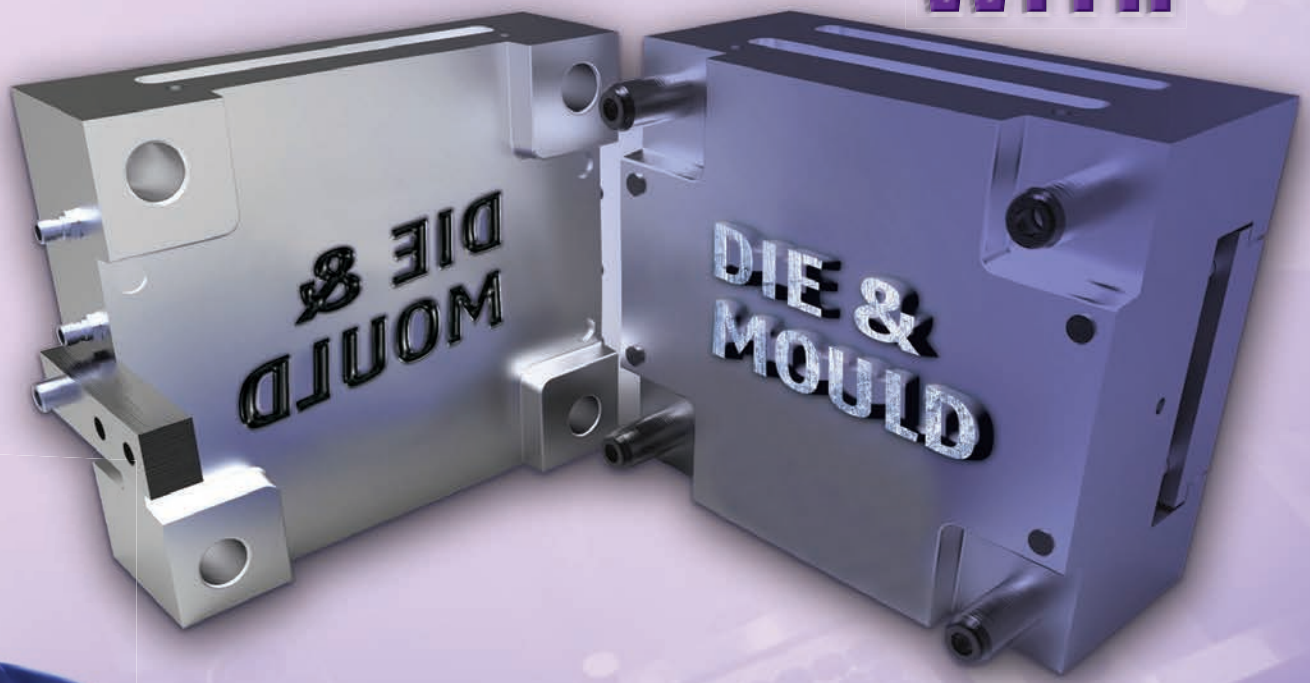

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PG Jadeja
President, Indian Machine Tool Manufacturers' Association (IMTMA) and
Chairman & Managing Director, Jyoti CNC Automation Ltd

Creating a Roadmap for Economic Growth

Dear Readers,

India's economy has recorded a steady growth amidst the global hemisphere of uncertainties. Finance Minister Arun Jaitely while presenting the 2016–17 budget called India a bright spot. Offering stability and opportunities, India's manufacturing sector and its machine tool industry are brimming with confidence as never before.

India's Rail and Union Budget that were released last month reaffirm its commitment to ensuring macro-economic stability and prudent fiscal management. The budget has brought certainty in taxation. The slew of reforms proposed to be introduced in rural economy, infrastructure, Make in India, banking, exports, taxation, foreign direct investments, etc will ease the doing of business.

The Rail Budget proposal to set up two new locomotive factories, three freight corridors and a first ever rail-auto logistics hub will spur manufacturing. The Union Budget on the other hand marks a paradigm shift towards empowering the farming sector, rural and semi-urban areas, small enterprises and the underprivileged. The allocation of funds for development of these areas will lead to higher domestic consumption, industrial production and demand for manufactured goods.

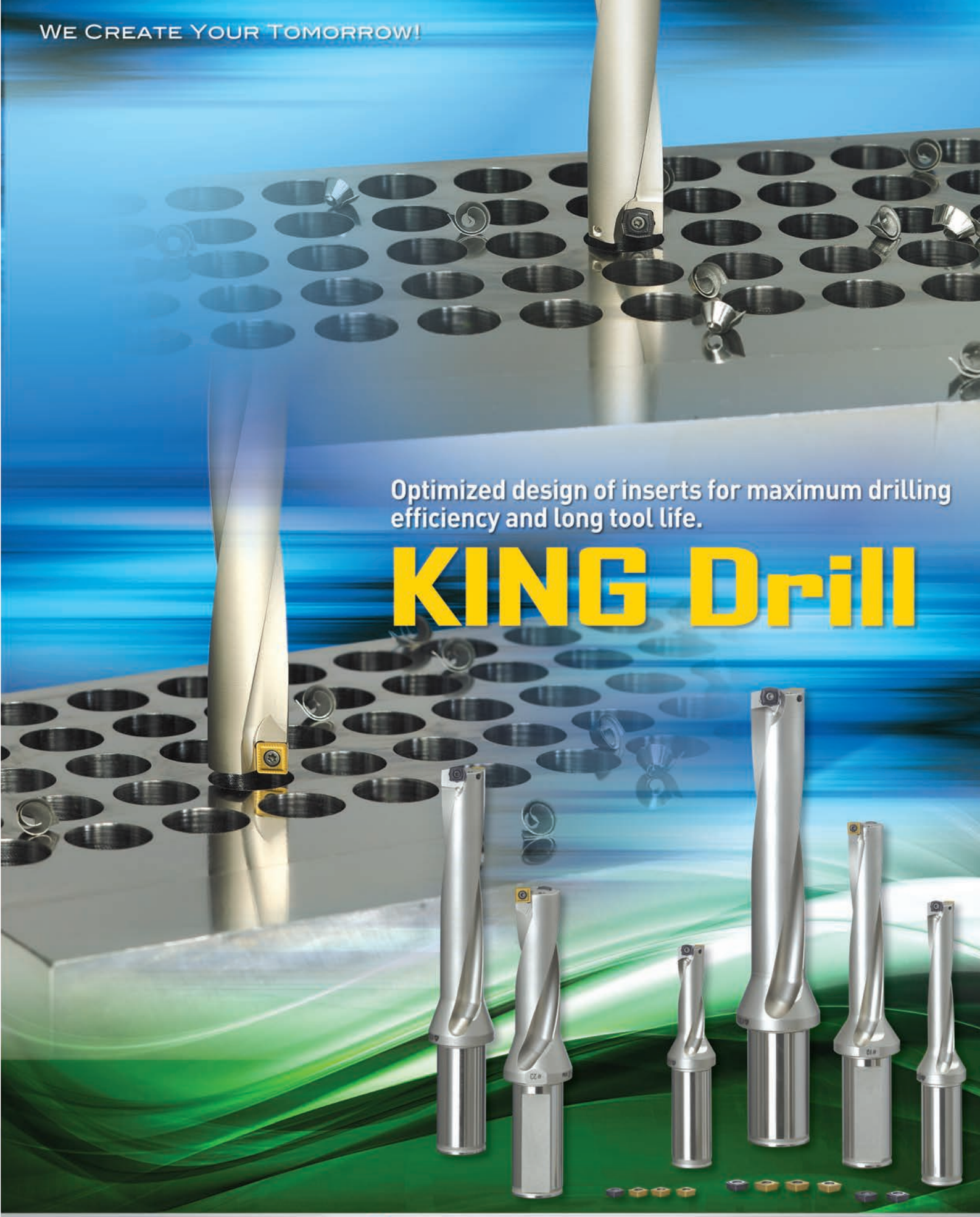
The industry welcomes the ministry's move to control fiscal deficit at 3.9 per cent for FY16 and 3.5 per cent for FY17 while going ahead with the planned development. Setting up of the National Board of Skill Development Certification in partnership with the industry and academia will ensure availability of skilled manpower for the industry. Changes in customs and excise duty rates on certain inputs to reduce costs and improve competitiveness of the domestic industry in capital goods, defence, textile, chemicals, petrochemicals, overhauling of aircrafts and ship repair will propel the 'Make in India' initiative.

Reduction in corporate tax for small enterprises will aid the production capacities of the SMEs. Development of roads and railways will help improve passenger and freight movement. Revival of unserved and underserved airports will improve connectivity. The announcement of a new Digital Literacy Scheme for rural India to cover six crore additional households in the next three years will result in more use of digital technology for administering taxes and issuing secure education certificates. Allocation of funds under the Swachh Bharat scheme will give SMEs engaged in manufacturing of cleaning equipment an uptick in their business.

Vibrant manufacturing is critical for India's economic progress. The incentives given in the budgets are but an initial step. It will take some time for these to trickle down to end users and result in the demand for goods and services. We are however confident that with the momentum given by the budget, the industry will once again pick itself up to move directionally on track.

As over the years the Indian Machine Tool Manufacturers' Association (IMTMA) is fully committed to supporting the machine tool industry in innovative ways. IMTMA will be holding a regional machine tool expo in Pune and its flagship IMTEX (Metal Cutting) exhibition in Bengaluru next year. More initiatives are on the anvil.

In this edition of MMI you will read more about manufacturing as an engine for economic growth. I am sure that the contents herein will be very valuable for all the readers. I would like to conclude by calling upon the industry to whole heartedly support our initiatives and join hands with IMTMA on its road towards manufacturing growth. I wish you all the very best for the year ahead.



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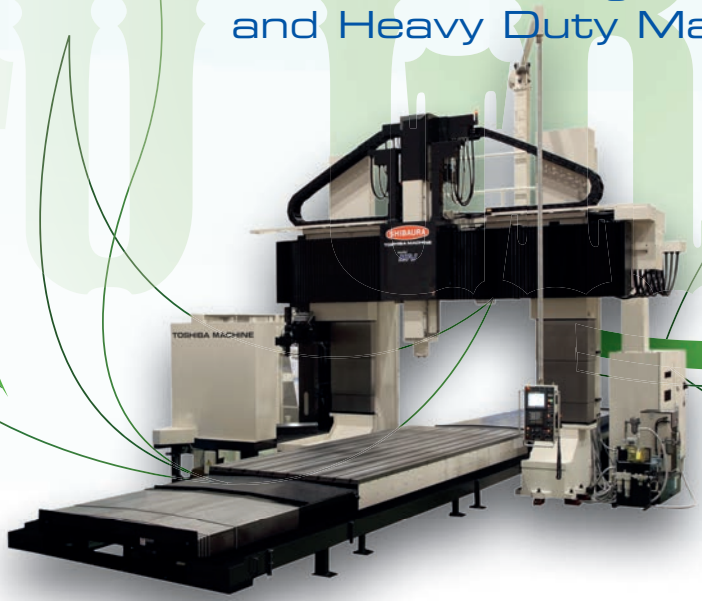

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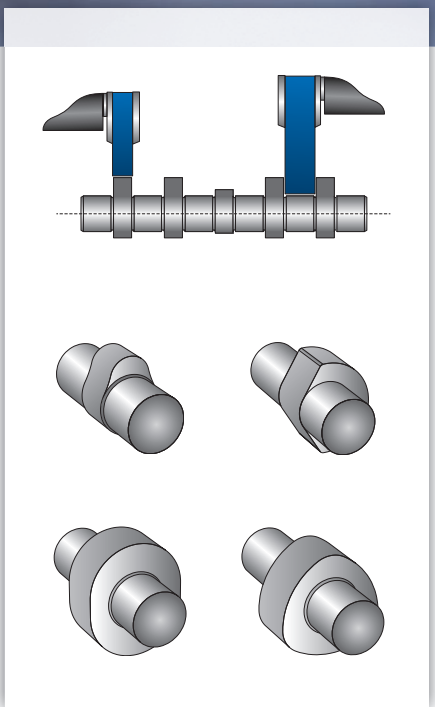

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Room to Grow and Groom!

Finance Minister, Arun Jaitley brought to the forefront several policies in the Union Budget 2016 that are favourable to the 'Start Up India, Stand Up India' initiative. The announcements made have a strong focus on boosting the start-up culture and encouraging entrepreneurship in India. Several measures such as simplification of registration process, low-cost patent registration, compliance regime based on self-certification, setting up of `10,000 crore start-up fund, research parks, faster exit norms, relaxed norms of public procurement for start-ups, tax exemptions to start-ups in the form of exemption from income-tax and capital gain taxation were highlighted in the budget.

"Things work out best for those who make the best of how things work out."

~John Wooden

The new manufacturing firms established from March 1, 2016, onwards, shall be taxed at 25 per cent (plus cess and surcharge) and with no further exemptions available for the companies if they choose to be taxed at 25 per cent. Previously, the flat corporate tax rate was 30 per cent (plus cess and surcharge). The investments on capital expenditure are huge, and a 5 per cent curtail in tax payable will allow such funds to be routed in more capital infusion expenses.

With a raft of tax incentives and proposals perhaps entrepreneurship in India will witness a boost and contribute towards 'ease of doing business in India' and facilitate the 'Make-in India' campaign successful by creating jobs through domestic manufacturing.

In this backdrop, we bring you the perspective of industry players on the budget and how India's oldest industry sector—die and mould is riding the success wave.

Furthermore, we welcome you to the DIEMOULD India 2016 exhibition scheduled to be held next month, and witness the magnificence of 'Make in India'.

As always, we wish you a happy read and welcome your feedback on the issue!

SM

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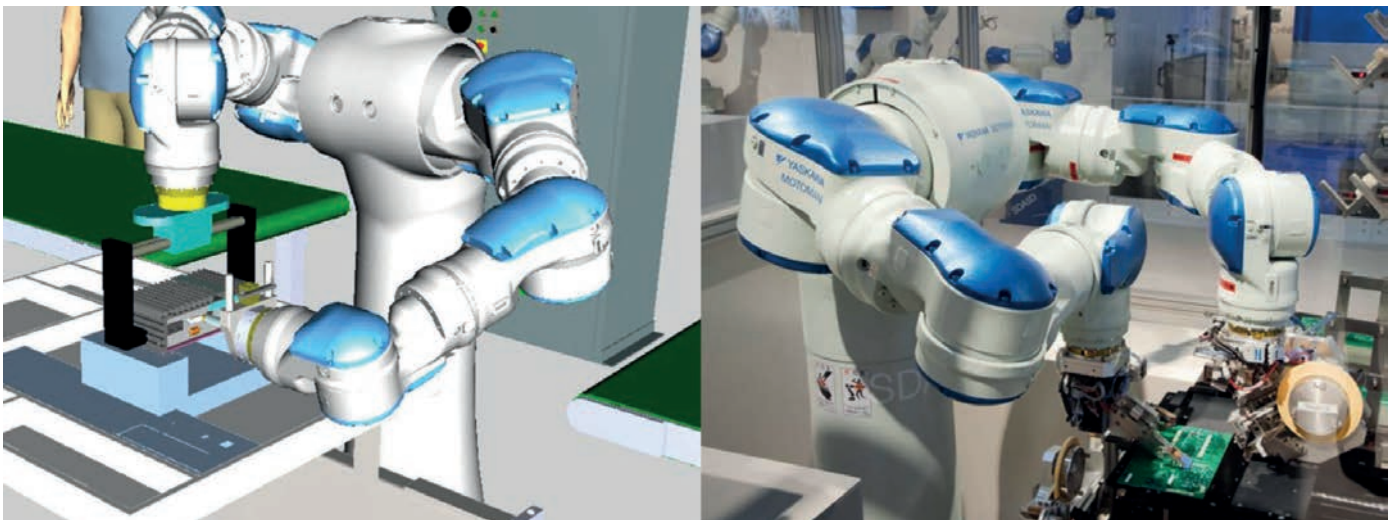

▶ **MANUFACTURING SOFTWARE:** A side-by-side view of a digital twin that realistically replicates the product design and assembly processes. **58**

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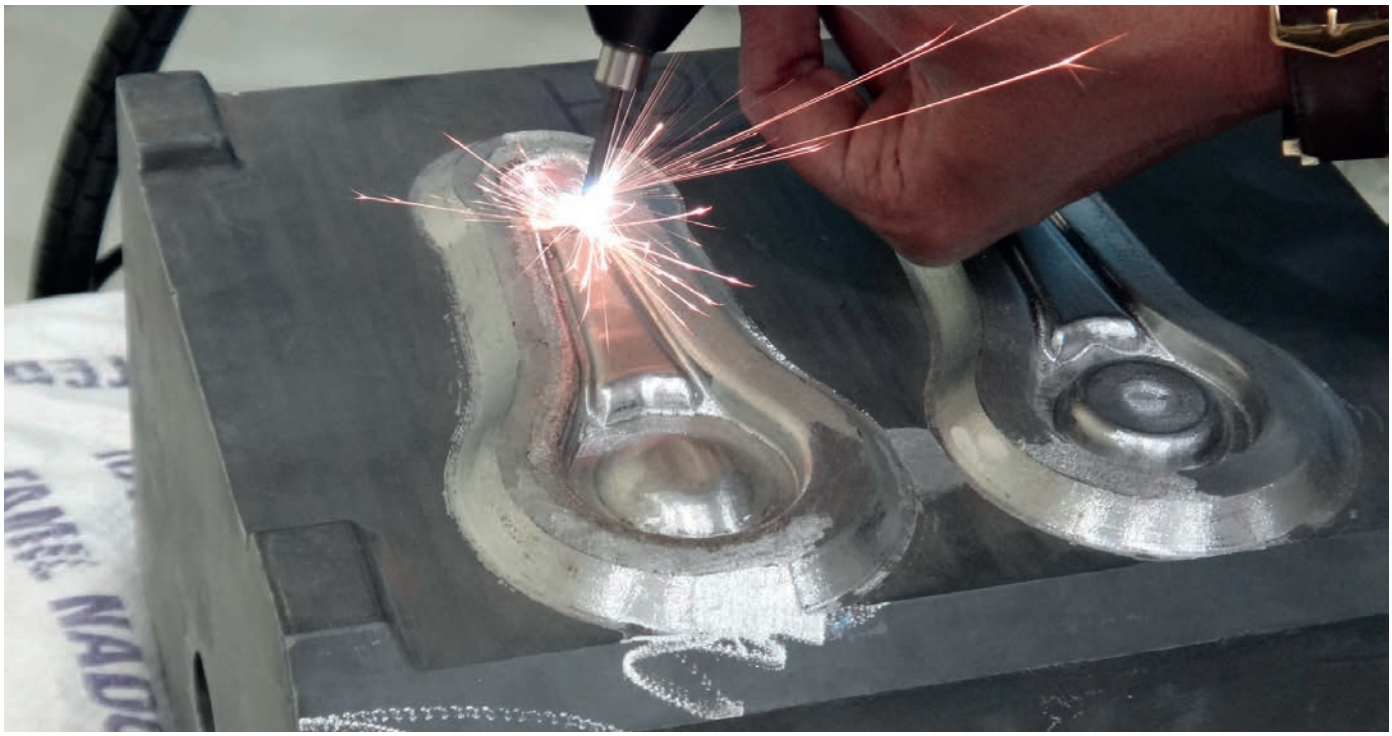

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EVENT PREVIEW

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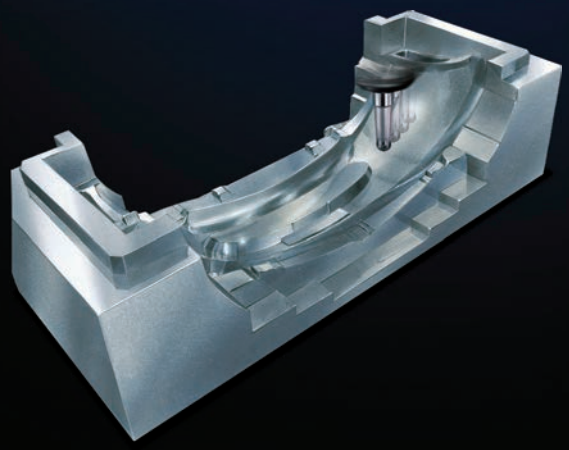

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CEO,
Micromatic Machine Tools Pvt Ltd,
TK Ramesh

The word gatekeeper is analogous to a guard with discretionary powers to open or close doors to your opportunities and should be seen as an aid or a block of your endeavour from going to the next step.

Typical gatekeepers for machine tool marketing people are executive assistants, secretaries and many times even receptionists who work with key executives such as the CEO, CFO, GM's, etc. As it is the job of these gatekeepers to manage time, agendas and take the load of the key executives, they are important people that need to be for you and even in the worst case scenario not against you. Also in very many cases, these gatekeepers are reasonably engaged with the business and are in a position to handle direct solicitation. More importantly, these people understand what is significant to the key executive and his or her goals; thus, they can also be resourceful.

How do you deal with them?

There is a school of thought that says you treat them with little consequence as they do not participate in the decision making process and at best could be instructed to by their executives. Also they may not be able to directly contribute commercially or technically in the win loss process. However, the more effective way is to communicate and treat gatekeepers with due respect similar to the executive. Keeping them abreast of the purpose of your call and agenda in adequate detail is worth your time. Also sharing with them how their boss and his business could benefit from you and your company can always help and in no ways harm your cause.

Working effectively

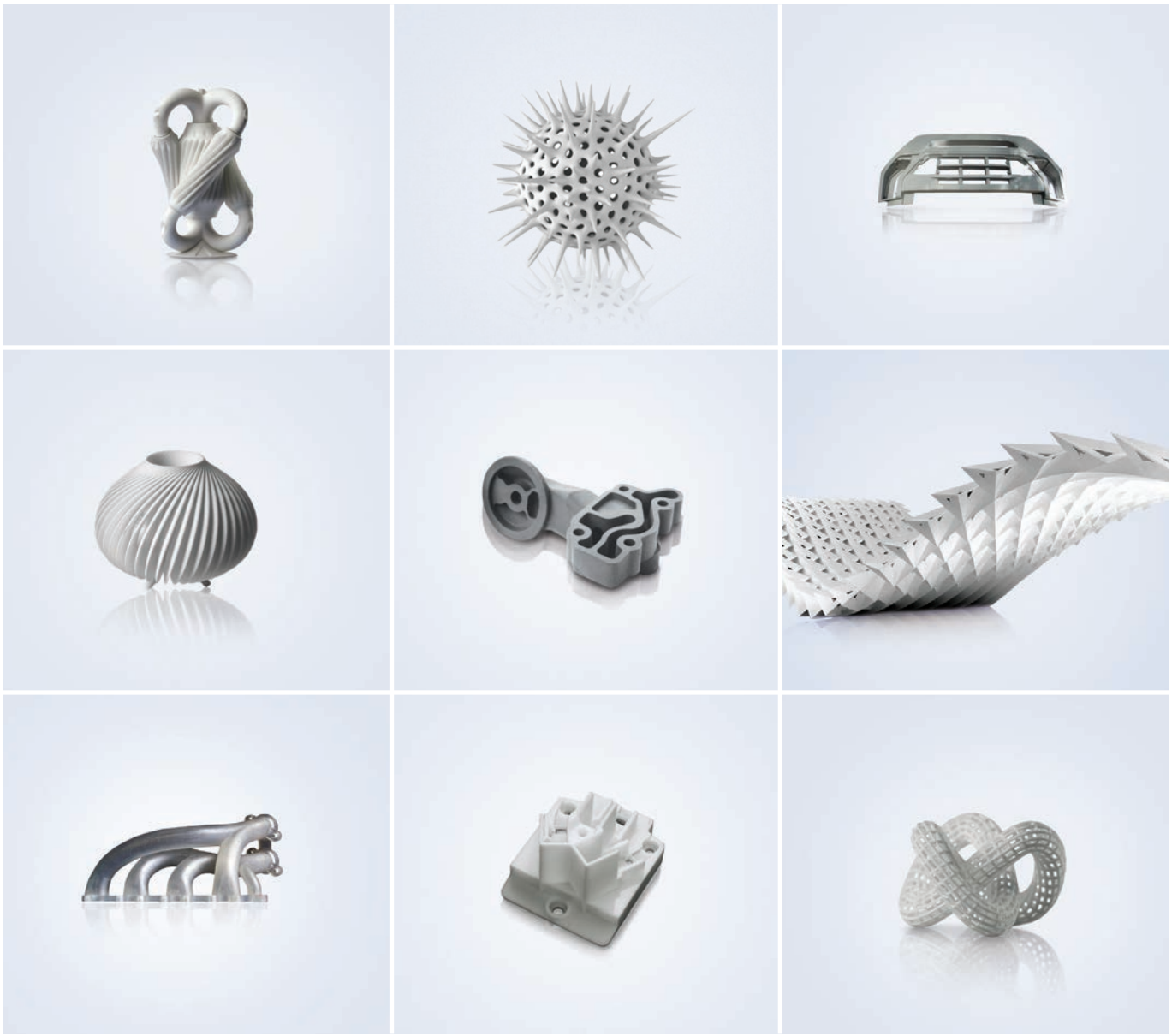
Good sales persons, selling capital equipment in complex situations, can infer a lot of information in customer environments by engaging meaningfully with these gatekeepers. Listening to what they are saying will help you bring about solutions tailored to the company's needs. In the initial meetings and interactions with the gatekeepers, the key objective of the sales person should be to gain access to the executive; this happens when you engage the gatekeeper with considerate confidence, providing him with relevant information that eventually gets complicated for them to handle.

