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The Official Magazine of



Indian Machine Tool
Manufacturers' Association

In Association with



Die & Mould: Where the Manufacturing Begins!



COUNTRY FOCUS:
INDIA-USA

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IT'S ALL ABOUT HAVING THE RIGHT TOOLS

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We are what we repeatedly do.
Excellence then, is not an act, but a habit.
Aristotle

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IMPRINT

**PUBLISHER &
DIRECTOR GENERAL & CEO, IMTMA**
V Anbu

EDITORIAL
Editor-in-Chief
Soumi Mitra

Chief Copy Editor
Poonam Pednekar

Senior Correspondent
P K Chatterjee

Correspondent
Arunima Nath

Design
Manesh Bajaj

SALES & MARKETING
Indian Machine Tool Manufacturers'
Association (IMTMA)
Murali Sundaram, Magic Wand Media Inc
murali.sundaram@magicwandmedia.in

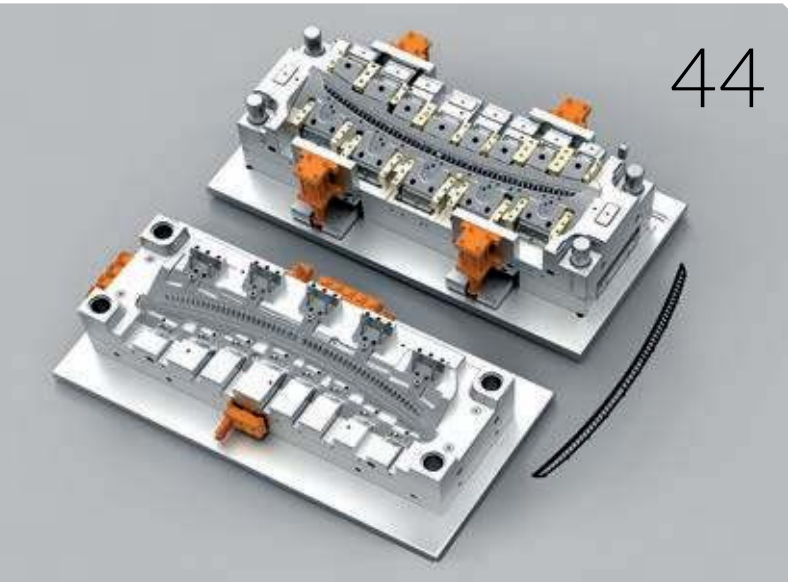
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EMPOWERING MSMEs TO THE NEXT LEVEL OF MANUFACTURING

A significant number of MSMEs dot India's manufacturing landscape. It may be noted that these many MSMEs are the primary drivers for sustained growth of the country's GDP. India banks on these units in its onward march to greater heights.

More often than not MSMEs face existential crises in their endeavours to stay afloat and succeed in business. Lack of sustainable work, capital, affordable marketing channels and excessive government regulations hamper these industries to blossom.

It is heartening to note that the Government of India has reduced the corporate tax rate to 25 percent for entities with annual revenue of up to ₹250 crore. The Union Budget 2018 has also earmarked ₹3 trillion for the development of MSME sector under the Pradhan Mantri Mudra Yojana, popularly called the MUDRA scheme, as many of the MSMEs operate within the prescribed limits. This is a welcome move.

The incentives announced in the budget will, without any doubt, spur MSMEs to enhance their production capacities. In a country where millions join the workforce every year, MSMEs play a pivotal role by accommodating a large number of job aspirants including those from rural and remote areas. In this way, they reduce the regional imbalances, enhance equitable distribution of national income and wealth, besides playing a complementary role to large industries as ancillary units.

As MSMEs are the bulwark for industrial growth, onus is on us that we encourage them to stay competitive through rigorous pursuits of skill development which will enhance research and innovations leading to justifiable growth.

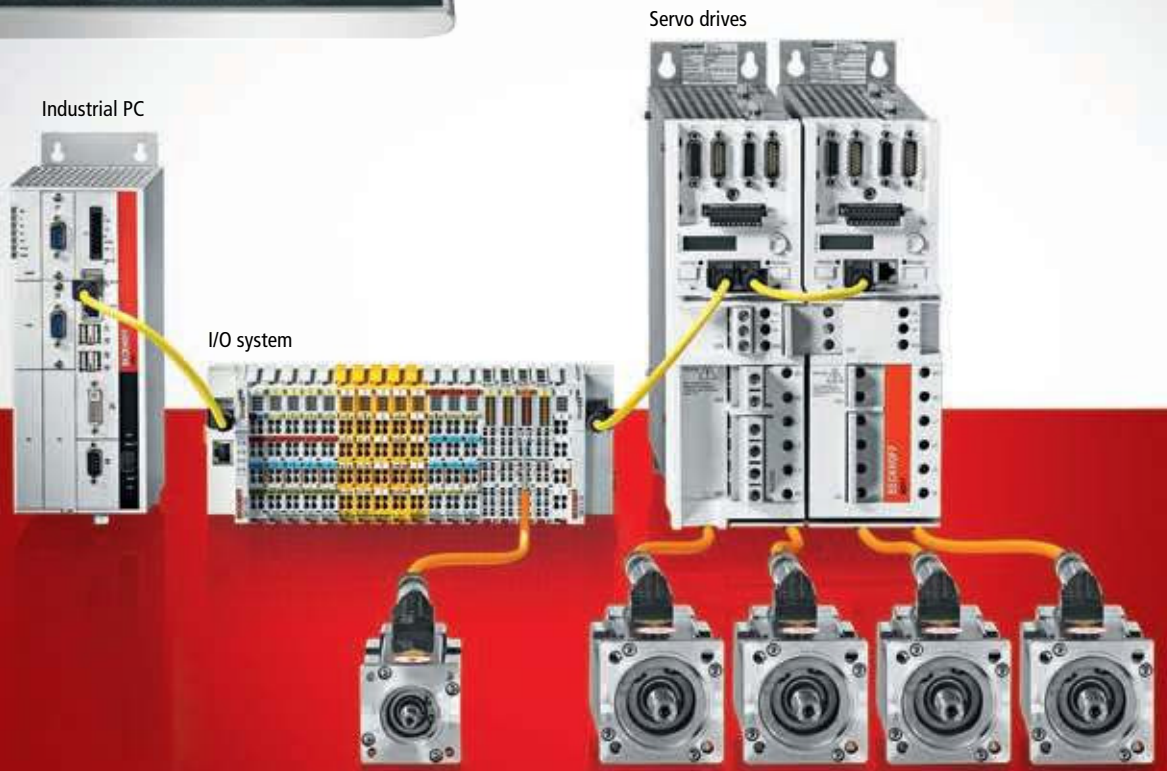
I would like to inform readers that it is a matter of satisfaction for the machine tool industry that the Government has extended concessional customs duty on critical imports to all categories of CNC metalworking machine tools.

Vibrant manufacturing is important for a country's growth. With the Indian manufacturing industry showing its readiness to embrace advanced technologies, it is imperative that we develop MSMEs to the next level so that they can take manufacturing to greater heights.

P RAMADAS
President, Indian Machine Tool Manufacturers' Association

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Dear MMI Readers,

Reading a magazine becomes thoroughly enjoyable when you see depth, value and intensity in the subjects covered in it. Modern Manufacturing India (MMI) has made its mark by covering the most up-to-date information relating to advancements in manufacturing and bringing to the doorsteps of our readers.

Indian Machine Tool Manufacturers' Association (IMTMA) has been receiving tremendous response and acceptability from the industry stakeholders for MMI which has spurred us to move forward and create new benchmarks. Along with our overseas associate - Gardner Business Media, we have covered some stimulating stories on tomorrow's technologies.

In this issue, we have weaved together some thought-provoking articles and reports on die and mould industry. The issue also features articles on MSMEs which form the backbone of the Indian manufacturing sector.

On behalf of IMTMA, I thank you for your continued interest in MMI. Your valuable feedback will be beneficial in our onward journey.

Wish you a happy reading.

V ANBU
Director General and CEO
IMTMA

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Soumi Mitra

SOUMI MITRA
Editor-in-Chief
Modern Manufacturing India
soumi.mitra@magicwandmedia.in

THE POSSIBILITIES ARE ENDLESS

It's a profound truth that legends never die. With the recent passing away of Stephen William Hawking, the noted physicist, cosmologist and author, there was more a sense of awe and admiration than grief. Struck with ALS at the age of 21, the gifted scientist was told that his days were numbered. He stayed for over 55 years after that, revolutionizing physics with his groundbreaking work on "Black Holes" and Cosmology.

Through the life he chose to live extraordinarily, he proffered to us the truth that glory is rife with trials and tribulations. It's important to stay in the game if that needs to be won and giving up halfway is not an option. "The past, like the future, is indefinite and exists only as a spectrum of possibilities," are his words that will keep inspiring us to seek a definite way to make it happen.

The present Indian manufacturing sector echoes this sentiment of vast possibilities that are waiting to be turned into opportunities. The world acknowledges this fact as did Nobel Prize-winning economist Paul Krugman

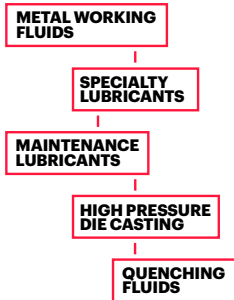
"I have noticed even people who claim everything is predestined, and that we can do nothing to change it, look before they cross the road."

on his recent visit to the country. He hailed India's per capita GDP quadrupling in such short duration a unique growth story that makes the country an ideal location for business.

MMI celebrates the industry's remarkable position in the global scene and welcomes you to join in through its insightful reads on the latest and innovative developments in manufacturing. Do read and rejoice!

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Source: IMTMA

BRIDGING SKILL GAPS IN MANUFACTURING INDUSTRY: **IMTMA, A TORCHBEARER**

Educated but unemployed is the reality of today's youth who are often victims of the glitches in our education system. IMTMA, with its thoughtfully designed programs, is all set out to iron out these kinks and make the young engineers industry-ready.

You have a degree in electrical and mechanical engineering from one of the premium institutions which is quite commendable. Now what next? Those of you who are looking to gain a foothold into manufacturing industry may feel that the options are limited. This is so as firms often prefer hiring engineers who have experience of working with machines. However, that is not always true. There are plenty of skill development programs that make students 'industry-

ready'. Indian Machine Tool Manufacturers' Association (IMTMA) conducts many such programs at its Tech Centers in Bangalore, Pune and Gurgaon.

Leaping the theory-practical chasm

Educated but unemployed is the reality of today's youth who are often victims of the glitches in our education system and this has been long in the making. The overarching bent towards theory leaves them with almost 'zero' exposure to practical knowhow which the

industry requires.

"It is no secret that from the millions of job aspirants floating around, only a few thousands perhaps may find their feet in some company. To change this, we need to integrate skill training with the regular mainstream education imparted in engineering colleges," says P Ramadas, President, IMTMA.

"The organized Indian machine tool industry, comprising IMTMA member companies, employs close to 60,000 people. The gap between demand and supply is significantly wide.



Technologies are ever changing, so has to be the skill sets of the engineers engaged in the day-to-day manufacturing process. But this has not been the case. This perhaps necessitates training the manpower to meet industry standards. IMTMA has been in the forefront of doing this since decades,” says V Anbu, Director General & CEO, IMTMA, talking on the skill gaps and the need to bridge them thoroughly.

He further adds, “Many industry segments such as automobiles, auto components, railways, defence, power, electronics, white goods, aerospace and several others are dependent on machine tool industry to supply them with the most advanced technologies required for their operations. It is, therefore, equally important that engineers working behind those machines are well trained and equipped and have the design skills to handle tasks related to production.”

Preparing for the future

Indian machine tool companies are on the lookout for adding depth to their manufacturing through technology, research and innovations to meet consumer expectations. Often they find the going tough due to the lack of trained manpower especially in technical and soft skills required by the industry. The new recruits are not job ready and when employed, struggle to keep pace with the requirements of the industry.

“There is a total mismatch in what they learnt in colleges and what they are expected to do on the shop floor,” says Ramadas speaking on what hampers the new recruits to the industry from performing.

IMTMA as an industry reformer

To progress as a nation, we need to support tech growth and the first step in this is to enhance the skill set of the young engineers and impart in them the knowledge to prepare for the future.

Towards this, IMTMA conducts long-term comprehensive training programs at its centers. Students are trained in production engineering (metal cutting), production engineering (metal forming), machine design (mechanical), and machine design (electrical and electronics), and automation.

IMTMA also conducts several short-term training programs for engineers already working in the industry. The engineers are trained in productivity, design, maintenance, automation, and so on. More than 160 short-term as well as long-term training programs were conducted during 2017-18.

Overall, these efforts have enabled IMTMA to record 16,244 man-days of training and support the manufacturing industry in skill development and upgradation.

The industry has recognized IMTMA as an institution that combines theory as well as practical aspects of training to make engineers “industry ready” from DAY ONE. Employees from end-user segments of various industries such as automobiles, defence, aerospace and others have actively taken part in the training imparted by industry experts.

Auto industry’s contribution

Speaking on the impact that IMTMA training had on his day-to-day work, a senior

IMTMA conducts several skill development programs at its Tech Centers in Bangalore, Pune and Gurgaon to make engineers industry-ready.

TO PROGRESS AS A NATION, WE NEED TO SUPPORT TECH GROWTH AND THE FIRST STEP IN THIS IS TO ENHANCE THE SKILL SET OF THE YOUNG ENGINEERS AND IMPART IN THEM THE KNOWLEDGE TO PREPARE THEM FOR THE FUTURE.

official working with a leading automobile company in Bangalore said that the trainings are conducted by industry experts with domain expertise in automotive industries. The programs are highly interactive and participants are able to solicit guidance on specific technical issues which are vital for their industry operations.

IMTMA, a founding member of the Capital Goods Skill Council

IMTMA is one of the founding members of the Capital Goods Skill Council which plays a proactive role in bridging the gap by creating a vibrant ecosystem for quality training and skill development for the Capital Goods Sector. The council has been promoted by Federation of Indian Chambers of Commerce and Industry and Department of Heavy Industries, Government of India, under the aegis of Ministry of Skills Development and Entrepreneurship with financial support by National Skill Development Corporation. For more info visit www.cgsc.in

It is an open secret that automobile and auto components are the biggest customers of machine tools. IMTMA and Automotive Component Manufacturers Association (ACMA) are jointly working on identifying the skill gaps to address the key challenges that the industry is facing today.

Job aspirants need to stay tuned to make a mark in the employment landscape and IMTMA training programs is the stepping stone for them to survive in the age of Industry 4.0.



BOOSTING PRODUCTIVITY ON THE **MANUFACTURING FLOOR**

Shane Strowski, President of Precision Waterjet & Laser, lists tips to help increase shop floor success.

Regardless of the size of your business, boosting productivity is essential to enhancing gross profits and maintaining competitiveness. Productivity on the manufacturing floor depends on a combination of efficient employees, equipment and processes. Driving improvement in all of these areas involves examining the current practices in place and

making adjustments to systems, employee training and even the equipment used to generate parts and components.

Before you can adopt any method for productivity improvement, you'll need to measure your existing output levels, create a baseline and implement solutions for measuring change. Shane Strowski, President, Precision Waterjet & Laser, lists the following eight steps to help

you design a more productive and successful manufacturing floor for your business:

» **Examine the existing workflow.** The first step is all about identifying pain points in your current workflow. Analyze the people, technology and processes required for production, as well as the procedures, communication tools and resources available



Source: Modern Machine Shop

across the company. Consider using value mapping as an effective solution for identifying and monitoring projects for process improvement; this strategy enables managers to pinpoint issues and record how changes impact the overall system.

» **Update business processes.** Share current workflow problems with project managers to develop improvement plans for the manufacturing process. This could mean re-assigning resources to different areas of the manufacturing floors, managing budgets or becoming ISO certified. Be sure to systematically evaluate performance and interpret any appropriate changes.

» **Invest in continued employee education.** The manufacturing, machining and cutting industries are constantly changing - there's always a new technology promising to make manufacturing floors more efficient than ever. Technological advancements often change the skills required for certain tasks, and workers will require access to regular training to keep up with more advanced specialist skills.

» **Have realistic expectations.** Client expectations, pressures regarding production and strict deadlines can contribute to unrealistic goals. When workload benchmarks on the manufacturing floor are unattainable without some compromise to safety or quality, employees become dissatisfied, preventing the company from reaching labor goals. To boost worker efficiency, it's important to set realistic, clearly defined objectives that ensure a combination of punctuality, high-quality output and safe procedures.


» **Get smarter machining tools.** Manufacturing is an industry in which an employee can only be as productive as his or her tools. While innovative machines, such as waterjet machines or CNC mills, can be costly in terms of initial set-up and training, advanced equipment can have a positive long-term effect. Manufacturing companies often find that a machinery upgrade helps them stay competitive in a new and innovative market.

» **Invest in maintenance.** There's a link between

BEFORE YOU CAN ADOPT ANY METHOD FOR PRODUCTIVITY IMPROVEMENT, YOU'LL NEED TO MEASURE YOUR EXISTING OUTPUT LEVELS, CREATE A BASELINE AND IMPLEMENT SOLUTIONS FOR MEASURING CHANGE.

the costs associated with downtime and the time and budget invested into preventive measures. While new equipment can boost productivity, it also requires maintenance to ensure that it continues working at an optimum level. It is important that employees know how to troubleshoot instances of system downtime, to quickly find root causes of errors. Don't be too quick to blame the tool for problems -- remember to think about the process, the blueprint, the material and more.

» **Stay organized.** The number of lost dollars and wasted man-hours that result from a lack of organization can be surprising. One surefire way to enhance productivity in any environment is to ensure there's a well-organized place for everything - from materials, to machine tools and documents. When organizing your work area, think about the layout of your machining equipment and tools and whether they currently maximize efficiency. If not, consider rearranging your manufacturing floor to create a smoother workflow.

» **Encourage collaboration.** The manufacturing floor is most productive when everyone works together towards the same goal with as little waste and conflict as possible. While focusing on work is important, it's also crucial to ensure that each staff member feels comfortable as part of a team. The better the members of your team can work together, the more they will encourage a productive workplace culture. 

CUSTOMER EXPERIENCE: FROM COMMUNICATING TO CONNECTING

All good companies do things right and hence become successful. However, in times of mature markets and intense competition, the need to go beyond the established comfort zones arises and the subtle nuances of 'Customer Experience' become increasingly relevant.

Gaining customers in times past meant: Researching the market; Picking a segment of target customers; Developing or customizing your machine for the segment at the best price point; Pitching professionally to them; Rinse and Repeat. The formula needed no further tweaking. Now, Customer Experience is the battlefield where customers are won or lost.

When orders are lost to the competition, it is common in performance review meetings to have discussions that revolve around the lack of specifications, features, price or rapport.

However, when you correspond with the customers at a senior level, the reasons for the loss of order, more often than not, turn out to be beyond these realms. Your machines were just fine for them they tell you and so was the price, but the competition could offer them what they were exactly looking for. What this means, in simple terms, is that the competition could speak the customers' language and anticipate and tell them their needs even before the customers could realize that themselves.

Good companies have competent systems of design, manufacturing, testing, logistics, and support, which are well aligned internally as per their perspective. These need to be aligned externally with the customers' needs. This is the 'Customer Experience' that distinguishes a good company from a great one.

There is a need to develop a 'Customer Experience Strategy' after having sincerely sought answers to questions such as: What is our true overall value proposition? Who are our customers? What customer experience do we promise? What capabilities do we need to deliver that experience? and How will our culture help or impede us from delivering that experience? The answers to these will lead to aligning the emotional elements of the customer experience with the customer touch points, including pricing, with the best capabilities of the company.

A customer experience strategy is the delivery of the value that is distinguished by the experience the company delivers to its set of customers. This experience is the composite of performance of the machine and the entire service channel with the technology used. A good customer experience strategy will coordinate all the needed functions, skills, and practices.

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T K RAMESH
Whole time Director and CEO
Micromatic Machine Tools Pvt Ltd



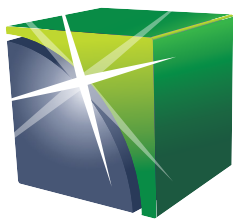
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Bharat Forge chooses PTC to adopt Industry 4.0

Bengaluru, India - PTC has announced that Bharat Forge Ltd, a technology driven leading Indian multinational, has selected the ThingWorx IoT Platform from PTC to monitor its factory operations to improve operational efficiency and factory quality.

The Pune-based world's largest forging company chose the platform for its rapid application enablement, connectivity, machine learning capabilities, augmented reality, and integration with leading device cloud offerings.

ThingWorx was purpose-built from the ground up for the Internet of Things. It contains the most complete set of integrated IoT-specific development tools and capabilities available, offering the industry's deepest functional capabilities. ThingWorx makes it easy to develop and deliver powerful Enterprise IoT solutions that deliver transformative business value.

India to overtake EU at renewables

New Delhi, India - India's renewable energy expansion is set to surpass that of the European Union for the first time by 2022. This is according to a report titled 'Renewables 2017' issued by the International Energy Agency (IEA). The installed renewable energy generation capacity in the country would also double by then.

The report added that Solar Photo Voltaic (PV) and wind together represent 90 percent of India's capacity growth. The auctions for contracts to develop power-generation capacity have yielded some of the world's lowest prices for both technologies.

Boosted by a strong solar PV market, the production of renewable energy accounted for almost two-thirds or 165 GW of the net new power capacity last year.

WIDIA India celebrates 50 years

Bengaluru, India - With a view to commemorate completion of 50 successful years in India, WIDIA Business Group recently celebrated an eventful evening with its Indian distributors at Bengaluru.

"WIDIA's long presence in the country has given a good brand understanding to our customers. At one point of time, there were only two companies associated with cutting tools in India. So, obviously, we did have early mover advantage. In the recent years, post-acquisition of WIDIA product group by KENNAMETAL INC USA, the product offerings have grown significantly with enhanced customer value delivery," said Prashant Shetty, Director - Commercial, WIDIA India.

Stressing on the long and successful association with the company, Kapil Jhalani, Managing Director, Nannai Mal Janki Das (NMJD), a WIDIA India distributor present at the event said, "With WIDIA's completion of 50 years in India, we too finish 50 years of our relationship with the company. Its policies and culture are phenomenal, and the company has always supported us exceptionally."



The Business Group of WIDIA in India celebrated its 50 successful years in the country at Bengaluru.

Call for removal of propellant from Defence RFPs

New Delhi, India - The Automotive Component Manufacturers Association of India (ACMA) has put in a request to the Defence Ministry for the removal of propellant/primer from Critical Technology list. As per RFPs, regarding the procurement of 23mm ammunition, 30 MM HEI and HET ammunition, 30 MM VOG17 for AGL ammunition, 40MM MGL and UBGL ammunition, the explosives required in Primer and Propellant are in few grams and comprises 2 to 3 percent cost of manufacturing which incidentally is not manufactured in India.

Vinnie Mehta, Director General, ACMA, said, "The cost of setting up Primer & Propellant plant of size 1500 to 2000 MT is approx. ₹ 1,000 crore. Hence, many Indian private manufacturers who wish to bid for these ammunitions cannot set up a propellant plant as it would be commercially unviable. It involves either losing the performance bank guarantee of several crores or buying the indigenized propellant at a high price dictated due to monopoly."

Godrej Aerospace beefs up its bond with Rolls-Royce

Mumbai, India - Godrej Aerospace, a business unit of Godrej & Boyce, has got into a ₹ 200-crore deal with aerospace major Rolls-Royce.

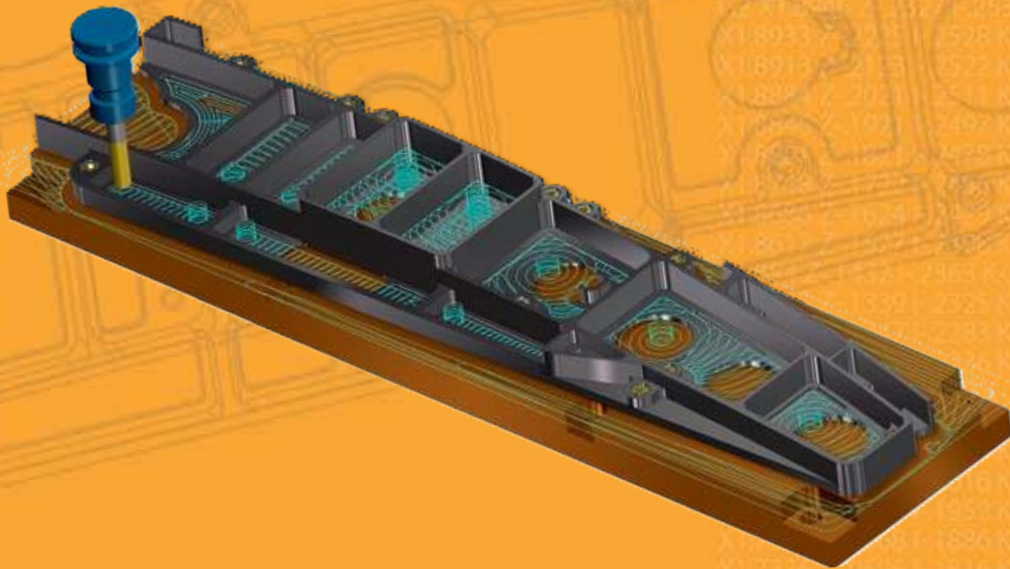
The contract comprises manufacturing products like unison rings, complex fabrication and external brackets and supplying 600 different components to Rolls-Royce's civil aerospace engine portfolio. The company will make the parts at its new facility in Mumbai over the next five years.

With the goal to strengthen its foothold in the aerospace sector, Godrej Aerospace also inaugurated its Center of Excellence (CoE) in Mumbai with the investment of ₹ 50 crore to enhance its manufacturing capabilities in the aero engine industry.

"In line with our vision to expand our footprint and partner with global majors we have established this CoE. I am confident that this will strengthen and deepen our wonderful partnership with Rolls-Royce and establish Godrej as their preferred partner," said Jamshyd Godrej, Chairman & Managing Director, Godrej & Boyce.



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OPENING UP OPPORTUNITIES IN MANUFACTURING

Union Budget 2018, with its focus on economy, attracting investments and encouraging innovation and digitization, protecting domestic businesses, and creating more indigenous jobs, has provided the much-needed impetus to the manufacturing industry. Insiders welcome the measures and present their two cents over it...



“The Government of India with this budget has tried to establish harmony between demands rising from various sectors and bringing some kind of a fiscal discipline to meet the country’s economic goals in the long-term. The aim to bring down the fiscal deficit to 3.2 percent of the country’s GDP will help the country’s manufacturing growth in the long run. The reduction in corporate tax for entities with turnover of up to ₹ 250 crore to 25 percent is expected to benefit MSMEs as well as the Indian machine tool industry which has a significant number of MSMEs. This is also expected to help the ease of doing business besides generating jobs. IMTMA welcomes the announcements made in the budget. We believe that it will take some time for the buds to flower and create a demand for goods and services in sunrise sectors. The budget serves as a morale boost for the industry to charter its path through innovations and research which are vital for establishing long-term success for manufacturing in India.”

P Ramadas
President - IMTMA
Managing Director
Ace Manufacturing Systems Ltd



“The reduction in corporate tax rate for MSMEs is a positive development since many of these units operate within prescribed limits. The incentives spelt out in the budget will bolster these units to enhance their production capacities. The increase in budget outlay for infrastructure development, especially for railways electrification and capacity enhancement including development of tracks, is expected to step up demand for coach manufacturing. This will also create a demand for a broad range of machine tools such as special-purpose wheel lathes, light-rail transit systems, heavy-duty single and double column vertical turning lathes, large bridge type milling machines, horizontal lathes and special machines. Further, the increased budget allocation for road and public infrastructure, rural infrastructure development and public healthcare will also give a fillip to these sectors and meet the aspirations of ‘Make in India.’”

V Anbu
Director General & CEO
IMTMA



“Budget 2018 has many positives. Some of the most significant and uplifting moves, guaranteed to help the manufacturing industry are:

Infra spend - Infrastructure spend in the country is expected to go up from ₹ 4.9 lakh crore to ₹ 6 lakh crore, which is a jump of 20 percent. This will generate employment and demand for capital goods and consumption.

Aviation capacity - Special focus announcements promise augmenting domestic airports’ capacities to meet future demands, gearing towards enabling at least a billion flights every year. This activity over the next five years will involve significant capital outlay, and generate direct and indirect employment and demand for capital goods.”

L Krishnan
Past President, IMTMA
Managing Director
TaeguTec India Pvt Ltd



“A lot of focus in this budget has been on increasing rural incomes and investing in agricultural growth which would see demand for manufacturing segments related to tractors, two wheelers and the utility vehicle segments. Import duties on select auto components like gearboxes and transmission components, engines and engine components etc. have been increased to 15 percent, which is a clear push for the ‘Make In India’ program. Auto companies would now be looking to outsource a larger percentage of these components from local vendors. The Government’s infrastructure spending is to be increased by 1 lakh crore and the focus will be on improving the road network through the Bharat Mala network of widening the existing roads and building new roads. Commercial vehicles and the Earth Moving Equipment manufacturing sectors would benefit significantly in the short to medium term.”

Reji Verghese
Managing Director
Forms & Gears



“This year’s Union Budget can be termed as well-balanced. The various measures announced for infrastructure are quite positive for the sector. The capex of Indian railways has been pegged at an increase of nearly 14 percent from the previous year, thus the companies supplying equipment and technology to railways are set to gain. The customs duty on certain components including engine & transmission parts, brakes, suspension, gear boxes, airbags and parts etc. has been increased to 15 from 7.5 percent, and on lithium ion batteries used in electric and hybrid vehicles, has been raised from 10 to 20 percent to promote ‘Make in India’.”

Rajesh Nath
Managing Director
VDMA India



“The Government of India’s recent budget announcements are in the right direction of accelerating the growth of the economy, and more importantly, ensuring inclusive growth for all. Higher spends on road transport and infrastructure sector is highly positive for the auto sector and the overall growth of the economy.

With the policy initiatives such as Make in India, Digital India, Smart cities, Infrastructure development etc. getting a higher support in the budget, the manufacturing sector will see an increased level of activities. The end markets of aerospace, defence, and railways are expected to provide added opportunities for companies like us that are engaged with them.”

BC Rao
Managing Director
Kennametal India Ltd



“The budget 2018 has been widely acclaimed by the manufacturing sector, especially the move of allocating capital expenditure by 25.4 percent against the previous year and also the controlling of the fiscal deficit at 3.2 percent of GDP for the year 2018. It will assure the operational expansion across the manufacturing spectrum. It will take some time for the sops to reach the end-users, consequently increasing the demand for goods and services.”

Maulik Patel
Executive Director
Sahajanand Laser Technology Ltd



“MSME is an important sector for the Government, as it maintains a relentless focus on increasing GDP and employment. Formalization of MSME businesses is being undertaken on a massive scale after demonetization and the introduction of GST. The core focus of the Union Budget 2018 indicates the Government’s commitment to continue strengthening MSMEs. Small companies having a turnover of ₹ 250 crore (for FY 2016-17) and below would be entitled to a 5 percent lower corporate tax rate. This will make smaller businesses more competitive and generate employment, giving a fillip to manufacturing as over 80 percent of the companies engaged in the auto component manufacturing are SMEs.”

DK Sharma
President
Tool and Gauge Manufacturers
Association of India (TAGMA INDIA)



Source: Mastercam (CNC Software Inc., USA)

DIE & MOULD: WHERE THE MANUFACTURING BEGINS!

The die and mould industry in India has evolved over the years and is currently enjoying a significant position in the global manufacturing landscape. An insight into the industry that is keeping pace with the time and redefining quality and precision...

The die and mould industry of the country has undergone an awe-inspiring transformation. Capable of catering to a variety of specific demands from a number of booming sectors including Automotive, Plastic, Electronics and Electrical, Healthcare, and Machine Tools, the industry finds itself brimming with opportunities.

“The market is positive and the tooling industry will grow from the current market size of ₹ 15,000 crore to ₹ 20,000 crore

by 2020 with 9-10 percent growth with about 13 percent CAGR,” reveals DK Sharma, President, Tool and Gauge Manufacturers Association of India (TAGMA India).

Industry players sense the upbeat Die & Mould scene

D Shanmugasundaram, MD, S&T Engineers Pvt Ltd is highly optimistic about the market: “Undeniably, there is a strong and sustainable growth ahead in the Indian die and mould market in the coming years.”

According to him, the die and mould market is directly related to the automotive industry. “The passenger vehicle sales in India was 3.2 million in the year 2017. The country’s passenger vehicle market is expected to expand by 10 percent and it is set to overtake Germany this year. In such case, in 2018, the Indian passenger car market will overtake the German market in terms of volume for the first time. The demand for die and mould will increase to support the growing automotive sector

POONAM PEDNEKAR
Chief Copy Editor
Magic Wand Media Inc
poonam.pednekar@magicwandmedia.in





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DK Sharma
President
Tool and Gauge Manufacturers
Association of India (TAGMA India)



“There are clear trends that the economy is moving in the right direction. The present Central Government has made significant progress on important economic reforms to improve the ease of doing business.”

D Shanmugasundaram
Managing Director
S&T Engineers Pvt Ltd



“Constantly improving and keeping abreast of the latest in technology - both related and unrelated to the toolmaking domain, will further raise the overall bar for the domain.”

Vineet Seth
Managing Director
South Asia & Middle East
Mastercam India Pvt Ltd

A MAJOR FOCUS OF THE CAD/CAM INDUSTRY, CURRENTLY, IS ON BRIDGING THE GAP BETWEEN SUBSTRUCTIVE AND ADDITIVE MANUFACTURING. ANOTHER AREA OF GROWING INTEREST IS THE USE OF INDUSTRIAL ROBOTS FOR APPLICATIONS LIKE MILLING, TAPE-LAYING AND LASER CUTTING.

Organized by TAGMA, the 11th edition of Die & Mould India International Exhibition will be held from April 11-14, 2018 at Bombay Exhibition Centre (BEC), Goregaon, Mumbai. The biennial event will host 300 exhibitors who will display their latest offerings in Die casting process technology, High speed machining, 5-axis machining centers, Hot runner systems, Cube moulding technology, Additive manufacturing – 3D printing, Texturing, Tool steel and associated heat treatment surface finishing processes, Molding machineries, Ancillary materials and equipment.

many OEMs have started manufacturing in India. This will be a driving factor for the die and mould industry,” says Shanmugasundaram. Vivek Nanivadekar, Executive Director, Fibro India Precision Products Pvt Ltd shares the same opinion with regards to the potential the market holds. “The automobile is the largest customer of the die and mould, followed by the white goods. These both sectors have promising future. The premier car makers are still importing dies but are slowly contemplating to localize some tools. This will give the boost to the die and mould industry,” he opines.

in both the passenger car and two-wheeler segments,” he adds. “With lot many activities in government sectors, more plastics will be consumed. Also in line with ‘Make in India’,

“India is now a global manufacturing hub which has attracted world-wide manufacturers to start up their manufacturing facilities here. The domestic automobile market is still the most promising for die and mould and tool room business,” notes Vikas Taneja, Vice President - Marketing, Jyoti CNC Automation Ltd. According to Dr Vishwas R Puttige, Head - Business Development, Ace Manufacturing Systems Ltd, “The automotive industry continues to look promising in the year ahead. The electronics sector is fast emerging in India with many new manufacturers



Source: Ace Manufacturing Systems Ltd



Source: Machine Tool Division Lakshmi Machine Works Ltd (LMW)



Source: S&T Engineers Pvt Ltd



“The automobile is the largest customer of the die and mould, followed by the white goods. These both sectors have promising future.”

Vivek Nanivadekar
Executive Director
Fibro India Precision Products Pvt Ltd

setting up bases here. The manufacturers in the general engineering sector are also investing heavily in capacity. Hence, the moulds required for each of these industries are likely to see increased requirements in the years ahead.”

“Aerospace and Composites sectors are doing quite well. Toolmaking organizations have an implicit understanding of micro precision, which makes them most suitable to diversify into these sunrise markets in the country,” believes Vineet Seth, Managing Director - South Asia & Middle East, Mastercam India Pvt Ltd.

Pro-market Government policies

There are clear trends that



Source: Jyoti CNC Automation Ltd

THE DIE & MOULD INDIA INTERNATIONAL EXHIBITION, ORGANIZED BY TAGMA, IS AROUND THE CORNER WHICH IS TO DISPLAY INDIA'S METTLE IN THE SECTOR.



“The domestic automobile market is still the most promising for die and mould and tool room business.”

Vikas Taneja
Vice President - Marketing
Jyoti CNC Automation Ltd

the economy is moving in the right direction. “The present Central Government has made significant progress on important economic reforms to improve the ease of doing business. Almost all industries are booming. Still phenomenal growth being in the automobile, aerospace and consumables is expected to move faster. Infrastructure developments including railways and new energy plants have boosted the demand for metal cutting,” states Shanmugasundaram.