Then these gatekeepers are the first to exit such conversations and direct you to the logical decision making person.

Plan ahead

Over time as the sales stage moves on, the initial engagement with the gatekeepers can immensely help in getting the right names of the decision tree at the customers end. Keep a tab on your competition, see if they are also making their rounds at the customer, understanding the executive's decision making methodology and time constraints as the gate keepers normally have a feel for things at their end. MMI

The views expressed by the author are personal and he can be contacted at rameshtkr@gmail.com



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The Union Budget has confirmed India's firm resolve towards fiscal consolidation without compromising on development. India is targeting a fiscal deficit of 3.5 per cent for FY 2016–17, Union Minister, Arun Jaitely said while unveiling the budget in the parliament. It is heartening to see that the budget has been rural specific. There is a paradigm shift towards empowering the farm sector, rural and semi-urban areas, small enterprises, and underprivileged. Allocation of funds for rural development under the Mahatma Gandhi National Rural Employment Guarantee Scheme will enhance domestic consumption, increase industrial production and enhance manufacturing. Setting up the National Board of Skill Development Certification in partnership with industry and academia will ensure availability of skilled manpower for the manufacturing industry. Tax exemption for small business units with a turnover of up to ₹2 crore and 100 per cent deduction of profits for three out of five years for startups set up during 2016–2019 will provide stimulus for business expansion. Infrastructure has been given a thumbs up. The decision to develop roads—both rural and highways along with railways will generate employment; enhance efficiency and quality of life.

Source: IMTMA

Coach, full of goodies

India's railway budget is loaded with opportunities for the manufacturing industry. Two new locomotive factories have been proposed to be set up with an order book of ₹40,000 crore as part of the 'Make in India' initiative. The decision to develop three freight corridors and opening of India's first rail-auto logistics hub will see railways playing the role of a national logistics provider. The move will encourage fresh investments and larger traffic to the railways. Further the overall investment proposed for development of railways especially infrastructure such as electrification of rail lines including more number of berths, broad gauge conversion in north east, etc are some of the key elements that would give enough opportunities for small and medium enterprises in the manufacturing industries, leading to an increase in the demand for machine tools.

India had launched the 'Make in India' initiative to promote the country as a preferred global manufacturing destination. The initiative led industry players to ramp up their manufacturing facilities. Recognizing India's potential as a significant market, indigenous and foreign manufacturers in various sectors such as electronics, automobiles, defence and aviation among others are making heavy investments to set up plants and research and development units in India. Today India is ranked among the top 10 FDI nations. It is first among the world's fastest growing economies and the first among 100 countries on the growth, innovation and leadership index. India is also the first choice for many nations that are willing to set up research

DIGITAL VERSION

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Source: thinkstockphotos.in

The tax regime will help attract fresh investments and go a long way in making India a universal manufacturing powerhouse.

and development centers offshore.

Make in India Week

Recently we celebrated the 'Make in India Week' in Mumbai. The event propelled the economy by showcasing India's potential of design, innovation and sustainability across manufacturing sectors. This provided an apt platform for taking the corporate and public participation to the next level and reinforced India's commitment and potential to emerge as a global manufacturing hub. At the 'Make in India Week,' the government announced the Capital Goods Policy, which has measures to steer this growth. Its successful implementation could see the capital goods sector contributing effectively to India's vision of enhancing the share of manufacturing in the overall GDP to around 25 per cent as well as generate a hundred million jobs in the country's manufacturing sector.

As India shifts its gear to move up the high growth path, its Micro, Small and Medium Enterprises (MSMEs) will assume a vital role in driving the growth engine. These MSMEs provide good opportunities for employment outside the agricultural sector. MSMEs however need funds to operate to their optimum levels. They need to secure new technologies including cost effective automation, exploration of new geographies and ability to compete in overseas markets. Setting up of the MUDRA (Micro Units Development Refinance Agency) Bank has helped such enterprises to unleash their true potential. The Bank not only grants MSMEs access to funds but also offers refinance and assistance to the micro finance institutions that will provide funds to the MSMEs.

Source: thinkstockphotos.in

Succesful implementation of the government's initiatives could see generation of jobs in the country's manufacturing sector.

Expanding the manufacturing powerhouse

Going forward, India needs to implement the Goods and Services Tax, which will dismantle the existing tax barriers between the states and unify India into a single market making it easy to carry out trade. The Goods and Services Tax along with a predictable tax regime will help attract fresh investments and go a long way in making India a universal manufacturing powerhouse. **MMI**

IMTMA Celebrates Completion of 25 Batches in Finishing School

Bengaluru – The Finishing School in Production Engineering, an initiative by the Indian Machine Tool Manufacturers' Association (IMTMA) to train engineers on all aspects of production engineering has successfully completed 25 batches of training ever since it began with the first batch in September 2010. Expressing his views on the impact of Finishing School on the manufacturing sector, President, IMTMA, PG Jadeja said, "Well trained manpower is essential to provide strong support to the manufacturing sector. As one of the premier institutes that is recognized for training in production technology in India, IMTMA Productivity Institute has been conducting a Finishing School to train engineers on all aspects of manufacturing with CNC technologies." Concurring with Jadeja's statement, Director General, IMTMA, V Anbu said, "The course enhances the skill sets of fresh engineers in mechanical engineering. We offer students a blend of theory and practical sessions, hands-on training on CNC turning and machining centres along with industry visits." He further elaborated, "The training program acts as a major cost effective option for the industry as it trains their fresh recruits and ensures that their engineers come well prepared to take over their job responsibilities." IMTMA training activities and skill development initiatives have been well appreciated by the manufacturing industry. Overall, IMTMA's exclusive four weeks duration course has been ideal for new recruits as well as fresh engineers.

Source: IMTMA

Demonstration for the students held within the IMTMA's Finishing School.

Drill Tap Launched

Bengaluru – Micromatic Machine Tools Pvt Ltd, launched the new High speed Drill Tap center DTC – 400 XL on February 9, 2016, at their Technology center in Peenya, Bengaluru. DTC 400 XL is the latest contribution to Indian manufacturing of Ace Manufacturing Systems (AMS) Ltd, the machining center arm of the India's largest machine tool conglomerate – Ace Micromatic Group. Senior Vice President, TVS Motor Co Ltd, Dr S Devarajan graced the inaugural ceremony as the chief guest and launched the new product amidst a large crowd of manufacturing professionals from in and around Bengaluru. He also shared with the audience, his vision and deep insight of manufacturing and machine tools and the importance of various aspects of TPM and lean manufacturing. The presence of Managing Director, Micromatic Grinding Technology, NK Dhand and Managing Director, AMS and current Vice President, IMTMA, P Ramadas and along with CEO of Micromatic Machine Tools Pvt Ltd, TK Ramesh made the event memorable.

Source: AMS Ltd

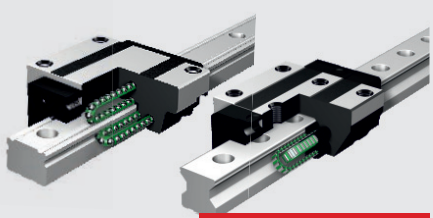
The launch of DTC 400 XL at Micromatic Machine Tools' Technology center in Bengaluru.

BLECH India Returns to Mumbai in 2017

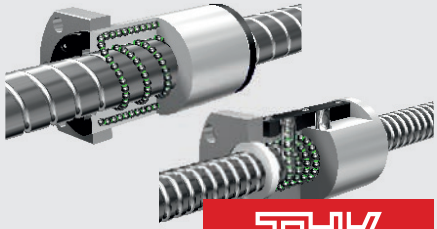
Mumbai – Inter Ads-Brooks Exhibitions Pvt Ltd, organizers of India's premier exhibition for the sheet metal working industry, have announced that BLECH India will take place between April 27–29, 2017 at the Bombay Exhibition Centre in Mumbai. Maharashtra is India's leading industrial state, contributing 13 per cent of national industrial output. Furthermore, a large number of foreign companies have already settled in the Mumbai region. Riding on India's manufacturing initiative 'Make in India', BLECH India 2015 demonstrated the campaign's intention to foster entrepreneurship and facilitate business opportunities on a global scale. The fourth edition of BLECH India that was held in Mumbai attracted 3,798 visitors and strengthened its position as a renowned business platform for India's sheet metal working industry. The four-day event attracted both global visitors and exhibitors. Some 147 exhibitors from 16 different countries were present at the exhibition. The majority of exhibitors were Indian based companies. However, many were from outside India, namely from Germany, Italy, USA, China, Turkey and Switzerland. The exhibitors showcased a comprehensive range of machines, tool and solutions for the complete sheet metal forming and fabrication process; an enormous amount of live machine demonstrations were on display. BLECH India 2015 provided exhibitors the ideal platform to establish successful business relations with customers, agents and partners in India, whilst allowing them to raise brand awareness by presenting their products and innovations to a highly qualified audience.

LINEAR MOTION TECHNOLOGIES

Linear Motion Guides



Precision Ball Screws

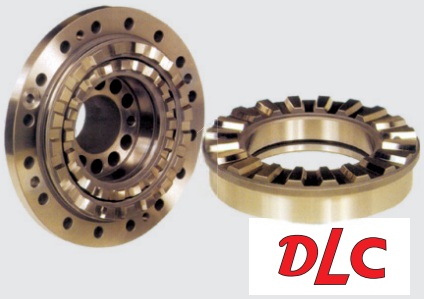


Precision Cross Roller Ring

Clamps for Linear Guides

Cross Roller Guides

Curvic Coupling



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ACMA's New Delhi Automotive Summit 2016

New Delhi – The Automotive Component Manufacturers Association (ACMA), the apex body representing the Indian auto component industry, organized the New Delhi Automotive Summit 2016. The theme for the event was 'Make Quality & Technology in India' in the backdrop of the 'Make in India' campaign. The summit was conducted in New Delhi, alongside the 13th Auto Expo Components Show, which is celebrating its 30th anniversary. The event witnessed participation from several leading global and domestic automotive leaders such as Director, McKinsey & Company Inc, Ramesh Mangaleswaran; Past President, ACMA & Co-Chairman & Managing Director, Sandhar Technologies Ltd, JayantDavar; Past President & Chairman-ACT & Finance Committee, ACMA & Managing Director, Wheels India Ltd, Srivats Ram; Purchasing Leader-India ABO, Cummins India Ltd, Manoj Solanki; Managing Director, Wabco India Ltd, P Kaniappan and others. Speaking at the New Delhi Automotive Summit, Minister of Heavy Industries and Public Enterprises of India, Anant Geete said, "I want to instill confidence in the industry and reiterate the fact that our Ministry will contribute and do whatever it takes for fighting the challenges faced by the Indian automotive industry to ensure its desired growth. We have a mammoth challenge and an opportunity too, in form of scaling up to BS-VI by 2020. I am happy to see that the components industry is already ready to adapt to the technology being demanded for. To further fuel this zeal, I would strongly urge the finance ministry to introduce a technology fund in this year's budget. I truly endorse the theme of the New Delhi Automotive Summit – Make Quality & Technology in India which is imperative for the true success of the Make in India campaign."

Source: ACMA

Prominent industry players light the lamp at the New Delhi Automotive Summit 2016.

BFW sets up Dr Kalam Center for Innovation

Bengaluru – Bharat Fritz Werner (BFW), a leading manufacturer of machine tools for more than fifty years, recently inaugurated the Dr Kalam Center for Innovation at its premises in Bengaluru, India. This world class research & development centre, which has been set up with an investment of ₹25 million, is a step forward towards increasing BFW's global footprint, while simultaneously retaining its position in India. BFW expects to end FY2016 with an annual turnover of ₹900 crore. This Innovation Center named after Dr APJ Abdul Kalam is a tribute to the great scientist, researcher and innovator. This is BFW's first Innovation Center spread over 3,000 ft^2.

The Dr Kalam Center for Innovation was inaugurated by Chairman, Indian Space Research Organization, AS Kiran Kumar. Scientists at this Center will work on core research to improve and develop energy efficient and alternative material machine tools. Also present on the occasion were Director & Head, Karnataka State Office, Confederation of Indian Industry, GK Moinudeen and grandnephew of Dr APJ Abdul Kalam, J Sheik Saleem.

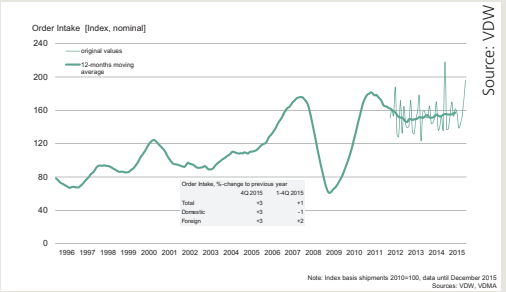
Source: BFW

The inauguration of BFW's Center for Innovation named after the late Dr Kalam in Bengaluru.

Europe Drives Demand for Machine Tools in 2015

Frankfurt am Main, Germany – In the fourth quarter of 2015, the German machine tool industry recorded 3 per cent growth in order bookings compared to the final quarter of 2014. Orders from both Germany and abroad increased equally, up by 3 per cent compared with the preceding year. For 2015 as a whole, the final rise in order bookings was one per cent. The growth has been crucially driven by a substantial 16 per cent increase in orders from the Euro zone. "For the German machine tool industry, 2015 ended with a moderate rise in order bookings," comments Executive Director, VDW (German Machine Tool Builders' Association), Dr Wilfried Schäfer. The result was boosted by the year's fourth quarter, November in particular, which recorded the highest growth rate of the entire year. The European machine tool industry is in good shape. "For all four quarters of 2015, our member companies have reported a consistently high level of demand," emphasizes Dr Schäfer.

Source: VDW



Order bookings in the German machine tool industry.

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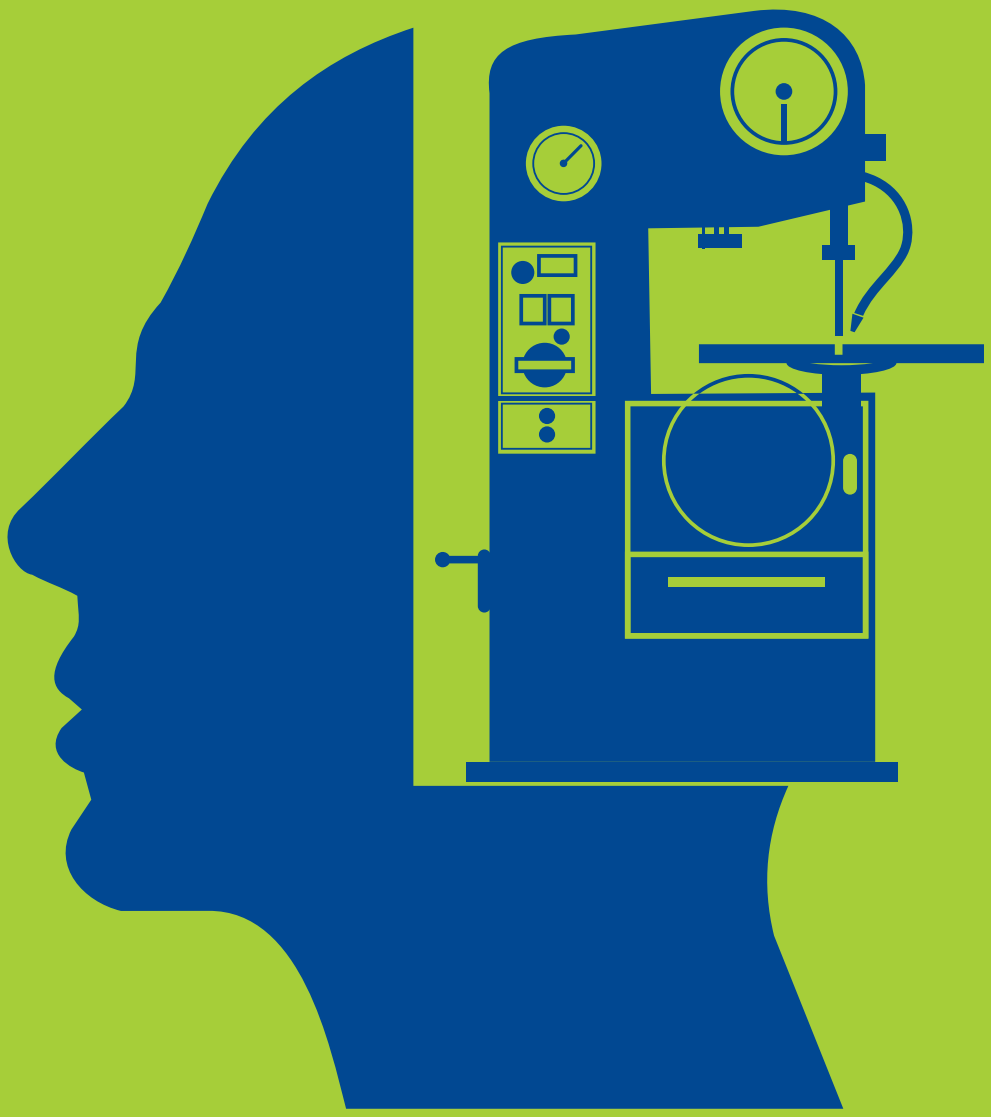

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STUDER SCHAUDT MIKROSA Press Conference 2016

Germany – The Motion Meeting 2016 unites the brands STUDER, SCHAUDT and MIKROSA in a friendly competition under the symbol of the three rings and the motto THE FLAME OF PASSION. In contrast to the Olympic ideal, for the three cylindrical grinding companies it is not about taking part, but only about winning, because there is no second place in the awarding of contracts. Success only comes to those who do more than the others and who do so with passion, conviction, commitment and the will to win.

Source: United Grinding Group

The STUDER management and in part SCHAUDT MIKROSA (from left to right): Fred Gaegauf, Dr Gereon Heinemann, Gerd König and Jens Bleher.

Incoming orders

STUDER and SCHAUDT MIKROSA show very different business development in incoming orders. While STUDER lagged behind the very highly set budget figures relatively early on, SCHAUDT MIKROSA stayed on course and achieved the target, even significantly outperforming the rather weak previous year 2014. STUDER did not manage to achieve the very ambitious target set for 2015.

This was marked by a very strong year end in 2014. After floating of the euro exchange rate and the resulting Franc crisis, the targets came under pressure. A variety of measures were taken to mitigate the effects and prevent market share losses. After a weak start to the year and interim pick-up, EMO in Milan was highly successful and promising. However, the hoped-for year end rally never came, so that the previous year's figures could not be achieved. Based on this starting position and the relevant economic forecasts for the industry, 2016 has been moderately planned. SCHAUDT MIKROSA was able to significantly increase incoming orders after a slow year in 2014. Even in the spring, the figures were already considerably above those of the previous year.

Gratifyingly, this good performance continued throughout the entire year. The target for 2015 was thus successfully achieved. Further growth is planned for 2016.

The distribution of STUDER's incoming orders across the geographical regions shows Germany as the largest market, followed by Western Europe and China, with North America faltering due to the low oil price.

CNCSSIPL to Host MUMBAI DEMO DAY

Mumbai – A division of CNC Servicing & Solutions has announced the MUMBAI DEMO DAY, the first for the year 2016. With live demos and tours, the event will be conducted at Kopar Khairne, Navi Mumbai from April 28–30, 2016. Visitors at the Demo Day will see the company's latest generation of CNC machines, VF-2 & ST-35. The Haas VF-2 CNC vertical machining centre has travels of 762 x 406 x 508 mm in the X, Y and Z axes. The machine uses a 40 taper spindle driven by a 22.4 kW vector drive motor delivering high torque through to a maximum speed of 8100 rpm. The VF-2 boasts a 20-station carousel tool changer and 25.4 m/min rapids on the three main axes. The Haas ST-35 big bore CNC lathe can accommodate bars up to 102 mm in diameter and offers a capacity of 533 (dia) x 660 mm (length) with 806 mm of swing. The 29.8 kW, 2400 rpm spindle is served by a two-speed gearbox, while additional features include a 381 mm chuck, 12-station bolt-on turret and rigid tapping capability. Visitors are invited to bring along components or drawings for a full evaluation of optimized machining solutions.

Source: Haas Automation

With live demos and tours, the MUMBAI DEMO DAY will be conducted at Kopar Khairne, Navi Mumbai from April 28–30, 2016.

Added features

The Demo Day will also feature many of the company's industrial partners, such as Prime Industries that is based in Nashik. The company is India's largest and oldest imported graphite machine shop. Regarded as the premium quality graphite supplier offering the highest quality products in India, the firm exclusively represents Tokai Carbon Co Ltd, Japan since 1998 in the Indian market. Seco Tools will showcase a comprehensive portfolio of advanced metal cutting solutions at the Mumbai Demo Day. The company's practical experts will be available to assist manufacturers in redefining their productivity and profitability at the event. Also present would be Zeiss, Mitsubishi & Delcam to offer complementary technologies and advice to the visitors.