Nanivadekar points out to the paucity of commercial tool rooms in the country and applauds the Government’s measures that come as a relief to the MSMEs. “Around 50 percent supply comes from the small and medium tool makers. The small toolmaker is not in a position to expand in a big way due to the lack of finance. But now with the new MSME policy, the government has committed to provide the finance at a reasonable cost to the MSME sector.” He adds, “Due to ‘Make in India’ drive by the central government, OEMs are going



“With a bullish market this financial year and the forecasts of the trend continuing into the next financial year in most of the market sectors, we believe there is a big opportunity in the mould market.”

Dr Vishwas R Puttige
Head - Business Development
Ace Manufacturing Systems Ltd

for localization. This is crucial if they have to be competitive in the Indian market. Once they are competitive in the Indian market, they can be competitive all over the world.”

Open to change

The fortune of any industry is predicted from how accommodating it is to the changing trends and the challenges that follow. The die and mould makers of the country are optimistic about the demand for their products in 2018 as are the solution providers to them. The players are geared up to adapt to the newer and advanced concepts and technologies in tool and mould making that can further enhance the quality as well as productivity, flexibility and efficiency while shortening the lead times. “We seek more information on the latest trends in advanced CNC programming for dies and moulds, ultra-high speed spindles, software upgradations, R&D on high accuracy mould making and mould maintenance techniques as well as new applications

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of data gathering, increased automation, cloud computing and Internet of Things (IoT) that forms the crux of Industry 4.0," says Indraneel Bhattacharya, Senior General Manager Marketing & Sales, Machine Tool Division, Lakshmi Machine Works Ltd (LMW).

"In the materials front, lighter materials and more complex alloys and their machining will impact the die and mould industry. New software upgrades that pave way for several automated tasks, different control features for eliminating input errors, and faster spindle speeds would pay major dividend in the die and mould sector," believes Bhattacharya.

According to Puttige, with the advancements in technology, new processes are being adapted for product development in tool room & die and mould industry. "Some of the interesting emerging trends are advanced materials, superior surface finishes using nano-machining, moulds with conformal cooling, etc.," he notes. A major focus of the CAD/CAM industry, currently, is on bridging the gap between subtractive and additive manufacturing. Another area of growing interest is the use of Industrial Robots for applications like milling, tape-laying and laser cutting. Companies like Mastercam have already created an ecosystem around the product to help independent players to build innovative products on the programming interface offered by Mastercam. "We are also working with partners in the areas of Industry 4.0 to enable Industrial Internet of Things (IIoT) in their planning and manufacturing processes," says Seth.

Beng Chieh Quah, Head - Marketing, Asia Pacific, FARO Technologies, stresses on the need for quality in the products, "There is an increasing demand

IN ORDER TO ADDRESS THE PRESENT CHALLENGES IN THE INDIAN TOOLING INDUSTRY AND TO DEVELOP IT TO BECOME GLOBALLY COMPETITIVE, THERE IS AN ACUTE NEED OF AN ECOSYSTEM LIKE ITS GLOBAL COUNTERPARTS.



"As we move towards smart factories, it is crucial to know the potential technologies and advancements relevant to the die and mould industry."

Indraneel Bhattacharya
Senior General Manager
Marketing & Sales
Machine Tool Division
Lakshmi Machine Works Ltd (LMW)

for greater accuracy in die and mould products. There is much potential for the Indian die and mould market, especially with India expected to become the fifth largest manufacturing country in the world by the end of year 2020."

Market offerings

With the future of the die and mould market looking up, the players providing solutions to the industry are all geared up to cater to its specific requirements. Below are the state-of-the-art offerings that claim to take the sector a notch higher.

S&T's EX 40/EX 400 5-axis control CNC Wirecut EDM machine and VL 610 high speed vertical machining center are best suited for die-mould applications.

JV 80 VMC from LMW: It is an advanced vertical machining center with a die and mould application that offers high spindle speeds of 15,000 rpm with increased rapids on all axes, which greatly reduces cycle time.

540V from AMS: BT-40 model with rear chip disposal is suitable




"There is an increasing demand for greater accuracy in die and mould products."

Beng Chieh Quah
Head - Marketing, Asia Pacific
FARO Technologies

for machining smaller sized die components at a lower cycle time. It employs a high rigid casting bed for stable machining. **VMC 1580 from Jyoti:** This machine finds its application where heavy material removal and direct machining are required from castings and forgings.

Efforts underway

In order to address the present challenges in the Indian tooling industry and to develop it to become globally competitive, there is an acute need to have an ecosystem like its global counterparts. TAGMA is paying heed to this, and with the grant of Department of Heavy Industry, Government of India, is setting up a TAGMA Centre of Excellence and Training in Chakan, Pune. "There are many technical institutions to impart training in tooling. The young generation must avail of them to understand the opportunities in it and get motivated to enter the industry, which is considered the mother industry of manufacturing," suggests Sharma. 

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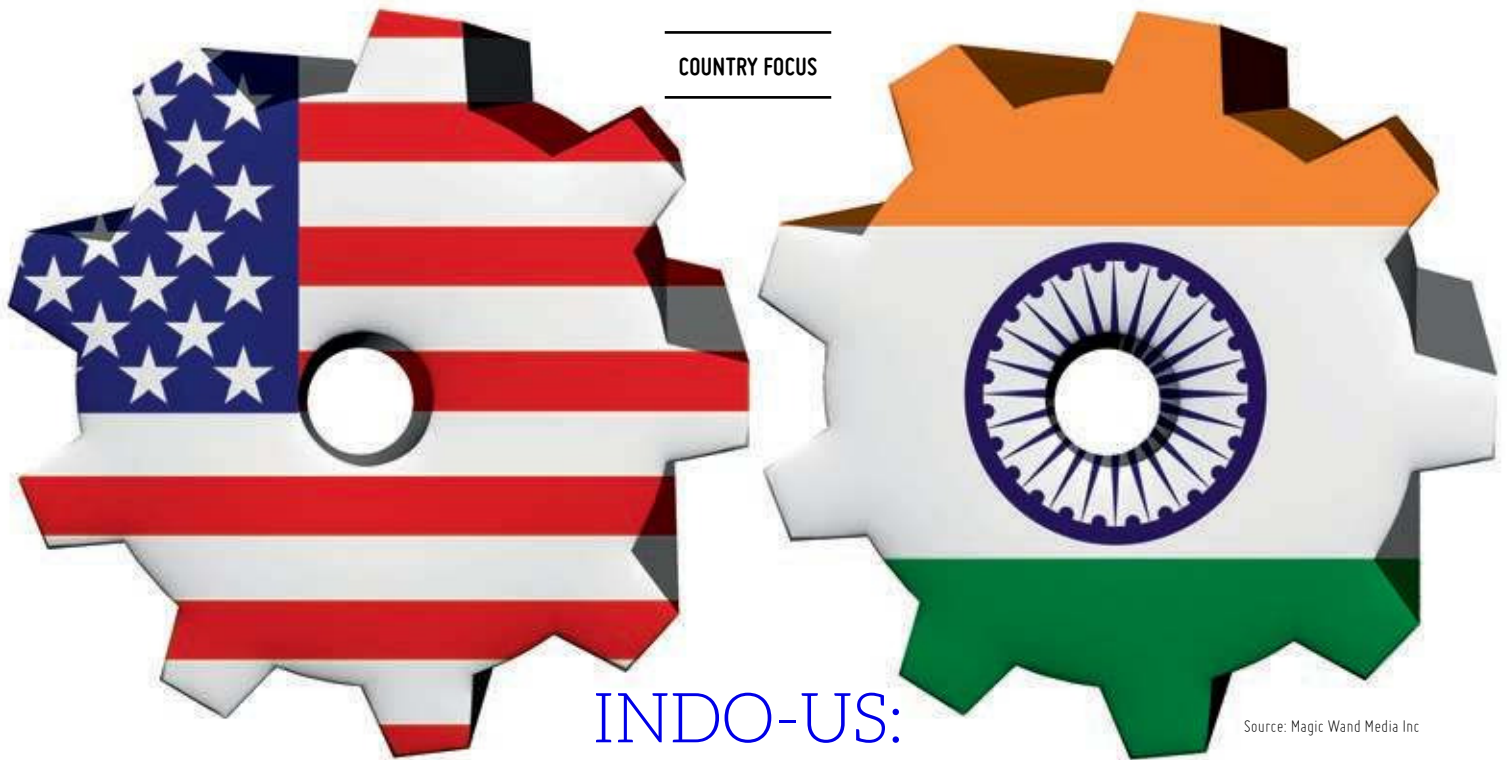
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Source: Magic Wand Media Inc

EXCHANGING EACH OTHER'S BEST

With the same set of economic goals to attain, India and the US are sparing no effort to further enhance their trade relationship that has witnessed a significant surge in the last couple of years. An insight into the exchange happening in the machine tools sector in the vast scheme of things between the two nations...

India and the US share closer economic ties, with their goals in perfect alignment with each other. The relation between the two countries has evolved over time, owing their bilateral trade which has more than doubled in the last decade. The trade, according to the US India Strategic and Partnership Forum (USISPF), reached \$140 billion in 2017. Currently, India is working towards its goal of increasing the annual trade to \$500 billion, which in Indian Finance Minister Arun Jaitley's words is not a 'distant dream'.

India, US' vital export partner in machine tools

According to Douglas Woods, President, The Association for Manufacturing Technology

(AMT), US exports for machine tools to India grew in 2017 compared to 2016, totalling \$78 million in 2017 vs. \$62 million in 2016. "India has grown to become one of the top 10 US machine tool export partners, and every major automotive and off-road/construction equipment company, along with their supply chain partners, now has a presence in India," he adds.

AMT is a trade association that is responsible for representing and promoting US-based manufacturing technology and its members.

"India is one of the fastest-growing economies in the world. AMT has encouraged its members to expand their businesses into India through our Chennai Tech Center, a place

where members can start their in-country business operations, develop relationships with key customers and explore market opportunities," he notes.

Yolking American expertise with Indian talent

With its fast-growing economy and a government-led focus on expanding its manufacturing industry, India is a significant market for US manufacturing technology providers. "It is important for US companies to offer technology that is suited to the Indian market, and for businesses from both countries to work together to help manufacturing continue to grow in India in support of a strong global industry," opines Wood.

POONAM PEDNEKAR
Chief Copy Editor
Magic Wand Media Inc
poonam.pednekar@magicwandmedia.in



“Technologies for automation are particularly in demand in India, as well as those for key industries like automotive, off-road/construction equipment, aerospace, and electronics. The automotive industry in India continues to grow, with analysts predicting that India will consume more than 11 million cars per year by 2030,” he adds. There are benefits for US companies beyond just market expansion. “India graduates an estimated 1.5 million engineers every year through its education system, an important source of talent for the manufacturing industry. US companies can be confident in expanding in-country operations in India with a sufficient pool of skilled workers,” states Woods.

Smart manufacturing technologies

There is a considerable focus on modern manufacturing including advanced materials, advanced robotics and 3D printing, among others. And the US is best suited to provide that to India.

According to Woods, the US market is ripe with many software and control solutions for automation: data collection, connectivity, data storage, analytics, and utilization. A key application for this kind of automation is computing on the edge. “This is the next step beyond cloud computing, as it allows the processing power to become more localized rather than existing in the cloud. It reduces the amount of bandwidth needed to perform analytics and lessens security risks by keeping data local vs. sending it out to the cloud. Edge computing has become a significant technology enabler because of its ability to channel data to locations where computational power

and timing make the most sense, and because of its capability to collect data from devices at the edge of the network – such as the sensors on machinery,” he explains.

“Other more traditional technologies are being deployed in a more non-traditional way. One example is metrology and inspection technologies. While such technologies have typically been used last in the manufacturing process, there are US companies that are developing and integrating those technologies further upstream in the manufacturing process. This better enables first part correctness and real-time statistical process control. With machine learning becoming more commonplace in manufacturing, these data points are crucial to improving and providing a more consistent manufacturing process,” adds Woods.

IMTS 2018 and what India should expect of it

AMT is the show sponsor for International Manufacturing Technology Show (IMTS). The event is held every even-numbered year in Chicago and attracts buyers and sellers from 117 countries. IMTS 2018 is the 32nd edition of the premier manufacturing technology show in North America, and is going to be held from September 10-15, 2018.

“IMTS is shaping up to be the dynamic, must-see event that the manufacturing industry has come to expect. Of particular interest in 2018 will be an expanded Additive Manufacturing pavilion showcasing the latest additive technologies on the market. The show will also feature for the first time two Emerging Technology Centers, demonstrating the latest applications for advanced



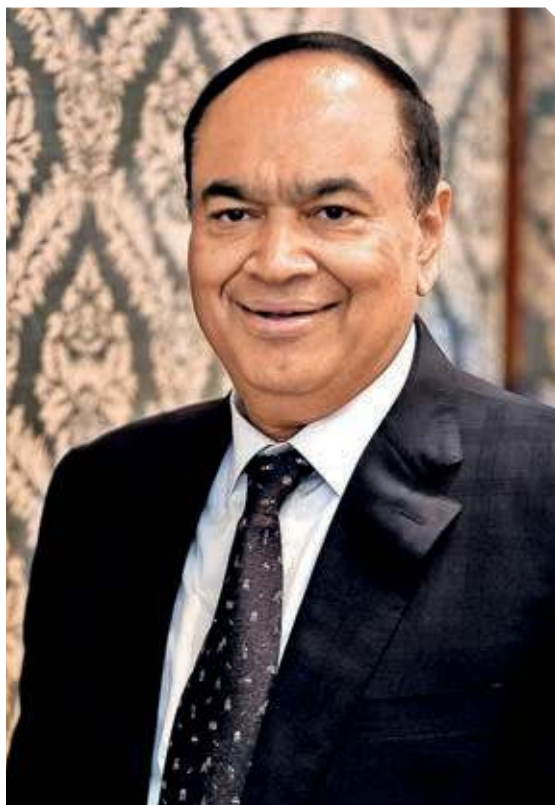
“India is one of the fastest-growing economies in the world. AMT has encouraged its members to expand their businesses into India through our Chennai Tech Center, a place where members can start their in-country business operations, develop relationships with key customers and explore market opportunities”

Douglas Woods
President
The Association for Manufacturing Technology (AMT)

INDIA HAS GROWN TO BECOME ONE OF THE TOP 10 US MACHINE TOOL EXPORT PARTNERS. US EXPORTS FOR MACHINE TOOLS TO INDIA GREW IN 2017 COMPARED TO 2016, TOTTALLING \$78 MILLION IN 2017 VS. \$62 MILLION IN 2016.

manufacturing technologies,” informs Woods.

Beyond additive, IMTS will feature advanced technologies for enhancing productivity and innovation in every key manufacturing industry – automotive, aerospace, medical, machine shops, and power generation. The show is expected to see more than 100,000 visitors this year and will also feature several co-located industrial shows organized by Hannover Messe, as well as the Smartforce Student Summit to educate students on careers in advanced manufacturing. “Visitors from India or anywhere around the world can expect to find solutions for their manufacturing challenges, and to learn about the latest applications and technologies,” he adds.



Source: ACMA

TOWARDS A BRIGHT FUTURE

Nirmal K Minda, President, Automotive Component Manufacturers Association (ACMA), and Chairman & Managing Director, Minda Industries, sheds light on the highly upbeat Indian Automobile and Auto Component sector which is making its mark globally. He supports the case with heartening figures and stresses on the need to harness the opportunities around electric vehicles and associated technologies. A highly edifying read...

Team MMI

What's your observation on the growth of the Indian Auto Component Industry from a global perspective?

The export performance of the Indian Auto Component industry in the first three quarters i.e. in April-December 2017 has been fairly robust, the industry exported components worth \$ 9 billion, growing 22 percent. Our exports to the US and Europe, which account for over a third of our exports, have witnessed steep growth at 32 percent and 15 percent respectively. This is indeed very heartening.

It is pertinent to note that this growth has been on the back of somewhat sluggish global automotive market. According to Organisation Internationale des Constructeurs d'Automobiles (OICA) in CY 2017, the global production of vehicles grew by 2.4 percent over CY 2016, which recorded 4.5 percent growth. Major countries such

as Germany, the US, the UK have shown a negative growth in vehicle production. Going forward, sustaining growth could be a challenge should the sombre mood continue.

On the domestic front, Society of Indian Automobile Manufactures (SIAM) recently released the vehicle production figures for April 2017-January 2018, which are extremely promising. The total vehicle production remained buoyant with 26.4 million units growing 14.41 percent; this augurs well for the component industry.

Do you feel that by 2020 India will be the fourth largest automobile producer globally?

We have recently overtaken Germany and are already the fourth largest vehicle producer in the world. In fact, India is all set to become the third largest vehicle manufacturer

in the world with 7 million vehicles in production by 2020, surpassing Japan and leaving only China and the US ahead of it.

This growth has been possible due to a fast growing economy, adequate financing availability, decreasing unemployment, increasing disposable incomes, and rising consumer expectations. Today, the Indian component manufacturers are well equipped to provide solutions and adapt to changing industrial dynamics and support their customers well.

Please share your views on the implications of Budget 2018 on the auto component sector.

The Budget has been pro-manufacturing and the component sector is delighted that the duty on select items such as engine & transmission parts, brakes, suspension,

gear boxes, airbags and parts thereof have been enhanced from 7.5/10 percent to 15 percent. These items account for more than 50 percent of the \$ 43.5 billion domestic component industry's turnover and over 30 percent of its \$ 11 billion exports. The industry is extremely competitive in these areas and this measure will not only encourage investments, but also encourage technology development. Further, reduction in corporate tax to 25 percent for SMEs with turnover of up to ₹ 250 crore is yet another welcome step, as over 80 percent of the companies engaged in the auto component manufacturing are SMEs. That apart, simplification of procedure for credit availability through online-system for SMEs was much appreciated.

With the focus of the Indian automobile industry shifting towards electric vehicles (EVs), what kind of impact do you anticipate on the Auto Component sector and how is the sector gearing up to align with the new trends?

ACMA appreciates the drive of the Government to promote electric mobility in the country. The opportunities around electric vehicles and associated technologies are immense. However, the industry needs to be prepared to harness them. It is critical that the government encourages localization through supportive policies (land, financing, capability development, R&D tax benefit etc.) and through allocation of significant funding towards indigenous R&D for creation of standard battery, motors and other components of

powertrain, ensuring creation of local IP. A clear roadmap and a definite timeline by the government is necessary for automotive components industry to help individual auto players to create their distinct roadmap and allow the component sector to create capacities and indigenous solutions accordingly.

We at ACMA believe that there should be coexistence of multiple technologies for xEVs, as is the case in other countries be it Europe or Japan or the US or even China. This is because the battery technology is still evolving and eventually market forces will decide the best fit; the technological progression need not be disruptive but evolutionary to allow for the local industry to graduate.

What are your views on the capability of the Indian machine tool industry in terms of supplying customized machinery required for manufacturing auto components of global standard?

Newer manufacturing technology requirements by Automotive Components industry would necessitate up-scaling of capabilities and standards in the Machine Tool sector.

The Machine Tool industry needs to adopt environment-friendly technologies and practices as the world moves towards Green Manufacturing. Issues of safety are critical to the work environment and should not be lost sight of.

Qualitative improvements also need urgent attention which many a time are found lacking, because of which many component manufacturers resort to import of high-precision, high-productive




“ACMA and IMTMA are jointly working to develop a roadmap to fast track improvements in the Indian machine tool sector. These include: improving reliability of peripherals; conducting detailed machine performance benchmarking; and a joint cooperative development of new machines.”

**Nirmal K Minda, President
Automotive Component
Manufacturers Association (ACMA)
Chairman & Managing Director
Minda Industries**

**NEWER
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AND STANDARDS
IN THE MACHINE
TOOL SECTOR.**

machines. In this context, I am happy to mention that ACMA and Indian Machine Tool Manufacturers' Association (IMTMA) are jointly working to develop a roadmap to fast track improvements in the Indian Machine Tool sector. These include: improving reliability of peripherals; conducting detailed machine performance benchmarking; and a joint cooperative development of new machines.

Further, I am given to understand that over 65 percent of the total requirement of the machine tools in the country is met through imports. This is indeed a very large number and a ripe case for indigenizing machine tool manufacturing in India to support the growing demand for machine tools in the auto and auto components industry. 

MAKING THE RIGHT MOVES

UCAM Pvt Ltd, a specialist in precision CNC rotary tables, and Gear hobbing solutions for machine tool applications, has leveraged technology and performance to define its growth.



Source: UCAM Pvt Ltd

UCAM's Bengaluru facility.

Not all entrepreneurs start out with all advantages. Most have to deal with their fair share of struggles on their path to building a unique and profitable venture. Then comes the challenge of constantly improvising to scale and create a stellar reputation to get appreciated by the stakeholders. UCAM story is no different and is replete with the pains that it weathered on its way to the top. “Fortunately for UCAM, we could identify a niche product in Rotary Tables very early in our journey. Like any other Indian manufacturer of a niche product, UCAM had to struggle a lot to make the domestic market accept an Indian product. But once the small window of opportunity was opened, there was no looking back,”

said Indradev Babu, Founder & Managing Director, UCAM Pvt Ltd and Vice President, IMTMA. To stay competitive, UCAM took to the path of backward integration of key subsystems of its products through investment in R&D and association with institutions of higher learning and industrial expertise. “As we look back today, there is a lot of satisfaction in the path we have traversed and grown to be recognized as a house of Excellence in Engineering. UCAM’s speciality is its ability to harness technology and engineer products of precision to match the continuously changing customer needs,” he shared.

Wide range of product offerings

It specializes in the manufac-

turing of precision CNC Rotary Tables, Index Tables and Pallet Changing Solutions for Machine Tool applications. The products boast of their consistent quality, reliability and performance in challenging and high demanding applications in various industries such as automobile, aerospace, power generation, medical & orthopedic implants, oil & gas exploration, pumps & valves, general engineering etc. With the state-of-the-art, cutting-edge technology and a comprehensive approach to continuous product innovation through R&D and a pro-active customer relation management, UCAM has risen in stature as a global brand in the machine tool industry. “UCAM’s standard product range in Rotary Tables starts

POONAM PEDNEKAR
Chief Copy Editor
Magic Wand Media Inc
poonam.pednekar@magicwandmedia.in



from 150 mm dia to 600 mm dia across 4- and 5-axis solutions. UCAM has been successful in designing, developing and delivering Rotary solutions ranging from 800 mm to 3000 mm dia,” informed Ramesh TK, Director, UCAM Pvt Ltd.

“We have recently delivered a special customer request for a TurnMill Table. We are proud that this first product offering is helping the customer meet his market demands successfully,” he added.

The company’s standard range of products is quite vast in itself and it also enjoys catering to customized requests. “Customization is, in fact, UCAM’s competitive advantage. We receive requests from Europe’s OEMs for 5-axis solutions to fit into their portfolios. As of the ratio of standard to customized products, it keeps varying every year,” stated Ramesh.

Customer-first culture

Knowing the customer inside out is the key. The success of any enterprise is defined by its ability to align its products and services to the ever-changing customer needs.

In the domestic segment, UCAM is able to understand its customers’ needs through various modes of engagement like exhibitions, technical seminars, periodic customer visits by the sales and service teams, and other social media engagements. “Government initiatives like ‘Make in India’ also present possibilities in the defence and aerospace segments in the domestic market,” noted Ramesh.

“Our global engagement is limited to a handful of OEMs to whom UCAM is the first choice provider of rotary indexing solutions. In the coming years, we will be focussing to expand



“There is a lot of satisfaction in the path we have traversed and grown to be recognized as a house of Excellence in Engineering. UCAM’s speciality is its ability to harness technology and engineer products of precision to match the continuously changing customer needs.”

Indradev Babu
Founder & Managing Director
UCAM Pvt Ltd
Vice President, IMTMA

our reach to global customers across various geographies and industry segments. ‘Benchmarking’ will be the key to our customer acquisition strategy, both globally and domestically,” he shared.

Business units

“The seeds for the emerging business units of UCAM – Nimble Electric, Nimble Machines and Nimble Motion have been the need for subsystems of high quality and competitive pricing of products. These two key factors have triggered ‘Backward Integration’ as a defining process in UCAM,” explained Babu.

“Nimble Electric caters to the Direct Drive Motor needs for Rotary Table and Nimble Machines’ businesses. While Nimble Machines, which emanated from the internal manufacturing need for Worm Gear and Worm Shafts for Rotary Tables, is now catering to the increasing domestic customer demand




“In the coming years, we will be focussing to expand our reach to global customers across various geographies and industry segments. ‘Benchmarking’ will be the key to our customer acquisition strategy, both globally and domestically.”

Ramesh TK
Director
UCAM Pvt Ltd

for Gear Hobbing Machines, a worthy competition for global manufacturers,” he added.

UCAM Mechatronics is a trading division representing principles from Europe. It deals with the subsystem needs of the machine tool and other manufacturing industries that are also the customers of UCAM for its indexing and gear hobbing solutions.

Saving the planet

That UCAM believes in environmental sustainability is proven by the fact that the complete campus at Bangalore facility is powered by energy-efficient LED lights for low power consumption. The company’s commitment to going green is reflected in its initiatives at its plant design and operations. UCAM is also about to invest in solar energy generation with a sizable investment. Rain water harvesting and STP are other routine practices that it has in place. 

WITH THE STATE-OF-THE-ART, CUTTING-EDGE TECHNOLOGY AND A COMPREHENSIVE APPROACH TO CONTINUOUS PRODUCT INNOVATION THROUGH R&D AND A PRO-ACTIVE CUSTOMER RELATION MANAGEMENT, UCAM HAS RISEN IN STATURE AS A GLOBAL BRAND IN THE MACHINE TOOL INDUSTRY.

COMPOSITES: STRONGER WHEN TOGETHER

The advantages offered by composite materials, moulded through compression presses, such as low weight, resilience, strength, thermal properties, cost reduction and safety far exceed that of individual materials like plastics, aluminum and steel.

As the automotive vehicle design strives towards weight reduction and automotive engineers search for ways to make it lighter, at lower cost component, the compression moulding of composites takes the center stage in composites-for-metal substitution.

Compression moulding presses

More strength and flexural modulus due to longer fibers is achieved with the advances in composites and more reinforcement-intensive thermoset compounds. This attribute is pushing composites more into structural and semi-structural application field, traditionally reserved for metals, enabling significant reductions in part wall thickness. The ability of the compression moulded composites to play any number of roles and play them well is a major reason they continue to rise above the challenges of other materials such as plastics, steel and aluminum.

The advantage of weight and cost reduction has prompted the development of compression moulding presses over other composites processing systems.

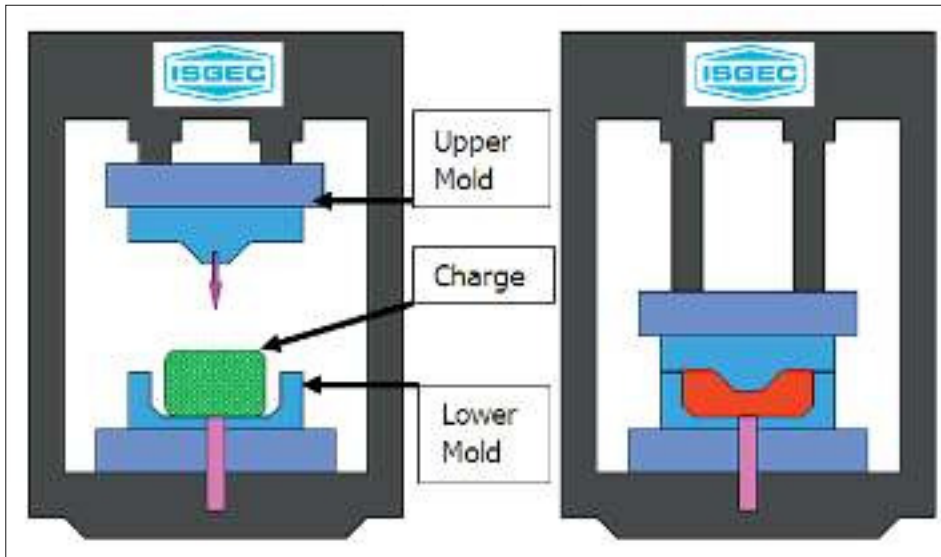


Source: ISGEC Heavy Engineering Ltd

Operators at ISGEC's Compression Moulding Press

VIVEK NIGAM
Executive Vice President
Head of Business Unit -
Machine Building
Isgec Heavy Engineering Ltd
nigam@isgec.com





Hence, ISGEC's compression moulding presses with the capability to reproduce fiber-reinforced composite parts in significant volumes, with the precision, repeatability and pace to which the automotive industry has become accustomed in the stamping of metal parts, garner interest as an economical quick-change solution.

ISGEC presses

In thermoset applications, results are achieved with greater percentages of fiber loading and the use of high-performance fibers which add strength and rigidity to the composite components,

A schematic representation of ISGEC's Compression Moulding Press and its working.

THE ADVANTAGE OF WEIGHT AND COST REDUCTION HAS PROMPTED THE DEVELOPMENT OF COMPRESSION MOULDING PRESSES OVER OTHER COMPOSITES PROCESSING SYSTEMS.

but relatively poor in-mould flow characteristics of these materials challenge the limits of compression moulding press design, particularly in terms of press speed. ISGEC presses put a premium on press speeds and meet the challenge of keeping cycle times down as material viscosities go up.


To successfully mould composite components, the company has accelerated both the advance speeds (closing the mould) and full-tonnage speeds (applying the moulding pressures) in the hydraulic systems. ISGEC presses feature computer control for both velocity profiling, allowing for non-

linear velocity at full tonnage, and pressure profiling to keep from overpowering the charge, thereby giving greater flexibility in component production.

Speeds and pressures in ISGEC presses are controlled with closed-loop motion control and pressure-controlled servo hydraulic systems, integrated with programmable logic controllers and touch-screen operator interfaces. Advances in microprocessor technology translate to greater control as these advances have applied to ISGEC's presses.

Precision measurement

A primary measurement of precision in compression moulding presses is deflection, which is normally measured across the diagonal of the platen. ISGEC press configuration is with optimized deflection properties in order to achieve uniform wall thicknesses. Furthermore, a parallelism control system holds the platen accurately to within required tolerances as per process requirement.

ISGEC's press expertise lies in low consumption/high performance and the know-how in complete automated production lines to suit varied customer needs. 



Who did you notice more?

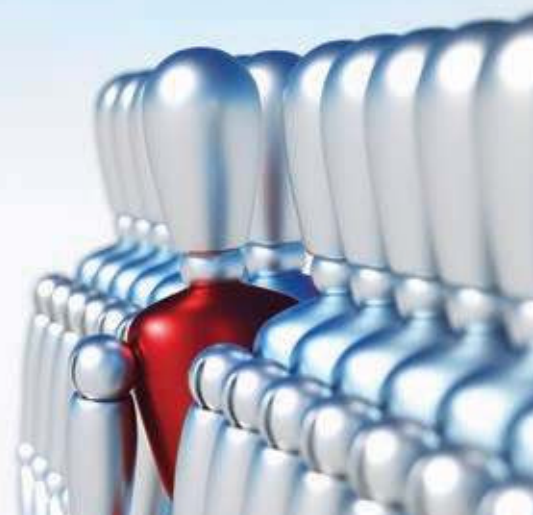


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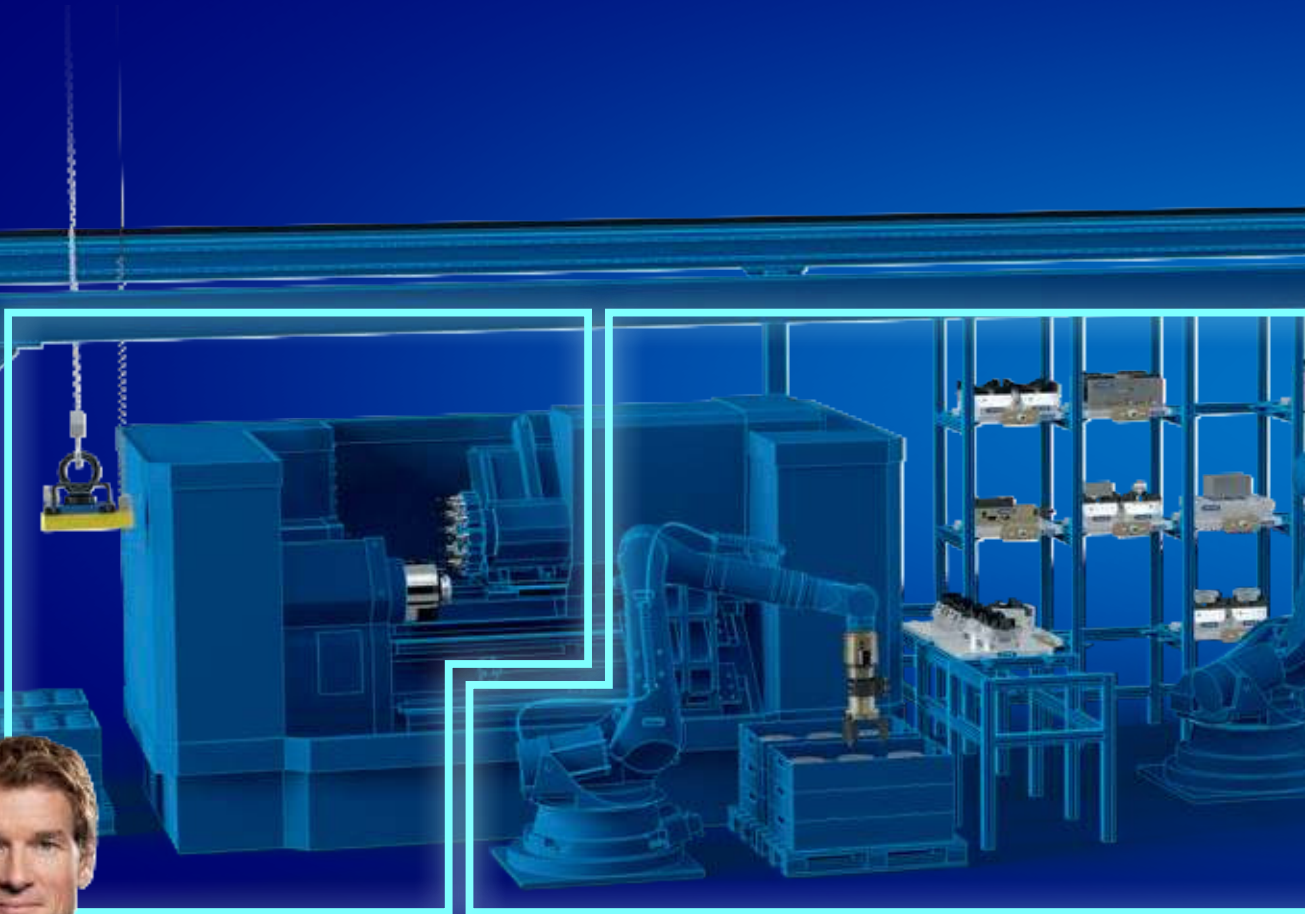


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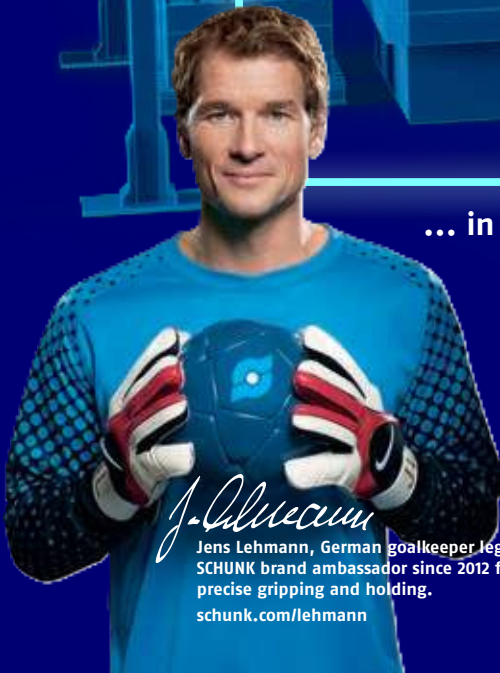
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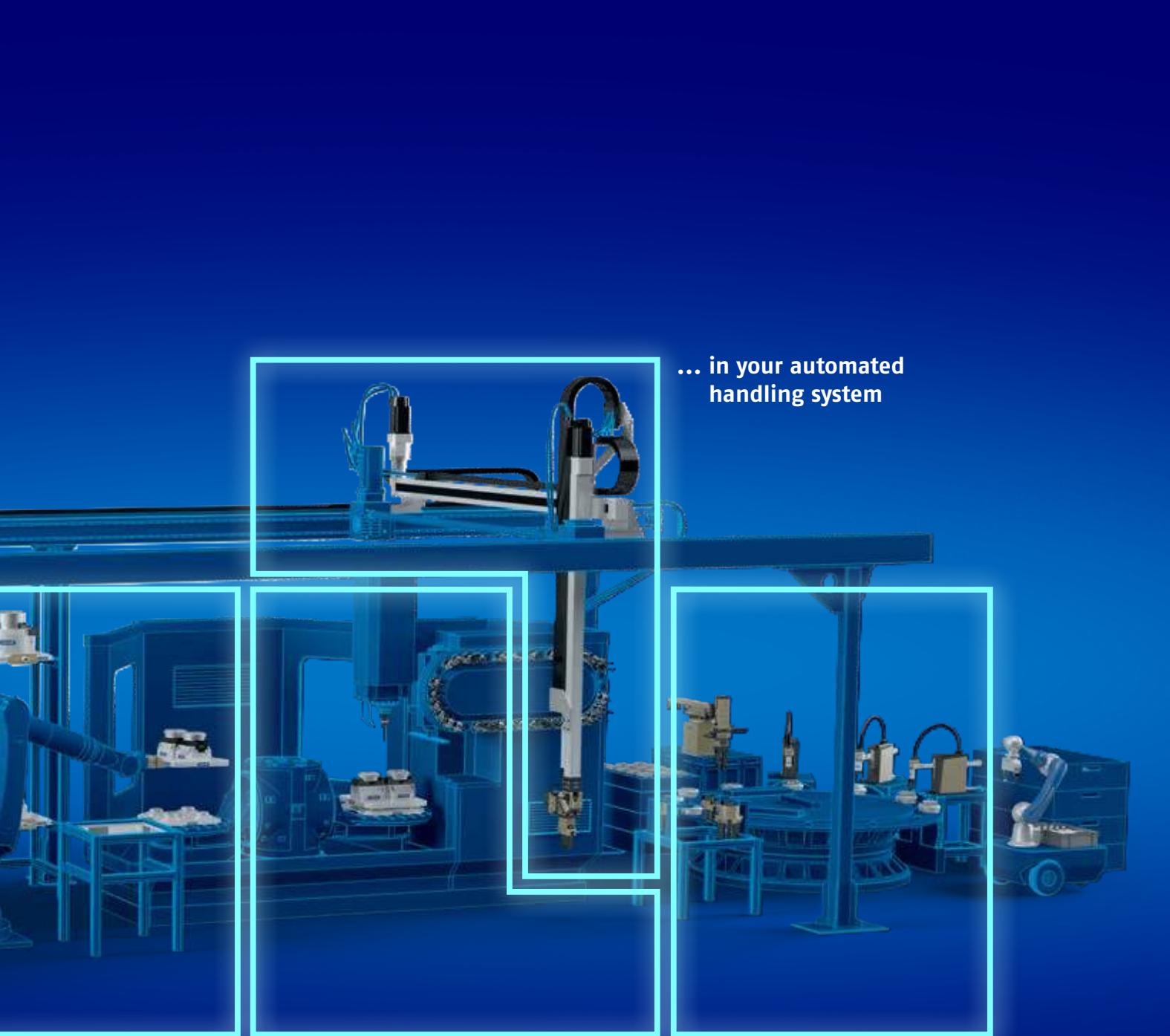
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TAKING MACHINING TO GREATER HEIGHTS

TaeguTec's machining solutions help an engine part maker supplying to aerospace engineering giants improve productivity and cycle time in a rough-milling-followed-by-finish-milling application involving a high-temperature alloy.