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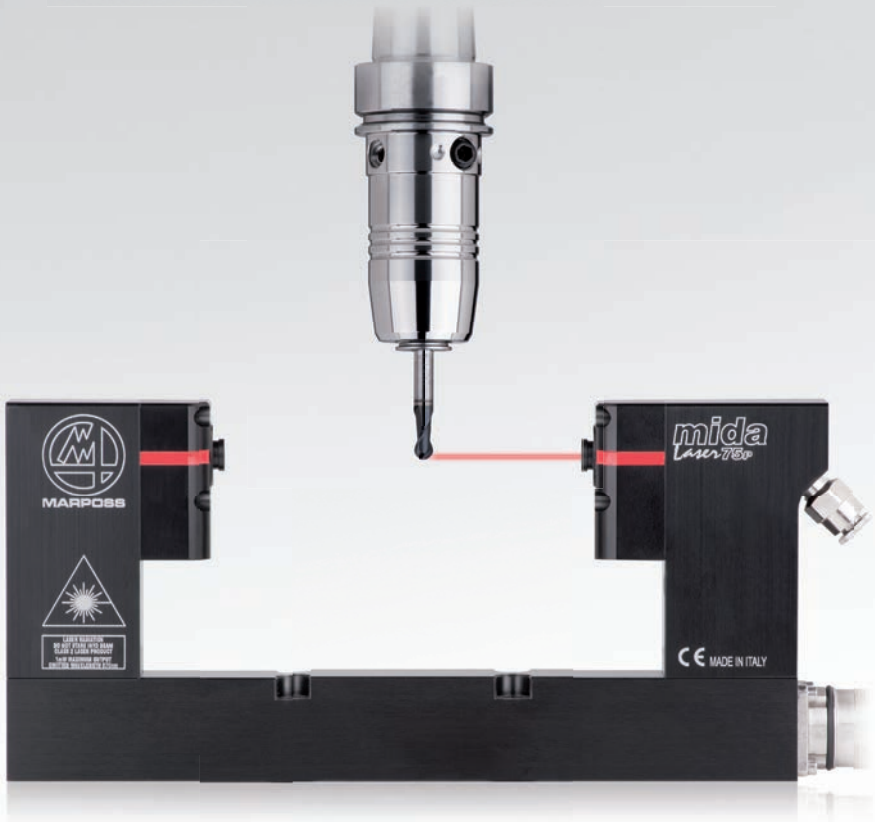

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Source: Mitsubishi Electric

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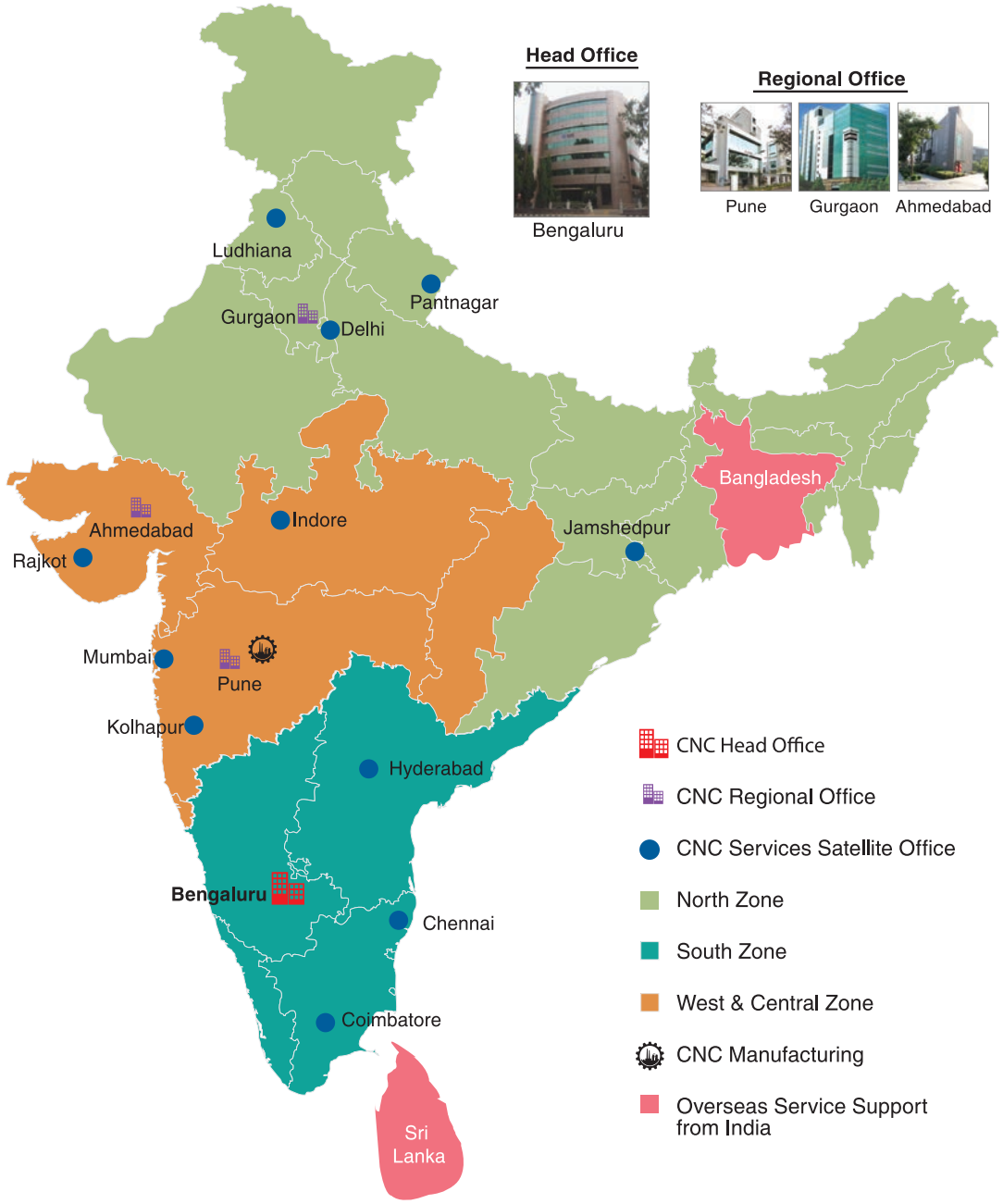

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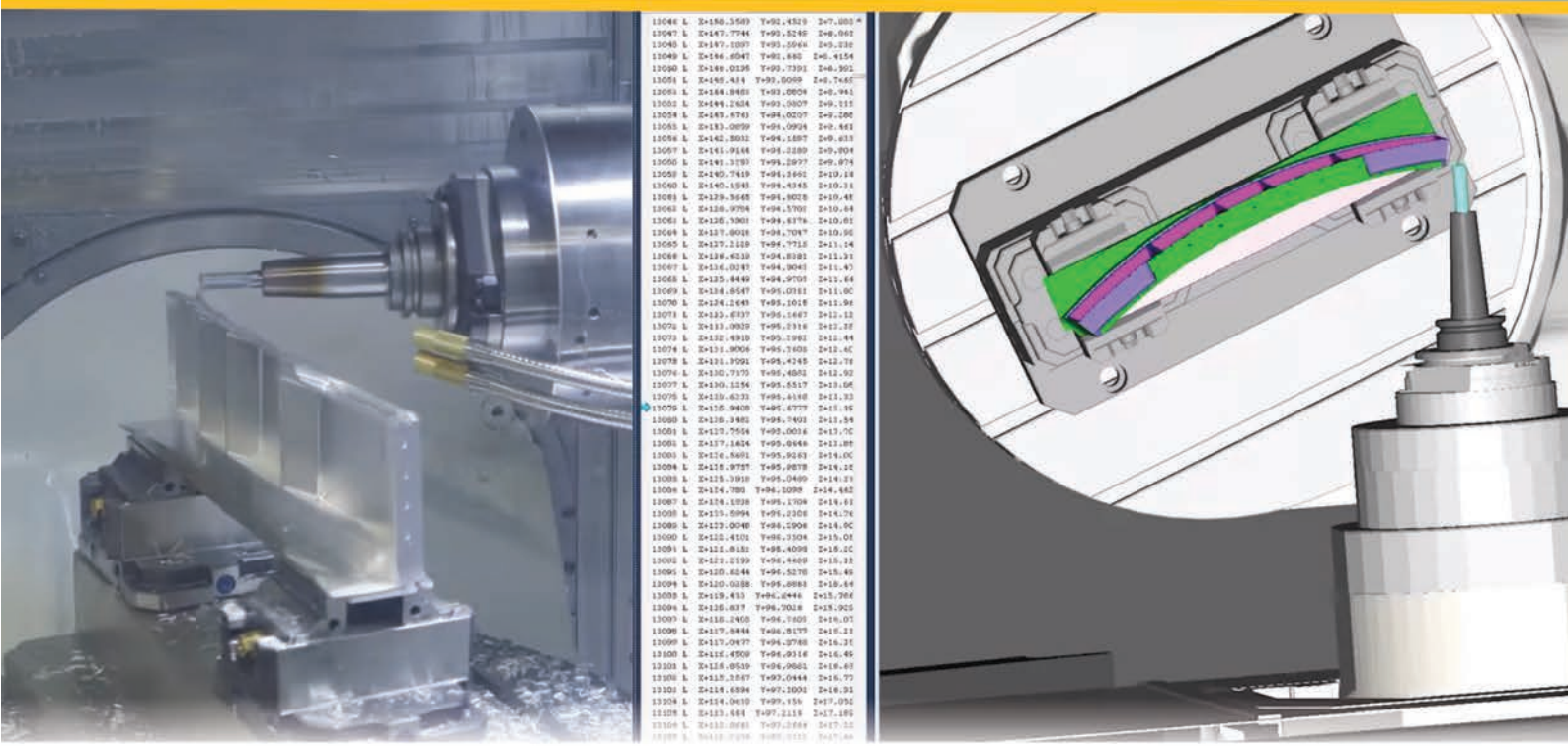

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Significance of the Budget for the Manufacturing Sector

Compiled by: Nedra Pereira, Deputy Editor,
Vogel Business Media India
nedra.pereira@vogel.de

"The Union Budget aims to create a balance in terms of rural and urban needs through development of agriculture and infrastructure. The industry welcomes the ministry's move to control fiscal deficit at 3.5% for FY17. It is a step towards restructuring the economy which will ensure stability and aid industry players to arrive at prudent decisions for long-term investments. The budget has made doing business less taxing. Lowering of corporate tax for SMEs will aid their development, 100% deduction of profits for three out of five years for startups set up between 2016 and 2019 will encourage entrepreneurs, development of rail and freight corridors will enhance movement of goods and services at a faster pace. The development of the rural sector will lead to domestic consumption, increased industrial production and demand for manufactured goods."

Director General,
IMTMA,
V Anbu

"Indian economy has recorded a steady growth amidst the uncertain economic prospects across the globe. The Finance Minister's budget 2016–17 offers favorable and stable opportunities for India's manufacturing sector. The infrastructure sector has received a huge impetus in the budget with roll out of ₹2.21 lakh crore for roads, railways and other facilities, which will spur manufacturing. The ₹27,000 crore allocation to roadways will boost commercial and earth moving segments, the rail budget proposal to set up two new locomotive factories, three freight corridors and a first ever rail-auto logistics hub will spur manufacturing and ultimately will bring a boost to the machine tool industry. Reduction in corporate tax for SMEs will aid their production capacity. Setting up of a National Board of Skill Development by allocating ₹1,700 crore for establishing 1,500 skill development centers will ensure availability of skilled manpower for the manufacturing industry. To sum up, Budget 2016–17 presents a balanced perspective on the economy. We are confident that with the thrust given by the budget, the industry will once again pick itself up to move directionally on track."

President, IMTMA and CMD,
Jyoti CNC Automation Ltd,
PG Jadeja

"It is a mixed bag for the manufacturing industry. The initiative in respect of skill development—setting up of 1,500 multi-skill training institutes and provision of ₹1,700 crore for it, may enhance the growth of the manufacturing sector. Specific reduced income tax rate of 25% for new manufacturing companies will help establishment of such new companies. The three years tax holiday in the first five years for startups is going to encourage new entrepreneurs; thereby, boosting the industry growth. Reduction in the 'deduction for R&D expenses from 200% to 150%' may act as a setback to the R&D projects undertaken. In terms of the announcement made in the last budget that the corporate tax rates would be brought down in a phased manner, the industry was expecting at least a marginal reduction in corporate tax rates; however, this has not been done, barring the 1% reduction for small companies. The issue of phasing out of CST and the introduction of GST has not seen any light. Introduction of additional dividend tax of 10% at the hands of the recipients may amount to double taxation."

Vice President, IMTMA
and Managing Director,
Ace Manufacturing Systems Ltd,
P Ramadas

"The budget focuses on two key levers to crank up the domestic demand and consumption in an environment where most parts of the world are experiencing difficult economic situations and reduced growth rates or degrowth. Infrastructure spend is increasing. The road and railway spend is expected to be over ₹90,000 crore. This will spur demand and increase employment across the country. Affordable housing got a big thrust. It is socially relevant and this will again increase the demand for manufactured goods. Rural /agri focus can be expected to push economic activity in the country thereby increasing consumption. This is clearly a medium-term game plan. The government has made many small changes to ensure inverted duty structures are corrected to give a competitive edge to local value addition at the component level. This will strengthen the 'Make in India' drive. If the allocations are spent well during the next 12 months, we will see accelerated demand-generation leading to better times for the manufacturing Industry ahead."

Immediate Past President,
IMTMA and Managing Director,
TaeguTec India,
L Krishnan

The Union Budget for 2016 comes at a time of unusual volatility in the international economic environment. Markets have begun to swing on fears that the global recovery may be faltering, while risks of extreme events are rising. Amidst this gloomy landscape, the Economic Survey for 2015-16 calls India "… a haven of stability and an outpost of opportunity". Ernst & Young recently held a meet to discuss the budget implications for investments and the Make in India campaign. It brought to the forefront various ways in which companies can leverage on the new initiatives. In the same backdrop, we feature views of industry stalwarts on their expectations of how this budget affects the manufacturing sector.

"The budget is in continuation of the government's commitment to provide 24x7 electricity for all, with increased allocation in the power sector. The focus on augmenting nuclear power with an allocation of ₹3,000 crore is a welcome step and reflects the government's intent to achieve the right fuel balance. The industry welcomed the government's commitment to achieve 100% village electrification by May 1, 2018. A fund allocation of ₹8,500 crore was allocated, out of which ₹3,000 crore and ₹5,500 crore was allocated to Deendayal Upadhyaya Gram Jyoti Yojana and Integrated Power Development Scheme respectively. The budget 2016–17 addresses skill development and new job creation, with 1,500 multi skill training institutes proposed to be set up under the Pradhan Mantri Kaushal Vikas Yojana, across the country with an amount of ₹1,700 crore. Moreover, the proposal to set up a National Board for Skill Development Certification in partnership with the industry and academia is encouraging, which will train one crore youth over the next three years, further benefitting the manufacturing sector. This will also result in uniformity of growth and development across the country."

Director General,
IEEMA,
Sunil Misra

"The budget unveiled by the finance minister has brought in a welcome change giving an adequate focus on development of the agricultural and social sector, as well as, that of the industry and infrastructure. However, the area of concern for the industry is the reductions in the 200% weighted deduction on R&D spend. This will now be limited to 150% from April 1, 2017 and 100% from April 1, 2020, which will immensely impact the growth in domestic innovation at a time when there is a need for higher spend on R&D. That apart, the government's move to levy an extra 1% tax on purchase of luxury cars and an additional 1% infrastructure cess on small, petrol, LPG,CNG cars while 2.5–4% on diesel and SUV's having higher engine capacity may have an adverse impact on the automotive industry that has been witnessing a flat growth over the last nine months."

President,
ACMA,
Arvind Balaji

"It was a commendable effort by our finance minister, who for the first time defined and allocated substantial resources for sections that hold the key to India's sustainable growth, i.e., rural India, agriculture, farmers and infrastructure development. In order to fund these noble but ambitious long-term goals, various additional taxes and levies have been imposed on industries, which are seen to have a direct/indirect environmental impact. We all know the adverse impact of competiveness with rising burden on taxes. However, giving priority to national long-term goals, it is of utmost importance for the government to take actions with the additional levies that will help achieve these goals. For example, to lessen environmental impact from the automobile sector, the government can provide customer incentives for scrapping BS 1 & BS 2 vehicles, which have a larger environmental impact than the current generation BS 4 vehicles, and promote advanced eco-friendly technologies such as hybrids and electrics that besides improving the environment contribute to the nation's key objective to lessen dependence on import of crude oil."

Vice Chairman & JV Partner,
Toyota Kirloskar Motor,
Vikram Kirloskar

"The announcement such as allocating large funds for infrastructure development such as roads and railways will certainly create demand in the manufacturing industry through the trickle-down effect. The focus on development of the rural economy will also in the medium term to long term should have a positive effect for manufacturing. Increase in taxes on cars and other automobiles will have a negative effect on demand. Consequently, the manufacturing industry demand for capital goods such as machine tools can reduce. Additionally, on account of the stressed assets in the banking sector, availability of funds will also impact the demand for manufactured goods. In conclusion, hopefully the 'Make in India' initiative and the investment in infrastructure and railways may kick start the much needed demand for the manufacturing sector in the general and capital goods sector in particular in the medium term."

Past President, IMTMA and
Managing Director,
Ace Designers Ltd,
Shrinivas G Shirgurkar

Significance of the Budget for the Manufacturing Sector

"The Union Budget 2016 has firmly focused on domestic manufacturing of capital goods and electronic hardware. It is very well in sync with the national policy of capital goods and electronic hardware. It is an attempt to strengthen the domestic manufacturing by reducing net productions costs, and simultaneously drive the exports on high volume. Improvement in export statistics will certainly make the sector grow tremendously and largely, it will bring the much needed vitality to the economy of our country. The disappointing element of this budget is the reduction in the government's incentives for innovation and technology. Previously the incentives granted for up to 200%, is now reduced to 100% and that is going to affect R&D in manufacturing significantly. In conclusion, the budget is definitely echoing with the 'Make in India' tunes, it promises to bring about the change being projected on paper. It focuses to enhance the capacity of domestic manufacturing right from the roots as the small scale industries have also been given adequate importance. Amendment in many duties indicates encouraging outcomes for the manufacturing sector."

Managing Director,
Sahajanand Laser Technology Ltd,
Dr Arvind Patel

"The Union Budget of India has laid thrust on long term developmental initiatives such as infrastructure development, skill development, 'Make in India', fiscal discipline and support to the agriculture sector through various initiatives. We are hopeful that the government's vision will help the country in holistic and rapid development of the economy. The budget is a mixed bag of announcements, changes in customs and excise duty rates on certain inputs to reduce costs and improve competitiveness of the domestic industry in sectors such as information technology hardware, capital goods, defense production, textiles, mineral fuels and mineral oils, chemicals and petrochemicals, paper, paperboard and newsprint, maintenance repair and overhauling (MRO) of aircrafts and ship repair. Also the announcement of increased Investments in infrastructure of ₹70,000 crore in 2015–16 is good news for everyone. Increased outlay on infrastructure would spur demand for capital goods and benefit the whole manufacturing fraternity as a whole. These initiatives will boost manufacturing in the country and help improve the economy's competitiveness."

Head – Corporate Services &
Strategic Planning,
Mitsubishi Electric India Pvt Ltd,
Rajeev Sharma

"There are many positives for the manufacturing sector from the recent budget. The huge investments in infrastructure; particularly, the road sector: ₹97,000 crore during 2016–17, the total outlay for infrastructure: ₹2,21,246 crore, will help the road segment gain market share in the country's overall freight movement; thereby driving growth in commercial vehicles in the long run. This would see the automobile industry gain momentum over the next few years. The impetus on increased rural financing as well as the aim to double farmer's income by 2020 along with agriculture and farmers welfare promises positive growth for two wheelers, passenger vehicles and tractors. The allocation of ₹1,804 crore in skill development would definitely help the manufacturing sector. A rise in actual capital spend would be positive for the Indian defense companies as this will encourage growth in the manufacturing sector. Allocation of ₹3,000 crore p.a. for nuclear power generation capacities would see huge investments in the power sector, which will boost the manufacturing industry. The duty changes have been made on inputs to make manufacturing competitive for sectors such as IT, capital goods and defense."

Managing Director, UCAM Pvt Ltd,
Indradev Babu

"We welcome the focus of the budget on rural, social and skill development, making it an inclusive budget. It also includes steps which have been proposed to simplify tax laws and improve ease of doing business. We also welcome the increased investments in railways and highways and hope that the government acts upon rationalizing corporate tax and interest rates to encourage private sector spending."

MD & CEO,
Siemens Ltd,
Sunil Mathur

The Union Budget for 2016 comes at a time of unusual volatility in the international economic environment. Markets have begun to swing on fears that the global recovery may be faltering, while risks of extreme events are rising. Amidst this gloomy landscape, the Economic Survey for 2015-16 calls India "… a haven of stability and an outpost of opportunity". Ernst & Young recently held a meet to discuss the budget implications for investments and the Make in India campaign. It brought to the forefront various ways in which companies can leverage on the new initiatives. In the same backdrop, we feature views of industry stalwarts on their expectations of how this budget affects the manufacturing sector.

"Having lived in India for 15 years, I appreciate the focus in the budget on topics such as water, education, infrastructure and rural development to ensure the future of India. I personally do not like complicated tax systems and subsidizations as it creates administrative effort and rarely ends up in the targeted area. Here, I see no simplification to make business easier. I believe that the increase of taxes in the car industry will bring down the sales figures; unfortunately, in a moment of new focus that the international car industry has on India, but environmental impulses of the tax together with strict pollution rules will benefit not only the environment but also the industry by fueling the innovative power and that will increase the international competitiveness and will drive the initiative 'Make In India' away from the low cost production corner to an innovative bright future."

Director,
EMAG India Pvt Ltd,
Andreas Zieger

"This is perhaps the first time, the government's annual budget seeks to dovetail; thereby provide catalysis to a government program for manufacturing. The 2016 budget seeks to achieve that, in the backdrop of the 'Make in India' program that the government pushes aggressively. For manufacturing, the finance minister has sought to address three key dimensions through the budget—Ease of Business, Impetus to Start-ups and Small Enterprises and Manufacturing growth through Innovation. The introduction of the new dispute redressal mechanism; reduction of number of returns by a central excise assesee; assurances from the finance minister on no retrospective taxes and a facility for revision of returns are welcome measures in the budget that would go the distance in compliance, consistency and transparency. The budget also proposes a 100% profit linked incentive for specified companies engaged in any business involving innovation and generation of intellectual property. These three areas should form a thrust for the manufacturing industry despite the apparent cuts in corporate tax that are yet to impact as well as the delay in GST."

Director,
Terragni Consulting,
Anil V Pillai

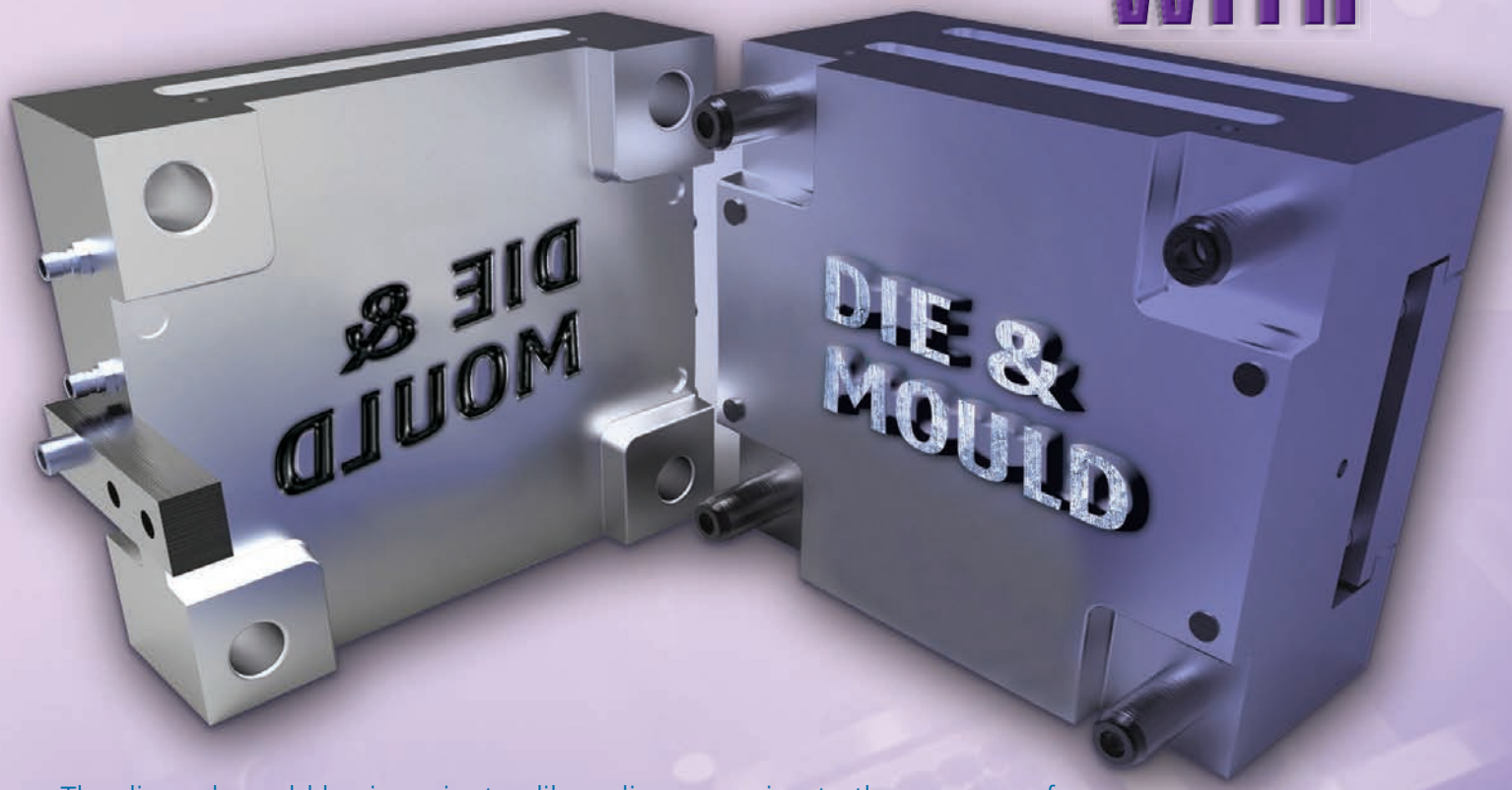
"The much awaited budget presented by Finance Minister, Arun Jaitley, shows immense promise. A net investment of ₹97, 000 crore in the road sector has been proposed and a total of nearly 10,000 km of national highway has been approved by the government. With this proposed advancement in infrastructure, the country shows that it is now ready for the advent of smart transport options. These initiatives are truly the right ones for stimulating the off-highway products where ZF is present. Additionally, the setting up of 1,500 multi-skill training institutes will help auto component manufacturers in acquiring skilled talent. The Finance Ministry has also promised to enforce the necessary revisions in the Motor Vehicle Act and open up the road transport sector in the passenger cars segment. All in all, we at ZF are looking forward to this financial year as this budget provides us the motivation to continue on our path of a futuristic and sustainable growth."

Country Head, ZF and
Head of ZF India Pvt Ltd,
Suresh KV

"In this year's budget, there are no major changes that directly impact the status of manufacturing companies in India. The budget gives a big push to the investments in infrastructure development such as highways, road, power generation and distribution, etc. Large government spending in these sectors will give a boost to the demand and manufacturing of related capital goods companies such as earthmoving equipment, machinery, compressors, generators, etc. The 2.5% increase in custom duties on aluminum and zinc alloys will make Indian manufacturers competitive. The 4% excise duty increase in large utility vehicles and cars, a 2.5% excise duty increase in diesel vehicles and a 1% duty hike in small cars will increase the costs and can act as a dampener on the demand of the vehicles pushing the automotive OEMs and components industry away from the growth path. Lastly, the permission of 100% FDI in the food processing sector will attract investments and create opportunities in the food processing and manufacturing sectors in India."