The Indian aerospace industry has seen a much-desired boost in recent times, thanks to policy reforms including increased FDI investment attractiveness, as well as better access to finance and technology transfer. The 'Make in India' efforts have induced a spike in demand from industries like aerospace and defence, resulting in gradual redistributing of the manufacturing pie to expand beyond automotive manufacturing.

While public-sector units have hitherto been the mainstay of the Indian aerospace industry, the gradual easing of government control in this space has given way to private players - global majors and small indigenous manufacturers - with successful public-private partnership outings. Now the challenges in aerospace manufacturing, per se, are very different from those arising in the automotive and auto parts set-ups, due to materials and volumes of manufacturing.

Materials, a challenge in aerospace

In terms of materials, aluminum - what was once the staple of aerospace industry - is long passé now. While paneling and interiors utilize light-weight carbon fiber reinforced polymers (CFRPs) and honeycomb materials, the critical engine parts and components are pushing towards lower weight and

higher temperature resistance for better flight economics. Materials like heat resistant super alloys (HRSAs), including titanium alloys and nickel alloys, are much in demand, but machinability-wise, they present a whole set of challenges.

At one such aerospace customer - an engine part maker supplying to aerospace engineering giants - the challenge was to improve productivity and cycle time in a roughing-followed-by-finishing application involving a high-temperature alloy. A concentration of Ni greater than 50 percent renders the material extremely difficult to machine. The existing set of tools in the shopfloor were mostly Solid Carbide that are increasingly being outperformed by indexable tools. Solid Carbide tools are a high-maintenance set insofar as the frequent regrinding requirements go, not to mention the environmental disservice relating to high carbide consumption.

Roughing solution

TaeguTec's high-feed solution Chase2Feed BLMP 06 was considered and it resulted in the benefit of 2 extra corners over the competition (productivity improvement by 17 percent), in addition to 31 percent reduction in CPC. The clamping rigidity was also much superior to that of the competition wherein the insert screws were getting damaged frequently.

CHASE2FEED

Chase2Feed BLMP 06

Chase2Feed cutters have higher density of inserts compared to other designs due to mini insert size. This enables improved productivity and higher feed rates. The new insert with 4 cutting edges is a highly cost-effective solution for facing, shouldering, straight ramping, helical ramping and cavity machining applications.

Features

- Particularly suitable for High Feed Machining
- Low cutting forces
- 4 corner inserts for cost-effective machining
- Excellent chip evacuation
- Through coolant (air) system
- Low chipping tendency
- Minimum diameter 16 mm



Source: TaeguTec India Pvt Ltd

Finishing solution

The Chase2Mill family came to the rescue in Finishing operations, with the compact four corners double sided 4NKT 06 inserts. The advantage of 4 corners was able to perform at 58 percent reduced CPC, while improving life per corner by 43 percent.

CHASE2MILL

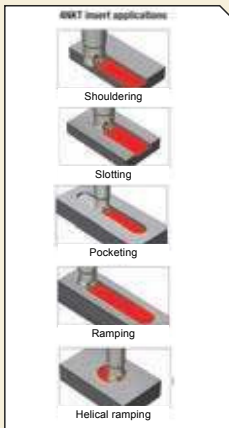
Chase2Mill 4NKT 06

The 90° entering angle insert, despite the double-sided design, is suitable for high ramp down angle applications. Its high positive geometry generates low cutting force while the cross edge insert geometry prevents unexpected insert failure. The insert thickness and high strength combined with the cutter's wide bottom for improved clamping enables excellent high stability and productive machining.

All cutters include an internal coolant supply for efficient chip evacuation that prevents built-up-edges. The 4NKT 06 inserts are available in two geometries: "M" for general purpose machining applications and "ML" for low power machining in unstable set-ups and long overhang applications.

Features

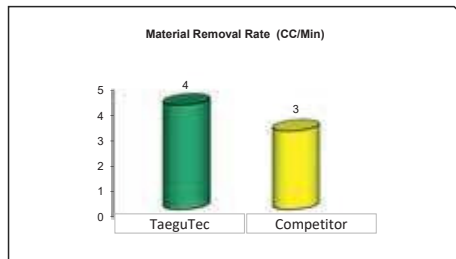
- True 90° shoulder milling
- High axial and radial positive geometry
- High ramp down angle
- A fine pitch cutter for high productivity machining
- Capable of multiple milling applications
- Internal coolant supply
- Wide bottom pocket
- Strong M3.0 screw



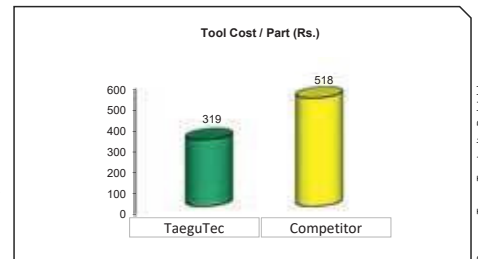
Source: TaeguTec India Pvt Ltd

Application: Rough Milling of engine component		
Material:	RENE M 77	
	TaeguTec	Competitor
Cutter	TEBL 216-16-06-S	Dia 16mm
No of Inserts / Cutter (Z) :	2	2
Insert Description :	BLMP 0603R-ML TT3540	Competitor 2-corner insert
Operating Parameters		
Cutting Speed Vc (m/min) :	40	40
RPM :	796	796
Feed Ft (mm/tooth) :	0.8	0.6
Feed Fm (mm/min) :	1274	955
Depth of Cut (mm) :	0.2	0.2
No. Of Passes :	10	10
Width Of cut ae (mm) :	16	16
Length Of Cut (mm) :	150	150
Coolant :	YES	YES
Results		
Total Cycle Time (sec) :	600	720
Insert Contact Time (sec) :	500	600
Productivity improvement % :	117%	100%
Material Removal Rate (CC/Min) :	4	3

Source: TaeguTec India Pvt Ltd



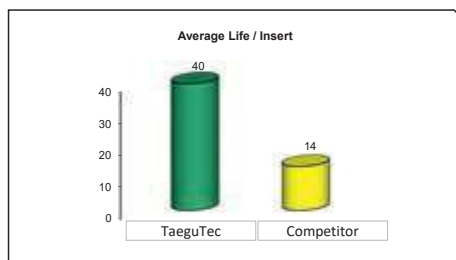
Source: TaeguTec India Pvt Ltd



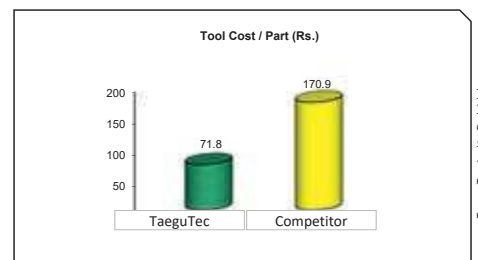
Source: TaeguTec India Pvt Ltd

Application: Finish milling of engine component		
Material:	RENE M 77	
	TAEGUTEC	COMPETITOR
Cutter /Tool Holder :	4N TE90-425-W25-06	DIA 25MM
No of Inserts / Cutter (Z) :	4	4
Insert Description :	4NKT 060316R-ML TT3540	Competitor 2 corner insert
Operating Parameters		
Cutting Speed Vc (m/min) :	30	30
RPM :	382	382
Feed Ft (mm/tooth) :	0.075	0.075
Feed Fm (mm/min) :	115	115
Depth of Cut (mm) :	0.1	0.1
No. Of Passes :	5	5
Width Of cut ae (mm) :	25	25
Length Of Cut (mm) :	150	150
Coolant :	YES	YES
Results		
Average Life / Corner (Nos) :	10.0	7.0
% Increase in Life / Corner :	43%	-

Source: TaeguTec India Pvt Ltd



Source: TaeguTec India Pvt Ltd



Source: TaeguTec India Pvt Ltd

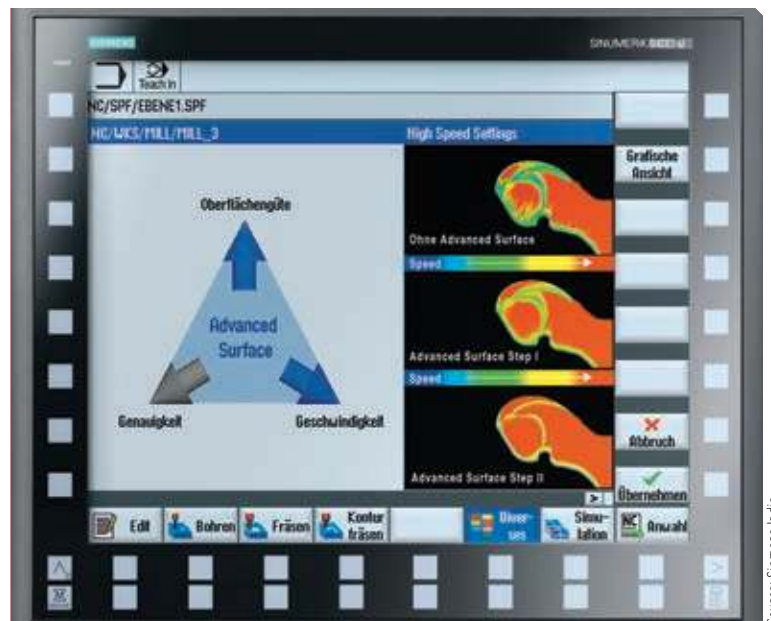
DRIVING THE DIGITAL MACHINE SHOP

Once a skill-oriented craft, die-making has now evolved and is considered the 'Mother of Manufacturing'. Thanks to the growing popularity of India as a manufacturing hub, the die and mould sector of the country is experiencing a major boom. A peek into the challenges and opportunities that the sector encounters, and Siemens' contribution to it...

The demography of India and urbanization support growth in automotive sector and consumer durables market, driving the growth in the die and mould sector. The key industry players see a favorable scenario: with major OEMs developing and manufacturing locally, there is an increase in demand, especially in the commercial tool rooms. This growth also enables qualitative manufacturing locally and helps foray into global markets. With the market's conditions favouring die and mould, good growth is estimated in the near term of 2-3 years.

Die boom

Automotive industry is pushing new launches faster and more frequently, which increases the demand for dies. Similarly, packaged products in consumer goods also increase the need for dies in the food industry. Export tool room requirements are also the key drivers in the demand. Additionally, global OEMs developing and manufacturing locally have also supported in the growth of this sector. The quality and



Source: Siemens India

productivity of manufacturing is the main element that has supported India to become one of the global manufacturing hubs.

Traditional tool and die making was envisaged as a skill-oriented craft. However, this is now commoditized. This has been possible due to 3D modelling, rapid tooling and high speed machining. The entire value chain of the industry has gone through a phase shift which aided the growth of this

sector feeding the demands of automobile, auto component, plastics, packaging, etc. The current challenge is the growing demand for precision dies and complex dies due to efficient designs in product development and challenges in an effective ecosystem which can support these demands.

Siemens' comprehensive portfolio

We, at Siemens, have an extensive portfolio which covers the

VIJAY PRATAP SINGH
Head of Business
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Machine Tool Systems
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Highlights

- High speed built in spindle
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- CNC system with high end Die & Mould Features
- Large working area
- TPM friendly design



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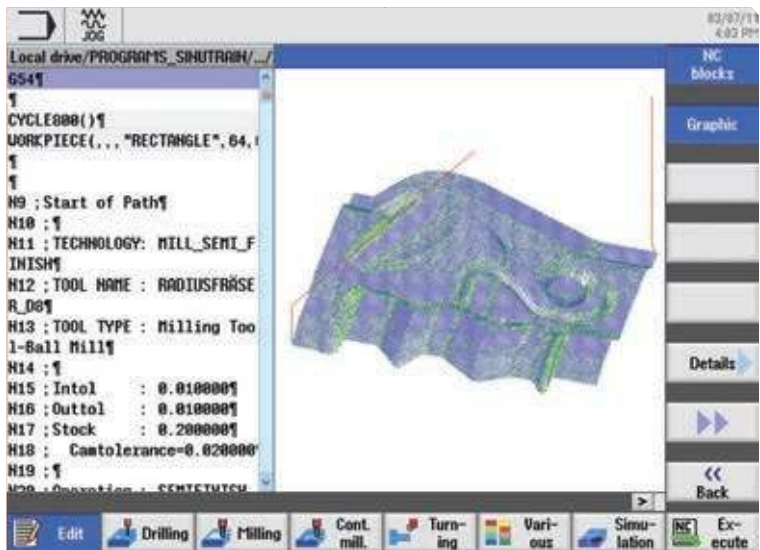


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entire process chain involving manufacturing of a mould and die product. From the design/3D modelling using our NX platform, to resource management with TEAMCENTER, until machining with SINUMERIK CNC, delivering high precision machining with high productivity and efficiency. With SINUMERIK MDynamics technology package, our new expertise in milling, SINUMERIK is always ready for challenging machining profiles.

Different shapes and designs require different machining operations and the decision often has to be made as to which manufacturing strategy should be used: three axes, three plus two axes or five axes. Convex or concave free-form surfaces with uniform curvature are usually machined with three controlled axes. However, five axes are required for deep cavities or frequent changes of the curvature. No matter whether three or five axes – SINUMERIK supports every machining strategy.

Innovative solutions

Out of the various solutions specific to mould and die, below are the few that stand out. Siemens today is the only organization that can support

the concept of digital twin, a concept widely discussed under technologies supporting the ecosystem of Industry 4.0. This helps to enable virtual realization of the real machine with the help of NX platform and SINUMERIK Virtual NCK. The digital twin supports the user to visualize the digital print of the component from the digital twin of the real machine, effectively increasing the availability and efficiency of the machine tool itself.

The SINUMERIK MDynamics technology package offers intelligent path control with Advanced Surface feature which ensures optimal workpiece surface at very high machining speed. The adaptive features enable the machine operator to choose surface finish requirements with respect to machining times, enabling best surfaces with highest efficiency.


Top Surface - SINUMERIK 828D and SINUMERIK 840Dsl solutions are now available with Top Surface, a technology package which understands the errors in the part programs which typically arise out of CAM post processors and corrects the same to ensure best surface finish and is a benchmark in the industry. By effectively reducing

errors in programming, which typically is not controlled by the tier suppliers of the mould in India, the faults in the workpiece can be avoided effectively.

Mould View in SINUMERIK CNC enables the operator to understand the workpiece surfaces right on the CNC to verify the even point distribution of the profile so as to ensure best surface before machining.

Overcoming challenges

The current scenario of industrial die and mould manufacturing consists of independent process chains including 2D to 3D modelling, 3D model editing, post processing, machining simulation, creation of part program, simulation of part program, machine set up and finally machining. Today, all these processes have different standards and different software platforms which do not talk effectively with each other.

There is a considerable loss in productivity at every stage, which effectively reduces the efficiency of the entire system. By adopting technologies which support the Industry 4.0 revolution, the Indian tool room industry can ensure consistent quality through the process chain which is the need of the hour. Utilizing technologies like digital twin of machine for virtual realization of the component near to the real world enables reduced time to market. Integrated CAD CAM and machining enables reduction of errors and effective utilization of the machine tool, further increasing the availability and productivity of the machine tool. Adopting these technologies will help us in overcoming high costs and ensuring that we stay competitive as well as fulfilling the quality requirements of tomorrow sustainably. 

BY ADOPTING TECHNOLOGIES WHICH SUPPORT THE INDUSTRY 4.0 REVOLUTION, THE INDIAN TOOL ROOM INDUSTRY CAN ENSURE CONSISTENT QUALITY THROUGH THE PROCESS CHAIN.