Managing Director,
DesignTech Systems Ltd,
Vikas Khanvelkar

SHAPING IT WITH



The die and mould business is steadily scaling up owing to the progress of various sectors such as the automobile segment. Read on to find out the latest technologies, business opportunities and suggestions from the industry to the government to ensure growth of this vital industry.

Source: Vogel Business Media India

DIGITAL VERSION

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DIE AND MOLD

The estimated market size of the Indian tooling industry for the year 2014–15 was ₹15,100 crore, with imports contributing to 22 per cent, i.e., ₹3,322 crore, according to a report from the Tool & Gauge Manufacturers Association (TAGMA) India. It further states that the total estimated demand for plastic moulds is 40 per cent; sheet metal 35 per cent, forging dies 13 per cent and die casting dies 12 per cent. Through this, it is evident that the die and mould segment plays a vital role in the tooling industry and there is a need to encourage this sector further in order to make 'India—manufacturing hub by 2020' a reality.

Latest trends

The die and mould industry caters to a range of sectors such as auto components, automobiles, industrial machinery, defense, railways, medical equipment, etc. When it comes to the automobile sector, India is the seventh largest producer in the world with an average annual production of 23.36 million vehicles and is expected to become the fourth largest automobiles producer globally by 2020 after China, US and Japan. That is not all! The country is also poised to be known as an emerging global hub for sourcing auto components. This scenario has changed the dynamics of the die and mould sector wherein players are making use of the latest technologies to stay ahead of their competitors. Executive Vice President & Business Head, Godrej Tooling, Godrej & Boyce Mfg Co Ltd, DK Sharma mentions, "With increased demands for safe automobiles and India becoming a global hub for car exports, more and more high-strength steel parts are used with new model cars. Godrej has developed the expertise for high-tensile part stamping tools. We are using technologies such as auto form spring back analysis/compensation software at the design stage to high-speed 3D scanners from GOM at the inspection stage."

Speaking of automobiles, the two-wheeler production has grown from 8.5 million units annually to 15.9 million units in the last seven years. Hence, significant opportunities exist in rural markets as well. Head–Manufacturing Operations, India Yamaha Motor Pvt Ltd, Sanjiv Paul says, "The penetration of two wheelers in India is currently only about 50 per cent, which is expected to increase to 65 per cent in the next five years. This penetration is much lesser compared to China and other developed markets. With the evident increase in volumes, the need of a strong tool manufacturing set-up is very important as tools and moulds form the basis of any new product development process. Keeping the above in view, the basic need for the Indian tooling industry is to upgrade its technological capability to match the global standards and at the same time, remain cost and quality competitive as compared to other global suppliers."

The die and mould industry is constantly loaded with jobs for new developments and new products, hence it differs from the typical cyclic load of other industries. The growing needs in aesthetics and product quality adds to criticality and development of the die and mould industry. High product quality in terms of high surface finish and high accuracy warrants very high level of finishing on the CNC machines. Therefore, the die and mould industry requires high speed and high precision CNC machines equipped with very high spindle speeds and linear drives that provide very high feed rates. Managing Director, DMG MORI India, S Ravi Shankar opines, "India is known globally for its technical competency and engineering skills; hence, it is a great opportunity for India to capture the global market by providing better quality products at competitive prices. Global customers demand very high levels of accuracy and precision. Therefore, the use of high-precision and technologically advanced machines such as DMG MORI's range of Linear and eVo machines will help Indian suppliers to meet the global customer needs."

"The Indian die and mold industry is globally very competitive in terms of the price factor. However, the quality of the final product is still being questioned."

Managing Director, DMG MORI India, S Ravi Shankar

DMG MORI offers intricate moulds with sharp features that can be better machined on 5-axis machines where short and slim tools can easily approach the work piece. Advancements in the latest CNC controls and CAD CAM systems enable 5-axis machining to be more precise and productive. The company has been the fore-runner and market leader in 5-axis machining and has the maximum possible variants (More than 100 models in 3 & 5 axis machines) which cover the entire range of machining requirements. DMG MORI offers various machine models DMU 65 MonoBLOCK, DMC 55H duo BLOCK, DMU 50, DMU60 eVo, HSC 55

Ahlam Rais
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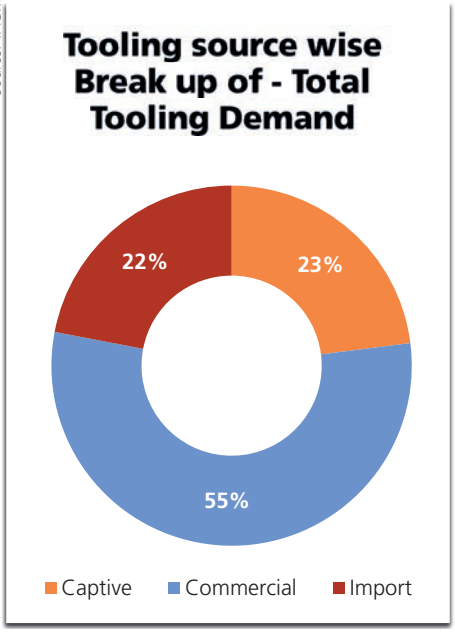
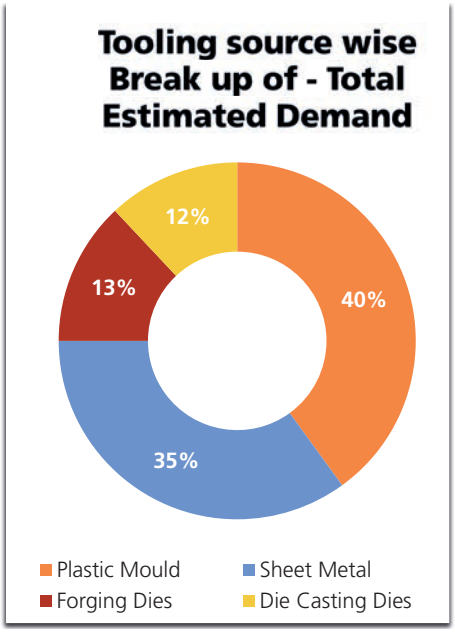
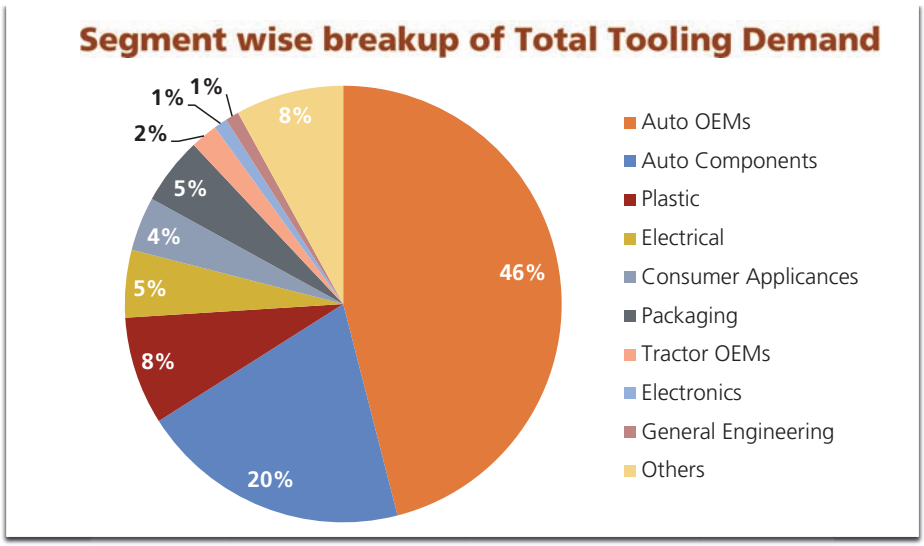
Market size of the Tooling Industry

Source: TAGMA India





The estimated market size of the Indian tool room industry for the year 2014-15 is ₹15,100 crore, with imports contributing to 22% i.e. ₹3,322 crore.



DOMESTIC ONLY, EXCLUDING EXPORTS

Domestic Production (₹ crore)						
Sub- sectors	**2009-10**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**
Dies and Moulds	11,080	12,485	13,421	12,789	13,793	14,647

Exports (₹ crore)						
Sub- sectors	**2009-10**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**
Dies and Moulds	3,100	3,410	2,899	2,590	2,694	2,869

Imports (₹ crore)						
Sub- sectors	**2009-10**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**
Dies and Moulds	3,755	4,150	4,728	3,431	3,081	3,322

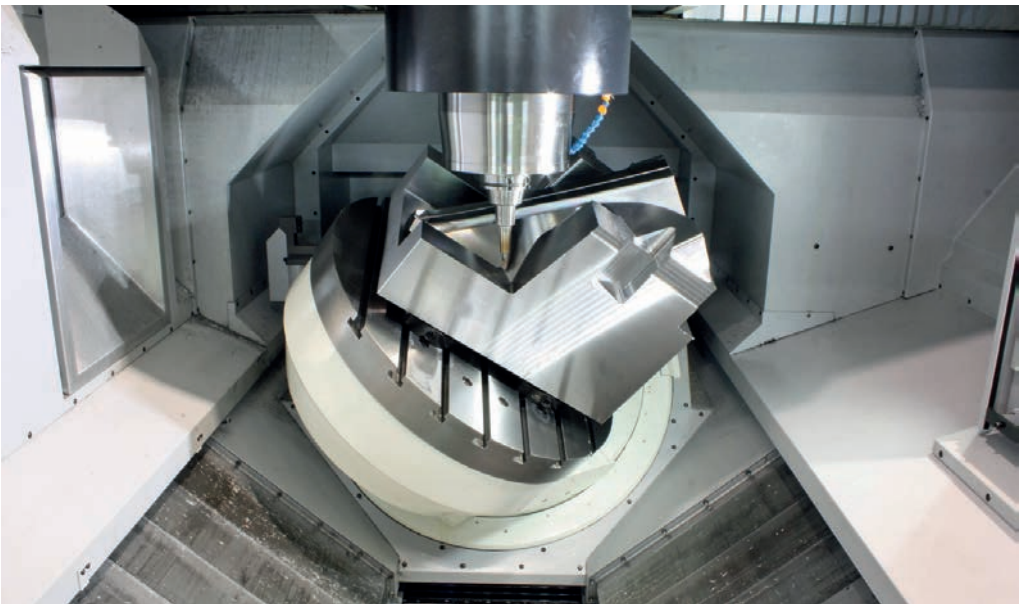
All figures in ₹ crore

linear 5X, DMF 360/11 linear, DMU 80P duoBLOCK, etc. With a highly rigid machine condition and stability, machines are capable of directly finishing the moulds hardened to 60+ HRc. The linear drives provide long life for the machine by eliminating the use of ball screws, which wear out quickly in die mould applications. DMG MORI also offers a wide range of LASERTEC machines. These machines unlock new economic opportunities for laser precision machining of high-technical, high-quality surface textures, intricate cavities, fine engravings, inscriptions and holes with a wide variety of high-tech materials and diamond tools.

Die and Mould Specialist, MAKINO, Hidehiko Yamamoto shares, "The die and mould industry supports the automotive sector. The quality and cost of a component depends on the kind of mould used. Hence, global suppliers are always on the lookout for new mould builders that will help them to enhance their quality and cost." In this background, MAKINO has introduced high speed milling machines that result in reduced manufacturing lead times.

Business opportunities

Geographically, India proves to be the ideal country to become a manufacturing hub as it is closer to key automotive markets such as the ASEAN, Japan, Korea and Europe, and hence, vehicles can be exported conveniently. "Global companies are increasing their investments and also planning to increase localization. These strategies will increase the demands in the local markets," shares Sharma. In the automobile segment, Volkswagen, Ford and GM are running their factories in India 24*7 in order to meet the increasing export demand. Apart from this, the luxury automobile player, Mercedes-Benz India has also announced an investment of ₹1,000 crore for expansion of its Chakan facility in Pune. With this, the company's annual production capacity will increase to 20,000 units, thus making it the largest installed production capacity for any luxury car maker in the country. Also, several global Tier-I suppliers have announced plans to increase procurement from their Indian subsidiaries. The government has allowed 100 per cent Foreign Direct investment (FDI) under the automatic route in the auto and auto component sector, subject to all the applicable regulations and laws. This has brought numerous business opportunities for the die and mould industry.



Source: MAKINO

High speed milling machine by MAKINO.

Suggestions for the government

To keep the momentum going for the industry, certain changes have to be made by the government in terms of taxes and policies. For instance, the input costs are high for the tooling industry owing to import duty, surcharge, other cesses such as octroi, freight, clearance and other charges, these make the landed cost of alloy steel, the basic raw material and other components, standard parts, accessories, globally in competitive, according to TAGMA. In addition to this, high interest rate of finance makes importation of raw material, components difficult. As mentioned above, 22 per cent of domestic tooling requirement is met through imports. Hence, import substitution of this percentage is also a good opportunity for the die and mould industry. "Technical upgradation and cost competitiveness will not only lead to import substitution for tooling presently being imported by Indian OEMs but also generate revenue for India through exports to customers in global markets," mentions Paul. It can achieve this milestone only through the support of the government. TAGMA suggests a few pointers that are listed below for the government in order to promote this industry further.

Duty reduction:

- Special die mould grade steels which are 100 per cent imported to be made duty free at 0 per cent presently at 5 per cent.
- Various inputs such as components used in dies and moulds presently at 7.5 per cent to be brought at 2.5 per cent.
- Specific cutting tools, consumables used for cutting dies and moulds to be reduced from 10 per cent to 5 per cent.
- Under the various WTO FTA Duty reduction on imports of tools, dies and moulds not to be allowed for three years at least.

Manufacture raw materials:

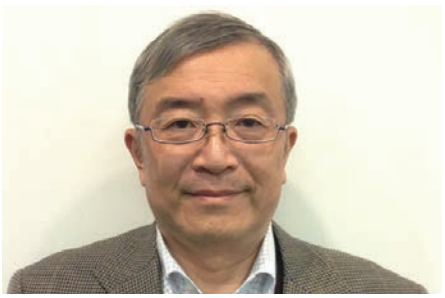
Initiative to manufacture raw materials such as a few basic alloy steels in India at low costs for better global competition of the Indian tool room industry.

Increase in duty of finished dies imports:

The duties in Annexure 2 are quite low and should be increased to make the local industry responsible for the growth of the Indian tooling industry.

"Global companies are increasing their investments and also planning to increase localization. These strategies will increase the demands in the local markets."

Executive Vice President & Business Head, Godrej Tooling, Godrej & Boyce Mfg Co Ltd, DK Sharma



"The quality and cost of a component depends on the kind of mould used. Hence, global suppliers are always on the lookout for new mould builders that will help them to enhance their quality and cost."

Die and Mould Specialist, MAKINO, Hidehiko Yamamoto

"Technical upgradation and cost competitiveness will not only lead to import substitution for tooling presently being imported by Indian OEMs but also generate revenue for India through exports to customers in global markets."

Head–Manufacturing Operations, India, Yamaha Motor Pvt Ltd, Sanjiv Paul

Challenges and solutions

The current major challenge faced by this industry is improving the quality side of the final product. Shankar explains, "The Indian die and mould industry is globally very competitive in terms of the price factor. However, the quality of the final product is still being questioned. To get the desired quality there is a strong need to have better inputs, which also include better machine tools. This is where the machines from DMG MORI play a bigger role in improving the quality of the output, at the same time providing a lower cost of ownership of the machine." The tooling industry is a capital intensive business with new technologies evolving in the global markets. Sharma adds, "The quality demand and new technologies from domestic OEM's have been increasing since India has already become an international hub for exports. However the OEM's are comparing the cost of product with traditional process and are not prepared to pay for advanced technology. With the advent and increase in CNC technology there is no entry barrier for the tooling industry. The industry is growing with many small suppliers from being a machining supplier to a tooling solution provider. The industry has grown with many unorganized players making the industry uncompetitive for quality products. With increasing competition, investment in new technologies and retaining talent in the industry has been put on a back stage. Companies adopting innovation and new technologies quickly will be the leaders. Strategies of deskilling and increasing productivity will witness sustainable growth."

With so much happening in the die and mould sector, we expect innovative technologies, policy reforms along with numerous business opportunities to mould a positive future for the scaling industry! MMI

Source: DMG MORI India

Innovative die & mould technologies by DMG MORI.

HIGHLIGHT

TAGMA Suggestion: Manufacture of few basic alloy steels P20

Basic alloy steels for plastic molds is P20 for large size molds. This steel is locally manufactured in countries such as China, Korea, Taiwan and priced very low, thereby making them cost competitive globally. In India, the government should initiate manufacture of the basic alloy steel in India to enable Indian tool room industries to compete globally.

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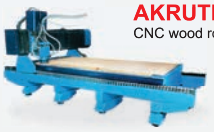


1995

FUTURE X
High Power
Fiber Laser Cutting System

2013

BRAHMASTRA
CO2 Laser Cutting System for sheet metal fabrication

1998

2012

BRAHMASTRA VECTOR
Fiber Laser Cutting System for sheet met

2003

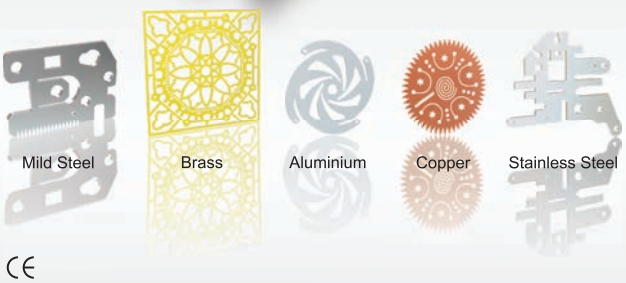
BRAHMASTRA
Fiber Laser Cutting System for sheet metal

2007

BRAHMASTRA
Fiber Laser Cutting System for sheet metal

2011

BRAHMASTRA PRIME
Fiber Laser Cutting System for sheet metal



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"The goal of the 'Make in India' program is to get from where we are to a much higher level. In this scenario, research & development is also an equally important factor."

Member, NITI Aayog, Government of India, Dr VK Saraswat

Source: IMTMA

Achieving Manufacturing Excellence

The 'Make in India' initiative has encouraged the manufacturing industry. It is a long term program that would not only encourage but also guide the industry to pave the way to success. Member, NITI (National Institution for Transforming India) Aayog, Dr VK Saraswat speaks about the same at the inauguration of IMTEX FORMING 2016. Here is an excerpt of his speech.

Speaking at the inauguration of IMTEX FORMING 2016, Member, NITI (National Institution for Transforming India) Aayog, Dr VK Saraswat voiced the importance of the 'Make in India' program and how its objectives can be achieved. At the occasion, he mentioned that organizations such as the Indian Machine Tool Manufacturers' Association (IMTMA) play an important role in making the government's initiative a success. The steps taken by the association in view of improving the sector will eventually contribute to the development of the manufacturing sector. Further he stated, "If the goals of 'Make in India' have to be achieved, the contribution made by the manufacturing industry will have to reach around 25 per cent of the GDP." He further mentioned that the whole Indian manufacturing fraternity, including the public and private sector, has to come together to work towards it.

However, this is not enough. It is also important for the industry to gain advanced knowledge and adopt sustainable manufacturing practices.

Reducing imports

Furthermore, reducing imports is key to the success of this industry. Elaborating on the same, Dr Saraswat pointed out that around five decades ago, India was highly dependent on imports. He further added, "I remember when I started my career in 1972, the first machine I ever operated was GEDEE WEILER Lathe, which was imported. Since then, India has made great progress." Now, numerous companies have started manufacturing machines in the country. All these companies help in increasing the percentage of the manufacturing sector to the GDP.

"As compared to the previous five decades, I would say India has achieved a lot. When I look at the advanced machines made in India, it underlines the same fact," Saraswat mentioned. Alternatively, he also stated that accuracy and cost efficiency also play a key role in the progress of the manufacturing industry. Keeping these points in view, India has come a long way, with still a lot more to achieve.

Focus on R&D

"The goal of the 'Make in India' program is to get from where we are to a much higher level. In this scenario, research & development is also an equally important factor," continued Saraswat. Also, there is a clear need to set up more R&D centers. As R&D plays an important role in innovation, it must be strengthened so that new technologies emerge, and hence support the growth of the country. Hence, funding should take place in R&D for bringing out innovative technologies.

It is a great opportunity for the country to turn towards the manufacturing sector and hence reduce imports. This is one of the ways to put the 'Make in India' initiative into action. Events such as IMTEX FORMING help in boosting the confidence of the manufacturing fraternity as it encourages companies to 'Make in India'! MMI

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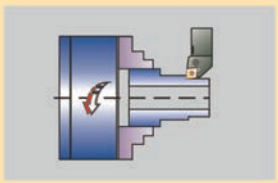


SC-8K
GANTRY LOADER

SC-14
BIG BORE LATHE

SC-25
CNC HEAVY DUTY LATHE

CNC Internal Grinding

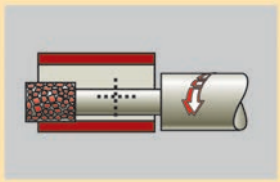
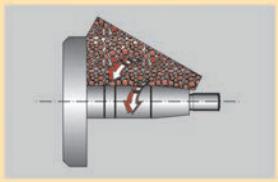


FIG-200 SPL CNC
BIG BORE GRINDER

FIGT-300 CNC
FOUR STATION TURRET

FIGE-150 CNC
ID / OD GRINDER

CNC Cylindrical Grinding

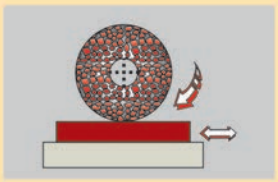


AWH-1500 CNC
LONG SHAFT GRINDER

AWH-2000 CNC
HEAVY DUTY GRINDER

SWH-400 CNC
AUTO LOADING

Surface Grinding



SG-106 CNC
CREEP FEED GRINDER

SGR-60
ROTARY GRINDER

SG-63
HYDRAULIC / PLC

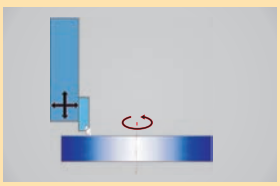
Automats

A15/25

TD36
AUTOLOADING

A42/60

Vertical Turning Lathe



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Creating the Future

Spread across an area of 18,000 ft² in Mumbai, Imaginarium's facility specializes in 3D printing and serves to more than 30 sectors. We provide an insight on the company's technologies on the shop floor and also highlight the growing demand for 3D printing in today's age.

Since its incorporation in 2009, Imaginarium has been growing at a rate of 30 per cent CAGR. Currently, the company's facility occupies an area of 18,000 ft² in Mumbai and is dominated with 18 high-end production machines. Serving more than 30 sectors including automotive, aerospace, white goods, healthcare, FMCG packaging, electrical, electronics, jewelry, etc, the facility specializes in 3D printing, Stereolithography Apparatus (SLA), and Selective Laser Sintering (SLS).

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Background sketch

Going down memory lane, the company's founding team had years of experience in laser technology for diamonds and was the first to introduce the concept of 3D printing in the jewelry segment. This was used as the default process for jewelry realization and rapid manufacturing and hence, in 2009 the group created a new brand—Imaginarium with an intention to serve India with the 3D printing technology in every possible field of application. Director, Imaginarium India Pvt Ltd, Guruprasad K Rao opines, "Since then, we have been learning every day about this technology through the requirements of our customers and this had led us to become an expert and trusted name in the industry. Today, we are not only a leading brand in the 3D space but also a preferred platform for new ideas to grow using 3D printing."

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Creating the Future

Tech talk

The major technologies offered at Imaginarium's facility include:

- Stereolithography Apparatus (SLA)
- Selective Laser Sintering (SLS)
- Multi jet 3D printing
- Poly jet 3D printing
- DLP based 3D printing
- Fused Deposition Modeling (FDM)

The SLA technology is the world's first 3D printing technology and was also the company's first tool. It offers solutions to the jewelry and engineering industry with a very fine build quality that are best suited for 'making masters.' Being transparent, this technology is used in medical and industrial sectors for creating prototypes and masters.

The SLS technology is world's most promising technology as it helps to create impossible objects. "We can print large parts that can be tested for functional validity. It is this technology that is used to print most medical models in biocompatible plastic or metal. It offers models in nylon and nylon composites that prove beneficial

Source: Imaginarium India Pvt Ltd

3D printed model of an air intake system used in formula cars.

for aerospace and automotive applications," explains Rao.