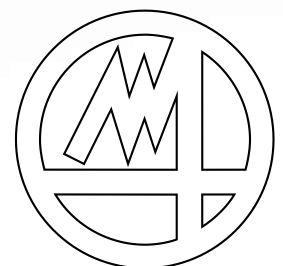
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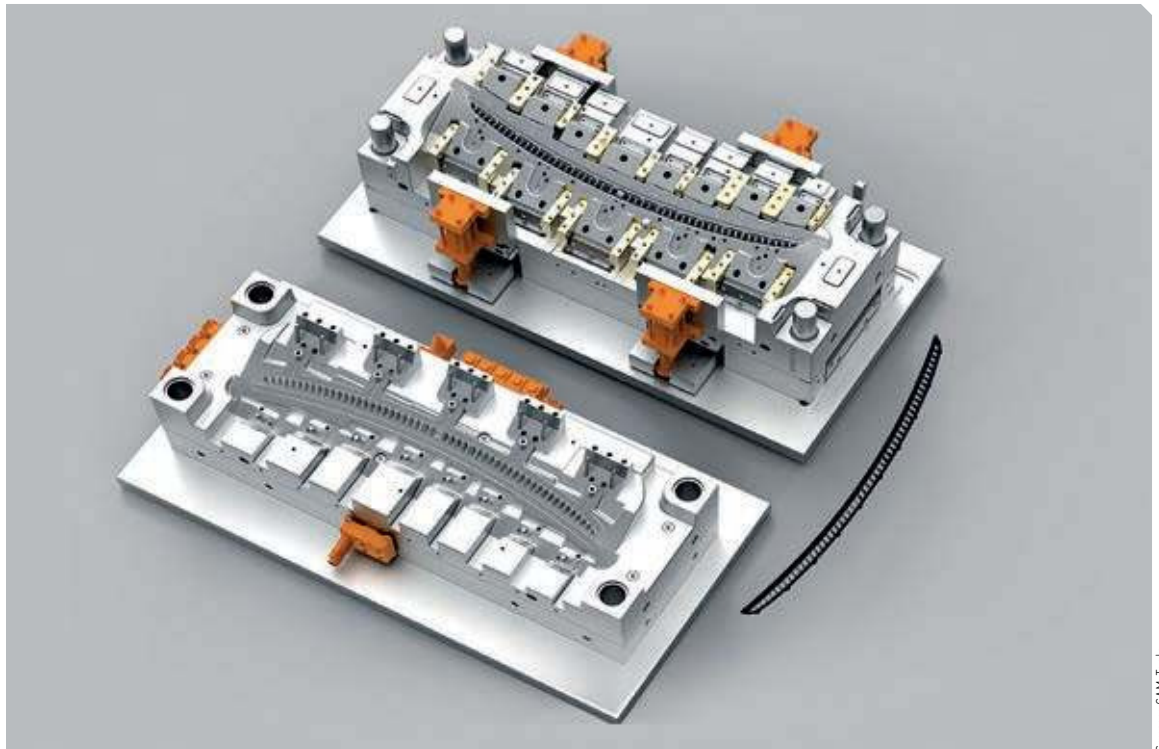
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SAVING TIME, ENHANCING EFFICIENCY

CAM Tools undertakes a project for Faurecia using Autodesk PowerMill and PowerShape to provide a complex tooling solution within the stipulated time.



Source: CAM Tools

CAM Tools is engaged in precision mould making of plastics and supplying of injection moulded parts. CAM Tools is a well-known name in the tooling industry. Started as a service provider for toolmakers in and around Mumbai in 2002, today CAM Tools offers solutions for complex tooling challenges to companies across the globe and develops moulds up to 850 tonne.

“We also have an injection moulding plant in Pune. So, you can say that we provide total turnkey solutions for injection moulding components i.e. right from the tooling to the production of the components,”

said Paresh Panchal, CEO, CAM Tools.

Automotive companies and OEMs form a major chunk of CAM Tools clientele. “Around 80 percent of our clients are automotive companies which include both two-wheeler and four-wheeler,” added Panchal. The company also caters to the aerospace sector and has worked for major Government PSUs (Public Sector Undertaking) that required impellers and turbine machines for various projects.

“We started with one Computer Numeric Control (CNC) and one Electric Discharge Machining (EDM) machine in 2002, and in

2007, we added in-house injection moulding facilities. By 2012, we had our own 5-axis machine from Deckel Maho, more famous as DMG. Sensing a huge demand for auto components from Pune, we started our manufacturing operation in the city in 2016,” he informed.

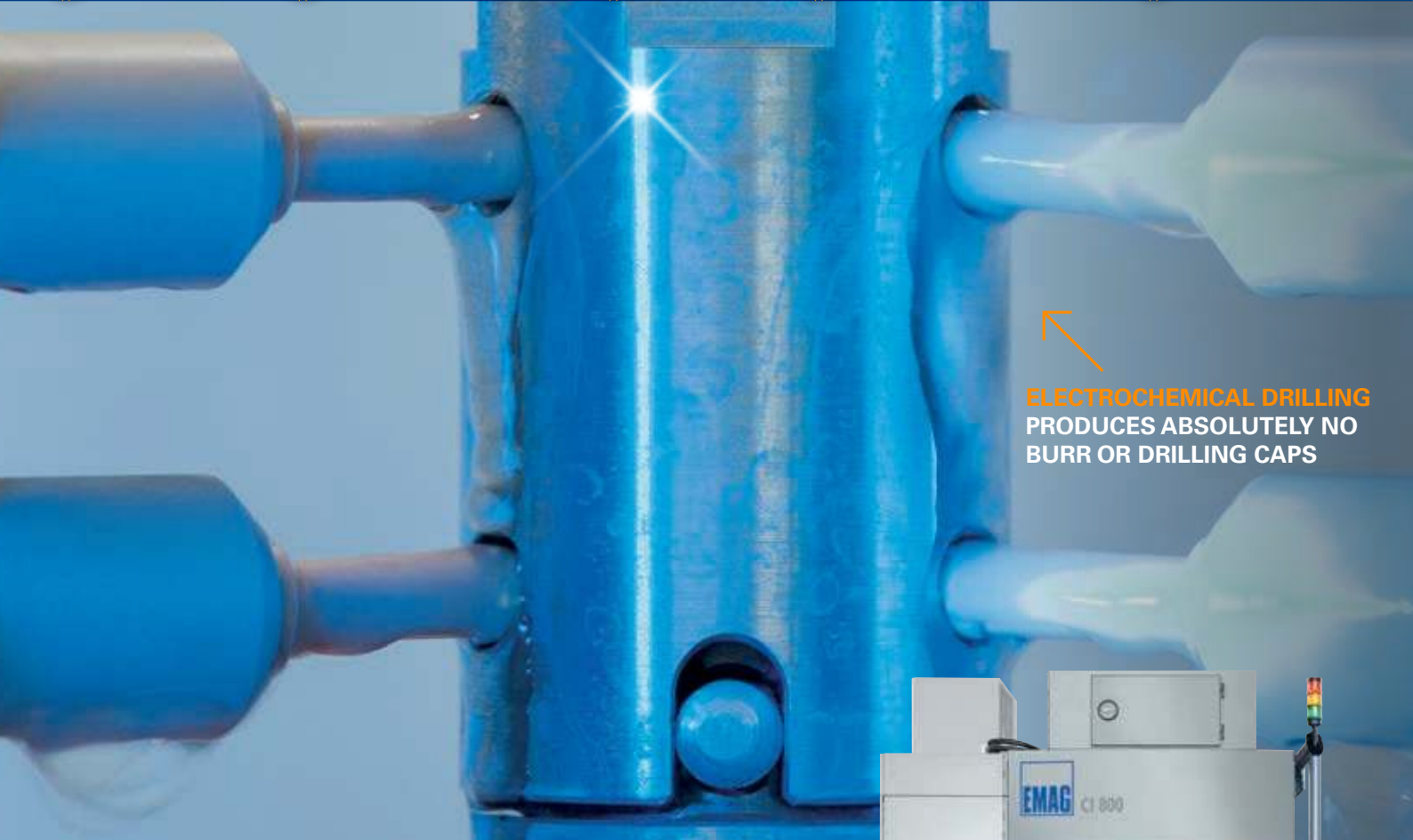
Prestigious projects

Expertise in CAD/CAM helped CAM Tools with a very fast turnaround time and it bagged some prestigious projects.

“With the help of Autodesk PowerShape, we work on the mould designs, initial concept drawing and feasibility studies. PowerShape boasts of user-

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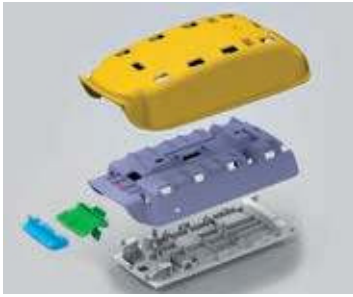


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HIGHLIGHTS

- + Drilling produces no burr or drilling caps. This means no deburring – a crucial advantage for machining components which are difficult to access.
- + The material is not heated by the ECM process which means no negative effects on its microstructure and no micro-cracks.
- + A lot of ECM boreholes (20 or more) can be drilled at the same time; short cycle times and lean processes are a matter of fact. The feed rate can be up to 5 mm/min.
- + The process is suitable for hard and soft machining. The material hardness does not affect the feed rate.
- + The service life of the drilling cathodes is very long, even for hard materials. The tools suffer almost no wear.





Source: CAM Tools

friendly comparison tools, along with up to the mark estimation tools. The core/cavity wizard is also a useful feature. It divides a solid model into cavity and core pieces that can then be separated dynamically using a simple slider. Individual faces can be split quickly and efficiently and then attached to the correct part of the tool. Clear

Business challenges: Investing in a new 5-axis CNCs and EDM highlighted the need for a modern CAM programming system that could support CAM Tools' existing machines while driving the 5-axis DMG machine efficiently and producing complex parts within a strict deadline.

Solution: Autodesk's PowerShape and PowerMill provided CAM Tools total confidence to drive both 3- and 5-axis machines unattended for long hours. The workflow in PowerShape and PowerMill was much faster and helped the company in delivering the project accurately.

Business impact: The combination of high-end CNCs and Autodesk acted as a catalyst for the development and improvement of the manufacturing process of CAM Tools.

graphical feedback, including undercut shading, shows potential moulding issues, giving you a complete control," added Panchal.

According to him, PowerShape makes the overall tool designing faster. "We use software from Autodesk for

designing and manufacturing activities. One such project is tooling for Faurecia. Under this project, the complete tool design, tool manufacturing and electrode extraction was done using PowerShape and PowerMill. CAM Tools was responsible for tooling and moulding of around 27 auto components," he stated.

PowerMill possesses various machining techniques such as roughing, rest roughing, semi-finishing and finishing which were used for the project. CAM Tools has been using PowerMill for more than 15 years and is highly satisfied with the results.

"We work on unmanned machining environment where the program embedded by PowerMill is very safe. It's all Automatic Tool Changer (ATC) programmed, so on weekends or on holidays, we leave the programmed machine for 36 to 40 hours together where



Source: CAM Tools

practically nobody attends it," explained Panchal.

PowerMill CAM software provides tools for high-speed machining and multi-axis CNC. It rapidly creates high-quality toolpaths and NC programs which have been helping CAM Tools meet its unique needs over the years. "We use PowerMill 5-axis, which reduces the overall EDM time. It is user-friendly and we do not face any complications," he noted.



"We have been using Autodesk PowerMill and Autodesk PowerShape software for more than 15 years and have grown along with its improvement in the software."

Paresh Panchal
CEO
CAM Tools

He added, "Autodesk's high-speed roughing technology Vortex controls the maximum engagement angle of the cutter in the material, such that



Source: CAM Tools

the angle calculated for the programmed step over is never exceeded, even in internal corners. This allows for optimal cutting conditions to be maintained throughout the tool path. By controlling the maximum engagement angle and the load on the tool, Vortex can take deeper cuts than traditionally used in roughing operations. Depths of cut up to the full flute length enable maximum material removal rate from solid carbide tooling

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FEATURES SUCH AS CAVITY/CORE WIZARD, ARC-FITTING, DIRECT MODELLING AND UNDERCUT SHADING MAKE POWERSHAPE ONE OF THE MOST COMPETITIVE SOLUTIONS TODAY.



Source: CAM Tools

and reduce machining times by up to 60 percent. Vortex technology can be applied to 2- and 3-axis roughing, positional 5-axis roughing and for rest roughing.”

Other than Vortex, features such as Dynamic Stock Model, Toolpath Editing, and Point Distribution make PowerMill efficient and faster. “Toolpath Editing helped us to remove/modify selected areas of a toolpath without needing to recalculate from scratch. As a result, we were able to reduce production lead times,” said Panchal.

The process

CAM Tools used Autodesk products right from the beginning of the project. It begins when the Request For Quotation (RFQ) arrives and the moulds have to be quoted in three days.

He added, “There were around 20-25 moulds. We systematically worked on PowerShape, made the initial concept mould design using the software and quoted to the customers. Once the quotation was approved, we conducted a feasibility study which was submitted to the customer. PowerShape commands such as draft angle analysis and medium radius shading were very useful during this process. It was followed by core cavity separations and complete mould designs and was sent for



Source: CAM Tools

machining once the electrode results were satisfactory. Machining on PowerMill is fast which reduces the overall machining time.”

Features such as Cavity/Core Wizard, Arc-fitting, Direct Modelling and Undercut Shading make PowerShape one of the most competitive solutions today.

“The new Cavity/Core wizard divides a solid model into cavity and core pieces that can then be separated dynamically using a simple slider. Ambiguous faces or regions that require slides or lifters can be assigned to the appropriate side or to a completely new line-of-draw quickly and simply, ensuring that your part can be moulded in the most economical way possible. Individual faces can be split quickly and efficiently and then attached to the correct part of the tool. Clear graphical feedback, including undercut shading, shows any potential moulding issues, giving you complete control,” he added.

Talking about the after-sales service, Panchal said, “The after-sales service is extremely good. Autodesk has its people strategically placed whether it is in Mumbai, Gujarat or any part in the country.”

In brief - the Faurecia project


Project Duration: 12 weeks - 4 weeks for designing and 8



Source: CAM Tools

weeks for manufacturing.

The Designing: It started with a feasibility study where CAM Tools conducted the draft angle analysis to make sure that the draft is adequately provided. PowerShape has draft undercut shading features where it highlights whether the draft is under 3 degree or 5 degree, required for texturing of the cavity. Feasibility-wise this is a very useful command and there are certain undercuts which had to be highlighted using PowerShape tools such as under shading and minimum radius shading. Once the feasibility study was submitted to the customer, they checked it for any modification/update. PowerShape helped them design the tool faster within the deadline.

The Manufacturing: Once the designing process was completed, the file was converted into required neutral format and exported to PowerMill. PowerMill was utilized for the project that possesses various machining techniques such as alignment, roughing, rest roughing, semi-finishing and finishing. Subsequently, it generated the toolpath and was exported to NC programming. The NC file was then sent to control system for the machining process. 

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Source: acp – advanced clean production GmbH

Cooling and cleaning with the quattroClean technology when machining aluminum.

HOW **MACHINING** WITH **CO₂** WORKS

CO₂ as a process coolant offers a slew of benefits: it significantly improves the cost-efficiency of machining, increases productivity by around a third when the machining workpieces are made from PEEK and aluminum, and last but not the least, helps stay components and machines much cleaner.

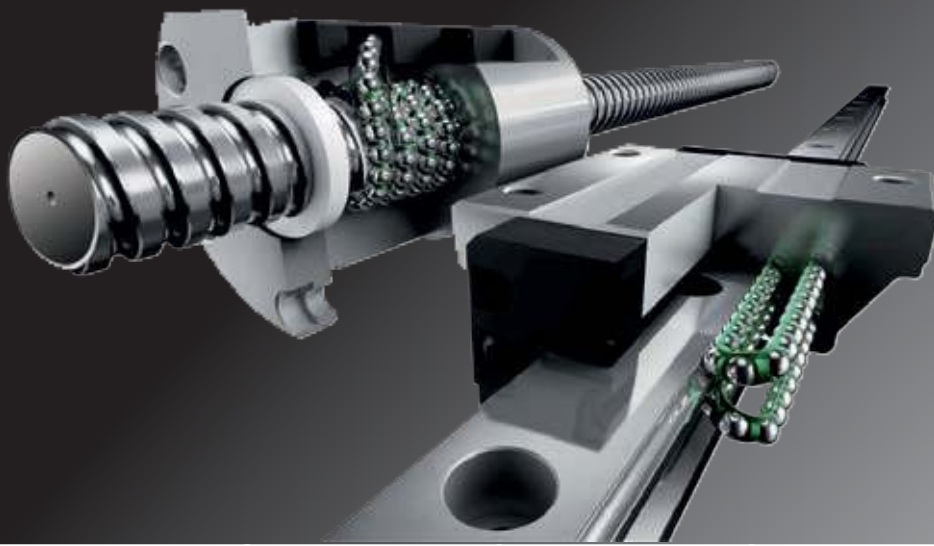
DORIS SCHULZ
Journalist (DJV)
SCHULZ.PRESSE.TEXT
ds@presstextschulz.de



In recent years, the use of CO₂ as a coolant for machining processes has become much more popular as an alternative to conventional cooling lubricant concepts. One

of the reasons for this is the higher rate of material removal, which increases productivity and also reduces tool wear and the associated downtimes. The so-called cryogenic cooling

method with carbon dioxide therefore decreases production costs. With its quattroClean snow jet technology, acp – advanced clean production GmbH offers a cooling system



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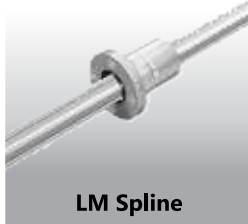
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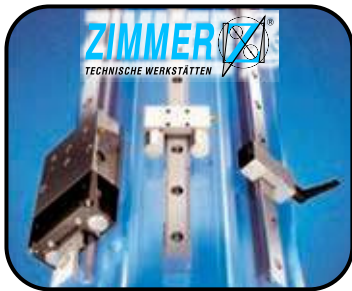
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that has proved its worth in serial productions. It can also be integrated into CNC machines and machining centers at a later stage.

Reliable cooling, thanks to non-wearing circular two-component nozzle

The quattroClean system works with liquid carbon dioxide, which is generated as a by-product from chemical processes as well as from the generation of energy from biomass, thus making it environmentally neutral. It is transported at room temperature to the non-wearing circular two-component nozzle. The CO₂ only transforms from a liquid to a solid state in the form of fine snow crystals as it leaves the nozzle. The crystals are then bundled by a circular jacketed jet of compressed air and advanced to the process zone at supersonic speed. The temperature of the medium at this point can be as low as -78°C. On the one hand, the patented technology with the jacketed jet ensures a constant pressure and consistently good cooling results. On the other hand, only the quantity of carbon dioxide needed for the desired cooling effect is supplied.

Dry, residue-free machining

The fact that solid-state carbon dioxide sublimates at room temperature makes this a dry process. Consequently, chips are clean and dry as well as fully recyclable. Dry machining also means that workpieces and machines stay much cleaner. In many cases, there is no further need to clean workpieces after processing. Depending on cleaning requirements, a cleaning module can be integrated quickly and efficiently downstream of the machining process. A further



Source: acp — advanced clean production GmbH

advantage of cooling with CO₂ is that parts, for example for medical products, are machined free of contamination. The low temperature also minimizes the risk of a workpiece deforming. Finally, no costs are incurred either for maintenance, care or the disposal of cooling lubricants.