Multi jet & Poly jet printing are similar to inkjet printing and dispense propitiatory inks to build resin and wax models. Poly jet offers a maximum range of materials with the help of its two material mixing head, which can print soft and hard, transparent or opaque at one go.

The DLP based systems are the latest and smartest production machines; they are extremely quick, efficient and are used in medical applications. Whereas, the FDM is a very mature technology and has been available as an open source technology that is quite popular to make objects in ABS and PLA. While low-end machines are used for teaching, large systems cater to the automotive industry.

Growing demand for 3D printing

This technology is going to be disruptive and the demand for 3D printing is growing exponentially and several hitherto untapped markets are now becoming aware of this technology. "Companies are incorporating 3D printing into their processes and products, initially as an experiment and over time as a standard process. Students in schools and colleges are also getting access to 3D printers. All these factors are directing towards a growing India that is expected to become a preferred destination for application expertise in advanced manufacturing, fuelled by the positive impetus of the 'Make in India' initiative," mentions Rao.

Increasing productivity and efficiency

Being in a new technology area, the company is different as compared to the industry when it comes to productivity and efficiency. "We have a highly skilled work force that is trained by us and technology that inherently supports a lean manufacturing system. Productivity is dependent on machine availability, setup time, downtime of machines and planning. As we make a small batch quantity, six sigma is not directly applicable to us. However, we carry out 100 per cent quality checks and 100 per cent quality creation.

"Today, we are not only a leading brand in the 3D space but also a preferred platform for new ideas to grow using 3D printing."

Director, Imaginarium India Pvt Ltd, Guruprasad K Rao

We believe quality has to be created and for this individual skills are vital. We focus on skill development in order to better our efficiency," explains Rao.

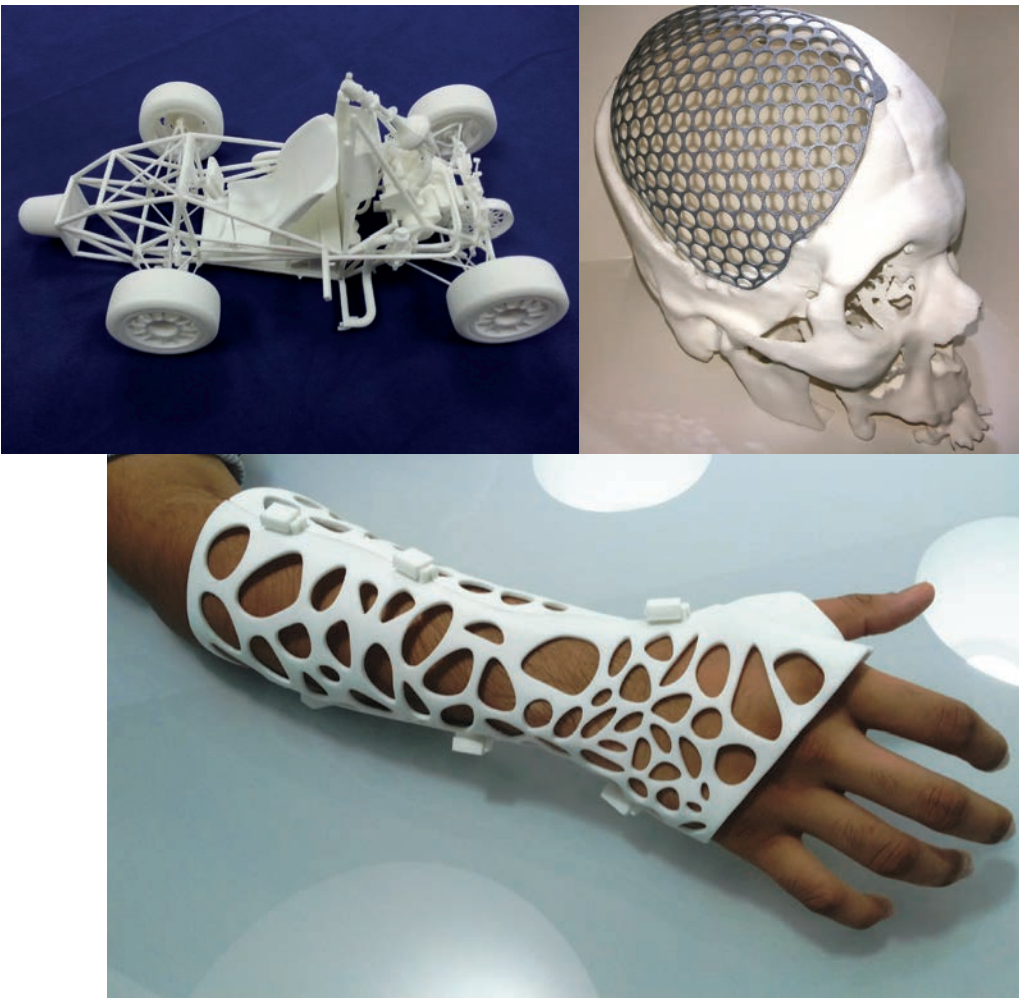
Research and development

Research and development proves to be a vital segment for any industry. Rao adds, "R&D is absolutely critical to our survival, and without constant innovation not only in technology and applications but also in new business models, we would soon stagnate. For this purpose, we have set up Imaginarium Labs, a team of young, dynamic tinkerers that have been given a mandate to explore the breadth of applications in the world of 3D printing. We incubate new business ideas within Imaginarium Labs till they mature into a full-fledged BU."

The way ahead...

Imaginarium's expansion is in tune with the market demand and will continue. It is also open to investing further in order to get the best technologies to India. Also, the company is actively creating tools and interfaces to help domains access 3D printing and build their ideas; thereby, reducing the friction they face in understanding and using this new technology. "Over time, we seek to build domain expertise in many more interesting fields and look forward to the exciting developments that come up across the world," concludes Rao.

Imaginarium is sure to act as a catalyst in the nation building process as its growth is directly proportional to the innovation happening in the country! MMI



Source: Imaginarium India Pvt Ltd

Diverse products created by Imaginarium India Pvt Ltd.

Confederation of Indian Industry

CII Naoroji Godrej Centre of Manufacturing Excellence

INTENSIVE PROGRAMME ON MANUFACTURING EXCELLENCE

HIGHLIGHTS:

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- Focus on discrete and process industries
- Equal emphasis on strategy and execution through project work
- Plant visits
- Dale Carnegie module on Advancing Projects through Motivational Leadership
- Faculty from CoE, industry and WMG

GOLD SASH

The CII Naoroji Godrej Centre of Manufacturing Excellence, one of the 9 Centres of Excellence promoted by CII across the country, is offering a unique, high value programme with an aim to create professionals who can take up challenging roles globally.

The Intensive Programme on Manufacturing Excellence is built to reflect the needs of today's global industry. It is a one-year part time programme for industry professionals. On completion, a Gold Sash certificate will be given to all participants who successfully navigate the course.

The objective of the programme is to create a culture of collaborative excellence in manufacturing and develop a bank of world class manufacturing leaders who will:

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- Understand integration of operational excellence initiatives into manufacturing strategy
- Understand the impact of manufacturing strategy on sustained profitability of the enterprise

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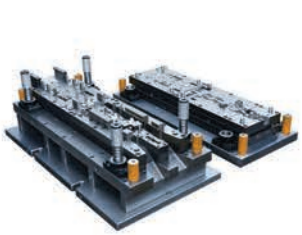

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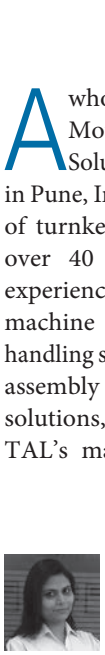
TAL Soars to Greater Heights with FARO Measurement Solutions

TAL's aerospace division improved measurement accuracy and efficiency of its components with the help of the FaroArm and Laser Tracker ION. The company also enjoyed several benefits in its production workflow, such as the devices' portability, ease of use, as well as versatility.

A wholly-owned subsidiary of TATA Motors Ltd, TAL Manufacturing Solutions Ltd (TAL) was established in Pune, India in 2000 as a pioneer provider of turnkey manufacturing solutions. For over 40 years, TAL has had various experiences in designing and building machine tools, engaging in material-handling systems, test rigs, painting systems, assembly and process lines, robotics solutions, and fixtures across industries. TAL's main operations are strategically segregated by industry focus to provide top-line support to its customers. TAL has four business units, of which one is solely dedicated to the aerospace industry. This aerospace business unit maintains a strong focus in the total manufacturing process of precision body components and assemblies for aerospace structures. Catering to the needs of commercial and business partners, the aerospace division is fully supported with a state-of-the-art facility in Nagpur, India, where cutting edge solutions are developed.

The TAL aerospace division, in line with its business unit motto, strives to uphold its reputation as being the most reliable provider in the development, manufacturing, and assembly of aerospace components and structures. The division is always on the lookout for more efficient methods to improve existing processes. "We believe that we can further add value to our customers by continuously improving on our manufacturing processes and standards," shared Quality Engineer, TAL Manufacturing Solutions Ltd – Aerospace Business Unit, Bhupendra Darne. "By doing so, we also gain competitive advantages which can benefit TAL in the long run." In an ideal world, every manufacturing component would be perfectly crafted and tedious measurement checks would not be necessary. However, with safety issues and stringent regulations to abide by in the air travel market, measurement requirements are very much a part of the manufacturing process, and companies such as TAL take active steps to ensure that



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Time–savings of up to 70 per cent enables TAL to achieve the highest levels of productivity.

Source: FARO Singapore Pte Ltd

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TAL Soars

inspections are properly executed.

Measurement concerns

In the aerospace industry where safety concerns always come under the spotlight, measurement requirements must be thorough to ensure zero deviation from computer-aided design (CAD) data. Failure to meet these standards can delay approval on aircraft components, and ultimately incur losses on time as well as investment costs. Measuring systems that can provide accurate measurements are therefore considered as vital support equipment in the industry.

Moreover, aircraft components can range from 2–30 meters, and it can be especially challenging to measure large component parts where run-of-the-mill coordinate measurement machines (CMM) may be unable to capture the data accurately. "The components that we measure can come in different sizes and there are times when we have to carry the larger parts to the machine for measurement," added Darne. "It can be straining and time consuming for us, especially when we have complex parts that can be difficult to measure using our existing CMM."

The Journey towards Improvement

Within the aerospace division, TAL employees were already using CMMs. However, it was an older device that offered a smaller measuring range and lower levels of accuracy. Influenced by its customers' positive reviews on FARO solutions, TAL first tried the FaroArm through a lease in 2006 and subsequently went on to rent the unit on numerous occasions. With a measuring range of 10 feet, the FaroArm was capable of offering high accuracy measurement, including fixture alignment, calibration, and dimensional calculations.

The FaroArm soon became an invaluable tool to TAL, and a decision was finally made to purchase the device later that same year. The main factor fueling the purchase then was because the equipment rental process proved to be too time consuming for the team, with tedious paperwork that came with each instance. When the team at TAL realized that the portable CMM was required on a regular basis, it became evident that an asset investment had become a necessity, not just an option. In this way, the operators were able to freely access the unit whenever a measurement need arose.

"The FaroArm helped us greatly in our production process," said Darne. "This was especially so on the sub-assembly level, where the FaroArm provides us with high accuracy when conducting inspection for small components. The level of accuracy required in our line of work is nearly 120 microns, and the device complied with our requirements." Darne recalled. Won over by the positive experience, TAL went on to purchase its second unit of FaroArm in 2010. With an extended measuring range of up to 12 feet, this device performs similar functions as the first unit, allowing the team at TAL to measure parts over a larger volume. Widely used in the aerospace industry to carry out a series of activities such as first article inspection, the FaroArm is capable of detecting even the slightest deviation to ensure closest conformity to intended specifications. As TAL's business expanded, the need for a device with an even larger measuring range to carry out aircraft fixture calibration and alignment processes surfaced.

"As we had a positive experience with FARO, we decided to further extend our capabilities by investing in two sets of FARO Laser Tracker ION in 2011," acknowledged Darne. "Right from the start, the Laser Trackers were clearly valuable additions to TAL's existing operations, providing us with outstanding accuracy levels on major inspections in the post-production stages. With this device, we are assured of precision even with bigger components." A state-of-the-art interferometer (IFM) based measurement system, the Laser Tracker ION is capable of providing high-accuracy machine calibration and in-line measurements. Due to their line of work, TAL uses both devices on a weekly basis, each usage spanning over 8 hours and can extend up to 16 hours for critical components measurement. The remarkable features have helped TAL in easing time constraints and made significant differences in total time-savings.

Pushing Forward

At the fundamental level, TAL improved measurement accuracy and efficiency with four FARO devices under their belt. On top of that, however, the company also enjoyed several benefits in its production workflow, such as the devices' portability, ease of use, as well as versatility. The team found both the FaroArm and Laser Tracker ION easy to operate, which meant a gradual learning curve even for any inexperienced workers. Moreover, the portability of the FaroArm and Laser Tracker ION greatly reduced the need for manual labor as the device can now be easily transported to the shop floor, instead of having to move large, bulky components to a climate-controlled measuring room. In addition, these FARO devices required only a short set-up time, further sweetening the whole FARO experience for TAL.

"Since we purchased the FaroArm and FARO Laser Tracker ION, we have achieved up to 70 per cent time savings," shared Darne. "In the past, we would take up to 2-3 days to complete component measurements. However, using FARO devices, we have narrowed it down to just 1.5 days. TAL continuously welcomes efficient methods for improvement. When the need arises again, FARO will definitely be on the top of our list for consideration." MMI

Source: FARO Singapore Pte Ltd

Offering accuracy levels of up to 0.004 inch, the FARO Laser Tracker ION offers highly precise measurements for a variety of applications.

Metal Laser Melting

From rapid prototyping to a recognized manufacturing technology—metal laser melting by Toolcraft has attracted eyeballs from various sectors. Read on to know more…

Toolcraft is offering completely new possibilities in metal laser melting that are extremely cost-effective. The company's additive manufacturing process builds a workpiece layer by layer, as the laser melts the powdered form of the material concerned. This procedure is therefore characteristically different from turning and milling, which are known as subtractive methods. With these methods, the part is produced by the removal of material. But in Toolcraft's innovative process, the design data for the manufacture of the component is divided into cross sections and then formed on top of one another during the melting process. The part is thus literally built up in a '3D' way.

Source: Toolcraft

Additive manufacturing is growing in popularity

Metal laser melting is enjoying growing interest. The process has made the leap from being used for rapid prototyping to developing into a recognized manufacturing technology. In the past, it was primarily used to produce prototypes but today, additive manufacturing is used in many industries for (small and medium) series manufacturing. This is why Toolcraft has invested twice in extending its suite of machines in the past year. Four laser melting machines are now available for manufacturing precision parts. "The industrial metal laser melting market has a lot of potential. Machines, materials, processes, customers and suppliers continue to develop in exciting ways," says Managing Director, Toolcraft, Christoph Hauck. The company has recently built up its portfolio in this direction and has invested in its own measurement technology. This means that Toolcraft can now test the quality of the powder as well as the properties of the material once a part has been manufactured.

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Metal Laser Melting

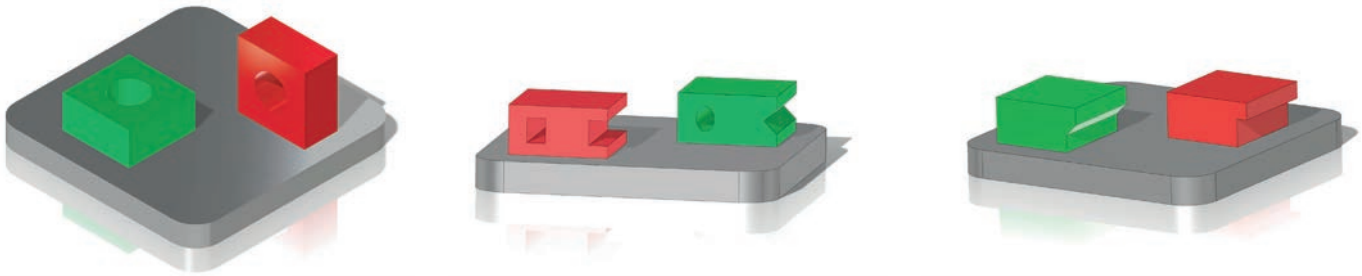
Metal laser melting - making the near impossible possible

The innovative process has a number of clear benefits, ranging from the ability to manufacture complex geometries and manipulate materials that are difficult to machine, to the creation of components without the use of tools in very short periods of time and with extremely minimal waste of material. Lower piece costs, less warpage and reduced void formation make the manufacturing technology extremely effective. Prototypes, pilot series and small series can thus be executed quickly and

Toolcraft has been working with the machine manufacturer CONCEPT Laser GmbH for producing pioneering work in metal laser melting.

Source: Toolcraft

Source: Toolcraft



Diagrams 1-3: Simplified illustrations of design guidelines for constructing laser melted parts. Green indicates meltable constructions that do not require a support structure, while red constructions can only be manufactured if a support structure is made simultaneously.

efficiently. The limits on the potential for innovation are also boundless. As a research and development partner, Toolcraft can open up new perspectives with its manufacturing technology as well as market opportunities. In addition, the results are of an impressive quality and meet the demanding requirements of aerospace. In comparison with conventional manufacturing processes, the benefits are diverse. These are particularly apparent in the case of extremely complex parts that are needed quickly and in small numbers.

From the idea to the finished product

When an order is received, information is firstly exchanged. At this stage, Toolcraft makes a prior assessment of the feasibility of the design. If only 2D data is available, the in-house engineering team can translate this into 3D data. After further preparation of the data, the original mould is produced. Due to a special construction process in which the laser jumps back and forth between pre-determined melting points, the precision part is produced with a low amount of tension. Production takes place under a protective gas atmosphere depending on the material. In wire cutting, a wire precisely separates the part from the manufacturing plate.

Holistic solutions

Heat treatment following the full completion of the manufacturing process makes the final workpiece completely free of tension and ensures that it possesses the desired mechanical properties. Depending on the part, it may be necessary to carry out further refinement by milling or turning. If, for example, an extremely high level of precision is required, this can be achieved by further processing the surfaces. The final inspection and optical measuring are performed exclusively by qualified specialists, who can also use non-destructive surface testing equipment to check the part for cracks, overlaps, wrinkles, pores and a lack of fusion. As a partner for complete solutions, Toolcraft can reproduce the entire process chain from the idea to the finished part in-house.

Design guidelines

Contrary to widely held opinion, a number of design guidelines must be taken into consideration when constructing laser-melted parts. For example, larger drilled holes can only be made in the direction of construction without the need to use support structures. *Diagrams 1-3* show simplified illustrations of the most important basic principles. Green indicates meltable constructions that do not require a support structure, while elements in red can only be manufactured if a support structure is made simultaneously. Overhangs under 45° require an external support underneath because the powder cannot be melted when the angle is so acute. Apertures under 45° also need a support structure. In this case, however, a review of the construction design is recommended. Ovals and overhangs greater than 45° are more suitable because they are able to support themselves, thus enabling the additional costs of a support structure to be avoided.

A reliable and equal partner

Since introducing the process, Toolcraft has been working with the machine manufacturer CONCEPT Laser GmbH. The collaboration between these two companies constitutes a perfect symbiosis that produces pioneering work. CONCEPT Laser contributes its existing results and experience to the development of the parameters of the metal laser melting process for different materials. Meanwhile, Toolcraft contributes strategies and expertise concerning the further processing of parts in machining processes. The company establishes guidelines in this regard, such as measurements and shapes to facilitate tensioning in order to meet customer requirements. The machines offer a workspace of 250 mm x 250 mm x 280 mm in the x, y and z directions. They melt down layers measuring 20-80 µm in thickness at a speed of 2-20 cm^3/h depending on the material. The laser has an output of 400 watts.

The process in detail

Diagram 4 illustrates the configuration of a part of laser melting equipment. The manufacturing plate is located in the workspace. The coater applies a thin layer of powder. The laser processes this at the pre-set melting points in a pre-determined order. In this way, a solidified layer is produced from the loose material. When the melting process is complete, a new layer of powder is applied from the stock of powder. The number of melted layers varies depending on the size of the part. When the job is completed, the majority of the unprocessed material remaining in the powder bed can be reused. Qualified specialists sift the powder and

Source: Toolcraft

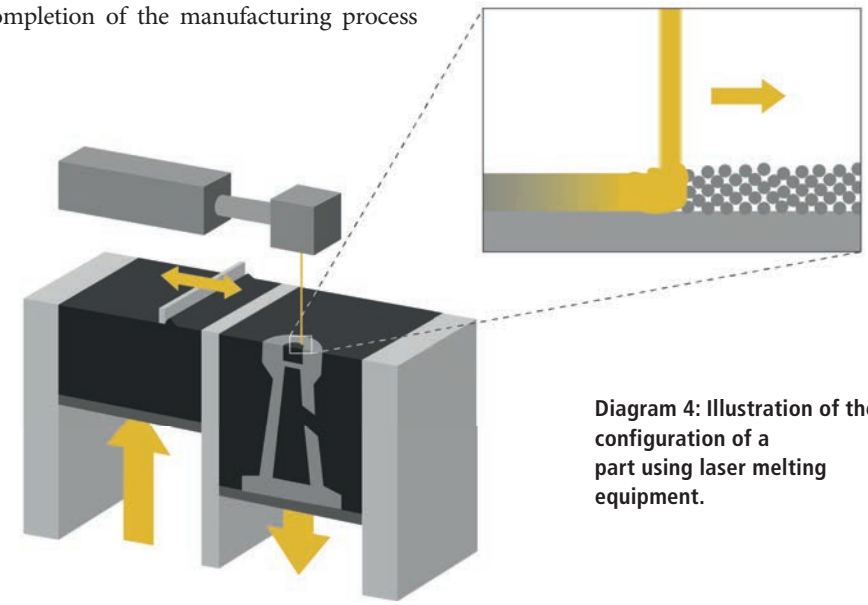


Diagram 4: Illustration of the configuration of a part using laser melting equipment.

Source: Toolcraft

The technology can be used to make housing parts and complex, thin-walled structures for gas turbines.

Source: Toolcraft

Cooling jacket with a sophisticated cooling system mould made using internally cooled molding inserts.

Source: Toolcraft

The metal laser melting process allows profiled pins with integrated cooling to be manufactured.

subject it to a strict quality control procedure.

Diverse base of materials

Metal laser melting, in combination with established core techniques such as turning and milling for materials that are difficult to machine, provides significant added value. This is why Toolcraft constantly works to improve the process as well as to extend its production capacity. When selecting materials, the company applies its expertise in materials and manufacturing to the needs of its customers. In principle, any material that can be welded can be processed. Toolcraft uses nickel-based alloys such as Inconel 718 and Inconel 625 as well as stainless steels such as 1.4404, 1.4828, 17-4PH and the hot-work steel 1.2709.

Invar 1.3912, Haynes 188 and Scalmalloy added to the mix

Since 2013, Toolcraft has been working with the nickel-iron alloy Invar 1.3912, a material with a very low thermal expansion coefficient. It is used in the aerospace sectors, semiconductors and composite manufacturing. Another new material that the company has recently started to process is the cobalt-based alloy Haynes 188, which is a combination of cobalt, nickel, chromium and tungsten. The material is not only extremely heat-resistant but also resistant to oxidizing environments up to 1,095 °C. Due to its properties, it is particularly suitable for use in the aerospace and motor sports industries. In this regard, it easily meets the high requirements of the production of engines as well as industrial gas turbines. Toolcraft has also begun to use Scalmalloy, a high-strength aluminium alloy produced by the company Airbus APWorks. The material is corrosion-resistant with the specific strength of titanium at a simultaneously high ductility. In addition, it is more than twice as strong as the aluminium-silicon powder currently in use. Because of these properties, Scalmalloy is ideal for high-performance applications in the aerospace and aviation industries, for automotive applications and for special machinery manufacturing.

An innovative process for almost all industries

Toolcraft creates pilot and small series for the automotive/motor sports sector, as well as engine, pump and vehicle components. The company also manufactures parts made of highly heat-resistant materials. For aerospace, it produces housing parts and complex, thin-walled structures for gas turbines. For this purpose, the company primarily uses nickel-based alloys (Inconel 718, Inconel 625, Haynes 188), titanium alloys (TiAl6V4) and aviation steels (17-4PH) in powder form.

Example of tool and mould making

When manufacturing moulds, profiled pins are used as mould inserts that form contours. The rigidity and sturdiness of molding pins in injection molding and pressure casting contribute significantly to a successful end product. The metal laser melting process allows profiled pins with integrated cooling to be manufactured. Large cooling surfaces enable ideal heat transfer, which results in maximum cooling effect at the front end of the cooling pin. In addition, the one-piece structure of the coiling and molding pins ensures optimum sturdiness and rigidity of the molding pin. Toolcraft also offers a special service where it conducts an efficiency and air-flow simulation before the start of production, taking into account construction design, air-flow behavior, heat dissipation and a strength calculation. The tactile and/or optical measurement of laser-melted components ensures the highest quality. Finally, the workpiece components are also subjected to non-destructive testing.

Groundbreaking improvement

Up to 30 per cent shorter cycle times are achievable through the use of laser–melted profiled pins with internal cooling. Without exaggeration, this number constitutes a groundbreaking improvement. These pins can also save customers the cost of injection-molding or pressure casting equipment and tools in long-term projects. Metal laser melting also dramatically reduces the reject rate due to the optimized cooling effect significantly minimizing faults in the parts produced and distinctly improving the quality of casting. A further opportunity to save costs is through the extension of maintenance cycles. In this way, the production of high-quality plastic and metal parts is no longer problematic and also provides a significant competitive advantage in addition to reduced costs.

Benefits also transferable to other industries

Thanks to its wide applicability, Toolcraft can transfer its experience from one industry to the requirements of other sectors. “Laser melting is a perfect addition to our existing services, whether it is through the manufacture of complex parts which can neither be turned nor milled or through the reduction of cycle times in injection molding and mould making using internally cooled molding inserts,” says Christoph Hauck. In this way, the benefits of conformal cooling can also be transferred to other industries. This is used in the medical industry, for example. For this purpose, Toolcraft has built a cooling jacket with a sophisticated cooling system.

Visions of the future

What first began as rapid prototyping has very rapidly established itself as a recognized manufacturing technology. “Many attempts are made to make laser melting more commercial. However, above all it requires years of experience in designing parts with regard to the behavior of materials. This means that the use of qualified specialists will continue to be essential in the future,” concludes Hauck. MMI

DESIGN INSTITUTE

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Machine Tool Design - Electrical

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Course Outline

- ⇨ Fundamentals of electrical design
- ⇨ Introduction to Mechatronics
- ⇨ Basics of PLC Programming
- ⇨ Introduction to CNC system
- ⇨ CAD Training
- ⇨ Electrical Design for CNC machine
- ⇨ Electrical Design for Industrial machine
- ⇨ Industy Visit

Benefits

- ⇨ Better employability
- ⇨ Comprehensive Machine tool electrical design
- ⇨ Hands on experience of machine tool electrical design
- ⇨ Develops confidence on machine design
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- ⇨ Placement support

Participant Profile

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A Better Way: Finding Efficiencies in the Product Design and Manufacturing Process

The authors discuss the inefficiencies that need to be ironed out before introducing the concept of the Digital Twin and what this means for the way goods are created and produced.

To visit a modern manufacturing plant is to witness a jaw-dropping symphony of people, parts, materials, robots and machines – all working down to the minute or second to hit schedules. It looks incredible. But behind the scenes the way goods are designed and planned for production remains based on aged processes. This is not to criticise anyone. A great piece of design is a major accomplishment. And it can be a hugely complex task that, in some instances, can involve millions of parts and thousands of people and partners—often coordinated across countries. Furthermore, in key markets such as electronics (faster processors, miniaturization), automotive (the green agenda and emissions) and aviation (the green agenda and the drive for composite-based aircraft), there is a relentless drive for improvement that means new designs must be achieved more quickly. Given the complexity, there is understandable reluctance to move beyond tried and tested development processes. This said, our customers report common problems across the development and production chain with some areas susceptible to causing costly delays.

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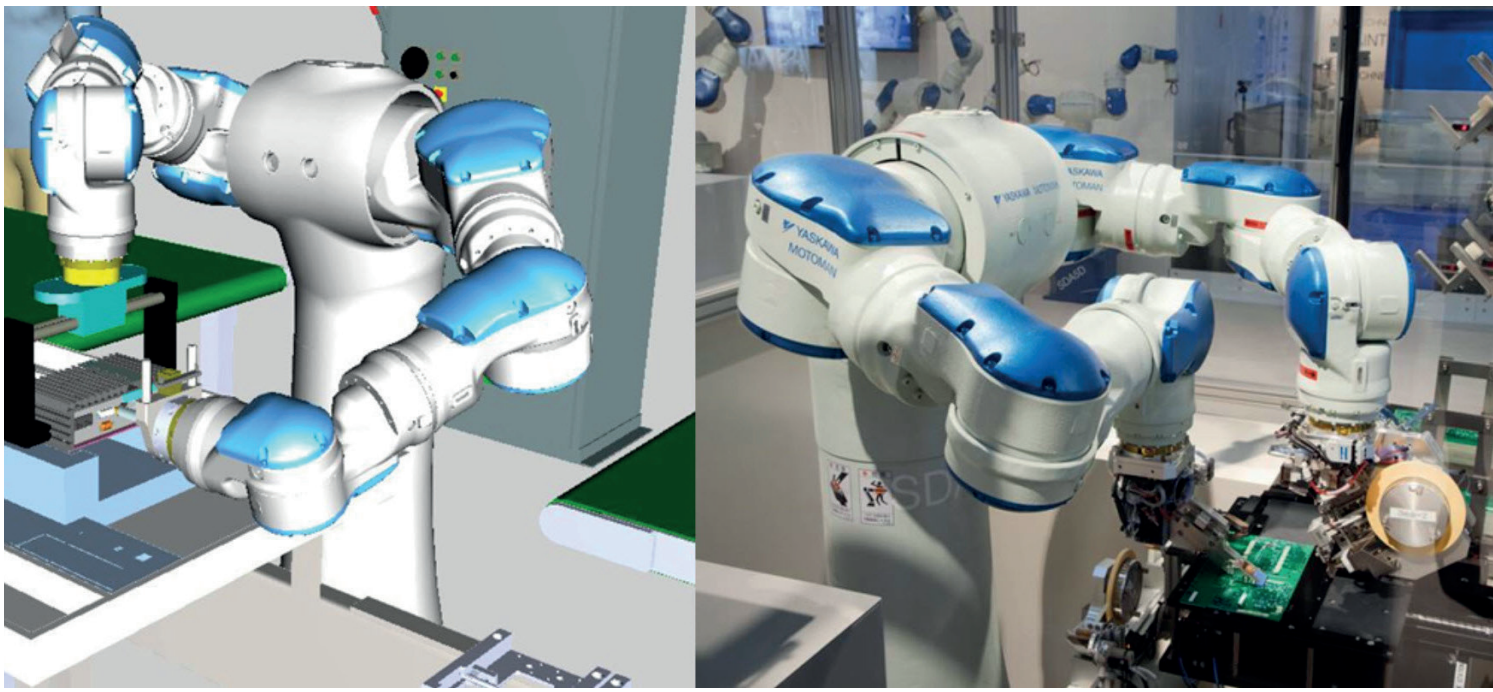
A Better Way

Source: Siemens PLM Software



A side-by-side view of a digital twin that realistically replicates the product design and assembly processes.

Common challenges

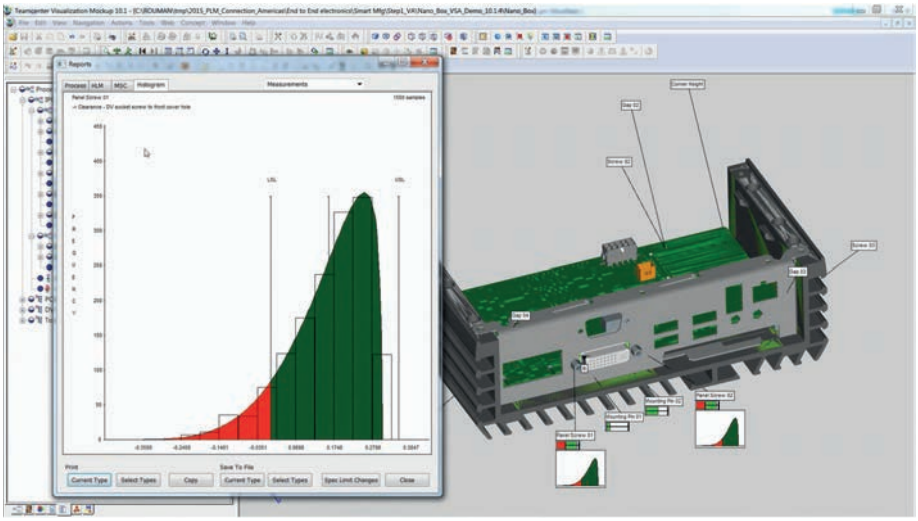
One of the most important issues we see is that the design team uses separate systems to their manufacturing colleagues. In practice this can mean that designers pass over their creations to the manufacturing guys who have to try to create the subsequent process plan using the software they are used to. In this scenario—which is quite common—information can get out of sync, so it is difficult for everyone to see what is happening. This increases the scope for failure.

Moving through into the creation of the manufacturing floor layout, we regularly encounter problems here too. These tend to be based around the fact that layouts are created using 2D floor plans and paper blueprints that take time and effort to create. While they are an essential part of the process, they are quite inflexible and we often find that any changes to the floor's layout do not get reflected in the plans. This can become especially problematic in fast-moving markets such as consumer electronics where production systems must be continuously extended and refreshed. Why? Because 2D plans lack the intelligence and connectedness for manufacturers to know exactly what is in production to make smart decisions and act quickly.

Following on from the layout, the manufacturing workflow typically progresses through into process validation. Here we also find a potentially major barrier to efficiency. It is that manufacturers typically wait for actual equipment to be in place to see how it performs. If it does not do as well as expected, it is late in the day to look for an alternative solution and, in our experience, any breakdown in this process can cause serious delays. Finally there are two other areas at the end of the production chain where customers report challenges: throughput performance and manufacturing execution.

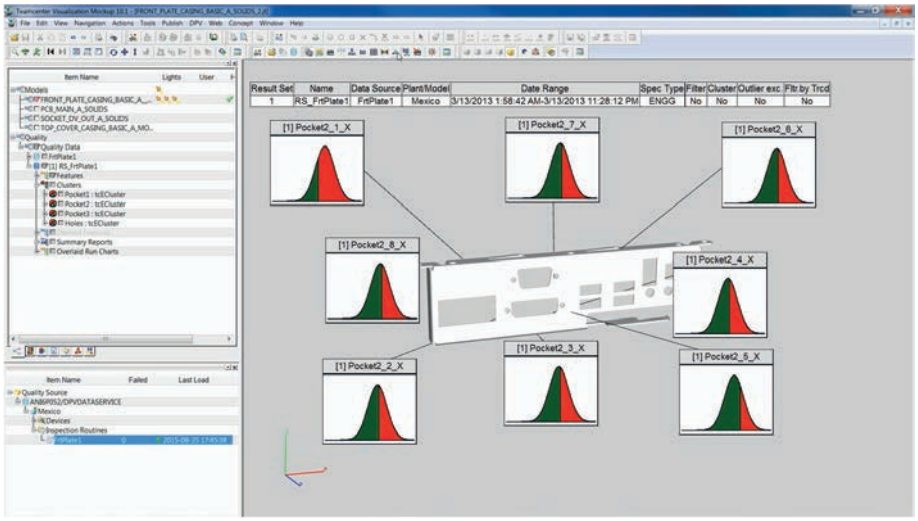
Because of the complexity of the modern floor and, more often than not, a lack of coordination between different software and planning systems, it can be difficult to isolate areas or cells in production that are delaying the line. And, when it comes to the last piece of the jigsaw—manufacturing execution—customers report that it is often difficult to measure performance and see if how the process was planned to perform is actually how it is performing. Again the issue here is complexity, with challenges in feeding back information from the shop floor into product design, engineering and manufacturing teams.

So, what is to be done? Let us take a look at our central idea around which we think all the key steps in the production process can gravitate and be improved: the Digital Twin.



Source: Siemens PLM Software

Digital Twin analyzed for manufacturability. During the analysis, we discover that 9% of the builds are out of spec due to an insufficient tolerance specification. The issue is easily corrected in the digital design model and warranty claims avoided.



Source: Siemens PLM Software

The digital twin closes the loop between the virtual and physical worlds of manufacturing so you can compare the as-design model to its as-build result.

The Digital Twin

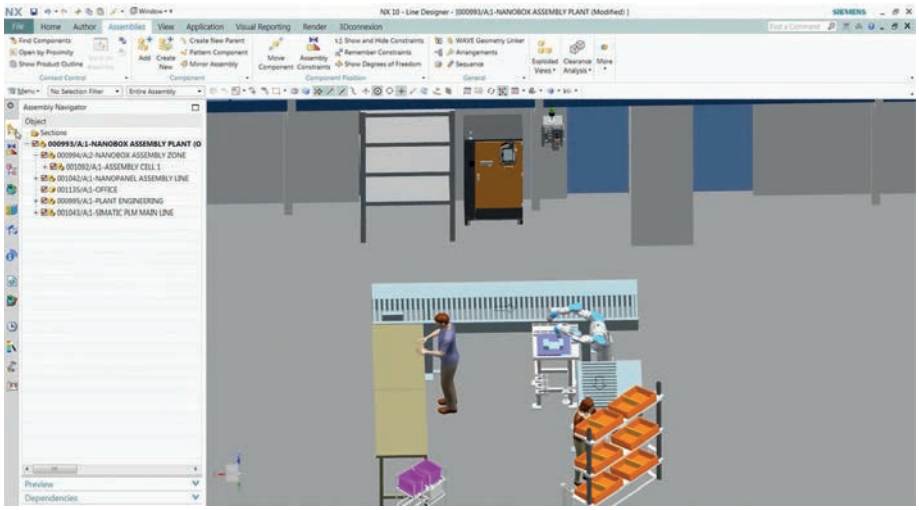
A Digital Twin is a virtual copy of something that is modelled to behave realistically. Without wishing to get too much into our products here, we have aligned our Project Lifecycle Management (PLM) tools to provide a complete digital framework around which Digital Twins can be modelled to realistically replicate the product design and assembly processes – from beginning to the end. So what does this mean? Using the same stages we discussed above, we have highlighted some of the key capabilities we think are most valuable in this approach.

► **Design:** Using the NX software (and other CAD systems), we can create a model of our product – and open them in Teamcenter as a 3D JT model. The software can virtually build literally thousands of variations of the product, just as it would be physically built, in seconds. It uses big data techniques, descriptions of the Product and Manufacturing and Information (PMI) (that specify the product's tolerances and components), and a basic description of the manufacturing process to determine if we have any clashes. We trialled this approach on the design of one of our own electronics products. We were able to instantly see that the connector screws and corresponding video output connector holes had become misaligned. Unchecked, this could have resulted in warranty claims as the connector would separate from the PCB due to the manufacturing fault. Identifying design problems this early in the piece can save serious time and money – into and beyond

Source: Siemens PLM Software

Manufacturing execution: The digital twin is connected directly to the manufacturing operations management system to ensure it is executed properly on the shop floor.

Source: Siemens PLM Software



The production system layout is also managed in Teamcenter ensuring the product design, manufacturing process plan and production system stay synchronized so that production starts without delay.

the manufacturing process.

▶ **Process planning:** The Digital Twin can improve collaboration between the design and manufacturing teams to better plan what needs to be made, how it should be made, the resources needed and where it can be made. Let us take an example of an updated assembly. Working with our tools, your planning team can use the new Bill of Materials (BOM) to input the new steps into a 3D working model of the current process. You can model any production system anywhere, so a team in Paris can be planning production for a site in Rio. With time estimates available for the new processes, the team can see if the workflow will still ensure that the average unit product targets are met. If not, the revised or new cells can be moved up or downstream and a simulation run again until the sequence ensures that production targets are met. The revised plan can be easily accessed by all stakeholders and signed off. If there are any issues revealed during the process, the design and planning team can work together to rectify these.

▶ **Layout:** With the floor layout, we recommend creating the Digital Twin—with all the mechanical, automation and resource details—and inseparably linking it to the product design and manufacturing eco-system. Using a combination of PLM tools, you can simply drag and drop cells, equipment and people into place on your line and simulate the operation. It is a very simple but hugely effective way to design your floor and make changes. So, if a product is changed and this requires the use of a new robot, simulation engineers can see if the robot's size will, for example, interfere with one of the conveyors. The layout engineer can then make the adjustment and issue a change request notifying purchasing that a new piece of equipment is needed. Furthermore, impact analysis can be run when changes are needed to avoid mistakes and inform any suppliers that might be affected.

▶ **Process validation:** With process validation, the Digital Twin can be used to digitally validate the assembly process. Intelligent modelling using quantitative analysis can assess all the human factors associated with the build to advise on issues such as working posture to help prevent employee fatigue and injury. The report can be used for training with videos and process guidelines produced for the staff.

▶ **Throughput optimisation:** The Digital Twin can also be used to statistically simulate and assess your planned production system. It can evaluate whether to use people, robots or a combination of the two. It is possible to simulate all workflows—even down to how much energy is utilized by the production equipment—to look to streamline the process as much as possible. The analysis can show you how many parts will be produced by what process so that you can be sure to hit schedules prior to creating the physical line.

▶ **Manufacturing execution:** You can improve manufacturing execution by using the Digital Twin to close the loop between the physical and virtual worlds. Manufacturing instructions are released direct to the design floor where operators can view them along with associated videos. Operators can feed back data from the production floor (e.g., the gap between two panel screws) while other automated systems can also collect performance data. This can be used to assess if there is any difference between the build designs and results to isolate and rectify any issues.

A new way of doing things

Using a Digital Twin, which truly replicates a physical product, can help you to spot problems more quickly to accelerate production and reduce costs across the production chain. What is more, it ensures that you know the design can be made; the plan is always up to date and synchronised; the strategies will work; and production will perform as you anticipated. It also helps you to see how new technologies can be integrated into your lines without the risk of buying and installing them to see how they perform. For one of the world's most advanced industries, manufacturing has long relied on proven but dated approaches to planning its products and lines. Now is the time to bring the spirit of innovation that drives success to the way we approach design, process planning and execution; now is the time to try something new. MMI

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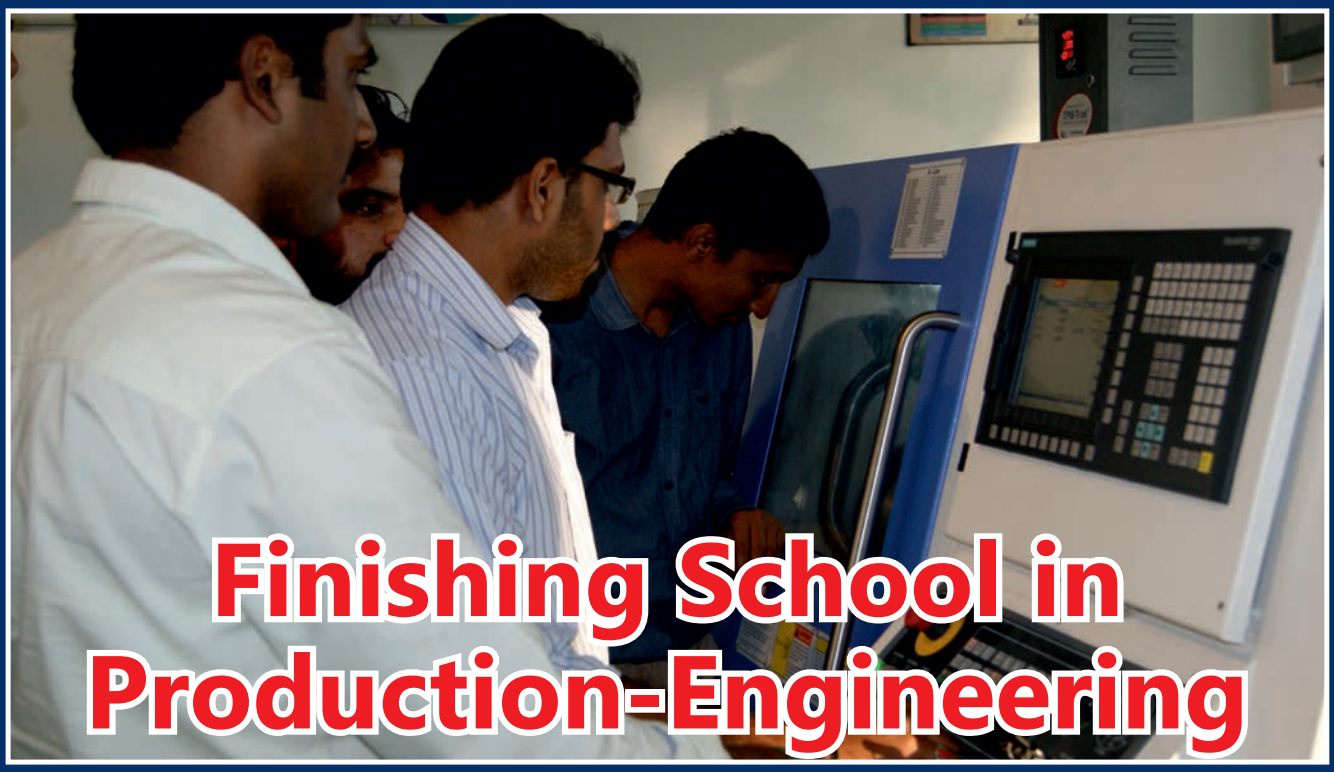

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Increasing Die and Tool Life

Die, mould and tool wear are major reasons for production downtime and increased costs in most industries. Apart from using strong base metals for making dies, a few effective treatments can be administered to dies to increase their service life. However, even if this is possible, such treatments are not feasible for all metal-forming units. This article introduces the Japanese Cold-Welding Technique—a practical and economical technique to increase die, mould and tool life. The technique can be easily adopted by all metal-forming units, big and small.

Popular treatments to increase die life, repair or reclaim forging dies include the following.

Nitriding

Gas Nitriding/Plasma Ion Nitriding are popular surface hardening treatments carried out on dies. With an initial die hardness of 42 HRC, the nitriding process can further harden the surface of die up to 64 HRC. Many large forge shops in India carry out nitriding of 100 per cent of their forging dies. However, very few forging companies have an in-house nitriding facility. Nitriding is found effective in many cases. The skill of the nitrider, flawless nitriding facility and process play a vital role in the success of this technique. Nitriding is also a capital-intensive technique and not many companies can afford the finance, space and skilled workforce to set up an in-house nitriding facility. Getting the dies nitrided from commercial heat treat shops is not always feasible. Finally, additional efforts are required to carry out selective nitriding and mask areas of components where nitriding is to be avoided.

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Increasing Die

PVD & CVD

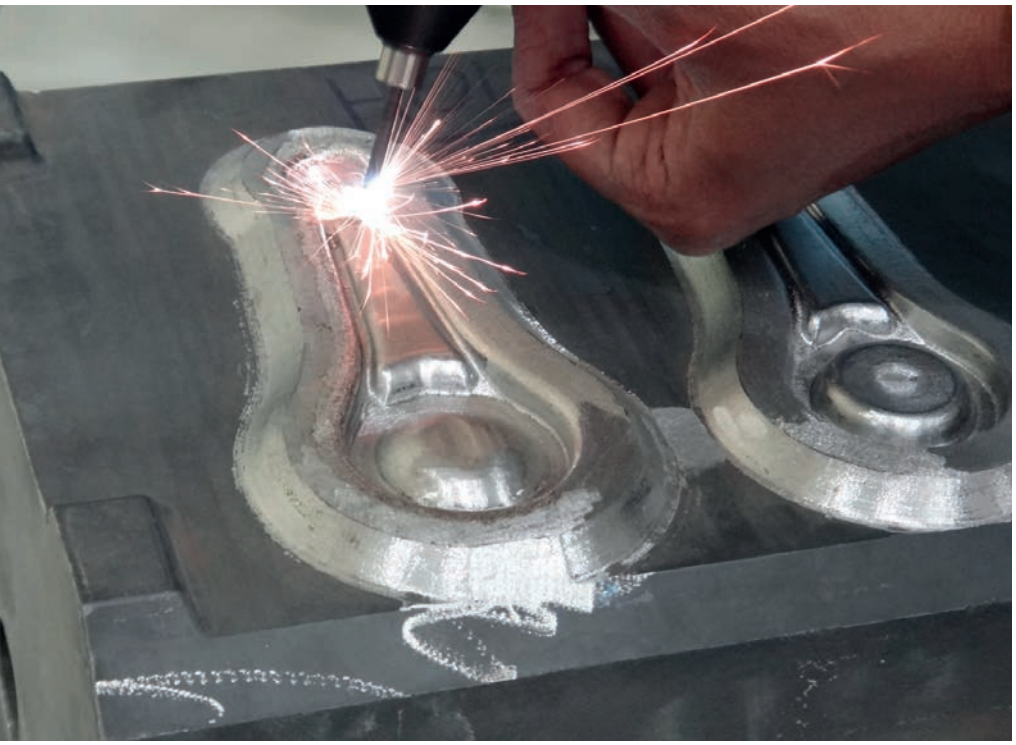
Treatments like Physical Vapor Deposition (PVD) and Chemical Vapor Deposition (CVD) are popular in the machine-tool industries in America and European countries. These techniques are yet to evolve completely in the Indian forging industry. PVD is slowly gaining share in the Indian machine-tool treatment market. It ensures surface hardness of up to 90 HRC. However, the result of PVD treatment on forging dies has not documented. CVD technology, as of now, has not been introduced in India.