External cooling prevents icing up and facilitates retrofitting


In contrast with other solutions, cooling takes place externally with the quattroClean system rather than through the tool. The non-abrasive and non-toxic jet of snow and compressed air is easy to focus and can be directed exactly where it is needed in the defined process zone around the cutting edge, chips and tool. For this, the CO₂ nozzle travels with the tool. Among other applications, the quattroClean system is used in serial productions to lubricate, cool and simultaneously clean machined implants and medical components made from PEEK

Cooling and cleaning with the quattroClean system when machining PEEK.

THE PATENTED TECHNOLOGY WITH THE JACKETED JET ENSURES A CONSTANT PRESSURE AND CONSISTENTLY GOOD COOLING RESULTS. SECONDLY, ONLY THE QUANTITY OF CARBON DIOXIDE NEEDED FOR THE DESIRED COOLING EFFECT IS SUPPLIED.

(polyether ether ketone). Another serial application is in metal processing. Here, the system is used to cool tools when machining parts are made from aluminum. In both cases, productivity could be stepped up by over thirty percent by cooling with CO₂ externally using the acp system.

Compact and targeted control

Thanks to its modular concept, the system can be easily adapted to customer demands and has a very small footprint. Process parameters, such as the volume flow for compressed air, or the quantity of carbon dioxide required, can be optimally adjusted to the application concerned. The duration of the jet for both process parameters can also be modified separately. This high degree of flexibility enables the system to be used for completely new applications, as well as for applications which were unsuccessful with standard systems. 

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TECHNOLOGY TRANSFER: FROM LAB TO SHOP FLOOR

A project by the students of Marathwada Institute of Technology, Aurangabad in the state of Maharashtra garnered tremendous attention from the industry fraternity at i2 Academia Pavilion, an IMTMA initiative at IMTEX Forming 2018. The attempt echoes the need for the industry and academic institutions to collaborate for each to be benefitted.



The slitting action.

DR CL GOGTE
Professor
Marathwada Institute of
Technology, Aurangabad
gogtecl@gmail.com



The transfer of a technology from a research laboratory to a manufacturing shop floor or an application is always a challenge. While institutes like IITs are routinely involved in the process, the government and private institutions have now realized its importance and have started moving in that direction.

Involving students in such projects immensely helps them to get 'industry ready' after their graduation. To make it possible, faculties in engineering institutes must acknowledge these needs and get connected with the industry.

One such project was undertaken by the students of Marathwada Institute of Technology, Aurangabad, Maharashtra, which bagged them the first prize in i2 Academia Pavilion at the recently held IMTEX Forming & Tooltech 2018, a premier exhibition on forming technologies at Bengaluru. i2 Academia Pavilion, an Indian Machine Tool Manufacturers' Association (IMTMA) initiative, was held with the intent to get the industry and the academia on the same page.

In pursuit of a solution

The subject for the project was identified by undergraduate third year students of mechanical engineering during their visit to a rolling mill. The manufacturing of the rolled bar in the mill begins with the melting of scrap in an induction furnace followed by continuous casting of billets that consequently go through a number of roll passes to finish as bars of required diameter. During the rolling operation, high carbon high chromium steel slitters are used in the intermediate operation. A pair of slitters slits through the incoming hot

stock into two bars. During the splitting, the splitters also get hot to around 150 to 200°C. These slitters are continuously water cooled so as to last longer. A couple of slitters last for the making of 400 metric tons (MT) steel bars before wearing out. A project was thought of to process these AISI D2 steel slitters cryogenically and to carry out the life assessment in the laboratory and also on the shop floor.

Cryogenic treatment of materials

Cryogenic processing (processing of materials below -150°C) is making inroads into the industries due to an extensive research being carried out since 1982 when Barron RF first tried this processing on different materials. Cryogenic treatment is the process of causing changes in materials by exposing them to cryogenic temperatures for a predetermined time period. Although the research could back up the effects of this treatment on different materials, the adoption of the process in the industries is still not up to the mark. Various benefits of this process have been supported by the research. Some of them are improvement in the wear resistance and surface roughness of tools and other alloy steels, polymers, aluminum alloys, composites etc.

If one searches the web, many research papers are available on the subject. However, it's rare to

find verification of the laboratory results on the actual application or the shop floor. While lab results in the research about the improvements are highly attractive, the benefit realization on the shop floor often creates debatable results. It's very important to understand here that an engineering component during its manufacture undergoes various steps and each step contributes to the final attainment of the desired performance. It has been proven beyond doubt today that each heat treatment step of a steel component is interrelated and affects the final performance of the material.

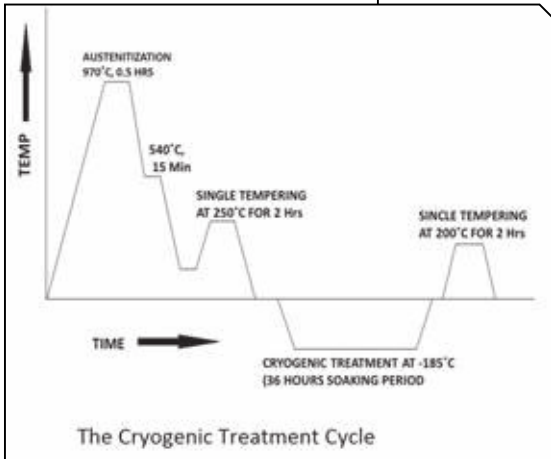
Project execution

When the project on the AISI D2 slitters was executed, each step of the heat treatment was

INVOLVING STUDENTS IN SUCH PROJECTS IS OF IMMENSE HELP TO THEM TO GET 'INDUSTRY READY'. TO FACILITATE THIS, FACULTIES IN ENGINEERING INSTITUTES MUST ACKNOWLEDGE THIS NEED AND CONNECT WITH THE INDUSTRY.



The slitter.




monitored for the parameters and the treatment conditions. It was also planned to assess the economic implications, as the results were to be applied to the manufacturing activity. This is an important factor at the interface of laboratory and the shop floor. The processor was designed and developed by one of the alumni of the institute. The imported cryogenic processors are exorbitantly priced. Therefore, the processor was indigenously developed suitable to the laboratory needs. This also motivated a student to convert it into a business activity as a start-up.

Lab evaluation

Samples for the lab evaluation were carved out of the slitters by EDM. The conventionally manufactured slitters and the samples were subjected to vacuum hardening and tempering in an industrial furnace. This material was further subjected to cryogenic treatment at -185°C for 36 hours by carefully adjusting the ramp down, soaking, and ramp up cycle. The treatment parameters and other necessary details are already in the literature available in plenty. A low temperature tempering cycle at 180°C for 2 hours was given to the slitters after the cryogenic treatment. The lab evaluation of wear was carried out by Pin on Disc testing machine. The weight loss was measured under standard conditions for untreated, cryogenically treated, at room temperature and at 150°C . It was observed that the improvement in the wear weight loss of the slitters was 53 percent for the room temperature test, and 71 percent for the wear test at 150°C . The improvement in the wear at elevated temperature can be attributed to additional precipitation of the Eta carbides.

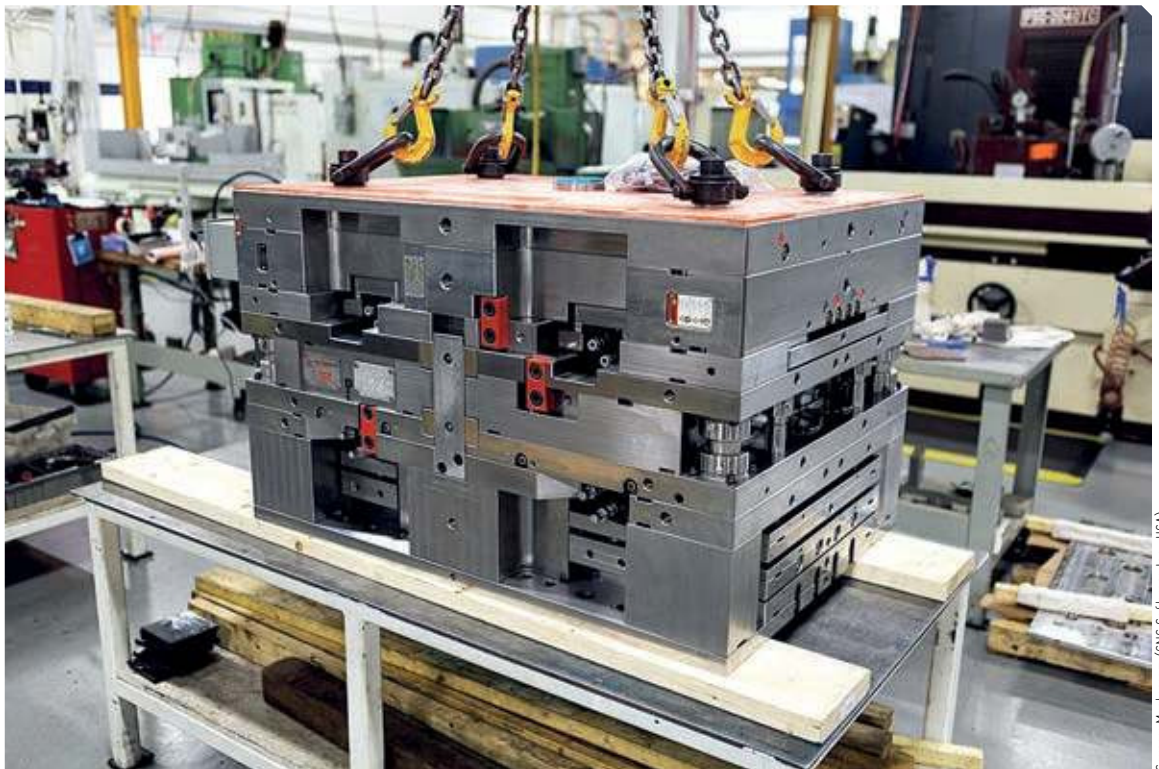
The slitters were further subjected to the field test at the rolling mill. The capacity of the plant is to produce 22,000 MT of steel bars per month. The measurements were made for the depth of the ring of the slitters before and after the production of 400 MT of steel bars for both untreated and treated slitters. The worn-out depth of the cryogenically treated slitters was observed to be one third of the normal slitters. The weight loss in a slitter before and after the production of 400 MT of steel bars was also measured and the best result was the improvement by 70 percent for the cryogenically treated slitter. The outcome of the field test shows that the cryogenically treated couple of slitters can produce approximately 1200 MT of steel bars before wearing out. The requirement of slitters reduces drastically from 110 to 36 for a month of manufacturing. The cost calculations per ton of steel bars produced indicates that during normal working, a slitter costs ₹15 per ton of steel bars produced whereas a cryogenically treated slitter contributes only ₹5 per ton of steel bars produced. A net saving of ₹10 per ton of steel amounts to an annual saving of ₹26.4 lakh.

A worthwhile effort

In similar kind of studies, both in the laboratory and on the actual field, the results thus obtained can easily induce confidence in the industry to adopt a certain technology. It's mainly students who will be benefitted of such an exposure to the industry to get prepared for the challenges in the journey ahead. The i2 Academia Pavilion initiative by IMTMA at IMTEX is a step in the direction to bridge the academia and the industry gap, and the effort is already bearing fruit. 

IT'S ALL ABOUT HAVING THE **RIGHT TOOLS**

Advanced CAM techniques help Cap-Thin Molds reduce moulding cycles and tool lead times.



Source: Mastercam (CNC Software Inc., USA)

Cap-Thin Molds, a manufacturer of precision, multi-cavity tools for caps and closures, has a unique value proposition. The company will guarantee cycle times and if the tools do not perform accordingly, Cap-Thin will return the customer's money.

Carmen Goudey, Manager of CNC Operations, Cap-Thin Molds, explained that customers sometimes resist the idea of paying a few thousand dollars more for Cap-Thin's high-precision tooling, but once the tools start producing, it's a different story. He recalls the reaction of a new customer

that started using a 12-cavity tool guaranteed to deliver an eight-second cycle. The previous mould, that was in nearly-continuous use for five years, had a 12-second cycle. The customer was absolutely amazed at the productive capacity that had been gained. The extra cost of the tool was recovered almost immediately.

Cycle times, lead times challenges

While cycle times are no problem for Cap-Thin's customers, lead times were. Cap-Thin came into being in 2013 as the result of a merger between two highly regarded

tool makers that wanted to grow its infrastructure in order to satisfy customer requests for more tooling and shorter lead times. At the time of the merger, lead times for 32-cavity moulds were 18-20 weeks.

Today, the manufacturing operations are consolidated within a new, larger facility and lead times for a 32-cavity mould have been driven down to 8-10 weeks. Goudey said that much of lead time improvements could be credited to the company's reliance on 4-axis high speed machining centers and advanced computer aided software - Mastercam CAM software from CNC Software, Inc., Tolland, CT.

Source: Mastercam (CNC Software Inc., USA)

Bench free machining

In the CNC shop, there are typically 15 to 20 projects going on at any one time. Each machinist programs, sets up, and operates his own machine. Each CNC machine has a computer with its own seat of Mastercam installed on it. The company has a little more than a dozen seats of Mastercam and anticipates

Problem:
Cap-Thin Molds' lead times were the issue: for 32-cavity moulds, the lead times were 18-20 weeks.

Solution:
With the aid of 4-axis high speed machining centers and advanced computer aided software - Mastercam CAM software from CNC Software, lead times for a 32-cavity mould have been driven down to 8-10 weeks. The company by roughing toolpaths with the incorporation of Mastercam's Dynamic Motion technology has been able to minimize cutting tool wear. This has not only reduced tool costs, but has also improved manufacturing process' accuracy and consistency.

installing additional seats of more modules soon. Cap-Thin's programmer machinists are very experienced. They create precision CNC programs in Mastercam, based

on solid models sent from the engineering department. Goudey said, "We pride ourselves on the fact that our moulds are bench free. The machine tools are very accurate and our surfaces are extremely high precision and high finish. So when the components come off the machine, everything fits like a glove. There is no hand work involved."

"We specialize in high speed machining. The bulk of our equipment are 4-axis high speed state-of-the-art machining centers. To take full advantage of them, you need specialized software. When CNC Software came out with its 3D high speed toolpaths, it was a real game changer for us. We started out using some of the high speed toolpaths and some of the legacy. For the most part, now we can do everything we need to do with the high speed toolpaths."

To make such intricate, high precision components, Cap-Thin's programmer machinists typically do not rely on the "book value" when setting machining parameters. Goudey said, "We will program what we think is correct and then the tool talks to you. You can usually hear it and see by the motion of the machine if you are at risk of breaking a tool or having it pull out of the chuck

CUSTOMERS SOMETIMES RESIST THE IDEA OF PAYING A FEW THOUSAND DOLLARS MORE FOR CAP-THIN'S HIGH-PRECISION TOOLING, BUT ONCE THE TOOLS START PRODUCING, IT'S A DIFFERENT STORY.



"We look forward to continuing our relationship with Mastercam. I fully expect improvements in the future. I am a Beta tester, so I have a vision of what is coming our way with the next release and beyond. It excites me that CNC Software does not sit on its laurels but continues to evolve with their technology and software. We have a sizable investment in Mastercam and maintenance and training. As our company grows, it's nice to see that Mastercam continues to grow too."

Carmen Goudey
CNC Operations Manager
Cap-Thin Molds, Mississauga, Ontario, Canada

or if there is a problem with evacuation. Based on what the tool is telling us, we fine-tune the feeds and speeds to what seems to be most acceptable for that particular part. Then we capture everything in a Mastercam file so that when we have to make the part again; it's plug and play." High speed machining, along



Source: Mastercam (CNC Software Inc., USA)



Source: Mastercam (CNC Software Inc., USA)

with reducing the number of set-ups, tool changes and secondary operations, have all played an important role in reducing lead times by almost 50 percent in many cases. However, none of these time compression strategies are viable if they in any way compromise the machining precision that ultimately contributes to cycle time reduction on the injection moulding press.

Chasing tenths

Goudey said, “We are chasing tenths. That is a challenge because there are so many factors that go into maintaining accuracy. We control temperature in our shop to 1° or 2°C. All of our machines are

on special vibration dampening foundations. Our cooling is tightly controlled because equipment operating at 42,000 and 30,000 rpm will generate a lot of heat and spindle growth. We just implemented on-machine gauging with our spindle probes to eliminate the need to take complex components off the machine a couple times for in-process checks at the CMM.

Cap-Thin is also increasingly relying on roughing toolpaths incorporating Mastercam’s Dynamic Motion technology to minimize cutting tool wear. This not only reduces tool costs, but also improves manufacturing process’ accuracy and consistency.

Goudey said, “With the

“WE PRIDE OURSELVES ON THE FACT THAT OUR MOULDS ARE BENCH FREE. THE MACHINE TOOLS ARE VERY ACCURATE AND OUR SURFACES ARE EXTREMELY HIGH PRECISION AND HIGH FINISH. SO WHEN THE COMPONENTS COME OFF THE MACHINE, EVERYTHING FITS LIKE A GLOVE. THERE IS NO HAND WORK INVOLVED.”



Source: Mastercam (CNC Software Inc., USA)

Dynamic toolpaths, our tooling costs are less because we are using multi-fluted carbide variable geometry end mills. We can use the flute of the end mill rather than having toolpaths where you are stepping down in small Z steps and all the wear is distributed on the bottom corners of the tool. With Dynamic, you are using a deeper depth of cut with a shallow radial depth of cut that distributes the wear over a larger portion of the tool. Our tool life is probably ten times better, evacuation is excellent, and there is less wear and tear on our machines.

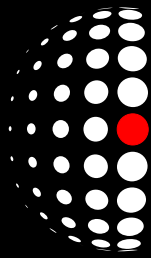
Looking forward

Simply building a complex precision multi-cavity tool is not enough to ensure the reduced press cycle value proposition will actually be fulfilled. So Cap-Thin has a test facility with three injection moulding machines dedicated to verifying that moulds are production-ready when they arrive at the customer.

Another recent venture targeting value-add was a partnering effort with a moulding machine builder to develop a mould system that makes it possible to perform two-color moulding on a conventional press.

Goudey said that Cap-Thin is continually updating equipment to improve precision and break bottlenecks. Securing a steady stream of qualified workers who can understand and use these technologies effectively is a concern that is being addressed via work-study programs that Cap-Thin is involved in with two local area colleges. “All these things involve a lot of work,” he said, “but it is something we owe our loyal customers who are rewarding us with more business.”