Welding to repair/reclaim worn out dies

Apart from the mentioned treatments, the only other option available to repair and reclaim the dies is through welding. Conventionally, welding of the worn out areas of dies or welding of cracks in dies is carried out. Flood welding of the dies is also carried out to completely reclaim the dies. However, this technique also poses its own limitations.

Limitations of conventional welding

- Lack of skilled welders
- The need for open space or effective ducting for carrying out welding operation
- Time consuming process as forging dies

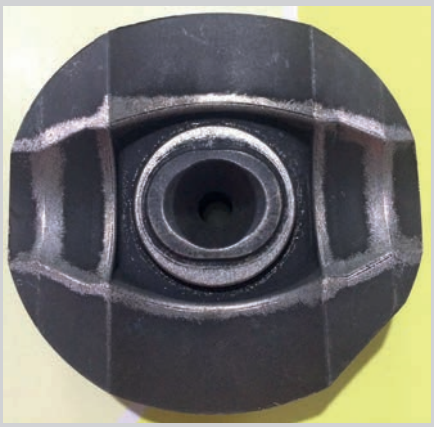


Source: Steel Plant Specialities LLP

Japanese cold welding technique involves electronic coating of tungsten carbide on selective wear-prone areas of dies/moulds/tools.

Scratch and serrations-prone inner diameter of a forging die that was coated. Carbide coating is seen as silvery coarse layer.

Sheet metal pressing and punching tools set carbide coated on edges and wear-prone areas.



Sensitive areas of the die were protected with carbide coating. It is seen as silvery layer on edges of die profile.

Source: Steel Plant Specialities LLP

must be taken to a welding area

- Pre and post welding heat treatment/stress relieving is necessary

Usually, conventional welding is a 'Repair-Oriented' technique. It is carried out after the dies are damaged or worn out.

Japanese cold welding

A new Japanese cold-welding technique enables appropriate surface hardening of dies, moulds and tools to increase their service life. This involves electronic coating of tungsten carbide on selective wear-prone areas of dies/moulds/tools through the 'Japanese cold welding technique'.

Cold welding is carried out as a 'preventive maintenance' technique on new dies. It is a surface hardening technique, similar to nitriding and PVD, but is administered using a completely different methodology. Hardness of tungsten carbide layer deposited by cold-welding on dies can surpass nitriding to reach hardness of more than 70 HRC.

Benefits of the Japanese cold welding technology are:

- Skilled welders are not a requirement
- No fumes are generated during cold welding
- Time saving process as dies need not be removed from forging equipment
- Pre and post treatments not required as no stresses are generated during cold welding.

Principle of operation

Consumable electrode made of alloys and intermetallic compounds are deposited on the die by means of an electronic spark at a frequency of 10^{-1} to 10^{-3} second for one to millionth of seconds per spark. Direct current from the power supply will heat the electrode to 8,000 to 25,000°C, only at the contact areas and transfer a small quantity of electrode to the work piece under an ionized state. A strong metallurgical bond is thereby produced. The substrate does not get heated and hence, there are no heat-stresses generated. Sparks generated during carbide coating are minimal and harmless. No fumes are generated. This is well depicted in the first photograph given at beginning of this article.

Substantial increase in die life after cold-welding

S. No.	Description	Metal Forming Equipment	Not coated die life (No of parts made)	Japanese cold-welded die life (No of parts made)	Percentage of increase in die life (%)
1.	Sheet metal pressing die & tool set	Sheet metal press	18500	25900	40
2.	Hot forging die	1000 ton forging press	4000	5400	35
3.	Hot forging die	1600 ton forging press	8000	12000	58
4.	Hot forging die	1600 ton forging press	10000	22000	120

Carbide coating characteristics

- Wear resistant: Owing to inherent strength of tungsten carbide, the wear resistance is high. If the die is hard and properly heat treated, the life expectancy of the forging die will be increased after the carbide protective coating.
- Heat resistant: The coating is heat resistant and will not cause heat checks. Excessive heat leading to die wear will be prevented in protected areas.
- Scuffing resistant: Scuffing and bruising is the initial stage of having serrations on die. This scuffing will be prevented or substantially delayed.
- Lubricity: Many times, owing to the very smooth finish of new dies, the forging/casting die lubricant does not adhere to the die. This problem is not faced in the case of carbide coated dies.

Till date, no negative result is observed in any of the demonstrations of this technique carried out in various metal forming operations. The percentage of increase in die and tool life has varied from as low as 14 per cent to as high as 120 per cent. Various parameters that contribute to success of this technique are well documented, leading to refinement of the technique, assuring best results in each new trial.

Summary

Japanese cold welding technique of electronically overlaying protective carbide layer on metal-forming dies and tools holds promises of increased die and tool life, reduced maintenance downtime, convenience of operation and better productivity. As the concept is proven, it is a requirement in every modern metal-forming unit seeking cost reduction and increased profitability. MMI

Simulation Software Simplifies Complex Mouldmaking Challenges

As machine tools and mould designs become more complex, part program verification using CNC machine simulation becomes an essential tool for ensuring that the mouldmaker's NC programs machine the mould correctly the first time. Learn more on how simulation software can simplify complex mouldmaking challenges.

To be truly effective, CNC machine simulation software must interactively simulate and display the material removal process of a NC program. NC programmers use the software to verify the quality and accuracy of their NC programs while 3D simulation of the CNC machine checks for collisions. But the goal of simulation is not simply a collision-free and efficient NC program. The first and most important goal is a NC program that produces the correct workpiece.

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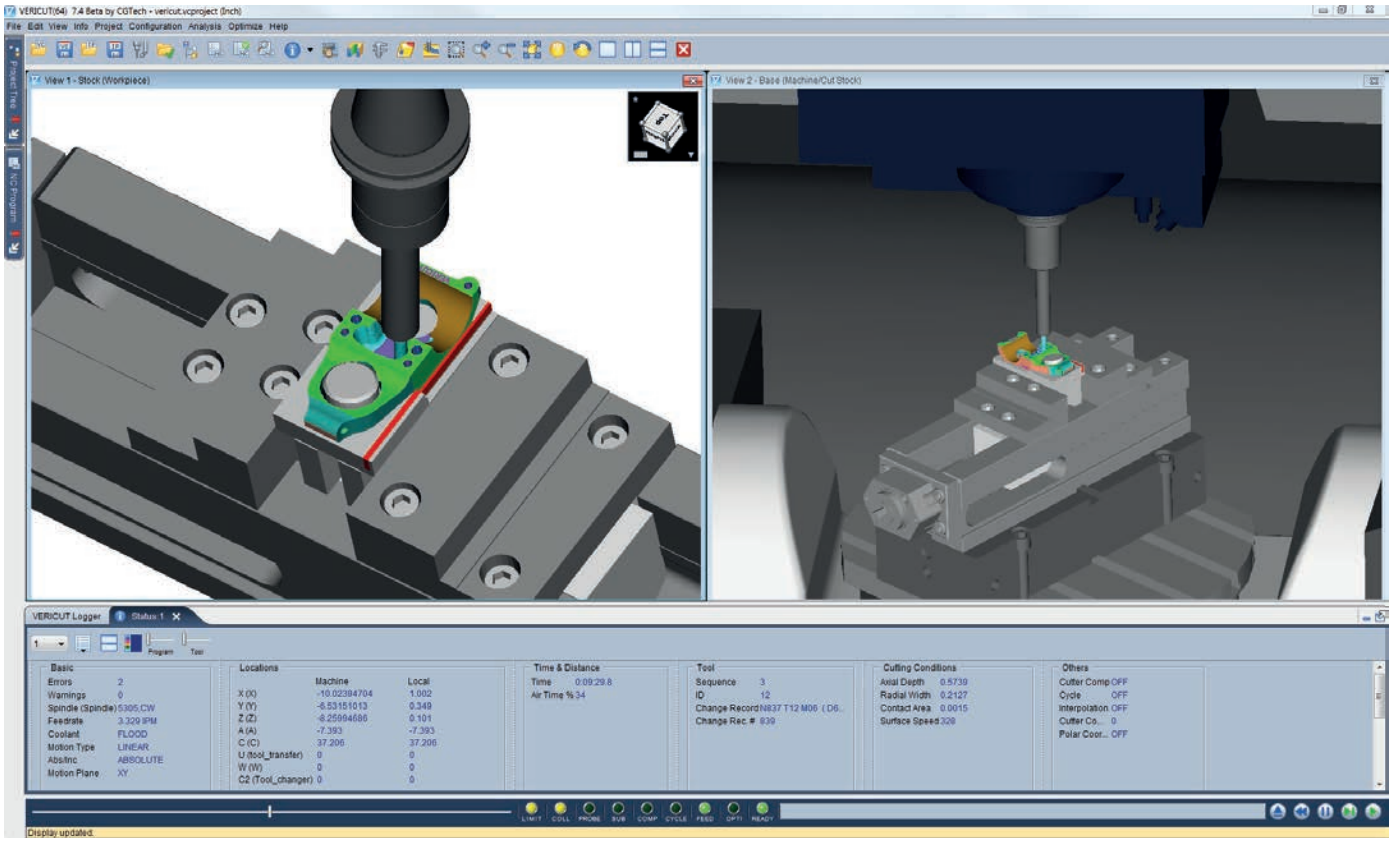
Verifying machine simulation

The current version of VERICUT CNC machine simulation and optimization software, developed by CGTech, significantly reduces the time required for mouldmakers to develop, analyze, inspect, and document the CNC programming and machining process. VERICUT's in-process model tells the mouldmaker whether or not his NC program will make a correct mould. For example, many NC programs use circular interpolation. VERICUT emulates the circle motion and creates an as-machined cylinder feature that can be measured to ensure its correctness. Most internal simulations—the simulation included with most CAM—do not emulate circle motion, but instead divide the circle motion into a series of linear motions

Source: CGTech



Complexity of mould designs requires verification using CNC machine simulation to ensure that the NC program used machine the mould correctly the first time around.

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Simulation Software

approximating the cylinder. These segments are not measurable as a cylinder.

VERICUT software development is driven by the evolutionary changes in manufacturing technology: new CAD/CAM software features; new machines and tooling; new machining techniques and processes; and mouldmakers' need to implement and improve on these changes.

Improvements for ease of use

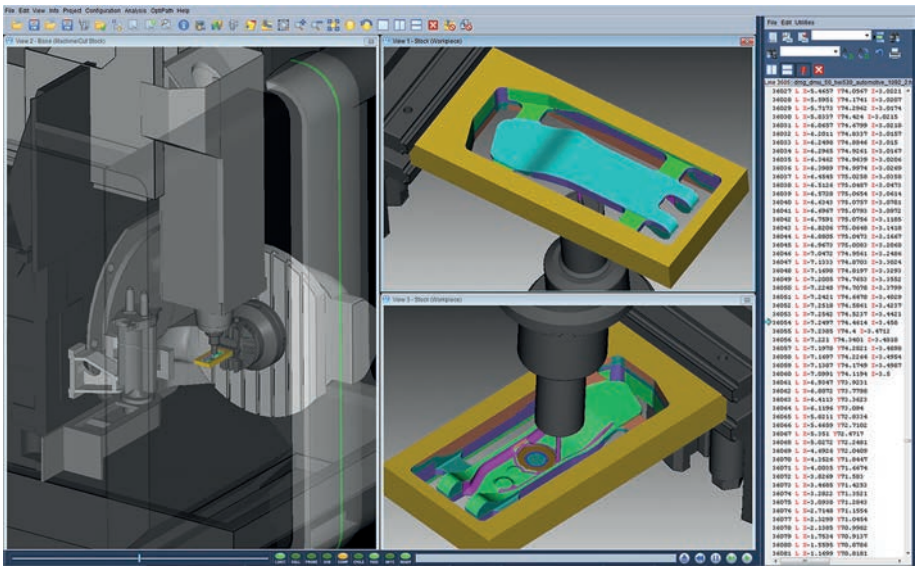
Here are the trends and challenges facing mouldmakers today that have resulted in ongoing software enhancements.

More and more mouldmakers need to simulate specialized processes and complex machines. When a specialized process reduces production time or increases reliability, it becomes adopted by more companies. By simulating these 'special' processes early, VERICUT instantly supports the next customers who adopt them. For example, years ago it was rare to see a NC program utilizing local part coordinate transformations and tool axis vector programming. Now it is fairly common.

Adoption and evolution is inevitable

Adoption of complex machines is similar. Not many years ago, the use of 5-axis machines was rare by mouldmakers. Today, more multi-axes milling machining centers are being used for mouldmaking previously done using simple 3-axis milling machines. This trend has been fueled by a significant decrease in the price of multi-axis machining centers over the past several years. Even small and mid-size mould shops that previously would not have considered buying a 5-axis milling machine, now have to learn how to setup and program these machines, making accurate 5-axis NC program verification and machine simulation a mandatory tool.

While the mouldmakers benefit from significantly fewer required setups, the chance for collisions between machine components, tools and parts is very high. Complex machine tools typically involve many moving parts, often moving simultaneously, in a small space, at very high speeds, very close to an expensive workpiece. Additionally, the machine parts themselves are expensive and sometimes have a long lead-time if they need to be replaced due to a collision. Wrecking a high-speed spindle can ruin more than just a mouldmakers day, but the effort required to manually validate a NC program that drives a highly complex machine is impractical. Significant VERICUT enhancements were added to support these complex machines during their early introduction into the industry.



Source: CGTech

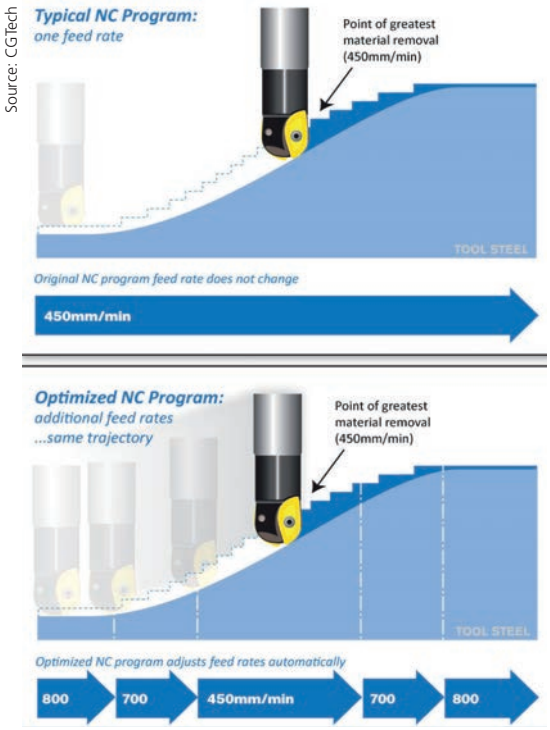
An in-process model tells the mouldmaker whether or not his NC program will make a correct mould.

No one wants to spend time simulating a machining process. However it is a necessary engineering step because of today's complex and fast-paced manufacturing environment. The faster the simulation can return results, the better. The time of the overall simulation is an important consideration. VERICUT is constantly evaluated, inventing and implementing new algorithms to improve speed. Thousands of development hours have gone toward optimizing VERICUT's simulation methods, thereby creating the fastest, most efficient motion simulation to date.

To further simplify setting up a simulation session, the tool library can now be created by importing CAD solid models of inserts and holders. The new CAD Geometry feature added to the Tool Manager makes it simple to specify which parts of the CAD model file corresponds with holders, cutters, or inserts. CATIA v5 and STEP models are supported.

In a nutshell

Over its 24 year life, VERICUT has been continually enhanced and modernized as both the manufacturing and computer industry evolves. But as more features are added, added complexity is inevitable. VERICUT's design is regularly reviewed and refreshed, focusing on how customers use VERICUT and how it can better fit a modern manufacturing environment. In the latest release, VERICUT's user interface has a more natural sequence to common user actions. Utilizing a top-down flow through a graphical tree layout, context sensitive choices appear as the user moves along the NC program simulation process. As a result, setting up a new project and running a VERICUT simulation is very simple. Because the user's actions are acted on immediately he clearly sees the results. MMI



Source: CGTech

Comparison of a typical NC program to an optimized NC program.

SAVE THE DATES

EVENT CALENDAR

Event Name	Contact	Date & Venue
Die & Mould India International Exhibition	Bhaskar Kanchan T: +91(22) 28526876 E: diemould@tagmaindia.org www.diemouldindia.org	April 6–9, 2016 BIEC, Bengaluru, India
SIMTOS 2016	T: +91 (22) 34532721 E: simtos2016@simtos.org www.simtos.org	April 13–17, 2016 Korea International Exhibition Center (KINTEX), South Korea
HANNOVER MESSE	www.hannovermesse.de	April 25–29, 2016 Hannover, Germany
BIEMH - International Machine Tool Exhibition	Carmen Gorostiza T: +34 (94) 4040078 E: mcgorostiza@bec.eu www.biemh.bilbaoexhibitioncentre.com	May 30–June 4, 2016 Bilbao Exhibition Centre, Spain
ACMEE 2016	S Raghavan T: +91 (0) 9790974048 E: info@acmee.in www.acmee.in	June 16–20, 2016 Chennai Trade Centre, Chennai
AMTEX 2016	T: +91 (80) 43307474 E: info@reedtriuneexhibitions.com www.amtex2015.com	July 8–11, 2016 Pragati Maidan, New Delhi, India
IMTS 2016	T: +1 (703) 8932900 E: AMT@AMTonline.org	September 12–17, 2016 McCormick Place, Chicago, US
30.BI-MU	T: +39 (02) 26255860 E: bimu.esp@ucimu.it	October 4–8, 2016 Fieramilano, Italy
JIMTOF 2016	E: jimtof@tokyo-bigsight.co.jp www.jimtof.org	November 17–22, 2016 Ariake Koto Tokyo, Japan

To suggest an event, please send details to swati.deshpande@vogel.de

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Source: IMTMA

Ribbon cutting ceremony at IMTEX FORMING 2016.

Creating Positive Ripples

IMTEX FORMING 2016 and Tooltech 2016 enabled manufacturers to showcase their technological prowess while it gave visitors the opportunity to browse through the latest innovations. Here is a report on the event.

IMTEX FORMING 2016, an international show on forming technology and a concurrent event, Tooltech 2016, organized by Indian Machine Tool Manufacturers' Association (IMTMA), which were held from January 21–26, 2016, concluded on a positive note. The exhibition hosted around 485 exhibitors who demonstrated over 500 machines.

Compiled by
Swati Deshpande
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The inauguration of IMTEX FORMING 2016 took place in the presence of officials from the Government as well as prominent personalities from the metal forming industry. On the occasion, Minister for Large and Medium Industries & Tourism, Government of Karnataka, RV Deshpande underlined the importance of maintaining quality in the manufacturing industry. Speaking on the same Deshpande said, "The world has become a global village wherein competition, quality and consumer satisfaction have become vital pointers. Karnataka wants its industries to be competitive and qualitative."

Alternatively, President, IMTMA, and Chairman & Managing Director, Jyoti CNC Automation Ltd, PG Jadeja said, "Many reforms initiated over the past year such as gradual reduction of corporate tax and putting on hold the provisions of the General Anti-Avoidance Rules have reduced uncertainties and ushered in positive sentiments to pave way for manufacturing growth. We expect the demand for metal forming machine tools to grow at a healthy rate in the medium to long term."

Joint Secretary, Department of Heavy Industry, Government of India, Vishvajit

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Creating Positive Ripples

Sahay elaborated on the steps undertaken by the Government of India as well as the Karnataka Government in order to strengthen the machine tool industry. "The Central Government is focusing on the 'Make in India' initiative. We are working together with the machine tool industry and one of the efforts that has been a focus for our ministry is how to facilitate the role of new technologies in the machine tool sector. We are also launching schemes that will revolve around technology, skilled labor, and related issues. Also, we are actively working with the Government of Karnataka to set up a machine tool park in Tumkur," added Sahay. Moreover, Member, NITI (National Institution for Transforming India) Aayog, Government of India, Dr VK Saraswat emphasized on the goal of the 'Make in India' program, which is to achieve new heights in the near future. He further added that funding should take place in R&D for innovative technologies and that there is a need to set up more R&D centers.

Elaborating on IMTMA's role in the growth of the machine tool industry, Director General, IMTMA, V Anbu said, "Export of machine tools can witness a major growth only if our products and manufacturers have a continuous presence in the export market. The IMTMA Export Development Cell has been constituted with members from machine tool OEMs and accessory manufacturers with the objective of boosting the export efforts of the Indian machine tool industry and thus enhances the 'Brand India' image in overseas markets."

IMPRESSIVE

Leaders' Speak

"Many reforms such as gradual reduction of corporate tax and putting the provisions of the General Anti-Avoidance Rules on hold have reduced uncertainties in the market. We expect the demand for metal forming machine tools to grow in the future."

President, IMTMA, and Chairman & Managing Director, Jyoti CNC Automation Ltd, PG Jadeja

"The Development Cell has been constituted with members from machine tool OEMs and accessory manufacturers with the objective of boosting the export efforts of the Indian machine tool industry and thus enhances the 'Brand India' image in overseas markets."

Director General, IMTMA, V Anbu

AWARD CEREMONY

IMTMA–Premier Outstanding Entrepreneur Award

Source: IMTMA

The session ended by awarding the 7th 'IMTMA – Premier Outstanding Entrepreneur Award' in memory of Vinod Doshi to Vice President, IMTMA and Managing Director, ACE Manufacturing Systems Ltd, P Ramadas.

Exhibitors' experience

The trade fair offered multiple benefits to the exhibitors. Speaking on the same, Director, Radcam Technologies Pvt Ltd, Siddhu Jolad stated, "Thanks to IMTEX FORMING, we got a chance to meet multiple technology companies from across the world under a single roof. It is the perfect platform to search for new partners and form new alliances."

Offering a different dimension, Country Head India and SEA, FARO Business Technologies Pvt Ltd, Harkiran Sandhu mentioned, "Tooltech, the concurrent exhibition, was a tremendous nurturer to the machine tool industry. In the beginning of the new year, this show's mechanism offered fresh hope to the industry." Additionally, IMTEX and Tooltech also offered a good indication of the current market situation. Product Manager, Güthle Pressenspannen GmbH, Kunal Bankapur added, "Exhibitions can be a reflection of the current economic situation, but at the same time, it can also be the initiator for new developments and trends within the market."

In addition to being a watchdog of the industry, IMTEX FORMING also brought together manufacturers and users on a common platform. "Through this show, ideas and problems are exchanged and

Source: Yamazaki Mazak India Pvt Ltd

Yamazaki Mazak India's booth at IMTEX FORMING 2016.

understood. The manufacturers are motivated to rise up and solve the customers' challenges by implementing innovative changes in sheet metal forming machineries," opined Director, Magal Engineering Co India Pvt Ltd, Sheila N Rao.

IMTEX FORMING 2016 offered exhibitors an excellent platform to showcase their technological prowess. Speaking on the benefits of the exhibition, Managing Director, Sahajanand Laser Technology Ltd (SLTL), Dr Arvind Patel said, "IMTEX FORMING has always been an incredible platform for us to showcase our innovative laser solutions to the buyers, users and the industry."

Launching pad

In this edition of IMTEX FORMING, SLTL introduced its new loading unloading machine that aims to eliminate the trouble caused while lifting and shifting metal sheets. The fully automatic machine reduces time and human efforts. Furthermore, it comes with vertical and horizontal alternatives that fit exactly into the premises as per the requirements. It standardizes the processes at the facility and decreases the rate of errors. The loading-unloading machine can be synced with any sort f metal forming system such as laser, water jet, etc. It can also load/unload the sheets swiftly.

Alternatively, Carl Zeiss unveiled its latest innovation—O-SELECT at IMTEX FORMING 2016. "This revolutionary product will change the industry's approach towards metrology. Its user-friendliness and intelligent software eliminates the need of having special skilled operators to work on the system," informed Member of the Board & COO, Carl Zeiss Industrielle Messtechnik GmbH, Felix Hoben.

Delegates

To witness this technological prowess, delegates from across the country and varied sector industries including aerospace, auto components, automobiles, capital goods, defence, electrical and electronics, oil & gas equipment, railways, plastic machinery, white & brown goods, etc., visited the show. Key public sector undertakings such as Bharat Heavy Electricals Ltd (BHEL), Hindustan Aeronautics Ltd (HAL), Indian Space Research Organisation (ISRO), National Aeronautics Ltd, Indian Railways, Ordnance Factory Board, etc., visited the show as part of the trade delegation. Many private companies such as Bajaj Auto, Fiat India Automobiles, Larsen & Toubro, Robert Bosch Automotive Electronics India, Volvo Construction Equipment, Hawkins Cookers, Toyota, Maruti Suzuki, Caterpillar, PRICOL,

Source: IMTMA

An overview of the exhibition hall at IMTEX FORMING 2016.

Source:IMTMA

Students having a close look of the technologies showcased at the event.

Infosys, UTC Aerospace, Honda Cars, TVS and Kalyani Technoforge also visited the event.

Concurrent events

Moreover, IMTMA also hosted a range of concurrent events along with IMTEX FORMING 2016 and Tooltech 2016. The 'International Seminar on Forming Technology', which took place on January 20, 2016, became a platform that brought together the metal forming industry and its users.

The highlight of the event was the keynote address titled 'Vehicle Light Weighting' by Division Director 'Bulk Metal Forming', The Fraunhofer Institute for Machine Tools & Forming, Chemnitz, Germany, Dr Andreas Sterzing. He pointed out that the main challenge for industrial businesses is the development of strategies to reduce costs, resource and energy input as well as emissions. This implies that one needs to produce the most out of the raw material (input) and energy.

The seminar attracted around 250 delegates participating in concurrent sessions on design & software, equipment and tools, and process.

Additionally, in an attempt to bridge the evident gap between the industry and academia, the association brought out the 'Academia Pavilion' initiative. This initiative was taken in order to realize the importance of building R&D capabilities by connecting the industry with academic institutions.

At IMTEX FORMING 2016, the pavilion witnessed the participation of 40 educational institutions. What makes the initiative unique at this edition is that for the first time 12 presentations were organized. These presentations were made by faculty members from renowned educational institutions.

Source: IMTMA

Visitors having a look at the machine displayed by SLTL at IMTEX FORMING 2016.

Also, for the first time 40 academic institutions participated in the i2 Academia Pavilion. Twelve institutions including IITs made presentations to the industry as part of the IMTMA Industry Institution Collaboration (IIIC) initiative. The best research presentations were awarded prizes.

The other initiative—CONNECT was undertaken to inspire students to start a career in the manufacturing sector. Several gurus from the machine tool sector imparted words of wisdom to students attending the session. Around 300 students participated in the event. Students from both mechanical and electrical engineering streams availed of this opportunity to gain more knowledge on machine tools and the manufacturing sector. By interacting with industry experts, they were able to understand how the machine tool industry helps in the growth of the industry.

In addition to this, close to 40 students participated in 'JAGRUTI'– a program to familiarize engineering students with the machine tool industry and the technological happenings in this industry segment. IMTMA organized JAGRUTI with the help of UDAAN members.

Source: IMTMA

An innovative technology displayed by an exhibitor at the show.

Conclusion

With the number of parallel events, IMTEX FORMING 2016 and Tooltech 2016 were a grand success. It created ripples in the market and gave new hope to the industry, which is currently facing uncertain market conditions. The strong presence of business visitors and policymakers from India and overseas made it a truly global event and also paved the way for further growth of the Indian manufacturing industry. IMTEX FORMING will return in the year 2018. MMI

Opening New Avenues

ELECRAMA is known to be the largest event of the power sector in the country. It not only brings opportunity for exhibitors to showcase its technologies but also creates a platform to meet existing and new customers. Additionally, the concurrent events act as knowledge sharing platforms for the participants.

Spread over a gross area of 77,000 m^2, ELECRAMA-2016 kicked off on a high note. The inauguration session started with a lamp lighting ceremony by Minister of State (IC) for Power Coal, New & Renewable Energy, Government of India, Piyush Goyal; Minister of Energy, Government of Karnataka, DK Shivakumar along with other high profile dignitaries.

While giving the welcome address Chairman, ELECRAMA-2016, Aaditya R Dhoot pointed out that with a unique theme—'World Electricity Forum', this year's edition of the show would bring toogther the electrical fraternity under one roof and bequeath an implausible platform for the players to promote innovative solutions and cutting edge technologies for future. Also, for the first time in ELECRAMA with the help of ministry of power, the Review Planning and Monitoring meeting was planned to be held at the venue where the top decision makers from all states and the central government would interact and discuss key challenges and opportunities in the power sector."

Minister of State (IC) for Power Coal, New & Renewable Energy, Government of India, Piyush Goyal began his speech by praising the audience, he mentioned, "The entire industry has come together to support the Prime Minister's vision of providing 24x7 affordable and quality electricity to all." He also expressed his pleasure of attending ELECRAMA-2016. He said, "I am truly amazed by the size, scale, and spirit of this conference. The event truly embodies the spirit of nationalism, where we in India will make in India, to truly global standards and make the best of class cutting edge technology products that will benefit the entire world. ELECRAMA-2016 should become the front runner of the industry's engagement with the rest of the world."

Alternatively, President, Indian Electrical & Electronics Manufacturers' Association (IEEMA), Babu Babel appreciated the use of technology and transparent processes adopted by the power minister and ministry. He further said that India highest GDP growth rate and as the finance minister has stated that we need 8 per cent GDP growth, the power sector needs to grow at 15 per cent per annum.

The trade fair hosted over 900 exhibitors who demonstrated their latest products and innovations.

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Source: IEEMA

Ribbon cutting ceremony at ELECRAMA 2016.

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Opening New Avenues

Concurrent event

Right from industry giants to MSME players participated in the event. Apart from the exhibition, the event also accommodated pavilions and concurrent events to meet new age challenges. Realizing that the renewable are going to be an essential part of the energies of the future, a dedicated pavilion was built at ELECRAMA-2016 for companies offering renewable energy related technologies. This pavilion gave a platform for equipment manufacturers, public sector representatives from renewable sector to display and interact with visitors.

World Utility Summit, the another attraction of the event, was brought by IEEMA in association with IEEE PES as lead partner to share knowledge, experiences, best practices, on ground issues and management of change amongst themselves. The World Utility Summit created a forum exclusively for the utilities, by the utilities and of the utilities. The Summit featured over 100 utilities, regulators, energy efficiency, standards, finance and policy makers from around the world. Alternatively, the International T&D Conclave, which was inaugurated by Minister of Heavy Industries and Public Enterprises, Government of India, Anant Geete, focused

on challenges faced in integrating renewable energy with the main grid and how to reduce distribution losses.

Another popular event that IEEMA brings during ELECRMA—Reverse Buyer Seller Meet (RBSM) also known as ChangeXchange 2016 was attended by representatives from 52 countries from across the globe. These attendees came from Africa, ASEAN, CIS, and SAARC, along with Iran. Elaborating on the benefits of participating at the meet, Chairman –International Business Division, IEEMA and Managing Director, Elektrolites (Power) Pvt Ltd, Anil Saboo mentioned, "An important aspect of the RBSM is that it is in line with the 'Make in India' initiative. By having buyers come and have one-on-one meetings with the Indian market, three things are achieved. One, being introduced to buyers from different markets and highlighting solutions and capability to these buyers; two, development of products for new requirements, which will also lead to new technology development, and lastly, increasing the base for exports. Apart from this, both parties gain from knowledge sharing, development of mutually beneficial partnerships and introduction to new markets."

CIGRE Tutorials was one of the other interesting concurrent events that ELECRAMA-2016 hosted. This year's edition concentrated on five topics—Overhead Lines, Smart Grids, HVDC, Substations and HV Equipment. It acted as a true knowledge sharing platform.

Additionally, to bridge the gap between the finance and power sector IEEMA created a unique platform 'NETWORK2NETWORTH'. The event offered an opportunity for key decision makers from the finance sector to interact with experts from the power industry in order to understand the opportunities and key challenges in the industry for developing new business associations.

Furthermore, in order to encourage the youth to enter the power industry, ELECRAMA offered a platform to students to showcase their projects. Engineer Infinite 2016—an initiative was student project competition, wherein students displayed their projects. This pavilion as well attracted visitors' attention.

Conclusion

In all, ELECRAMA-2016 provided the stakeholders in the power industry a worldview on technology, best practices, new systems, and helped in forecasting the trends in the future of electricity, both from the technology and a socioeconomic point-of-view. It gave opportunity for visitors to browse through latest technologies while opening new avenues for the exhibitors. MMI

The 125 years of electricity' pavilion showcasing the journey of electricity from its beginning in 1800s.

Source: IEEMA

Panelists on the dias at the Network2Networth event at ELECRAMA-2016.

The International T&D Conclave, concurrent event at ELECRAMA-2016.

Eminent personalities on the dias for the World Utility Summit.

CIGRE sessions: Knowledge sharing on Overhead Lines, Smart Grids, HVDC, Substations and HV Equipment.

Benefits of Manufacturing 'Smart'

IMTMA recently organized the 1st Symposium on Smart Manufacturing 2016 in Bengaluru from February 22–23, 2016. Read on to know its proceedings.

Smart manufacturing is envisioned as the future of manufacturing. It integrates human ingenuity coupled with data and technology to revolutionize the development and application of manufacturing intelligence to all aspects of business.

To address and understand the real-time benefits and applications of 'Automation' in Smart Manufacturing, the Indian Machine Tool Manufacturers' Association (IMTMA) scheduled its first edition of a 2-day symposium on Smart Manufacturing—'Automation, a key driver' at the Bangalore International Exhibition Centre (BIEC), Bengaluru.

Industry experts from Siemens, Robert Bosh Engineering, TAL Manufacturing, Fanuc India, and Festo India addressed the latest trends and challenges in automation and smart manufacturing.

The event had a number of technical presentations, panel discussions and a brain storming session. More than 275 delegates from around 150 organizations took part in the symposium. Attendees included users and manufacturers of automation, viz., automation equipment & elements suppliers, system integrators, automation designers, enablers, automation software, solution providers, mechanical engineering / electrical /electronics and other manufacturing industries.

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Benefits... 'Smart'

Source: IMTMA

Eminent personalities from the industry on the dais at the 1st Symposium on Smart Manufacturing 2016.

Addressing the opportunities

Welcoming the delegates, Director General, IMTMA, V Anbu spoke about the benefits of using automation in the industry. He further stated that automation plays a crucial role in helping the manufacturing industry achieve the target of 25 per cent contribution to the GDP.

Adding to the sentiment, Chief Guest, Vice Chairman & Whole Time Director, Toyota Kirloskar, Shekhar Viswanathan said, "There exists plenty of opportunities to implement the smart systems in manufacturing." Moreover, he discussed areas where smart manufacturing can help in increasing the output and ensure quality standards are continuously met.

Director, Frost & Sullivan's Middle East, North Africa and South Asia region, Arunkumar Janarthanan, in his keynote address on Smart Manufacturing talked about how smart manufacturing can play an enabling role in connecting the various processes of business enterprises.

Day 1

Post the inauguration and keynote

Source: IMTMA

Networking between exhibitors and visitors at the AUTOMATION BUZZ 2016.

addresses, the symposium witnessed seven sessions and a panel discussion. The topics that were covered included Strategies for Implementing Automation by Gudel, Industry 4.0 – Future of Manufacturing by Robert Bosch, Assembly Automation – Case Studies by Titan, Flexibility and Low Cost Automation Production by TAL Manufacturing, Flexible and Multiple Griping by Schunk, Transformational Realities Towards Smart Manufacturing by Siemens and MT Connect (Plug and Play interface for machines) by Fanuc. A 30-minute panel discussion on 'Are Indian Factories Future Ready' was also conducted.

Day 2

On the second day of the symposium, seven sessions and a panel discussion were conducted. The day opened with a session on Integrating Vision Systems for 3D/Bin Picking Applications by Cognex. It was followed by Design and Implementing a Complete Line Automation by PARI, Industrial Internet of Things – Making Machine Tools Future Ready by the ARC Advisory Group, Collaborative Robots for Assembly Automation by Universal Robots, Manufacturing Intelligence by Rockwell Automation, Latest Trends in Pneumatics for Automation by Festo Controls and Implementation of Automation – A Case Study by Sansera Engineering.

A panel discussion on 'Drawing up Roadmap for Smart Manufacturing' provided the perfect conclusion for the symposium. Post this, a review of the learning from all the presentations over the past two days was conducted. The session helped the delegates get an overview of their learning during the symposium. It also provided a platform for the delegates to interact with the panelists.

Concurrent exhibition

An exhibition was also held in parallel with the symposium—The 'AUTOMATION BUZZ'. The exhibition displayed a wide range of automation devices and systems, software and a host of automation solutions.

The AUTOMATION BUZZ 2016 witnessed leading companies namely, TAL Manufacturing Solutions, Festo India, Siemens, Beckoff, Ace Micromatic and Universal Robots amongst others showcasing their latest technologies.

In summary

Spread over two days, the symposium delved into a wide gamut of areas including manufacturing intelligence, strategies for implementing automation, Industry 4.0, collaborative robots, MTConnect, industrial internet of things to name a few. The event concluded by "Drawing up a Roadmap for 'Smart Manufacturing'". MMI

International Tooling Summit

The International Tooling Summit was recently held in Mumbai to discuss the eminent role of tooling in the ambitious 'Make in India' initiative. Read on to know more…

The recently conducted International Tooling Summit discussed the eminent role of tooling in the ambitious 'Make in India' initiative. Held in Mumbai, the event was brought forth in association with TAGMA India. Today, India stands amongst the twenty largest producers of cutting tools in the world. The tooling industry as per the industry survey is estimated to be ₹15,100 crore for 2014–15 out of which close to ₹8,000 crore is met indigenously. Understanding the importance of the sector in the infrastructure of the economy, Business Head, TCL, Sunita Quadros said, "The strength of the tooling industry is directly associated to the growth of auto and electronics business. We, at Economic Times are glad that we could provide a platform which triggers discussions, provides insights and facilitates change and growth of the sector."

Sharing his views Managing Director, Volvo, Kamal Bali said, "I believe that the 'Make in India' program strikes at the root of the critical shortcomings in manufacturing, namely the need for higher value-capture in India. The tooling industry is rightfully positioned to fulfill this shortcoming by facilitating higher value addition, thereby creating greater economic activity. Competitiveness of the Indian manufacturing sector, more jobs, inclusive and sustainable growth will pave way for higher exports from India."

The event witnessed several thought provoking panel discussions, as a part of which VP, Production Engg, Maruti, Anoop Chaturvedi said, "The Indian automobile/ manufacturing industry is rapidly evolving as a key global player. This rapid growth coupled with globalization has led developments in technology and regulations. This offers growth opportunities to the tooling industry, which is known for low cost manufacturing but needs to build world class capabilities in design and innovation, robust processes, and reduce product development time while keeping the focus on quality."

As a part of the panel 'Making India the manufacturing hub of the world,' Managing Partner India, Chairman Middle-East & Africa, Head Automotive Asia, Roland Berger Strategy Consultants Pvt Ltd, Dr Wilfried G Aulbur said, "National manufacturing industries depend on high-performing tool manufacturers to bring products to the market. Meeting quality, performance, aesthetics and cost targets is impossible without reliable partners on the machine tool side. India's machine tool manufacturers have moved up the value chain as the increasing success in import substitution demonstrates. However, to be true partners in making the 'Make in India' happen, further improvements across a number of process parameters are necessary."

Despite various challenges, the tooling industry has managed to surge ahead in the last ten years with diversification into several emerging areas. It has given a new lease of life to the sector with an expectancy of 15–20 per cent year-on-year growth. MMI

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International Tooling

Source: TAGMA

The distinguished panel of car makers, auto component suppliers and tool makers deliberated on the opportunities and challenges faced by the tooling industry.

Meeting New Challenges

With the hint of positive trend the overall economy and government's focus on the manufacturing sector are encouraging the tooling industry to develop new and innovative products. As a result, DIEMOULD INDIA 2016 is expected to showcase the latest products. Here is an overview of the event.

The tenth biennial Die & Mould International Exhibition—DIEMOULD INDIA 2016 (DMI 2016), an event hosted by TAGMA India, is scheduled to take place from April 6–9, 2016 at Bangalore International Exhibition Centre (BIEC), Bengaluru, Karnataka. The series of DIEMOULD exhibitions is organized by TAGMA from 1998 and since then, the show has gained reputation of being a unique trade fair in India for the die & mould industry.

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Glimpses of last edition

In spite of an overall global economic downturn, the previous edition of DIEMOULD INDIA exhibition achieved a milestone success. The show was inaugurated by Former President of India, Dr APJ Abdul Kalam. While giving his keynote address, he highlighted the importance and necessity to grow this vital mother industry, which largely contributes to a successful manufacturing economy of the country.

Owing to the regular participation since inception of leading brands from India and abroad exhibiting their latest proven technologies, incorporating features to improve productivity, quality and reduce costs, the event attracts quality visitors such as CEOs, consultants, decision makers to the exhibition. In the last edition, visitors expressed their satisfaction of finding solutions to their needs at the exhibition. The other advantages of visiting the show are—seeing new innovative products and manufacturing process covering the entire supply chain to the tooling industry, browsing through a wide spectrum of products to choose from.

Source: TAGMA India

Former President of India, Late Dr APJ Abdul Kalam lighting the traditional lamp at the inauguration ceremony at the last edition of the event while other dignitaries (L-R) Executive Director, TAGMA, PN Surendranath; President, TAGMA, SC Kalyanpur; Director (TR), Office of the Development Commissioner (MSME), RK Rai; Officer-In-Charge & National Programme Officer, UNIDO-ICAMT, Deepak Ballani; and Founder President and Executive Council Member, TAGMA, N Reguraj look on.

What to expect?

In view of the overwhelming response for DMI 2016, Hall 1 and Hall 2 have been fully booked; hence, additional space is being made available in Hall 3A to accommodate further demand.

Moreover, DMI 2016 will have an expanded product range and focus on various initiatives like:

- New product range—3D additive manufacturing technology solutions, precision machining, aerospace, injection moulding machine, etc. solutions
- Buyers Pavilion
- B2B Meetings
- Country Pavilions
- Special Overseas Delegations

With a positive recovery trend in the overall economy and tremendous growth prospects along with the government's focus on the growth of the manufacturing sector, the Indian Tooling Industry is poised to meet new growth challenges and achieve new heights of success. MMI

Insert Line for High Feed, High Productivity Machining

TaeguTec's ChaseFeed family of highly efficient SBMT inserts and relevant holders have been expanded to enable the excellent performance for high feed rate conditions in smaller depth of cut applications. The SBMT 09 insert comes with a high positive helix cutting edge and is perfectly suited for smooth machining applications. Similar to its SBMT 13 counterpart, the SBMT 09 is a single-sided, four-cutting-edge insert specifically suited to generate a lower cutting load during machining.

▸ **TaeguTec India P Ltd**
T: +91 (080) 27839111, E: sales@taegutec-india.com
www.taegutec-india.com

T-style Sialon Ceramic Inserts

Seco Tools India (P) Ltd has expanded the roughing and semi-finishing performance capabilities of its Secomax CS100 sialon ceramic grade by adding inserts with T-style edge preparation to the line. Featuring a free-cutting, extremely sharp geometry, the new inserts bring stability and performance longevity to the machining of nickel-based superalloys in unstable conditions. Well suited for turning applications that require tight tolerances and low cutting forces, the T-style (chamfered) CS100 inserts are available in 20-degree chamfers that range from 0.05 to 0.1 mm in width.

▸ **Seco Tools India (P) Ltd**
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Fiber Laser System

Phoenix FL, a compact fiber laser system from LVD includes a welded steel frame construction that minimizes deformation caused by high acceleration thus, improving overall machine accuracy. Powered by a high efficiency solid-state doped fiber laser source, the fiber laser provides fast, accurate processing of various sheet thicknesses and types. Moreover, the Phoenix FL features a lightweight, high rigidity beam delivery system to allow for highly dynamic processing.

▸ **LVD Company nv**
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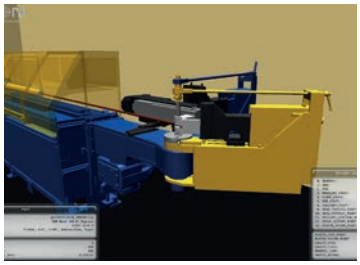
Simulating Software



Unison Ltd has launched software to manage the tube bending process from programming to production. Its latest software tools package provide significant progress in three areas—simulation, machine programming flexibility, and data collection. The resulting optimization and versatility of tube bending will help tubular part manufacturers to substantially boost the productivity of operations. One of the key features of the software is its three-dimensional simulator—Opt2Sim—to accelerate the development of control programs for all-electric tube bending machines.

▸ **Unison Ltd**
T: +44 (01723) 582868, E: sales@unisonltd.com
www.unisonltd.com

Hydraulic Tryout Press

The 2,500 ton hydraulic tryout press from Schuler is equipped with dynamic force control (DFC). This means that the slide cylinders are switched on and off via the press control system in order to increase the working speed. A special servo hydraulic control guides the entire flow of oil from the main pumps to the required cylinder surfaces; thereby ensuring an optimum degree of utilization of the main drives. In this way, higher working speeds can be achieved with lower drive power.

▸ **Schuler AG**
T: +49 (0) 7161667789, E: Simon.Scherrenbacher@schulergroup.com
www.schulergroup.com

CNC System

Lubi Electronics offers Advantech LNC CNC System with EtherCAT Open portal communication base CNC System. The key feature of the system is that it is capable of communicating with third party servo systems. It can control up to 32 axes with six channel path operations. Moreover, the company offers wide CNC product range based on customer needs and market segments, starting from basic model to higher end model for complex machine tools requirements.

▸ **Lubi Electronics**
T: +91 79 39845354, E: arpatel@lubielectronics.com
www.lubielectronics.com

Schunk, a leading provider of clamping technology and gripping systems, has numerous innovative products in its portfolio. Here are some of its offerings:

Magnetic Grippers

SCHUNK offers EGM magnetic grippers that do not require compressed air or vacuum for actuation and deactivation. It only requires a short current pulse of 300 ms. Since no energy supply is required in activated condition, the parts are reliably gripped even in the case of an emergency stop or a sudden loss of power. The individual holding forces of every magnetic gripper depend on the workpiece surface quality, the material, and the workpiece geometry. Under ideal conditions, the EGM gripper has gripping forces of 1.2 and 22.5 kN, and it is designed for parts weighing a maximum of 147 kg, with a material thickness starting from 3.5 mm.

Clamping Blocks

SCHUNK has expanded its family of high-performance SCHUNK TANDEM plus clamping force blocks. The smallest TANDEM plus (size 64) is available with a fixed jaw, for fixed definition of the zero point. This eliminates the possibility of the reference point moving. The compact clamping force block is ideal for fully automated serial production of small parts. In addition, it can be combined in series with clamping force blocks of the same type for clamping of long parts, such as profiles. Two versions are available for pneumatic (KSP-F plus) or hydraulic (KSH-F plus) actuation. The clamping force amounts to 4,000 N and the jaw stroke is 2 mm.

High-Speed Picker with Safety Functionality

The SCHUNK EGP Safety is the world's first performance level d/SIL3-certified electric small component gripper on the market with an omni-directional gripping force safety functionality. In combination with a special safety module, it enables SOS and STO functions. If the assembly process is interrupted as a result of an emergency shut-down, the module automatically switches to safe operating stop. As opposed to existing solutions on the market, the SCHUNK EGP Safety is supplied with continuous power in case of a safe operating stop, so that gripped parts are held reliably even without mechanical gripping force maintenance.

Gripping Module

With the new SCHUNK PGN-plus-P, the competence leader for clamping technology and gripping systems has once again raised the bar with pneumatically powered universal grippers. The electric SCHUNK PGN-Plus-E applies the high-performance features of the pneumatic flagship directly in the area of mechatronic handling.

The tool features improved multi-tooth guidance. By enlarging supporting dimensions between the six load-bearing shoulders of the patented multi-tooth guidance, higher moment can be accommodated, and thus longer fingers can be used. In order to ensure a perfect fit, each individual base jaw undergoes elaborate manual grinding and is individually adapted to the respective housing in the new gripper generation.

Mobile Handling System

SCHUNK in cooperation with SERVUS INTRALOGISTICS has developed a mobile handling and transport system that links storage, production and assembly in an automated fashion. The central elements of the system are the SCHUNK LWA 4P Powerball Lightweightarms. Owing to their integrated electronics and their suitability as a battery-operated device, these Powerball Lightweightarms are ideal for the mobile use. Also, they can handle both individual components and complete trays. Rail-guided SERVUS transport shuttles move the lightweight arms together with the trays containing the components flexibly between the Kanban warehouse, the picking area and the stations for production and assembly.

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