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IMTEX FORMING 2018 & TOOLTECH 2018: FOCUSING ON FUTURE GROWTH

Held with the aim to showcase the latest in the forming technologies, Indian Machine Tool Manufacturers' Association's (IMTMA) premier exhibition for South and South-East Asia, IMTEX FORMING 2018 & Tooltech 2018, turned out to be a raging success. A snapshot of the event.



Dignitaries at the opening ceremony of IMTEX FORMING 2018.

IMTMA's highly awaited flagship event for the Indian metal forming industry, IMTEX FORMING 2018 & Tooltech 2018 at the Bangalore International Exhibition Centre (BIEC), Bengaluru, was held from January 25-30, 2018.

The mega show brought together visitors from a wide spectrum of manufacturing and ancillary industries including key decision and policy makers as well as industry captains keen to source latest technologies and manufacturing solutions for their product lines.

Inaugural ceremony

The six-day mega affair on the metal forming sector was inaugurated by Shri RV Deshpande, Hon'ble Minister for Large & Medium Scale Industries and Infrastructure Development, Government of Karnataka. Other dignitaries present were Jamshyd N Godrej, Chairman - Exhibitions, IMTMA & Chairman, Board of Godrej & Boyce Mfg Ltd; P Ramadas, President, IMTMA & Managing Director, AMS Ltd; V Anbu, Director General & CEO, IMTMA; Indradev Babu, Vice President, IMTMA & Managing

Director, UCAM Pvt Ltd; Nirmal K Minda, President, ACMA & Chairman & Managing Director, Minda Industries Ltd; and AS Kiran Kumar, Vikram Sarabhai Distinguished Professor & Former Chairman, ISRO.

Addressing the gathering of manufacturers, end-users, and experts in the Indian metal forming industry, Godrej stressed on the importance of IMTEX and other exhibitions: "Exhibitions have a huge role to play in the industrial growth. It is through such trade fairs that the industrial strength

POONAM PEDNEKAR
Chief Copy Editor
Magic Wand Media Inc
poonam.pednekar@magicwandmedia.in





“Exhibitions like IMTEX FORMING help Indian companies to grow. The industry also has a significant role to play towards skilling, which will not only address the pertinent talent gap, but will also help create employment.”

Shri RV Deshpande
Hon'ble Minister for Large & Medium Scale Industries and Infrastructure Development
Government of Karnataka

of a nation is gauged, and the windows of opportunity opened for further progress.” Providing statistics, Ramadas highlighted the success of the machine tool industry, “Indian machine tool industry registered an impressive growth rate of 23 percent during 2016-17. The Indian machine tool industry is expected to grow by around 20 percent during 2017-18 and Indian metal forming industry is expected to grow at a CAGR of around 15 percent in the next 3 years.” Making a case for investing in the state of Karnataka, Shri Deshpande said, “Karnataka remains committed to supporting growth with



“Exhibitions have a huge role to play in industrial growth. It is through such trade fairs that the industrial strength of a nation is gauged, and the windows of opportunity opened for further progress.”

Jamshyd N Godrej
Chairman - Exhibitions, IMTMA
Chairman
Board of Godrej & Boyce Mfg Ltd

infrastructure, like quality roads and Namma Metro which will soon extend up to BIEC.” He emphasized on the industry’s responsibility to create local jobs and allow MSMEs to thrive. Minda lauded the contribution of the machine tool industry to the growth and development of engineering industry of the nation. True to his academic roots, Kiran Kumar reminded the gathering of the vital role of innovation, “As metal forming and tool technology keeps improving, it is for the industry captains to make sure that they spend some more money in R&D and really go ahead of the global market.”



“The manufacturing Purchasing Managers’ Index (PMI) recorded 54.7 in December 2017 as compared to November 2017. The rupee is gaining on the US dollar, which is an encouraging sign for indigenous manufacturers. We are having a bullish year in 2017-18, which will carry over the next five years.”

P Ramadas
President, IMTMA
Managing Director, AMS Ltd

At the ceremony, Babu was honored with the IMTMA - Vinod Doshi Outstanding Entrepreneur Award. The award has been instituted in memory of Vinod Doshi, Chairman of Premier Ltd, an outstanding industrialist and one of the founding fathers of IMTMA.

Stats speak

The exhibition featured over 500 exhibitors in 3 halls covering a gross exhibition area of around 33,000 sq mt. Twenty-three countries including India participated in the show with group participations from three country-group pavilions: China, Taiwan and Germany.

THE INDIAN MACHINE TOOL INDUSTRY IS EXPECTED TO GROW BY AROUND 20 PERCENT DURING 2017-18 AND INDIAN METAL FORMING INDUSTRY IS EXPECTED TO GROW AT A CAGR OF AROUND 15 PERCENT IN THE NEXT 3 YEARS.



Indradev Babu, Founder & Managing Director, UCAM and Vice President, IMTMA, receiving the IMTMA Premiere Outstanding Entrepreneur Award from Shri RV Deshpande, Hon'ble Minister of Medium to Large Industries, Government of Karnataka, at the inaugural ceremony of IMTEX FORMING 2018.



Out of the 44 institutes that participated in i2 Academia Pavilion to showcase their R&D capabilities in metal working field, Marathwada Institute of Technology (MIT), Aurangabad, bagged the first prize.



“This year, the Metal forming sector has grown almost 15 percent, and is expected to cross ₹ 2,800 cr in terms of consumption, up from around ₹ 2,450 cr last financial year. Riding on investments in various sectors like Auto, Aerospace, Railways and others, I have no doubt that the industry will be able to maintain this growth pace for the next two to three years.”

V Anbu
Director General & CEO
IMTMA

Opinions that matter

IMTEX 2018 welcomed visitors from varied industries and had something to offer to all. “It was a wonderful experience to have all the machine tools manufacturers under one roof. IMTEX FORMING 2018 displayed several innovative ways of manufacturing. It covered everything from material handling to robotics,” said SN Dileep, Unit Head, Apollo Tyres Ltd. The delegates also held IMTEX in high regard. “We are on an expansion drive and need to install some additional sheet metal machines such as bending machines, plasma cutting machines etc. Our purpose in visiting IMTEX 2018 was to find prospective suppliers or manufacturers of those machines and also to check their prices. The event, therefore, played crucial for us at this stage,” revealed B Saravana Sridhar, General Manager - Operations, Sieger Spintech Equipments Pvt Ltd.

Parallel events

Coinciding with IMTEX FORMING 2018 & Tooltech 2018, IMTMA

RUNNING CONCURRENT TO THE EVENT WAS i2 ACADEMIA PAVILION, ANOTHER IMTMA INITIATIVE THAT PROVIDED AN OPPORTUNITY FOR INDIAN ACADEMIC / R&D INSTITUTIONS TO SHOWCASE THEIR R&D CAPABILITIES IN METAL WORKING FIELD.



“I congratulate IMTMA not only for organizing this exhibition, but also for the contribution of the machine tool industry to the growth and development of the engineering industry of the nation.”

Nirmal K Minda
President, ACMA
Chairman & Managing Director
Minda Industries Ltd



“Thanks to the Indian Government’s initiatives like ‘Make in India’ and political stability, the market sentiment has improved, which has contributed to creating a positive market trend.”

Niraj Seth
President
Amada India Pvt Ltd

organized a one-day International Seminar on Forming Technology. Running concurrent to the event was i2 Academia Pavilion, another IMTMA initiative that provided an opportunity for Indian Academic / R&D Institutions to showcase their R&D capabilities in metal working field. 44 institutes presented their projects that were appreciated by the industry fraternity and the best ones were awarded. Marathwada Institute of Technology was announced the winner. PPDM IIT DM won the second prize and IIT Bombay came third.



“The Indian market is favorable due to the various initiatives by the Indian Government. It’s encouraging that exhibitions like IMTEX FORMING 2018 are happening at such a crucial period of this positive shift in Indian economy.”

Anil Bhardwaj
Managing Director
Yamazaki Mazak India Pvt Ltd




“IMTEX is the best platform to showcase our latest offerings and meet our potential customers.”

Jitendrakumar Kataria
Managing Director
Beckhoff Automation Pvt Ltd

There were other initiatives such as CONNECT and Reverse Buyer Seller Meet (RBSM).

IMTEX soon to turn 50

IMTEX has come a long way from its humble beginnings in Mumbai, and the 2019 edition of IMTEX CUTTING will mark the 50th anniversary of its first ever exhibition. IMTMA’s flagship event IMTEX 2019 will happen from January 24-30, 2019 in Bengaluru at BIEC. Mark your calendar and join in the celebration. 

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EMPOWERING THE GENNEXT

It was an exhilarating experience to be part of the charged up audience comprising 5,000 engineers, industry leaders, academicians, students and partners for SOLIDWORKS World 2018 (SWW 18), in Los Angeles, California. The three-day conference from February 05-07, 2018 demonstrated the latest technologies in designing software and high-powered customer stories. A report...

The mega annual user conference raised its curtain by bringing Bernard Charlès, Vice Chairman of the Board of Directors and CEO, Dassault Systèmes and Gian Paolo Bassi, CEO, SOLIDWORKS, on a moveable feast table designed in SOLIDWORKS by Two Bit Circus.

Brent Bushnell, CEO, Two Bit Circus, delivered the keynote address on how it uses SOLIDWORKS to design temporary high-tech entertainment and promotional installations for corporate clients.

SOLIDWORKS' 3DEXPERIENCE platform

Elaborating on the company's string of successful years, Bassi spoke about the new 3DEXPERIENCE platform, which gives the users the option to transition to it. "We are increasing the ability of our products to help you automate and integrate your innovation processes to increase the speed with which you can transform information into knowledge and seamlessly transmit that knowledge within your own and your partners' organizations," he explained.

3DEXPERIENCE Social Collaboration Services: provides an open, cloud-based collaboration platform for connecting



Presenting his vision at SWW 2018, Gian Paolo Bassi, CEO, SOLIDWORKS, oriented that the next revolution is Digitization and Collaboration of information.

Source: Magic Wand Media Inc

stakeholders and contributors ranging from the design team to final consumers.

SOLIDWORKS 3DEXPERIENCE PLM Services: helps to collaborate and manage the life of part generation.

SOLIDWORKS Product Designer: is fully Integrated from Art to Part.

SOLIDWORKS xDesign: is a cloud-based solid modeling system that runs anytime and anywhere on any browser and operating system.

3DEXPERIENCE Marketplace: The 3DEXPERIENCE Marketplace Make and 3DEXPERIENCE Marketplace Part Supply jointly provide an environment in which contract manufacturers and suppliers can interact with SOLIDWORKS users to bridge the gap between the virtual

and the real world and improve collaboration efficiency.

Explaining the thought process behind the platform, Charlès said, "Our vision with the 3DEXPERIENCE platform is to transform the design process into a single, virtual, social enterprise that accelerates our users' ability to do business, innovate, and create value."

Echoing the sentiment, Suchit Jain, Vice President, Strategy & Business Development, SOLIDWORKS reiterated, "What I love about SOLIDWORKS is very simple: you, our massive and growing user community, who is driving innovation in many different fields including aerospace, automotive, consumer electronics, industrial machinery and many others."

SOUMI MITRA
Editor-in-Chief
Modern Manufacturing India
soumi.mitra@magicwandmedia.in





SG Robotics uses SOLIDWORKS to design exoskeletons that enable people with a wide range of disabilities to walk without assistance.

Source: Magic Wand Media Inc

Collaboration works

With over 5 million users, SOLIDWORKS' MySolidWorks is the largest online community in the world where the solution partners make huge contributions. In this regard, Jain emphasized three emerging areas that are shaping the future of engineering: VR/AR, 3D Printing, and IoT.

With new capabilities to be launched soon, Meta has shortened the process of taking a CAD model into an Augmented Reality (AR) / Virtual Reality (VR) model.

The increased focus on 3D Printing was clearly visible in

the Partner Pavilion and the number of booths showing innovations in this field. Ric Fulop, CEO & Co-Founder, Desktop Metal, commented, "We are excited to partner with Dassault Systèmes on the preview of our latest innovation, Live Parts, and offer our software tool as a means for educational exploration to the largest community of engineers leading advancements in additive manufacturing."

Connected products and IoT are changing the way products are designed. As the demand for "smart" products become more prevalent, SOLIDWORKS is investing in partnerships to ensure users have the tools to meet the demand for IoT.

Knowledge-based startups

The company acknowledges the fact that education is critical for growing the next generation of engineers and, hence, provides free software and mentorship to aspiring designers through its SOLIDWORKS Entrepreneur program. Marie Planchard, Director Education & Early Engagement, SOLIDWORKS, shared that by supporting 3,000 plus competitive teams, and sponsoring hundreds of organizations, such as SAE,



Source: Magic Wand Media Inc

The twins - Yash Dhake from Mechanical Engineering stream and Samruddhi Dhake from Computer Engineering branch from Pimpri Chinchwad College Of Engineering (PCCOE) Pune - winners of the seventh edition of 'Aakruti', an annual nationwide design competition, presented their innovative design on 'Smart Product for Waste management and Reuse' at SOLIDWORKS World 2018 in Los Angeles along with their guide Dr SS Lakade, Dean R&D, PCCOE.

AUVSI, and FIRST Robotics, students are being provided the opportunity to enrich their classroom work with real-life engineering projects.

One such inspiration is Dr Kyoungchul Kong, CEO, SG Robotics and Professor at Sogang University, who was applauded at SWW 18 for his work in developing exoskeletons that reclaim mobility for paraplegics and others with partial disabilities. "We designed both the WalkON and Angelegs exoskeletons entirely in SOLIDWORKS and also made extensive use of SOLIDWORKS analysis tools. The critical safety analysis for the two exoskeletons was performed entirely in SOLIDWORKS," Dr Kong added.

SWW 18 HONORED PHIL SLUDER, A 20-YEAR SOLIDWORKS WORLD VETERAN ATTENDEE, WHO HAS BEEN AT ALL USER SESSIONS AT WORLD SINCE 1999.



Source: Magic Wand Media Inc

The new HP Jet Fusion 3D Printer Series enables to get high-quality, production-level parts, at par with injection moulding and CNC machines from a 3D printer

Future of possibilities

SWW 18 provided an insight into the ways myriad industry sectors are using SOLIDWORKS to innovate their designs to change the world. There is much to look forward to at SOLIDWORKS World 2019 on the software's new capabilities that is scheduled to take place in Dallas, Texas.



Grinding Solutions

CUSTOMIZED CYLINDRICAL GRINDER FOR TRANSMISSION SHAFTS

To meet the demands of manufacturing components with complex geometric details with the highest precision, the EMAG Group has individualized grinding solutions for the shafts integrated into complete production lines.

Technological advances in automotive engineering are rapidly changing the demands for production technology. The grinding specialists from the EMAG Group have developed the perfect solution for this environment: the HG 208 horizontal cylindrical grinder for the precision machining of shafts in series production.


Why customization is necessary

Off-the-shelf grinding solutions are virtually impossible for

many applications: Drive shafts for electric motors, complex camshafts or crankshafts as well as transmission shafts all require very different processes. "It is these very different demands that characterize the development of the HG 208 horizontal cylindrical grinder," explains Guido Hegener, Managing Director of EMAG Maschinenfabrik headquartered in Salach, Germany. "We offer our customers a wide range of different technology modules that can be easily integrated into a standardized machine. For instance, the HG 208 can be equipped with one or two compound slides, on each of which different external and internal grinding spindles can be fitted. By using a B-axis or a center drive, for example, we can provide the perfect solution for each customer-specific application." With its modular design principle, these machines can be adapted to a wide variety of machining tasks and integrated into EMAG production lines.

in order to avoid reclamping errors and to achieve increased precision. For machining the grooves, the grinder is equipped with a dressable ceramic CBN grinding wheel. With its perfect dressing system, the quality of the ball track stays high. For machining the taper face on the primary shaft (and similar surfaces on other shafts), EMAG has recently expanded its HG modular system: A corundum grinding wheel with a maximum diameter of 750 mm (29.5 in.) is used for this task.

Complete production lines from EMAG

Another important factor for production planners in the automotive industry is the holistic approach from EMAG. The mechanical engineering company masters all processes for soft and hard machining and has extensive experience in the establishment of complete production solutions. For example, a transmission shaft is pre-processed on EMAG VTC (vertical turning centers) and finished on HG series grinders. With the associated line automation, EMAG completely adapts itself to customer requirements. "The HG 208 has been on the market for around 15 years already – this means customers benefit from a technology that is well established, but which continues to intelligently expand in order to cover a variety of fields of application," summarizes Hegener. 

Meeting today's requirements

The central or primary CVT transmission shaft represents a real grinding challenge in the production process: On the one hand, the control wheel surface is precisely machined by an angle plunge. On the other hand, axial ball track grooves have to be machined. With EMAG, both processes are performed in a single clamping operation

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Modular Drills

Modular Drilling with Solid Carbide Performance

KenTIP FS is a perfect combination of a solid carbide and an indexable drill.

After having received an overwhelming response to KenTIP modular drill in the past decade, Kennametal has launched its upgrade - KenTIP FS, which is capable of drilling in steel, stainless steel and cast iron materials and has the parameters of a high-performance solid carbide drill.

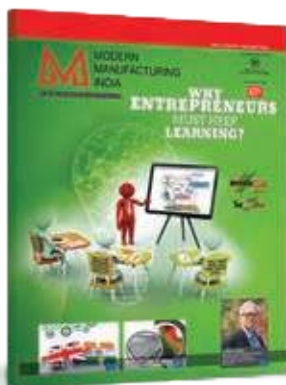
Following are the features of KenTIP FS that make it a one-stop solution for substantial cost savings and process simplifications on the shop floor.

- The modular drilling system covers a 6–26 mm diameter range and up to 12 x D drilling depths.
- Applicable in steel, stainless steel, and cast iron.
- The KenTIP FS is available in 3-point geometries, 3 high-performance grades and 3 different shank styles.
- **Full solid carbide circumferential insert design:** Ensures less holder wear even in unstable cutting conditions.
- **Multi coolant capability:** Ensures at least 40 percent higher coolant flow to the cutting edge, which maximizes tool life.
- **Fast flow:** The flute design plus polishing ensures obstruction free chip flow even in long chipping materials and deeper holes. Thus it helps in less holder washouts, high process safety, and enhanced tool life and performance.
- **Intelligent Interface design:** The advanced patented intelligent interface ensures highest rigidity clamping. It allows less stress peaks and radial loads in the interface, thereby promoting high feed capability. Retention lock prevents insert pullout.
- **Increased feed capabilities by up to 15 percent:** Increases pocket life through lower stress peaks, less movement, less contact with chips and workpiece.



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murali.sundaram@magicwandmedia.in
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Mumbai: Arunima Nath
arunima.nath@magicwandmedia.in
+91 9833744969

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